

GREENHOUSE GAS TECHNICAL REPORT

Introduction

This technical report examines the direct and indirect impacts of the proposed Cabrillo Town Center Project related to greenhouse gas (GHG) emissions and global climate change by disclosing GHG emissions generation and by addressing the Project's consistency with applicable GHG emission reduction plans, policies, and regulations. Calculation worksheets and documentation are included in the Technical Appendix to this analysis.

Environmental Setting

Global climate change refers to changes in average climatic conditions on Earth as a whole, including changes in temperature, wind patterns, precipitation, and storms. Global warming, a related concept, is the observed increase in average temperature of Earth's surface and atmosphere. One identified cause of global warming is an increase of GHG emissions in the atmosphere. GHG emissions are those compounds in Earth's atmosphere that play a critical role in determining Earth's surface temperature.

Earth's natural warming process is known as the "greenhouse effect." It is called the greenhouse effect because Earth and the atmosphere surrounding it are like a greenhouse with glass panes in that the glass allows solar radiation (sunlight) into Earth's atmosphere but prevents radiative heat from escaping, thus warming Earth's atmosphere. Some levels of GHG emissions keep the average surface temperature of Earth close to a hospitable 60 degrees Fahrenheit. However, it is believed that excessive concentrations of anthropogenic GHG emissions in the atmosphere can result in increased global mean temperatures, with associated adverse climatic and ecological consequences.¹

Scientists studying the particularly rapid rise in global temperatures have determined that human activity has resulted in increased emissions of GHG emissions, primarily from the burning of fossil fuels (from motor vehicle travel, electricity generation, consumption of natural gas, industrial activity, manufacturing), deforestation, agricultural activity, and the decomposition of solid waste. Scientists refer to the global warming context of the past century as the "enhanced greenhouse effect" to distinguish it from the natural greenhouse effect.²

Global GHG emissions due to human activities have grown since pre-industrial times. As reported by the United States Environmental Protection Agency (USEPA), global carbon emissions from fossil fuels increased by over 16 times between 1900 and 2008 and by about 1.5 times between 1990 and 2008. In addition, in the Global Carbon Budget 2014 report, published in September 2014, atmospheric carbon dioxide (CO₂) concentrations in 2013 were found to be 43 percent above the concentration at the start of the Industrial Revolution, and the present concentration is the highest during at least the last 800,000

¹ Intergovernmental Panel on Climate Change, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)].

² Center for Climate and Energy Solutions, Climate Change 101: Understanding and Responding to Global Climate Change.

years.³ Global increases in CO₂ concentrations are due primarily to fossil fuel use, with land use change providing another significant but smaller contribution. Regarding emissions of non-CO₂ GHG, these have also increased significantly since 1990. In particular, studies have concluded that it is very likely that the observed increase in methane (CH₄) concentration is predominantly due to agriculture and fossil fuel use.⁴

In August 2007, international climate talks held under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC) led to the official recognition by the participating nations that global emissions of GHG must be reduced. According to the “Ad Hoc Working Group on Further Commitments of Annex I Parties under the Kyoto Protocol,” avoiding the most catastrophic events forecast by the United Nations Intergovernmental Panel on Climate Change (IPCC) would entail emissions reductions by industrialized countries in the range of 25 to 40 percent below 1990 levels. Because of the Kyoto Protocol’s Clean Development Mechanism, which gives industrialized countries credit for financing emission-reducing projects in developing countries, such an emissions goal in industrialized countries could ultimately spur efforts to cut emissions in developing countries as well.⁵

With regard to the adverse effects of global warming, as reported by the Southern California Association of Governments (SCAG), “Global warming poses a serious threat to the economic well-being, public health, and natural environment in southern California and beyond. The potential adverse impacts of global warming include, among others, a reduction in the quantity and quality of water supply, a rise in sea level, damage to marine and other ecosystems, and an increase in the incidences of infectious diseases. Over the past few decades, energy intensity of the national and state economy has been declining due to the shift to a more service-oriented economy. California ranked fifth lowest among the states in CO₂ emissions from fossil fuel consumption per unit of Gross State Product. However, in terms of total CO₂ emissions, California is second only to Texas in the nation and is the 12th largest source of climate change emissions in the world, exceeding most nations. The SCAG region, with close to half of the state’s population and economic activities, is also a major contributor to the global warming problem.”

GHG Emissions Background. GHG emissions include CO₂, CH₄, nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃).⁶ Carbon dioxide is the most abundant GHG. Other GHG emissions are less abundant but have higher global warming potential than CO₂. Thus, emissions of other GHG emissions are frequently expressed in the equivalent mass of CO₂, denoted as CO₂e. Forest fires, decomposition, industrial processes, landfills, and consumption of fossil fuels for power generation, transportation, heating, and

³ C. Le Quéré, et al., Global Carbon Budget 2014, (Earth System Science Data, 2015, doi:10.5194/essd-7-47-2015).

⁴ USEPA, Atmospheric Concentrations of Greenhouse Gas, updated June 2015.

⁵ United Nations Framework Convention on Climate Change, Press Release—Vienna UN Conference Shows Consensus on Key Building Blocks for Effective International Response to Climate Change, August 31, 2007

⁶ As defined by California Assembly Bill (AB) 32 and Senate Bill (SB) 104.

cooking are the primary sources of GHG emissions. A general description of the GHG emissions is provided in Table 1.

Global Warming Potential (GWP) is one type of simplified index based upon radiative properties used to estimate the potential future impacts of emissions of different gases upon the climate system. The GWP is based on several factors, including the radiative efficiency (heat-absorbing ability) of each gas relative to that of CO₂, as well as the decay rate of each gas (the amount removed from the atmosphere over a given number of years) relative to that of CO₂. The higher the GWP, the more that a given gas warms the Earth compared to CO₂ over that period. A summary of the atmospheric lifetime and GWP of selected gases is presented in Table 2.⁷ As indicated on the table, the GWP ranges from 1 to 22,800.

Projected Impacts of Global Warming in California. The scientific community's understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain significant scientific uncertainties in, for example, predictions of local effects of climate change, occurrence, frequency, and magnitude of extreme weather events, effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the Earth's climate system and inability to accurately model it, the uncertainty surrounding climate change may never be eliminated. Nonetheless, the IPCC's Fifth Assessment Report, Summary for Policy Makers states that, "it is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forces together."⁸ A report from the National Academy of Sciences concluded that 97 to 98 percent of the climate researchers most actively publishing in the field support the tenets of the IPCC in that climate change is very likely caused by human (i.e., anthropogenic) activity.⁹

According to the California Air Resources Board (CARB), the potential impacts in California due to global climate change may include: loss in snow pack; sea level rise; more extreme heat days per year; more high ozone days; more large forest fires; more drought years; increased erosion of California's coastlines and sea water intrusion into the Sacramento and San Joaquin Deltas and associated levee systems; and increased pest infestation. Below is a summary of some of the potential effects that could be experienced in California because of global warming and climate change.

Air Quality. Higher temperatures, conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect and, therefore, its indirect effects, are uncertain. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would exacerbate air quality. Additionally, severe heat accompanied by drier conditions and poor air quality could increase

⁷ Atmospheric lifetime is defined as the time required to turn over the global Atmospheric burden. Source: Intergovernmental Panel on Climate Change, IPCC Third Assessment Report: Climate Change 2001 (TAR), Chapter 4: Atmospheric Chemistry and Greenhouse Gases, 2001, p. 247.

⁸ Intergovernmental Panel on Climate Change, Fifth Assessment Report, Summary for Policy Makers, page 5, 2013, <http://ipcc.ch/report/ar5/syr/>. Accessed April 2020.

⁹ Anderegg, William R. L., J.W. Prall, J. Harold, S.H., Schneider, Expert Credibility in Climate Change, Proceedings of the National Academy of Sciences of the United States of America. 2010;107:12107-12109.

the number of heat-related deaths, illnesses, and asthma attacks throughout the state.¹⁰ However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thus ameliorating the pollution associated with wildfires.

In 2009, the California Natural Resources Agency (CNRA) published the *California Climate Adaptation Strategy* as a response to the Governor's Executive Order S-13-2008.¹¹ The CNRA report lists specific recommendations for state and local agencies to best adapt to the anticipated risks posed by a changing climate. In accordance with the *California Climate Adaptation Strategy*, the California Energy Commission (CEC) was directed to develop a website on climate change scenarios and impacts that would be beneficial for local decision makers.¹² The website, known as Cal-Adapt, became operational in 2011¹³ and provides a projection of potential future climate scenarios. The data are comprised of the average values (i.e., temperature, sea-level rise, snowpack) from a variety of scenarios and models and are meant to illustrate how the climate may change based on a variety of different potential social and economic factors.

Water Supply. Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. Studies have found that, "[c]onsiderable uncertainty about precise impacts of climate change on California hydrology and water resources will remain until we have more precise and consistent information about how precipitation patterns, timing, and intensity will change."¹⁴ For example, some studies identify little change in total annual precipitation in projections for California while others show significantly more precipitation.¹⁵ Warmer, wetter winters would increase the amount of runoff available for groundwater recharge; however, this additional runoff would occur at a time when some basins are either being recharged at their maximum capacity or are already full. Conversely, reductions in spring runoff and higher evapotranspiration because of higher temperatures could reduce the amount of water available for recharge.¹⁶

¹⁰ California Environmental Protection Agency, *Preparing California for Extreme Heat: Guidance and Recommendations*, October 2013, https://www.cdph.ca.gov/Programs/OHE/CDPH%20Document%20Library/CCHEP-General/CDPH-EPA-2013-Preparing-CA-for-Extreme-Heat_ADA.pdf. Accessed April 2020

¹¹ California Natural Resources Agency, Climate Action Team, 2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008, 2009.

¹² California Natural Resources Agency, Climate Action Team, 2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008, 2009.

¹³ The Cal-Adapt website address is: <http://cal-adapt.org>.

