City of Redlands

CLIMATE ACTION PLAN

Adopted December 5, 2017

City of Redlands

CLIMATE ACTION PLAN

Adopted December 5, 2017

Prepared for

City of Redlands

by

DYETT & BHATIA
Urban and Regional Planners

Table of Contents

List of Figures

List of Tables

This page intentionally left blank.

Executive Summary

This Redlands Climate Action Plan (CAP) is designed to reinforce the City's commitment to reducing greenhouse gas (GHG) emissions, and demonstrate how the City will comply with State of California's GHG emission reduction standards. As a Qualified GHG Reduction Strategy, the CAP will also enable streamlined environmental review of future development projects, in accordance with the California Environmental Quality Act (CEQA).

The CAP includes:

- An inventory of the city's GHG emissions;
- Forecasts of future GHG emissions;
- Monitoring and reporting processes to ensure targets are met; and
- Options for reducing GHG emissions beyond State requirements that could be adopted at a future date, if so needed or desired.

The CAP, which has been prepared concurrently with the updated Redlands General Plan, provides analysis of GHG emissions to the year 2035, which is the horizon year for the General Plan.

State-Mandated Local GHG Emissions Targets and Guidelines

The CAP reflects guidelines established in the 2017 Scoping Plan prepared by the California Air Resources Board (CARB). The Scoping Plan, designed to implement the State's GHG emission targets set in Executive Order S-3-15 and Senate Bill 32, recommends that local governments target 6 metric tons carbon dioxide equivalent ($MTCO_2e$) per capita per year in 2030 and 2 $MTCO_2e$ per capita per year in 2050 in their CAPs.

Emissions Inventory and Forecast

The 2015 emissions inventory and 2030 and 2035 emissions forecasts cover direct GHG emissions from sources within the boundaries of Redlands. Indirect emissions associated with the consumption of energy (such as electricity, with no endpoint emissions) that is generated outside the borders of the city are also included. The emissions inventory and forecast tally emissions from ten sectors: residential, commercial, industrial, transportation, solid waste, water, wastewater, off-road equipment, public lighting, and agriculture.

The City's General Plan includes closely integrated land use and transportation systems and policies designed to foster a more sustainable community. Table ES-1 shows the 2015 emissions inventory and 2030 and 2035 emissions forecasts reflecting already planned State actions, and incorporating results of the traffic forecasts conducted for the General Plan Update, as well additional reductions from other policies contained in the General Plan.

Table ES-1 shows that Redlands will meet its targets for 2030 and 2035 without any additional (beyond those already included in the General Plan) measures.

TABLE ES-1: EMISSIONS INVENTORY, FORECASTS, AND TARGETS

Year	Inventory/Forecast ($MTCO_2e$ per year)	Inventory/Forecast ($MTCO_2e$ per capita per year)	GHG Emissions Targets ($MTCO_2e$ per capita per year)
2015	419,417	6.2	N/A
2030	362,092	4.8	6.0
2035	359,358	4.5	5.0

Monitoring and Reporting Progress

The City will periodically monitor and report on progress towards achieving the emissions targets, potentially every five years, unless otherwise required more frequently by State law. The monitoring report will include information on the status of the federal and State level emissions reductions measures identified in Chapter 3 of this CAP, as well as any new efforts that may emerge in the reporting year.

Updating the GHG Inventory and the CAP

The City will update the GHG inventory periodically. If an updated inventory reveals that Redlands is not making adequate progress toward meeting the GHG target, or that new technologies and programs emerge that warrant inclusion in the CAP, the City will adjust the CAP by modifying, adding, and/or replacing policies in the General Plan or elsewhere, or incorporating optional measure(s) to further reduce emissions outlined in Section 4.2 of this CAP. For illustration purposes, the CAP outlines several candidate measures, and quantifies the likely GHG emissions reductions resulting from them. The measures include:

- Photovoltaic systems;
- Energy efficiency retrofits;
- Facility commissioning;
- Efficient lighting standards; and
- Increased Zero-Emission Vehicle Travel.

1

Introduction

1.1 Scope and Purpose

Background and Purpose

The Redlands Climate Action Plan (CAP) – the City's first CAP – is designed to reinforce the City's commitment to reducing greenhouse gas (GHG) emissions, and demonstrate how the City will comply with State of California's GHG emission reduction standards. As a Qualified GHG Reduction Strategy, the CAP will also enable streamlined environmental review of future development projects, in accordance with the California Environmental Quality Act (CEQA).

The CAP has been prepared concurrently with the updated Redlands General Plan, reflecting the City's most current land use and transportation strategy, and GHG implications of various General Plan's goals and policies. The General Plan Environmental Impact Report (EIR) also serves as the EIR on the CAP, and the GHG analysis in the CAP is fully synchronized with the analysis in the EIR.

The General Plan includes strategies such as transit-oriented and mixed-use development, integrated transportation and land use planning, promotion of bicycle and pedestrian movements, and parking and transportation demand management. It also includes goals and policies to promote energy efficiency, waste reduction, and resource conservation and recycling. These strategies, goals, and policies would result in GHG reduction compared to baseline trends.

As a document adopted by the City of Redlands City Council, the CAP applies to the municipal limits of the City of Redlands. All information and data presented in the CAP, unless otherwise noted, is for the area within the City's municipal limits. The General Plan covers a larger Planning Area that includes the unincorporated communities of Mentone and Crafton; information on existing and future GHG emissions in this larger General Plan Planning Area is presented in Section 3.6 for informational purposes.

CAP Contents

The CAP 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.

While there is no sunset year for the CAP, the CAP provides analysis of GHG emissions to the year 2035, which is the General Plan horizon year.

Community Vision and Environmental Stewardship

As part of the General Plan update visioning process, members of the community were asked to describe those qualities that make Redlands a great community and which should guide the City in the future. The resultant General Plan Vision incorporates sustainability as a key tenet:

"We envision Redlands as a distinctive city characterized by its small-town feeling and cultural richness; whose citizens enjoy a livable, healthy, and sustainable community and a prosperous economy."

In addition, the General Plan reflects several high-level values that can be applied across several topics in the General Plan, and serve as the document's organizing themes. Sustainability is reflected as a core value:

> ***Sustainability.*** Serve as an environmental steward; ensure that residents enjoy clean air and water; make efficient use of energy, water, and land resources; and grow in a manner in which increased population does not negatively impact resources.

1.2 Climate Change and Greenhouse Gases Overview

Greenhouse Effect and GHGs

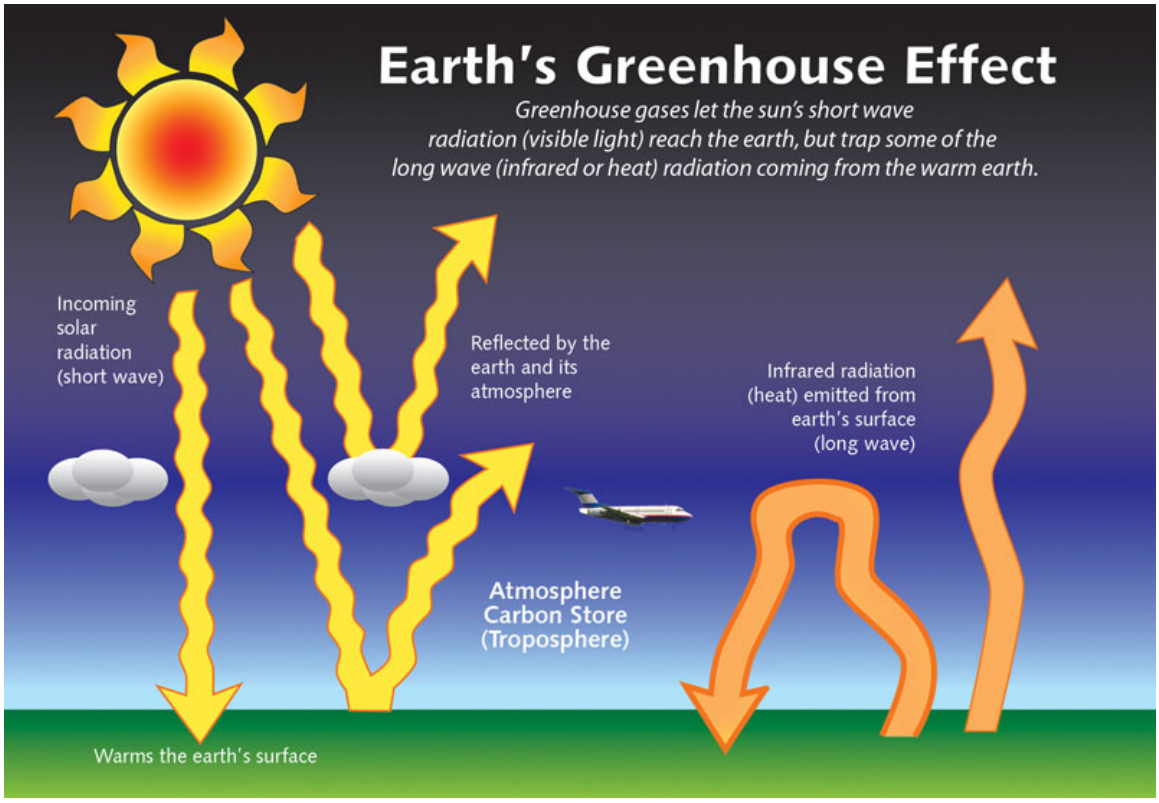
Gases that trap heat in the atmosphere are often called "greenhouse gases" or GHGs. The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short-wave radiation emitted by the sun is absorbed by the earth; the earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation, emitting some of it into space and the rest back toward the earth. This "trapping" of the long-wave (thermal) radiation emitted back toward the earth is the underlying process of the greenhouse effect (Figure 1-1).

Principal GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and water vapor (H_2O). Some GHGs, such as CO_2, CH_4, and N_2O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Since different

gases contribute to the greenhouse effect in different proportions, the term CO_2e (carbon dioxide equivalent) provides the reference frame based on comparison to CO_2's contribution.

The greenhouse effect is a natural process that contributes to regulating the earth's temperature. Without it, the temperature of the earth would be about 0°F (–18°C) instead of its present 57°F (14°C) and unlikely to support human life in its current form.

Figure 1-1: Greenhouse Gas Effect



(Source: NYS Department of Environmental Conservation, http://www.dec.ny.gov/energy/76533.html)

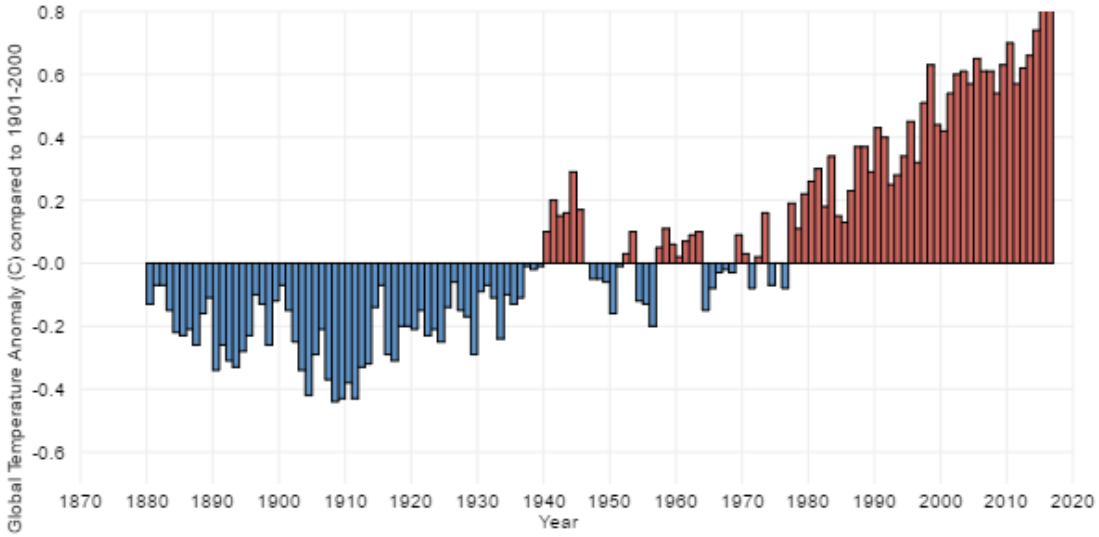
Carbon Cycle and Global Temperatures

The global carbon cycle is complex and incorporates natural sources of atmospheric carbon dioxide, including respiration of aerobic organisms, wildfires, and volcanic outgassing, and sinks such the removal of CO_2 by land plants for photosynthesis, and absorption by the ocean. Data collected on global GHG concentrations over the past 800,000 years demonstrates that the concentration of CO_2, the principal GHG, has increased dramatically since pre-industrial

times, from approximately below 300 parts per million (ppm) in 1800, to about 353 ppm in 1990 and 403 ppm in 2016.[1]

Increased atmospheric concentrations of GHGs have led to a rise in average global temperatures. Figure 1-2 shows the increase in global temperatures from 1880 to 2016. While average global temperatures fluctuate on a yearly basis, the general trend shows a long-term temperature increase. Since 1976, every year has been warmer than the long-term average. In 2015, the average temperature across global land and ocean surfaces was 1.62°F (0.90°C) above the twentieth-century average—the hottest year in the 136-year record. The consensus among climate scientists is that earth's climate system is unequivocally warming, and rigorous scientific research demonstrates that anthropogenic[2] greenhouse gases are the primary driver.

Figure 1-2: Change in Average Global Temperatures



(Source: National Oceanic and Atmospheric Administration, https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature)

Climate Change

Global climate change concerns are focused on the potential effects of climate change resulting from excessive GHGs in the atmosphere and how communities can mitigate effects and adapt to change in the short and long term.

Numerous observations document the impacts of global climate change, including increases in global average air and ocean temperatures, the widespread melting of snow and ice, more intense heat waves, and rising global average sea level. Scientists have high confidence that global temperatures will continue to rise in the foreseeable future, largely due to anthropogenic

[1] Source: National Oceanic and Atmospheric Administration "Trends in Atmospheric Carbon Dioxide," http://www.esrl.noaa.gov/gmd/ccgg/trends/

[2] Caused by human activities

GHG emissions. In addition to the physical impacts to the environment from increased temperatures, sea level rise, and more frequent extreme weather events, global climate change is predicted to continue to cause ecological and social impacts. Ecological impacts of climate change include greater risk of extinction of species, loss of species diversity, and alteration of global biogeochemical cycles, which play an essential role in nutrient distribution. The social impacts of climate change include impacts on agriculture, fisheries, energy, water resources, forestry, construction, insurance, financial services, tourism, and recreation.

According to the International Panel on Climate Change (IPCC) in North America, the regional impacts of climate change are a forecast of decreased snowpack in the western mountains, a 5 to 20 percent decrease in the yields of rain-fed agriculture in some regions, and increased frequency, intensity and duration of heat waves in cities that currently experience them.

