

GREENHOUSE GAS EMISSIONS**4.6 GREENHOUSE GAS EMISSIONS**

This chapter describes the regulatory framework and existing conditions related to greenhouse gas (GHG) emissions, and the potential for impacts from the adoption and implementation of the proposed project. Because no single project is large enough individually to result in a measurable increase in global concentrations of GHG emissions, global warming impacts of a project are considered on a cumulative basis. The proposed Plan addresses GHG emissions and sustainability in the Land Use Element; Transportation Element; Open Space, Parks, and Conservation Element; and the Environmental Hazards Element. Air quality, GHG, and land use/transportation policies and actions are designed to minimize GHG emissions to the extent feasible. This chapter is based on the methodology recommended by the Bay Area Air Quality Management District (BAAQMD). The proposed project is evaluated using BAAQMD's plan-level review criteria, based on the preliminary information available. GHG emissions are based on vehicle miles traveled (VMT) provided by Kittelson for the on-road transportation emissions section and energy use provided by the Pacific Gas & Electric (PG&E) company. The GHG emissions modeling is included in Appendix D, Air Quality and Greenhouse Gas Data, of this Draft EIR.

4.6.1 ENVIRONMENTAL SETTING**4.6.1.1 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE**

GHG emissions are various gases that are released into the atmosphere, largely as a by-product of burning fossil fuels, such as oil, natural gas, and coal, or as methane during the production and transport of fossil fuels. Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping GHG to the atmosphere. The Intergovernmental Panel on Climate Change (IPCC) has identified four major GHG—water vapor, carbon dioxide (CO₂), methane (CH₄), and ozone (O₃)—that are the likely cause of an increase in global average temperatures observed in the 20th and 21st centuries. Other GHG identified by the IPCC that contribute to global warming to a lesser extent are nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons.^{1,2,3} The major GHG are briefly described below.

- **Carbon dioxide (CO₂)** enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and respiration, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (i.e., sequestered) when it is absorbed by plants as part of the biological carbon cycle.

¹ Water vapor (H₂O) is the strongest GHG and the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant or a primary cause of change, but part of the feedback loop.

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

³ Intergovernmental Panel on Climate Change, Third Assessment Report: Climate Change 2001, New York: Cambridge University Press.

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- **Methane (CH₄)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices, and from the decay of organic waste in landfills and water treatment facilities.
- **Nitrous oxide (N₂O)** is emitted during agricultural and industrial activities as well as during the combustion of fossil fuels and solid waste.
- **Fluorinated gases** are synthetic, strong GHG that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent GHG, they are sometimes referred to as high global-warming-potential (GWP) gases. Fluorinated gases include the following:
 - **Chlorofluorocarbons (CFCs)** are GHG covered under the 1987 Montreal Protocol and used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants. Since they are not destroyed in the lower atmosphere (i.e., troposphere), CFC drift into the upper atmosphere where, given suitable conditions, they break down the ozone layer. These gases are therefore being replaced by other compounds that are GHG covered under the Kyoto Protocol.
 - **Perfluorocarbons (PFCs)** are a group of human-made chemicals composed of carbon and fluorine only. These chemicals (predominantly perfluoromethane [CF₄] and perfluoroethane [C₂F₆]) were introduced as alternatives, along with HFC, to ozone-depleting substances. In addition, PFC are emitted as by-products of industrial processes and are used in manufacturing. PFC do not harm the stratospheric ozone layer, but they have a high GWP.
 - **Sulfur Hexafluoride (SF₆)** is a colorless gas that is soluble in alcohol and ether and slightly soluble in water. SF₆ is a strong GHG used primarily in electrical transmission and distribution systems as an insulator.
 - **Hydrochlorofluorocarbons (HCFCs)** contain hydrogen, fluorine, chlorine, and carbon atoms. Although they are ozone-depleting substances, they are less potent than CFC. They have been introduced as temporary replacements for CFC.
 - **Hydrofluorocarbons (HFCs)** contain only hydrogen, fluorine, and carbon atoms. They were introduced as alternatives to ozone-depleting substances to serve many industrial, commercial, and personal needs. HFC are emitted as by-products of industrial processes and are also used in manufacturing. They do not significantly deplete the stratospheric ozone layer, but they are strong GHG.^{4,5}

The GWPs of GHG are dependent on the lifetime or persistence of the gas molecule in the atmosphere. Some GHG have a stronger greenhouse effect than others. As noted above, they are referred to as high GWP gases. The GWP of GHG emissions are shown in Table 4.6-1. The GWP is used to convert GHG to CO₂-equivalence (CO₂e) to show the relative potential that different GHG have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. For example, under IPCC's Second

⁴ United States Environmental Protection Agency, Greenhouse Gas Emissions, 2012, <http://www.epa.gov/climatechange/ghgemissions/gases.html>, accessed on September 24, 2014.

⁵ Intergovernmental Panel on Climate Change, Third Assessment Report: Climate Change 2001, New York: Cambridge University Press.

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Assessment Report, the GWP value for CH₄ is 21; a project that generates 10 metric tons (MT) of CH₄ would be equivalent to 210 MT of CO₂.⁶

TABLE 4.6-1 GHG EMISSIONS AND THEIR RELATIVE GLOBAL WARMING POTENTIAL COMPARED TO CO₂

Greenhouse Gases	Atmospheric Lifetime (Years)	Second Assessment Report (SAR) Global Warming Potential Relative to CO₂^a	Fourth Assessment Report (AR4) Global Warming Potential Relative to CO₂^b
Carbon Dioxide (CO ₂)	50 to 200	1	1
Methane ^c (CH ₄)	12 (±3)	21	25
Nitrous Oxide (N ₂ O)	120	310	298
Hydrofluorocarbons:			
HFC-23	264	11,700	14,800
HFC-32	5.6	650	675
HFC-125	32.6	2,800	3,500
HFC-134a	14.6	1,300	1,430
HFC-143a	48.3	3,800	4,470
HFC-152a	1.5	140	124
HFC-227ea	36.5	2,900	3,220
HFC-236fa	209	6,300	9,810
HFC-4310mee	17.1	1,300	1,030
Perfluoromethane: CF ₄	50,000	6,500	7,390
Perfluoroethane: C ₂ F ₆	10,000	9,200	12,200
Perfluorobutane: C ₄ F ₁₀	2,600	7,000	8,860
Perfluoro-2-methylpentane: C ₆ F ₁₄	3,200	7,400	9,300
Sulfur Hexafluoride (SF ₆)	3,200	23,900	22,800

Notes: The IPCC has published updated GWP values in its Fifth Assessment Report (2013) that reflect new information on atmospheric lifetimes of GHG and an improved calculation of the radiative forcing of CO₂ (radiative forcing is the difference between energy from sunlight received by the earth and radiated back into space). However, GWP values identified in the Second Assessment Report are still used to maintain consistency in GHG emissions modeling and thresholds used in BAAQMD's CEQA Guidelines. In addition, the 2008 Scoping Plan was based on the GWP values in the Second Assessment Report.

a. Based on a 100-Year Time Horizon of the GWP of the air pollutant relative to CO₂. Intergovernmental Panel on Climate Change. 2001. Third Assessment Report: Climate Change 2001. New York: Cambridge University Press.

b. Based on a 100-Year Time Horizon of the GWP of the air pollutant relative to CO₂. Intergovernmental Panel on Climate Change. 2007. Fourth Assessment Report: Climate Change 2001. New York: Cambridge University Press.

c. The methane GWP includes direct effects and indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO₂ is not included.

Sources: Intergovernmental Panel on Climate Change, 2001, Third Assessment Report: Climate Change 2001, New York: Cambridge University Press; Intergovernmental Panel on Climate Change, 2007, Fourth Assessment Report: Climate Change 2001, New York: Cambridge University Press.

⁶ CO₂-equivalence is used to show the relative potential that different GHG have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The global warming potential of a GHG is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

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California's Greenhouse Gas Sources and Relative Contribution

If California was a country, it would be the tenth largest GHG emitter in the world. It is the second largest emitter of GHG in the United States, surpassed only by Texas; however, California also has over 12 million more people than the state of Texas.⁷ Because of more stringent air emission regulations, in 2001 California ranked fourth lowest in carbon emissions per capita and fifth lowest among states in CO₂ emissions from fossil fuel consumption per unit of Gross State Product (total economic output of goods and services).⁸

The California Air Resources Board's (CARB) last update to the statewide GHG emissions inventory was in 2012 for year 2009 emissions and used the Second Assessment Report GWPs.⁹ In 2009, California produced 457 MMTCO₂e GHG emissions. California's transportation sector is the single largest generator of GHG emissions, producing 37.9 percent of the state's total emissions. Electricity consumption is the second largest source, comprising 22.7 percent. Industrial activities are California's third largest source of GHG emissions, comprising 17.8 percent of the state's total emissions. Other major sectors of GHG emissions include commercial and residential energy use, recycling and waste, high global warming potential GHG, agriculture, and forestry.^{10,11}

In 2015, the statewide GHG emissions inventory was updated for 2000 to 2013 emissions using the GWP in IPCC's Fourth Assessment Report. Based on these GWP, California produced 459 MMTCO₂e GHG emissions in 2013. California's transportation sector remains the single largest generator of GHG emissions, producing 36.8 percent of the state's total emissions. Electricity consumption made up 19.7 percent, and industrial activities produced 20.2 percent. Other major sectors of GHG emissions include commercial and residential, recycling and waste, high global warming potential GHG, and agriculture.¹²

Human Influence on Climate Change

For approximately 1,000 years before the Industrial Revolution, the amount of GHG in the atmosphere remained relatively constant. During the 20th century, however, scientists observed a rapid change in the climate and climate change pollutants that is attributable to human activities. The amount of CO₂ has increased by more than 35 percent since preindustrial times and has increased at an average rate of

⁷ California Energy Commission, 2005, Climate Change Emissions Estimates from Bemis, Gerry and Jennifer Allen, Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2002 Update, California Energy Commission Staff Paper CEC-600-2005-025, Sacramento, California, June.

⁸ California Energy Commission, 2006, Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004, Report CEC-600-2006-013-SF, December.

⁹ Methodology for determining the statewide GHG inventory is not the same as the methodology used to determine statewide GHG emissions under Assembly Bill 32 (2006).

¹⁰ CO₂-equivalence is used to show the relative potential that different GHG have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The global warming potential of a GHG is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

¹¹ California Air Resources Board, 2012, California Greenhouse Gas Inventory for 2000–2009: By Category as Defined by the Scoping Plan, April.

¹² California Air Resources Board, 2015. California Greenhouse Gas Inventory for 2000–2013: By Category as Defined by the Scoping Plan, April 24.

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1.4 parts per million per year since 1960, mainly due to combustion of fossil fuels and deforestation.¹³ These recent changes in climate change pollutants far exceed the extremes of the ice ages, and the global mean temperature is rising at a rate that cannot be explained by natural causes alone.¹⁴ Human activities are directly altering the chemical composition of the atmosphere through the buildup of climate change pollutants.¹⁵

Like the variability in the projections of the expected increase in global surface temperatures, the environmental consequences of gradual changes in the Earth's temperature are also hard to predict. Projections of climate change depend heavily upon future human activity. Therefore, climate models are based on different emission scenarios that account for historic trends in emissions and on observations of the climate record that assess the human influence of the trend and projections for extreme weather events. Climate-change scenarios are affected by varying degrees of uncertainty. For example, there are varying degrees of certainty on the magnitude of the trends for:

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

Potential Climate Change Impacts for California

Observed changes over the last several decades across the western United States reveal clear signals of climate change. Statewide average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been greatest in the Sierra Nevada. By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1 to 8.6°F, depending on emissions levels.¹⁶

In California and western North America, observations of the climate have shown: 1) a trend toward warmer winter and spring temperatures, 2) a smaller fraction of precipitation falling as snow, 3) a decrease in the amount of spring snow accumulation in the lower and middle elevation mountain zones,

¹³ Intergovernmental Panel on Climate Change, Fourth Assessment Report: Climate Change 2007, New York: Cambridge University Press.

¹⁴ At the end of the last ice age, the concentration of CO₂ increased by around 100 ppm (parts per million) over about 8,000 years, or approximately 1.25 ppm per century. Since the start of the industrial revolution, the rate of increase has accelerated markedly. The rate of CO₂ accumulation currently stands at around 150 ppm/century—more than 200 times faster than the background rate for the past 15,000 years.

¹⁵ California Climate Action Team, 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature, March.

¹⁶ California Climate Change Center. 2012, July. Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California.

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4) an advanced snowmelt of 5 to 30 days earlier in the springs, and 5) a similar shift (5 to 30 days earlier) in the timing of spring flower blooms.¹⁷ According to the California Climate Action Team—a committee of state agency secretaries and the heads of agencies, boards, and departments, led by the Secretary of the California Environmental Protection Agency—even if actions could be taken to immediately curtail climate change emissions, the potency of emissions that have already built up, their long atmospheric lifetimes, and the inertia of the Earth’s climate system could produce as much as 0.6°C (1.1°F) of additional warming. Consequently, some impacts from climate change are now considered unavoidable. Global climate change risks to California are shown in Table 4.6-2 and include public health impacts, water resources impacts, agricultural impacts, coastal sea level impacts, forest and biological resources impacts, and energy impacts.

TABLE 4.6-2 SUMMARY OF GHG EMISSIONS RISKS TO CALIFORNIA

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

Sources: California Energy Commission, 2006, Our Changing Climate: Assessing the Risks to California, 2006 Biennial Report, California Climate Change Center, CEC-500-2006-077; California Energy Commission, 2008, The Future Is Now: An Update on Climate Change Science, Impacts, and Response Options for California, CEC-500-2008-0077.