¹⁴ Pacific Institute for Studies in Development, Environment and Security, *Climate Change and California Water Resources: A Survey and Summary of the Literature*, July 2003, page 5, http://www.pacinst.org/reports/climate_change_and_california_water_resources.pdf. Accessed April 2020.

¹⁵ Pacific Institute for Studies in Development, Environment and Security, *Climate Change and California Water Resources: A Survey and Summary of the Literature*, July 2003, http://www.pacinst.org/reports/climate_change_and_california_water_resources.pdf. Accessed April 2020.

¹⁶ California Natural Resources Agency, *Safeguarding California: Reducing Climate Risk*, an Update to the 2009 California Climate Adaptation Strategy, 2014.

The California Department of Water Resources report on climate change and effects on the State Water Project (SWP), the Central Valley Project, and the Sacramento-San Joaquin Delta, concludes that “climate change will likely have a significant effect on California’s future water resources...[and] future water demand.” It also reports that “much uncertainty about future water demand [remains], especially [for] those aspects of future demand that will be directly affected by climate change and warming. While climate change is expected to continue through at least the end of this century, the magnitude and, in some cases, the nature of future changes is uncertain.”¹⁷ It also reports that the relationship between climate change and its potential effect on water demand is not well understood, but “[i]t is unlikely that this level of uncertainty will diminish significantly in the foreseeable future.” Still, changes in water supply are expected to occur, and many regional studies have shown that large changes in the reliability of water yields from reservoirs could result from only small changes in inflows.¹⁸ In its *Fifth Assessment Report*, the IPCC states “Changes in the global water cycle in response to the warming over the 21st century will not be uniform. The contrast in precipitation between wet and dry regions and between wet and dry seasons will increase, although there may be regional exceptions.”¹⁹

Hydrology and Sea Level Rise. As discussed above, climate change could potentially affect: the amount of snowfall, rainfall, and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide, and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes: expansion of seawater as the oceans warm, and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California’s water supply. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture. California has a \$30 billion agricultural industry that produces half the country’s fruits and vegetables. Higher CO₂ levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater ozone pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thus affect their quality.²⁰

Ecosystems and Wildlife. Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Increasing concentrations of GHGs are likely to accelerate the rate of climate change. Scientists expect that the average global

¹⁷ California Department of Water Resources Climate Change Report, Progress on Incorporating Climate Change into Planning and Management of California’s Water Resources, July 2006, page 2-54, https://water.ca.gov/LegacyFiles/climatechange/docs/CCprogress_nov06.pdf. Accessed April 2020

¹⁸ California Department of Water Resources Climate Change Report, Progress on Incorporating Climate Change into Planning and Management of California’s Water Resources, July 2006, page 2-75, https://water.ca.gov/LegacyFiles/climatechange/docs/CCprogress_nov06.pdf. Accessed April 2020

¹⁹ Intergovernmental Panel on Climate Change, Fifth Assessment Report, Summary for Policy Makers, 2013, page 20.

²⁰ California Climate Change Center, Our Changing Climate: Assessing the Risks to California, 2006, <https://www.ucsusa.org/resources/our-changing-climate-assessing-risks-california>. Accessed April 2020.

surface temperature could rise by 2-11.5°F (1.1-6.4°C) by 2100, with significant regional variation.²¹ Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Sea level could rise as much as 2 feet along most of the United States coastline. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes such as carbon cycling and storage.²²

Table 1
Description of Identified GHG Emissions^a

Greenhouse Gas	General Description
Carbon Dioxide (CO₂)	An odorless, colorless GHG, which has both natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic (human caused) sources of CO ₂ are burning coal, oil, natural gas, and wood.
Methane (CH₄)	A flammable gas and is the main component of natural gas. When one molecule of CH ₄ is burned in the presence of oxygen, one molecule of CO ₂ and two molecules of water are released. A natural source of CH ₄ is the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain CH ₄ , which is extracted for fuel. Other sources are from landfills, fermentation of manure, and cattle.
Nitrous Oxide (N₂O)	A colorless GHG. High concentrations can cause dizziness, euphoria, and sometimes slight hallucinations. N ₂ O is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used in rocket engines, racecars, and as an aerosol spray propellant.
Hydrofluorocarbons (HFCs)	Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in CH ₄ or ethane (C ₂ H ₆) with chlorine and/or fluorine atoms. CFCs are non-toxic, non-flammable, insoluble, and chemically unreactive in the troposphere (the level of air at Earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. Because they destroy stratospheric ozone, the production of CFCs was stopped as required by the Montreal Protocol in 1987. HFCs are synthetic man-made chemicals that are used as a substitute for CFCs as refrigerants. HFCs deplete stratospheric ozone, but to a much lesser extent than CFCs.

²¹ National Research Council, Advancing the Science of Climate Change, 2010, <http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/Science-Report-Brief-final.pdf>. Accessed April 2020.

²² Parmesan, C., and H. Galbraith, Observed Impacts of Global Climate Change in the U.S., Prepared for the Pew Center on Global Climate Change, November 2004, <https://www.c2es.org/site/assets/uploads/2004/11/observed-impacts-climate-change-united-states.pdf>. Accessed April 2020.

Table 1
Description of Identified GHG Emissions^a

Greenhouse Gas	General Description
Perfluorocarbons (PFCs)	PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. High-energy ultraviolet rays about 60 kilometers above Earth's surface destroy the compounds. PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane and hexafluoroethane. The two main sources of PFCs are primary aluminum production and semi-conductor manufacturing.
Sulfur Hexafluoride (SF₆)	An inorganic, odorless, colorless, non-toxic, and non-flammable gas. SF ₆ is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semi-conductor manufacturing, and as a tracer gas for leak detection.
Nitrogen Trifluoride (NF₃)	An inorganic, non-toxic, odorless, non-flammable gas. NF ₃ is used in the manufacture of semi-conductors, as an oxidizer of high-energy fuels, for the preparation of tetrafluorohydrazine, as an etchant gas in the electronic industry, and as a fluorine source in high power chemical lasers.
<p><i>GHG emissions identified in this table are ones identified in the Kyoto Protocol and other synthetic gases recently added to the IPCC's Fifth Assessment Report.</i></p> <p><i>Source: Association of Environmental Professionals, Alternative Approaches to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents, Final, June 29, 2007; Environmental Protection Agency, Acute Exposure Guideline Levels (AEGLs) for Nitrogen Trifluoride; January 2009.</i></p>	

Table 2
Atmospheric Lifetimes and Global Warming Potential

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)
Carbon Dioxide (CO ₂)	50–200	1
Methane (CH ₄)	12 (+/-3)	25
Nitrous Oxide (N ₂ O)	114	298
HFC-23: Fluoroform (CHF ₃)	270	14,800
HFC-134a: 1,1,1,2-Tetrafluoroethane (CH ₂ FCF ₃)	14	1,430
HFC-152a: 1,1-Difluoroethane (C ₂ H ₄ F ₂)	1.4	124
PFC-14: Tetrafluoromethane (CF ₄)	50,000	7,390
PFC-116: Hexafluoroethane (C ₂ F ₆)	10,000	12,200
Sulfur Hexafluoride (SF ₆)	3,200	22,800
Nitrogen Trifluoride (NF ₃)	740	17,200
<p><i>Source: IPCC, Climate Change 2007: Working Group I: The Physical Science Basis, Direct Global Warming Potentials</i></p>		

Regulatory Framework: Federal

In response to growing scientific and political concern with global climate change, federal and state entities have adopted a series of laws to reduce emissions of GHG emissions to the atmosphere.

Federal Clean Air Act. The U.S. Supreme Court ruled in *Massachusetts v. Environmental Protection Agency*, 127 S.Ct. 1438 (2007), that CO₂ and other GHG emissions are pollutants under the federal Clean Air Act (CAA), which the USEPA must regulate if it determines they pose an endangerment to public health or welfare. The U.S. Supreme Court did not mandate that the USEPA enact regulations to reduce GHG emissions. Instead, the Court found that the USEPA could avoid acting if it found that GHG emissions do not contribute to climate change or if it offered a “reasonable explanation” for not determining that GHG emissions contribute to climate change.

On April 17, 2009, the USEPA issued a proposed finding that GHG emissions contribute to air pollution that may endanger public health or welfare. On April 24, 2009, the proposed rule was published in the Federal Register under Docket ID No. EPA-HQ-OAR-2009-0171. The USEPA stated that high atmospheric levels of GHG emissions “are the unambiguous result of human emissions and are very likely the cause of the observed increase in average temperatures and other climatic changes.” The USEPA further found that “atmospheric concentrations of greenhouse gases endanger public health and welfare within the meaning of Section 202 of the Clean Air Act.” The findings were signed by the USEPA Administrator on December 7, 2009. The final findings were published in the Federal Register on December 15, 2009. The final rule was effective on January 14, 2010.²³ While these findings alone do not impose any requirements on industry or other entities, this action is a prerequisite to regulatory actions by the USEPA, including, but not limited to, GHG emissions standards for light-duty vehicles.

On April 4, 2012, the USEPA published a proposed rule to establish, for the first time, a new source performance standard for GHG emissions. Under the proposed rule, new fossil fuel-fired electric generating units larger than 25 megawatts (MW) are required to limit emissions to 1,000 pounds of CO₂ per MW-hour (CO₂/MWh) on an average annual basis, subject to certain exceptions. Subsequently, on April 23, 2018, the USEPA issued a policy stating that CO₂ emissions from biomass-fired and other biogenic sources would be considered carbon neutral when used for energy production at stationary sources.

Corporate Average Fuel Economy (CAFE) Standards. In response to the *Massachusetts v. Environmental Protection Agency* ruling, the George W. Bush Administration issued Executive Order 13432 in 2007, directing the USEPA, the United States Department of Transportation (USDOT), and the United States Department of Energy (USDOE) to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the National Highway Traffic Safety Administration (NHTSA) issued a final rule regulating fuel efficiency for and GHG emissions from cars and light-duty trucks for model year 2011; in 2010, the USEPA and the NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016.