In California, the Climate Action Team (CAT)—a group of state agency secretaries and the heads of agency, boards, and departments, led by the Secretary of the California Environmental Protection Agency—synthesized current research on the environmental and economic impacts of climate change. The CAT found that climate changes are poised to affect virtually every sector of the state's economy and most ecosystems. Key findings of the CAT include predicted decreases in water supply that could cause revenue losses of up to $3 billion in the agricultural sector by 2050, increases in statewide electricity demand of up to 55 percent by the end of the century, increased wildfire risk that may cause monetary impacts of up to $2 billion by 2050, and ecosystems impacts affecting California's historic ranching culture and a source of local, grass-fed beef.

Higher temperatures, changes in precipitation, decreased water supplies accompanied by increased demand, increased risk of wildfire, a greater number of extremely hot days, the decline or loss of plant and animal species, and other impacts of climate change are expected to continue to affect Redlands. Climate change also has public health impacts. Redlands residents who are already more vulnerable to health challenges are likely to be the most affected by climate change. These populations tend to be the young and the old, the poor, and those who are already sick. Increases in extreme heat events can increase the risk of heat-related illness or death, or the worsening of chronic health conditions. Food scarcity and higher food prices from impacts to agriculture can cause increased hunger and reduced availability of nutrition. The increased frequency of natural disasters such as floods, droughts, wildfires, and storm surges can cause injury or death, illness, and increases or shifts in infectious disease.

1.3 California GHG Reduction Legal Framework

California has taken an aggressive stance to reduce GHG emissions in order to combat the impacts of climate change; some of the State actions include the following.

Governor's Executive Order S-3-05

Executive Order S-3-05 (EO S-3-05) issued in 2005 recognizes California's vulnerability to increased temperatures causing human health impacts, rising sea levels, and reduced Sierra snowpack due to a changing climate. The Executive Order established targets to reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

Global Warming Solutions Act of 2006 and CARB Scoping Plan

The Global Warming Solutions Act of 2006 (Assembly Bill 32, or AB 32) codifies the targets set in EO S-3-05 of statewide reductions to 1990 emissions levels by 2020. AB 32 directs the California Air Resources Board (CARB) to develop and implement a scoping plan and regulations to meet the 2020 target.

CARB approved the Scoping Plan in 2008, which provides guidance for local communities to meet AB 32 and EO S-3-05 targets. The Scoping Plan adopted a quantified cap on GHG emission representing 1990 emission levels, instituted a schedule to meet the emission cap, and developed tracking, reporting, and enforcement tools to assist the State in meeting the required GHG emissions reductions.

Governor's Executive Order S-3-15

Executive Order S-3-15 (EO 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 metric tons carbon dioxide equivalent ($MTCO_2e$) per capita per year in 2030 and 2 $MTCO_2e$ per capita per year in 2050.

The CAP's GHG emission targets are based on meeting the goals set in EO S-3-15 and SB 32, following the CAP guidelines established in the 2017 Scoping Plan.

1.4 Federal and State Emissions Reductions Strategies and Standards

Several federal and state standards have been adopted to reduce GHG emissions, in addition to and in support of the targets set in EO S-3-15 and SB 32.

Federal Standards

The United States Environmental Protection Agency (EPA) regulates and tests gas mileage or fuel economy in order to deter air pollution in the United States. Since the transportation sector produces 26 percent[3] of GHG emissions in the U.S. as a whole, fuel economy regulations are an important way to reduce GHG emissions. The EPA's Corporate Average Fuel Economy (CAFE) standards require vehicle manufacturers to comply with the gas mileage or fuel economy standards to reduce energy consumption by increasing the fuel economy of cars and light trucks. The most recent CAFE GHG emissions standards were set in 2012, which will increase the fuel economy to 54.5 miles per gallon average for cars and light trucks by Model Year 2025, and reduce U.S. oil consumption by 12 billion barrels per year. The EPA also imposes the Gas Guzzler Tax on manufacturers of new cars that do not meet required fuel economy levels, to discourage the production and purchase of fuel-inefficient vehicles.

The EPA is taking further action to reduce GHG emissions in addition to setting fuel economy standards. The EPA established a renewable fuel standard to include a minimum volume of renewable fuel in 2017, which applies to all gasoline and diesel produced or imported. On August 3, 2015, the EPA finalized the Carbon Pollution Standards, 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 Standards

California Senate Bill 375

SB 375 (2008) requires each Metropolitan Planning Organization (MPO) in the state to adopt a Regional Transportation Plan (RTP) aimed at achieving a coordinated and balance regional transportation system, including mass transit, highways, railroads, bicycles, and pedestrians, among other forms of transit. Each MPO is required to prepare a Sustainable Communities Strategy (SCS) which sets forth forecast development patterns and describes the transportation system that achieve the regional GHG emission reduction targets set by CARB.

Established in 2010, CARB's targets called for the Southern California Association of Governments (SCAG) region, the MPO in which Redlands is located, to reduce per capita

[3] In 2014, GHG emissions from transportation were about 26 percent of the total 6,702 million metric tons CO_2e (Source: https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions).

emissions 8 percent by 2020 and 13 percent by 2035 based on a 2005 baseline. SCAG adopted its own RTP/SCS in April 2012. 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. As the SCS is focused on passenger vehicle emissions on a regional scale, it is considered separate from the reductions outlined in this CAP.

Governor's Executive Order S-1-07 (Low Carbon Fuel Standard)

Executive Order S-1-07, the Low Carbon Fuel Standard (LCFS), requires a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. The LCFS requires oil refineries and distributors to ensure that the mix of fuel sold in California meets this reduction. The reduction comes from production cycle (upstream) emissions from the production and distribution of transport fuels within the state, rather than the combustion cycle (tailpipe) emissions from the use of those transport fuels.[4]

Renewable Portfolio Standards

California's Renewable Portfolio Standard (RPS), established in 2002 by the California State Senate in SB 1078, accelerated in 2006 and expanded in 2011, is one of the most ambitious renewable energy standards in the country. The RPS requires each energy provider to supply 33 percent of their electricity from eligible renewable energy resources by 2020. Signed in October 2015, SB 350 requires providers to supply 50 percent of their electricity from eligible renewable energy resources by 2030.

Pavley Fuel Economy Standards (AB 1493)

In 2009, CARB adopted amendments to the Pavley regulations to reduce GHG emissions in new passenger vehicles from 2009 to 2016. The standards became the model for the updated federal CAFE standards.

Advanced Clean Cars (ACC) Program

In 2012, CARB adopted the 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 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.

Title 24 Building Standards & CALGreen

Title 24 is California's Building Energy Code, which is updated every three years. In 2010, Title 24 was updated to include the "California Green Building Standards Code," referred to as CALGreen. CALGreen requires that new buildings reduce water consumption, increase system efficiencies, divert construction waste from landfills, and install low pollutant-emitting finish

[4] EMFAC2014 Volume III - Technical Documentation

materials. CALGreen has mandatory measures that apply to nonresidential and residential construction. 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.

75 Percent Solid Waste Diversion

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.

1.5 Planning Process

How This Plan Was Prepared

The CAP reflects the City's commitment to the core values presented in the General Plan, and links elements of the plan—including Distinctive City, Livable Community, Connected City, Healthy Community, and Sustainability—with the goal of GHG reduction. The CAP was prepared in 2017 by City staff and consultants.

Relationship to the California Environmental Quality Act

The California Environmental Quality Act (CEQA) is a statute that requires local agencies to identify significant environmental impacts of their actions and avoid or mitigate those impacts, if feasible. In 2007, California's lawmakers enacted SB 97, which expressly recognizes the need to analyze GHG emissions as part of the CEQA process. SB 97 required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to address GHG emissions as an environmental effect.

In 2010, OPR's amendments to the CEQA guidelines addressing GHG emissions became effective. Lead agencies are now obligated to describe, calculate or estimate the amount of GHG emissions resulting from a project, by using a model or methodology to quantify GHG emissions resulting from a project or relying on a qualitative analysis or performance based standards. The lead agency should determine whether a project's GHG emissions significantly affect the environment by considering whether the project's emissions, as compared to the existing environmental setting, exceeds a threshold of significance that the lead agency determines applies to the project, and the extent to which the project complies with the regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. In addition, the lead agency is required to impose feasible mitigation to eliminate or substantially reduce significant effects.

The CAP will help the City with compliance with CEQA Guidelines Section 15183.5(b): Tiering and Streamlining the Analysis of Greenhouse Gas Emissions[5], which became effective in 2010.

[5] 15183.5(b) of CEQA Guidelines states, "Plans for the Reduction of Greenhouse Gas Emissions. Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's

The required elements of a CAP, as cited in the guidelines, state that a plan for the reduction of GHG emissions should:

- Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;
- Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
- Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and
- Be adopted in a public process following environmental review.

The CAP is intended to fulfill these requirements. The CAP also contains a Project Review Checklist, which allows for streamlined review of GHG emissions for projects that demonstrate consistency with the CAP, as described in CEQA Guidelines Section 15183.5(b).

Relationship to General Plan and Future Projects

The City's approach to addressing GHG emissions within the General Plan is parallel to the climate change planning process followed by numerous California jurisdictions. A General Plan is a project under CEQA, and projects under CEQA are required to estimate CO_2 and other GHG emissions, as described above. The CAP is designed to provide discrete actions to operationalize the General Plan policies that help with GHG reduction. The preparation of a CAP is also consistent with CEQA Guidelines Section 15183.5 that allows jurisdictions to analyze and mitigate the significant effects of GHG at a programmatic level, by adopting a plan to reduce GHG emissions.

Project-specific environmental documents prepared for projects consistent with the General Plan may rely on the programmatic analysis contained in the CAP and the EIR certified for the Redlands General Plan.

incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances."

1.6 How to Use This Plan

The CAP is intended to be a tool for policy makers, community members and others to guide the implementation of actions that limit Redlands's GHG emissions. Ensuring that the CAP translates from policy language to on-the-ground results is critical to its success. Chapter 4 describes how the City can monitor progress in reducing emissions, and periodically revisit assumptions and key provisions of the plan. This chapter also outlines GHG emission reduction policies the City can implement if it wishes to reduce its emissions beyond the State-mandated targets,

This page intentionally left blank

2

Emissions Inventory

This chapter identifies the major sources and the overall magnitude of greenhouse gas (GHG) emissions in Redlands, pursuant to Sections 15183.5(b)(1)(A) and 15183.5(b)(1)(C) of the state CEQA Guidelines. As part of the Climate Action Plan (CAP) preparation effort, this 2015 GHG inventory was prepared to provide a recent measure of emissions and is summarized in this chapter.

The inventory follows the standards developed by the International Council for Local Environmental Initiatives (ICLEI) for community GHG inventories.[6] The inventory methodology is described first, followed by the inputs, and results.

2.1 Methodology

The emissions inventory covers direct GHG emissions[7] from sources within the boundaries of Redlands, including fuel combusted and solid waste generated within the city. Indirect emissions associated with the consumption of energy (such as electricity, with no end point emissions) that is generated outside the borders of the city are also included. The emissions inventory tallies emissions from ten sectors:

- Residential;
- Commercial;
- Industrial;
- Transportation;
- Solid waste;
- Water;
- Wastewater;

[6] According to the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.1. July 2013.

[7] GHGs considered in the report are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The emissions have been converted to carbon dioxide equivalent (CO_2e), which converts the two other GHGs into the equivalent mass of carbon dioxide.

- Off-Road Equipment;
- Public Lighting; and
- Agriculture.

Developed by ICLEI, the SEEC ClearPath California[8] model was used to estimate emissions from solid waste disposal, process and fugitive emissions from wastewater treatment, and residential, commercial, industrial, and wastewater treatment natural gas use. The California Air Resources Board's (CARB's) EMFAC2014[9] model was used to calculate transportation emissions, and CARB's OFFROAD[10] model was used for the off-road equipment sector.

The majority of emissions were calculated using activity data and emissions factors. Activity data refers to a measurement of energy use or another GHG-generation process, such as residential electricity use, or vehicle miles traveled. Emissions factors are used to convert activity data to emissions, and are usually expressed as emissions per unit of activity data (e.g. metric tons carbon dioxide [CO_2] per kilowatt hour of electricity). To estimate emissions, the following basic equation is used:

$$[Activity\ Data]\ x\ [Emissions\ Factor] = \text{Emissions}$$

As an example, multiplying the total amount of residential electricity use (activity data, expressed in kilowatt-hours) by the emissions factor (expressed as CO_2e emissions per kilowatt-hour) produces the emissions in CO_2e from residential energy use. The following section describes the inputs for the emissions inventory based on activity data (or usage).

Certain emissions that occur in Redlands are not counted in the inventory. For example, emissions related to the Mountainview Generating Station are not included in Redlands's GHG inventory. The reason is as follows: embodied emissions, such as those resulting from power generation that is produced locally but distributed regionally, are not covered in the Redlands inventory, in accordance with ICLEI standards. These emissions are included at the points where energy is *consumed* (some of which are in Redlands) rather than where it is simply *produced*—otherwise emissions would either be double counted, or if only counted at the production source, electricity consumption (which is the second largest contributor to GHG) in climate action planning would be meaningless.

For transportation trips that originate or end in Redlands, emissions for half of the entire trip, not just for the miles traveled within Redlands, are included; however, trips that just pass through the Redlands are excluded, as their emissions would be reflected at their trip ends.[11]

[8] ClearPath is a web-based model developed by ICLEI to inventory, forecast, and manage GHG emissions.

[9] The EMFAC2014 model was developed by CARB to measure various emissions from on-road vehicles.

[10] The OFFROAD model was developed by CARB to measure various emissions from off-road vehicles.

[11] For example, for a trip that begins in downtown San Bernardino and ends in Redlands, the entire trip length is calculated for that trip. Half of the entire trip length is assigned to Redlands, and the other half is assigned to the City of San Bernardino. Using half the trip length is standard ICLEI methodology for assigning regional VMT to a particular jurisdiction.

Furthermore, although pass-through trips contribute a substantial amount to VMT totals, the City and the Redlands community have limited ability to influence them.

2.2 Emissions Inventory

Residential, Commercial, and Industrial (RCI) Electricity and Natural Gas Usage

Emissions from electricity consumption were calculated outside the model using electricity usage for the residential, commercial, and industrial (RCI) sectors, along with Southern California Edison's (SCE's) 2015 GHG per unit of electricity provided in Edison International's 2015 Corporate Responsibility Report: 0.23 metric tons CO_2e per megawatt-hour ($MTCO_2e/MWh$). Emissions from natural gas consumption for the RCI sectors were calculated by inputting natural gas consumed into the ClearPath model.

Table 2-1 shows RCI electricity and natural gas consumption, and the total citywide consumption of electricity and natural gas, for 2015. The commercial sector has the largest electric consumption followed by residential and industrial. The greatest natural gas consumption is from the residential sector, primarily used for heating homes and water, followed by the commercial and industrial sectors.