¹⁷ California Climate Action Team, 2006, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March.

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Specific climate change impacts that could affect the project include:

- **Water Resources Impacts.** By late-century, all projections show drying, and half of the projections suggest 30-year average precipitation will decline by more than 10 percent below the historical average. This drying trend is caused by an apparent decline in the frequency of rain and snowfall. Even in projections with relatively small or no declines in precipitation, central and southern parts of the state can be expected to be drier from the warming effects alone—the spring snowpack will melt sooner, and the moisture contained in soils will evaporate during long dry summer months.¹⁸
- **Wildfire Risks.** Earlier snowmelt, higher temperatures, and longer dry periods over a longer fire season will directly increase wildfire risk. Indirectly, wildfire risk will also be influenced by potential climate-related changes in vegetation and ignition potential from lightning. Human activities will continue to be the biggest factor in ignition risk. The number of large fires statewide are estimated to increase from 58 percent to 128 percent above historical levels by 2085. Under the same emissions scenario, estimated burned area will increase by 57 percent to 169 percent, depending on location.¹⁹
- **Health Impacts.** Many of the gravest threats to public health in California stem from the increase of extreme conditions, principally more frequent, more intense, and longer heat waves. Particular concern centers on the increasing tendency for multiple hot days in succession, and heat waves occurring simultaneously in several regions throughout the state. Public health could also be affected by climate change impacts on air quality, food production, the amount and quality of water supplies, energy pricing and availability, and the spread of infectious diseases. Higher temperatures also increase ground-level ozone levels. Furthermore, wildfires can increase particulate air pollution in the major air basins of California.²⁰
- **Increase Energy Demand.** Increases in average temperature and higher frequency of extreme heat events combined with new residential development across the state will drive up the demand for cooling in the increasingly hot and longer summer season and decrease demand for heating in the cooler season.

Warmer, drier summers also increase system losses at natural gas plants (reduced efficiency in the electricity generation process at higher temperatures) and hydropower plants (lower reservoir levels). Transmission of electricity will also be affected by climate change. Transmission lines lose 7 percent to 8 percent of transmitting capacity in high temperatures while needing to transport greater loads. This means that more electricity needs to be produced to make up for the loss in capacity and the growing demand.²¹

¹⁸ California Climate Change Center. 2012, Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California.

¹⁹ California Climate Change Center. 2012, Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California.

²⁰ California Climate Change Center. 2012, Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California.

²¹ California Climate Change Center. 2012, Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California.

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4.6.1.2 REGULATORY FRAMEWORK

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

Federal Regulations

The United States Environmental Protection Agency (US EPA) announced on December 7, 2009, that GHG emissions threaten the public health and welfare of the American people and that GHG emissions from on-road vehicles contribute to that threat. The US EPA's final findings respond to the 2007 US Supreme Court ruling that GHG emissions fit within the Clean Air Act definition of air pollutants. The findings did not themselves impose any emission reduction requirements, but allowed the EPA to finalize the GHG standards proposed in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation.²²

The US EPA's endangerment finding covers emissions of six key GHG—CO₂, CH₄, N₂O, hydrofluorocarbons, perfluorocarbons, and SF₆—that have been the subject of scrutiny and intense analysis for decades by scientists in the United States and around the world. The first three constitute the majority of GHG emissions from land uses in the City and, per BAAQMD guidance, are the GHG emissions that should be evaluated as part of a community GHG emissions inventory.

United States Mandatory Report Rule for GHG (2009)

In response to the endangerment finding, the US EPA issued the Mandatory Reporting of GHG Rule that requires substantial emitters of GHG emissions (e.g., large stationary sources) to report GHG emissions data. Facilities that emit 25,000 MTCO₂e per year are required to submit an annual report.

Update to Corporate Average Fuel Economy Standards (2010/2012)

The current Corporate Average Fuel Economy (CAFE) standards (for model years 2011 to 2016) incorporate stricter fuel economy requirements promulgated by the federal government and California into one uniform standard. Additionally, automakers are required to cut GHG emissions in new vehicles by roughly 25 percent by 2016 (resulting in a fleet average of 35.5 miles per gallon [mpg] by 2016). Rulemaking to adopt these new standards was completed in 2010. California agreed to allow auto makers who show compliance with the national program to be considered in compliance with state requirements. The federal government issued new standards in 2012 for model years 2017 to 2025, which will require a fleet average of 54.5 mpg in 2025.

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

Pursuant to its authority under the Clean Air Act, the US EPA has been developing regulations for new stationary sources such as power plants, refineries, and other large sources of emissions. Pursuant to the President's 2013 Climate Action Plan, the US EPA will be directed to develop regulations for existing stationary sources.

²² United States Environmental Protection Agency, 2009, EPA: Greenhouse Gases Threaten Public Health and the Environment, Science overwhelmingly shows greenhouse gas concentrations at unprecedented levels due to human activity, December, <http://yosemite.epa.gov/opa/admpress.nsf/0/08D11A451131BCA585257685005BF252>.

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State Laws

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

Executive Order S-03-05

Executive Order S-3-05, signed June 1, 2005, set the following GHG reduction targets for the state:

- Reduce statewide GHG emissions to 2000 levels by 2010.
- Reduce statewide GHG emissions to 1990 levels by 2020.
- Reduce statewide GHG emissions to 80 percent below 1990 levels by 2050.

Executive Order B-30-15

Executive Order B-30-15, signed April 29, 2015, sets a goal of reducing GHG emissions within the state to 40 percent of 1990 levels by year 2030. Executive Order B-30-15 also directs CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the state and requires state agencies to implement measures to meet the interim 2030 goal of Executive Order B-30-15 as well as the long-term goal for 2050 in Executive Order S-03-5. It also requires the Natural Resources Agency to conduct triennial updates of the California adaption strategy, *Safeguarding California*, in order to ensure climate change is accounted for in state planning and investment decisions.

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

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in AB 32, the Global Warming Solutions Act. AB 32 was passed by the California state legislature on August 31, 2006, to place the state on a course toward reducing its contribution of GHG emissions. AB 32 follows the 2020 tier of emissions reduction targets established in Executive Order S-3-05.

CARB Scoping Plan

AB 32 mandated CARB develop a plan, updated every five years, to describe the approach the State will take to reduce GHG in order to meet the 2020 reduction goals. The *Scoping Plan* was adopted by CARB in 2008 with the first update approved in 2014.²³

The 2008 Scoping Plan identified that GHG emissions in California are anticipated to be approximately 596 million metric tons (MMT) of CO₂e in 2020. In December 2007, CARB approved a 2020 emissions limit of 427 MMTCO₂e (471 million tons) for the state. The 2020 target requires a total emissions reduction of 169 MMTCO₂e, 28.5 percent from the projected emissions of the business-as-usual (BAU) scenario for the year 2020 (i.e., 28.5 percent of 596 MMTCO₂e).^{24,25}

²³ The first update can be viewed here: <http://www.arb.ca.gov/cc/scopingplan/document/updatescopingplan2013.htm>, accessed December 12, 2015.

²⁴ California Air Resources Board, 2008, *Climate Change Scoping Plan: a Framework for Change*. CARB defines BAU in its Scoping Plan as emissions levels that would occur if California continued to grow and add new GHG emissions but did not adopt any measures to reduce emissions. Projections for each emission-generating sector were compiled and used to estimate

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Key elements of CARB's GHG reduction plan that may be applicable to the proposed project include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards (adopted and cycle updates in progress).
- Achieving a mix of the state's energy generation in which 33 percent is from renewable sources (anticipated by 2020).
- A California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system for large stationary sources (adopted 2011). The cap-and-trade program was expanded in 2013 to include the electricity sector, and then again in 2015 to include fuels (including natural gas and gasoline).
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets (several Sustainable Communities Strategies have been adopted).
- Adopting and implementing measures pursuant to state laws and policies, including California's clean car standards (amendments to the Pavley Standards adopted 2009; Advanced Clean Car standard adopted 2012), goods movement measures, and the Low Carbon Fuel Standard (adopted 2009).
- Creating target fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation (in progress).

Table 4.6-3 shows the anticipated reductions from regulations and programs outlined in the 2008 Scoping Plan. In recognition of the critical role local governments play in the successful implementation of AB 32, the 2008 Scoping Plan cited a GHG reduction goal for local governments that is 15 percent of current levels (2005-2008) by 2020 to ensure that municipal and community-wide emissions match the state's reduction target.²⁶ Measures that local governments take to support shifts in land use patterns are anticipated to emphasize compact, low-impact growth over development in greenfields, resulting in fewer VMT.²⁷

First Update to the Scoping Plan

CARB adopted the First Update to the Scoping Plan at the May 22, 2014, board hearing. The Update to the Scoping Plan defines CARB's climate change priorities for the next five years and lays the groundwork to reach post-2020 goals in Executive Orders S-3-05 and B-16-2012. The update includes the latest scientific findings related to climate change and its impacts, including short-lived climate pollutants. The GHG target identified in the 2008 Scoping Plan is based on IPCC's GWPs identified in the Second Assessment Report (see Table 4.6-1). IPCC's Fourth and Fifth Assessment Reports identified more recent GWP values based on the latest available science. CARB recalculated the 1990 GHG emission levels with the updated GWPs

emissions for 2020 based on 2002–2004 emissions intensities. Under CARB's definition of BAU, new growth is assumed to have the same carbon intensities as was typical from 2002 through 2004.

²⁵ California Air Resources Board, 2008, Climate Change Proposed Scoping Plan: A Framework for Change.

²⁶ The Scoping Plan references a goal for local governments to reduce community GHG emissions by 15 percent from current (interpreted as 2008) levels by 2020, but it does not rely on local GHG reduction targets established by local governments to meet the State's GHG reduction target of AB 32.

²⁷ California Air Resources Board, Climate Change Scoping Plan: A Framework for Change, 2008.

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TABLE 4.6-3 SCOPING PLAN GHG REDUCTION MEASURES AND REDUCTIONS TOWARD 2020 TARGET

Recommended Reduction Measures	Reductions Counted toward 2020 Target of 169 MMT CO₂e	Percentage of Statewide 2020 Target
Cap and Trade Program and Associated Measures		
California Light-Duty Vehicle GHG Standards	31.7	19%
Energy Efficiency	26.3	16%
Renewable Portfolio Standard (33 percent by 2020)	21.3	13%
Low Carbon Fuel Standard	15	9%
Regional Transportation-Related GHG Targets ^a	5	3%
Vehicle Efficiency Measures	4.5	3%
Goods Movement	3.7	2%
Million Solar Roofs	2.1	1%
Medium/Heavy Duty Vehicles	1.4	1%
High Speed Rail	1.0	1%
Industrial Measures	0.3	0%
Additional Reduction Necessary to Achieve Cap	34.4	20%
<i>Total Cap and Trade Program Reductions</i>	<i>146.7</i>	<i>87%</i>
Uncapped Sources/Sectors Measures		
High Global Warming Potential Gas Measures	20.2	12%
Sustainable Forests	5	3%
Industrial Measures (for sources not covered under cap and trade program)	1.1	1%
Recycling and Waste (landfill methane capture)	1	1%
<i>Total Uncapped Sources/Sectors Reductions</i>	<i>27.3</i>	<i>16%</i>
<i>Total Reductions Counted toward 2020 Target</i>	<i>174</i>	<i>100%</i>
Other Recommended Measures – Not Counted toward 2020 Target		
State Government Operations	1.0 to 2.0	1%
Local Government Operations ^b	To Be Determined	NA
Green Buildings	26	15%
Recycling and Waste	9	5%
Water Sector Measures	4.8	3%
Methane Capture at Large Dairies	1	1%
<i>Total Other Recommended Measures – Not Counted Toward 2020 Target</i>	<i>42.8</i>	<i>NA</i>

Notes: The percentages in the right-hand column add up to more than 100 percent because the emissions reduction goal is 169 MMTCO₂e and the Scoping Plan identifies 174 MTCO₂e of emissions reductions strategies. Based on the SAR GWPs. MMTCO₂e = million metric tons of CO₂e

a. Reductions represent an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target.

b. According to the Measure Documentation Supplement to the Scoping Plan, local government actions and targets are anticipated to reduce vehicle miles by approximately 2 percent through land use planning, resulting in a potential GHG reduction of 2 million metric tons of CO₂e (or approximately 1.2 percent of the GHG reduction target). However, these reductions were not included in the Scoping Plan reductions to achieve the 2020 target.

Source: California Air Resources Board, 2008, Climate Change Scoping Plan: A Framework for Change.

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in the Fourth Assessment Report, and the 427 MMTCO₂e 1990 emissions level and 2020 GHG emissions limit, established in response to AB 32, is slightly higher, at 431 MMTCO₂e.²⁸

In the First Update to the Scoping Plan (also referred to as the 2014 Scoping Plan), CARB projects that statewide BAU emissions in 2020 would be approximately 509 MMTCO₂e.²⁹ Therefore, to achieve the AB 32 target of 431 MMTCO₂e (i.e., 1990 emissions levels) by 2020, the state would need to reduce emissions by 78 MMTCO₂e compared to BAU conditions, a reduction of 15.3 percent from BAU in 2020. The data from the First Update to the Scoping Plan regarding GHG emissions and reductions needed to achieve the 1990 emissions target are shown in Table 4.6-4.

