5.4 GREENHOUSE GAS EMISSIONS

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for the Lincoln Avenue Specific Plan (proposed project) to cumulatively contribute to greenhouse gas (GHG) emissions. Because individually no single project is large enough 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 chapter evaluates consistency of the proposed project with the strategies outlined in the California Air Resources Board's (CARB) Scoping Plan in accordance with the GHG reduction goals of Assembly Bill 32 (AB 32), and strategies proposed by the Southern California Association of Governments (SCAG) to reduce vehicle miles traveled (VMT) in the region, in accordance with Senate Bill 375 (SB 375). This chapter also considers policies and mitigation suggested by the California Attorney General and the California Air Pollution Control Officer's Association (CAPCOA) to reduce GHG emissions. GHG modeling is included in Appendix C of this DEIR.

5.4.1 Environmental Setting

Greenhouse Gases and Climate Change

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHG, to the atmosphere. Climate change is the variation of Earth's climate over time, whether due to natural variability or as a result of human activities. The primary source of these GHGs is fossil fuel use. The Intergovernmental Panel on Climate Change (IPCC) has identified four major GHGs—water vapor,[1] carbon (CO_2), methane (CH_4), and ozone (O_3)—that are the likely cause of an increase in global average temperatures observed during the 20th and 21st centuries. Other GHGs identified by the IPCC that contribute to global warming to a lesser extent include nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons (IPCC 2001). The major GHGs are briefly described below. Table 5.4-1 lists the GHGs applicable to the proposed project and their relative global warming potentials (GWP) compared to CO_2.

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

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

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

[1] Water vapor (H_2O) is the strongest GHG and the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant.

Table 5.4-1
Greenhouse Gases and Their Relative Global Warming Potential Compared to CO_2

GHG	Atmospheric Lifetime (years)	Global Warming Potential Relative to CO_2[1]
Carbon Dioxide (CO_2)	50 to 200	1
Methane (CH_4)[2]	12 (±3)	21
Nitrous Oxide (N_2O)	120	310
Hydrofluorocarbons:		
HFC-23	264	11,700
HFC-32	5.6	650
HFC-125	32.6	2,800
HFC-134a	14.6	1,300
HFC-143a	48.3	3,800
HFC-152a	1.5	140
HFC-227ea	36.5	2,900
HFC-236fa	209	6,300
HFC-4310mee	17.1	1,300
Perfluoromethane: CF_4	50,000	6,500
Perfluoroethane: C_2F_6	10,000	9,200
Perfluorobutane: C_4F_{10}	2,600	7,000
Perfluoro-2-methylpentane: C_6F_{14}	3,200	7,400
Sulfur Hexafluoride (SF_6)	3,200	23,900

Source: USEPA 2008, IPCC 2001.
[1] Based on 100-Year Time Horizon of the Global Warming Potential (GWP) of the air pollutant relative to CO_2.
[2] The methane GWP includes the direct effects and those indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

Fluorinated gases are synthetic, strong GHGs 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 GHGs, they are sometimes referred to as High GWP gases.

- *Chlorofluorocarbons (CFCs)* are GHGs 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 (troposphere, stratosphere), CFCs drift into the upper atmosphere where, given suitable conditions, they break down ozone. These gases are also ozone-depleting gases and are therefore being replaced by other compounds that are GHGs covered under the Kyoto Protocol.

- *Perfluorocarbons (PFCs)* are a group of human-made chemicals composed of carbon and fluorine only. These chemicals (predominantly perfluoromethane [CF_4] and perfluoroethane [C_2F_6]) were introduced as alternatives, along with HFCs, to the ozone-depleting substances. In addition, PFCs are emitted as by-products of industrial processes and are also used in manufacturing. PFCs do not harm the stratospheric ozone layer, but they have a high global warming potential.

- *Sulfur Hexafluoride (SF_6)* is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF_6 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 ozone-depleting substances, they are less potent at destroying stratospheric ozone than CFCs. They have been introduced as temporary replacements for CFCs and are also GHGs.

- *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. HFCs 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 GHGs (USEPA 2008a).

California's GHG Sources and Relative Contribution

California is the second largest emitter of GHG in the United States, only surpassed by Texas, and the tenth largest GHG emitter in the world. However, because of more stringent air emission regulations, in 2001 California ranked fourth lowest in carbon emissions per capita and fifth lowest among states in CO_2 emissions from fossil fuel consumption per unit of gross state product (total economic output of goods and services) (CEC 2006).

