

3.5 Energy, Greenhouse Gases, and Climate Change

This section describes energy use and greenhouse gas (GHG) emissions in the Planning Area and analyzes potential impacts of the Proposed Project on energy usage and GHG emissions.

Environmental Setting

PHYSICAL SETTING

Energy

In the United States, California is the second largest consumer of energy, second only to Texas (EIA, 2016). However, California's per capita energy consumption is relatively low, in part due to mild weather that reduces energy demand for heating and cooling, and in part due to the State's energy efficiency programs and standards. Petroleum and natural gas currently supply the majority of the energy consumed in California.

The concept of sustainable energy generally refers to renewable energy sources, such as solar power, wind power, wave power, geothermal power, tidal power, and biomass, as well as technologies that improve energy efficiency. Energy conservation refers to efforts made to reduce energy consumption in order to preserve future resource capacities and reduce pollutants. Energy conservation can be achieved through increased energy efficiency, decreased energy consumption, and/or reduced consumption from conventional, nonrenewable energy sources.

State Energy Conditions

Electricity

In 2014, California used over 262,560 gigawatt-hours of electricity (EIA, 2016). Electricity use in California for differing land uses varies substantially by the type of uses in a building, type of construction materials used in a building, and the efficiency of all electricity-consuming devices within a building.

Because of the State's energy efficiency standards and efficiency and conservation programs, California's per capita electricity use has remained stable for more than 30 years while the national average has steadily increased. The California Energy Commission's (CEC's) 2016 Integrated Energy Policy Report Update estimates that electricity consumption will grow by up to 1.42 percent per year between 2015 and 2026, with peak demand growing an average of 1.03 percent annually over the same period.

Of California's electricity generation in 2015, the majority is from natural gas (60 percent), nuclear power plants (9 percent), and solar production (8 percent). Other sources include coal-fired power plants and other renewable energy sources, such as wind turbines. California also imports electricity from out of state (CEC, 2016a).

Natural Gas

In 2014, California used approximately 2.4 trillion cubic feet of natural gas (EIA, 2016). California is the second largest natural gas consumer in the United States, representing more than 10 percent of national natural gas consumption. In 2012, residential and commercial uses accounted for 30 percent of the state's natural gas demand, large consumers such as electricity generators and the industrial sector accounted for about 70 percent of demand, and vehicle fuel amounted to 1 percent of natural gas usage in the state (CEC, 2017a). California remains heavily dependent on natural gas to generate electricity, which accounted for roughly 40 percent of natural gas demand (CEC, 2016b).

The CEC's 2015 Integrated Energy Policy Report forecasts that natural gas consumption by end users (excluding electricity generation) is expected to grow by up to 0.33 percent annually through 2024 (CEC, 2016b).

Petroleum

In 2010, California used approximately 588.5 million barrels of petroleum (EIA, 2016). Petroleum use in California includes petroleum products such as motor gasoline, distillate fuel, liquefied petroleum gases, and jet fuel.

Due to the prevalence of petroleum product use in the transportation sector, the rise in costs of these fuels, the federal Renewable Fuel Standard (RFS), and the California Low Carbon Fuel Standard (LCFS), California is diversifying its transportation fuel sources, increasing fuel efficiency, and changing land use and urban design to reduce the needs for transportation.

Local Energy Conditions

Table 3.5-1 shows 2015 electricity and natural gas usage in the Planning Area for the residential, commercial, and industrial sectors.

Table 3.5-1: Annual Residential, Commercial, and Industrial Electricity and Natural Gas Use; 2015

Sectors	Utility Type	Redlands Usage	Planning Area Usage
Residential	Electric (kWh)	203,878,268	205,849,668
	Natural Gas (therms)	9,399,719	9,473,958
Commercial	Electric (kWh)	216,129,896	216,645,511
	Natural Gas (therms)	4,393,353	4,408,735
Industrial	Electric (kWh)	83,940,583	89,783,966
	Natural Gas (therms)	62,390	64,224
Total by Utility Type			
Electricity (kWh)		503,948,747	512,279,144
Natural Gas (therms)		13,855,462	13,946,916

Sources: Southern California Edison, 2017; Southern California Gas Company, 2017.

Greenhouse Gas Emissions

The Greenhouse Effect and Greenhouse Gases

Gases that trap heat in the atmosphere are often called “greenhouse gases” (GHGs). The greenhouse effect traps heat in the troposphere through a threefold process as follows: short-wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. This “trapping” of the long-wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect. Principal GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃), and water vapor (H₂O). Some GHGs, such as CO₂, CH₄, and N₂O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO₂ and CH₄ are emitted in the greatest quantities from human activities. Emissions of CO₂ are largely by-products of fossil fuel combustion, whereas CH₄ results mostly from off-gassing associated with agricultural practices and landfills. Human-made GHGs, which have a much greater heat-absorption potential than CO₂, include fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃), which are associated with certain industrial products and processes (CAT, 2006).

The greenhouse effect is a natural process that contributes to regulating the Earth’s temperature. Without it, the temperature of the Earth would be about 0° Fahrenheit (F) (–18° Celsius (C)) instead of its present 59°F, or 15°C (University Corporation for Atmospheric Research, 2017). Global climate change concerns are focused on whether human activities are leading to an enhancement of the greenhouse effect, which increases the Earth’s temperature.

The effect each GHG has on climate change is measured as a combination of the mass of its emissions and the potential of a gas or aerosol to trap heat in the atmosphere, known as its “global warming potential” (GWP). GWP varies between GHGs; for example, the GWP of CH₄ is 25, and the GWP of N₂O is 298. Total GHG emissions are expressed as a function of how much warming

would be caused by the same mass of CO₂. GHG gas emissions are typically measured in terms of pounds or tons of “CO₂ equivalent” (CO₂e).¹

California Contributions to Greenhouse Gas Emissions

In 2014, the United States produced 6,870.5 million metric tons of CO₂e (MMTCO₂e) (EPA, 2016a). The primary GHG emitted by human activities in the United States was CO₂, representing approximately 81 percent of total GHG emissions. The largest source of CO₂, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 94 percent of the CO₂ emissions and 76 percent of overall GHG emissions.

According to the 2014 GHG inventory data compiled by the California Air Resources Board (CARB) for the California Greenhouse Gas Inventory for 2000–2014, California emitted 441.5 MMTCO₂e of GHGs, including emissions resulting from out-of-state electrical generation (CARB, 2016). The primary contributors to GHG emissions in California are transportation, industry, electric power production from both in-state and out-of-state sources, agriculture and forestry, and other sources, which include commercial and residential activities. These primary contributors to California’s GHG emissions and their relative contributions in 2014 are presented in Table 3.5-2, GHG Sources in California.

Table 3.5-2: GHG Sources in California

Source Category	Annual GHG Emissions (MMTCO ₂ e)	Percent of Total
Transportation	163.0	36.9 percent
Industrial uses	104.2	23.6 percent
Electricity generation (In State)	51.8	11.7 percent
Electricity generation (Imports)	36.6	8.3 percent
Agriculture and forestry	36.1	8.2 percent
Residential	27.4	6.2 percent
Commercial	21.6	4.9 percent
Other	0.8	0.2 percent
TOTALS	441.5	100.00 percent

Source: CARB, 2016.

Local GHG Emissions

The City of Redlands conducted a GHG emissions inventory for the Planning Area in 2015, finding that the Planning Area emitted 472,651 metric tons CO₂e (MTCO₂e) in 2015. As shown in Table 3.5-3 below, the transportation sector was the largest source of emissions, generating approximately 186,782 MTCO₂e, or 40 percent of total 2015 emissions. Transportation sector emissions are the result of diesel and gasoline combustion in vehicles traveling on both local roads and State highways that pass through the jurisdictional boundaries of the Planning Area. Electricity and natural gas consumption within the residential sector, the second greatest source of 2015 emissions, generated

¹ The CO₂ equivalent for a gas is derived by multiplying the mass of the gas by the associated GWP, such that MTCO₂e = (metric tons of a GHG) x (GWP of the GHG). For example, the GWP for CH₄ is 25. This means that emissions of 1 metric ton of methane are equivalent to emissions of 25 metric tons of CO₂.

97,723 MTCO₂e, or 21 percent of the total. The third greatest source, electricity and natural gas use in the Planning Area’s commercial sector, produced 73,272 MTCO₂e, or 16 percent of total emissions.

Table 3.5-3: 2015 GHG Emissions Summary by Sector (MTCO₂e)

<i>Sector</i>	<i>Annual Redlands Greenhouse Gas Emissions</i>	<i>Annual Planning Area Greenhouse Gas Emissions</i>
Residential	96,875	97,723
Commercial	73,071	73,272
Industrial	19,637	20,991
Transportation	170,635	186,782
Solid Waste	18,618	21,140
Water Transport, Distribution, and Treatment	2,284	2,594
Wastewater	2,222	2,523
Off Road Equipment	34,797	39,512
Public Lighting	747	848
Agriculture	530	27,267
TOTAL	419,417	472,651

Source: Dyett & Bhatia, 2017.

Climate Change

Climate change refers to a change in the average global climate that may be measured by wind patterns, storms, precipitation, and temperature. The term climate change is often used interchangeably with the term global warming. Global warming refers to an average increase in the temperature of the atmosphere near the Earth’s surface, which can contribute to changes in global climate patterns. However, rising temperatures are just one aspect of climate change.

The EPA’s indicators of climate change include:

- **Greenhouse Gases:** the amount of GHGs emitted into the atmosphere through human activities, the concentrations of these gases in the atmosphere, and how emissions and concentrations have changed over time.
- **Weather and Climate:** frequency of heat waves, increased drought conditions, increased average precipitation and shifting weather patterns, and the intensity of tropical storms.
- **Oceans:** increased ocean heat affecting water temperature, sea level, and currents; changes in sea level; increased ocean acidity affecting marine organisms.
- **Snow and Ice:** reduced Arctic sea ice, diminished glaciers, decreased time that lakes stay frozen, decreased snow cover and snowpack.
- **Health and Society:** heat-related illnesses, increased length of growing season reflecting earlier spring warming and later fall/winter frosts, prolonged allergy seasons.