TABLE 4.6-4 STATE BAU FORECAST IN THE FIRST UPDATE TO THE SCOPING PLAN

Category	2020 MMTCO ₂ e – Fourth Assessment Report GWPs
AB 32 Baseline 2020 Forecast Emissions (2020 BAU) with Pavley I and the Renewable Electricity Standard (RPS)	539
AB 32 Baseline 2020 Forecast Emissions (2020 BAU) ^a	509
Expected Reductions from Sector-Based Measures	
Energy	25
Transportation	23
High-GWPs	5
Waste	2
Cap-and-Trade Reductions ^b	23
2020 Limit	431
Percent Reduction from BAU with Pavley I and RPS	20.0%
Percent Reduction from BAU without Pavley and RPS	15.3%

a. The total projected emissions in the 2020 BAU scenario accounts for reductions anticipated from Pavley I and the Renewable Electricity Standard (30 million MTCO₂e total).

b. The cap-and-trade reductions depend on the emissions forecast.

Sources: CARB 2014, First Update to the Climate Change Scoping Plan: Building on the Framework, Pursuant to AB 32, The California Global Warming Solutions Act of 2006, May 15.

The update highlights California’s progress toward meeting the near-term 2020 GHG emission reduction goals defined in the original 2008 Scoping Plan. As identified in the Update to the Scoping Plan, California is on track to meeting the goals of AB 32. However, the Update to the Scoping Plan also addresses the state’s longer-term GHG goals within a post-2020 element. The post-2020 element provides a high-level view of a long-term strategy for meeting the 2050 GHG goals, including a recommendation for the state to adopt a mid-term target (e.g., 2030). According to the Update to the Scoping Plan, local government

²⁸ California Air Resources Board, 2014, *First Update to the Climate Change Scoping Plan: Building on the Framework, Pursuant to AB 32, The California Global Warming Solutions Act of 2006*.

²⁹ The BAU forecast includes GHG reductions from Pavley and the 33% Renewable Portfolio Standard (RPS).

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reduction targets should chart a reduction trajectory that is consistent with, or exceeds, the trajectory created by statewide goals.³⁰

According to the Update to the Scoping Plan, reducing emissions to 80 percent below 1990 levels will require a fundamental shift to efficient, clean energy in every sector of the economy. Progressing toward California's 2050 climate targets will require significant accelerations of GHG reduction rates. Emissions from 2020 to 2050 will have to decline several times faster than the rate needed to reach the 2020 emissions limit.³¹

Second Update to the Scoping Plan

The new Executive Order B-30-15 requires CARB to prepare another update to the Scoping Plan to address the 2030 target for the state. During the October 1, 2015, CARB workshop, CARB announced that the next update to the Scoping Plan would be adopted by late 2016 and would address the new 2030 interim target to achieve a 40 percent reduction below 1990 levels by 2030.

Senate Bill 375

In 2008, Senate Bill 375 (SB 375), the Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions reductions targets established in the 2008 Scoping Plan for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions reduction targets for each of the 18 metropolitan planning organizations (MPOs).

Assembly Bill 1493

California vehicle GHG emission standards were enacted under AB 1493 (Pavley I). Pavley I is a clean-car standard that is anticipated to reduce GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) by 30 percent from 2009 through 2016. California implements the Pavley I standards through a waiver granted to California by the US EPA. In 2012, the US EPA issued a Final Rulemaking that sets even more stringent fuel economy and GHG emissions standards for model years 2017 through 2025 light-duty vehicles (see also the discussion on the update to the CAFE standards under "Federal Laws," above). In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for a greater number of zero-emission vehicles into a single package of standards. Under California's Advanced Clean Car program, by 2025, new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.³²

³⁰ California Air Resources Board, 2014, *First Update to the Climate Change Scoping Plan: Building on the Framework, Pursuant to AB 32, The California Global Warming Solutions Act of 2006*.

³¹ California Air Resources Board, 2014, *First Update to the Climate Change Scoping Plan: Building on the Framework, Pursuant to AB 32, The California Global Warming Solutions Act of 2006*.

³² See also the discussion on the update to the CAFE standards under Federal Laws, above. In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combines the control of smog, soot and global warming gases and requirements for greater numbers of zero-emission vehicles into a single

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Executive Order S-01-07

On January 18, 2007, the state set a new low carbon fuel standard (LCFS) for transportation fuels sold in the state. Executive Order S-1-07 sets a declining standard for GHG emissions, measured in CO₂e grams per unit of fuel energy sold in California. The LCFS requires a reduction of 2.5 percent in the carbon intensity of California's transportation fuels by 2015 and a reduction of at least 10 percent by 2020. The standard applies to refiners, blenders, producers, and importers of transportation fuels, and would use market-based mechanisms to allow providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods.

Executive Order B-16-2012

On March 23, 2012, the state directed CARB, the California Energy Commission (CEC), the Public Utilities Commission, and other relevant agencies to work with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to accommodate zero-emissions vehicles in major metropolitan areas, including infrastructure to support them (e.g., electric vehicle charging stations). The executive order also directs the number of zero-emission vehicles in California's state vehicle fleet to increase through the normal course of fleet replacement so that at least 10 percent of fleet purchases of light-duty vehicles are zero-emission by 2015 and at least 25 percent by 2020. The executive order also establishes a target for the transportation sector of reducing GHG emissions to 80 percent below 1990 levels by 2050.

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

A major component of California's Renewable Energy Program is the renewable portfolio standard (RPS) established under Senate Bills 1078 (Sher)³³ and 107 (Simitian)³⁴. Under the RPS, certain retail sellers of electricity were required to increase the amount of renewable energy each year by at least 1 percent in order to reach at least 20 percent by December 30, 2010. Executive Order S-14-08 was signed in November 2008 and expands the state's Renewable Energy Standard to 33 percent renewable power by 2020. This Executive Order was adopted by the legislature in 2011 under SBX1-2. Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. The increase in renewable sources for electricity production will decrease indirect GHG emissions from development projects because electricity production from renewable sources is generally considered carbon neutral.

California Building Code: Building and Energy Efficiency Standards

Energy conservation standards for new residential and nonresidential buildings were originally adopted by the California Energy Resources Conservation and Development Commission (now the CEC) in June 1977 (California Code of Regulations [CCR], Title 24, Part 6). Title 24 requires the design of building shells and building components to conserve energy. The standards are updated about every three years to allow for

package of standards. Under California's Advanced Clean Car program, by 2025, new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

³³ Official California Legislative Information, http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_1051-1100/sb_1078_bill_20020912_chaptered.html, accessed on September 24, 2014.

³⁴ Official California Legislative Information, http://www.leginfo.ca.gov/pub/05-06/bill/sen/sb_0101-0150/sb_107_bill_20060926_chaptered.html, accessed on September 24, 2014.

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consideration of new energy efficiency technologies and methods. In 2012, the CEC adopted the 2013 Building and Energy Efficiency Standards, which went into effect on July 1, 2014. Buildings that are constructed in accordance with the 2013 Building and Energy Efficiency Standards are 25 percent (residential) to 30 percent (nonresidential) more energy efficient than the 2008 standards as a result of changes in requirements for windows, insulation, lighting, ventilation systems, and other features.

Most recently, the CEC adopted the 2016 Building and Energy Efficiency Standards. The 2016 standards will continue to improve upon the current 2013 standards for new construction of, and additions and alterations to, residential and nonresidential buildings. These standards will go into effect on January 1, 2017. Under the 2016 standards, residential buildings are 28 percent more energy efficient than the 2013 standards, and non-residential buildings are 5 percent more energy efficient.³⁵

The 2016 standards will not achieve zero net energy (ZNE). However, they do get very close to the state's goal and make important steps toward changing residential building practices in California. The 2019 standards will take the final step to achieve ZNE for newly constructed residential buildings throughout California.³⁶

California Building Code: CALGreen

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (24 CCR, Part 11, known as "CALGreen") was adopted as part of the California Building Standards Code. CALGreen established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and indoor air contaminants.³⁷ The mandatory provisions of CALGreen became effective January 1, 2011, and were updated most recently in 2013. The building efficiency standards are enforced through the local building permit process.

2006 Appliance Efficiency Regulations

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

Solid Waste Regulations

California's Integrated Waste Management Act of 1989 (AB 939, Public Resources Code 40050 et seq.) set a requirement for cities and counties throughout the state to divert 50 percent of all solid waste from landfills by January 1, 2000, through source reduction, recycling, and composting. In 2008, the

³⁵ California Energy Commission. 2015, 2016 Building Energy Efficiency Standards, Adoption Hearing Presentation. <http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/>, accessed on September 23, 2015.

³⁶ California Energy Commission. 2015, 2016 Building Energy and Efficiency Standards Frequently Asked Questions. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf, accessed on September 23, 2015.

³⁷ The green building standards became mandatory in the 2010 edition of the code.

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requirements were modified to reflect a per capita requirement rather than tonnage. To help achieve this, the act requires that each City and County prepare and submit a source reduction and recycling element. AB 939 also established the goal for all California counties to provide at least 15 years of ongoing landfill capacity.

AB 341 (Chapter 476, Statutes of 2011) increased the statewide goal for waste diversion to 75 percent by 2020 and requires recycling of waste from commercial and multifamily residential land uses.

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

Section 5.408 of the 2013 California Green Building Standards Code also requires that at least 50 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse.

Water Efficiency Regulations

The 20x2020 Water Conservation Plan was issued by the Department of Water Resources (DWR) in 2010 pursuant to Senate Bill 7, which was adopted during the 7th Extraordinary Session³⁸ of 2009–2010 and therefore dubbed “SBX7-7.” SBX7-7 mandated urban water conservation and authorized the DWR to prepare a plan implementing urban water conservation requirements (20x2020 Water Conservation Plan). In addition, it required agricultural water providers to prepare agricultural water management plans, measure water deliveries to customers, and implement other efficiency measures. SBX7-7 requires urban water providers to adopt a water conservation target of 20 percent reduction in urban per capita water use by 2020 compared to 2005 baseline use.

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

Regional Regulations

Bay Area Air Quality Management District

BAAQMD is the agency responsible for ensuring that the National and California ambient air quality standards are attained and maintained in the San Francisco Bay Area Air Basin. Building on state and other regional climate protection efforts, BAAQMD has adopted a resolution to reduce GHG emissions by:

³⁸An extraordinary session is a period when the legislative body convenes outside of the normal legislative session.

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- Setting a goal for the Bay Area region to reduce GHG emissions by 2050 to 80 percent below 1990 levels.
- Developing a Regional Climate Protection Strategy to make progress towards the 2050 goal, using the Air District's Clean Air Plan to initiate the process.
- Developing a 10-point work program to guide the Air District's climate protection activities in the near term.³⁹

BAAQMD is working on a Regional Climate Protection Strategy for achieving the 2050 goal for GHG emission reductions that complements existing planning efforts at the State, regional, and local levels, and uses the Air District's 2016 Draft Clean Air Plan to initiate the process. Based on BAAQMD's 10-Point Climate Action Work Program, the Regional Climate Protection Strategy will include an updated GHG emissions inventory and forecast and GHG reduction goals and interim targets for the Bay Area.⁴⁰

Plan Bay Area

The Association of Bay Area Governments (ABAG), Metropolitan Transportation Commission (MTC), BAAQMD, and San Francisco Bay Conservation and Development Commission (BCDC) share joint responsibility for creating, updating, and overseeing *Plan Bay Area*, the Sustainable Communities Strategy (SCS) for the nine-county Bay Area region pursuant to SB 375. Under SB 375, *Plan Bay Area's* targets are a 7 percent per capita reduction in GHG emissions from 2005 by 2020, and 15 percent per capita reduction from 2005 levels by 2035.⁴¹ SB 375 requires CARB to periodically update the targets, no later than every 8 years. CARB plans to propose updated targets for consideration in 2016, with the intent to make them effective in 2018. Sustainable communities strategies (SCSs) adopted in 2018 would be subject to the updated targets.⁴²

Each of the agencies involved in the SCS has a different role in regional governance. ABAG primarily deals with regional land use, housing, environmental quality, and economic development, while MTC is tasked with regional transportation planning, coordinating, and financing. BAAQMD is responsible for regional air pollution regulation. BCDC's focus is to preserve, enhance, and ensure responsible use of San Francisco Bay.

These agencies jointly created *Plan Bay Area*,⁴³ adopted in July 2013 and now a regulating portion of the Bay Area's 25-year Regional Transportation Plan (RTP), which in part dictates funding for local transportation programs and improvements. By federal law, the RTP must be internally consistent. Therefore, the more than \$200 billion dollars of transportation investment typically included in the RTP

³⁹ Bay Area Air Quality Management District, 2013, Resolution No. 2013-11: Resolution Adopting a Greenhouse House Gas Reduction Goal and Commitment to Develop a Regional Climate Protection Strategy. <http://www.baaqmd.gov/~media/files/planning-and-research/climate-protection-program/climateresolution.pdf?la=en>, accessed September 23, 2015.

⁴⁰ Bay Area Air Quality Management District, 2014, 10-Point Climate Action Work Program. <http://www.baaqmd.gov/~media/files/planning-and-research/climate-protection-program/10-point-work-program-pdf.pdf?la=en>, accessed on September 23, 2015.

⁴¹ California Air Resources Board, 2010, Staff Report Proposed Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375.

⁴² California Air Resources Board, 2015, ARB Process and Schedule for SB 375 Target Update, <http://www.arb.ca.gov/cc/sb375/sb375.htm>, accessed on May 10, 2016.

⁴³ To read more about Plan Bay Area go to www.OneBayArea.Org.

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must align with and support the SCS land use pattern. State law also requires that the updated 8-year regional housing need allocation (RHNA) prepared by ABAG for municipal housing element updates is consistent with the SCS. The update to *Plan Bay Area, Plan Bay Area 2040*, is currently underway.

Plan Bay Area sets a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce GHG emissions from cars and light trucks beyond the per capita reduction targets identified by CARB pursuant to SB 375.