CARB's latest update to the statewide GHG emissions inventory was conducted in 2012 for year 2009 emissions.[2] In 2009, California produced 457 MMTons of CO_2-equivalent (CO_2e) GHG emissions.[3] 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 sources of GHG emissions include commercial and residential, recycling and waste, high global warming potential GHGs, agriculture, and forestry (CARB 2012).

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 are attributable to human activities. The amount of CO_2 has increased by more than 35 percent since preindustrial times and has increased at an average rate of 1.4 parts per million (ppm) per year since 1960, mainly due to combustion of fossil fuels and deforestation (IPCC 2007). These recent changes in climate change pollutants far exceed the extremes of the ice ages, and the global mean temperature is warming at a rate that cannot be explained by natural causes alone. Human activities are directly altering the chemical composition of the atmosphere through the buildup of climate change pollutants (CAT 2006).

Climate-change scenarios are affected by varying degrees of uncertainty. IPCC's 2007 Fourth Assessment Report projects that the global mean temperature increase from 1990 to 2100, under different climate-change scenarios, will range from 1.4 to 5.8°C (2.5 to 10.4°F). In the past, gradual changes in the earth's temperature changed the distribution of species, availability of water, etc. However, human activities are accelerating this process so that environmental impacts associated with climate change no longer occur in a geologic time frame but within a human lifetime (CAT 2006).

Potential Climate Change Impacts for California

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. 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

[2] Methodology for determining the statewide GHG inventory is not the same as the methodology used to determine statewide GHG emissions under AB 32.
[3] CO_2-equivalence is used to show the relative potential that different GHGs 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.

amount of spring snow accumulation in the lower and middle elevation mountain zones, 4) an advance 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 (CAT 2006). According to the California Climate Action Team (CAT), even if actions could be taken to immediately curtail climate change emissions, the potency of emissions that have already built up, their long atmospheric lifetimes (see Table 5.4-1), and the inertia of the Earth's climate system could produce as much as 0.6°C (1.1°F) of additional warming. Consequently, some impacts from climate change are now considered unavoidable. Global climate change risks are shown in Table 5.4-2 and include public health impacts, water resources impacts, agricultural impacts, coastal sea level impacts, forest and biological resource impacts, and electricity impacts. Specific climate change impacts that could affect the proposed project include health impacts from a reduction in air quality, water resources impacts from a reduction in water supply, and increased energy demand.

Table 5.4-2
Summary of Global Climate Change 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 • Shrinking beaches • Worsened impacts on infrastructure
Forest and Biological Resource Impacts	• Increasing risk and severity of wildfires • Lengthening of the wildfire season • Movement of forest areas • Conversion of forest to grassland • Increasing threats from pest and pathogens • Declining forest productivity • Shifting vegetation and species distribution • Altered timing of migration and mating habits • Loss of sensitive or slow-moving species
Electricity	• Potential reduction in hydropower • Increased energy demand

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

Regulatory Setting

Regulation of GHG Emissions on a National Level

The U.S. Environmental Protection Agency (EPA) announced on December 7, 2009, that GHG emissions threaten the public health and welfare of the American people and that GHG emissions from on-road vehicles contribute to that threat. The EPA's final findings respond to the 2007 U.S. Supreme Court decision that GHG emissions fit within the Clean Air Act definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements, but allow 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 (EPA 2009).

The EPA's endangerment finding covers emissions of six key GHGs—CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and SF_6—that have been the subject of scrutiny and intense analysis for decades by scientists in the United States and around the world (the first three are applicable to the proposed project).

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

Regulation of GHG Emissions on a State Level

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in AB 32, the Global Warming Solutions Act, and Executive Order S-03-05. 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, signed June 1, 2005. Executive Order S-03-05 set the following GHG reduction targets for the state:

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

AB 32 directed CARB to adopt discrete early action measures to reduce GHG emissions and outline additional reduction measures to meet the 2020 target. Based on the GHG emissions inventory conducted for the Scoping Plan by CARB, GHG emissions in California by 2020 are anticipated to be approximately 596 million metric tons (MMTons). In December 2007, CARB approved a 2020 emissions limit of 427 MMTons (471 million tons) for the state. The 2020 target requires a total emissions reduction of 169 MMTons, 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 MMTons) (CARB 2008).[4]

Since release of the 2008 Scoping Plan, CARB has updated the statewide GHG emissions inventory to reflect GHG emissions in light of the economic downturn and measures not previously considered in the 2008 Scoping Plan baseline inventory. The updated forecast predicts emissions to be 507 MMTons by 2020. The new inventory identifies that an estimated 80 MMTons of reductions are necessary to achieve the statewide emissions reduction of AB 32 by 2020, 15.7 percent of the projected emissions compared to BAU in year 2020 (i.e., 15.7 percent of 507 MMTons) (CARB 2012).