- **Society and Ecosystems:** shifts in plant hardiness zones reflecting higher winter temperatures, changes in bird migration patterns as a result of temperature variability (EPA, 2016b).

Potential Effects of Human Activity on Climate Change

Among scientists, global climate change is now a widely accepted phenomenon. National and international science academies and scientific societies have assessed the available evidence and largely followed or endorsed the Intergovernmental Panel on Climate Change (IPCC) position of January 2001 which states: “An increasing body of observations gives a collective picture of a warming world and other changes in the climate system. There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities.” Since 1976, every year has been warmer than the twentieth-century average temperature. In 2015, the average temperature across global land and ocean surfaces was 1.62°F (0.90°C) above the twentieth-century average (NOAA, 2017). To date, no scientific body of national or international standing has maintained a dissenting opinion; the last was the American Association of Petroleum Geologists, which in 2007 updated its 1999 statement rejecting the likelihood of human influence on recent climate with its current noncommittal position.

Some of the potential impacts in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, higher O₃ days, larger forest fires, and more drought years. Several recent studies have attempted to explore the possible negative consequences that climate change, left unchecked, could have in California. These reports acknowledge that climate scientists’ understanding of the complex global climate system, and the interplay of the various internal and external factors that affect climate change, remains too limited to yield scientifically valid conclusions on such a localized scale. Substantial work has been done at the international and national level to evaluate climatic impacts, but far less information is available on regional and local impacts.

REGULATORY SETTING

Federal Regulations

Energy Policy and Conservation Act

In 1975, Congress enacted the Energy Policy and Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the act, the EPA and National Highway Traffic Safety Administration (NHTSA) are responsible for establishing additional vehicle standards. In 2012, new Corporate Average Fuel Economy (CAFE) standards were approved to increase the fuel economy to 54.5 miles per gallon average for cars and light trucks by Model Year 2025 (EPA, 2012). Fuel economy is determined based on each manufacturer’s average fuel economy for the fleet of vehicles available for sale in the United States.

The regulations also include targeted incentives to encourage early adoption and introduction into the marketplace of advanced technologies to dramatically improve vehicle performance, including:

- Incentives for electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles.

- Incentives for hybrid technologies for large pickups and for other technologies that achieve high fuel economy levels on large pickups.
- Incentives for natural gas vehicles.
- Credits for technologies with potential to achieve real-world GHG reductions and fuel economy improvements that are not captured by the standards test procedures.

Energy Star Program

Energy Star is a joint program of the EPA and the DOE. The program establishes criteria for energy efficiency for household products and labels energy efficient products with the Energy Star seal. Homes can be qualified as “Energy Star Homes” if they meet efficiency standards. In California, Energy Star Homes must meet energy efficiency standards as determined by a CEC-approved software program, pass the California Energy Star Homes Quality Insulation Installation and Thermal Bypass Checklist Procedures, have Energy Star windows, and have minimal duct leakage.

Massachusetts vs. EPA

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

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

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

Energy Independence and Security Act

The Energy Independence and Security Act of 2007 (EISA) set increased CAFE standards for motor vehicles and established other provisions related to energy efficiency:

- Renewable Fuel Standard (RFS) (EISA Section 202)
- Appliance and Lighting Efficiency Standards (EISA Sections 301–325)
- Building Energy Efficiency (EISA Sections 411–441).

This federal legislation requires ever-increasing levels of renewable fuels—the RFS—to replace petroleum. The EPA is responsible for developing and implementing regulations to ensure that

transportation fuel sold in the United States contains a minimum volume of renewable fuel. The RFS program regulations were developed in collaboration with refiners, renewable fuel producers, and many other stakeholders.

The RFS program was created under the Energy Policy Act of 2005 and established the first renewable fuel volume mandate in the United States. As required under the act, the original RFS program (RFS1) required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. Under the EISA, the RFS program was expanded in several key ways that lay the foundation for achieving significant reductions of GHG emissions from the use of renewable fuels, for reducing imported petroleum, and encouraging the development and expansion of our nation's renewable fuels sector. The updated program is referred to as RFS2 and includes the following:

- EISA expanded the RFS program to include diesel, in addition to gasoline.
- EISA increased the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022.
- EISA established new categories of renewable fuel and set separate volume requirements for each one.
- EISA required the EPA to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.

Additional provisions of the EISA address energy savings in government and public institutions, promoting research for alternative energy, additional research in carbon capture, international energy programs, and the creation of “green jobs.”

Carbon Pollution Standards and Clean Power Plan

On August 3, 2015, the EPA finalized the Carbon Pollution Standards, which are national limits on the amount of carbon pollution that new, modified, and reconstructed power plants will be allowed to emit. On the same date, the EPA also finalized the Clean Power Plan, national limits on the amount of carbon pollution from existing power plants. The EPA also approved oil and natural gas air pollution standards in 2016 to reduce pollution from the oil and natural gas industry.

State Regulations

Building Energy Efficiency Standards (Title 24) and CALGreen

California's Energy Efficiency Standards for Residential and Nonresidential Buildings (24 California Code of Regulations (CCR) Part 6) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption.

In 2007, Governor Schwarzenegger directed the California Building Standards Commission (CBSC) to work with State agencies on the adoption of green building standards for residential, commercial, and public building construction for the 2010 code adoption process. A voluntary version of the California Green Building Standards Code, referred to as CalGreen, was added to Title 24 as Part 11 in 2009. The 2010 version of CalGreen took effect January 1, 2011, and instituted mandatory minimum environmental performance standards for all ground-up new construction of commercial and low-rise residential buildings, state-owned buildings, schools, and hospitals.

The most recent CALGreen code was adopted in 2016 and became effective in 2017. CALGreen contains voluntary Tier 1 and Tier 2 levels, which are designed to exceed energy efficiency and other standards by 15 percent or 30 percent, respectively.

The California Building Code (CBC) has been amended and adopted as Title 15 of the Redlands Municipal Code, which regulates all building and construction projects within the city.

Assembly Bill 1493

In a response to the transportation sector accounting for more than half of California's CO₂ emissions, Assembly Bill (AB) 1493 was enacted in 2002. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the State board to be vehicles whose primary use is noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004.

Before these regulations could go into effect, the EPA had to grant California a waiver under the federal CAA, which ordinarily preempts State regulation of motor vehicle emission standards. The EPA Administrator granted the waiver on June 30, 2009. On March 29, 2010, the CARB Executive Officer approved revisions to the motor vehicle GHG standards to harmonize the State program with the national program for 2012–2016 model years (see *Energy Policy and Conservation Act* above). The revised regulations became effective on April 1, 2010.

Advanced Clean Cars Program

In 2012, CARB adopted the Advanced Clean Cars (ACC) program, developed in coordination with the EPA. The components of the ACC program are the Low-Emission Vehicle (LEV) regulations that reduce GHG emissions from light- and medium-duty vehicles, and the Zero-Emission Vehicle (ZEV) regulation, which requires manufacturers to produce an increasing number of battery electric and fuel cell electric vehicles, with provisions to also produce plug-in hybrid electric vehicles in the 2018 through 2025 model years.

Executive Order S-3-05

In 2005, Executive Order S-3-05 established California's GHG emissions reduction targets: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80 percent below 1990 levels by 2050. The California Environmental Protection Agency (CalEPA) Secretary is required to coordinate efforts of various agencies to collectively and efficiently reduce GHGs. The California Climate Action Team (CAT) is responsible for implementing global warming emissions reduction programs. Representatives from several State agencies comprise the CAT.

AB 32

In furtherance of the goals established in Executive Order S-3-05, the Legislature enacted AB 32, the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed on September 27, 2006. The GHG emissions limit is equivalent to the 1990 levels, which are to be achieved by 2020.

CARB has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions. This program will be used to monitor and enforce compliance with the established standards. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 allows CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.

The first action under AB 32 resulted in the adoption of a report (June 21, 2007) listing early action GHG emission reduction measures. The early actions include three specific GHG control rules that meet the narrow legal definition of “discrete early action GHG reduction measures”:

- A low-carbon fuel standard to reduce the “carbon intensity” of California fuels
- Reduction of refrigerant losses from motor vehicle air conditioning system maintenance to restrict the sale of “do-it-yourself” automotive refrigerants
- Increased methane capture from landfills to require broader use of state-of-the-art methane capture technologies.

On October 25, 2007, CARB approved an additional six early action GHG reduction measures under AB 32, which were also considered “discrete early action GHG reduction measures”:

- Reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology
- Reduction of auxiliary engine emissions of docked ships by requiring port electrification
- Reduction of PFCs from the semiconductor industry
- Reduction of propellants in consumer products (e.g., aerosols, tire inflators, and dust removal products)
- Requirements that all tune-up, smog check, and oil change mechanics ensure proper tire inflation as part of overall service in order to maintain fuel efficiency
- Restriction on the use of SF₆ from non-electricity sectors if viable alternatives are available.

As required under AB 32, on December 6, 2007, CARB approved the 1990 GHG emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 MMTCO₂e. In addition to the 1990 emissions inventory, CARB also adopted regulations requiring mandatory reporting of GHGs for large facilities that account for 94 percent of GHG emissions from industrial and commercial stationary sources in California. About 800 separate sources fall under the new reporting rules and include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and other industrial sources that emit CO₂ in excess of specified thresholds.

On December 11, 2008, CARB approved the *Climate Change Proposed Scoping Plan: A Framework for Change* to achieve the goals of AB 32. The scoping plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The scoping plan evaluates opportunities for sector-specific reductions, integrates all CARB and CAT early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program.

The key elements of the scoping plan include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
- Achieving a statewide renewables energy mix of 33 percent
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the LCFS
- Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of California's long-term commitment to AB 32 implementation.