As part of the implementation framework for *Plan Bay Area*, local governments may identify “Priority Development Areas” (PDAs) to focus growth. The PDAs are transit-oriented, infill development opportunity areas within existing communities. Over two-thirds of overall Bay Area growth through 2040 is allocated to the PDAs, which are expected to accommodate 80 percent (or over 525,570 units) of new housing and 66 percent (or 744,230) of new jobs in the region.⁴⁴ Additionally, the plan designates “Priority Conservation Areas” (PCAs), which are regionally significant open spaces for which there exists broad consensus for long-term protection, but which face nearer-term development pressures.

Plan Bay Area includes the following PDAs and Potential PDA in the City of San Leandro:⁴⁵

- Downtown Transit Oriented Development (City Center) PDA
- East 14th Street Mixed Use Corridor PDA
- Bay Fair BART Transit Village (Transit Town Center) Potential PDA

Local Regulations

San Leandro Climate Action Plan

In 2009 the City of San Leandro developed the *Climate Action Plan (CAP): A Vision of a Sustainable San Leandro* and adopted the municipal measures (i.e., City actions) within the CAP. The CAP includes a 2005 emissions inventory for community-wide emissions and emissions from municipal operations, with a goal to reduce GHG emissions 25 percent below 2005 levels by 2020. The CAP includes GHG emissions reduction measures and actions for reducing GHG emissions from buildings (commercial/industrial, and residential), transportation and land use, solid waste disposal, and municipal operations; however, as identified above, only government implementation actions were adopted.⁴⁶

4.6.1.3 EXISTING CONDITIONS

San Leandro Communitywide GHG Emissions

Table 4.6-5 shows community-wide GHG emissions in the City of San Leandro. San Leandro’s baseline emissions inventory totaled 524,283 MTCO₂e in 2015. As shown in this table, the on-road transportation sector is the largest contributor of GHG emissions in the City (49.5 percent), with the energy sector

⁴⁴ Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments, 2013, *Final Plan Bay Area, Strategy for a Sustainable Region*.

⁴⁵ Metropolitan Transportation Commission and Association of Bay Area Governments, 2013, Priority Development Area Showcase. <http://gis.abag.ca.gov/website/PDAShowcase/>, accessed on February 2016.

⁴⁶ City of San Leandro, 2009, *Climate Action Plan: A Vision for a Sustainable San Leandro*. Prepared by KEMA.

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emissions contributing the majority of the remainder (45.8 percent). The energy and transportation sectors account for approximately 95.3 percent of total emissions. Solid waste disposal is 3.0 percent of the inventory. Potable water use, wastewater treatment, and off-road equipment use are small contributors by comparison, making up the remaining 1.7 percent of the inventory.

TABLE 4.6-5 CITY OF SAN LEANDRO BASELINE YEAR GHG EMISSIONS

Sector	2015 MTCO ₂ e	Percentage of Inventory
On-Road Transportation ^a	259,709	49.5%
Residential Energy Use ^b	99,911	19.1%
Nonresidential Energy Use ^b	137,285	26.2%
Municipal Energy Use ^b	2,827	0.5%
Solid Waste Disposal ^c	15,633	3.0%
Water Use/Wastewater Generation ^d	2,873	0.5%
Other – Off-road Equipment ^e	6,046	1.2%
Total Community Emissions	524,283	100%
Service Population ^f	128,679	—
MTCO ₂ e/SP	4.07	—
BAAQMD Permitted Sources^g	33,587	—

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

- a. Based on on-road VMT provided by Kittelson and modeled using EMFAC2014-PL.
- b. Based on electricity and natural gas use provided by PG&E.
- c. Based on solid waste disposal in the City obtained from CalRecycle and modeled using CARB’s Landfill Emissions Tool. Does not include lifecycle emissions, including solid waste diverted from landfills.
- d. Water use and wastewater demand is estimated based on rates from the East Bay Municipal Utility District’s (EBMUD) Urban Water Management Plan (UWMP). Fugitive GHG emissions from wastewater treatment use are based on the LGOP emissions factors.
- e. GHG emissions from off-road equipment use is based on OFFROAD2007. Excludes harbor craft emissions.
- f. Air Quality and GHG modeling is based on household population, which excludes population in non-households (such as nursing homes and assisted living facilities). Based on the existing demographics in San Leandro (85,810 population and 42,869 employees).
- g. These emissions are not regulated by the City but provided for informational purposes. Includes GHG emissions from permitted sources in the City provided by BAAQMD for 2011, which is the latest data available on BAAQMD’s website.

For CEQA purposes, the GHG emissions inventory for the proposed Plan is based on emissions sources that are directly or indirectly affected by land use decisions in the city. The emissions inventory is compiled based on activity-data using a combination of a geographic-based (e.g., where emissions are generated) and consumption-based (e.g., associated with where the fuel/water is used even though the emissions are generated elsewhere). As part of BAAQMD’s *Climate Protection Program Pathway to 2050*, BAAQMD is compiling an update of emissions sources and emissions in the Bay Area, which is based on a consumption-based methodology. A consumption based inventory supplements the geographic/production-based inventory by including upstream and downstream emissions from consumption of materials (i.e., a lifecycle analysis) and shifts emissions attributable from producers of the emissions to consumers of emissions. While the BAAQMD inventory will address lifecycle pre-consumer emissions embodied in purchase of consumer goods, the proposed project and this EIR are not required to do so.

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Stationary sources of GHG emissions are not under the direct control of the City of San Leandro because they require a permit from BAAQMD. However, because this data is available from BAAQMD for the City of San Leandro and provides a more complete snapshot of the sources of emissions within the City, Table 4.6-5 includes emissions from stationary source emissions as well. However, these emissions are not traditionally considered in local GHG emissions target setting for GHG emissions planning purposes because they are regulated separately by BAAQMD and CARB.

4.6.2 STANDARDS OF SIGNIFICANCE

The proposed project would result in a significant impact to greenhouse gas emissions if it would:

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

This section analyzes potential project and cumulative impacts to greenhouse gas emissions.

4.6.2.1 BAAQMD PLAN-LEVEL SIGNIFICANCE CRITERIA

The BAAQMD CEQA Air Quality Guidelines were prepared to assist in the evaluation of air quality and GHG emissions impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. They also include recommended assessment methodologies for GHG emissions.

Chapter 4.2 of this Draft EIR, Air Quality, contains a detailed discussion of the adoption, subsequent legal challenges, and most recent court decisions regarding BAAQMD's CEQA Guidelines. As explained in that chapter, the City of San Leandro has independently determined that use of BAAQMD's CEQA Guidelines is supported by substantial evidence, and those guidelines have been found by the courts to be valid guidelines for use in the CEQA environmental review process. In addition, CEQA grants local agencies broad discretion to develop their own thresholds of significance, or to rely on thresholds previously adopted or recommended by other public agencies or experts so long as they are supported by substantial evidence. Accordingly, the City is using the BAAQMD's 2011 thresholds to evaluate project impacts in order to evaluate the potential effects of the project on GHG emissions.

The BAAQMD CEQA Guidelines include thresholds for GHG impacts for general plan analyses that are consistent with the GHG reduction goals of AB 32. Therefore, the impact of a general plan is less than significant if it:⁴⁷

⁴⁷ BAAQMD's CEQA Guidelines also allow cities to tier from plans adopted to mitigate the effects of GHG emissions on a city/town level, consistent with AB 32 goals. However, the proposed project is an update to the General Plan Land Use and Circulation Element, which has a horizon year beyond the analysis in the CAP.

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1. Reduces emissions to 1990 GHG emission levels by 2020; or
2. Reduces emissions to 15 percent below 2008 or earlier emission levels by 2020; or
3. Meets the plan efficiency threshold of 6.6 MTCO₂e per service population per year.

Option 1: For the City of San Leandro, a 1990 emissions inventory was not available, and therefore this potential significance criterion was not used. An existing emissions inventory was compiled, which could be used to evaluate the second criterion.

Option 2: Achieving a 15 percent reduction from existing (2008) emissions was not used as a significance criterion because the CEQA Guidelines allow for thresholds to accommodate some amount of growth. Consequently, the significance threshold should be set at some amount above “zero” MTCO₂e.⁴⁸ Anything less than “zero” would be an improvement to the CEQA baseline, and therefore a beneficial impact of the project and GHG emissions regulations and policies adopted since 2008. While the second criterion identified by BAAQMD was not applied as the CEQA significance criteria, the overall change in GHG emissions from existing conditions to projected future conditions has been evaluated in order to quantify GHG emissions impacts due to the project.

Option 3: BAAQMD’s third criterion, which evaluates the efficiency of the plan, has been determined to be the applicable threshold for the proposed project.

The proposed Plan includes existing and new land uses and, therefore, the statewide GHG targets are applicable on a citywide level. The proposed Plan horizon year (2035) is beyond year 2020. Therefore, the efficiency targets have been adjusted based on the long-term GHG reduction targets of Executive Order B-30-15, which set a goal of 40 percent below 1990 levels by 2030, and Executive Order S-03-05, which set a goal of 80 percent below 1990 levels by 2050, as shown in Table 4.6-6.

Consequently, total emissions are compared to the GHG efficiency targets described below.

- The City’s 2020 GHG estimated efficiency target would be 6.6 MTCO₂e per service population per year, to align with BAAQMD’s efficiency target, identified in their CEQA Guidelines, that is consistent with AB 32.
- The City’s 2035 GHG estimated efficiency target would be 3.2 MTCO₂e per service population per year, to align with the mid-term GHG reduction goal of Executive Order B-30-15 and Executive Order S-03-05.⁴⁹

⁴⁸ As explained by the California Natural Resources Agency’s “Final Statement of Reasons for Regulatory Action, Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to Senate Bill 97” (2009), the CEQA Guidelines do not establish a zero emissions threshold of significance because there is no one-molecule rule in CEQA.

⁴⁹ The proposed project horizon year is 2035; therefore, the BAAQMD efficiency target has been extrapolated to 2035 based on the GHG reduction goal of Executive Order B-30-15, which is to reduce GHG emissions 40 percent below 1990 levels by 2030, and Executive Order S-03-05, which is to reduce GHG emissions 80 percent below 1990 levels by 2050.

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TABLE 4.6-6 FORECASTING THE POST-2020 GHG REDUCTION TARGETS

Category	GHG Emissions MTCO ₂ e/Year ^a (SAR GWPs)		Notes
2020 Statewide GHG Target	433,290,000		1990 levels by 2020
2030 Statewide GHG Target	259,970,000		40% below 1990 levels by 2030
2050 Statewide GHG Target	86,660,000		80% below 1990 levels by 2050
2035 Statewide GHG Target^b	216,640,000		Trend-line between 2030 and 2050: 60 percent reduction from 1990 levels by 2040.
Population and Employment Forecasts	2035	2050	
Population ^c	45,747,645	49,779,362	Based on the California Department of Finance forecasts
Employment ^d	21,864,480	22,895,900	Based on California Department of Transportation
Service Population (SP)	67,612,125	72,342,882	—
Efficiency Target	3.2 MTCO₂e/SP	1.2 MTCO₂e/SP	—

Notes: SAR: Second Assessment Report; GWP: Global Warming Potentials; MTCO₂e: metric tons of carbon dioxide-equivalent

Sources:

a. CARB. 2007, November. California Greenhouse Gas Inventory (millions of metric tonnes of CO₂ equivalent) — Summary by Economic Sector.

b. Based on the 2030 target of 40 percent below 1990 levels by 2030 under Executive Order B-30-15 and the target of 80 percent below 1990 levels by 2050 under Executive Order S-03-05.

c. California Department of Finance. 2014, Report P-1 (County): State and County Total Population Projections, 2010-2060 (5 -year increments). <http://www.dof.ca.gov/research/demographic/reports/projections/P-1/>, accessed on May 10, 2016.

d. California Department of Transportation. Long-Term Socio-Economic Forecasts by County. http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic.html, accessed on May 10, 2016

- The City's 2050 GHG estimated efficiency target would be 1.2 MTCO₂e per service population per year, to align with the long-term GHG reduction goals of Executive Order S-03-05. Since the 2050 horizon extends beyond the 2035 horizon year of the proposed Plan, this efficiency metric is only considered for consistency with the statewide GHG reduction targets, which are addressed in the CARB Scoping Plan (see Impact GHG-2). Under this criterion, efficiency is used as a way to gauge whether the City is on a trajectory to achieve the even longer-term targets under the Executive Order S-03-05.

4.6.3 IMPACT DISCUSSION

This section analyzes potential proposed project impacts to GHG emissions from implementation of the proposed Plan as described in Chapter 3, *Project Description*.

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Methodology

Community-wide GHG emissions for the proposed project, which includes growth in the City, follows BAAQMD's *GHG Plan Level Guidance*⁵⁰ and ICLEI's *US Community Protocol for Accounting and Reporting of GHG Emissions*.⁵¹ For general plan level analyses, BAAQMD CEQA Guidelines recommend that GHG emissions from direct and indirect community-wide emission sources be quantified for the baseline year, the year 2020 (for consistency with AB 32), and the projected year of buildout. Direct sources of emissions include on-site combustion of energy such as natural gas used for heating and cooking, emissions from industrial processes, and fuel combustion from mobile sources. Indirect emissions are emissions produced off-site from energy production and water conveyance due to a project's energy use and water consumption. Biogenic CO₂ emissions are not included in the quantification of a project's GHG emissions impacts because biogenic CO₂ is derived from living biomass (e.g., organic matter present in wood, paper, vegetable oils, animal fat, food, animal, and yard waste) as opposed to fossil fuels. Pursuant to guidance from the Governor's Office of Planning and Research and the California Air Pollution Control Officer's Association, lifecycle emissions are also not included in the quantification of a project's GHG emissions impacts for CEQA.⁵² The analysis includes the following sectors:

- **On-Road Transportation:** On-road transportation emissions from passenger vehicles and trucks generated by land uses in the City are based on daily VMT data provided by Kittelson for existing conditions and year 2035, based on the City's traffic model, which includes regional trips. This traffic model data, presented in Chapter 4.13 of this Draft EIR, includes assumptions about truck routes and fleet mix consistent with the proposed Plan. Accounting of VMT is based on the recommendations of CARB's Regional Targets Advisory Committee (RTAC) created under Senate Bill 375 (SB 375).⁵³ GHG emissions associated with the VMT provided by Kittelson were modeled using CARB's EMFAC2014-PL.⁵⁴ Consistent with CARB's methodology within the *Climate Change Scoping Plan Measure Documentation Supplement*, daily VMT was multiplied by 347 days per year to account for reduced

⁵⁰ Bay Area Air Quality Management District (BAAQMD), 2012, *GHG Plan Level Guidance*, <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/GHG%20Quantification%20Guidance%20May%202012.ashx?la=en>, accessed on May 12, 2016.