[4] 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 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.

GREENHOUSE GAS EMISSIONS

In order to effectively implement the emissions cap, AB 32 directed CARB to establish a mandatory reporting system to track and monitor GHG emissions levels for large stationary sources that generate more than 25,000 MTons per year, prepare a plan demonstrating how the 2020 deadline can be met, and develop appropriate regulations and programs to implement the plan by 2012. The Climate Action Registry Reporting Online Tool was established through the Climate Action Registry to track GHG emissions. Key elements of CARB's GHG reduction plan include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a mix of 33 percent for energy generation from renewable sources;
- Developing 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;
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (LCFS);[5]
- Creating target fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

Table 5.4-3 shows the proposed reductions from regulations and programs outlined in the Scoping Plan. While local government operations were not accounted for in achieving the 2020 emissions reduction, CARB estimates that land use changes implemented by local governments that integrate jobs, housing, and services result in a reduction of 5 MMTons, which is approximately 3 percent of the 2020 GHG emissions reduction goal. In recognition of the critical role local governments play in the successful implementation of AB 32, CARB is recommending GHG reduction goals of 15 percent of today's levels by 2020 to ensure that municipal and community-wide emissions match the state's reduction target. 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 (CARB 2008).

[5] On December 29, 2011, the U.S. District Court for the Eastern District of California issued several rulings in the federal lawsuits challenging the LCFS. One of the court's rulings preliminarily enjoins the CARB from enforcing the regulation during the pendency of the litigation.

Table 5.4-3
Scoping Plan Greenhouse Gas Reduction Measures and Reductions toward 2020 Target

Recommended Reduction Measures	Reductions Counted toward 2020 Target of 169 MMT CO_{2e}	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[1]	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%
Total Cap and Trade Program Reductions	146.7	87%
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%
Total Uncapped Sources/Sectors Reductions	27.3	16%
Total Reductions Counted toward 2020 Target	174	100%
Other Recommended Measures – Not Counted toward 2020 Target		
State Government Operations	1.0 to 2.0	1%
Local Government Operations	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%
Total Other Recommended Measures – Not Counted toward 2020 Target	42.8	NA

Source: CARB 2008.
Notes: The percentages in the right-hand column add up to more than 100 percent because the emissions reduction goal is 169 MMTons and the Scoping Plan identifies 174 MMTons of emissions reductions strategies.
$MMTCO_{2e}$: million metric tons of CO_{2e}
[1] Reductions represent an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target.
[2] 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 CO_{2e} (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.

Energy Conservation Standards

Energy conservation standards for new residential and nonresidential buildings were adopted by the California Energy Resources Conservation and Development Commission in June 1977 and most recently revised in 2008 (Title 24, Part 6, of the California Code of Regulations [CCR]). Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods. On May 31, 2012, the CEC adopted the 2013 Building and Energy Efficiency Standards, which go into effect on January 1, 2014. Buildings that are constructed in accordance with the 2013 Building and Energy Efficiency Standards are 25 percent (residential) to 30 percent (non-residential) more energy efficient than the 2008 Standards as a

result of better windows, insulation, lighting, ventilation systems, and other features that reduce energy consumption in home and businesses.

The 2006 Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608) were adopted by the California Energy Commission 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. While these regulations are now often viewed as "business-as-usual," they exceed the standards imposed by all other states and they reduce GHG emissions by reducing energy demand.

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (proposed Part 11, Title 24) was adopted as part of the California Building Standards Code (Title 24, California Code of Regulations). The green building standards that became mandatory in the 2010 edition of the code established voluntary standards on planning and design for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants. The mandatory provisions of the California Green Building Code Standards became effective January 1, 2011.

Renewable Power Requirements

A major component of California's Renewable Energy Program is the renewable portfolio standard (RPS), established under Senate Bills 1078 (Sher) and 107 (Simitian). Under the RPS, certain retail sellers of electricity were required to increase the amount of renewable energy each year by at least 1 percent in order to reach at least 20 percent by December 30, 2010. CARB has now approved an even higher goal of 33 percent by 2020. 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.

Vehicle Emission Standards/Improved Fuel Economy

Vehicle GHG emission standards were enacted under AB 1493 (Pavley I) and the LCFS. Pavley I is a clean-car standard that reduces GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016 and is anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. 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.