Executive Order S-3-15

Executive Order S-3-15 issued in 2015 established an interim target to reduce GHG emissions to 40 percent below 1990 levels by 2030. In 2016, the Legislature passed Senate Bill (SB) 32, which codified the 2030 GHG emissions reduction target. To reflect this target, CARB's 2017 Climate Change Scoping Plan Update recommends that local governments target 6 MTCO₂e per capita per year in 2030 and 2 MTCO₂e per capita per year in 2050.

Senate Bill 1368

In September 2006, Governor Schwarzenegger signed SB 1368, which requires the CEC to develop and adopt regulations for GHG emissions performance standards for the long-term procurement of electricity by local publicly owned utilities. These standards must be consistent with the standards adopted by the California Public Utilities Commission (CPUC). This effort will help protect energy customers from financial risks associated with investments in carbon-intensive generation by allowing new capital investments in power plants whose GHG emissions are as low or lower than new combined-cycle natural gas plants, by requiring imported electricity to meet GHG performance standards in California, and by requiring that the standards be developed and adopted in a public process.

Executive Order S-1-07

Issued on January 18, 2007, Executive Order S-1-07 sets a declining LCFS for GHG emissions measured in CO₂e gram per unit of fuel energy sold in California. The target of the LCFS is to

reduce the carbon intensity of California passenger vehicle fuels by at least 10 percent by 2020. The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. CARB adopted the implementing regulation in April 2009. The regulation is expected to increase the production of biofuels, including those from alternative sources such as algae, wood, and agricultural waste. In addition, the LCFS would drive the availability of plug-in hybrid, battery electric, and fuel-cell power motor vehicles.

SB 97

In August 2007, the legislature enacted SB 97, which directs the Governor's Office of Planning and Research (OPR) to develop guidelines under the California Environmental Quality Act (CEQA) for the mitigation of GHG emissions. OPR was to develop proposed guidelines by July 1, 2009, and the Natural Resources Agency was directed to adopt the guidelines by January 1, 2010. On April 13, 2009, OPR submitted to the Secretary for Natural Resources its proposed amendments to the CEQA Guidelines.

The Natural Resources Agency adopted the CEQA Guidelines amendments on December 30, 2009, and transmitted them to the Office of Administrative Law on December 31, 2009. On February 16, 2010, the Office of Administrative Law completed its review and filed the amendments with the secretary of state. The amendments became effective on March 18, 2010. The amended guidelines establish several new CEQA requirements concerning the analysis of GHGs, including the following:

- Requiring a lead agency to “make a good faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project” (CEQA Section 15064.4(a))
- Providing a lead agency with the discretion to determine whether to use quantitative or qualitative analysis or performance standards to determine the GHG emissions resulting from a particular project (CEQA Section 15064.4(a))
- Requiring a lead agency to consider the following factors when assessing the significance of impacts from GHG emissions on the environment (CEQA Section 15064.4(b)):
 - The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting.
 - Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
 - The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.
- Allowing lead agencies to consider feasible means of mitigating the significant effects of GHG emissions, including, among others (CEQA Section 15126.4(c)):
 - Measures in an existing plan or program for reduction of emissions that are required as part of the lead agency's decision.

- Reductions in emissions through the implementation of project features or off-site measures, including offsets that are not otherwise required.
- In the case of the adoption of a general plan, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

The amended CEQA guidelines also establish two new guidance questions in the Environmental Checklist regarding GHG emissions (CEQA Guidelines Appendix G):

- Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The adopted amendments do not establish a GHG emission threshold, and instead allow a lead agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts. The Natural Resources Agency also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions.

SB 375

In August 2008, the legislature passed and on September 30, 2008, Governor Schwarzenegger signed, SB 375, which addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. Regional GHG reduction targets for the automobile and light-duty truck sector for 2020 and 2035, as determined by CARB, are required to consider the emission reductions associated with vehicle emission standards (see AB 1493), the composition of fuels (see Executive Order S-1-07), and other CARB-approved measures to reduce GHG emissions. Regional metropolitan planning organizations (MPOs) will be responsible for preparing a sustainable communities strategy (SCS) within their regional transportation plan (RTP).

The goal of the SCS is to establish a development plan for the region, which, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets. If a SCS is unable to achieve the GHG reduction target, an MPO must prepare an alternative planning strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies. SB 375 provides incentives for streamlining CEQA requirements by substantially reducing the requirements for "transit priority projects," as specified in SB 375, and eliminating the analysis of the impacts of certain residential projects on global warming and the growth-inducing impacts of those projects when the projects are consistent with the SCS or alternative planning strategy. On September 23, 2010, CARB adopted the SB 375 targets for the regional MPOs. Achieving these goals through adoption of a SCS will be the responsibility of the MPOs. CARB's targets called for the Southern California Association of Governments (SCAG) region, the MPO in which the Planning Area is located, to reduce per capita emissions 8 percent by 2020 and 13 percent by 2035 based on a 2005 baseline.

SCAG adopted its own RTP/SCS in April 2012 (see discussion below). The SCS lays out how the region will meet GHG targets to reduce per capita emissions 9 percent by 2020 and 16 percent by 2035 based on a 2005 baseline. In April 2016, SCAG adopted targets of 8 percent, 18 percent, and 21 percent reduction per capita GHG emissions by 2020, 2035, and 2040, respectively, based on a 2005 baseline.

Executive Order S-14-08

On November 17, 2008, Governor Schwarzenegger issued Executive Order S-14-08. This Executive Order focuses on the contribution of renewable energy sources to meet the electrical needs of California while reducing the GHG emissions from the electrical sector. The governor's order requires that all retail suppliers of electricity in California serve 33 percent of their load with renewable energy by 2020. Furthermore, the order directs State agencies to take appropriate actions to facilitate reaching this target. The California Natural Resources Agency, through collaboration with the CEC and California Department of Fish and Wildlife (CDFW), is directed to lead this effort. Pursuant to a Memorandum of Understanding between the CEC and the CDFW creating the Renewable Energy Action Team, these agencies will create a "one-stop" process for permitting renewable energy power plants.

Executive Order S-21-09

On September 15, 2009, Governor Schwarzenegger issued Executive Order S-21-09. This Executive Order directed CARB to adopt a regulation consistent with the goal of Executive Order S-14-08 by July 31, 2010. CARB is further directed to work with the CPUC and CEC to ensure that the regulation builds upon the Renewable Portfolio Standard (RPS) program and is applicable to investor-owned utilities, publicly owned utilities, direct access providers, and community choice providers. Under this order, CARB is to give the highest priority to those renewable resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health and can be developed the most quickly in support of reliable, efficient, cost-effective electricity system operations. On September 23, 2010, CARB adopted regulations to implement a "Renewable Electricity Standard," which would achieve the goal of the executive order (contribution of renewable energy to meet the state's electrical needs) with the following intermediate and final goals: 20 percent for 2012–2014, 24 percent for 2015–2017, 28 percent for 2018–2019, and 33 percent for 2020 and beyond. Under the regulation, wind; solar; geothermal; small hydroelectric; biomass; ocean wave, thermal, and tidal; landfill and digester gas; and biodiesel would be considered sources of renewable energy. The regulation would apply to investor-owned utilities and public (municipal) utilities.

SB X1-2

On April 12, 2011, Governor Jerry Brown signed SB X1-2 in the first extraordinary session, which would expand the RPS by establishing a goal that renewable energy shall comprise 20 percent of the total electricity sold to retail customers in California per year, by December 31, 2013, and 33 percent by December 31, 2020, and in subsequent years. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current and that meets other specified requirements with respect to its location. In addition to the retail sellers covered prior, SB X1-2 adds local publicly owned electric utilities to the RPS. By January 1, 2012, the CPUC is

required to establish the quantity of electricity products from eligible renewable energy resources to be procured by retail sellers in order to achieve targets of 20 percent by December 31, 2013; 25 percent by December 31, 2016; and 33 percent by December 31, 2020. The statute also requires that the governing boards for local publicly owned electric utilities establish the same targets, and the governing boards would be responsible for ensuring compliance with these targets. The CPUC will be responsible for enforcement of the RPS for retail sellers, while the CEC and CARB will enforce the requirements for local publicly owned electric utilities.

Senate Bill 350

SB 350 was approved by the California legislature in September 2015 and signed by Governor Brown in October 2015. Its key provisions are to require the following by 2030: (1) a renewables portfolio standard of 50% and (2) a doubling of energy efficiency (electrical and natural gas) by 2030, including improvements to the efficiency of existing buildings. These mandates will be implemented by future actions of the CPUC and CEC.

Assembly Bill 341

In 2011, AB 341 set the goal of 75 percent recycling, composting, or source reduction of solid waste by 2020 calling for the California Department of Resources Recycling and Recovery (CalRecycle) to take a statewide approach to decreasing California's reliance on landfills. This goal was an update to the former goal of 50 percent waste diversion set by AB 939. Reductions in solid waste disposal has the potential to reduce GHG emissions from landfills.

California Air Pollution Control Officers Association

The California Air Pollution Control Officers Association (CAPCOA) is the association of air pollution control officers representing all 35 air quality agencies throughout California. CAPCOA is not a regulatory body, but has been an active organization in providing guidance in addressing the CEQA significance of GHG emissions and climate change as well as other air quality issues.

Local Regulations

SANBAG Regional Greenhouse Gas Reduction Plan

The San Bernardino Associated Governments (SANBAG) Regional Greenhouse Gas Reduction Plan serves as a guide to help policymakers in 21 participating cities (one of which is Redlands) address climate change as they make decisions to meet the needs of our growing population, maintain and enhance our quality of life, and promote economic stability. The policy measures are not requirements under SANBAG, local governments, or any other entity. Moreover, it is the discretion of each agency to decide whether and how to best implement the various policy measures listed in this plan.

SCAG Regional Transportation Plan/Sustainable Community Strategy

The SCAG RTP/SCS is an integrated long-range land-use/housing plan and transportation plan and demographic and economic forecast for the SCAG region, which includes the Planning Area. This plan coordinates land use and transportation in order to reduce greenhouse gases emissions for cars and light-duty trucks for the region through the year 2040.