TABLE 2-1: RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL (RCI) INPUTS; 2015

		Inputs
Residential	Electric (kWh per year)	203,878,268
	Natural Gas (therms per year)	9,399,719
Commercial	Electric (kWh per year)	216,129,896
	Natural Gas (therms per year)	4,393,353
Industrial	Electric (kWh per year)	83,940,583
	Natural Gas (therms per year)	62,390
Total by Source		
Electricity (kWh per year)		503,948,747
Natural Gas (therms per year)		13,855,462

Source: Southern California Edison, 2017; Southern California Gas Company, 2017

Transportation

Transportation emissions are based on vehicle miles traveled (VMT) for on-road vehicles. GIS-based 2015 VMT data from the San Bernardino Associated Governments (SANBAG) for all roadways was used. All roadways including the zone connectors were used. The SANBAG data is reported as daily weekday VMT. This was converted to annual VMT by multiplying it by

347[12], as recommended by CARB. The total annual VMT in 2015 was 569,237,534 vehicle miles traveled.

EMFAC2014 was used to find CO_2 emission factors (emissions per VMT) for vehicles in the portion of San Bernardino County within the South Coast Air Basin (SCAB). The emission factors were found for calendar year 2015; annual emissions (no season was chosen); and all model years, speeds, and fuels. The United States Environmental Protection Agency's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014 was used to find national CH_4 and N_2O emission factors. Emissions were calculated by multiplying emission factors by VMT.

Solid Waste

The City of Redlands Quality of Life Department (QOL) provided waste characterization data on the percentage of organic residential and commercial waste that consisted of nine categories of waste, as shown in Table 2-2.

TABLE 2-2: RESIDENTIAL AND COMMERCIAL WASTE CHARACTERIZATION; 2015

Waste Category	Percentage Residential Waste	Percentage Commercial Waste
Newspaper	5.65	0.91
Office Paper	4.73	3.73
Corrugated Cardboard	35.65	13.83
Magazine/Third Class Mail	6.33	3.62
Food Scraps	14.85	39.68
Grass	6.74	3.55
Leaves	5.98	2.96
Branches	0.39	6.91
Dimensional Lumber	19.68	24.81
Total	**100.00**	**100.00**

Source: City of Redlands, 2017

QOL also provided the amount of organic commercial and residential solid waste disposed of in landfills. 24,054 tons of commercial waste and 16,618 tons of residential waste were generated and disposed of within Redlands. These data were input into ClearPath to calculate CO_2e emissions.

Water

Emissions from supplying water were calculated using the 2015 electricity consumption input provided by the City of Redlands Municipal Utilities and Engineering Department (MUED) for potable and reclaimed water: 9,535,459 kWh and 395,838 kWh, respectively. A small part in the southeastern portion of Redlands is served by the Western Heights Mutual Water

[12] CARB recommends that 347 be used instead of 365 to convert from average daily VMT to annual VMT to account for less travel on weekends.

Company. The water supplied by this water company is not included in the 2015 San Bernardino Valley Regional Urban Water Management Plan and is small enough to be considered negligible for emissions accounting purposes.

Wastewater Treatment

Emissions from electricity and natural gas used during wastewater treatment in 2015 were calculated using consumption input provided by MUED: 5,847,105 kWh electricity and 782,520 standard cubic feet (scf) of natural gas. Emissions from methane and nitrous oxide generated in the process of digester gas combustion were determined using the ClearPath model using inputs provided by MUED for digester gas: 48,308 scf/day and 33 percent methane content. Nitrous oxide emissions from wastewater effluent was calculated in ClearPath using the effluent's nitrogen content provided by MUED: 477.5 kilograms per day (kg/day). Methane emissions from septic tank use were calculated using assumptions in the ICLEI Protocol.

Off-Road Equipment

Off-road emissions in Redlands include lawn and garden equipment, construction equipment, and industrial equipment, in addition to other categories for which CARB's OFFROAD2007 model generates emission outputs. The model generates emissions for a total of 16 categories across San Bernardino County. The CO_2, CH_4, and N_2O emissions were calculated in short tons per day for the portion of the county that lies in SCAB. The emissions were found for calendar year 2015; Monday through Sunday; annual emissions (no season was chosen); and all equipment, fuels, and horsepowers. These emissions were then pro-rated by Redlands's share of the county population within SCAB, multiplied by 365 days, and converted to metric tons.

Public Lighting

This sector covers electricity consumed from three sources in 2015: traffic signals, streetlights, sports stadium lighting, and other outdoor lighting. As shown in Table 2-3, streetlights make up the great majority of electricity consumption in this sector.

TABLE 2-3: PUBLIC LIGHTING INPUTS (KWH PER YEAR)

	2015	% of Total
Streetlights	2,735,330	84%
Sports Stadium Lighting	312,895	10%
Traffic Signals/Controllers	199,082	6%
Outdoor Lighting	1,032	<1%
TOTAL	**3,248,339**	

Agriculture

Emissions from agricultural electricity usage were calculated from 2015 electricity usage data provided by Southern California Edison for the agricultural sector: 2,303,651 kWh.

Total Emissions

The total GHG emissions were 419,417 $MTCO_2e$ per year in 2015. Table 2-4 summarizes the sources and quantities of emissions, and Figure 2-1 shows the emissions graphically by sector. The largest sector is transportation, at 41 percent, followed by residential (23 percent) and commercial (17 percent).

Figure 2-1: 2015 GHG Emissions by Sector

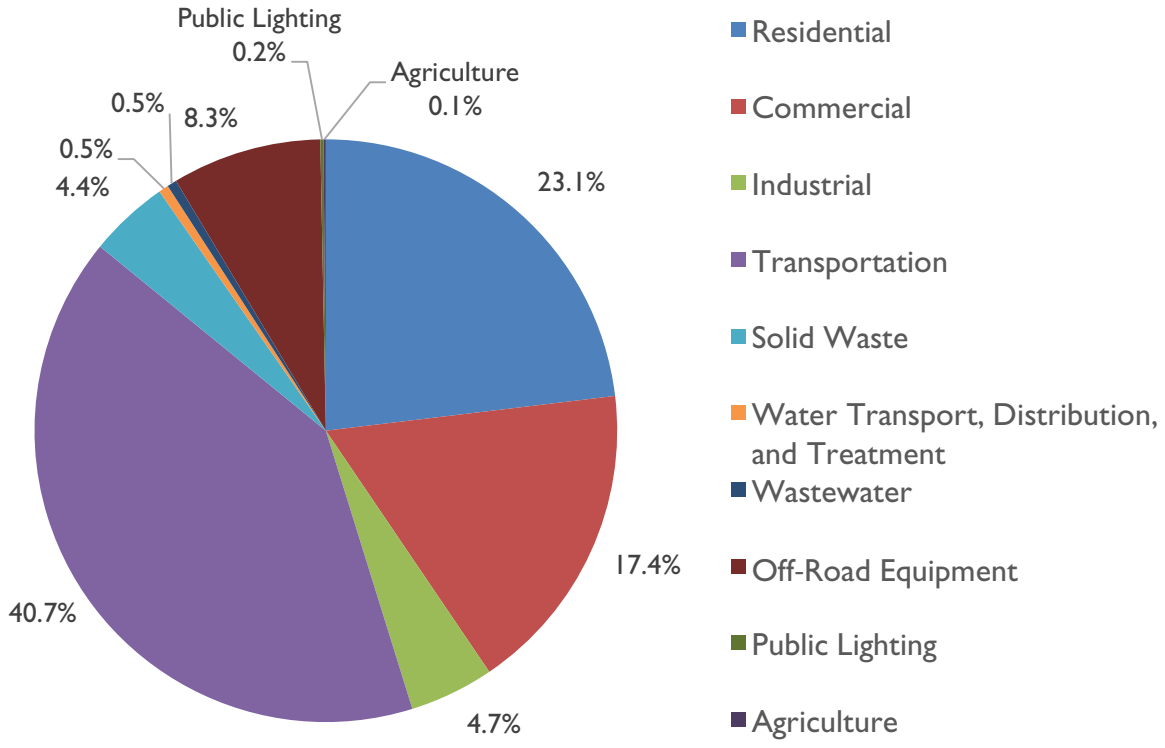


TABLE 2-4: 2015 GHG EMISSIONS ($MTCO_2E$ PER YEAR)		
Sector	**Subsector**	**Emissions**
Residential	Electricity	46,892
	Natural Gas	49,983
	Total Residential	**96,875**
Commercial	Electricity	49,710
	Natural Gas	23,362
	Total Commercial	**73,071**
Industrial	Electricity	19,306
	Natural Gas	331
	Total Industrial	**19,637**
Transportation	**Total Transportation**	**170,635**
Solid Waste	**Total Solid Waste**	**18,618**
Water	**Total Water**	**2,284**
Wastewater	**Total Wastewater**	**2,222**
Off-Road Equipment	**Total Off-Road**	**34,797**
Public Lighting	**Total Public Lighting**	**747**
Agriculture	**Total Agriculture**	**530**
GRAND TOTAL		**419,417**

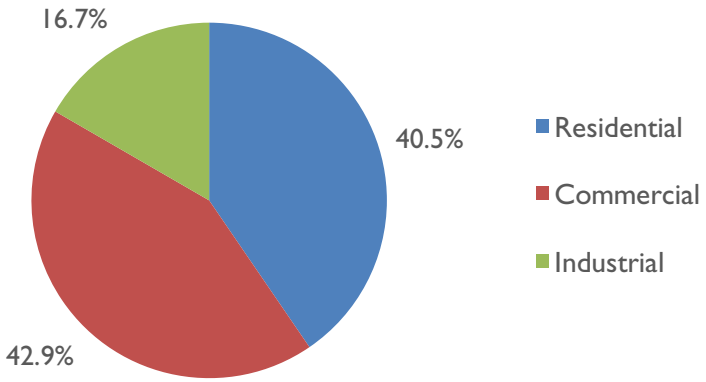
RCI Emissions by Source

Electricity

RCI electricity emissions account for 28 percent of the total emissions. Table 2-5 and Figure 2-2 show electricity use emissions by sector—the commercial sector accounts for 43 percent of all electricity emissions in Redlands, followed by the residential sector, which accounts for 40 percent.

TABLE 2-5: ELECTRICITY EMISSIONS BY SECTOR ($MTCO_2E$ PER YEAR)	
Sector	**2015 Emissions**
Residential	46,892
Commercial	49,710
Industrial	19,306

Figure 2-2: Electricity Emissions by Sector



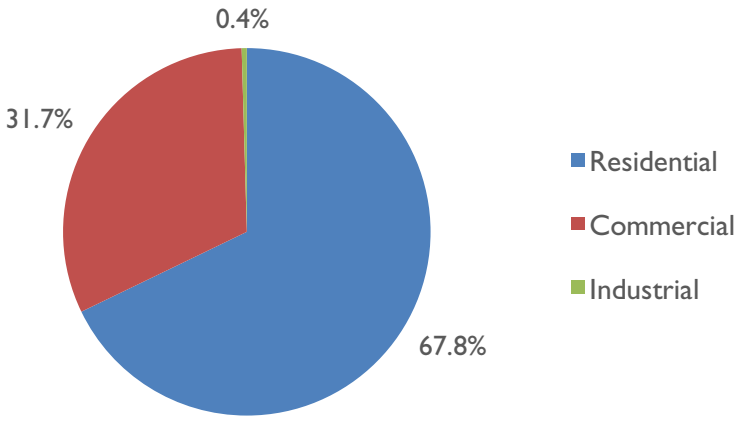
Natural Gas

Natural gas use accounts for 18 percent of total emissions in Redlands. The residential sector accounts for 68 percent of natural gas use, while the commercial sector accounts for 32 percent. Table 2-6 and Figure 2-3 show natural gas use emissions by sector.

TABLE 2-6: NATURAL GAS EMISSIONS BY SECTOR ($MTCO_2E$ PER YEAR)

Sector	2015 Emissions
Residential	50,378
Commercial	23,443
Industrial	341

Figure 2-3: Natural Gas Emissions by Sector



3

Greenhouse Gas Reduction Targets and Forecasts

This chapter describes the greenhouse gas (GHG) reduction targets provided by State law, provides a baseline forecast of GHG emissions, and models forecasts of future GHG emissions through 2035. The chapter also quantifies GHG reductions from (1) State actions and (2) the updated General Plan policies and actions, and applies these reductions to the emissions forecast.

3.1 GHG Reduction Target

Governor's Executive Order S-3-15

As discussed in Section 1.3 of this Climate Action Plan's (CAP's) Introduction, 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.

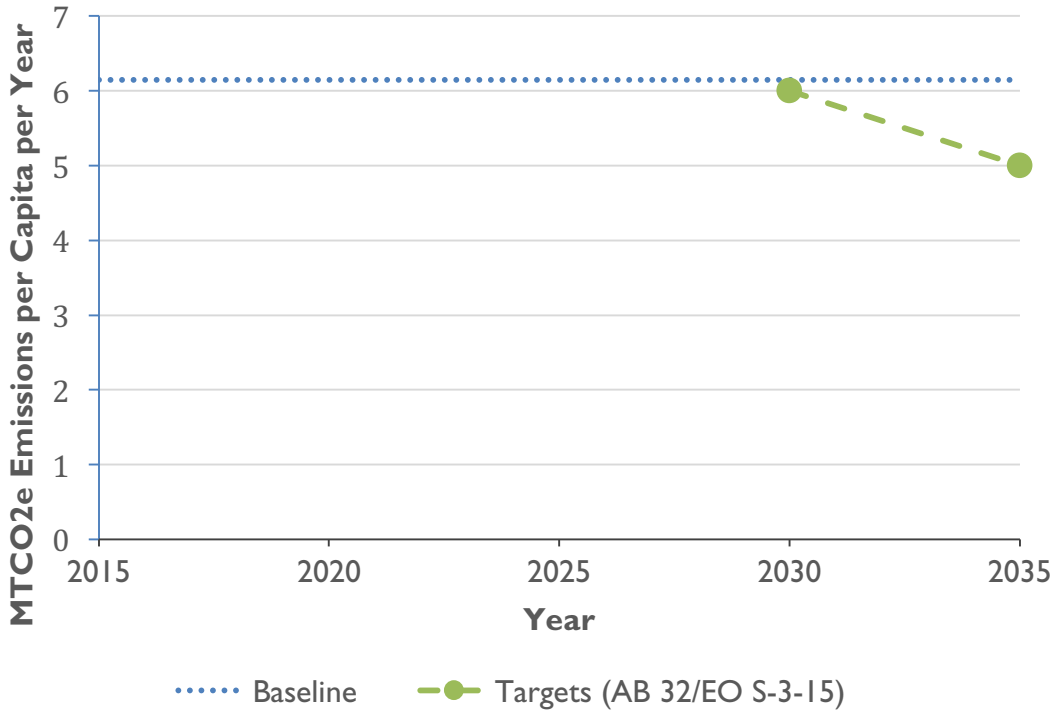
To reflect these targets, the California Air Resources Board (CARB) recommends that local governments reduce their GHG emissions to 6 metric tons carbon dioxide equivalent ($MTCO_2e$) per capita per year in 2030 and 2 $MTCO_2e$ per capita per year in 2050.

The horizon year for analysis in this CAP is 2035, corresponding with the General Plan horizon. The CAP uses a linear trajectory in emissions reductions between 2030 and 2050 to determine the 2035 target: 5 $MTCO_2e$ per capita per year.