⁵¹ ICLEI – Local Governments for Sustainability USA, 2012, *US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions*. Version 1.0, October.

⁵² Lifecycle emissions include indirect emissions associated with materials manufacture. However, these indirect emissions involve numerous parties, each of which is responsible for GHG emissions of their particular activity. The California Resources Agency, in adopting the CEQA Guidelines Amendments on GHG emissions found that lifecycle analyses was not warranted for project-specific CEQA analysis in most situations, for a variety of reasons, including lack of control over some sources, and the possibility of double-counting emissions (see Final Statement of Reasons for Regulatory Action, December 2009). Because the amount of materials consumed during the operation or construction of the proposed project is not known, the origin of the raw materials purchased is not known, and manufacturing information for those raw materials are also not known, calculation of life cycle emissions would be speculative. A life-cycle analysis is not warranted.

⁵³ For accounting purposes, there are three types of trips: (1) Vehicle trips that originated and terminated within the City of San Leandro (Internal-Internal, I-I). Using the accounting rules established by RTAC, 100% of the length of these trips, and their emissions, are attributed to the City of San Leandro. (2) Vehicle trips that either originated or terminated (but not both) within the City of San Leandro (Internal-External or External-Internal, I-X and X-I). Using the accounting rules established by RTAC, 50 percent of the trip length for these trips is attributed to San Leandro. (3) Vehicle trips that neither originated nor terminated within the City of San Leandro. These trips are commonly called pass-through trips (External-External, X-X). Using the accounting rules established by RTAC, these trips are not counted towards the City's VMT or emissions.

⁵⁴ California Air Resources Board, 2014, EMFAC2014-PL.

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traffic on weekends and holidays to determine annual emissions.⁵⁵ The emissions forecast include the GHG emissions reductions from federal and State regulations included in EMFAC2014 including, the Pavley I fuel efficiency standards, the California Advanced Clean Car Standards, the LCFS, on-road diesel fleet rules, and the Smartway/Phase I Heavy Duty Vehicle Greenhouse Gas Regulation.

- **Residential and Non-residential Energy:** Purchased electricity and natural gas use for residential and non-residential land uses in the City are based on data provided by PG&E. To account for fluctuation in annual energy use as a result of natural variations in climate between inventory years, BAAQMD recommends averaging energy use over several years.⁵⁶ Therefore, residential natural gas and electricity use are normalized based on five years of electricity and natural gas usage data (2009-2013) for the baseline inventory. Electricity use is then multiplied by the carbon intensity of PG&E's electricity. GHG emissions from natural gas use are based on emissions rates in CARB's Local Government Operations Protocol (LGOP), Version 1.1. For the Residential Sector, total electricity use and natural gas use in the baseline year are forecasted based on the percent increase in housing units from the baseline year. For the Non-residential Sector, total electricity use and natural gas use in the baseline year are forecasted based on the percent increase in employment from the baseline year for each of the proposed project development scenarios. This means that under the BAU conditions, the emissions forecasts for the Residential and Non-residential sectors do not include reductions in average annual building energy use (non-plug load) associated new buildings from the triennial updates to the Title 24 Building Code or energy efficiency improvements that reduce electricity use in existing buildings.
- **Water/Wastewater:** GHG emissions from this Sector include indirect GHG emissions from the embodied energy associated with water use and wastewater generation and fugitive GHG emissions from processing wastewater. Annual water demand and wastewater generation was based on rates from the East Bay Municipal Utility District's (EBMUD) Urban Water Management Plan (UWMP) and the embodied energy associated with water supply and conveyance and wastewater treatment.^{57 58} Then energy is multiplied by PG&E's carbon intensity of energy. Fugitive emissions from wastewater treatment in the city were calculated using the emission factor's in CARB's LGOP, Version 1.1.⁵⁹
- **Waste:** GHG emissions from solid waste disposed of by residents and employees in the City is based on the waste-in-place (WIP) method. The WIP method assumes that the degradable organic component (degradable organic carbon, DOC) in waste decays slowly throughout a few decades, during which CH₄ and biogenic CO₂ are formed. If conditions are constant, the rate of CH₄ production depends solely on the amount of carbon remaining in the waste. As a result, emissions of CH₄ from waste deposited in a disposal site are highest in the first few years after deposition, then gradually decline as the degradable carbon in the waste is consumed by the bacteria responsible for the decay. Significant CH₄ production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer. BAAQMD recommends averaging waste disposal over several

⁵⁵ California Air Resources Board, 2008, Climate Change Proposed Scoping Plan, a Framework for Change, October.

⁵⁶ Bay Area Air Quality Management District, 2012, *GHG Plan Level Guidance*, <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/GHG%20Quantification%20Guidance%20May%202012.aspx?la=en>, accessed on May 10, 2016.

⁵⁷ East Bay Municipal Utility District, 2011, 2010 Urban Water Management Plan.

⁵⁸ California Energy Commission, 2006, Refining Estimates of Water-Related Energy Use in California. CEC-500-2006-118. Prepared by Navigant Consulting, Inc.. Based on the electricity use for Northern California.

⁵⁹ California Air Resources Board, 2010, Local Government Operations Protocol, Version 1.1.

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years to account for fluctuations in average annual solid waste disposal.⁶⁰ Waste generated in the City is averaged over a three-year period (2011-2013),⁶¹ based on data obtained from CalRecycle, to provide an estimate of GHG emissions for existing conditions (baseline year).⁶² GHG emissions from solid waste disposal in the baseline year were modeled using CARB's Landfill Emissions Tool Version 1_2013, which includes waste characterization data from CalRecycle.⁶³ Only fugitive sources of GHG emissions from landfill are included. Modeling assumes a 75 percent reduction in fugitive GHG emissions from the landfill's Landfill Gas Capture System. The Landfill gas capture efficiency is based on CARB's LGOP, Version 1.1.⁶⁴ Total GHG emissions from waste disposal in the baseline year are forecasted based on the percent increase in service population. The emissions forecast do not account for reductions from increasing waste diversion.

- **Other, Off-Road Equipment:** OFFROAD2007⁶⁵ was used to obtain a rough estimate of GHG emissions from landscaping equipment, light commercial equipment, and construction equipment in the City. OFFROAD2007 is a database of equipment use and associated emissions for each county compiled by CARB. Annual emissions were compiled using OFFROAD2007 for the County of Alameda for year 2015. In order to determine the percentage of emissions attributable to the City of San Leandro, landscaping and light commercial equipment is estimated based on population, (Landscaping),⁶⁶ employment (Light Commercial Equipment),⁶⁷ and construction building permits (Construction)⁶⁸ for San Leandro as a percentage of Alameda County. Daily off-road construction emissions are multiplied by 347 days per year to account for reduced/limited construction activity on weekends and holidays. Annual average construction emissions are assumed to be similar to historic conditions. Total GHG emissions from landscaping equipment and commercial equipment in the baseline year are forecasted based on the percent increase in population and employment growth, respectively. The emissions forecast for the Other Sector included GHG reductions from the LCFS.

⁶⁰ Bay Area Air Quality Management District, 2012, *GHG Plan Level Guidance*, May. <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/GHG%20Quantification%20Guidance%20May%202012.ashx?la=en>, accessed on May 10, 2016.

⁶¹ 2014 data is not available from CalRecycle.

⁶² CalRecycle, 2015, Disposal Reporting System, Jurisdiction Reporting by Facility, San Leandro, <http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx>, accessed on May 10, 2016.

⁶³ California Department of Resources Recycling and Recovery, Disposal Reporting System, 2016, *2013-2010 San Leandro Jurisdiction Disposal By Facility with Reported Alternative Daily Cover (ADC) and Alternative Intermediate Cover (AIC)*, <http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx>, accessed on May 10, 2016.

⁶⁴ California Air Resources Board, 2010, Local Government Operations Protocol, Version 1.1.

⁶⁵ Although there is a new OFFROAD Model, the 2011 update did not categorize emissions at the county-level, only statewide in the new model update. Therefore, GHG emissions from this sector are a conservative estimate from off-road equipment.

⁶⁶ U.S. Census Bureau, 2010.

⁶⁷ U.S. Census Bureau. 2010. *Longitudinal Employer-Household Dynamics*. <http://lehd.ces.census.gov/>.

⁶⁸ U.S. Census Bureau, 2010. Building Permits, <http://censtats.census.gov/bldg/bldgprmt.shtml>.

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GHG-1 **Implementation of the proposed Plan would directly and indirectly generate greenhouse gas (GHG) emissions but would not exceed identified GHG efficiency targets for 2020 or General Plan horizon year of 2035, and, therefore, would not have a significant impact on the environment.**

Proposed General Plan Update

Development under the proposed project would contribute to climate change through direct and indirect emissions of GHG from energy (natural gas and purchased electricity), on-road transportation sources, potable water use, wastewater generation, solid waste disposal, and off-road sources (e.g., equipment used for landscaping, commercial activities, and construction).

The community-wide GHG emissions inventory for the proposed General Plan scenarios compared to existing conditions is included in Table 4.6-7 for years 2020 and 2035. Emissions are estimated for the year 2020 in order to evaluate consistency with AB 32, which sets a statewide target for 2020. Emissions are estimated for the year 2035 since that is the horizon year of the proposed General Plan.

Year 2020 – AB 32 Target

Table 4.6-7 shows that compared to the existing baseline emissions inventory, the City would experience a decrease of GHG emissions in 2020 as a result of State and federal regulations adopted to reduce GHG emissions and turnover of California’s on-road vehicle fleets. Additionally, the City would achieve BAAQMD’s year 2020 efficiency metric of 6.6 MTCO₂e/SP, which is consistent with the GHG reduction targets of AB 32.

Plan Horizon Year 2035 – Trajectory to the Executive Order B-30-15 and Executive Order S-03-05 Goals

The community-wide GHG emissions inventory for the proposed Plan horizon year 2035 is also included in Table 4.6-7. Emissions generated by additional growth in the City would be offset by a reduction in existing emissions from implementation of federal, State, and local regulations and programs adopted to reduce GHG emissions and from turnover of California’s on-road vehicle fleets. A project that does not generate an increase of emissions or generates a net decrease in emissions does not result in a significant impact (i.e., the impact threshold should be set at some point above zero). GHG emissions in the city would be 7 percent less than the baseline community GHG emissions by year 2025.

BAAQMD has not adopted a 2035 per capita GHG threshold for operation-related GHG emissions. However, for the purposes of this EIR analysis, a 2035 efficiency target was derived for the proposed project based on a trajectory toward the goals in Executive Order B-30-15 and Executive Order S-03-05, and is estimated at 3.2 MTCO₂e/SP for the proposed Plan horizon year 2035. Table 4.6-6 shows that the proposed Plan would achieve the BAAQMD efficiency metric for year 2035 that would ensure the City maintains a trajectory that is consistent with the GHG reduction target of Executive Order B-30-15.

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TABLE 4.6-7 PROPOSED PROJECT GHG EMISSIONS FORECAST

Sector	2015 MTCO ₂ e	2020 ^a MTCO ₂ e	2035 MTCO ₂ e	Percent of Total 2035
On-Road Transportation ^a	259,709	257,836	203,401	42%
Residential Energy Use ^b	99,911	92,577	103,911	21%
Nonresidential Energy Use ^b	137,285	124,811	147,399	30%
Municipal Energy Use ^b	2,827	2,213	2,494	1%
Solid Waste Disposal ^c	15,633	16,845	18,982	4%
Water Use/Wastewater Generation ^d	2,873	2,603	2,910	1%
Other – Off-road Equipment ^e	6,046	6,414	7,162	1%
Total Community Emissions	524,283	503,299	486,261	100%
Change from Existing	—	-20,985	-38,023	-7
Service Population ^f	128,679	138,656	156,249	—
MTCO ₂ e/SP	4.1	3.6	3.1	—
Plan-Level Efficiency Target	—	6.6	3.2	—
Achieves Plan-Level Efficiency Target	—	Yes	Yes	—

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

Sources:

a. Based on on-road VMT provided by Kittelson and modeled using EMFAC2014-PL.

b. Based on electricity and natural gas use provided by PG&E.

c. Based on solid waste disposal in the City obtained from CalRecycle and modeled using CARB’s Landfill Emissions Tool.

d. Water use and wastewater demand is estimated based on rates from the East Bay Municipal Utility District’s (EBMUD) Urban Water Management Plan (UWMP). Fugitive GHG emissions from wastewater treatment use are based on the LGOP emissions factors.

e. GHG emissions from off-road equipment use is based on OFFROAD2007.

f. Air Quality and GHG modeling is based on household population, which excludes population in non-households (such as nursing homes and assisted living facilities). Based on ABAG population and employment for San Leandro in year 2020 (92,087 population and 46,569 employees) and at the 2035 GP Horizon Year (101,252 population and 54,997 employees).

g. The 2050 efficiency target is 1.2 MTCO₂e based on the long-term target of Executive Order S-03-05. However, this target extends past the horizon year of the proposed project. This CEQA analysis considers this threshold under GHG-2, to analyze the trajectory toward the even long-term GHG reduction goals under Executive Order S-03-05, to provide a conservative finding of GHG emissions impacts. Because the proposed Plan horizon year is 2035, this threshold is not analyzed under GHG-1.