To achieve greenhouse gas emissions reductions, the 2016 RTP/SCS promotes compact, mixed-use commercial and residential development walkable and bikable and close to public transit, jobs, schools, shopping, parks, recreation, and other amenities. The plan provides a strategy for meeting 46 percent of the region's future housing growth in High Quality Transit Areas (HQTAs), which are areas near public transit with high service frequency during peak commuting hours.

Redlands Water Conservation and Solid Waste Recycling Ordinances

The City of Redlands Municipal Code includes ordinances to conserve water and reduce the amount of solid waste disposed in landfills. Water conservation efforts reduce energy use from supplying water. See Chapter 3.14: Utilities for details.

Redlands Buildings and Construction Ordinance

The City of Redlands has a buildings and construction ordinance (Municipal Code Title 15) that adopts the 2016 California Building Standards Code, which includes energy efficiency measures as described under the State Regulations section above.

Impact Analysis

SIGNIFICANCE CRITERIA

Energy

The CEQA Guidelines Appendix G does not contain specific thresholds to identify when a significant energy-use impact would occur. CEQA Guidelines Appendix F, Energy Conservation, provides direction as to the type of information, analysis, and mitigation that should be considered in evaluating a proposed project, but does not provide specific energy conservation thresholds.

Other guidance on the content and standards for environmental impact report (EIR) energy evaluations has come from recent case law. On August 27, 2009, the California Court of Appeal, Third Appellate District, issued the first ever CEQA decision on the requirements of an energy conservation impacts analysis in the case of *Tracy First v. City of Tracy* 177 Cal.App. 4th 912 (2009). The court ruled it was appropriate for the EIR to rely upon the CBC Energy Efficiency Standards, which are part of the State's Title 24 Building Code, to determine that the project's energy impacts would be less than significant. The court also held that CEQA does not require that an EIR discuss "every possible energy impact or conservation measure" listed in Appendix F of the CEQA Guidelines.

In accordance with Appendix F of the CEQA Guidelines and recent case law, and for the purposes of this EIR, the Proposed Project would result in a significant impact to energy conservation if it would:

Criterion 1: Cause wasteful, inefficient, and unnecessary consumption of energy during project construction, operation, and/or maintenance; or

Criterion 2: Conflict with the CBC Energy Efficiency Standards, the CARB passenger vehicle GHG emission reduction targets for 2020 and 2035, or any other applicable energy conservation regulations.

Greenhouse Gas Emissions and Climate Change

The California Natural Resources Agency, through its December 2009 amendments to the CEQA Guidelines provides a framework for the evaluation of the GHG emissions associated with the Proposed Project.

The State of California has developed guidelines to address the significance of climate change impacts based on Appendix G of the CEQA Guidelines, which provides guidance that implementation of the Proposed Project would have a significant environmental impact if it would:

Criterion 3: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

Criterion 4: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

METHODOLOGY AND ASSUMPTIONS

Information and analysis regarding the proposed General Plan GHG emissions have been compiled based on an understanding of the existing local and regional greenhouse gas sources and review of existing technical data, aerial maps, and applicable laws, regulations, and guidelines. Analysis of GHG emissions and reductions was also derived from the proposed Climate Action Plan (CAP).

The proposed CAP, which has been prepared concurrently with the City's General Plan, includes:

- An inventory of the city's GHG emissions;
- Forecasts of future GHG emissions;
- Actions that demonstrate the City of Redlands commitment to achieve State GHG reduction targets by monitoring and reporting processes to ensure targets are met; and
- Options for reducing GHG emissions beyond State requirements.

SUMMARY OF IMPACTS

Future development under the proposed General Plan would result in an increase in energy consumption and generation of GHG emissions from mobile, stationary, and area sources. Federal, State, and local regulations, as well as policies in the proposed General Plan would make the impacts of the proposed General Plan less than significant. Despite the overall increase in future energy use, the state's current and future energy code and the proposed General Plan policies would ensure energy efficient designs in new development and encourage energy efficiency upgrades in existing development, both of which would minimize wasteful, inefficient energy consumption. Additionally, the proposed General Plan would meet all GHG emissions targets through 2035. Moreover, the proposed General Plan would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

IMPACTS

Impact 3.5-1 Development under the Proposed Project would not cause wasteful, inefficient, and unnecessary consumption of energy during project construction, operation, and/or maintenance. (*Less than Significant*)

Development under the proposed General Plan would increase future energy consumption within the plan area, resulting in additional demand for electricity and natural gas supply and services. Future development projects and land uses proposed under the proposed General Plan would increase the population and employment in the city, and associated energy demand above existing conditions. However, despite the overall increase in future energy use, the state's current and future energy code and the proposed General Plan policies would ensure energy efficient designs in new development and encourage energy efficiency upgrades in existing development, both of which would minimize wasteful, inefficient energy consumption. The proposed General Plan policies listed below also require energy conservation.

The proposed CAP was designed to ensure that the City meets State targets for GHG emissions through monitoring and optional GHG reduction measures. As GHG emissions are often the result of energy consumption, the proposed CAP may help to promote energy efficiency by helping to maintain emissions below a certain level.

Future development would be required to comply with Title 24 energy performance standards and the proposed General Plan energy conservation policies and actions. With implementation of the proposed General Plan and the proposed CAP, impacts would be less than significant.

Proposed General Plan Policies that Reduce the Impact

Healthy Community Element

Public Health Actions

- 7-A.44 Support the use of clean fuel and “climate friendly” vehicles in order to reduce energy use, energy costs, and greenhouse gas emissions by residents, businesses, and City government activities.

Sustainable Community Element

Energy Efficiency and Conservation Principles

- 8-P.1 Promote energy efficiency and conservation technologies and practices that reduce the use and dependency of nonrenewable resources of energy by both City government and the community.
- 8-P.2 Promote energy awareness community-wide by educating the community regarding energy audits and incentive programs (tax credits, rebates, exchanges, etc.) available for energy conservation.
- 8-P.3 Proactively review and update City plans, resolutions, and ordinances to promote greater energy efficiency in both existing and new construction in regard to site planning, architecture, and landscape design.

Energy Efficiency and Conservation Actions

- 8-A.1 Work with Southern California Edison Company (SCE) and Southern California Gas Company (SCG) to educate the public about the need to conserve energy resources and the higher energy efficiency of new appliances and building materials.
- 8-A.2 Support San Bernardino County and San Bernardino Associated Governments (SANBAG) in implementation of their energy-related policies.
- 8-A.3 Leverage and help drive community participation in utility company programs and financial incentives within the city (e.g., one stop information clearinghouse, incentives, on bill financing, etc.).
- 8-A.4 Continue pursuit of sustainable energy sources—such as hydroelectricity; geothermal, solar, and wind power; and biomethane—to meet the community’s needs.
- 8-A.5 Accelerate the adoption of solar power and/or other alternative energy usage in Redlands through actions such as:
- Establishing incremental growth goals for solar power/alternative energy systems in Redlands;
 - Developing guidelines, recommendations, and examples for cost-effective solar and/or other alternative energy-based installation; and
 - Installing solar/alternative energy technology on available City spaces.
- 8-A.7 Seek alternatives to reduce non-renewable energy consumption attributable to transportation within the Planning Area. Seek funding and other assistance from the South Coast Air Quality Management District (AQMD) for installation of electric vehicle charging stations at appropriate locations throughout the city.
- 8-A.8 Implement and enforce California Code of Regulations Title 24 building standards (parts 6 and 11) to improve energy efficiency in new or substantially remodeled construction. Consider implementing incentives for builders that exceed the standards included in Title 24 and recognize their achievements over the minimum standards.
- 8-A.9 Encourage the use of construction, roofing materials, and paving surfaces with solar reflectance and thermal emittance values per the California Green Building Code (Title 24, Part 11 of the California Code of Regulations) to minimize heat island effects.
- 8-A.10 Integrate trees and shade into the built environment, to mitigate issues such as stormwater runoff and the urban heat island effect.
- 8-A.11 Further City efforts to be a model of energy conservation stewardship by:
- Continuing participation in SCE/SCG’s Community Partnership program;
 - Moving City electric load off-peak where practical;
 - Partnering directly with large consumers of energy and encouraging and promoting their energy efficiency activities;
 - Establishing energy efficiency and conservation baselines; and
 - Reporting routinely on the progress of goals.

- 8-A.12 Explore participating in new high-efficiency technology programs such as LED lighting for City facilities, safety lighting in parks and other public spaces, and LED street lighting conversion for all City-owned street lights.
- 8-A.13 Identify and obtain funding sources to implement energy conservation and efficiency programs and other emerging energy strategies suitable to conditions within the city.
- 8-A.14 Seek funding programs to assist low and moderate-income households in energy conservation.
- 8-A.15 Encourage City employees to submit energy efficiency and conservation recommendations for City operations and follow up on the recommendations.
- 8-A.16 Complete a comprehensive review of City codes and standards for applicability for energy and water efficiency/conservation measures and make changes to modify them accordingly.
- 8-A.17 Set goals consistent with the State’s Long-Term Energy Efficiency Strategic Plan. Design and implement programs and incentives to meet these goals in both private and public sector construction:
- All new residential construction in California will be zero net energy by 2020.
 - All new commercial construction in California will be zero net energy by 2030.
 - The heating, ventilation, and air conditioning (HVAC) industry will be improved to ensure optimal equipment performance; and all eligible low-income homes will be energy efficient by 2020.
- 8-A.18 Allocate savings realized from energy efficiency improvements at City facilities to implement additional energy efficiency improvements at City facilities.
- 8-A.19 Explore adoption of a model dark sky ordinance for appropriate areas of the city i.e. the rural areas of the canyons and Crafton.
- 8-A.20 Support energy resiliency through a diversified system of energy sources including zero and near-zero emission technologies.

Water Conservation Actions

- 8-A.27 Seek funding sources to implement renewable energy sources determined to be feasible for water and wastewater operations.
- 8-A.29 Reduce consumption of carbon-based fuels for conveyance and treatment of water and wastewater.