Table 3-1 summarizes these emissions targets and the 2015 emissions. Figure 3-1 graphs the 2015 inventory emissions in MTCO2e per capita along with the emissions targets, following a linear trajectory, from 2030 to 2035. As can be seen, the 2015 emissions exceed both the 2030 and the 2035 targets.

TABLE 3-1: 2015 EMISSIONS AND EMISSIONS TARGETS		
Year	**GHG Emissions and Targets ($MTCO_2e$ per year)**	**GHG Emissions and Targets ($MTCO_2e$ per capita per year)**
2015	419,417	6.1
2030	N/A	6.0
2035	N/A	5.0

Figure 3-1: 2015 Emissions and Emissions Targets



3.2 Business as Usual Forecast with General Plan Land Use and Circulation System

Methodology

The business as usual (BAU) forecast estimates emissions through the year 2035. The BAU forecast assumes the General Plan land use and circulation system, but does not include the effects of the following State actions discussed in Section 1.4 of this CAP's Introduction: The Renewable Portfolio Standard (RPS), 2016 Title 24 Building Energy Efficiency Standards, or the 75 percent solid waste diversion goal. The Pavley regulations and the Advanced Clean Cars program discussed in Section 1.4 of the Introduction 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 Low Carbon Fuel Standard (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. Since upstream emissions from transportation fuels are not considered in this CAP, LCFS will not be included in Section 3.3, which quantifies state actions that reduce GHG emissions and incorporates these actions into the forecast.

The forecast predicts all direct GHG emissions[13] from sources within the boundaries of Redlands, including fuel combusted in the city.[14] Indirect emissions associated with the consumption of energy that is generated outside the borders of the city 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 ten sectors:

- Residential;
- Commercial;
- Industrial;
- Transportation;
- Solid waste;
- Water;
- Wastewater;
- Off-Road Equipment;

[13] GHGs considered in the report are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The emissions have been converted to carbon dioxide equivalent (CO_2e), which converts the three other GHGs into the equivalent mass of carbon dioxide.

[14] This does not include the Mountainview Generating Station, for reasons described in Chapter 2.

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

Inputs

Residential

Emissions from the residential sector are from electricity and natural gas demand. The growth in residential electricity and natural gas consumption was assumed to scale with housing unit growth, estimated at 0.76 percent per year through 2035, based on General Plan buildout estimates.

Commercial

The increase in commercial demand for electricity and natural gas was assumed to scale with the commercial building square footage growth, estimated at 1.10 percent per year through 2035.

Industrial

The increase in industrial demand for electricity and natural gas was assumed to scale with the industrial building square footage growth, estimated at 1.33 percent per year through 2035.

Transportation—With General Plan Land Use and Circulation System

Transportation emissions are based on the emissions associated with VMT. The VMT projections were taken from San Bernardino Associated Governments (SANBAG) GIS models of regional VMT projections clipped to the Redlands boundaries and adjusted to remove through trips, or trips that did not originate nor end within city boundaries. The SANBAG data was reported as daily weekday VMT. This was converted to annual VMT by multiplying it by 347[15], as recommended by CARB.

The VMT forecasts incorporate GHG reductions from General Plan land use projections and new roadway construction through 2035. These VMT forecasts reflect the General Plan land use patterns. The land use projections and new roadway construction are described in detail in the General Plan.

Table 3-2 shows the Redlands VMT for 2015 and projected VMT forecast, used to estimate transportation emissions. EMFAC2014 was used to find CO_2 emission factors for calendar years 2030 and 2035. The United States Environmental Protection Agency's Inventory of U.S.

[15] 347 was used instead of 365 to average out the effect of a dip in traffic during the weekend.

Greenhouse Gas Emissions and Sinks: 1990-2014 was used to find national CH_4 and N_2O emission factors. Emissions were calculated by multiplying emission factors by VMT.

TABLE 3-2: 2015 VMT AND PROJECTED 2030 AND 2035 VMT

Year	Vehicle Miles Traveled Per Year
2015	519,969,784
2030	620,287,271
2035	657,905,407

Solid Waste

Waste emissions from solid waste generated in Redlands and disposed of in landfills, was assumed to scale with population growth at 0.75 percent per year through 2035.

Water

The increased demand for electricity usage for supplying reclaimed and potable water was assumed to be proportional to the water demand projections for the City of Redlands according to the 2015 San Bernardino Valley Regional Urban Water Management Plan (RUWMP). The RUWMP includes the effect of conservation policies. Table 3-3 shows reclaimed and potable water demand used in the forecast, in addition to the 2015 water demand from the General Plan.

Wastewater

The RUWMP was used to determine the growth in emissions from wastewater treatment. The demand for wastewater treatment was assumed to scale with total projected water demand listed in the RUWMP. Table 3-3 shows water demand used in the forecast, in addition to the 2015 water demand from the General Plan.

TABLE 3-3: 2015 WATER DEMAND AND UWMP PROJECTED 2030 AND 2035 WATER DEMAND

Year	Potable Water Delivery (acre-feet per year)	Reclaimed Water Delivery (acre-feet per year)	Total Water Delivery (acre-feet per year)
2015	20,005	4,733	24,738
2030	29,538	5,402	34,940
2035	30,313	5,402	35,715

Source: City of Redlands MUED, 2016; 2015 San Bernardino Valley Regional Urban Water Management Plan

Off-Road Equipment

CARB's OFFROAD2007 model was used to generate emission outputs for calendar years 2030 and 2035.

Public Lighting

Electricity use for public lighting was assumed to scale with population growth at 0.75 percent per year through 2035.

Agriculture

The decrease in agricultural demand for electricity was assumed to scale with the decrease in agricultural jobs in Redlands, estimated at 1.00 percent per year through 2035.

Results

Table 3-4 shows the BAU emissions from the forecast for each sector—residential, commercial, industrial, transportation, solid waste, water, wastewater, off-road equipment, public lighting, and agriculture—and the total emissions. The forecast includes the effect of the General Plan land use and circulation system on transportation emissions but not the transportation-related policies discussed in Section 3.4 below. Section 3.4 quantifies the emissions reductions due to these policies. The Environmental Impact Report for the General Plan and CAP quantifies the reduction in VMT due to the General Plan in comparison to lower VMT under the 1995 General Plan (the No Project alternative). The BAU forecast does not include the reduction from RPS, 2016 Title 24, or 75 percent solid waste diversion goals, which are quantified separately in Section 3.3 below.

The greatest projected emissions continue to be from the transportation sector, which accounts for 31 percent of emissions in 2030 and 27 percent of emissions in 2035. Residential emissions are the next largest sector, with 25 percent of emissions in 2030 and 26 percent of the total in 2035.

TABLE 3-4: 2015 EMISSIONS AND BAU FORECAST EMISSIONS BY SECTOR, 2030 AND 2035 ($MTCO_2E$ PER YEAR)

Sector	2015	2030	2035
Residential	96,875	108,357	112,491
Commercial	73,071	86,071	90,899
Industrial	19,637	23,955	25,595
Transportation	170,635	133,727	117,667
Solid Waste	18,618	21,501	21,501
Water	2,284	3,342	3,427
Wastewater	2,222	3,138	3,208
Off-Road Equipment	34,797	46,659	52,326
Public Lighting	747	836	867
Agriculture	530	455	433
TOTAL	**419,417**	**428,041**	**428,414**

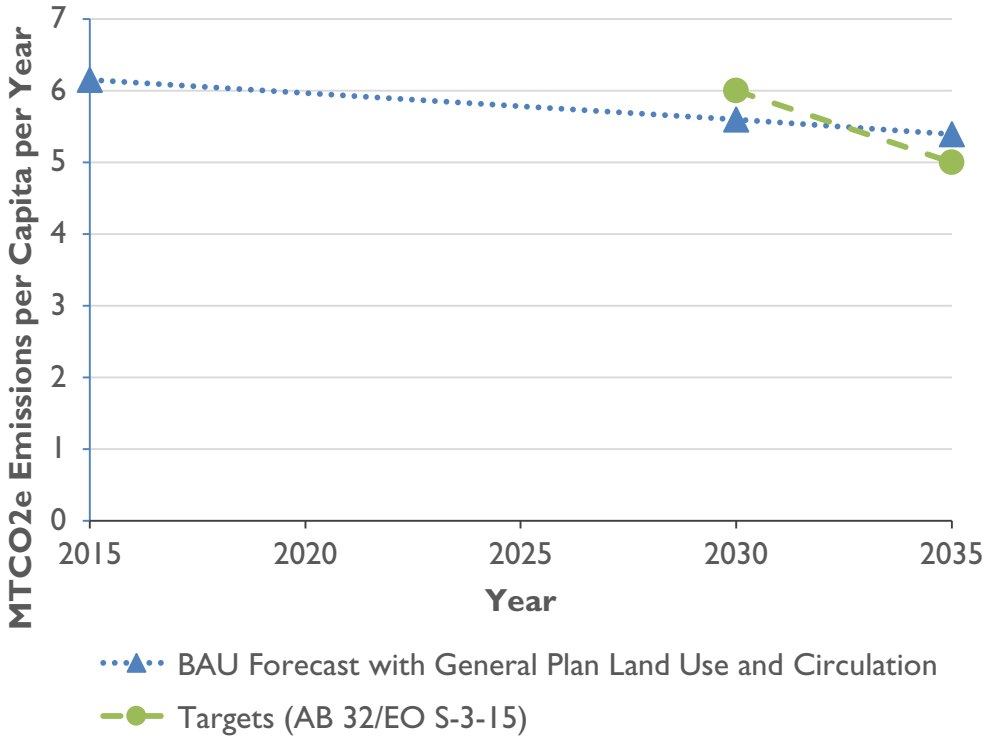
Figure 3-2 shows the change in modeled forecast emissions over time. Total emissions in the BAU scenario are projected to increase from 419,417 $MTCO_2e$ per year in 2015 to 428,414 $MTCO_2e$ per year in 2035 (an increase of 2 percent).

In 2030, the total emissions would be 428,041 $MTCO_2e$ per year, and using the General Plan-projected population growth rate (which gives a population of 76,117 in 2030), would result in 5.6 $MTCO_2e$ per capita per year. These 2030 BAU emissions are 0.4 $MTCO_2e$ per capita per year below the State target of 6.0 $MTCO_2e$ for that year. In 2035, the total emissions of 427,083

$MTCO_2e$ per year or, using the General Plan-projected population growth rate (which gives a population of 79,013 in 2035), 5.4 $MTCO_2e$ per capita per year. This would be 0.4 $MTCO_2e$ per capita per year above the State (interpolated) target of 5.0 $MTCO_2e$ for that year.

The following section quantifies GHG reductions from ongoing State actions and applies them to the BAU emissions forecast.

Figure 3-2: Forecast with General Plan Land Use and Circulation System



3.3 GHG Reductions to Forecast from State Actions

Methodology

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

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

Renewable Portfolio Standard (RPS)

California's RPS, discussed in Section 1.4 of this CAP's Introduction, 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. Table 3-5 lists the reductions from the RPS in 2030 and 2035. These reductions were calculated based on SCE's 2015 energy portfolio from Edison International's 2015 Corporate Responsibility Report: 24.3 percent of the energy delivered to SCE's customers was from renewable sources. To find the GHG emissions from electricity use accounting for RPS, the emission factor for electricity generated by SCE, discussed in Section 2.2 of this CAP, was adjusted for an energy portfolio of 50 percent renewable energy sources in 2030 and 2035: 0.15 $MTCO_2e$ per megawatt-hour.

TABLE 3-5: RPS GHG REDUCTIONS

Year	$MTCO_2e$ Reductions per Year
2030	47,918
2035	49,255

Title 24 Building Efficiency Improvements

Title 24, discussed in Section 1.4 of this CAP's Introduction, 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.

To determine the 2017 code update's effect on emissions from new buildings for the GHG forecast, an impact analysis conducted by the California Energy Commission was used to find the electricity and natural gas usage differences between buildings constructed under the 2013

standards and those constructed according to the 2017 standards.[16] Table 3-6 lists the GHG reductions from building efficiency improvements in new construction in 2030 and 2035.

TABLE 3-6: TITLE 24 BUILDING EFFICIENCY IMPROVEMENTS GHG REDUCTIONS

Year	$MTCO_2e$ Reductions per Year
2030	6,710
2035	9,478

75 Percent Solid Waste Diversion

Assembly Bill 341, as discussed in Section 1.4 of this CAP's Introduction, set the goal of 75 percent recycling, composting, or source reduction of solid waste by 2020. The State-assigned pounds per day (PPD) waste disposal target for Redlands to achieve the former 50 percent waste diversion goal is 5.9 PPD according to CalRecycle.[17] To forecast the PPD waste disposal for 2020 and beyond, 5.9 PPD was halved to account for the 75 percent waste diversion goal, and 2.95 PPD was used. Table 3-7 lists the GHG reductions from the 75 percent waste diversion goal in 2030 and 2035.

TABLE 3-7: GHG REDUCTIONS FROM 75 PERCENT SOLID WASTE DIVERSION

Year	$MTCO_2e$ Reductions per Year
2030	2,134
2035	2,239

[16] Source: California Energy Commission "Impact Analysis 2016 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings," http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/15-day_language/impact_analysis/

[17] Source: CalRecycle "Jurisdiction Diversion/Disposal Rate Summary (2007 - Current)," http://www.calrecycle.ca.gov/LGCentral/reports/diversionprogram/JurisdictionDiversionPost2006.aspx

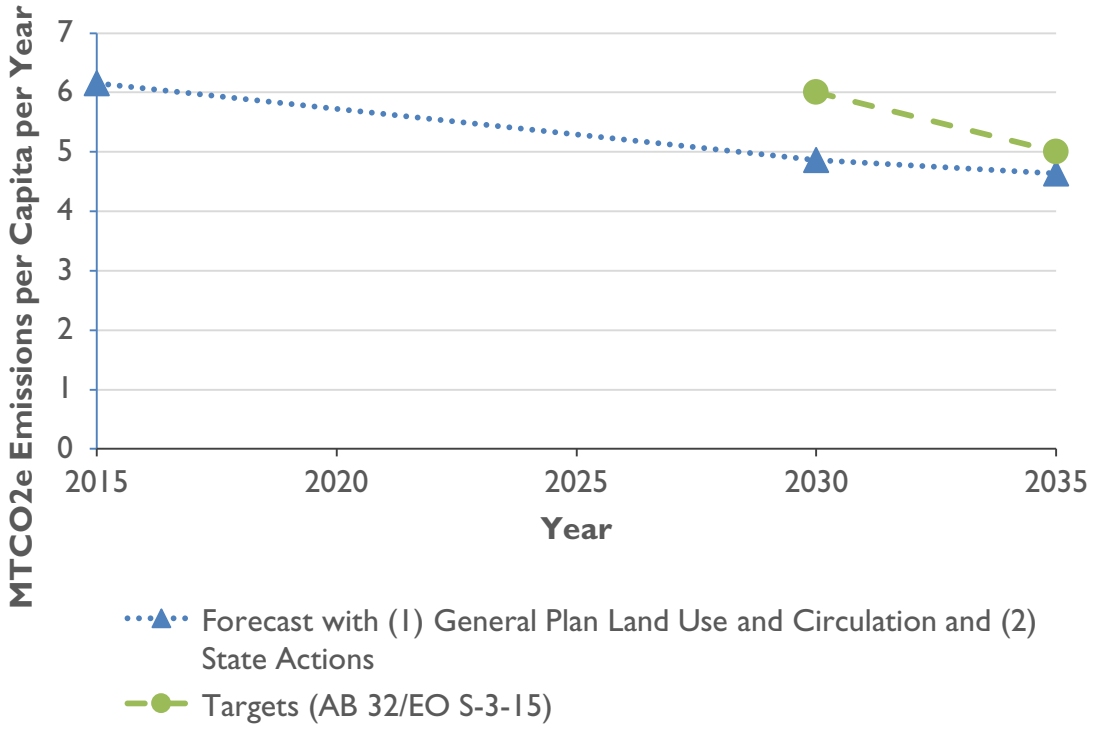
RESULTS

The annual reductions from the above State actions—RPS, Title 24 building efficiency improvements, and 75 percent solid waste diversion—were combined. Table 3-8 lists the total forecast in 2030 and 2035, juxtaposed with reductions from State actions. Figure 3-3 shows the forecast with General Plan land use and circulation system, as well as State actions.