The proposed Plan establishes the framework for future growth and development in San Leandro. A general plan does not directly result in development without additional approvals. Before any development can occur in the City, it is required to be analyzed for consistency with the proposed Plan, zoning requirements, and other applicable local and state requirements; comply with the requirements of CEQA; and obtain all necessary clearances and permits. As identified in Table 4.6-7, the proposed Plan would result in a decrease in emissions from existing conditions and would achieve the 2035 performance criteria that would ensure the City is on a trajectory to achieve the GHG reductions targets of Executive Order B-30-15. Consequently, GHG emissions impacts of the proposed Plan are *less than significant*.

Applicable Regulations:

- California Global Warming Solutions Act (AB 32)
- Sustainable Communities and Climate Protection Act (SB 375)
- Greenhouse Gas Emission Reduction Targets (Executive Order S-3-05)

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- Clean Car Standards – Pavley (AB 1493)
- Renewable Portfolio Standards (SB 1078)
- California Integrated Waste Management Act of 1989 (AB 939)
- California Mandatory Commercial Recycling Law (AB 341)
- California Advanced Clean Cars CARB/ Low-Emission Vehicle Program – LEV III (Title 13 CCR)
- Heavy-Duty Vehicle Greenhouse Gas Emissions Reduction Measure (Title 17 CCR)
- Low Carbon Fuel Standard (Title 17 CCR)
- California Water Conservation in Landscaping Act of 2006 (AB 1881)
- California Water Conservation Act of 2009 (SBX7-7)
- Airborne Toxics Control Measure to Limit School Bus Idling and Idling at Schools (13 CCR 2480)
- Airborne Toxic Control Measure to Limit Diesel-Fuel Commercial Vehicle Idling (13 CCR 2485)
- In-Use Off-Road Diesel Idling Restriction (13 CCR 2449)
- Building Energy Efficiency Standards (Title 24, Part 6)
- California Green Building Code (Title 24, Part 11)
- Appliance Energy Efficiency Standards (Title 20)

Significance before Mitigation: Less than significant.

Proposed Zoning Code Amendments

The proposed amendments to the Zoning Code would bring the Zoning Code into conformance with the proposed General Plan. The proposed Zoning Code would implement the proposed Plan and would help to guide development in key areas of the city. Proposed Zoning Code amendments that would allow increased growth include increased building density, intensity (FAR), and height limits in commercial districts. The potential increase in growth as a result of these Zoning Code amendments is captured in the buildout of the proposed Plan that is analyzed above. Future growth under the proposed Zoning Code amendments would contribute to climate change through direct and indirect emissions of GHG. As shown in Table 4.6-6, the proposed project would achieve the 2020, 2035, and 2050 performance criteria that would ensure the City is on a trajectory to achieve the GHG reductions targets of Executive Orders B-30-15 and S-03-05. Therefore, impacts from the proposed Zoning Code amendments would be *less than significant*.

Significance before Mitigation: Less than significant.

GHG-2 **The proposed Plan could conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.**

The State’s GHG emissions reductions objectives are embodied in AB 32, Executive Order B-30-15, Executive Order S-03-05, and SB 375. Applicable plans adopted for the purpose of reducing GHG emissions include the *Scoping Plan* and *Plan Bay Area*. Additionally, a consistency analysis with the San Leandro Climate Action Plan (CAP) was conducted even though only the local government implementation actions were adopted at the time the CAP was developed.

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In accordance with AB 32, CARB developed the *2008 Scoping Plan* to outline the State's strategy to achieve 1990 level emissions by year 2020. To estimate the reductions necessary, CARB projected statewide 2020 BAU GHG emissions (i.e., GHG emissions in the absence of statewide emission reduction measures). CARB identified that the State as a whole would be required to reduce GHG emissions by 28.5 percent from year 2020 BAU to achieve the targets of AB 32.⁶⁹ The GHG emissions forecast was updated as part of the First Update to the Scoping Plan. In the First Update to the Scoping Plan, CARB projected that statewide BAU emissions in 2020 would be approximately 509 million MTCO₂e.⁷⁰ Therefore, to achieve the AB 32 target of 431 million MTCO₂e (i.e., 1990 emissions levels) by 2020, the State would need to reduce emissions by 78 million MTCO₂e compared to BAU conditions, a reduction of 15.3 percent from BAU in 2020.^{71,72}

Statewide strategies to reduce GHG emissions identified in the *2008 Scoping Plan* include the LCFS; California Appliance Energy Efficiency regulations; California Building Standards (i.e., CALGreen and the Building and Energy Efficiency Standards); California Renewable Portfolio Standard (RPS); changes in the corporate average fuel economy standards (e.g., Pavley I and Pavley II, which is now known as the California Advanced Clean Cars program); and other measures that would ensure the State is on target to achieve the GHG emissions reduction goals of AB 32. The Statewide strategies in the Scoping Plan apply to State agencies only and are not directly applicable to individual projects or cities. However, without the strategies identified in the Scoping Plan, local jurisdictions would likely not be able to achieve local GHG reduction targets. Statewide GHG emissions reduction measures reduce emissions from existing and future development and would reduce the City's future GHG emissions.

Trajectory to the 2050 Executive Order S-03-05 Goal

In 2014, CARB adopted its *First Update to the Scoping Plan*. As identified in the update, as California continues to build its climate policy framework, there is a need for local government climate action planning to adopt mid-term and long-term reduction targets that are consistent with scientific assessments and the statewide goal of reducing emissions 80 percent below 1990 levels by 2050. CARB identifies that local government reduction targets should chart a reduction trajectory that is consistent with, or exceeds, the trajectory created by statewide goals. CARB is also in the process of updating the Scoping Plan to address the new interim GHG reduction target for 2030 under Executive Order B-30-15.

While the proposed Plan would achieve efficiency targets for 2035, as identified in Table 4.6-6, additional GHG reductions would be necessary to achieve the more aggressive GHG reduction targets of an 80 percent reduction below 1990 levels by 2050 under Executive Order S-03-05. Examples of policies in the

⁶⁹ California Air Resources Board, 2008, *Climate Change Proposed Scoping Plan, a Framework for Change*.

⁷⁰ The BAU forecast includes GHG reductions from Pavley and the 33 percent Renewable Portfolio Standard (RPS).

⁷¹ California Air Resources Board, 2014, *First Update to the Climate Change Scoping Plan: Building on the Framework, Pursuant to AB 32, The California Global Warming Solutions Act of 2006*.

⁷² If the GHG emissions reductions from Pavley I and the Renewable Electricity Standard are accounted for as part of the BAU scenario (30 million MTCO₂e total), then the State would need to reduce emissions by 108 million MTCO₂e, which is a 20 percent reduction from BAU.

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proposed Plan that would reduce GHG from development projects to the maximum extent practicable include:

- **Policy OSC-7.1: Recycling.** Actively promote recycling, composting, and other programs that reduce the amount of solid waste requiring disposal in landfills.
- **Policy OSC-7.2: Water Conservation.** Promote the efficient use of existing water supplies through a variety of water conservation measures, including the use of recycled water for landscaping.
- **Policy OSC-7.3: Drought-Tolerant Landscaping.** Encourage the use of native vegetation and Bay-friendly landscaping and enforce the State Department of Water Resources Model Water Efficient Landscape Ordinance (WELO).
- **Policy OSC-7.4: Development Standards.** Maintain local planning and building standards that require the efficient use of water through such measures as low-flow plumbing fixtures and water-saving appliances. Require water conservation measures as a condition of approval for major developments.
- **Policy OSC-7.5: City Conservation Practices.** Ensure that City itself follows conservation practices in its day-to-day operations and is a role model for businesses and residents in the area of conservation. The City should encourage the use of reusable and recyclable goods in its purchasing policies and practices, and should develop strategies that encourage residents and businesses to do the same.
- **Policy OSC-7.6: Reducing Municipal Greenhouse Gas Emissions.** Reduce greenhouse gas emissions associated with municipal operations, including those associated with energy use, City vehicles, City recycling and composting operations, and utilities.
- **Policy OSC-7.7: Climate Action Plan.** Maintain and periodically update a local Climate Action Plan. The Plan should be periodically updated to reflect the completion of tasks, emerging priorities, new technologies, new laws, and higher targets for emissions reduction.
- **Policy OSC-7.8: Green Building.** Promote green building in new construction and remodels
- **Policy OSC-7.9: Reducing Greenhouse Gases Through Land Use and Transportation Choices.** Locate and design new development in a manner which maximizes the ability to use transit, walk, or bicycle for most trips, reduce dependence on fossil fuel powered vehicles, and reduce vehicle miles traveled.
- **Policy OSC-7.10: Open Space and Carbon Emissions.** Enhance the quality of the urban environment, including streets, parks, and yards, in order to absorb carbon emissions and reduce greenhouse gas emissions.
- **Policy OSC-8.1: Conservation and Energy Efficiency.** Strongly advocate for increased energy conservation by San Leandro residents and businesses, and ensure that the City itself is a conservation role model.
- **Policy OSC-8.2: Planning and Building Practices.** Encourage construction, landscaping, and site planning practices that minimize heating and cooling costs and ensure that energy is efficiently used. Local building codes and other City regulations and procedures should meet or exceed state and federal standards for energy conservation and efficiency, and support the City's greenhouse gas reduction goals.
- **Policy OSC-8.3: Weatherization and Energy Upgrades.** Promote the weatherization and energy retrofitting of existing homes and businesses, including the development of solar space heating and water heating systems, and the use of energy-efficient lighting, fixtures and appliances.

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- **Policy OSC-8.4: Local Energy Resources.** Accommodate the use of local alternative energy resources, such as solar power, wind, methane gas, and industrial waste heat (cogeneration). Ensure that alternative energy infrastructure is compatible with surrounding land uses and minimizes environmental impacts on the community. ^{28.04}
- **Policy OSC-8.5: Public Information and Education.** Promote public information and education on energy conservation and retrofit programs, in part through partnerships with the agencies offering such programs.
- **Policy EH-3.2: Transportation Control Measures.** Promote strategies that help improve air quality and reduce greenhouse gas emissions by reducing the necessity of driving. These strategies include more reliable public transportation, carpooling and vanpooling programs, employer transportation demand management (TDM) programs, better provisions for bicyclists and pedestrians, and encouraging mixed use and higher density development around transit stations.
- **Policy EH-3.9: Alternative Fuel Vehicles.** Promote the development of infrastructure which supports the use of alternative fuel (i.e., electric) vehicles, including electric charging stations and preferential parking for electric vehicles.
- **Policy LU-2.5: Pedestrian and Bicycle Improvements.** Promote improvements that make San Leandro neighborhoods more friendly to pedestrians and bicyclists, such as bike lanes, street trees, and crosswalks.
- **Policy LU-3.1: Mix of Unit Types.** Encourage a mix of residential development types in the City, including single family homes on a variety of lot sizes, as well as townhomes, row houses, live-work units, planned unit developments, garden apartments and medium to high density multi-family housing.
- **Policy LU-3.4: Promotion of Infill.** Encourage infill development on vacant or underused sites within residential and commercial areas.
- **Policy LU-3.5: Mixed Use on Transit Corridors.** Encourage mixed use projects containing ground floor retail and upper floor residential uses along major transit corridors. Such development should be pedestrian-oriented, respect the scale and character of the surrounding neighborhood, and incorporate architectural themes that enhance the identity of adjacent commercial districts.
- **Policy LU-3.9: Live-Work Development.** Provide opportunities for “live-work” development to provide a housing resource for artists, craftspersons, and persons working from home. The design of live-work projects should be sensitive to the surrounding areas. Live-work is most appropriate as a buffer land use between residential and non-residential areas, in transit-oriented development areas, and in non-residential areas where the long-term viability of industry is compromised by small (less than one acre) parcels, buildings that cannot be easily adapted to higher-value uses, and proximity to sensitive uses such as schools and housing.
- **Policy LU-6.5: Reducing VMT Through Land Use Choices.** Provide a mix of land uses, site planning and design practices, and circulation improvements in the BART Station area that maximize transit ridership and the potential to reduce vehicle miles traveled (VMT).
- **Policy T-5.2: Evaluating Development Impacts.** Use vehicle miles traveled (VMT) as the primary metric for evaluating the transportation impacts of new development proposals. Traffic impact studies may also consider the total number of trips generated and the resulting impact on traffic volumes and

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congestion (e.g., "Level of Service"), but VMT shall provide the primary basis for determining appropriate mitigation measures.

- **Policy T-5.7: Technology and Roadway Efficiency.** Use technology, including smart phone applications, roadway sensors, and real time data on congestion, travel time, and parking supply to create a more efficient transportation system, and to maximize the benefits of the existing road system before investing in its expansion.
- **Policy T-5.8: Electric and Low Emission Vehicles.** Plan for a substantial increase in the number of electric vehicles and other low-emission or zero-emission vehicles on city streets. This should include the development of electric vehicle charging stations at the BART stations, in large parking structures and parking lots, at City facilities (including City parking facilities), in high-employment workplaces, and at other destinations around the city.
- **Policy T-5.9: Autonomous (Driverless) Vehicles.** Monitor the development of autonomous vehicle technology, and actively take part in regional discussions regarding the potential effects of these vehicles on local and regional traffic flow.
- **Policy T-6.1: Traffic Calming Strategies.** Use a variety of approaches to slow down or “calm” traffic on San Leandro streets, based on the specific conditions on each street. Emphasize approaches that improve conditions for pedestrians and bicyclists and enhance neighborhood aesthetics.