Waste Reduction and Recycling Actions

- 8-A.35 Invest in new infrastructure and technology and partnerships that contribute to increased waste diversion and capture/reuse of methane gas emissions from the landfill.
- 8-A.38 Explore the potential to generate energy using biomethane from the City’s landfill and wastewater treatment plant.

Green Building and Landscapes Actions

- 8-A.39 Continue implementation and enforcement of the California Building and Energy codes to promote energy efficient building design and construction.
- 8-A.40 Promote the Leadership in Energy and Environmental Design (LEED) certification program for the design, operation, and construction of high-performance green buildings.
- 8-A.41 Promote energy conservation and retrofitting of existing buildings through:
- Encouraging point-of-sale residential energy and water efficiency audits. Provide information on upgrading requirements and/or incentives if necessary;
 - Providing financial incentives and low-cost financing products and programs that encourage investment in energy efficiency and renewable energy within existing residential buildings; and
 - Educating residents about the availability of free home energy audit programs and encouraging the implementation of audit findings.
- 8-A.43 Decrease the need for artificial cooling, heating, and lighting, and promote outdoor lifestyles in Redlands' moderate climate by:
- Updating the Zoning Ordinance to provide for adequate private and common open spaces as part of multi-family developments; and
 - Encouraging residential and office buildings to have windows that open to the outside in all habitable rooms and maximize the use of daylight.
- 8-A.44 Prepare a Landscape Manual or enhance landscape standards in the Municipal Code to mitigate urban heat island effects through maximum tree canopy coverage and minimum asphalt and paving coverage—particularly for denser areas like Downtown, Transit Villages, shopping centers, and industrial and other areas with expansive surface parking. Consider the reflectance of stone and rock ground cover in heat generation.

Greenhouse Gas Reduction Principles

- 8-P.10 Demonstrate leadership by reducing the use of energy and fossil fuel consumption in municipal operations, including transportation, waste reduction, and recycling, and by promoting efficient building design and use.

Mitigation Measures

None required.

Impact 3.5-2 The Proposed Project would not conflict with the CBC Energy Efficiency Standards, the CARB passenger vehicle GHG emission reduction targets for 2020 and 2035, or any other applicable energy conservation regulations. (Less than Significant)

All future development under the proposed General Plan would be required to comply with the latest CBC requirements, including CBC Energy Efficiency Standards, as well as all federal, State, and local rules and regulations pertaining to energy consumption and conservation. The proposed General Plan includes policies that emphasize energy reduction strategies as described in Impact

3.5-1. The proposed CAP includes an inventory of citywide GHG emissions; forecasts of future citywide GHG emissions; monitoring and reporting processes to ensure State GHG targets are met; and options for reducing GHG emissions beyond State requirements. The proposed CAP is written for intended implementation through the year 2035.

Through implementation of City policies as delineated in the proposed General Plan and described under Impact 3.5-3, the proposed General Plan would support the CARB passenger vehicle GHG emissions reduction targets through measures that would reduce vehicle miles traveled (VMT) throughout the city. Additionally, CARB's LCFS, which aims to reduce the carbon intensity of the life-cycle of gasoline and diesel fuels by 10 percent by 2020, would further assist in meeting energy reduction goals and GHG emission reduction targets. Therefore, impacts would be considered less than significant.

Proposed General Plan Policies that Reduce the Impact

See proposed energy conservation and mobility-related policies listed above under Impact 3.5-1 and below under Impact 3.5-3.

Mitigation Measures

None required.

Impact 3.5-3 Development under the Proposed Project would generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. (Less than Significant)

The following analysis and emissions estimates were derived from data gathered during drafting of the proposed CAP. While gathering data for city-level emissions used in the proposed CAP, data for the Planning Area outside of city limits was also gathered for the purpose of conducting a Planning Area-level analysis in this EIR.

Planning Area GHG emissions from the 2015 inventory were 472,651 MTCO₂e per year, or 6.1 MTCO₂e per capita per year. As discussed under the State Regulations section above, in 2015 Executive Order S-3-15 established a target to reduce GHG emissions to 40 percent below 1990 levels by 2030, in addition to the target set by Executive Order S-3-05 of 80 percent below 1990 levels by 2050.

To reflect these targets, the California Air Resources Board (CARB) recommends that local governments reduce their GHG emissions to 6 MTCO₂e per capita per year in 2030 and 2 MTCO₂e per capita per year in 2050.

The horizon year for analysis in the Proposed Project is 2035. The proposed CAP uses a linear trajectory in emissions reductions between 2030 and 2050 to determine the 2035 target: 5 MTCO₂e per capita.

To project future GHG emissions, the following analysis provides a baseline forecast of GHG emissions, and models forecasts of future GHG emissions through 2035. The analysis then quantifies GHG reductions from State actions and the updated General Plan policies, and applies these reductions to the emissions forecast.

Business as Usual Forecast

The Business as Usual (BAU) forecast estimates emissions through the year 2035, based on the proposed General Plan land use and circulation system. However, it does not include the effects of the following State actions discussed in Section 1.4 of the proposed CAP: the RPS, 2016 Title 24 Building Energy Efficiency Standards, or the 75 percent solid waste diversion goal. The Pavley regulations and the ACC program discussed in Section 1.4 are already accounted for in the transportation emission factors output by the EMFAC2014 model, so these are automatically included in the BAU forecast. Conversely, the LCFS is not included in the EMFAC2014 model because LCFS GHG reductions come from upstream emissions, rather than tailpipe emissions, as discussed in the EMFAC2014 Technical Documentation (CARB, 2015). Additionally, the BAU forecast does not include the effects of policies in the proposed General Plan discussed in Section 3.4 of the proposed CAP.

The forecast predicts all direct GHG emissions² from sources within the Planning Area, including fuel combusted in the Planning Area.³ Indirect emissions associated with the consumption of energy that is generated outside the borders of the Planning Area are also included. Other indirect or embodied emissions are not covered in the forecast, in accordance with International Council for Local Environmental Initiatives standards. The forecast tallies emissions from 10 sectors:

- Residential;
- Commercial;
- Industrial;
- Transportation⁴;
- Solid waste;
- Water;
- Wastewater;
- Off-Road Equipment;
- Public Lighting; and
- Agriculture.

The emissions projected in the forecast use the activity data (or usage) from the 2015 emissions inventory as an initial value. The predicted growth in each sector is projected to scale with various

² GHGs considered in the report are carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). The emissions have been converted to carbon dioxide equivalent (CO₂e), which converts the three other GHGs into the equivalent mass of carbon dioxide.

³ This does not include the Mountainview Generating Station, for reasons described in the proposed CAP.

⁴ For transportation trips that originate or end in the Planning Area, emissions for the half of the entire trip are included, and not just for the miles traveled within the Planning Area; however, trips that just pass through the Planning Area are excluded, as their emissions would be reflected at their trip ends.

Redlands characteristics, such as population growth and increase in commercial building square footage. The proposed CAP describes how the predicted growth in each section was determined.

Under BAU conditions, Planning Area emissions are forecast to reach 489,519 MT CO₂e in the year 2035, as shown in Table 3.5-4. Table 3.5-4 shows the citywide and Planning Area emissions for each sector and the total emissions for all sectors.

The greatest projected emissions continue to be from the transportation sector, which accounts for 30 percent of emissions in 2030 and 26 percent of emissions in 2035. Residential emissions are the next largest sector, with 23 percent of emissions in 2030 and 24 percent of the total in 2035.

Table 3.5-4: BAU Forecast Emissions by Sector, 2015 to 2035 (MTCO₂e per year)

Sector	Redlands			Planning Area		
	2015	2030	2035	2015	2030	2035
Residential	96,875	108,357	112,491	97,723	112,845	118,389
Commercial	73,071	86,071	90,899	73,272	87,788	93,240
Industrial	19,637	23,955	25,595	20,991	25,713	27,512
Transportation	170,635	133,727	117,667	186,782	145,452	127,709
Solid Waste	18,618	21,501	21,501	21,140	24,414	25,615
Water Transport, Distribution, and Treatment	2,284	3,342	3,427	2,594	3,795	3,891
Wastewater	2,222	3,138	3,208	2,523	3,563	3,642
Off-Road Equipment	34,797	46,659	52,326	39,512	52,981	59,416
Public Lighting	747	836	867	848	980	1,028
Agriculture	530	455	433	27,267	26,899	26,802
TOTAL	419,417	428,041	428,414	472,651	484,430	487,245

Source: Dyett & Bhatia, 2017.

GHG Reductions from State Actions

GHG reductions from State actions and other trends to the forecast are quantified in this section. These reductions include the following:

1. Renewable Portfolio Standard;
2. Title 24 building efficiency improvements; and
3. 75 percent solid waste diversion.

Refer to the proposed CAP for details on how the GHG reductions from these policies were quantified.

Renewable Portfolio Standard

California’s RPS, discussed under the State Regulations section above, is one of the most ambitious renewable energy standards in the country. The RPS requires that investor-owned utilities like Southern California Edison (SCE) supply 33 percent of their electricity from renewable resources by 2020 and 50 percent of their electricity from renewable sources by 2030. Emissions reductions from the RPS for Redlands and the Planning Area are provided in Table 3.5-5.

Title 24 Building Efficiency Improvements

Title 24, discussed under the State Regulations section above, is California’s Building Energy Code. The most recent Title 24 code became effective in 2017. The Title 24 building efficiency improvements’ effects on emissions through the 2013 update were automatically incorporated into the 2015 inventory since this code update was already in effect by 2015. Emissions reductions from Title 24 for Redlands and the Planning Area are provided in Table 3.5-5.

75 Percent Solid Waste Diversion

AB 341, discussed under the State Regulations section above, set the goal of 75 percent recycling, composting, or source reduction of solid waste by 2020. The reductions in Redlands and Planning Area GHG emissions based on this waste diversion standard are shown in Table 3.5-5.

Emissions Reductions

The annual reductions from the above-referenced State actions—RPS, Title 24 building efficiency improvements, and 75 percent solid waste diversion—were combined. Table 3.5-5 lists the total BAU forecast for years 2030 and 2035, juxtaposed with reductions from State actions.