TABLE 3-8: FORECAST WITH STATE ACTIONS

Year	BAU Forecast Emissions with General Plan Land Use and Circulation System ($MTCO_2e$ per year)	Renewable Portfolio Standard ($MTCO_2e$ per year)	Title 24 Building Efficiency Improvements ($MTCO_2e$ per year)	75 Percent Waste Diversion ($MTCO_2e$ per year)	Total Forecast Emissions with General Plan Land Use and Circulation System & State Actions ($MTCO_2e$ per year)	Total Forecast Emissions with General Plan Land Use and Circulation System & State Actions ($MTCO_2e$ per capita per year)
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

Figure 3-3: Forecast with (1) General Plan Land Use and Circulation System and (2) State Actions



3.4 Modified Forecast: GHG Reductions from Additional General Plan Policies and Actions

Methodology

This section describes General Plan policies and actions that reduce GHG emissions, quantifies emissions reductions, and explains how these policies and actions will be implemented. These reductions are from policies and actions in addition to State regulations and the General Plan land use and circulation system, which incorporate reductions from "No Project" conditions that are already reflected in the SANBAG modeling discussed previously. The General Plan policies and actions are organized according to the following categories:

- Bikeway System Improvements;
- Pedestrian Improvements and Increased Connectivity;
- Traffic Calming;
- Parking Facilities and Policies; and
- Transportation Improvements.

The California Air Pollution Control Officers Association's (CAPCOA's) Quantifying Greenhouse Gas Mitigation Measures report was developed as a resource for local governments to assess emissions reductions from GHG mitigation measures. This section uses the methodology outlined in the CAPCOA report for each category to quantify emissions reductions from the General Plan policies and actions.[18] The reductions are applied to the emissions forecast in the following section to get the "modified forecast."

Pedestrian Improvements and Increased Connectivity

Pedestrian Improvements and Increased Connectivity	*General Plan Policies:* *2-A.5, 2-A.76, 2-A.79, 2-A.91, 2-A.98, 4-A.96, 4-P.42, 4-A.105, 4-A.107, 4-A.113, 4-A.114, 4-A.116, 4-A.117, 4-A.119, 4-A.125, 4-A.126, 4-A.132, 4-A.135, 5-A.3, 5-A.4, 5-A.5, 5-A.6, 5-A.7, 5-A.16, 5-P.16, 5-P.17, 5-P.18, 5-A.17, 5-A.18, 5-A.19, 5-A.21, 5-A.25, 5-A.40, 5-A.46, 5-A.63, 5-A.64, 7-P.17, 7-A.38, 7-A.39, 7-A.40, 7-A.42*	2030 Reduction: **1,337 $MTCO_2e$ per Year** 2035 Reduction: **1,177 $MTCO_2e$ per Year**

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

Policy/Action Description

Pedestrian Improvements

The pedestrian network in Redlands is extensive. Citywide, sidewalks are generally provided on both sides of the street. Additionally, multi-purpose trails that serve both pedestrians and cyclists, such as the Orange Blossom Trail, are proposed or under construction throughout the city. The Downtown Specific Plan identifies districts and corridors and provides direction for pedestrian circulation and pedestrian-oriented street design. The General Plan also includes policies that create more walkable, livable neighborhoods by expanding the multi-modal transportation system and creating a safe, pedestrian-oriented environment.

Increased Connectivity

The General Plan articulates a vision for transit-oriented development and strategies for future development patterns around the proposed Redlands Passenger Rail stations. These are intended as a foundation for realizing the goal of a connected, accessible, and active community by creating pedestrian- and transit-oriented villages that reflect each station area's existing assets and unique characteristics. Components of the strategy serve to improve connectivity between the proposed Transit Villages and the city's existing neighborhoods; provide new jobs, housing, and entertainment opportunities in compact, walkable environments; support multiple modes of transit, car travel, walking, and bicycling; and provide new development and infill opportunities as alternatives to building at the edges of the city. The General Plan also includes a number of other improvements to enhance connectivity for bicycles and pedestrians in Redlands.

Quantification

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[19], which corresponds to a reduction of 1,337 $MTCO_2e$ per year in 2030 and 1,177 $MTCO_2e$ per year in 2035.

Implementation

Pedestrian improvements and increased connectivity will occur through implementation of the Downtown Specific Plan and the General Plan.

Bikeway System Improvements

Bikeway System Improvements	*General Plan Policies:* *2-A.5, 2-A.6, 2-A.36, 4-A.96, 4-A.100, 4-A.109, 4-A.115, 4-A.126, 4-A.127, 4-A.133, 5-A.6, 5-P.13, 5-A.16, 5-P.19, 5-P.20, 5-A.3, 5-A.4, 5-A.17, 5-A.22, 5-A.23, 5-A.24, 5-A.25, 5-A.26, 5-A.27, 5-A.28, 5-A.29, 5-A.32, 5-A.33, 5-A.46, 5-A.65, 7-A.24*	2030 Reduction: **120 $MTCO_2e$ per year** 2035 Reduction: **106 $MTCO_2e$ per year**

[19] Center for Clean Air Policy. Transportation Emission Guidebook. http://www.ccap.org/safe/guidebook/guide_complete.html.

Policy/Action Description

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. 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.

Quantification

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 is 2,000 people per square mile.[20] With the total bicycle improvements, there would be approximately 5.5 miles of bike lanes per square mile. However, Redlands currently has approximately 1,879 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. Redlands will reach a density of 2,182 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 120 $MTCO_2e$ per year in 2030 and 106 $MTCO_2e$ per year[21] in 2035.

Implementation

The bikeway system enhancements will occur through the implementation of the Redlands Bicycle Master Plan and the General Plan.

Traffic Calming

Traffic Calming	*General Plan Policies: 5-A.3, 5-A.4*	2030 Reduction: **334 $MTCO_2e$ per year** 2035 Reduction: **294 $MTCO_2e$ per year**

Policy/Action Description

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.

Quantification

CAPCOA's *Quantifying Greenhouse 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

[20] Cambridge Systematics. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions. Technical Appendices. Prepared for the Urban Land Institute.

[21] In this chapter, reductions based on a portion of VMT have lower reductions in 2035 than in 2030 because they are assumed to decrease with greater vehicle efficiency standards over time.

improvements, which corresponds to a reduction of 334 $MTCO_2e$ per year in 2030 and 294 $MTCO_2e$ per year in 2035.

Implementation

The traffic calming improvements will occur through the implementation of the General Plan.

Parking Facilities and Policies

Parking Facilities and Policies	*General Plan Policies:* *2-A.70, 2-A.100, 4-A.15, 4-A.96, 5-A.65, 5-A.68, 5-A.69, 5-A.70*	2030 Reduction: **6,686 $MTCO_2e$ per year** 2035 Reduction: **5,883 $MTCO_2e$ per year**

Policy/Action Description

Getting parking right is critical to ensuring the success of any urban area. Inadequate parking is inconvenient and frustrating for businesses and residents. Too much parking underutilizes valuable land, results in lower density development, discourages use of other forms of transportation (such as public transit), spreads out land uses, and creates gaps in store fronts; thereby practically requiring the use of the automobile. Additionally, too much parking also requires more driveways for accessibility, introducing conflicts between pedestrians and vehicles. Overly high parking requirements—particularly in downtown areas or urban cores—can impact the ability to renovate or repurpose older buildings and revitalize activity centers that can be better served and connected by enhancing facilities and amenities for bicyclists and pedestrians. Therefore, it is important to "right size" and manage parking such that there is enough to support the needs generated by the use, but not so much that it wastes land and impairs other ways of getting around.

The City's Zoning Ordinance (Chapter 18.164 of the Redlands Municipal Code) provides standards for parking facilities based on development types within the city. To promote "right sizing" of parking facilities, the following techniques are included as part of the General Plan:

- Shared Parking – continue to allow uses that have different parking demands at different times of the day to share the same parking facilities. This is an effective way to minimize pavement, allow denser land use, provide for more landscaping, and provide improved walkability within a mixed-use area. The best example of shared parking is an office building and an apartment building as office's peak parking demand occurs at 10:00 a.m. and apartment's peak parking demand occurs at 11:00 p.m.
- In Lieu Parking Fees – continue strategies in appropriate areas by which developers can contribute fees toward the development of a common parking facility in lieu of providing on-site parking. This works best in downtown or concentrated commercial areas, works well to assist in paying for unified structured parking, and provides developers an opportunity to increase density on their parcels.
- Parking Management Strategies –a business district or businesses manage high demand parking locations and destinations through a number of different strategies including ridesharing parking cost subsidies, preferential parking for ride sharers, using off-site parking to meet their minimum requirements, and other techniques.

- Biking – businesses provide incentives to encourage their patrons and employees to ride rather than drive.
- Transit – businesses provide their customers and employees incentives to encourage them to use transit rather than drive.
- Encourage Pedestrian, Bicyclists, and Transit Users – design parking to minimize negative impacts on pedestrians, bicyclists, and transit users

Although there are additional parking strategies that are available and may become available in the future, most of the strategies work best in smart growth/mixed use development areas and will be necessary to accomplish the goals and visions identified in the General Plan.

Quantification

According to CAPCOA's *Quantifying GHG 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 6,686 $MTCO_2e$ per year reduction in 2030, and a 5,883 $MTCO_2e$ per year reduction in 2035.

Implementation

The parking strategies will occur through the implementation of the Zoning Ordinance and the General Plan.

Transportation Improvements

Transportation Improvements	*General Plan Policies:* *2-A.18, 2-A.20, 4-P.9, 4-A.12, 4-A.19, 4-A.53, 4-P.42, 4-P.45, 4-P.46, 4-A.106, 4-A.111, 5-P.14, 5-A.5, 5-A.16, 5-A.17, 5-A.21, 5-A.32, 5-A.40, 5-P.25, 5-P.26, 5-A.53, 5-A.54, 5-A.55, 5-A.56, 5-A.57, 5-A.58, 5-A.59, 5-A.60, 5-A.61, 5-A.62, 5-A.63, 5-A.64, 5-P.27, 5-A.65, 5-A.68, 7-P.46, 7-A.140*	2030 Reduction: **709 $MTCO_2e$ per year** 2035 Reduction: **624 $MTCO_2e$ per year**

Policy/Action Description

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

An inactive rail line runs through the center of Redlands. San Bernardino Associated Governments (SANBAG) is currently implementing the Redlands Passenger Rail project, which will extend rail transit to the city. 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 will not be 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 city, 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.

Quantification

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. Reductions from TSM were estimated using Cambridge Systematics' Moving Cooler report as a 0.01 percent VMT reduction. 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 709 $MTCO_2e$ per year reduction in 2030, and a 624 $MTCO_2e$ reduction per year in 2035.

Implementation

Transit improvements will occur through the implementation of the General Plan and by SANBAG regional planning efforts.

Results

Table 3-9 shows the GHG reductions from each of the above General Plan policies. 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 fall in the future due to higher fuel efficiency standards. Therefore, despite VMT projections' continuing to climb in the future, 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 in 2035 are 294 $MTCO_2e$ per year, which is less than the reduction in 2030 of 334 $MTCO_2e$ per year. The reductions from these policies are incorporated into the emissions forecast in the following section.

TABLE 3-9: GHG REDUCTIONS FROM ADDITIONAL GENERAL PLAN POLICIES AND ACTIONS ($MTCO_2E$ PER YEAR)

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
2030	120	1,337	334	6,686	709	**9,187**
2035	106	1,177	294	5,883	624	**8,084**

3.5 Modified Forecast

Table 3-10 shows the total emissions with the reductions from the following policies and actions:

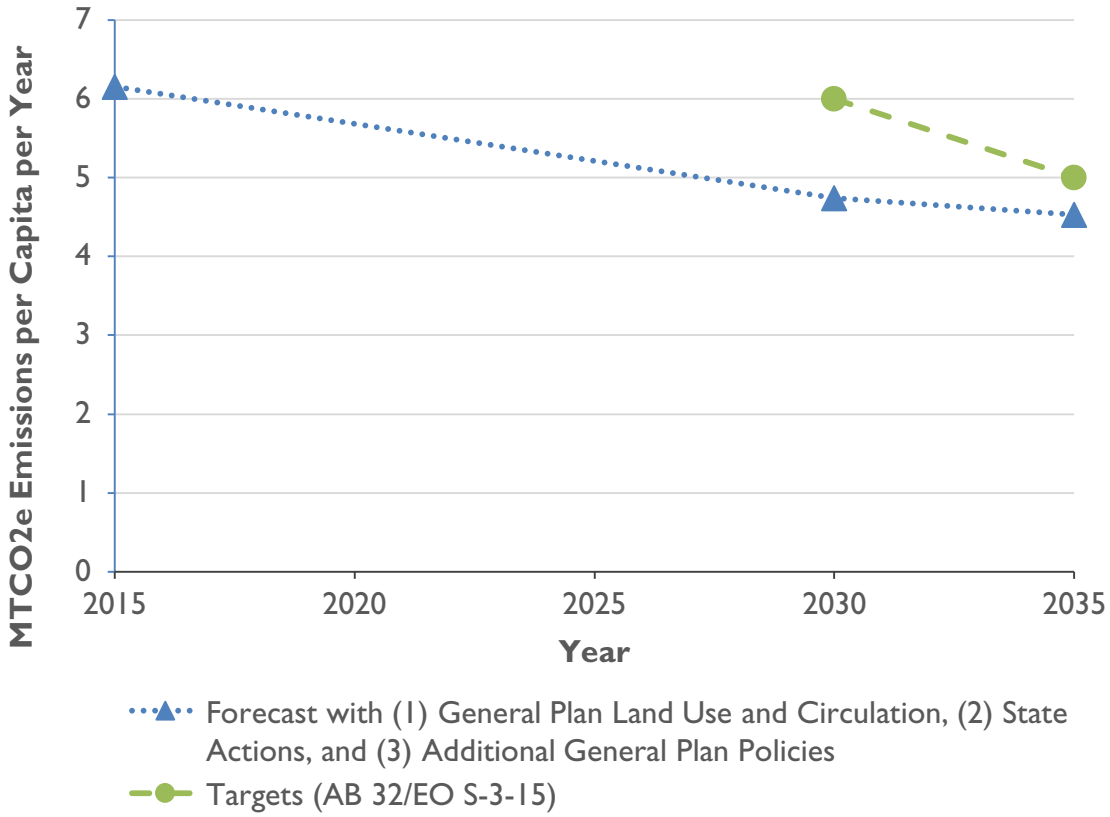
- General Plan land use and circulation system;
- State actions; and
- Additional General Plan policies.