In 2010, President Obama issued a memorandum directing the USEPA, USDOT, USDOE, and NHTSA to establish additional standards regarding fuel efficiency and GHG emissions reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, the USEPA and NHTSA proposed

²³ USEPA, Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, Final Rule.

stringent, coordinated federal GHG emissions and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards are projected to achieve 163 grams/mile of CO₂ in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon (mpg) if the standards were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021. In March 2020, NHTSA and USEPA adopted new less stringent standards covering model years 2021 through 2026.

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011 the USEPA and the NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018. The standards for CO₂ emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the USEPA, this regulatory program would reduce GHG emissions and fuel consumption for the affected vehicles by 6 to 23 percent over the 2010 baselines.²⁴

Building on the success of the first phase of standards, in August 2016, the USEPA and the NHTSA finalized Phase 2 standards for medium and heavy-duty vehicles through model year 2027 that will improve fuel efficiency and cut carbon pollution. The Phase 2 standards were to lower CO₂ emissions by approximately 1.1 billion metric tons and save vehicle owners fuel costs of about \$170 billion.²⁵ On August 10, 2021, NHTA proposed new CAFE standards for 2024-2026 that would increase the stringency of standards by 8 percent per year rather than the previous 1.5 percent.

On September 19, 2019, the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) and USEPA issued a final action entitled the "One National Program Rules" to enable the federal government to provide nationwide uniform fuel economy and greenhouse gas (GHG) emission standards for automobile and light duty trucks. This action finalizes the Safe Affordable Fuel Efficient (SAFE) Vehicles Rule and clarifies that federal law preempts state and local tailpipe GHG emissions standards as well as zero emission vehicle (ZEV) mandates. The SAFE Vehicle Rule also withdraws the CAA waiver granted to the State of California that allowed the state to enforce its own Low Emission Vehicle program.²⁶ On March 31, 2020, Part II of the SAFE Vehicles was issued and sets carbon dioxide emissions and CAFE standards for passenger vehicles and light duty trucks, covering model years 2021-2026.²⁷ On December 21, 2021, NHTA repealed the SAFE I Rule.

²⁴ The emission reductions attributable to the regulations for medium- and heavy-duty trucks were not included in the Project's emissions inventory due to the difficulty in quantifying the reductions. Excluding these reductions results in a more conservative (i.e., higher) estimate of emissions for the Project.

²⁵ USEPA and NHTSA Adopt Standards to Reduce GHG and Improve Fuel Efficiency of Medium- and Heavy-Duty Vehicles for Model Year 2018 and Beyond, August 2016.

²⁶ U.S. Department of Transportation and EPA. 2019. *One National Program Rule on Federal Preemption of State Fuel Economy Standards*, <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-one-national-program-federal-preemption-state#:~:text=In%20this%20action%20NHTSA%20is,and%20local%20programs%20are%20preempted.>

²⁷ U.S. Department of Transportation. 2020. *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks*, https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/final_safe_preamble_web_version_200330.pdf.

Energy Independence and Security Act. The Energy Independence and Security Act of 2007 (EISA) facilitates the reduction of national GHG emissions by requiring the following:

- Increasing the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) that requires fuel producers to use at least 36 billion gallons of biofuel in 2022;
- Prescribing or revising standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances;
- Requiring approximately 25 percent greater efficiency for light bulbs by phasing out incandescent light bulbs between 2012 and 2014; requiring approximately 200 percent greater efficiency for light bulbs, or similar energy savings, by 2020; and
- While superseded by the USEPA and the NHTSA actions described above, (i) establishing miles per gallon targets for cars and light trucks, and (ii) directing the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for trucks.

Additional provisions of the EISA address energy savings in government and public institutions, promote research for alternative energy, additional research in carbon capture, international energy programs, and the creation of “green jobs.”²⁸

Regulatory Framework: State

Executive Order S-3-05. This Executive Order, issued by Governor Schwarzenegger in June 2005, established GHG emissions targets for the state, as well as a process to ensure the targets are met. The order directed the Secretary for the California Environmental Protection Agency (CalEPA) to report every two years on the state’s progress toward meeting the Governor’s GHG emission reduction targets. The statewide GHG emissions reduction targets are as follows:

- By 2010, reduce to 2000 emission levels;²⁹
- By 2020, reduce to 1990 emission levels;
- By 2030, reduce to 40 percent below 1990 levels; and
- By 2050, reduce to 80 percent below 1990 levels.

²⁸ A green job, as defined by the United States Department of Labor, is a job in business that produces goods or provides services that benefit the environment or conserve natural resources.

²⁹ The 2010 target to reduce GHG emissions to 2000 levels was not met. Source: Rubin, Thomas A., “Does California Really Need Major Land Use and Transportation Changes to Meet Greenhouse Gas Emissions Targets?,” July 3, 2013.

The State Legislature adopted equivalent 2020 and 2030 statewide targets in the California Global Warming Solutions Act of 2006 (also known as Assembly Bill [AB] 32) and Senate Bill 32, respectively, both of which are discussed below. However, the Legislature has not yet adopted a target for the 2050 horizon year.

As a result of Executive Order S-3-05, the California CAT, led by the Secretary of CalEPA, was formed. The CAT is made up of representatives from several state agencies and was formed to implement global warming emission reduction programs and to report on the progress made toward meeting statewide targets established under the Executive Order. The CAT reported several recommendations and strategies for reducing GHG emissions and reaching the targets established in the Executive Order.³⁰ The CAT stated that smart land use is an umbrella term for strategies that integrate transportation and land-use decisions. Such strategies generally encourage jobs/housing proximity, promote transit-oriented development (TOD), and encourage high-density residential/commercial development along transit corridors. These strategies develop more efficient land-use patterns within each jurisdiction or region to match population increases, workforce, and socioeconomic needs for the full spectrum of the population. “Intelligent transportation systems” is the application of advanced technology systems and management strategies to improve operational efficiency of transportation systems and the movement of people, goods, and service.³¹

Executive Order B-30-15. Issued by Governor Brown in April 2015, established an additional statewide policy goal to reduce GHG emissions 40 percent below their 1990 levels by 2030. Reducing GHG emissions by 40 percent below 1990 levels in 2030 and by 80 percent below 1990 levels by 2050 (consistent with Executive Order S-3-05) aligns with scientifically established levels needed in the U.S. to limit global warming below 2 degrees Celsius.³²

Executive Order B-55-18. Issued by Governor Jerry Brown in September 2018, this establishes a statewide goal to achieve carbon neutrality as soon as possible, but no later than 2045, and achieve and maintain net negative emissions thereafter. Based on this executive order, CARB would work with relevant state agencies to develop a framework for implementation and accounting that tracks progress towards this goal, as well as ensuring future scoping plans identify and recommend measures to achieve the carbon neutrality goal.

Executive Order S-1-07 (California Low Carbon Fuel Standard). Executive Order S-1-07, the LCFS (issued on January 18, 2007), requires a reduction of at least 10 percent in the carbon intensity of California’s transportation fuels by 2020. Regulatory proceedings and implementation of the LCFS were directed to CARB. The LCFS has been identified by CARB as a discrete early action item in the adopted Climate Change Scoping Plan. The LCFS program was re-adopted in 2015 and will continue to

³⁰ CalEPA, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006.

³¹ CalEPA, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006, p. 58.

³² California Air Resources Board, Frequently Asked Questions about Executive Order B-30-15, 2030 Carbon Target and Adaptation FAQs, April 29, 2015.

complement other AB 32 measures, transform, and diversify the fuel pool, and is a key part of the State's petroleum reduction goals for 2030.

California Assembly Bill 32 (California Global Warming Solutions Act of 2006) and Senate Bill 32.

The California Global Warming Solutions Act of 2006 (also known as AB 32) commits the state to achieving the following:

- By 2010, reduce to 2000 GHG emission levels;³³ and
- By 2020, reduce to 1990 levels.

To achieve these goals, which are consistent with the California CAT GHG emissions reduction targets for 2010 and 2020, AB 32 mandates that CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce statewide GHG emissions from stationary sources consistent with the CAT strategies, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. To achieve the reduction targets, AB 32 requires CARB to adopt rules and regulations in an open public process that achieve the maximum technologically feasible and cost-effective GHG emissions reductions.³⁴

Senate Bill (SB) 32, signed September 8, 2016, updates AB 32 (the Global Warming Solutions Act) to include an emissions reductions goal for 2030. Specifically, SB 32 requires the state board to ensure that statewide GHG emissions are reduced to 40 percent below the 1990 level by 2030. The new plan, outlined in SB 32, involves increasing renewable energy use, imposing tighter limits on the carbon content of gasoline and diesel fuel, putting more electric cars on the road, improving energy efficiency, and curbing emissions from key industries.

Assembly Bill 197. Assembly Bill (AB) 197, signed September 8, 2016, is a bill linked to SB 32 that prioritizes efforts to cut GHG emissions in low-income or minority communities. AB 197 requires CARB to make available, and update at least annually, on its Internet Web site the emissions of greenhouse gases, criteria pollutants, and toxic air contaminants for each facility that reports to CARB and air districts. In addition, AB 197 adds two Members of the Legislature to the CARB board as ex officio, non-voting members and creates the Joint Legislative Committee on Climate Change Policies to ascertain facts and make recommendations to the Legislature and the houses of the Legislature concerning the state's programs, policies, and investments related to climate change.

³³ The 2010 target to reduce GHG emissions to 2000 levels was not met. Source: Rubin, Thomas A., "Does California Really Need Major Land Use and Transportation Changes to Meet Greenhouse Gas Emissions Targets?", July 3, 2013.

³⁴ CARB's list of discrete early action measures that could be adopted and implemented before January 1, 2010, was approved on June 21, 2007. The three adopted discrete early action measures are: (1) a low-carbon fuel standard, which reduces carbon intensity in fuels statewide; (2) reduction of refrigerant losses from motor vehicle air conditioning system maintenance; and (3) increased methane capture from landfills, which includes requiring the use of state-of-the-art capture technologies.