Table 3.5-5: GHG Forecast with State Actions Reductions

Scope	Year	BAU Forecast Emissions with General Plan Land Use and Circulation System ¹	Emissions Reductions from Renewable Portfolio Standard ¹	Emissions Reductions from Title 24 Building Efficiency Improvements ¹	Emissions Reductions from 75 Percent Waste Diversion ¹	Total Forecast Emissions with General Plan Land Use and Circulation System & State Actions Reductions ¹	Total Forecast Emissions with General Plan Land Use and Circulation System & State Actions Reductions ²
Redlands	2030	428,041	47,918	6,710	2,134	371,279	4.9
	2035	428,414	49,255	9,478	2,239	367,442	4.7
Planning Area	2030	486,656	52,300	8,180	2,423	423,753	4.7
	2035	489,519	53,626	11,392	2,542	420,432	4.5

Notes:

1. Measured by MTCO₂e per year.
2. Measured by MTCO₂e per capita per year.

Source: Dyett & Bhatia, 2017.

Modified Baseline: GHG Reductions from General Plan Policies and Actions

This section describes proposed General Plan policies and actions that reduce GHG emissions, quantifies emissions reductions, and explains how these policies and actions will be implemented. “No Project” conditions that result in reductions are reflected in the SANBAG modeling used to calculate VMT in the Planning Area, and are incorporated into the proposed General Plan land use and circulation system. The proposed General Plan land use and circulation system incorporates reductions from “No Project” conditions that are already reflected in the SANBAG modeling used to calculate VMT in the Planning Area. The following reductions are from policies and actions in addition to State regulations and the General Plan land use and circulation system. The General Plan policies and actions are organized according to the following categories:

1. Bikeway System Improvements
2. Pedestrian Improvements and Increased Connectivity
3. Traffic Calming
4. Parking Facilities and Policies
5. Transportation Improvements

Specific General Plan policies that would contribute to the reduction of GHG emissions are listed below.

CAPCOA’s *Quantifying Greenhouse Gas Mitigation Measures* report was developed as a resource for local governments to assess emissions reductions from GHG mitigation measures (CAPCOA, 2008). The proposed CAP uses the methodology outlined in the CAPCOA report for each category to quantify emissions reductions from the proposed General Plan policies and actions.⁵ The reductions are applied to the forecast to get the “modified forecast.” GHG reductions from proposed General Plan policies are provided in Table 3.5-6.

Bikeway System Improvements

The Redlands Bicycle Master Plan, adopted in 2015 and referenced in the General Plan, recommends the enhancement of the existing bicycle network with the implementation of 33 miles of new Class I bike paths and 148 miles of new Class II and III bikeways. Currently, there are 18 miles of bicycle paths in Redlands.⁶ In total, the recommended enhancements will create a total of 181 miles of new bike paths, to result in a total of 199 miles of bike paths.

An estimated 0.09 percent reduction in transportation GHG emissions is assumed to occur where there are 4 miles of bike lane per square mile. A reduction of 0.14 percent is assumed in areas with 8 miles of bike lanes per square mile. The minimum density threshold given for these assumptions

⁵ While many of the policies and actions quantified in the proposed CAP are project-level in nature, much of the supporting literature is from studies on a citywide, countywide, or regional context. The methodology in the proposed CAP is based on these regional studies, which is therefore applicable to the General Plan policies and actions listed in the proposed CAP.

⁶ One mile of bicycle paths is equivalent to 2 “lane miles,” a measure used in Section 3.15 of this EIR.

is 2,000 people per square mile. With the total bicycle improvements, there would be approximately 4.3 miles of bike lanes per square mile. However, the Planning Area currently has approximately 1,665 people per square mile, not quite reaching the threshold of 2,000 people per square mile. Therefore, the lower percent reduction in transportation GHG emissions of 0.09 is used. The Planning Area will reach a density of 2,017 people per square mile in 2035, passing the threshold of 2,000 people per square mile.

A 0.09 percent reduction in VMT emissions corresponds to 131 MTCO₂e per year in 2030 and 115 MTCO₂e per year in 2035 for the Planning Area. See Table 3.5-6 for policy reductions for Redlands and the Planning Area.

Pedestrian Improvements and Increased Connectivity

The City has adopted several programs and plans related to improving the walking environment. The Downtown Specific Plan identifies districts and corridors and provides direction for pedestrian circulation and pedestrian-oriented street design. Additionally, there are a number of improvements described in the proposed General Plan that will enhance connectivity for bicycles and pedestrians. The General Plan also articulates a vision for transit-oriented development and strategies for future development patterns around the proposed Redlands Passenger Rail stations.

Providing an improved pedestrian network and increasing connectivity encourages people to walk more and results in people driving less, causing a reduction in VMT. An estimate of a 1 percent reduction in VMT from pedestrian improvements and connectivity was assumed, which corresponds to a reduction of 1,455 MTCO₂e per year in 2030 and 1,277 MTCO₂e per year in 2035 for the Planning Area. See Table 3.5-6 for policy reductions for Redlands and the Planning Area.

Traffic Calming

The General Plan includes policies for “calming” traffic to make streets more safe and comfortable for pedestrian travel. Traffic calming devices include speed tables, speed bumps, roundabouts, and other devices that encourage people to drive more slowly or to walk or bike instead of using a vehicle, especially for short trips in and around residential neighborhoods.

CAPCOA’s *Quantifying Greenhouse Gas Mitigation Measures* was used to quantify the effect of traffic calming devices. A 0.25 percent reduction in VMT was assumed to occur from these improvements, which corresponds to a reduction of 364 MTCO₂e per year in 2030 and 319 MTCO₂e per year in 2035 for the Planning Area. See Table 3.5-6 for policy reductions for Redlands and the Planning Area.

Parking Facilities and Policies

To promote “right sizing” of parking facilities, techniques such as shared parking, in-lieu parking fees, and parking management strategies are included as part of the proposed General Plan Mobility Element. Refer to the proposed CAP for additional details.

According to CAPCOA’s *Quantifying Greenhouse Gas Mitigation Measures*, parking strategies have estimated VMT reductions. Reduced parking standards and other policies reducing parking availability have an estimated 5 to 12.5 percent VMT reduction. Conservatively assuming the effect of General Plan parking reduction strategies would result in the lower end of VMT reduction, the

cumulative reduction from implementations would result in a 5 percent VMT reduction to give an estimated 7,273 MTCO₂e per year reduction by 2030, and a 6,385 MTCO₂e per year reduction in 2035 for the Planning Area. See Table 3.5-6 for policy reductions for Redlands and the Planning Area.

Transportation Improvements

The Planning Area is accessible to neighboring communities via public transit. The Planning Area is served by Omnitrans bus routes connecting Redlands to San Bernardino, Loma Linda, Mentone, Fontana, Highland, Yucaipa, and Colton. Omnitrans also provides ADA accessible buses.

An inactive rail line runs through the center of Redlands. SANBAG is currently implementing the Redlands Passenger Rail project, which will extend rail transit to the Planning Area. This project is scheduled to be completed and in operation by 2020, providing commuter passenger service to San Bernardino, where it will connect with Metrolink, providing rail access to the greater Los Angeles region. SANBAG estimates that between 720 and 820 daily riders will use the Redlands route in 2018 and between 1,120 and 1,340 in 2038. Since this expansion of the transit network is already included in the SANBAG model from which VMT was calculated, it is not considered in calculations of additional GHG reductions resulting from General Plan policies.

General Plan policies seek to further transit-improvement efforts by organizing land uses and proposing new streets and bicycle paths to capitalize on the passenger rail extension, connect rail with other modes and destinations in the Planning Area, and allow for expansion of existing transit networks.

The General Plan also calls for traffic signal management (TSM) techniques as part of a long-term transportation solution and traffic mitigation strategy.

Transportation system improvements can result in VMT reductions. According to CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures*, transit system improvements can result in the following reductions: 0.02 to 3.2 percent VMT reduction from a bus rapid transit system and 0.5 to 24.6 percent VMT reduction from increasing transit accessibility. Conservatively assuming the combined effect of these strategies, summing the low end of the VMT reduction ranges gives a 0.53 percent reduction in VMT emissions, or estimated 771 MTCO₂e per year reduction by 2030, and a 677 MTCO₂e per year reduction by 2035 for the Planning Area. See Table 3.5-6 for policy reductions for Redlands and the Planning Area.

Emissions Reductions

Table 3.5-6 shows the GHG reductions from each of the above components for Redlands and the Planning Area. The largest reduction comes from parking facilities and policies, followed by pedestrian improvement and increased connectivity, transportation improvements, traffic calming, and bikeway system improvements. VMT emissions are projected to decrease in the future due to higher fuel efficiency standards. Therefore, despite VMT projections' continuing to climb from 2030 to 2035, the effect of the VMT reductions are greater in 2030 than in 2035 for all General Plan policies considered in this section. For example, the reductions from traffic calming for the Planning Area in 2035 are 319 MTCO₂e per year, which is less than the reduction in 2030 of 364 MTCO₂e per year.

Table 3.5-6: GHG Reductions from General Plan Policies and Actions (MTCO₂e per year)

Scope	Year	Bikeway System Improvements	Pedestrian Improvements and Increased Connectivity	Traffic Calming	Parking Facilities and Policies	Transportation Improvements	Total GHG Reductions from Additional General Plan Policies and Actions
Redlands	2030	120	1,337	334	6,686	709	9,187
	2035	106	1,177	294	5,883	624	8,084
Planning Area	2030	131	1,455	364	7,273	771	9,993
	2035	115	1,277	319	6,385	677	8,774

Source: Dyett & Bhatia, 2017.

Modified Forecast

Table 3.5-7 shows the total citywide and Planning Area emissions with the reductions from the following policies and actions described above:

- Proposed General Plan land use and circulation system;
- State actions; and
- Proposed General Plan policies (identified below).