Figure 3-4 shows the "modified forecast," which incorporates the reductions discussed thus far in comparison to the emissions targets. 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 in this chapter, the total forecast emissions are 361,392 $MTCO_2e$ in 2030, and 358,371 $MTCO_2e$ in 2035. Table 3-10 shows that Redlands will meet its targets for 2030 and 2035 without any additional measures.

TABLE 3-10: MODIFIED FORECAST (FORECAST EMISSIONS WITH GENERAL PLAN LAND USE AND CIRCULATION SYSTEM, STATE ACTIONS, AND ADDITIONAL GENERAL PLAN POLICIES) AND EMISSIONS TARGETS

Year	Total Modified Forecast ($MTCO_2e$ per year)	Total Modified Forecast ($MTCO_2e$ per capita per year)	GHG Emissions Targets ($MTCO_2e$ per capita per year)
2030	362,092	4.8	6.0
2035	359,358	4.5	5.0

Figure 3-4: Modified Forecast (Forecast Emissions with (1) General Plan Land Use and Circulation System, (2) State Actions, and (3) Additional General Plan Policies)



Conclusion

The emissions target is met in the year 2030, with forecast emissions of 4.8 $MTCO_2e$ per capita per year, well below the target of 6.0 $MTCO_2e$ per capita per year. The emissions target is met in the year 2035 as well, with forecast emissions of 4.5 $MTCO_2e$ per capita per year, which is lower than the target of 5.0 $MTCO_2e$ per capita per year. Thus, Redlands synergistic land use/transportation planning and other actions in the General Plan would enable the City to meet the standards outlined in California's 2017 Scoping Plan, and implementation of projects consistent with the General Plan would not require additional GHG analysis in accordance with CEQA.

3.6 General Plan Planning Area Emissions Forecasts

The CAP applies to Redlands municipal limits, given that the City has limited ability to implement zoning, parking, and other standards in unincorporated areas. However, for information purposes, Table 3-11 presents information on current and forecasted GHG levels for the entire Redlands Planning Area, including land both within and outside of city limits.

TABLE 3-11: PLANNING AREA 2015 EMISSIONS INVENTORY, 2030 AND 2035 FORECASTS, AND EMISSIONS TARGETS

Year	Total Modified Forecast ($MTCO_2e$ per year)	Total Modified Forecast ($MTCO_2e$ per capita per year)	GHG Emissions Targets ($MTCO_2e$ per capita per year)
2015	472,651	6.1	N/A
2030	413,819	4.6	6.0
2035	411,709	4.4	5.0

As can be seen, forecasted per capita GHG emission levels for the Planning Area as a whole are very similar to those for the city for the years 2030 and 2035, and well below the thresholds established in the 2017 Scoping Plan. Thus, should San Bernardino County choose to adopt this CAP for the unincorporated portions for the Planning Area and implement General Plan actions through its implementing regulations, areas outside Redlands but within its Planning Area would have a Qualified GHG Reduction Strategy as well.

This page intentionally left blank.

4

Monitoring Progress and Optional Measures to Further Reduce Emissions

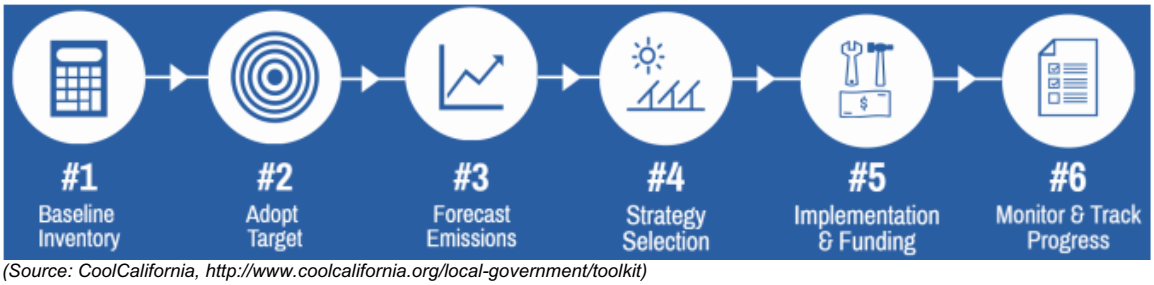
The forecast emissions in Chapter 3 incorporate reductions from (1) State actions, (2) General Plan land use and circulation system, and (3) additional General Plan policies. This analysis shows that projected GHG emissions in 2030 and in 2035 will be well below the standards established in California Air Resources Board's (CARB) 2017 Scoping Plan (slated for adoption in June 2017 by the CARB). Thus, additional GHG reduction actions are not needed for Redlands to have and maintain a Qualified GHG Reduction Strategy.

This chapter describes steps to monitor progress, and potential additional measures that can be taken in the future should the City so desire.

4.1 Monitoring Progress

This CAP provides a framework for the City of Redlands to monitor progress toward GHG emissions and continue to meet emissions targets. Climate action planning, however, is an iterative and adaptive management process: it requires administration, public outreach, monitoring progress and measuring results, periodically revisiting assumptions and adjusting provisions when necessary. Monitoring will enable the City to make timely adjustments to existing policies, replace ineffective actions, and/or add new policies as changes in technology, federal and state programs, or other circumstances warrant. Figure 4-1 shows the steps in the process of climate action planning.

Figure 4-1: Process of Climate Action Planning



(Source: CoolCalifornia, http://www.coolcalifornia.org/local-government/toolkit)

To continue the process of climate action planning, the City of Redlands will follow the steps below.

Monitoring and Reporting

The City will periodically monitor and report on progress towards achieving the emissions targets, potentially every five years, unless otherwise required more frequently by State law. The monitoring report will include information on the status of the federal and State level emissions reductions measures identified in Chapter 3 of this CAP, as well as any new efforts that may emerge in the reporting year. The report will be presented to the City Council at a public meeting during which interested parties may comment on the report.

Updating the GHG Inventory and the CAP

The City will update the GHG inventory periodically. For continuity, the inventory updates will tally emissions from the same sectors analyzed in Chapter 2 of this CAP. If an updated inventory reveals that Redlands is not making adequate progress toward meeting the GHG target, or that new technologies and programs emerge that warrant inclusion in the CAP, the City will adjust the CAP by modifying, adding, and/or replacing policies in the General Plan or elsewhere, or incorporating measure(s) outlined in Section 4.2.

4.2 Optional Measures to Further Reduce Emissions

The optional measures below are offered as a menu of choices should the City decide to more aggressively target GHG emissions at a future date. Measures can be undertaken independently or collectively. Measures and actions, and likely GHG emissions reductions that will result from them, are presented below.

Residential, Commercial, and Industrial Photovoltaic Systems

Option A: Promote Installation of Residential Photovoltaic (PV) Systems	
Goal: Promote installation of residential PV systems to increase solar capacity by 19.8 megawatts (MW) per year, or the equivalent of 15 percent of projected residential electricity supplied by Southern California Edison (SCE), by 2035.	2035 Reduction: 5,038 $MTCO_2e$ per year (approximately 1.4% of total projected GHG emissions in Redlands)
Potential Actions: *A-1:* *Temporarily—for a period of one year—suspend residential and commercial PV system permit fees, together with a publicity campaign to promote PV systems installation.* (Short-term) *A-2:* *On a continuing basis, ensure that regulatory provisions - such as complying with regulations for zoning, structure height, permit submittal and review, etc. - do not hinder residential and commercial PV system installation.* (Short to Long-term) *A-3:* *Evaluate the feasibility of adopting an ordinance that requires all new homes install PV panels to offset a portion of their energy use.* (Mid-term)	

Target: The target increase in solar capacity from residential PV systems would be 19.8 MW[22] per year in 2035, which is the equivalent amount of production to replace 15 percent of projected residential electricity supplied by SCE.

GHG Reduction Option Description: PV systems convert solar energy into electricity. Producing renewable energy locally through residential, commercial, and industrial PV systems reduces the need to construct costly new power plants that produce air pollution, use natural resources, and impact the environment.

Quantification of GHG Emissions Reductions: 15 percent of the 2035 forecast emissions from residential electricity usage, after applying State regulations discussed in Chapter 3.3 of this CAP, was calculated to quantify emissions reductions for Option A.

Responsibility and Implementation: The City of Redlands currently participates in five Property Assessed Clean Energy (PACE) programs: CaliforniaFIRST, Figtree, California HERO, SAMAS, and AllianceNRG. PACE programs provide financing to eligible property owners for sustainable energy projects, thereby offering a source of funding for residential PV systems. Property owners can finance PV system installations and energy efficiency improvements through a voluntary assessment on their property tax bills. Several other financing options are available to residents, including Federal Housing Financing

[22] According to the California Air Pollution Control Officers Association's (CAPCOA's) Quantifying Greenhouse Gas Mitigation Measures report, the average generation per kW installed solar capacity in the South Coast Air Quality Management District (SCAQMD), the air district in which Redlands is located, is 1,678 kWh/yr. Therefore, 19.8 MW converts to 33,164,145 kWh per year.

Administration- (FHFA) insured Energy Efficient Mortgages, HUD Title 1 Home Improvements Loans, and FHA PowerSaver Loans.

The City could temporarily suspend residential and commercial solar PV system permit fees to incentivize installation. The City could also ensure on a continuing basis that regulatory provisions—such as complying with regulations for zoning, structure height, permit submittal and review process, etc.—do not hinder PV panel installation.

Costs and Benefits:

Private: Private costs would come from the installation and maintenance of a residential PV system, which can be supported by PACE programs and other incentives. Benefits would accrue from reduced energy bills and increased property values.

City: City costs would occur from the analysis of potential regulatory barriers and the evaluation of the feasibility of incentivizing new homes to install PV systems. Revenue would be lost when permit fees are temporarily suspended.

Option B: Promote Installation of Commercial and Industrial Photovoltaic Systems	
Goal: Promote installation of commercial and industrial PV systems to produce an additional 33.7 MW per year, or 15 percent of projected commercial and industrial electricity supplied by SCE, by 2035.	2035 Reduction: 8,106 $MTCO_2e$ per year (approximately 2.3% of total projected GHG emissions in Redlands)
Potential Actions: (*See also actions A1 and A2 above*). *B-1:* *Adopt a commercial energy conservation ordinance requiring all new nonresidential developments with more than 50 cars surface parked or on roofs of parking structures to use PV panels over at least half of the surface/roof-parked cars, or provide equivalent energy conservation/generation by other means (over and above other requirements).* (Short-term) *B-2:* *Adopt an ordinance requiring existing and new nonresidential developments to install PV panels to offset a portion of their energy use.* (Mid-term)	

Target: The target is the PV production of 33.7 MW per year in 2035, which is the equivalent amount of production to replace 15 percent of projected commercial and industrial electricity supplied by SCE.

GHG Reduction Option Description: PV systems convert solar energy into electricity. Option B promotes the installation of PV systems on commercial buildings and industrial facilities an additional 33.3 MW per year.

Quantification of GHG Emissions Reductions: 15 percent of the 2035 forecast emissions from commercial and industrial electricity usage, after applying State regulations discussed in Chapter 3.3 of this CAP, was calculated to quantify emissions reductions for Option B.

Responsibility and Implementation: See Option A (above) for implementation.

Costs and Benefits:

Private: Private costs would result from the installation and maintenance of commercial and industrial PV systems. Benefits would accrue from reduced energy bills and increased property values.

City: City costs would occur from removing potential regulatory barriers and preparing and enforcing a nonresidential PV systems ordinance. Revenue would be lost when permit fees are temporarily suspended.

Residential and Commercial Efficiency Retrofits

Option C: Encourage Residential Energy Efficiency Retrofits	
Goal: Encourage residential efficiency retrofits with the goal of a 50 percent energy reduction compared to baseline in 30 percent of the total homes citywide by 2035 (9,332 homes out of a total of 31,105).	2035 Reduction: 12,712 $MTCO_2e$ per year (approximately 3.5% of total projected GHG emissions in Redlands)
Potential Actions: *C-1:* *Publicize available incentive and rebate programs, such as SCE's and Southern California Gas Company's (SCG's) Home Energy Efficiency Rebate (HEER) program, on the City's website and by other means.* (Short-term) *C-2:* *Create a citywide "Energy Challenge," similar to the Department of Energy's Better Buildings Challenge, to promote cost-effective energy improvements, while having residents and building owners commit to reducing energy consumption.* (Short-term) *C-3:* *Adopt a residential energy conservation ordinance, which requires residential property owners to conduct and disclose an energy audit at the time of major renovations (as defined by the ordinance), to ensure that homes and residential developments meet specified low cost energy efficiency measures—such as requisite ceiling insulation, insulated pipes, water heater blankets and exterior door weather stripping.* (Short-term)	

Target: The target is a 50 percent energy reduction in 30 percent of homes citywide by the year 2035.

GHG Reduction Option Description: As homes use a large portion of the city's total energy and older homes are substantially less efficient than newly constructed homes, there is a large opportunity to reduce GHG emissions through the retrofitting of existing homes. When a single-family homeowner seeks to make major improvements, the owner would be required to conduct an energy audit, and meet low-cost energy efficiency measures—such as improving insulation, providing weather stripping, promoting natural lighting and ventilation, and using "smart" thermostats to regulate energy use for heating and cooling. Multi-family residential retrofits are similar to single-family retrofits but can provide increased energy savings. For example, increasing insulation between residential units benefits both units. Other examples of multi-family residential retrofits include replacing incandescent and halogen lamps with LED or CFL lamps and installing energy-efficient windows and efficient appliances.

Quantification of GHG Emissions Reductions: 50 percent of the 2035 forecast emissions from 30 percent of residential energy usage, after applying State regulations discussed in Chapter 3.3 of this CAP, was calculated to quantify emissions reductions for Option C.

Responsibility and Implementation: Homeowners and multi-family unit owners would implement this measure. SCE and SCG offer the HEER program, which offers residential

customers rebates to improve the efficiency of appliances, such as water heaters, air conditioners, and pool pumps. HEER also offers residential customers rebates for smart thermostats, attic and wall insulation, and efficient furnaces. The City will publicize this and related programs on its website and by other means.

Costs and Benefits:

Private: Private costs would come from residential unit owners conducting energy audits and implementing efficiency retrofits. The cost of these retrofits is frequently 1 percent or less of the total renovation cost. Benefits would occur through reduced energy costs. Rebates are available as described above.