Regulation of GHG Emissions on a Regional Level

In 2008, SB 375 was adopted and was intended to represent the implementation mechanism necessary to achieve the GHG emissions reductions targets established in the Scoping Plan for the transportation sector as it relates to local land use decisions that affect travel behavior. Implementation is intended 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 with local land use planning to reduce vehicle miles traveled and vehicle trips. Specifically, SB 375 requires CARB to establish GHG emissions reduction targets for each of the 17 regions in California managed by a metropolitan planning organization (MPO). Pursuant to the recommendations of the Regional Transportation Advisory Committee, CARB adopted per capita reduction targets for each of the MPOs rather than a total magnitude reduction target. SCAG is the MPO for the southern California region, which includes the counties of Los Angeles, Orange, San Bernardino County, Riverside, Ventura, and Imperial. SCAG's targets are an 8 percent per capita reduction from 2005 GHG emission levels by 2020 and a 13 percent per capita reduction from 2005 GHG emission levels by 2035.

The 2020 targets are smaller than the 2035 targets because a significant portion of the built environment in 2020 has been defined by decisions that have already been made. In general, the 2020 scenarios reflect that more time is needed for large land use and transportation infrastructure changes. Most of the reductions in the interim are anticipated to come from improving the efficiency of the region's existing transportation network. The proposed targets would result in 3 MMTons of GHG reductions by 2020 and 15 MMTons of GHG reductions by 2035. Based on these reductions, the passenger vehicle target in CARB's Scoping Plan (for AB 32) would be met (CARB 2010).

SB 375 requires the MPOs to prepare a Sustainable Communities Strategy (SCS) in their regional transportation plan. For the SCAG region, the Draft SCS was adopted April 2012 (SCAG 2012). The SCS sets forth a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce GHG emissions from transportation (excluding goods movement). The SCS is meant to provide growth strategies that will achieve the regional GHG emissions reduction targets. However, the SCS does not require that local general plans, specific plans, or zoning be consistent with the SCS, but provides incentives for consistency for governments and developers.

Existing Community-Wide GHG Emissions

An existing emissions inventory of the Lincoln Avenue Specific Plan area was conducted based on the existing land uses and is shown in Table 5.4-4. The existing GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod), Version 2011.1.1.

Table 5.4-4
Existing GHG Emissions

Source	*GHG Emissions MTons/Year*	*Percent of Inventory*
Area	158	1%
Energy	5,923	33%
Transportation	11,007	62%
Waste	323	2%
Water	356	2%
Total	17,765	100%
Service Population[1]	1,178	—
Emissions per Service Population	15.1	—

Source: CalEEmod Version 2011.1.1. Based on 2012 Emission rates for transportation sources.
[1] Service population based on 451 employees and 727 residents within the Lincoln Avenue Specific Plan boundaries.

5.4.2 Thresholds of Significance

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

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

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

South Coast Air Quality Management District

To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, SCAQMD has convened a GHG CEQA Significance Threshold Working Group (Working Group). Based on the last Working Group meeting (Meeting No. 15) held in September 2010, SCAQMD is proposing to adopt a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency:

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

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

For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, SCAQMD requires an assessment of GHG emissions. SCAQMD is proposing a screening-level threshold of 3,000 MTons annually for all land use types or the following land-use-specific thresholds: 1,400 MTons for commercial projects, 3,500 MTons for residential projects, or 3,000 MTons for mixed-use projects. This bright-line threshold is based on a review of the Governor's Office of Planning and Research database of CEQA projects. Based on their review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line thresholds identified above. Therefore, projects that do not exceed the bright-line threshold would have a nominal, and therefore, less than cumulatively considerable impact on GHG emissions.

Tier 3 If GHG emissions are less than the screening-level threshold, project-level and cumulative GHG emissions are less than significant.

Tier 4 If emissions exceed the screening threshold, a more detailed review of the project's GHG emissions is warranted.

SCAQMD is proposing to adopt an efficiency target for projects that exceed the screening threshold. The current recommended approach is per capita efficiency targets. SCAQMD is not recommending use of a percent emissions reduction target. Instead, SCAQMD proposes a 2020 efficiency target of 4.8 MTons per year per service population (MTons/year/SP) for project-level analyses and 6.6 MTons/year/SP for plan level projects (e.g., program-level projects such as general plans).[6] For the purpose of this project, SCAQMD's project-level thresholds are used because the plan-level thresholds are more applicable at a General Plan level. If projects exceed these per capita efficiency targets, GHG emissions would be considered potentially significant in the absence of mitigation measures.