Senate Bill 350. Senate Bill (SB) 350, signed October 7, 2015, is the Clean Energy and Pollution Reduction Act of 2015. SB 350 is the implementation of some of the goals of Executive Order B-30-15. The objectives of SB 350 are: (1) to increase the procurement of electricity from renewable sources from 33 percent to 50 percent by December 31, 2030; and (2) to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.³⁵

Senate Bill 1368. Senate Bill (SB) 1368, signed September 29, 2006, is a companion bill to AB 32 that requires the CPUC and the CEC to establish GHG emission performance standards for the generation of electricity. These standards also generally apply to power that is generated outside of California and imported into the state. SB 1368 provides a mechanism for reducing the emissions of electricity providers, thereby assisting CARB to meet its mandate under AB32. On January 25, 2007, the CPUC adopted an interim GHG Emissions Performance Standard, which is a facility-based emissions standard requiring that all new long-term commitments for baseload generation to serve California consumers be with power plants that have GHG emissions no greater than a combined cycle gas turbine plant. That level is established at 1,100 pounds of CO₂ per MWh. Furthermore, on May 23, 2007, the CEC adopted regulations that establish and implement an identical Emissions Performance Standard of 1,100 pounds of CO₂ per MWh (see CEC Order No. 07-523-7).

Assembly Bill 1493 (Pavley I). Assembly Bill (AB) 1493, passed in 2002, requires the development and adoption of regulations to achieve “the maximum feasible reduction of greenhouse gases” emitted by noncommercial passenger vehicles, light-duty trucks, and other vehicles used primarily for personal transportation in the state. CARB originally approved regulations to reduce GHG emissions from passenger vehicles in September 2004, with the regulations to take effect in 2009. On September 24, 2009, CARB adopted amendments to these “Pavley” regulations that reduce GHG emissions in new passenger vehicles from 2009 through 2016.³⁶ Although setting emission standards on automobiles is solely the responsibility of the USEPA, the federal CAA allows California to set state-specific emission standards on automobiles if the state first obtains a waiver from the USEPA. The USEPA granted California that waiver on July 1, 2009. A comparison between the AB 1493 standards and the Federal CAFE standards was completed by CARB and the analysis determined that California emission standards are 16 percent more stringent through the 2016 model year and 18 percent more stringent for 2020 model year.³⁷ California is also committed to further strengthening these standards beginning with 2020 model year vehicles to obtain a 45-percent GHG reduction in comparison to the 2009 model year.

³⁵ Senate Bill 350 (2015–2016 Reg, Session) Stats 2015, ch. 547.

³⁶ California Air Resources Board, Clean Car Standards—Pavley, Assembly Bill 1493, www.arb.ca.gov/cc/ccms/ccms.htm, accessed April 2020.

³⁷ California Air Resources Board, “Comparison of Greenhouse Gas Reductions for all Fifty United States under CAFE Standards and ARB Regulations Adopted Pursuant to AB 1493”, January 23, 2008.

Senate Bill 97. SB 97, passed in August 2007, is designed to work in conjunction with CEQA and AB 32. SB 97 requires the Office of Planning and Rules (OPR) to prepare and develop guidelines for the mitigation of GHG emissions or the effects thereof, including, but not limited to, the effects associated with transportation and energy consumption. The Draft Guidelines Amendments for Greenhouse Gas Emissions (Guidelines Amendments) were adopted on December 30, 2009 and address the specific obligations of public agencies when analyzing GHG emissions under CEQA to determine a project's effects on the environment.

However, neither a threshold of significance nor any specific mitigation measures are included or provided in the Guidelines Amendments.³⁸ The Guidelines Amendments require a lead agency to make a good-faith effort, based on the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a project. The Guidelines Amendments give discretion to the lead agency whether to: (1) use a model or methodology to quantify GHG emissions resulting from a project, and which model or methodology to use; or (2) rely on a qualitative analysis or performance-based standards. Furthermore, the Guidelines Amendments identify the following three factors that should be considered in the evaluation of the significance of GHG emissions:

1. The extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting;
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and
3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.³⁹

The administrative record for the Guidelines Amendments also clarifies "that the effects of greenhouse gas emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis."⁴⁰

In December 2018, the Governor's Office of Planning and Research (OPR) approved a CEQA and Climate Change Advisory that updated the 2009 guidance for project-level analyses. It reaffirms the discretion that lead agencies have in establishing an appropriate methodology and determining significance.

Senate Bill 743. This 2013 legislation updates the way transportation impacts are measured in California, focusing on vehicle miles traveled (VMT) rather than level of service as the main measure of transportation impacts. It calls on decisionmakers throughout the State to focus on reducing overall VMT

³⁸ See 14 Cal. Code Regs. §§ 15064.7 (generally giving discretion to lead agencies to develop and publish thresholds of significance for use in the determination of the significance of environmental effects), 15064.4 (giving discretion to lead agencies to determine the significance of impacts from GHG emissions).

³⁹ 14 Cal. Code Regs. § 15064.4(b).

⁴⁰ Letter from Cynthia Bryant, Director of the Governor's Office of Planning and Research to Mike Chrisman, California Secretary for Natural Resources, dated April 13, 2009.

and the GHG emissions from such vehicle activity. Traffic studies in the City of Santa Ana began formally analyzing projects in this fashion effective July 1, 2020.

Senate Bill 375. Acknowledging the relationship between land use planning and transportation sector GHG emissions, Senate Bill (SB) 375 was passed by the State Assembly on August 25, 2008 and signed by the Governor on September 30, 2008. This legislation links regional planning for housing and transportation with the GHG reduction goals outlined in AB 32. Reductions in GHG emissions would be achieved by, for example, locating employment opportunities close to transit. Under SB 375, each Metropolitan Planning Organization (MPO) would be required to adopt a Sustainable Community Strategy (SCS) to encourage compact development that reduce passenger VMT and trips so that the region will meet a target, created by CARB, for reducing GHG emissions. If the SCS is unable to achieve the regional GHG emissions reduction targets, then the MPO is required to prepare an alternative planning strategy that shows how the GHG emissions reduction target could be achieved through alternative development patterns, infrastructure, and/or transportation measures.

Assembly Bill 1279. This 2022 legislation creates a legally binding goal that California achieve carbon neutrality by 2045. It would also require the State to reduce GHG emissions by 85 percent below 1990 levels by 2045.

Climate Change Scoping Plan. In 2008, CARB approved the original *Climate Change Scoping Plan* as required by AB 32.⁴¹ Subsequently, CARB approved updates to the *Climate Change Scoping Plan* in 2014 (*First Update*) and 2017 (*2017 Update*), with the *2017 Update* considering SB 32 (adopted in 2016) in addition to AB 32. In December 2022, CARB adopted the 2022 Update, which addresses the State's goal for carbon neutrality by 2045.

The original *Climate Change Scoping Plan* proposed a “comprehensive set of actions designed to reduce overall carbon GHG emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health.”⁴² The original *Climate Change Scoping Plan* identified a range of GHG reduction actions that included direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms, such as a cap-and-trade system, and an AB 32 implementation fee to fund the program.

The original *Climate Change Scoping Plan* called for a “coordinated set of solutions” to address all major categories of GHG emissions. Transportation emissions were addressed through a combination of higher standards for vehicle fuel economy, implementation of the Low Carbon Fuel Standard (LCFS), and greater consideration to reducing trip length and generation through land use planning and transit-oriented development. Buildings, land use, and industrial operations were encouraged and, sometimes, required to use energy more efficiently. Utility energy providers were required change to include more

⁴¹ Climate Change Proposed Scoping Plan was approved by CARB on December 11, 2008.

⁴² California Air Resources Board, Climate Change Scoping Plan, December 2008.

renewable energy sources through implementation of the Renewables Portfolio Standard (RPS).⁴³ Additionally, the original *Climate Change Scoping Plan* emphasized opportunities for households and businesses to save energy and money through increasing energy efficiency. It indicated that substantial savings of electricity and natural gas would be accomplished through “improving energy efficiency by 25 percent.”

The original *Climate Change Scoping Plan* identified several specific issues relevant to the Project, including the following:

- The potential of using the green building framework as a mechanism, which could enable GHG emissions reductions in other sectors (i.e., electricity, natural gas), noting that:

A Green Building strategy will produce greenhouse gas savings through buildings that exceed minimum energy efficiency standards, decrease consumption of potable water, reduce solid waste during construction and operation, and incorporate sustainable materials. Combined, these measures can also contribute to healthy indoor air quality, protect human health, and minimize impacts to the environment.

- The importance of supporting the Department of Water Resources’ work to implement the Governor’s objective to reduce per capita water use by 20 percent by 2020.⁴⁴ Specific measures to achieve this goal include water use efficiency, water recycling, and reuse of urban runoff. The original *Climate Change Scoping Plan* noted that water use requires significant amounts of energy, including approximately one-fifth of statewide electricity.
- Encouraging local governments to set quantifiable emission reduction targets for their jurisdictions and use their influence and authority to encourage reductions in emissions caused by energy use, waste and recycling, water and wastewater systems, transportation, and community design.

Forecasting the emissions for 2020 if no actions are taken was necessary to assess the scope of the reductions California must make to return to the 1990 emissions level by 2020 as required by AB 32. CARB originally defined the “business-as-usual” or BAU scenario as emissions in the absence of any GHG emission reduction measures discussed in the original *Climate Change Scoping Plan*. For example, in further explaining CARB’s BAU methodology, CARB assumed that all new electricity generation would be supplied by natural gas plants, no further regulatory action would impact vehicle fuel efficiency, and building energy efficiency codes would be held at 2005 standards. In the original *Climate Change Scoping Plan*, CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of approximately 28.5 percent from the otherwise projected 2020

⁴³ For a discussion of Renewables Portfolio Standard, refer to Subsection 2(h)(i), California Renewables Portfolio Standard.