Even with implementation of the policies in the proposed Plan, additional State and federal actions are necessary to ensure that State and federally regulated sources (i.e., sources outside the City’s jurisdictional control) take similar aggressive measures to ensure the deep cuts needed to achieve the long-term target. Emissions from 2020 to 2050 will have to decline several times faster than the rate needed to reach the 2020 emissions limit.⁷³ According to the California Council on Science and Technology’s (CCST) 2011 report, this includes switching from gasoline-powered cars and trucks to plug-in hybrids, all electric vehicles, or alternative fuels (hydrogen-fuel and/or biofuels); switching from fossil fuel to electricity to heat building space; de-carbonizing electricity⁷⁴ while maintaining a reliable electricity grid; and aggressive efficiency measures.⁷⁵ According to the CCST, emissions reductions of 80 percent can be achieved with feasible technology implementation plus research, development, and innovation. Approximately 60 percent of emissions reductions below 1990 levels can be achieved with current technology in use or in demonstration phase.

The remainder of the emission cuts to obtain the full 80 percent reduction below 1990 levels will require development and deployment of new or currently un-deployed technology. Achieving this second cut will thus require a substantial commitment to technology development and innovation. Several studies have also highlighted the variables that drive future scenario studies and challenges to meeting the 2050

⁷³ California Air Resources Board, 2014, *First Update to the Climate Change Scoping Plan: Building on the Framework, Pursuant to AB 32, The California Global Warming Solutions Act of 2006*.

⁷⁴ In general, there are three ways to de-carbonize electricity: nuclear power, fossil fuel with carbon storage, and renewable energy.

⁷⁵ California Council on Science and Technology, 2011, *California’s Energy Future – The View to 2050*, <http://www.ccst.us/publications/2011/2011energy.pdf>, accessed on May 12, 2016.

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target.^{76,77,78} Because no single technological approach will allow the State to accomplish its 2050 goal, obtaining an 80 percent reduction below 1990 levels will require a portfolio of solutions.⁷⁹

While the proposed project supports progress toward these long-term goals, it cannot yet be demonstrated that San Leandro will achieve GHG emissions reductions that are consistent with an 80 percent reduction below 1990 levels by the year 2050 based on existing technologies and currently adopted policies and programs.

CARB's 2014 Update to the Scoping Plan identified that California continues to build its climate policy framework, and there is a need for local government climate action planning to adopt long-term reduction targets that are consistent with scientific assessments and the statewide goal of reducing emissions 80 percent below 1990 levels by 2050. CARB states that local government reduction targets should chart a reduction trajectory that is consistent with or exceeds the trajectory created by statewide goals as shown in Table 4.6-10, *Statewide Trajectory to Achieve Interim Goal under Executive Orders B-30-15 and S-03-05*. The proposed project would be on a trajectory to achieve the interim target but would not achieve the 2050 long-term plan-efficiency target of 1.3 MTCO₂e/SP.

MTC's Plan Bay Area

Plan Bay Area is the Bay Area's SCS, adopted to reduce GHG emissions from land use and transportation, as required by SB 375. ABAG and MTC are currently in the process of preparing an update to the nine-county RTP/SCS, *Plan Bay Area 2035*, to reflect the updated priorities of the Bay Area. The housing, population, and employment forecasts prepared by ABAG will be integrated into the scenario modeling tools used to develop *Plan Bay Area 2035* in order to build upon earlier efforts to develop an efficient transportation network and grow in a financially and environmentally responsible way. The update will identify long-term goals to reduce GHG emissions from cars and light-duty trucks, house the region's projected population, improve public health, maintain the region's transportation infrastructure, and preserve open space.⁸⁰

As explained in Section 4.6.1.1, above, the *Plan Bay Area* land use concept plan for the region concentrates the majority of new population and employment growth in the region in locally-designated

⁷⁶ Greenblatt J.B. and Long J., 2012, *California's Energy Future – Portraits of Energy Systems for Meeting Greenhouse Gas Reduction Requirements*, California Council on Science and Technology, <http://ccst.us/publications/2012/2012ghg.pdf>, accessed on May 10, 2016.

⁷⁷ Morrison, Geoff M., Sonia Yeh, Anthony R. Eggert, Christopher Yang, James H. Nelson, 3 Alphabetic: Jeffery B. Greenblatt, Raphael Isaac, Mark Z. Jacobson, Josiah Johnston, Daniel M. Kammen, Ana Mileva, Jack Moore, David Roland-Holst, Max Wei, John P. Weyant, James H. Williams, Ray Williams, Christina B. Zapata. *Long-term Energy Planning In California: Insights and Future Modeling Needs*. UC-Davis Institute of Transportation Studies. Research Report – UCD-ITS-RR-14-08, http://www.its.ucdavis.edu/research/publications/publication-detail/?pub_id=2217, accessed on May 10, 2016.

⁷⁸ Energy+Environmental Economics, 2015, *Summary of the California State Agency's PATHWAYS Project: Long-term Greenhouse Gas Reduction Scenarios*, http://www.energy.ca.gov/commission/fact_sheets/documents/E3_Project_Overview_20150130.pdf, accessed on May 10, 2016,.

⁷⁹ California Council on Science and Technology, 2011, *California's Energy Future – The View to 2050*, <http://www.ccst.us/publications/2011/2011energy.pdf>, accessed on May 10, 2016.

⁸⁰ Association of Bay Area Governments, and Metropolitan Transportation Commission, 2015, *Plan Bay Area 2040, The Plan: The Context*, <http://planbayarea.org/the-plan/the-context.html>, accessed on May 10, 2016.

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PDA. PDAs are transit-oriented, infill development opportunity areas within existing communities. In San Leandro, *Plan Bay Area* includes two PDAs and a Potential PDA:⁸¹

- Downtown Transit Oriented Development (City Center) PDA
- East 14th Street Mixed Use Corridor PDA
- Bay Fair BART Transit Village (Transit Town Center) Potential PDA

The proposed project would encourage development consistent with the goals and objectives for these PDAs. The proposed project also includes policies that, once adopted, would reduce GHG emissions from transportation sources to the maximum extent practicable. In addition to the land use policies identified above (i.e., Policy LU-3.1, Policy LU-3.4, Policy LU-3.5, Policy, LU-3.9, and Policy LU-6.5), these transportation policies include:

- **Policy T-1.10: Reduced Trip Generation.** Encourage local employers to develop programs that promote ridesharing, flextime and telecommuting, bicycle use, and other modes of transportation that reduce the number and distance of vehicle trips generated.
- **Policy T-2.1: Complete Streets Serving All Users and Modes.** Create and maintain "complete" streets that provide safe, comfortable, and convenient travel through a comprehensive, integrated transportation network that serves all users.
- **Policy T-2.8: Car-Sharing and Bike-Sharing.** Encourage car-sharing, bike-sharing and other programs that reduce the need for individual car ownership. Such programs should be focused in the Downtown area and near the city's two BART stations.
- **Policy T-3.1: Citywide Bikeway System.** Develop and maintain a bikeway system that meets the needs of both utilitarian and recreational users, reduces vehicle trips, and connects residential neighborhoods to employment and shopping areas, BART stations, schools, recreational facilities and other destinations throughout San Leandro and nearby communities.
- **Policy T-3.3: Designing for Multiple User Groups.** Recognize the dual needs of experienced cyclists relying on bicycles for commute trips and daily travel and less experienced cyclists using bicycles principally for recreation. Where needed, develop facilities designed to serve each user group, with recreational routes primarily using low-volume streets and off street bike paths.
- **Policy T-3.5: Accommodation of Bicycles and Pedestrians.** Require new development to incorporate design features that make walking, bicycling, and other forms of non-motorized transportation more convenient and attractive. Facilities for bicycles and pedestrians, including secured bicycle parking, clearly marked crosswalks, well-lit streets and sidewalks, landscaping, and street furniture should be provided within new employment areas, shopping destinations, multi-modal transportation facilities, and community facilities.
- **Policy T-3.6: Pedestrian Environment.** Improve the walkability of all streets in San Leandro through the planning, implementing, and maintaining of pedestrian supportive infrastructure.
- **Policy T-3.7: Removing Barriers to Active Transportation.** Reduce barriers to walking and other forms of active transportation such as incomplete or uneven sidewalks, lack of wheelchair ramps and curb

⁸¹ Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG), 2013. Priority Development Area Showcase. <http://gis.abag.ca.gov/website/PDAShowcase/>, accessed on February 2016.

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cuts, sidewalk obstructions including cars parked on sidewalks, trail gaps, wide intersections, and poor sidewalk connections to transit stops.

- **Policy T-3.8: Education on Walking and Biking Benefits.** Raise awareness of the benefits of walking and biking, such as reduced noise, energy consumption, congestion and parking demand; improved air quality; and opportunities for exercise and a healthy lifestyle.
- **Policy T-4.1: Coordination with Service Providers.** Work collaboratively with AC Transit and BART to ensure that public transit service remains safe, reliable, and affordable, and to improve service frequency and coverage within San Leandro neighborhoods and employment centers.
- **Policy T-4.2: Integration of Schedules.** Support efforts by BART and AC Transit to integrate their schedules to reduce the loss of time associated with intermodal connections.
- **Policy T-4.3: Shuttle Buses.** Continue existing shuttle services and ensure they remain as a viable alternative to driving. Shuttles should connect the City's BART stations with major employment centers, residential areas, schools, shopping, health and other activity centers.
- **Policy T-4.4: Coordination of Shuttle Services.** Promote the consolidation of private shuttle services to provide more efficient and comprehensive service between the City's employment centers and major public transit facilities, and to make the expansion of such service more viable. Where shuttle service is provided, it should supplement rather than compete with conventional public transit service.
- **Policy T-4.5: Passenger Amenities.** Encourage amenities, such as shelters, lighting, and real-time information on bus arrivals and departures to increase rider safety, comfort and convenience.
- **Policy T-4.6: Barrier Free Transit.** Work with local public transit providers and social service agencies to eliminate barriers to personal mobility and more completely meet the transportation needs of persons with disabilities.
- **Policy T-4.8: Legislation and Pricing Strategies.** Support legislation and pricing strategies which make public transit more economical and affordable than driving.
- **Policy T-4.9: BART Station Provisions for Bicycles and Pedestrians.** Ensure that all BART stations and major bus routes are served by the bicycle and pedestrian systems. Bicycle and pedestrian connections between the Downtown San Leandro and Bay Fair BART stations and the surrounding neighborhoods, business districts, and community institutions should be improved, with special attention to the at-grade railroad crossings and connections through the parking lots.
- **Policy T-5.2: Evaluating Development Impacts.** Use vehicle miles traveled (VMT) as the primary metric for evaluating the transportation impacts of new development proposals. Traffic impact studies may also consider the total number of trips generated and the resulting impact on traffic volumes and congestion (e.g., "Level of Service"), but VMT shall provide the primary basis for determining appropriate mitigation measures.
- **Policy T-5.7: Technology and Roadway Efficiency.** Use technology, including smart phone applications, roadway sensors, and real time data on congestion, travel time, and parking supply to create a more efficient transportation system, and to maximize the benefits of the existing road system before investing in its expansion.
- **Policy T-5.8: Electric and Low Emission Vehicles.** Plan for a substantial increase in the number of electric vehicles and other low-emission or zero-emission vehicles on city streets. This should include

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the development of electric vehicle charging stations at the BART stations, in large parking structures and parking lots, at City facilities (including City parking facilities), in high-employment workplaces, and at other destinations around the city.

- **Policy T-5.9: Autonomous (Driverless) Vehicles.** Monitor the development of autonomous vehicle technology, and actively take part in regional discussions regarding the potential effects of these vehicles on local and regional traffic flow.
- **Policy T-6.1: Traffic Calming Strategies.** Use a variety of approaches to slow down or “calm” traffic on San Leandro streets, based on the specific conditions on each street. Emphasize approaches that improve conditions for pedestrians and bicyclists and enhance neighborhood aesthetics.
- **Policy T-6.5: Truck Routes.** Designate appropriate San Leandro streets as truck routes so that industrial traffic is channeled away from residential areas. The selection of truck routes should consider neighborhood impacts, freeway access, truck parking needs, turning radii requirements, and the locations of businesses generating the largest volumes of truck traffic.

These strategies, which encourage use of alternative modes of transportation, would strengthen support for future development within San Leandro’s PDAs, consistent with the objectives of *Plan Bay Area*. Therefore, the proposed project would be consistent with the land use concept plan for San Leandro that is identified in *Plan Bay Area*.

San Leandro Climate Action Plan

In 2009 the City of San Leandro developed the *Climate Action Plan (CAP): A Vision of a Sustainable San Leandro* and adopted the municipal measures (i.e., local government actions) within the CAP.⁸² A consistency analysis with the CAP GHG emissions reduction measures and actions for reducing GHG emissions from buildings (commercial/industrial, and residential), transportation and land use, solid waste disposal, and municipal operations is shown in Table 4.6-8. As identified in this table, although the communitywide (i.e., non-government) actions were not formally adopted at the time the CAP was developed, the policies and actions in the proposed Plan would be consistent with the measures in the CAP.

Conclusion

As identified above, the proposed project would be consistent with the regional objectives of the *Plan Bay Area* and the City’s CAP. The policies and programs in the proposed project would ensure substantial progress toward the long-term GHG reductions goals for 2050. However, CARB has not yet drafted a plan to achieve the statewide GHG emissions goals established in Executive Order S-03-05. In addition to the local measures included in the proposed project, additional state and federal measures are necessary to achieve the more aggressive targets established for 2050 in Executive Order S-03-05. Therefore, GHG impacts are considered to be *significant*, requiring mitigation.