Projected emissions drop steeply to 2030 from the combined effect of GHG reduction policies and actions and continue a gradual decline to 2035. The decline becomes more gradual because no increases in federal or State standards relating to renewable energy or other GHG reduction methods are assumed, even though these may well occur by that time. With the effect of all the GHG reductions considered, the total Planning Area forecast emissions are 412,148 MTCO₂e per year in 2030 and 409,351 MTCO₂e per year in 2035.

Table 3.5-7 shows that the Planning Area will meet its targets for 2030 and 2035 without any additional measures beyond those identified above.

Table 3.5-7: Modified Forecast (Forecast Emissions with General Plan Land Use and Circulation System, State Actions, and Additional General Plan Policies) and Emissions Targets

Year	GHG Emissions Targets ¹	Redlands		Planning Area	
		Total Modified Forecast ²	Total Modified Forecast ¹	Total Modified Forecast ²	Total Modified Forecast ¹
2030	6.0	362,092	4.8	413,819	4.6
2035	5.0	359,358	4.5	411,709	4.4

Notes:

1. Measured by MTCO₂e per capita per year
2. Measured by MT CO₂e

Source: Draft Redlands Climate Action Plan, 2017.

Section 4 of the proposed CAP provides information regarding steps to monitor GHG emissions progress, and potential additional measures that can be taken in the future should the City so desire.

As the proposed General Plan would meet all State-mandated emissions targets through 2035, impacts would be considered less than significant and no additional measures are required.

Proposed General Plan Policies that Reduce the Impact

Land Use and Community Design Element

Community Integration Actions

- 2-A.5 Develop new roadway connections, pedestrian paths, and bicycle routes that facilitate transportation in the north-south direction traversing the I-10 freeway.
- 2-A.6 Improve and make more efficient traffic flow for all modes of transportation along corridors that link north-south thoroughfares through techniques such as signal timing, additional lanes, sidewalks, bike paths, and other improvements.
- 2-A.18 Promote a safe and secure environment near transit stations through design, adjacent land use considerations, public space programming, and coordination with public safety providers.
- 2-A.34 Uphold the designation of the following streets within the city as scenic highways, drives, and historic streets. Special development standards have been adopted by Resolution for these streets. The streets are:
 - Brookside Avenue, from Lakeside Avenue to Eureka Street;
 - Olive Avenue, from Lakeside Avenue to Cajon Street;
 - Center Street, from Brookside Avenue to Crescent Avenue;
 - Highland Avenue, from Serpentine Drive to Cajon Street;
 - Sunset Drive, from Serpentine Drive to Edgemont Drive;
 - Cajon Street;
 - Mariposa Drive, between Halsey and Sunset Drive; and
 - Dwight Street, between Pepper Street and Mariposa Drive.

In addition, consider designating the following roads as scenic drives within the community as neighborhood connectors and recreational routes for drivers and bike riders.

- Riverview Drive along the Santa Ana River Wash;
- Live Oak Canyon Road;
- San Timoteo Canyon Road;
- Sylvan Boulevard;
- Nevada Street, from the Orange Blossom Trail to Barton Road;
- Pioneer Avenue, from River Bend Drive to Judson Street; and
- Rural roads in Crafton.

Cultural Resources Action

- 2-A.69 Encourage shared parking or in-lieu parking in older neighborhoods.

Street Trees and Streetscape Actions

- 2-A.77 Prepare and maintain a citywide inventory and streetscape plan that includes the following components:
- Streetscape strategies for major arterial streets that may include items such as tree species; median or parkway landscape treatment; and curbs and sidewalk location and materials
 - Updated official Street Tree List that is tied to streetscape strategies, which promotes use of native and water efficient trees, and trees that provide pedestrian shade and comfort.
- 2-A.80 Prepare a design manual for historic district streets that reflects the city's heritage and promotes cohesive, pedestrian-scale streetscapes that include sidewalks, signage and wayfinding, and historical markers.

Vibrant Downtown Actions

- 2-A.92 Provide public improvements for traffic and pedestrian circulation, flood control, utility services, and aesthetic amenities that will attract new private investment and economic development.
- 2-A.99 Ensure that new development along Redlands Boulevard is pedestrian-oriented.

Livable Community Element

Land Use Principle

- 4-P.9 Locate medium- and high-density development near regional access routes, transit stations, employment centers, shopping areas, and public services.

Land Use Actions

- 4-A.12 Support new residential development in Downtown, the Transit Villages, and other focused infill sites accessible to transit and in central parts of the community.
- 4-A.18 Focus the development of office space in transit-accessible locations.

Focus Areas Action

- 4-A.52 Improve access and movement of all modes of transportation in the East Valley Corridor and enhance linkages to transit.
- 4-A.95 Encourage the development of bicycle, pedestrian, and transit access that reduce the need for on-site parking.

Transit Villages Principles

- 4-P.41 Foster a connected, accessible, and active community by creating attractively designed pedestrian- and transit-oriented villages with a mix of uses in a compact area.

- 4-P.44 Provide choices for travel options, including walking, biking, vehicular, and transit.
- 4-P.45 Accommodate all appropriate modes of transportation in Transit Villages, and promote seamless transitions between modes.

Transit Villages Actions

- 4-A.99 Implement bicycle route improvements that provide intra-city and regional connections, connecting to Loma Linda, the City of San Bernardino, and north to the Santa Ana River Trail.
- 4-A.104 Add new streets to create a finer-grained (shorter blocks), pedestrian-scaled road network, connecting residential areas to parks and the Mixed-Use Core.
- 4-A.105 Provide streetscape improvements along the major corridors of Alabama Street and Redlands Boulevard to enhance comfort and safety for all modes of travel and strengthen north-south connections between major destinations and east-west routes.
- 4-A.106 Establish boulevards along Redlands Boulevard and Colton Avenue with pedestrian-oriented streetscape improvements and ground-floor active uses.
- 4-A.108 Implement bicycle route improvements that provide strong east-west connections to other Transit Villages and the city's wider bicycle network. Routes would include the Orange Blossom Trail and potentially a trail along Redlands Boulevard in this location.
- 4-A.110 Create an active and compact transit-oriented core with office uses that provide opportunities for jobs and innovation, as well as commercial and residential uses to serve the needs of the area's workers.
- 4-A.112 Establish boulevards along Redlands Boulevard and Colton Avenue with pedestrian-oriented streetscape improvements and ground-floor active uses.
- 4-A.113 Provide pedestrian routes between offices, neighborhoods, and Downtown.
- 4-A.114 Implement bicycle route improvements that provide strong east-west connections to other Transit Villages as well as north-south connections to improve access to existing neighborhoods to the north. Routes would include the Orange Blossom Trail, the Lugonia Trail on New York Street, and a route along Texas Street.
- 4-A.115 Implement intersection improvements, including pedestrian improvements, at the I-10 undercrossings at New York and Texas Street to increase comfort and safety for all modes of travel.
- 4-A.116 Ensure safe railway crossings at Tennessee Street, Texas Street, and New York Street for bicyclists and pedestrians.
- 4-A.118 Complete and implement an update of the Downtown Specific Plan to create a cohesive town center with amenities and pedestrian-oriented streets.
- 4-A.124 Establish boulevards along Orange Street, Colton Avenue, and Redlands Boulevard with pedestrian-oriented streetscape improvements and ground-floor active uses.
- 4-A.125 Strengthen pedestrian and bicycle circulation routes within Downtown and to and from adjacent neighborhoods.

- 4-A.126 Implement bicycle route improvements that provide strong east-west and north-south connections. Routes would include the Orange Blossom Trail, the Mission Creek Zanja Trail, and routes on Colton Avenue, Orange Street, and Citrus Avenue.
- 4-A.131 Promote pedestrian circulation between the station, homes, schools, and parks, with primary routes along multi-purpose trails (the Orange Blossom and Mill Creek Zanja trails), Citrus Avenue, and University Street.
- 4-A.132 Implement bicycle route improvements that enhance circulation between the station, homes, schools, and parks and provide connections to Downtown. Routes would include the Orange Blossom Trail, the Mill Creek Zanja Trail, and routes on Citrus Avenue, University Street, and Colton Avenue.
- 4-A.134 Improve the I-10 undercrossings at University Street and Citrus Avenue to allow safe and comfortable access for vehicles, pedestrians, and cyclists.

Connected City Element

Layered, Multi-Modal Network Principles

- 5-P.13 Ensure streets are designed to accommodate bicyclists per the Bicycle Master Plan.
- 5-P.14 Design streets to accommodate various modes according to roadway classification and reduce conflicts and safety risks between modes per Figure 5-4.

Layered, Multi-Modal Network Actions

- 5-A.3 Ensure new street design and potential retrofit opportunities for existing streets minimize traffic volumes and/or speed as appropriate within residential neighborhoods without compromising connectivity for emergency vehicles, bicycles, pedestrians, and users of mobility devices. This could be accomplished through:
 - Management and implementation of complete street strategies, including retrofitting existing streets to foster biking and walking as appropriate;
 - Short block lengths, reduced street widths, and/or traffic calming measures; and
 - Providing pedestrians and bicyclists with options where motorized transportation is prohibited.
- 5-A.4 Consider innovative design solutions to improve mobility, efficiency, connectivity, and safety through the use of traffic calming devices, roundabouts, curb extensions at intersections, separated bicycle infrastructure, high visibility pedestrian treatments and infrastructure, and signal coordination.
- 5-A.5 As part of street redesigns, plan for the needs of different modes – such as shade for pedestrians, lighting at pedestrian scale, mode-appropriate signage, transit amenities, etc.
- 5-A.6 Add bike and pedestrian facilities on roads with excess capacity where such facilities do not exist, using supporting transportation plans as guidance. Excess capacity includes street right-of-ways or pavement widths beyond the standards, or excess capacity in roadways based on actual vehicular travel versus design capacity.

- 5-A.7 Add new streets to create a finer-grained, pedestrian-scaled road network where the roadway network is characterized by particularly long blocks, connecting residential areas to parks and transit village cores. Ensure the street systems in Transit Villages support development of connected and accessible communities.