⁴⁴ California Department of Water Resources, 20x2020 Water Conservation Plan. The Plan called for California to reduce per capita water use from 192 to 154 gallons per capita daily from 2009 to 2020 and beyond. https://www.waterboards.ca.gov/water_issues/hot_topics/20x2020/docs/20x2020plan.pdf

emissions level (i.e., those emissions that would occur in 2020, absent GHG-reducing laws and regulations).⁴⁵

In 2014, CARB adopted the *First Update to the Climate Change Scoping Plan: Building on the Framework* (First Update).⁴⁶ The stated purpose of the First Update was to “highlight... California’s success to date in reducing its GHG emissions and lay...the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050.”⁴⁷ The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32 and noted that California could reduce emissions further by 2030 to levels squarely in line with those needed to stay on track to reduce emissions to 80 percent below 1990 levels by 2050 if the state realizes the expected benefits of existing policy goals.⁴⁸

In conjunction with the First Update, CARB identified “six key focus areas comprising major components of the state’s economy to evaluate and describe the larger transformative actions that will be needed to meet the state’s more expansive emission reduction needs by 2050.”⁴⁹ Those six areas were: (1) energy; (2) transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure); (3) agriculture; (4) water; (5) waste management; and (6) natural and working lands. The First Update identified key recommended actions for each sector that would facilitate achievement of the 2050 reduction target.

The First Update discussed new residential and commercial building energy efficiency improvements, specifically identifying progress towards zero net energy buildings as an element of meeting mid-term and long-term GHG emissions reduction goals. The First Update expressed CARB’s commitment to working with the California Public Utilities Commission (CPUC) and California Energy Commission (CEC) to facilitate further achievements in building energy efficiency.

In December 2017, CARB adopted California’s 2017 *Climate Change Scoping Plan Update: The Strategy for Achieving California’s 2030 Greenhouse Gas Target* (2017 Scoping Plan Update). The 2017 *Climate Change Scoping Plan* addresses the deeper cuts required by SB 32 by a 2030 horizon year and has a range of GHG reduction actions that include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 implementation fee to fund the program. The 2017 Scoping Plan Update includes policies to require direct GHG emissions reductions at some of the state’s largest stationary sources and mobile sources. These policies include the use of lower GHG fuels, efficiency regulations, and the Cap-and-Trade program, which constrains and reduces emissions at covered sources.

⁴⁵ California Air Resources Board, *Climate Change Scoping Plan: A Framework for Change*, p. 12, December 2008.

⁴⁶ Health & Safety Code §38561(h) requires CARB to update the Scoping Plan every five years.

⁴⁷ California Air Resources Board, *First Update*, May 2014, p. 4.

⁴⁸ California Air Resources Board, *First Update*, May 2014, p. 34.

⁴⁹ California Air Resources Board, *First Update*, May 2014, p. 6.

CARB adopted its 2022 *Scoping Plan* update on December 15, 2022 that lays the groundwork to achieving carbon neutrality statewide by 2045. The 2022 Scoping Plan is designed to reduce GHG emissions 85 percent below 1990 levels by 2045. Most reductions would come from conversion from combustion-based industries and technologies to electricity. While Statewide programs calling for electrifying the vehicle fleet and energy sources would account for the vast majority of GHG reductions needed by 2030, local actions are needed to supplement these. The Scoping Plan recommends City's develop local Climate Action Plans (CAPs) that are consistent with the Scoping Plan's GHG reduction goals, incorporate State-level GHG priorities into processes for approving land use projects, implement mitigation measures as needed to reduce GHG emissions from developments, and leverage opportunities for regional collaboration.

Cap-and-Trade Program. The original *Climate Change Scoping Plan* identified a cap-and-trade program as one of the strategies for California to reduce GHG emissions. Under cap-and-trade, an overall limit on GHG emissions from capped sectors is established, and facilities subject to the cap can trade permits to emit GHG emissions within the overall limit.

The Program is designed to reduce GHG emissions from major sources, such as refineries and power plants, (deemed "covered entities"). "Covered entities" subject to the Cap-and-Trade Program are sources that emit more than 25,000 metric tons CO₂e (MTCO₂e) per year. Triggering of the 25,000 MTCO₂e per year "inclusion threshold" is measured against a subset of emissions reported and verified under the California Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (Mandatory Reporting Rule or MRR).

Under the Cap-and-Trade Program, CARB issues allowances equal to the total amount of allowable emissions over a given compliance period and distributes these to regulated entities. Covered entities are allocated free allowances in whole or in part (if eligible) and may buy allowances at auction, purchase allowances from others, or purchase offset credits. Each covered entity with a compliance obligation is required to surrender an allowance for each metric ton CO₂e of GHG they emit.

The Cap-and-Trade Program provides a firm cap, ensuring that the 2030 statewide emission limit will not be exceeded. An inherent feature of the Cap-and-Trade program is that it does not guarantee GHG emissions reductions in any discrete location or by any source. Rather, GHG emissions reductions are only guaranteed on a cumulative basis. As summarized by CARB in the First Update:

The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit more have to turn in more allowances or other compliance instruments. Companies that can cut their GHG emissions have to turn in fewer allowances. But as the cap declines, aggregate emissions must be reduced.

For example, a covered entity theoretically could increase its GHG emissions every year and still comply with the Cap-and-Trade Program if there is a commensurate reduction in GHG emissions from other covered entities. Such a focus on aggregate GHG emissions is considered appropriate because climate change is a global phenomenon, and the effects of GHG emissions are considered cumulative.

The Cap-and-Trade Program works with other direct regulatory measures and provides an economic incentive to reduce emissions. If California's direct regulatory measures reduce GHG emissions more than expected, then the Cap-and-Trade Program will be responsible for relatively fewer emissions reductions. If California's direct regulatory measures reduce GHG emissions less than expected, then the Cap-and-Trade Program will be responsible for relatively more emissions reductions. Thus, the Cap-and-Trade Program assures that California will meet its 2030 GHG emissions reduction mandate.

*The Cap-and-Trade Program establishes an overall limit on GHG emissions from most of the California economy—the “capped sectors.” Within the capped sectors, some of the reductions are being accomplished through direct regulations, such as improved building and appliance efficiency standards, the [Low Carbon Fuel Standard] LCFS, and the 33 percent [Renewables Portfolio Standard] RPS. Whatever additional reductions are needed to bring emissions within the cap is accomplished through price incentives posed by emissions allowance prices. Together, direct regulation and price incentives assure that emissions are brought down cost-effectively to the level of the overall cap. [...]*⁵⁰

Overall, the Cap-and-Trade Program will achieve aggregate, rather than site-specific or project-level, GHG emissions reductions. Also, due to the regulatory framework adopted by CARB in AB 32, the reductions attributed to the Cap-and-Trade Program can change over time depending on the state's emissions forecasts and the effectiveness of direct regulatory measures. The Cap-and-Trade Program covered approximately 450 businesses responsible for about 85 percent of California's GHG emissions.⁵¹

The Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. Accordingly, GHG emissions associated with CEQA projects' electricity usage are covered by the Cap-and-Trade Program. The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels and from combustion of other fossil fuels not directly covered at large sources in the Program's first compliance period.⁵² Furthermore, the Cap-and-Trade Program also covers the GHG emissions associated with the combustion of transportation fuels in California, whether refined in state or imported. The point of regulation for transportation fuels is when they are “supplied” (i.e., delivered into commerce). Accordingly, as with stationary source GHG emissions and GHG emissions attributable to electricity use, virtually all, if not all, of GHG emissions from CEQA projects associated with vehicle-miles traveled (VMT) are covered by the Cap-and-Trade Program.

⁵⁰ California Air Resources Board, First Update, May 2014, p. 88.

⁵¹ Center for Climate and Energy Solutions, California Cap-and-Trade, <https://www.c2es.org/content/california-cap-and-trade/>, accessed April 2020.

⁵² While the Cap-and-Trade Program technically covered fuel suppliers as early as 2012, fuel suppliers did not have a compliance obligation (i.e., they were not fully regulated) until 2015.

Assembly Bill 398 was enacted in 2017 to extend the Cap-and-Trade Program from January 1, 2021, through December 31, 2030. As part of AB 398, refinements were made to the Cap-and-Trade program to establish updated protocols and allocation of proceeds to reduce GHG emissions.

California Renewables Portfolio Standard. The California RPS program (2002, SB 1078) required that 20 percent of the available energy supplies are from renewable energy sources by 2017. In 2006, SB 107 accelerated the 20 percent mandate to 2010. These mandates apply directly to investor-owned utilities. On April 12, 2011, California Governor Jerry Brown signed into law SB 2X, which modified California's RPS program to require that both public and investor-owned utilities in California receive at least 33 percent of their electricity from renewable sources by the year 2020.

Advanced Clean Cars Regulations. In 2012, CARB approved the Advanced Clean Cars (ACC) program, a new emissions-control program for model years 2015–2025.⁵³ The components of the Advance Clean Car program include the Low-Emission Vehicle (LEV) regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the Zero- Emission Vehicle (ZEV) regulation, which requires manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles (PHEV) in the 2018 through 2025 model years.⁵⁴

On September 23, 2020, Governor Gavin Newsom signed Executive Order No. N-79-20 that phases out sales of new gas-powered passenger cars by 2035 in California with an additional ten-year transition period for heavy vehicles. The state would not restrict used car sales, nor forbid residents from owning gas-powered vehicles. In accordance with the Executive Order, CARB is developing a 2020 Mobile Source Strategy, a comprehensive analysis that presents scenarios for possible strategies to reduce the carbon, toxic and unhealthy pollution from cars, trucks, equipment, and ships. The strategies will provide important information for numerous regulations and incentive programs going forward by conveying what is necessary to address the aggressive emission reduction requirements.