5.4.3 Environmental Impacts

On December 30, 2009, the Natural Resources Agency adopted amendments to the CEQA Guidelines. These amendments became effective on March 18, 2010. The amendments to the CEQA Guidelines include new requirements to evaluate GHG emissions. Pursuant to the amended CEQA Guidelines, a lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment:

1. The extent to which the project may increase (or reduce) GHG emissions compared to the existing environmental setting;

[6] It should be noted that the Working Group also considered efficiency targets for 2035 for the first time in this Working Group meeting.

2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;

3. The extent to which the project complies with regulations or requirements adopted to implement an adopted statewide, regional, or local plan for the reduction or mitigation of GHG emissions.[7]

Life cycle emissions are not included in this analysis because not enough information is available for the proposed project, and therefore life cycle GHG emissions would be speculative.[8]

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

IMPACT 5.4-1: NEW COMMERCIAL, OFFICE, AND RESIDENTIAL LAND USES WOULD RESULT IN A SUBSTANTIAL INCREASE IN GHG EMISSIONS IN THE LINCOLN AVENUE SPECIFIC PLAN AREA. [THRESHOLD GHG-1]

Impact Analysis: As described previously, a project does not generate enough GHG emissions on its own to influence global climate change; therefore, the GHG chapter measures a project's contribution to the cumulative environmental impact. The development contemplated by the proposed project would contribute to global climate change through direct emissions of GHG from onsite area sources and vehicle trips generated by the project, and indirectly through offsite energy production required for onsite activities, water use, and waste disposal. Annual GHG emissions were calculated for construction and operation of the project. Construction emissions were amortized into the operational phase in accordance with SCAQMD's proposed methodology. The total and net increases in GHG emissions associated with the proposed project are shown in Table 5.4-5.

[7] OPR recommendations include a requirement that such a plan be adopted through a public review process and include specific requirements that reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable, notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

[8] Life cycle 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. 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.

Table 5.4-5
Annual Operational Phase GHG Emissions: Lincoln Avenue Specific Plan

Source	GHG Emissions MTons/Year: 2022		
	Existing	Lincoln Avenue Specific Plan[1]	Change
Area	158	218	61
Energy[2]	4,072	8,135	4,063
Transportation	9,363	21,436	12,074
Waste	323	772	449
Water	356	596	240
Construction-Amortized	0	369	369
Total All Sectors	14,270	31,526	17,256
Per Service Population (SP)[3]	1,178	2,457	NA
Project Efficiency (MTons/SP)	12.1	12.8	NA
Proposed SCAQMD Efficiency Metric	4.8	4.8	NA
Exceeds Efficiency Metric	NA	Yes	Yes

Source: CalEEmod Version 2011.1.1. Based on 2022 transportation emission rates.

[1] Project emissions include commitment from Pasadena Water and Power to reduce the carbon intensity of electricity by 40 percent by 2020. Includes a requirement that all new buildings will exceed the 2008 Building and Energy Efficiency Standards by 15 percent. (Note: New buildings over 25,000 square feet would achieve a 20 percent reduction and buildings over 50,000 square feet would achieve a 30 percent reduction per the Pasadena Green Building Standards Code.) Also includes reductions associated with an increased land use intensity, walkability, destination accessibility, transit accessibility, and improvement in pedestrian network on- and offsite. Includes water efficiency improvements required under the Pasadena Water Efficient Landscape Ordinance and CALGreen.

[2] Includes a correction for existing units that are not constructed to the current standards. For the purposes of this environmental analysis, existing buildings are assumed to be constructed to achieve the 2005 Building and Energy Efficiency Standards. However, it is likely that based on the existing housing stock, many of the units are even less efficient.

[3] Service population based on:
Existing – 451 employees and 727 residents within the Lincoln Avenue Specific Plan boundaries.
Future – 1,416 employees and 1,041 residents within the Lincoln Avenue Specific Plan boundaries.

As shown in this table, the net increase in GHG emissions from project-related operational activities would exceed SCAQMD's draft bright-line screening threshold. Therefore, a detailed emissions analysis of the project's efficiency compared to the draft SCAQMD GHG per capita threshold is included. The project's efficiency is determined from the total emissions divided by the project's service population, which is the number of people who live or work within the specific plan area. The service population excludes people who live outside the specific plan area but may drive to the site for goods and service (i.e., retail customers). At buildout, the project would generate approximately 31,526 MTons of GHG per year, or 12.8 MTons per service population (employees and residents). The total increase in GHG emissions onsite from the project, 17,256 MTons, would be substantial and would exceed both the proposed bright-line threshold of 3,000 MTons for all land use types and the proposed 4.8 MTons per service population efficiency metric. The greatest increase in GHG emissions is a result of the increase in office and commercial land uses within the specific plan boundaries. The increase in per capita GHG emissions within the specific plan area, despite the increase in land use intensity, is a result of the number of vehicle trips generated by customers who neither live nor work in the specific plan area. Therefore, while the project would result in an increase in diversity of land use types within the specific plan area, GHG emissions are considered to be substantial enough to result in a significant cumulative impact relative to GHG emissions. The project's cumulative contribution to GHG emissions would be significant.