Pedestrian Movement Principles

- 5-P.16 Provide a safe, direct, and healthful pedestrian environment through means such as providing separate pedestrian-ways in parking lots, avoiding excessive driveway widths, and providing planting strips between sidewalks and streets where feasible.
- 5-P.17 Encourage creative walking paths pursuant to City planning codes, local, State, and federal laws.
- 5-P.18 Enhance street lighting for pedestrians where current lighting is inadequate.

Pedestrian Movement Actions

- 5-A.17 Continue implementing the Safe Routes to School program, and develop a “Safe Routes to Transit” program, focusing on pedestrian and bicycle safety improvements near local schools and transit stations.
- 5-A.18 Create appropriate enhancements to pedestrian crossings at key locations across minor arterials, boulevards, and collectors with a target of providing pedestrian crossings no further than 600 feet apart in appropriate areas and in accordance with State standards.
- 5-A.19 Provide pedestrian routes between offices, neighborhoods, Downtown, and Transit Villages. Plan for direct connections from the interiors of residential tracts to neighboring parks, schools, retail, and other services using sidewalks, trails, and paseos.
- 5-A.21 Include amenities such as shade trees, transit shelters and other transit amenities, benches, trash and recycling receptacles, bollards, public art, and directional signage that can enhance the pedestrian experience.

Bicycle Movement Principles

- 5-P.19 Establish and maintain a comprehensive network of on- and off-roadway bike routes to encourage the use of bikes for both commuter and recreational trips.
- 5-P.20 Develop bike routes that provide access to rail stations, Downtown, schools, parks, the University, employment, and shopping destinations.

Bicycle Movement Actions

- 5-A.22 Use the City’s Bicycle Master Plan as the primary resource for planning and implementing bikeway improvements.
- 5-A.23 Implement bicycle and trail improvements that provide strong east-west connections between Transit Villages and in the city’s wider bicycle network. Routes would include the Orange Blossom Trail, the Mission Creek Zanja Trail, routes on Colton Avenue and Citrus Avenue, and the San Timoteo Canyon Trail.
- 5-A.24 Implement bicycle and trail improvements that provide strong north-south connections, especially with major east-west trails, including routes on Mountain View

Avenue, California Street, Nevada Street, Alabama Street, Texas Street, New York Street, Orange Street, Church Street, and Wabash Avenue.

- 5-A.25 Implement safety improvements in mid-block areas that allow for bicycles to safely cross heavily traveled roads. Improvements can include stop signs for cyclists, warning beacons, and illuminated signs initiated by pedestrians and cyclists.
- 5-A.26 Seek assistance from major employers in providing support facilities to encourage use of bikes for commuter purposes.
- 5-A.27 Incorporate end-of-trip facilities into Transportation Demand Management (TDM) plans at employment sites and public facilities, depending upon distance from bikeways. Provide well-located, secure bike storage facilities at employment sites, shopping and recreational areas, and schools in order to facilitate bike use. Encourage major employers to provide shower and changing facilities or assist in funding bicycle transit centers in nearby locations.
- 5-A.28 Implement bicycle route improvements that provide inter-city and regional connections, connecting to trail systems in Loma Linda, Highland, Yucaipa, San Bernardino, and the Santa Ana River Trail.
- 5-A.29 Work with neighboring jurisdictions, the University of Redlands, and major employers to implement bike sharing programs.

Vehicular Movement Actions

- 5-A.32 Utilize transportation demand management strategies, non-automotive enhancements (bicycle, pedestrian, transit, train, trails, and connectivity), and traffic signal management techniques as part of a long-term transportation solution and traffic mitigation strategy.
- 5-A.33 Allow for flexibility and creativity in the roadway standards, where appropriate, to preserve historic features, specimen trees and significant landscaping, accommodate turn lanes, parking, wider sidewalks, bike paths, turnouts for buses, public art, and landscaped medians.
- 5-A.41 Establish new boulevards Downtown and in the transit villages that include planted center medians, accommodations for transit, wider sidewalks, and amenities for pedestrians.
- 5-A.47 Plan an integrated network of collector and local streets serving new neighborhoods. Design cul-de-sacs so they have pedestrian/bike connections at the terminus.

Transit Principles

- 5-P.25 Improve public transit as a viable form of transportation in Redlands.
- 5-P.26 Support passenger rail as an alternative mode of regional transit.

Transit Actions

- 5-A.54 Work with Omnitrans to accommodate and adjust transfer centers and bus service as necessary to support future rail service.

- 5-A.55 Work with Omnitrans to expand bus service to additional areas of the city and improving north-south connections.
- 5-A.56 Work with Omnitrans to plan for bus shelters, boarding areas, transfer centers, bus pads in the right-of-way, and bus turnouts.
- 5-A.57 Incorporate real-time information systems so that passengers will know when their bus or train is expected to arrive.
- 5-A.58 Support investments in passenger rail by providing effective on-site circulation and multi-modal connections to transit stations.
- 5-A.59 Develop station area plans to determine the appropriate modes of transportation to be accommodated at each passenger rail station, the inter connections between those modes, and the facilities to be provided to support each mode.
- 5-A.60 Upon completion of the passenger rail project, work with major employers, the University of Redlands, and major event organizers (such as Redlands Bowl) on a shuttle system to link transit and major destinations.
- 5-A.61 Continue to collaborate with regional transit partners to achieve seamless transfers between systems, including scheduling, ticketing, and shared fare systems.
- 5-A.62 Develop strategies to maximize off-peak use of transit.
- 5-A.63 Coordinate with other agencies and private entities to investigate methods of improving service and enhancing safety along the passenger rail corridor.
- 5-A.64 Encourage convenient and safe pedestrian linkages to and from transit service to provide better first-mile and last-mile connectivity.
- 5-A.65 Provide for direct pedestrian paths and access from new developments to the nearest public transportation stop.

Transportation Demand Management (TDM) and Parking Principle

- 5-P.27 Adopt and implement a Transportation Demand Management Program.

Transportation Demand Management (TDM) and Parking Action

- 5-A.66 Evaluate and include the following appropriate elements in a Transportation Demand Management (TDM) Program:
 - Telecommuting from home
 - Telecommuting from a satellite work Center
 - Compressed work week
 - Flex time
 - Ridesharing
 - Ridesharing subsidy and tax credits
 - Ridesharing parking cost subsidy
 - Ridematching and carpooling

- Guaranteed ride home
 - Car hire services
 - Commuter stores
 - Car share programs
 - Bike share programs
 - On-site facilities for commuters
 - Remote park-and-ride lots with amenities
 - Preferential parking for ride sharers
 - Transit pass programs
 - Other new and innovative alternatives that may arise in the future
- 5-A.69 Design parking to meet applicable urban design goals from area plans and minimize negative impacts on pedestrians, bicyclists, and transit users.
- 5-A.72 Encourage developers to meet their minimum parking requirements via shared parking between uses, payment of in-lieu fees, joint parking districts, or off-site parking within a reasonable walking time of 10 minutes or less.
- 5-A.73 Develop flexible on-site vehicle parking requirements. Such requirements would include implementation of innovative parking techniques, implementing effective TDM programs to reduce parking demand, and consideration of other means to efficiently manage parking supply and demand.

Healthy Community Element

Parks and Recreational Open Space Action

- 7-A.24 Coordinate trail planning with bike route planning in preparation for updates to the Redlands Bicycle Master Plan.

Public Health Principle

- 7-P.17 Achieve more walkable, livable neighborhoods by expanding the multi-modal transportation system and creating a safe, pedestrian-oriented environment.

Public Health Actions

- 7-A.38 Revise development standards to require pedestrian connections into and inside commercial projects.
- 7-A.39 Install appropriate facilities along streets and at roadway intersections to improve and insure pedestrian safety.
- 7-A.40 Improve signs directing residents and visitors to public parks and recreational facilities from all parts of the community. Integrate parks signage with bikeway and pedestrian-oriented signage systems throughout Redlands.
- 7-A.42 Work with interested community members and organizations to plan and develop a course of exercise circuits that take advantage of existing parks, trails, and other

pedestrian infrastructure. The course should be clearly marked, and contain simple stations and diagrams for self-guided training.

Air Quality Principle

- 7-P.47 Cooperate in efforts to expand bus, rail, and other forms of mass transit in the portion of the South Coast Air Basin within San Bernardino County.

Air Quality Action

- 7-A.146 Promote expansion of all forms of mass transit to the urbanized portions of San Bernardino, Orange, Los Angeles, and Riverside counties. Support public transit providers in efforts to increase funding for transit improvements to supplement other means of travel.

Mitigation Measures

None required.

Impact 3.5-4 Development under the Proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (Less than Significant)

Through implementation of the proposed General Plan policies aimed at reducing GHG emissions, and the proposed CAP that would serve as the implementation tool for GHG monitoring and reporting, the Proposed Project would serve to implement a number of strategies and measures aimed at reducing greenhouse gas emissions. Additionally, the SCAG RTP/SCS, discussed under the Local Regulations section above, includes a set of policy objectives related to mobility, reliability, system preservation and safety, social equity, healthy environment, and economic growth. The RTP will assist in SCAG's implementation of SB 375, the California Global Warming Solutions Act of 2006, and regional GHG targets. With implementation of the proposed General Plan's goals and policies related to sustainability and multi-modal transportation objectives, the proposed General Plan would complement the goals and policies of the RTP/SCS and would continue to carry out the goals of AB 32 and SB 375. Therefore, future development projects and land uses proposed under the proposed General Plan and proposed CAP would, by nature, result in reduced transportation GHG emissions relative to the No Project Alternative, as shown in Chapter 4.0 Alternatives. This achieves the overarching goals of local, regional, and State plans to reduce GHG emissions. As such, the Proposed Project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Impacts would be less than significant.

Proposed General Plan Policies that Reduce the Impact

See proposed energy conservation and mobility-related policies listed above under Impact 3.5-1 and Impact 3.5-3.

Mitigation Measures

None required.