City: City costs would come from promoting incentive programs, creating an "Energy Challenge" program, and adopting and enforcing a residential energy conservation ordinance.

Option D: Encourage Commercial and Industrial Efficiency Retrofits	
Goal: Encourage commercial and industrial efficiency retrofits with the goal equivalent to a 25 percent energy reduction in 30 percent of commercial square footage citywide by 2035.	2035 Reduction: 6,503 $MTCO_2e$ per year (approximately 1.8% of total GHG emissions in Redlands)
Potential Actions: *D-1:* *Promote available incentive and rebate programs, such as SCE's and SCG's On-Bill Financing (OBF) programs, on the City's website and by other means.* (Short-term) *D-2:* *Adopt a commercial and industrial energy conservation ordinance, which requires property owners to ensure that commercial and industrial buildings meet specified energy efficiency measures—such as requisite heating, ventilation, and air conditioning improvements, service water system requirements, and improved refrigeration equipment, at the time of conducting major renovations (as defined by the ordinance).* (Short-term)	

Target: The target is equivalent to a 25 percent energy reduction in 30 percent of the projected amount of commercial and industrial square footage.

GHG Reduction Option Description: Relatively straightforward fixes to commercial buildings can significantly reduce spending on fuel and electricity. Examples of retrofits include installing efficient boilers and equipment, high-quality windows, pipe insulation, and other building energy improvements.

Quantification of GHG Emissions Reductions: 25 percent of the 2035 forecast emissions from 30 percent of commercial and industrial energy usage, after applying State regulations discussed in Chapter 3.3 of this CAP, was calculated to quantify emissions reductions for Option D.

Responsibility and Implementation: Building owners would implement this measure for commercial buildings.[23] Funding is available through incentive and rebate programs, such as SCE's and SCG's OBF program.

[23] AB 1103, the California Nonresidential Building Energy Use Disclosure Program, requires an owner of a nonresidential building to benchmark the building's energy use data and disclose the energy use prior to the sale of the building, or

Costs and Benefits:

Private: Private costs would come from building owners and business owners implementing efficiency retrofits. Benefits would occur through reduced energy costs. Costs could be offset through incentive and rebate programs.

City: City costs would come from providing resources to help guide building owners to implement this measure, promoting available incentive and rebate programs, and adopting and enforcing a commercial energy conservation ordinance.

Commercial and Industrial Facility Commissioning

Option E: Promote Commercial and Industrial Facility Commissioning	
Goal: Encourage commercial and industrial commissioning, or improving existing and new building operations, with the goal of a 15 percent energy reduction in 30 percent of commercial and industrial square footage citywide by 2035.	2035 Reduction: 3,902 $MTCO_2e$ per year (approximately 1.1% of total GHG emissions in Redlands)
Actions: *E-1:* *Promote commissioning programs on the City of Redlands website such as SCE's and SCG's Retrocommissioning Program and similar programs for commercial and industrial buildings.* (Short-term)	

Target: The target is equivalent to a 15 percent energy reduction in 30 percent of existing and new commercial and industrial square footage citywide and in City facilities.

GHG Reduction Option Description: Commercial and industrial commissioning is a systematic process of ensuring that a building performs according to its design and the occupant's operational needs. Commissioning allows the design developed to be successfully constructed and operated. Examples includes measuring temperatures and flow rates from heating, ventilation, and air conditioning (HVAC) systems to calibrate to a known standard, as well as reviewing operations to verify that controls are properly functioning.

Quantification of GHG Emissions Reductions: 15 percent of the 2035 forecast emissions from 30 percent of commercial and industrial energy usage, after applying State regulations discussed in Chapter 3.3 of this CAP, was calculated to quantify emissions reductions for Option E.

Responsibility and Implementation: Building owners would implement this measure for commercial and industrial buildings. Programs exist to offer assistance with the commissioning. SCE's and SCG's Retrocommissioning Program, provides a free engineering study to qualified buildings to identify opportunities to save energy. After opportunities are identified, the program offers to help implement evaluate, and modify energy strategies at no cost. Once implementation is complete, energy savings are confirmed with the utility, and the program pays the building owner a portion of the implementation costs.

the lease and financing of the entire building. This benchmark data can be used to guide implementation of efficiency measures for buildings renovated after a recent sale.

Costs and Benefits:

Private: Private costs would come from building owners paying for building commissioning, which may be offset entirely through commissioning programs. Benefits would occur through reduced energy costs.

City: City costs would come from commissioning City facilities and from promoting commissioning programs to help guide building owners to implement this measure. Benefits would occur through reduced energy costs.

Efficient Lighting Standards

Option F: Promote Replacement of Incandescent and Halogen Bulbs with LED or Other Energy Efficient Lamps	
Goal: Replace 50 percent of incandescent and halogen light bulbs in residential and commercial buildings with LED or similarly efficient lighting by 2035.	2035 Reduction: 6,153 $MTCO_2e$ per year (approximately 1.7% of total GHG emissions in Redlands)
Actions: *I-1:* *Replace 50 percent of incandescent or halogen light bulbs in City facilities with LED or similarly efficient lighting.* (Short-term) *I-2:* *Promote the use of LED or other energy efficient lamps by publicizing rebate programs and information from SCE on the benefits of the use of LED or other energy efficient lighting on the City's webpage.* (Short-term) *I-3:* *Evaluate the feasibility of adopting a minimum natural lighting and ventilation standard, developed based on local conditions. Demonstrate natural lighting and ventilation features in future renovations or new construction.* (Mid-term)	

Target: The target is to replace 50 percent of incandescent and halogen bulbs in residential and commercial buildings with LED bulbs or similarly efficient lighting by 2035.

GHG Reduction Option Description: Replace inefficient incandescent and halogen light bulbs with more efficient light bulbs to reduce the amount of energy needed to power the bulbs, which will reduce the demand for electricity and thus the amount of GHG emissions created by the electrical power generation.

Quantification of GHG Emissions Reductions: An estimated 22 percent of residential and 35 percent of commercial electricity in California[24] is used for lighting. Applied to citywide energy use, these percentages correspond to about 22,301 $MTCO_2e$ of forecast emissions in 2035 (after applying State regulations discussed in Chapter 3.3 of this CAP). LED light bulbs reduce energy consumption and therefore GHG emissions by 70 percent compared to incandescent lighting.[25] This measure assumes that about 79 percent of the bulbs citywide are currently incandescent or halogen, and sets the target of replacing half of these bulbs with more efficient ones by 2035.[26] This would overall lead to a 28 percent decrease in emissions compared to

[24] California Public Utilities Commission; http://www.cpuc.ca.gov/General.aspx?id=4125

[25] https://www.energystar.gov/products/lighting_fans/light_bulbs

[26] It is estimated that 79 percent of lighting within the City is currently incandescent, halogen, or linear fluorescent. U.S. Department of Energy, 2010 U.S. Lighting Market Characterization, Table 4.1; https://energy.gov/eere/amo/downloads/2010-us-lighting-market-characterization

halogen/incandescent bulbs, which equates to emissions reductions of 6,153 $MTCO_2e$ per year.[27]

Responsibility and Implementation: The City has been and will continue to replace light bulbs within City facilities with LED or similarly efficient lighting, as facilities are upgraded. SCE currently does not offer rebates for the purchase of LED or similarly efficient lighting, but the City will promote rebates as they come available on its website and by other means. The City will also provide information on the benefits of the use of LED and efficient lighting from SCE and other sources.

Costs and Benefits:

Private: Private costs would be from purchasing LED light bulbs for new construction, and replacing existing light bulbs over time. Benefits would be from reduced energy costs and reduced cost to replace light bulbs (as LED lights last substantially longer).

City: City costs would come from replacing existing inefficient lighting in City facilities with more efficient light bulbs over time, providing information to homeowners and business owners to encourage a switch to LED or other efficient lamps, and evaluating the feasibility of a natural lighting and ventilation ordinance.

Increased Zero-Emissions Vehicle (ZEV) Travel

Option G: Promote an Increase in the Amount of Zero-Emissions Vehicle Travel	
Goal: Promote an increase in the amount of ZEV[28] passenger vehicle miles traveled from a projected 14 percent to 25 percent of total vehicle miles traveled by 2035.	2035 Reduction: 14,496 $MTCO_2e$ per year (approximately 4.0% of total GHG emissions in Redlands)
Actions: *G-1:* *Working with industry partners, construct a "PV to EV" pilot project to install a PV charging station at a City facility (such as City Hall), to charge ZEVs. The purpose of the pilot project would be to evaluate the feasibility of incorporating more ZEVs into the city's fleet.* (Short-term) *G-2:* *Prepare a community-wide charging station siting plan, which evaluates site visibility and exposure, EV driving ranges, high volume destinations, locations with high ownership or interest in EVs, and cost of construction.* (Short-term) *G-3:* *Construct ZEV charging stations based on the community-wide charging station siting plan described in G-2 above. The ZEV charging stations will be funded by grant funds when available, and the City will post signage directing ZEVs to charging stations described in G-2 above.* (Mid-term) *G-4:* *Offer dedicated ZEV parking and provide charging stations adjacent to ZEV parking as identified in the community-wide charging station siting plan.* (Mid-term) *G-5:* *Adopt requirements for ZEV parking for new developments.* (Short-term) *G-6:* *Adopt a residential energy conservation ordinance requiring the installation of EV chargers or pre-wiring in new residential construction and major renovations.* (Short-term)	

[27] 70 percent reduction in energy use in half of the 79 percent total incandescent bulbs is (70 percent)*(79 percent)*(50 percent)= 27.6 percent reduction

[28] Zero-Emissions Vehicle (ZEV) is a vehicle that emits no tailpipe pollutants from the onboard source of power. ZEVs include electric vehicles, fuel cell vehicles, and plug-in hybrids, when in electric mode.

Already-Projected Amount: According to EMFAC2014, 14 percent of the passenger vehicle miles traveled in 2035 are projected to be from ZEVs.

Target: The target is to increase the proportion of passenger vehicle miles traveled from 14 percent to 25 percent by the year 2035.

GHG Reduction Option Description: Driving ZEVs reduces carbon emissions by eliminating direct tailpipe emissions of carbon dioxide and other GHGs. The production of electricity used to power electric vehicles generates GHGs; however, SCE electricity generates much less GHGs than the direct combustion of fossil fuels. Furthermore, electric vehicles can be charged at home or the workplace using energy produced by PV panels, eliminating GHG emissions completely, at least for the months when PV panels produce the full amount of electricity needed for operations. The ability to provide entirely emissions-free transportation through the use of PV panels to charge ZEVs should be capitalized on whenever possible.

Quantification of GHG Emissions Reductions: The emissions reduction from increasing the proportion of ZEV passenger vehicle miles from 14 percent to 25 percent was calculated to quantify emissions reductions for Option G.

Responsibility and Implementation: The City would promote an increase in the amount of electric vehicle travel by constructing ZEV charging stations using the community-wide station siting plan described in Action G-2 above. Grant funding for the construction of the ZEV charging stations can come from the California Energy Commission's Electric Vehicle Charging Infrastructure grant, or other similar grant programs. The City would be responsible for operating (including electricity provision, for stations not using PV panels) and maintaining charging stations.

The City would also promote the use of ZEVs by offering dedicated ZEV parking and adopting requirements for ZEV parking for new development. The City would create an ordinance requiring the installation of ZEV chargers or pre-wiring in new residential construction and major renovations.[29]

Costs and Benefits:

Private: The private cost would be the purchase of an electric vehicle and the cost of electricity to power the electric vehicle, for community members who elect to purchase an electric vehicle. Costs may also occur from installing EV chargers or pre-wiring into new residential construction or major renovations. Benefits would accrue from reduced spending on gasoline.

City: City costs would be from planning for, constructing, operating (including providing electricity, for stations not using PV panels) and maintaining ZEV charging stations, which may be offset by potential user fees or grants from the California Energy Commission, or other

[29] Assembly Bill 1092 (2013) requires the Department of Housing and Community Development to propose minimum building standards for the installation of future electric vehicle charging infrastructure for parking spaces in multi-family dwellings and nonresidential development.

similar agencies. City costs may occur from developing ordinances to require the installation of ZEV chargers in new residential construction and major renovations. City costs may also occur from fleet purchases of ZEV vehicles. Benefits would accrue from reduced spending on gasoline.

Other Measures

Other measures that would lead to GHG emissions reductions under 1 percent of total emissions are listed below with approximate reductions in emissions in 2035.

- Implementation of a 5 percent improvement in energy efficiency above the City of Redlands green building code (based on CALGreen, the statewide green building code), for new construction **(500 $MTCO_2e$ per year)**;
- Produce 11,100 MWh, or the equivalent of 5 percent of projected residential electricity supplied by Southern California Edison (SCE) projected for 2035, from renewable energy projects **(1,700 $MTCO_2e$ per year)**;
- Replace incandescent and halogen light bulbs in public lighting with LED or similarly efficient lighting by 2035 **(up to 570 $MTCO_2e$ per year)**; and
- Reduce the intensity of GHG emissions from water utilities (including water supply, wastewater, and recycled water) conveyance, treatment, and distribution by 10 percent by 2035 **(400 $MTCO_2e$ per year)**.

This page intentionally left blank.

Appendix A

Climate Change Informational Resources

Combating climate change requires education and personal action. This section contains resources on climate change and its impacts, calculating individual carbon footprints, and ways to reduce individual carbon footprints.

Education

The evidence is clear that climate change is happening. Humans are largely responsible for recent climate change. International scientific bodies, federal agencies, and state agencies have numerous resources that summarize the current scientific understanding of climate change and the latest projections of climate change impacts.

The Intergovernmental Panel on Climate Change is the leading international body for the assessment of climate change:

- http://www.ipcc.ch/

The National Aeronautics and Space Administration (NASA) has documented recent impacts and future trends of climate change:

- http://climate.nasa.gov/effects

The U.S. Environmental Protection Agency (U.S. EPA) has information of climate change, and its effects:

- http://www.epa.gov/climatechange/basics/

Cal-Adapt, a product of the Public Interest Energy Research (PIER) program, funded by the California Energy Commission, provides California-specific climate change research, including interactive climate tools:

- http://cal-adapt.org/

Carbon Footprint

A carbon footprint is a measure of the total amount of GHG emissions produced by an individual. It can be thought of as a personal inventory of one's impacts on climate change. There are a number of online calculators that estimate personal carbon footprints. Individuals can use the following carbon footprint calculators as a guide to help reduce personal carbon emissions.

U.S. Environmental Protection Agency (EPA)

- http://www.epa.gov/climatechange/ghgemissions/ind-calculator.html

Cool California

- http://www.coolcalifornia.org/calculator

Cool Climate Network

- http://coolclimate.berkeley.edu/carboncalculator

Nature Conservancy

- http://www.nature.org/greenliving/carboncalculator/index.htm

Carbon Footprint

- http://www.carbonfootprint.com/calculator1.html

Global Footprint Network

- http://www.footprintnetwork.org/en/index.php/gfn/page/calculators/

Reducing your Carbon Footprint

Reducing one's personal carbon footprint saves money, decreases impact on the environment, and helps fight climate change. The following links provide resources from federal and state agencies on changes one can make in his or her day-to-day life to diminish GHG emissions.