IMPACT 5.4-2: THE PROPOSED PROJECT WOULD NOT CONFLICT WITH PLANS ADOPTED FOR THE PURPOSE OF REDUCING GHG EMISSIONS. [THRESHOLD GHG-2]

Impact Analysis: In accordance with AB 32, CARB developed the 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 and 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 (CARB 2008). Since release of the 2008 Scoping Plan, CARB has updated the 2020 GHG BAU forecast to reflect GHG emissions in light of the economic downturn and measures not previously considered within the 2008 Scoping Plan baseline inventory. The revised BAU 2020 forecast shows that the state would have to reduce GHG emissions by 21.6 percent from BAU without Pavley and the 33 percent RPS or 15.7 percent from the adjusted baseline (i.e., with Pavley and 33 percent RPS) (CARB 2012). The City of Pasadena has not yet adopted a GHG reduction plan that identifies local measures to achieve the City's local GHG reduction targets. However, the City of Pasadena has adopted a Green Building Standards Code (City of Pasadena Municipal Code, Chapter 14.04) to reduce building energy use and associated GHG emissions.

Pasadena Green Building Ordinance

The proposed project would include both residential and nonresidential development, all of which would be required to achieve at least a 15 percent increase in energy efficiency compared to the 2008 Building and Energy Efficiency Standards. Nonresidential development that is over 25,000 square feet would be subject to the mandatory Tier 1 CALGreen standards, and nonresidential development over 50,000 square feet would be subject to the mandatory Tier 2 CALGreen standards of Pasadena's Green Building Standards Code (City of Pasadena Municipal Code, Chapter 14.04, Green Building Standards Code, Section 14.04.504). Compliance with Pasadena's Green Building Standards Code (as amended) would result in a 15 to 30 percent increase in building (Title 24) energy efficiency compared to the 2008 Building and Energy Efficiency Standards (City of Pasadena Municipal Code, Section 14.04.540). The City also requires compliance with prerequisite and elective measures to achieve an equivalent 40 to 50 Leadership in Energy and Environmental Design (LEED) points for nonresidential projects over 25,000 square feet. The City's mandatory Green Building Ordinance's prerequisite and elective measures include:

- Designated parking requirements encompassing a minimum of 10 (Tier 1) to 12 (Tier 2) percent of parking capacity for fuel efficient vehicles.
- Roofing materials with a high solar reflectance index (i.e., cool roofs).
- Water-efficient landscaping that achieves a 50 percent reduction in landscape irrigation water use.
- Low-flow fixtures that achieve a 20 percent reduction in indoor water use.
- Construction and demolition debris diversion of 65 (Tier 1) to 80 (Tier 2) percent from landfills for recycling, reuse, or recovery.

Future development projects would incorporate these features as mandated by the City's Green Building Standards Code. No other GHG reduction plans are applicable for the proposed project. Statewide strategies to reduce GHG emissions include the LCFS, California Appliance Energy Efficiency regulations, California Building Standards (e.g., CALGreen and the 2008 Building and Energy Efficiency Standards and future cycle updates [e.g., the 2013 Building and Energy Efficiency Standards]), California RPS, changes in the corporate average fuel economy standards (e.g., Pavley I and Pavley II [Advanced Clean Cars]), and other measures that would ensure the state is on target to achieve the GHG emissions reduction goals of AB 32. Statewide GHG emissions reduction measures that are being implemented over the next eight years would assist the City in reducing the project's GHG emissions. The project would be consistent with GHG reduction policies and programs to achieve the GHG reduction targets of AB 32.

City of Pasadena Green City Action Plan

The City of Pasadena developed an Action Plan (2006) to create a more sustainable City capable of meeting growing demand and reducing impacts to natural resources. The City's Green City Action Plan goals are applicable on a City-level and include:

- Action 1: Increase the use of renewable energy to meet 10 percent of the city's peak electric load within seven years.

- Action 2: Reduce the city's peak electric load by 10 percent within seven years through energy efficiency, shifting the timing of energy demands and conservation measures.
    - Conducting a feasibility study for installing devices on municipal and private buildings that reduce the power required to operate equipment and for shifting the equipment usage to off-peak

    - Creating a "time of use" billing rate that offers lower rates for electric usage during off-peak hours than during peak hours. Other possible rates to consider include tiered energy rates.