In November 2022, the ACC II regulations took effect, setting annual ZEV and plug-in hybrid vehicle sales requirements for model years 2026 to 2035 (ZEV program) and increasingly more stringent exhaust and evaporative emission standards (LEV program) to ensure automakers phase out new sales of internal combustion engine vehicles.

California Appliance Efficiency Regulations (Title 20, Sections 1601 through 1608). The 2014 Appliance Efficiency Regulations, adopted by the CEC, include standards for new appliances (e.g., refrigerators) and lighting, if they are sold or offered for sale in California. These standards include minimum levels of operating efficiency, and other cost- effective measures, to promote the use of energy- and water-efficient appliances.

⁵³ California Air Resources Board, California's Advanced Clean Cars Program, www.arb.ca.gov/msprog/acc/acc.htm, accessed April 2020.

⁵⁴ Ibid.

California Building Energy Efficiency Standards (Title 24, Part 6). California's Energy Efficiency Standards for Residential and Nonresidential Buildings, located at Title 24, Part 6 of the California Code of Regulations and commonly referred to as "Title 24," were established in 1978 in response to a legislative mandate to reduce California's energy consumption. Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.⁵⁵ The 2022 standards continue to improve upon previous standards for new construction of, and additions and alterations to, residential and non-residential buildings and became effective January 1, 2023. Compliance with Title 24 is enforced through the building permit process. Key changes included encouraging heat pump technology for space and water heating, setting electric-ready requirements for single-family homes, expanding solar photovoltaic system and battery storage standards, and strengthening ventilation standards to improve indoor air quality.

California Green Building Standards (CALGreen Code). The California Green Building Standards Code (California Code of Regulations, Title 24, Part 11) are mandatory green building standards for new structures. They focus on measures to reduce water consumption, GHG emissions, and materials and waste. These codes are updated every three years, with the 2022 CalGreen code updates effective January 1, 2023. New requirements address requirements for Level 2 electric vehicle chargers and use of solar photovoltaic shade structures instead of shade trees. Voluntary measures focus on higher EV charging requirements for parking facilities.

Regulatory Framework: Regional

South Coast Air Quality Management District. The South Coast Air Quality Management District (SCAQMD) adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the Air Quality Management Plan. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

- Phase out the use and corresponding emissions of chlorofluorocarbons, methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;
- Phase out the large quantity use and corresponding emissions of hydrochlorofluorocarbons by the year 2000;
- Develop recycling regulations for hydrochlorofluorocarbons (e.g., SCAQMD Rules 1411 and 1415);
- Develop an emissions inventory and control strategy for methyl bromide; and

⁵⁵ California Energy Commission, 2019 Building Energy Efficiency Standards, <https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency>, accessed April 2020.

- Support the adoption of a California GHG emission reduction goal.

Southern California Association of Governments. To implement SB 375 and reduce GHG emissions by correlating land use and transportation planning, SCAG adopted the 2020-2045 RTP/SCS on September 3, 2020, calling for \$639 billion in transportation investments and reducing VMT by 19 percent per capita from 2005 to 2035. The updated plan accommodates 21.3 percent growth in population from 2016 (3,933,800) to 2045 (4,771,300) and a 15.6 percent growth in jobs from 2016 (1,848,300) to 2045 (2,135,900). The updated RTP/SCS calls for several land use-based strategies to accommodate growth, minimize criteria pollutant emissions, and achieve climate change objectives:

- Decreasing drive-along work commutes by three percent
- Reducing per capita VMT by five percent and vehicle hours traveled per capita by nine percent
- Increasing transit commuting by two percent
- Reducing travel delay per capita by 26 percent
- Creating 264,500 new jobs annually
- Reducing greenfield development by 29 percent by focusing on smart growth
- Locating six more percent household growth in High Quality Transit Areas (HQTAs), which concentrate roadway repair investments, leverage transit and active transportation investments, reduce regional life cycle infrastructure costs, improve accessibility, create local jobs, and have the potential to improve public health and housing affordability.
- Locating 15 percent more jobs in HQTAs

The 2020-2045 RTP/SCS calls for a 19 percent reduction in per capita GHG emissions by 2035 from 2005 levels. This is intended to be consistent with CARB's performance targets during this same period. The bulk of these reductions are to come from transportation investments, pricing strategies, TDM strategies, and land use programs. On October 30, 2020, CARB accepted the RTP/SCS quantification of GHG emissions on October 30, 2020 (Executive Order G-20-239, SCAG 2020 SCS ARB Acceptance of GHG Quantification Determination).

Regulatory Framework: Local

City of Santa Ana Building Code. The City relies on the 2022 Title 24 building codes and 2022 California Green Building Standards Code (CalGreen, effective January 1, 2023) that promote green building requirements that reduce carbon-based emissions from new construction and remodels.

City of Santa Ana Climate Action Plan. In December 2015, the City adopted the Climate Action Plan (CAP) that documents the City's GHG emissions inventory and sets a 2020 GHG emission reduction target of 15 percent below 2005 levels and a 2035 target of 30 percent below 2005 levels. It projected that 67 percent of these reductions by 2020 would come from energy sector changes, while 17 percent would come from transportation/land use and solid waste/water/wastewater sectors apiece. However, by 2035, the CAP projected that 54 percent of reductions would come from transportation and land use programs.

The City has dedicated \$750,000 in its 2024 budget to prepare an update to the City's CAP.

Existing Conditions

Existing Statewide GHG Emissions. GHG emissions are the result of both natural and human-influenced activities. Regarding human-influenced activities, motor vehicle travel, consumption of fossil fuels for power generation, industrial processes, heating and cooling, landfills, agriculture, and wildfires are the primary sources of GHG emissions. Without human intervention, Earth maintains an approximate balance between the emission of GHG emissions into the atmosphere and the storage of GHG emissions in oceans and terrestrial ecosystems. Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal), have contributed to the rapid increase in atmospheric levels of GHG emissions over the last 150 years.

As reported by the CEC, California contributes approximately one percent of global and 8.2 percent of national GHG emissions.⁵⁶ California represents approximately 12 percent of the national population. Approximately 80 percent of GHGs in California are CO₂ produced from fossil fuel combustion. The current California GHG inventory compiles statewide anthropogenic GHG emissions and carbon sinks/storage from years 2000 through 2019.⁵⁷ It includes estimates for CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆. The GHG inventory for California for years 2010 through 2019 is presented in Table 3. As shown therein, the GHG inventory for California in 2019 was 418.2 million MTCO₂e.

Table 3
California GHG Inventory
(metric tons of carbon dioxide equivalent [MTCO₂e])

	2013	2014	2015	2016	2017	2018	2019
Transportation	161.2	162.6	166.2	169.8	171.2	169.6	166.1
Electric Power	91.7	92.5	90.3	89.0	88.8	89.2	88.2
Industrial	16.8	17.7	18.6	19.2	20.0	20.4	20.6
Commercial & Residential	91.4	88.9	84.8	68.6	62.1	63.1	58.8
Agriculture	161.2	162.6	166.2	169.8	171.2	169.6	166.1
High GWP	91.4	88.9	84.8	68.6	62.1	63.1	58.8
Recycling & Waste	91.7	92.5	90.3	89.0	88.8	89.2	88.2
Total	447.5	443.0	440.7	429.1	424.6	425.1	418.2
Source: California Air Resources Board (2021). California Greenhouse Gas Emission Inventory - 2021 Edition. Data available at: https://ww3.arb.ca.gov/cc/inventory/data/data.htm							

⁵⁶ California Energy Commission, Tracking Progress, Greenhouse Gas Emission Reductions. <https://www.energy.ca.gov/data-reports/tracking-progress>. Accessed July 2023.

⁵⁷ A carbon inventory identifies and quantifies sources and sinks of greenhouse gases. Sinks are defined as a natural or artificial reservoir that accumulates and stores some carbon-containing chemical compound for an indefinite period.

Existing Project Site Emissions. The Project Site is improved with four commercial buildings totaling 173,025 square feet and 617 surface parking spaces. As summarized in Table 4, most existing GHG emissions are associated with the 1,876 daily vehicle trips traveling to and from the Project Site.⁵⁸

Table 4
Annual GHG Emissions Summary (Existing)^a
(metric tons of carbon dioxide equivalent [MTCO₂e])

Secgtor	MTCO₂^a
Area ^b	4
Energy ^c (electricity and natural gas)	724
Mobile	2,482
Solid Waste ^d	50
Water/Wastewater ^e	75
Refrigerants	<1
Total Emissions	3,335
^a CO ₂ e was calculated using CalEEMod and the results are provided in the Technical Appendix. ^b Area source emissions are from landscape equipment and other operational equipment only; hearths omitted. ^c Energy source emissions are based on CalEEMod default electricity and natural gas usage rates. ^d Solid waste emissions are calculated based on CalEEMod default solid waste generation rates. ^e Water/Wastewater emissions are calculated based on CalEEMod default water consumption rates. Source: DKA Planning, 2023.	

Methodology

CEQA Guidelines Section 15064.4(a) assist lead agencies in determining the significance of the impacts of GHG emissions, giving them discretion to determine whether to assess impacts quantitatively or qualitatively. It calls for a good-faith effort to describe and calculate emissions. This emissions inventory also demonstrates the reduction in a project's incremental contribution of GHG emissions that results from regulations and requirements adopted as implementation efforts for these plans for the reduction or mitigation of GHG emissions. As such, it provides further justification that a project is consistent with plans adopted for the purpose of reducing and/or mitigating GHG emissions by a project and over time. The significance of a project's GHG emissions impacts is not based on the amount of GHG emissions resulting from that project.

The City, SCAQMD, Office of Planning and Research (OPR), CARB, California Air Pollution Control Officers Association (CAPCOA), and other applicable agencies have not adopted a numerical threshold of significance for assessing impacts related to GHG emissions. As a result, the methodology for evaluating a project's impacts related to GHG emissions focuses on its consistency with statewide, regional, and local plans adopted for the purpose of reducing and/or mitigating GHG emissions.⁵⁹ This

⁵⁸ Linscott Law & Greenspan, Memorandum: Vehicle Miles Traveled Assessment for the Proposed Cabrillo Town Center Mixed-Use Project; June 27, 2023.