U.S. EPA: What can you do at home?

- https://www.epa.gov/climatechange/what-you-can-do-home

U.S. EPA: What can you do at school?

- https://www.epa.gov/climatechange/what-you-can-do-school

U.S. EPA: What can you do on the road?

- https://www.epa.gov/climatechange/what-you-can-do-road

U.S Department of Energy: Save energy, save money

- http://energy.gov/energysaver/energy-saver

California Air Resources Board: Low emissions vehicles

- https://www.arb.ca.gov/msprog/acc/acc.htm

This page intentionally left blank.

Appendix B

References

California Air Pollution Control Officers Association (CAPCOA). 2008. CEQA and Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act. Available: http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA-White-Paper.pdf. Accessed on April 11, 2017.

California Air Resources Board (CARB). 2015. EMFAC2014 Web Database. Available: https://www.arb.ca.gov/emfac/2014/. Accessed on: March 27, 2017.

CARB. 2015. EMFAC2014 Volume III - Technical Documentation. Available: https://www.arb.ca.gov/msei/categories.htm. Accessed on: March 27, 2017.

CARB. 2007. Off-Road Motor Vehicles. Available: https://www.arb.ca.gov/msei/categories.htm. Accessed on: March 27, 2017.

California Department of Justice, Office of the Attorney General. 2010. Addressing Climate Change at the Project Level. Available: http://ag.ca.gov/globalwarming/pdf/GW_mitigation_measures.pdf. Accessed on: April 11, 2017.

California Energy Commission. 2015. Impact Analysis 2016 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Available: http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/15-day_language/impact_analysis/. Accessed on: March 9, 2017.

California Governor's Office of Planning and Research. 2008. CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act. Available: http://opr.ca.gov/docs/june08-ceqa.pdf. Accessed on April 11, 2017.

California Public Utilities Commission. 2011. California's Long-Term Energy Efficiency Strategic Plan. "Chapter 13: Lighting." Available: http://www.cpuc.ca.gov/General.aspx?id=4125. Accessed on: April 11, 2017.

CalRecycle. 2017. Jusrisdiction Diversion/Disposal Rate Summary. Available: http://www.calrecycle.ca.gov/LGCentral/reports/diversionprogram/JurisdictionDiversionPost2006.aspx. Accessed on: March 20, 2017.

Cambridge Systematics. 2009. "Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions." Technical Appendices. Prepared for the Urban Land Institute.

Center for Clean Air Policy. 2014. Transportation Emission Guidebook. Available: http://www.ccap.org/safe/guidebook/guide_complete.html. Accessed on: March 21, 2017.

City of Redlands. 2017. Draft General Plan.

Edison International. 2016. 2015 Corporate Responsibility Report. Available: https://www.sce.com/corporateresponsibility. Accessed on: January 23, 2017.

Energy Star. 2017. "Light Bulbs." Available: https://www.energystar.gov/products/lighting_fans/light_bulbs. Accessed on: April 11, 2017.

International Council for Local Environmental Initiatives (ICLEI)–Local Governments for Sustainability USA. 2013. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Available: http://icleiusa.org/ghg-protocols/. Accessed on: November 16, 2016.

National Oceanic and Atmospheric Administration (NOAA). 2017. "Trends in Atmospheric Carbon Dioxide." Available: http://www.esrl.noaa.gov/gmd/ccgg/trends/. Accessed on: March 23, 2017.

San Bernardino Assiciated Governments (SANBAG). 2014. Regional Greenhouse Gas Reduction Plan. 2014. Available: http://www.sanbag.ca.gov/planning2/plan_greenhouse.html. Accessed on April 11, 2017.

San Bernardino Valley Municipal Water District (SBVMWD). 2011. 2015 San Bernardino Valley Regional Urban Water Management Plan. Available: http://www.sbvmwd.com/reports. Accessed on: February 28, 2017.

Statewide Energy Efficiency Collaborative (SEEC). 2017. SEEC ClearPath California. Available: http://californiaseec.org/seec-clearpath/. Accessed on: March 27, 2017.

United States Department of Energy. 2012. 2010 U.S. Lighting Market Characterization. Available: https://energy.gov/eere/amo/downloads/2010-us-lighting-market-characterization. Accessed on: April 11, 2017.

United States Environmental Protection Agency. 2017. "Sources of Greenhouse Gas Emissions." Available: https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions. Accessed on: March 23, 2017.

USEPA. 2016. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014. Available: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2014. Accessed on: January 30, 2017.

Appendix C

Applicable General Plan Policies

Bike System Improvements

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.36 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
- 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

- Rural roads in Crafton

4-A.96 Encourage the development of bicycle, pedestrian, and transit access that reduce the need for on-site parking.

4-A.100 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.109 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.115 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.126 Strengthen pedestrian and bicycle circulation routes within Downtown and to and from adjacent neighborhoods.

4-A.127 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.133 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.

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-P.13 Ensure streets are designed to accommodate bicyclists per the Bicycle Master Plan.

5-A.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.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.

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.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.22 Use the City's Bicycle Master Plan as the primary resource for planning and implementing bikeway improvements.

The Bicycle Master Plan, adopted in 2015, proposes an extensive network with over 100 additional miles of bicycle facilities. The plan should be updated as needed to reflect the updated General Plan, including proposals for new streets and connections in the Transit Villages.

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.

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.46 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.

5-A.65 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 innovate alternatives that may arise in the future

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

Pedestrian Improvements and Increased Connectivity

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.76 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.79 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.

2-A.91 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.98 Ensure that new development along Redlands Boulevard is pedestrian-oriented.

4-A.96 Encourage the development of bicycle, pedestrian, and transit access that reduce the need for on-site parking.

4-P.42 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-A.105 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.107 Establish boulevards along Redlands Boulevard and Colton Avenue with pedestrian-oriented streetscape improvements and ground-floor active uses.

4-A.113 Establish boulevards along Redlands Boulevard and Colton Avenue with pedestrian-oriented streetscape improvements and ground-floor active uses.

4-A.114 Provide pedestrian routes between offices, neighborhoods, and Downtown.

4-A.116 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.117 Ensure safe railway crossings at Tennessee Street, Texas Street, and New York Street for bicyclists and pedestrians.

4-A.119 Complete and implement an update of the Downtown Specific Plan to create a cohesive town center with amenities and pedestrian-oriented streets.

4-A.125 Establish boulevards along Orange Street, Colton Avenue, and Redlands Boulevard with pedestrian-oriented streetscape improvements and ground-floor active uses.

4-A.126 Strengthen pedestrian and bicycle circulation routes within Downtown and to and from adjacent neighborhoods.

4-A.132 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.135 Improve the I-10 undercrossings at University Street and Citrus Avenue to allow safe and comfortable access for vehicles, pedestrians, and cyclists.

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.

5-A.16 Prepare an Active Transportation Plan that provides a method of prioritizing City streets to best accommodate all road users including cars, bikes, pedestrians, transit, and logistics.

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.

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.

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.40 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.46 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.

5-A.63 Encourage convenient and safe pedestrian linkages to and from transit service to provide better first-mile and last-mile connectivity.

5-A.64 Provide for direct pedestrian paths and access from new developments to the nearest public transportation stop.

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

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.

Traffic Calming

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.

Parking Facilities and Policies

2-A.70 Encourage shared parking or in-lieu parking in older neighborhoods.

2-A.100 Encourage shared parking or in-lieu parking in older neighborhoods.

4-A.15 Encourage shared parking or in-lieu parking in older neighborhoods.

4-A.96 Encourage the development of bicycle, pedestrian, and transit access that reduce the need for on-site parking.

5-A.65 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 innovate alternatives that may arise in the future

5-A.68 Design parking to meet applicable urban design goals from area plans and minimize negative impacts on pedestrians, bicyclists, and transit users.

5-A.69 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.70 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.

Transportation Improvements

2-A.18 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.

2-A.20 Promote a safe and secure environment near transit stations through design, adjacent land use considerations, public space programming, and coordination with public safety providers.

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

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.19 Focus the development of office space in transit-accessible locations.

4-A.53 Improve access and movement of all modes of transportation in the East Valley Corridor and enhance linkages to transit.

4-P.42 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.45 Provide choices for travel options, including walking, biking, vehicular, and transit.

4-P.46 Accommodate all appropriate modes of transportation in Transit Villages, and promote seamless transitions between modes.

4-A.106 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.111 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.

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.

Example: automobiles are prioritized along major freeways and arterials, transit and walking are prioritized near rail stations and Downtown, and a variety of modes are evaluated and considered for appropriateness in neighborhoods based on land uses, right-of-way availability, and network connectivity.

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.16 Prepare an Active Transportation Plan that provides a method of prioritizing City streets to best accommodate all road users including cars, bikes, pedestrians, transit, and logistics.

5-A.17 Prepare an Active Transportation Plan that provides a method of prioritizing City streets to best accommodate all road users including cars, bikes, pedestrians, transit, and logistics.

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.

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.40 Establish new boulevards Downtown and in the transit villages that include planted center medians, accommodations for transit, wider sidewalks, and amenities for pedestrians.

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.

5-A.53 Work with Omnitrans to accommodate and adjust transfer centers and bus service as necessary to support future rail service.

5-A.54 Work with Omnitrans to expand bus service to additional areas of the city and improving north-south connections.

5-A.55 Work with Omnitrans to plan for bus shelters, boarding areas, transfer centers, bus pads in the right-of-way, and bus turnouts.

5-A.56 Incorporate real-time information systems so that passengers will know when their bus or train is expected to arrive.

5-A.57 Support investments in passenger rail by providing effective on-site circulation and multi-modal connections to transit stations.

5-A.58 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.59 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.60 Continue to collaborate with regional transit partners to achieve seamless transfers between systems, including scheduling, ticketing, and shared fare systems.

Collaborative technologies include online applications and changeable message signs at major transit stops.

5-A.61 Develop strategies to maximize off-peak use of transit.

5-A.62 Coordinate with other agencies and private entities to investigate methods of improving service and enhancing safety along the passenger rail corridor.

5-A.63 Encourage convenient and safe pedestrian linkages to and from transit service to provide better first-mile and last-mile connectivity.

5-A.64 Provide for direct pedestrian paths and access from new developments to the nearest public transportation stop.

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

5-A.65 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 innovate alternatives that may arise in the future

5-A.68 Design parking to meet applicable urban design goals from area plans and minimize negative impacts on pedestrians, bicyclists, and transit users.

7-P.46 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.

7-A.140 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.

This page intentionally left blank.

Appendix D

Potential Project Level GHG Reduction Measures

In addition to the potential programmatic measures contained in this Climate Action Plan, the following is a non-exclusive list of potential additional measures that can be applied at the project level to reduce greenhouse gas emissions. It should be noted that these measures are not essential for the City to meet its GHG reduction targets, but are presented here for information purpose. Sources for additional potential measures include those listed in CAPCOA's "CEQA and Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act (January 2008)"; the Attorney General's "Addressing Climate Change at the Project Level"; OPR's "CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA)"; and SANBAG's "Regional Greenhouse Gas Reduction Plan (2014)". Please see Appendix B for complete references.

Renewable Energy

- Provide onsite renewable energy system(s). Nonpolluting and renewable energy potential includes solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies
- Include in new buildings facilities to support the use of low/zero carbon fueled vehicles, such as the charging of electric vehicles from green electricity sources
- Provide solar water heaters

Green Building

- Meet recognized green building and energy efficiency benchmarks such as LEED and ENERGY STAR
- Incorporate materials which are resource efficient, recycled, with long life cycles and manufactured in an environmentally friendly way

Energy Efficiency

- Exceed Redlands Green Building Code (Title 24) mandatory efficiency requirements by 15% or more
- Install light colored "cool" roofs (e.g. Energy Star roofing) or other highly reflective, highly emissive roofing materials
- Install a vegetated ("green") roof that covers at least 50% of roof area

- Design project to maximize solar orientation (i.e., 75% or more building face north or south; include roof overhangs that block high summer sun, but not lower winter sun, from penetrating south-facing windows
- Plant trees and vegetation near structures to shade buildings and reduce energy requirements for heating/cooling
- Install energy-reducing ceiling/whole-house fans
- Install energy efficient lighting (e.g., light emitting diodes (LEDs)), heating and cooling systems, appliances, equipment, and control systems. (e.g., Energy Star)
- Install energy-reducing programmable thermostats that automatically adjust temperature settings

Transportation

- Develop commute trip reduction plans that encourage employees who commute alone to consider alternative transportation modes
- Create an online ridesharing program that matches potential carpoolers immediately through email
- Provide fair-share funding of transportation improvements
- Provide shuttle service or public transit incentives such as transit passes to decrease work-related auto trips
- Provide "end-of-trip" facilities including showers, lockers, and changing space (nonresidential projects)
- Incorporate public transit into project design
- Incorporate bicycle lanes, routes and facilities into street systems, new subdivisions, and large developments
- Provide amenities for non-motorized transportation, such as secure and convenient bicycle parking
- Provide plentiful short- and long-term bicycle parking facilities (nonresidential projects)
- Provide long-term bicycle parking is provided at apartment complexes or condominiums without garages
- Create pedestrian (and/or bicycle) access network that internally links all uses and connects to all existing/planned external streets and pedestrian (and/or bicycle) facilities contiguous with the project site
- Provide a parking lot design that includes clearly marked and shaded pedestrian pathways between transit facilities and building entrances
- Provide parking for EVs/CNG vehicles
- Install EV charging facilities

Water Conservation

- Install water-efficient fixtures and appliances such as low-flow fixtures, dual flush toilets, and other water efficient appliances
- Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls and use water-efficient irrigation methods
- Implement low-impact development practices that maintain the existing hydrology of the site to manage storm water and protect the environment
- Incorporate recycled/reclaimed water for landscape irrigation and other non-potable water use needs
- Incorporate rain barrels and gray water systems for landscape irrigation

Landscaping

- Install native and drought tolerant plant materials into landscapes
- Incorporate into landscapes drought resistant native trees, trees with low emissions and high carbon sequestration potential
- Provide parking lot areas with 50% tree cover within 10 years of construction, in particular low emitting, low maintenance, native drought resistant trees. Reduces urban heat island effect
- Dedicate space for neighborhood gardening

Mixed-Use

- Promote mixed-use development projects. These are predominantly characterized by properties on which various uses, such as office, commercial, institutional, and residential, are combined in a single building or on a single site in an integrated development project with functional interrelationships and a coherent physical design; or projects that have at least three of the following on site and/or offsite within one-quarter mile: residential development, retail development, office, transit, park, or open space
- Provide on-site shops and services for employees, as permitted by zoning and development standards

Solid Waste Measures

- Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard)
- Provide interior and exterior storage areas for recyclables and green waste and adequate recycling containers located in public areas
- Provide education and publicity about reducing waste and available recycling services

This page intentionally left blank.

DYETT & BHATIA
Urban and Regional Planners

755 Sansome Street, Suite 400
San Francisco, California 94111
415 956 4300 415 956 7315
www.dyettandbhatia.com