- Action 3: Reduce greenhouse gas emissions by 25 percent by 2030, and include a system for accounting and auditing these emissions.

- Action 4: Achieve zero waste to landfills and incinerators by 2040.

- Action 5: Reduce the use of disposable, toxic, or non-renewable product category by at least 50 percent in seven years.

- Action 21: Adopt municipal wastewater management guidelines and reduce the volume of untreated wastewater discharges by 10 percent in seven years through the expanded use of recycled water and the implementation of a sustainable urban watershed planning process that includes participants of all affected communities and is based on sound economic, social, and environmental principles.

Implementation of the proposed project would not hinder the City's ability to implement the goals contained within the Green City Action Plan.

SCAG's 2012 RTP/SCS

SCAG's 2012 RTP/SCS was adopted April 4, 2012. SCAG's 2012 RTP/SCS identifies multimodal transportation investments, including bus rapid transit (BRT), light rail transit, heavy rail transit, commuter rail, high-speed rail, active transportation strategies (e.g., bike ways and sidewalks), transportation demand management (TDM) strategies, transportation systems management, highway improvements (interchange improvements, high-occupancy vehicle lanes, high-occupancy toll lanes), arterial improvements, goods movement strategies, aviation and airport ground access improvements, and operations and maintenance to the existing multimodal transportation system. SCAG's RTP/SCS identifies that land use strategies that focus new housing and job growth in areas served by high quality transit areas and other opportunities areas would be consistent with a land use development pattern that supports and complements the proposed transportation network that emphasizes system preservation, active transportation, and transportation demand management measures (SCAG 2012).

The Lincoln Avenue Specific Plan is a mixed-used project that would increase land use intensity along the Lincoln Avenue corridor. Lincoln Avenue is a high quality transit area that is adequately served by existing public transit (i.e., near Metrolink and local bus lines). Intensifying residential, office, and commercial land uses along this corridor would be consistent with the SCS. A key component in the specific plan is a "road

diet" that would reduce the number of travel lanes (one northbound and southbound travel lane) south of Washington Avenue. The road diet is a traffic-calming measure that would improve safety and increase the right-of-way available for alternative transportation users (e.g., pedestrians, bicycles, and transit users). Consequently, the project would not conflict with the 2012 RTP/SCS.

5.4.4 Cumulative Impacts

Project-related GHG emissions are not confined to a particular air basin but are dispersed worldwide. Therefore, impacts identified under Impact 5.4-1 are not project-specific impacts to global warming but the proposed project's contribution to this cumulative impact. Because the project's GHG emissions were considered substantial, the project's GHG emissions and contribution to global climate change impacts are considered cumulatively considerable, and therefore significant.

Consideration of the Temporary Use of the Rose Bowl by the NFL

As discussed above, GHG emissions are by definition cumulative. Because the project's GHG emissions were considered substantial, the project's GHG emissions impacts are considered cumulatively considerable, with or without the temporary use of the Rose Bowl by the NFL.

5.4.5 Existing Regulations and Standard Conditions

State

- AB 32: California Global Warming Solutions Act
- Executive Order S-3-05: Greenhouse Gas Emission Reduction Targets
- Pavley Fuel Efficiency Standards (AB1493). Establishes fuel efficiency ratings for new cars.
- Title 24 California Code of Regulations, Part 6 (Building and Energy Efficiency Standards). Establishes building energy efficiency standards for residential and nonresidential development.
- Title 24 California Code of Regulations, Part 11 (California Green Building Code). Establishes sustainability criteria to reduce building energy use and water use for new residential and non-residential development.
- Title 20 California Code of Regulations (Appliance Energy Efficiency Standards). Establishes energy efficiency requirements for appliances.
- Title 17 California Code of Regulations (Low Carbon Fuel Standard). Requires the carbon content of fuel sold in California to be 10 percent less by 2020.
- California Water Conservation in Landscaping Act of 2006 (AB 1881). Requires local agencies to adopt the Department of Water Resources updated Water Efficient Landscape Ordinance or equivalent by January 1, 2010 to ensure efficient landscapes in new development and reduced water waste in existing landscapes.
- Statewide Retail Provider Emissions Performance Standards (SB 1368). Requires energy generators to achieve performance standards for GHG emissions.