⁵⁹ CEQA Guidelines, Section 14 CCR 15064.4.

evaluation is the sole basis pursuant to CEQA for determining the significance of a project's GHG-related impacts on the environment.

The analysis also calculates the amount of GHG emissions from the Project using recommended air quality models. The primary purpose of quantifying the Project's GHG emissions is to satisfy CEQA Guidelines Section 15064.4(a). The estimated emissions inventory is also used to determine if there would be a reduction in the Project's incremental contribution of GHG emissions because of compliance with regulations requirements adopted to implement plans for reducing or mitigating GHG emissions. However, the significance of the Project's GHG emissions is not based on the amount of emissions from the Project.

Consistency with Applicable Plans and Policies

A consistency analysis has been provided that describes the Project's compliance with or exceedance of performance-based standards, and consistency with applicable plans and policies adopted for the purpose of reducing GHG emissions, included in the applicable portions of the 2022 Climate Change Scoping Plan, the 2020-2045 RTP/SCS, and the City's CAP.

As part of the Climate Change Scoping Plan, a statewide emissions inventory was developed as required by AB 32 which directs CARB to develop and track GHG emissions reductions to document progress towards the state GHG target. The emissions inventory also takes into account GHG emissions reduction measures developed by CARB to achieve state targets. Consistency with the Climate Change Scoping Plan is evaluated by comparing the Project's GHG emissions reduction measures to those contained in the Scoping Plan.

As noted in CEQA Guidelines Section 15064.4(b)(3), consistency with such plans and policies "must reduce or mitigate the project's incremental contribution of greenhouse gas emissions." To demonstrate such incremental reductions, this chapter estimates reductions of Project-related GHG emissions resulting from consistency with plans. Consistent with evolving scientific knowledge, approaches to GHG emissions quantification may continue to evolve in the future.

While there are many ways to quantify the efficiency of the GHG reduction measures provided for in the plans and policies, this analysis compares the Project's GHG emissions to the emissions that would be generated by the Project in the absence of any GHG emissions reduction measures (i.e., the Project Without Reduction Features Scenario. This approach is consistent with the concepts used in CARB's 2022 Climate Change Scoping Plan. This methodology is used to analyze consistency with applicable GHG emissions reduction plans and policies and demonstrate the efficacy of the measures contained therein, but it is not a threshold of significance.

The analysis in this section includes potential emissions under the Project Without Reduction Features scenarios and from the Project at build-out based on actions and mandates expected to be in force in 2026. Early-action measures identified in the Climate Change Scoping Plan that have not been approved were not credited in this analysis. By not speculating on potential regulatory conditions, the analysis takes a conservative approach that likely overestimates the Project's GHG emissions at build-out. The Project Without Reduction Features scenario is used to establish a comparison with project-generated

GHG emissions. The Project Without Reduction Features scenario does not consider site-specific conditions, project design features, or prescribed mitigation measures. As an example, The Project Without Reduction Features scenario would apply a base Institute of Transportation Engineers (ITE) trip-generation rate for the Project and would not consider site-specific benefits resulting from the proposed mix of uses or close proximity to public transportation.

Based on further guidance from the 2022 Scoping Plan, this analysis also evaluates whether the Project would incorporate key GHG strategies for residential and mixed-use projects:⁶⁰

- Provide EV charging infrastructure that, at a minimum, meets the most ambitious voluntary standard in the California Green Building Standards Code.
- Locate projects on infill sites surrounded by urban uses and is served by existing utilities and essential public services (e.g., transit, streets, water, sewer).
- Does not result in the loss or conversion of natural and working lands.
- Consists of transit-supportive densities (i.e., 20 dwelling units per acre), is within 0.5 mile of transit stops, or satisfies more detailed and stringent criteria in the regional SCS.
- Reduces parking requirements.
- Dedicating at least 20 percent of residents as affordable to lower-income residents.
- Results in no net loss of existing affordable units.
- Uses all-electric appliances without any natural gas connections and does not use propane or other fossil fuels for space heating, water heating, or indoor cooking.

Pursuant to the 2022 Scoping Plan, these project attributes help identify residential and mixed-use projects that are “clearly consistent with the State’s climate goals.”

Quantification of Emissions

This analysis quantifies the Project’s GHG emissions for information purposes, considering the GHG reduction features that would be incorporated into the Project’s design. It relies on the California Emissions Estimator Model (CalEEMod) is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from a variety of land use projects. CalEEMod was developed in collaboration with the air districts of California, who provided data (e.g., emission factors, trip lengths, meteorology, source inventory) to account for local requirements and conditions. The model is considered by SCAQMD to be an accurate and comprehensive tool for quantifying air quality and GHG impacts from land use projects throughout California.

This analysis quantifies the Project’s emissions and compares them to a Project without Reduction

⁶⁰ California Air Resources Board, 2022 Scoping Plan for Achieving Carbon Neutrality, Appendix D (Local Actions) Table 3; November 2022.

Features scenario, as defined by CARB's most updated projections for AB 32 and SB 32. This comparison is included for informational purposes to disclose the relative carbon efficiency of the Project and to determine if there would be a reduction in the Project's incremental contribution of GHG emissions based on compliance with regulations and requirements adopted to implement plans for reducing GHG emissions. The Project Without Reduction Features scenario does not consider site-specific conditions, Project design features, or prescribed mitigation measures. This approach is consistent with the concepts used in the CARB's *Climate Change Scoping Plan* for the implementation of AB 32. This methodology is used to analyze consistency with applicable GHG reduction plans and policies and demonstrate the efficacy of the measures contained therein, but it is not a threshold of significance. The Project Without Reduction Features scenario is similar to the approach currently used by the City with respect to evaluating a proposed development project's consistency with CARB's Scoping Plans. Currently, the City evaluates the proposed project under two scenarios—one scenario without GHG reduction measures (akin to the Project Without Reduction Features scenario) and a second scenario with GHG reduction measures.

The Project without Reduction Features scenario also does not account for energy efficiency measures that would go beyond Title 24 building standards or trip reductions from the co-location of uses and availability of public transit. However, the Project without Reduction Features does consider regulatory measures included in CARB's *Climate Change Scoping Plan*, SCAG's 2020-2045 RTP/SCS, and the City's CAP.

Project GHG Emissions

The California Climate Action Registry (Climate Registry) General Reporting Protocol provides basic procedures and guidelines for calculating and reporting GHG emissions from a number of general and industry-specific activities.⁶¹ The General Reporting Protocol is based on the "Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard" developed by the World Business Council for Sustainable Development and the World Resources Institute through "a multi-stakeholder effort to develop a standardized approach to the voluntary reporting of GHG emissions."⁶² Although no numerical thresholds of significance have been developed, and no specific protocols are available for land use projects, the General Reporting Protocol provides a basic framework for calculating and reporting GHG emissions from the project. The information provided in this section is consistent with the General Reporting Protocol's reporting requirements.

The General Reporting Protocol recommends the separation of GHG emissions into three categories that reflect different aspects of ownership or control over emissions. They include the following:

- Scope 1: Direct, onsite combustion of fossil fuels (e.g., natural gas, propane, gasoline, and diesel).
- Scope 2: Indirect, offsite emissions associated with purchased electricity or purchased steam.

⁶¹ California Climate Action Registry, General Reporting Protocol Version 3.1, January 2009.

⁶² Ibid.

- Scope 3: Indirect emissions associated with other emissions sources, such as third-party vehicles and embodied energy (e.g., energy used to convey, treat, and distribute water and wastewater).⁶³

The General Reporting Protocol provides a range of basic calculations methods. However, the General Reporting Protocol calculations are typically designed for existing buildings or facilities. These retrospective calculation methods are not directly applicable to planning and development situations where buildings do not yet exist.

CARB recommends consideration of indirect emissions to provide a more complete picture of the GHG emissions footprint of a facility. Annually reported indirect energy usage aids the conservation awareness of a facility and provides information to CARB to be considered for future strategies.⁶⁴ For example, CARB has proposed requiring the calculation of direct and indirect GHG emissions as part of the AB 32 reporting requirements. Additionally, OPR has noted that lead agencies “should make a good-faith effort, based on available information, to calculate, model, or estimate... GHG emissions from a project, including the emissions associated with vehicular traffic, energy consumption, water usage and construction activities.”⁶⁵ Therefore, direct and indirect emissions have been calculated for the Project.

A fundamental difficulty in the analysis of GHG emissions is the global nature of the existing and cumulative future conditions. Changes in GHG emissions can be difficult to attribute to a particular planning program or project because the planning effort or project may cause a shift in the locale for some type of GHG emissions, rather than causing “new” GHG emissions. As a result, there is an inability to conclude whether a project’s GHG emissions represent a net global increase, reduction, or no change in GHG emissions that would exist if the project were not implemented. The analysis of the Project’s GHG emissions is particularly conservative in that it assumes all the GHG emissions are new additions to the atmosphere.

Construction

The Project’s construction emissions were calculated using CalEEMod Version 2022.1.1.14. Details of the modeling assumptions and emission factors are provided in the Technical Appendix. CalEEMod calculates emissions from off-road equipment usage and on-road vehicle travel associated with haul, delivery, and construction worker trips. GHG emissions during construction were forecasted based on the proposed construction schedule and included the mobile source and fugitive dust emissions factors derived from CalEEMod.

The calculations of the emissions generated during Project construction activities reflect the types and quantities of construction equipment that would be used to remove existing pavement, grade, and

⁶³ Embodied energy is a scientific term that refers to the quantity of energy required to manufacture and supply to the point of use a product, material, or service.

⁶⁴ California Air Resources Board, Initial Statement of Reasons for Rulemaking, Proposed Regulation for Mandatory Reporting of Greenhouse Gas Emissions Pursuant to the California Global Warming Solutions Act of 2006 (AB 32), Planning and Technical Support Division Emission Inventory Branch, October 19, 2007.