Significance before Mitigation: Significant.

⁸² City of San Leandro, 2009, *Climate Action Plan: A Vision for a Sustainable San Leandro*. Prepared by KEMA.

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TABLE 4.6-8 SAN LEANDRO COMMUNITY CLIMATE CHANGE ACTION PLAN GOALS AND ACTIONS

Goal	Actions	Consistency Analysis
Building and Energy Use		
Improve energy efficiency and reduce costs of energy upgrades for existing residential properties	Establish a standard for energy improvements in existing residential properties.	Consistent. The proposed Plan includes several policies that would encourage existing homeowners to implement energy upgrades. Policy OSC-8.3 directs the City to promote weatherization and energy retrofitting of existing homes through installation of solar hot water heaters, solar space heating, and energy-efficient lighting, fixtures, and appliances. Policy OSC-8.5 identifies that the City would promote these types of energy conservation and retrofit programs by providing public information and education. Policy OSC-7.8 also directs the City to promote green building practices in new construction and remodels.
	Adopt a third-party or municipal financing program for residential energy efficiency projects.	
	Develop a revolving loan fund for home performance audits.	
	Collaborate with grass roots organizations such as the CA Youth Energy Services (CYES).	
	Initiate a “Turn off your electronics” campaign.	
	Offer home performance classes by building staff.	
Improve energy efficiency and reduce costs of energy upgrades for existing commercial and industrial properties	Establish a standard for energy improvements in existing commercial and industrial properties.	Consistent. The proposed Plan includes several policies that would encourage existing business owners to implement energy upgrades. Policy OSC-8.3 directs the City to promote weatherization and energy retrofitting of existing businesses through installation of solar hot water heaters, solar space heating, and energy-efficient lighting, fixtures and appliances. Policy OSC-8.5 identifies that the City would promote these types of energy conservation and retrofit programs by providing public information and education. Policy OSC-7.8 also directs the City to promote green building practices in new construction and remodels.
	Require “beyond compliance” as a condition for approving new construction.	
	Leverage existing energy efficiency incentive programs for non-residential utility customers.	
	Promote use of Green Leases Toolkit.	
	Provide incentives for businesses that achieve “green business” accreditation with organizations such as the Bay Area Green Business Program.	
	Include and promote additional literature on energy efficiency at the City permit center and planning services website.	
Increase residential, commercial, and industrial renewable energy use	Establish a third-party or municipal financing program for solar (PV and solar hot water) and other renewable technology projects.	Consistent. Policy OSC-8.4 accommodates the use of local alternative energy resources, such as solar power, wind, methane gas, and industrial waste heat (cogeneration). Policy OSC-8.1 establishes direction for the City to strongly advocate for increased energy conservation by San Leandro residents and businesses, and ensure that the City itself is a conservation role model. In addition, the proposed Plan includes actions to continue to implement State codes protecting solar access and future viability of solar energy systems (Action OSC-8.4.C) and development of design guidelines for wind turbines (Action OSC-8.4.B).
	Marketing campaign for solar financing, tax and rebate opportunities to San Leandro residents.	
	Increase the number of solar facilities on low income housing.	

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TABLE 4.6-8 SAN LEANDRO COMMUNITY CLIMATE CHANGE ACTION PLAN GOALS AND ACTIONS

Goal	Actions	Consistency Analysis
Promote green building practices in both the new construction and remodel market	Establish mandatory green building ordinance for private new construction.	Consistent. Policy OSC-7.8 directs the City to promote green building practices in new construction and remodels. Policy OSC-8.5 identifies that the City would promote these types of energy conservation and retrofit programs by providing public information and education.
	Identify and promote funding sources and other incentives to subsidize green buildings.	
	Encourage voluntary compliance with green building standards for existing buildings, including LEED for Existing Buildings Operations and Management ¹⁴ for the commercial/industrial sector as well as GreenPoint Rated for Existing Homes for the residential sector.	
	Educate community members and local contractors on green building practices.	
Transportation and Land Use		
Encourage development which promotes walkable communities	Continue to support the implementation of the Downtown Transit Oriented Development (TOD) Strategy.	Consistent. Policy T-1.4 ensures that properties adjacent to the City’s BART stations and along heavily used public transit routes are developed in a way that maximizes the potential for transit use and reduces dependence on motorized vehicles. Such development should be of particularly high quality, include open space and other amenities, and respect the scale and character of nearby neighborhoods. Policy T-1.7 requires the City to implement variable parking standards that reflect such factors as proximity to transit, type of occupancy (seniors, etc.), number of bedrooms (for housing), and the expected level of parking demand. Additionally, Policy T-1.8 promotes the concept of parking areas which are “shared” by multiple uses with different peak demand periods as a means of reducing the total amount of parking which must be provided.
	Develop design standards for parking lots and encourage placement to the rear of businesses.	
	Allow reduced parking requirements where specific conditions are met.	
Ensure that public transportation is safe, convenient and affordable and provides a viable alternative to driving	Establish a Transportation Management Association (TMA).	Consistent. The proposed Plan includes policies to reduce vehicle trips and increase mobility choices. Policy T-1.3 requires developers to implement measures such as transportation demand management (TDM) and street improvements if a project will impact the City’s transportation system. Policy T-1.10 encourages local employers to develop programs that promote ride sharing, flextime and telecommuting, bicycle use, and other modes of transportation to reduce vehicle trips. Several policies direct the city to improve the transit system (Policies T-4.1 through T-4.9).
	Promote pre-tax commuter checks for community and City employees.	
	Implement programs to increase transit ridership.	
	Implement projects to increase safety and comfort for bus riders.	
	Improve bus service routes.	
	Explore innovative transit improvement projects.	

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TABLE 4.6-8 SAN LEANDRO COMMUNITY CLIMATE CHANGE ACTION PLAN GOALS AND ACTIONS

Goal	Actions	Consistency Analysis
Promote and accommodate alternative, environmentally friendly methods of transportation, such as walking and bicycling	Improve bike routes for safety.	Consistent. The proposed Plan includes several policies to expand the City’s pedestrian and bicycle infrastructure (Policies T-3.1 through T-3.8). Policy T-3.1 directs the City to develop and maintain a bikeway system that meets the needs of both utilitarian and recreational users, reduces vehicle trips, and connects residential neighborhoods to employment and shopping areas, BART stations, schools, recreational facilities, and other destinations throughout San Leandro and nearby communities. Policy T-3.5 requires new development project to incorporate design features and facilities for walking and biking.
	Continue to update and implement the Bicycle and Pedestrian Master Plan.	
	Improve crossings for pedestrians and cyclists at intersections in the City.	
	Expand the Safe Routes to Schools program.	
	Implement the East Bay Greenway Concept Plan.	
	Provide incentives to city employees who carpool, bike or take public transit to work.	
Enhance and expand car sharing and ridesharing programs	Provide further incentives for car sharing.	Consistent. Policy T-2.8 encourages car sharing and bike sharing in the City to reduce the need for individual car ownership. Policy T-5.7 identifies use of technology, including smart phone applications, to create a more efficient use of the transportation system.
	Work with car share companies to locate sites in San Leandro.	
	Support education and outreach regarding car sharing.	
	Ride share information webpage.	
Encourage the use of fuel efficient vehicles, low carbon fuels and more efficient traffic operations	Make existing traffic flow more efficiently to reduce the amount of time people spend idling in city traffic.	Consistent. As identified previously, the Transportation Element contains several policies that would improve the efficiency of the transportation network by improving the land-use transportation connection, reducing trips, and expanding mode choices. Additionally, the City supports use of fuel-efficient and alternative fueled vehicles. Policy T-5.8 directs the City to substantially increase the number of electric vehicles through development of electric vehicle charging stations at the BART stations, in large parking structures and parking lots, in high-employment workplaces, and at other destinations around the City.
	Provide preferred and designated parking for more fuel efficient vehicles, such as zero emissions vehicles and hybrid vehicles.	
	Continue working towards implementing plug-in stations at various locations throughout the City.	
	Provide incentives in City parking and transportation demand management policies for developers and business owners that provide charging stations for plug-in electric vehicles.	
	Install plug-in stations at the Water Pollution Control Plant.	
Increase and enhance urban green space	Increase urban forest canopy.	Consistent. Policy OSC-2.7 identifies that the City would support the development of additional community gardens in the City. Policy OSC-7.10 directs the City to enhance the quality of the urban environment, including streets, parks, and yards, in order to absorb carbon emissions and reduce GHG emissions. Policy OSC-8.2 also encourages construction, landscaping, and site planning practices that minimize heating and cooling costs.
	Adopt an Urban Agriculture Ordinance.	
	Provide education and outreach regarding benefits and best practices of growing food in San Leandro.	
	Allow multi-unit residential projects to provide street-level public open space in lieu of some required on-site private open space.	

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TABLE 4.6-8 SAN LEANDRO COMMUNITY CLIMATE CHANGE ACTION PLAN GOALS AND ACTIONS

Goal	Actions	Consistency Analysis
Waste Reduction and Recycling		
Increase recycling and composting in the residential sector	Increase residential participation in curbside recycling and composting programs.	Consistent. The proposed Plan includes policies to reduce waste from both the residential and commercial sectors. Policy OSC-7.1 requires the City to actively promote recycling, composting, and other programs that reduce the amount of solid waste requiring disposal in landfills. Policy OSC-7.5 ensures that City follows conservation practices, such as encouraging the use of reusable and recyclable goods in its purchasing policies and practices.
	Partner with StopWaste.Org to promote home composting programs.	
	Promote programs for recycling electronic waste or “E-waste.”	
Increase recycling and composting in the commercial sector	Consider a mandatory curbside recycling and composting programs.	Consistent. The proposed Plan includes policies to reduce waste from both the residential and commercial sectors (Policies OSC-7.1 and OCS-7-5). Furthermore, Assembly Bill 341 (AB 341) requires mandatory commercial recycling for businesses that generate 4 cubic yards or more of commercial solid waste per week or multi-family residential complexes of five or more units. Policy OSC-7.6 also directs the City to reduce GHG emissions associated solid waste disposal through recycling and composting operations.
	Continue working with StopWaste.Org to promote programs that help local businesses recycle, reduce waste and buy products made of recycled materials.	
	Work with restaurants to manage food waste.	
	Limit industrial waste.	
Promote waste reduction and material re-use in the community	Promote reusable transport packaging in the commercial industrial sector.	Consistent. As described previously, the proposed Plan includes policies to reduce waste from both the residential and commercial sectors (Policies OSC-7.1 and OCS-7-5).
	Promote re-use of materials in the community.	
	Support programs for locally produced compost.	
	Reduce plastic/paper waste associated with shopping bags.	
	Adopt a styrofoam ban and introduce bio-degradable containers to food related businesses.	

Source: San Leandro, City of. 2009, December 21. Climate Action Plan: A Vision for a Sustainable San Leandro. Prepared by KEMA.

Impact GHG-2: While the proposed Plan supports progress toward the long term-goals identified in Executive Order B-30-15 and Executive Order S-03-05, it cannot yet be demonstrated that San Leandro will achieve GHG emissions reductions that are consistent with an 80 percent reduction below 1990 levels by the year 2050 based on existing technologies and currently adopted policies and programs.

Mitigation Measure GHG-2: No mitigation measures are currently available to address post-2030 GHG reductions beyond continued implementation of existing and proposed policies and programs. The proposed Plan and the Climate Action Plan (CAP) include measures to align the City with the GHG reductions of AB 32 and Executive Order B-30-15. However, additional State and federal actions are necessary to ensure that State and federally regulated sources (i.e., sources outside the City’s jurisdictional control) take similar aggressive measures to ensure the deep cuts needed to achieve the 2050 target.

Significance after Mitigation: Significant and unavoidable. The City has a CAP to achieve the GHG reduction goals of AB 32 for year 2020. At this time there are no post-2020 federal and state

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measures that would assist the City in achieving the efficiency target at the proposed project year. Therefore, Impact GHG-2 would remain significant and unavoidable.

Proposed Zoning Code Amendments

The proposed amendments to the Zoning Code would bring the Zoning Code into conformance with the proposed General Plan. The proposed Zoning Code would implement the proposed Plan and would help to guide development in key areas of the city. Proposed Zoning Code amendments that would allow increased growth include increased building density, intensity (FAR), and height limits in commercial districts. The potential increase in growth as a result of these Zoning Code amendments is captured in the buildout of the proposed Plan that is analyzed above. As described above, while the proposed Plan supports progress toward meeting long-term GHG reduction goals, it cannot yet be demonstrated that San Leandro will achieve GHG emissions reductions that are consistent with an 80 percent reduction below 1990 levels by the year 2050 based on existing technologies and currently adopted policies and programs. However, the Zoning Code amendments in and of themselves would not create or exacerbate this impact. Therefore, the proposed Zoning Code amendments would not contribute significantly to Impact GHG-2 and impacts from the proposed Zoning Code amendments would be *less than significant*.

Significance before Mitigation: Less than significant.

4.6.4 CUMULATIVE IMPACTS

As described above, GHG emissions related to the proposed project are not confined to a particular air basin but are dispersed worldwide. Therefore, the appropriate setting for the analysis of cumulative GHG emissions extends far beyond the boundaries of the Study Area. As explained in Section 4.6.3, above, the analysis of impacts in Section 4.6.3, Impact Discussion, above, also addresses cumulative impacts because it includes transportation sources from the larger region, as reflected in the traffic model. While the policies of the proposed General Plan ensure substantial progress toward the long term-goals of Executive Order S-03-05, GHG impacts for consistency with the more aggressive 2050 targets are conservatively considered to be cumulatively considerable and therefore potentially *significant*. This is the same impact identified above as GHG-2.

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