- Renewable Portfolio Standards (SB 1078). Requires electric corporations to increase the amount of energy obtained from eligible renewable energy resources to 20 percent by 2010 and 33 percent by 2020.California Code of Regulations, Title 24: Energy Efficiency Standards.

Local

- City of Pasadena Zoning Code Chapter 17.46.320, Bicycle Parking Standards. Sets required number of bicycle spaces for any new structure, or an addition to any existing structure that exceeds 15,000 square feet in gross floor area.

- City of Pasadena Municipal Code Chapter 14.04, Green Building Standards Code. Makes select voluntary components of CALGreen mandatory.

    - All buildings required to be constructed to achieve 15 percent more energy efficiency than the 2008 Building and Energy Efficiency standards (Section 14.04.508) and include access for solar systems (i.e., solar readiness).

    - Buildings required to comply with Tier 1, as amended (Section 14.04.504):

        - Municipal buildings of 5,000 square feet or more of new construction

        - Non-residential buildings with 25,000 square feet or more of new construction.

        - Tenant improvements of 25,000 square feet or more mixed-use and multi-family residential buildings four stories in height or more.

      Buildings are required to have a 20 percent reduction in energy use (Section 14.04.540) and include prerequisite and elective measures to achieve an equivalent 40 Leadership in Energy Efficiency and Design (LEED) points including: installation of cool roofs, installation of dual plumbing where recycled water is available, and have 10 percent parking capacity designated for fuel efficient vehicles, and 65 percent reduction in construction waste.

    - Buildings required to comply with Tier 2, as amended (Section 14.04.504):

        - New municipal buildings.

        - Municipal renovations of 15,000 square feet or more.

        - Commercial buildings over 50,000 square feet.

      Buildings are required to have a 30 percent reduction in energy use (Section 14.04.540) and include prerequisite and elective measures to achieve an equivalent 50 LEED points including: installation of cool roofs, installation of dual plumbing where recycled water is available, and have 12 percent parking capacity designated for fuel efficient vehicles, and 80 percent reduction in construction waste.

5.4.6 Level of Significance Before Mitigation

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

- Impact 5.4-2 The proposed project would not conflict with plans adopted for the purpose of reducing GHG emissions.

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

- Impact 5.4-1 New commercial, office, and residential land uses would result in a substantial increase in GHG emissions in the Lincoln Avenue Specific Plan Area.

5.4.7 Mitigation Measures

Impact 5.4-1

The City of Pasadena's Green Building Practices Ordinance (Municipal Code Chapter 14.90) ensures new buildings are more energy efficient than the current building code. The following additional measures would encourage use of nonmotorized or alternative modes of transportation and energy-efficient appliances and reduce both criteria air pollutant and greenhouse gas emissions.

2-4 Residential developments that include garage parking shall be electrically wired to accommodate electric vehicle charging. The location of the electrical outlets shall be specified on building plans and proper installation shall be verified by the Building Division prior to issuance of a Certificate of Occupancy.

2-5 Applicant-provided appliances shall be Energy Star appliances (dishwashers, refrigerators, clothes washers, and dryers). Installation of Energy Star appliances shall be verified by the Building Division during plan check.

4-1 Applicants for non-residential projects within the Lincoln Avenue Specific Plan or applicable designee (e.g., building manager), that employ 20 of more people—which is equivalent to 16,000 square feet of retail space or 10,000 square feet of office space—shall implement an employee commute trip reduction (CTR) program. The CTR program shall identify alternative modes of transportation to the project, including transit schedules, bike and pedestrian routes, and carpool/vanpool availability. Information regard these programs shall be readily available to employees and clients. The project applicant or designee shall consider the following incentives for commuters as part of the CTR program:

- Ride-matching assistance (e.g., subsidized public transit passes)
- Vanpool assistance or employer-provided vanpool/shuttle
- Car-sharing program (e.g., Zipcar)
- Bicycle end-trip facilities, including bike parking and lockers.

5.4.8 Level of Significance After Mitigation

Impact 5.4-1

The Lincoln Avenue Specific Plan would increase commercial, office, and residential land use intensity along the Lincoln Avenue corridor. While the project would not conflict with plans adopted for the purpose of reducing GHG emissions, emissions generated at buildout of the Lincoln Avenue Specific Plan would exceed SCAQMD's draft per capita significance threshold and are considered to cumulatively contribute to GHG emissions. Mitigation Measures 2-4 through 2-6 would assist in reducing project-related GHG emissions, to

the extent feasible. While all feasible mitigation measures have been incorporated into the project, the total increase in GHG emissions onsite from the project would still exceed the proposed thresholds and be considered substantial. Impact 5.4-1 would remain significant and unavoidable.