⁶⁵ OPR Technical Advisory, p. 5.

excavate the Project Site; construct the proposed building and related improvements; and plant new landscaping within the Project Site.

In accordance with SCAQMD's guidance, GHG emissions from construction were amortized (i.e., averaged annually) over the lifetime of the Project. Because emissions from construction activities occur over a relatively short-term period, they contribute a relatively small portion of the overall lifetime GHG emissions for the Project. In addition, GHG emissions reduction measures for construction equipment are relatively limited. Thus, SCAQMD recommends that construction emissions be amortized over a 30-year project lifetime, so that GHG emissions reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies.⁶⁶ As a result, the Project's total construction GHG emissions were divided by 30 to determine an approximate annual construction emissions estimate comparable to operational emissions.

Operation

Similar to construction, CalEEMod is used to calculate potential GHG emissions generated by new land uses on the Project Site, including area sources, electricity, natural gas, mobile sources, stationary sources (i.e., emergency generators), solid waste generation and disposal, and water usage/wastewater generation.

Area source emissions include landscaping equipment that are based on the size of the land uses (e.g., square footage or dwelling unit), the GHG emission factors for fuel combustion, and the global warming potential (GWP) values for the GHG emissions emitted.

GHG emissions associated with electricity demand are based on the size of the land uses, the electrical demand factors for the land uses, the GHG emission factors for the electricity utility provider, and the GWP values for the GHG emissions emitted. As with electricity, the emissions of GHG emissions associated with natural gas combustion are based on the size of the land uses, the natural gas combustion factors for the land uses in units of million British thermal units (MMBtu), the GHG emission factors for natural gas combustion, and the GWP values for the GHG emissions emitted.⁶⁷

Mobile source GHG emissions are calculated based on an estimate of the Project's annual VMT, which is derived using CalEEMod based on the trip generation provided in the Transportation Study prepared for the Project. The CalEEMod-derived VMT values account for the daily and seasonal variations in trip frequency and length associated with new employee and visitor trips to and from the Project Site and other activities that generate a vehicle trip.

Stationary source GHG emissions are based on proposed stationary sources (i.e., emergency generators) that would be provided on the Project Site.

⁶⁶ SCAQMD Governing Board Agenda Item 31, December 5, 2008.

⁶⁷ Energy consumption estimates with CalEEMod 2022.1.1.14.1.12 are based on the California Energy Commission's 2020 Residential Appliance Saturation Survey (residential uses) and 2021 Commercial Forecast database, both of which reflected the 2019 Title 24 energy efficiency standards. These energy consumption estimates were adjusted to reflect the 2022 Title 24 standards that cumulatively produce a 0.49 percent reduction in electricity use and 0.45 percent reduction in natural gas use when compared to the 2019 standards.

GHG emissions associated with solid waste disposal are based on the size of the Project's proposed land uses, the waste disposal rate for the land uses, the waste diversion rate, the GHG emission factors for solid waste decomposition, and the GWP values for the GHG emissions emitted.

GHG emissions related to water usage and wastewater generation are based on the size of the land uses, the water demand factors, the electrical intensity factors for water supply, treatment, and distribution, electrical intensity factors for wastewater treatment, the GHG emission factors for the electricity utility provider, and the GWP values for the GHG emissions emitted.

The analysis of Project GHG emissions at buildout uses assumptions in CARB's EMFAC2021 model (1.0.1) and considers actions and mandates expected to be in force when the Project is operational (e.g., Pavley I Standards, full implementation of California's 33 percent RPS by 2030 and 50 percent by 2050 and the California LCFS). In addition, because mobile source GHG emissions are directly dependent on the number of vehicle trips, a decrease in the number of project-generated trips because of project features (e.g., proximity to transit) would provide a proportional reduction in mobile source GHG emissions compared to a generic project without such locational benefits. Calculation of Project GHG emissions conservatively did not include actions and mandates that are not already in place but are expected to be enforced when the Project is operational (e.g., Pavley II, which could further reduce GHG emissions from use of light-duty vehicles by 2.5 percent). Similarly, emissions reductions regarding Cap-and-Trade were not included in this analysis as they applied to other future reductions in non-transportation sectors. As for the Cap-and-Trade program's benefits for the transportation sector, the analysis utilizes CARB's assumptions in EMFAC2021 for any short-term reductions in GHG emissions. By not speculating on potential regulatory conditions, the analysis takes a conservative approach that likely overestimates the Project's GHG emissions at buildout, because the state is expected to implement several policies and programs aimed at reducing GHG emissions from the land use and transportation sectors to meet the state's long-term climate goals.

There are no GHG emissions thresholds adopted by the SCAQMD that are applicable to the Project. In 2008, SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds.⁶⁸ Within its October 2008 document, the SCAQMD proposed the use of a percent emission reduction target to determine the significance for commercial/residential projects that emit greater than 3,000 MTCO₂e per year. Under this proposal, such commercial and residential projects would have been assumed to have a less than significant impact on climate change. However, this proposed screening threshold was not adopted by the SCAQMD.

Consistency with Applicable Plans and Policies

A consistency analysis has been provided that describes the Project's compliance with or exceedance of performance-based standards, and consistency with applicable plans and policies adopted for the

purpose of reducing GHG emissions, included in the applicable portions of the *Climate Change Scoping Plan*, the 2020-2045 RTP/SCS, and the City's CAP.

As part of the *Climate Change Scoping Plan*, a statewide emissions inventory was developed as required by AB 32 which directs CARB to develop and track GHG emissions reductions to document progress towards the state GHG target. The emissions inventory also considers GHG emissions reduction measures developed by CARB to achieve state targets. Consistency with the *Climate Change Scoping Plan* is evaluated by comparing the Project's GHG reduction measures to those contained in the Scoping Plan.

As noted in CEQA Guidelines Section 15064.4(b)(3), consistency with such plans and policies "must reduce or mitigate the project's incremental contribution of greenhouse gas emissions." To demonstrate such incremental reductions, this chapter estimates reductions of project-related GHG emissions resulting from consistency with plans. Consistent with evolving scientific knowledge, approaches to GHG quantification may continue to evolve in the future.

While there are many ways to quantify the efficiency of the GHG reduction measures provided for in the plans and policies, this analysis compares the Project's GHG emissions to the emissions that would be generated by the Project in the absence of any GHG reduction measures (i.e., the Project Without Reduction Features scenario. This approach is consistent with the concepts used in CARB's 2022 Climate Change Scoping Plan. This methodology is used to analyze consistency with applicable GHG reduction plans and policies and demonstrate the efficacy of the measures contained therein, but it is not a threshold of significance.

The analysis in this section includes potential emissions under a Project Without Reduction Features scenarios and from the Project at build-out based on actions and mandates expected to be in force in 2027. Early-action measures identified in the Climate Change Scoping Plan that have not been approved were not credited in this analysis. By not speculating on potential regulatory conditions, the analysis takes a conservative approach that likely overestimates the Project's GHG emissions at build-out. The Project Without Reduction Features scenario is used to establish a comparison with project-generated GHG emissions. The Project Without Reduction Features scenario does not consider site-specific conditions, project design features, or prescribed mitigation measures. As an example, a Project Without Reduction Features scenario would apply a base ITE trip-generation rate for the project and would not consider site-specific benefits resulting from the proximity to public transportation.

Thresholds of Significance

State CEQA Guidelines Appendix G

In accordance with Appendix G of the State CEQA Guidelines (Appendix G), a project would have a significant impact related to GHG emissions if the project would do the following:

- a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment;**

b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHG emissions.

The Project would comply with all applicable state and local regulatory requirements, including the provisions set forth in the City's Building Ordinance. Furthermore, the Project would also include sustainability features related to energy conservation, water conservation, and waste reduction.

Project Impacts

Consistency with Applicable Plans and Policies

The discussion below describes the extent the Project complies with or exceeds the performance-based standards included in the regulations outlined in the *Climate Change Scoping Plan* and the 2020-2045 RTP/SCS, each of which identifies GHG-reducing measures that directly and indirectly apply to the Proposed Project. This analysis also evaluates the Project's consistency with the City's CAP. As shown herein, the Project would be consistent with the applicable GHG reduction plans and policies.

Statewide: Climate Change Scoping Plan

The goal to reduce GHG emissions to 1990 levels by 2020 (Executive Order S-3-05) was codified by the Legislature as the 2006 Global Warming Solutions Act (AB 32). In 2008, CARB approved a Climate Change Scoping Plan as required by AB 32 that has been updated over time to reflect updated strategies. In addition, SB 32 was approved in 2016, calling for deeper GHG emissions reductions by 2030. The 2022 Climate Change Scoping Plan addresses the 2030 horizon but also addresses the objective of carbon neutrality by 2045 and has a range of GHG emissions reduction actions that include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 implementation fee to fund the program. The following discussion demonstrates how the pertinent reduction actions relate to and reduce project-related GHG emissions.

Table 5 evaluates the Project's consistency with applicable reduction actions/strategies by emissions source category outlined in the *2022 Climate Change Scoping Plan Update*.⁶⁹ When compared to SB 32, the Proposed Project would be consistent with its objectives and the GHG reduction-related actions and strategies of the 2022 Scoping Plan. Table 5 confirms that the Proposed Project is consistent with the Scoping Plan's focus on increasing renewable energy use, putting more electric cars on the road, and improving energy efficiency. Although a number of these strategies are currently promulgated, some have not yet been formally proposed or adopted. It is expected that these measures or similar actions to reduce GHG emissions will be adopted as required to achieve statewide GHG emissions targets.

Independent studies confirm CARB's determination that the state's existing and proposed regulatory framework will put the state on a pathway to reduce its GHG emissions level to 40 percent below 1990 levels by 2030, and to 85 percent below 1990 levels by 2045 to meet carbon neutrality objectives if

⁶⁹ An evaluation of stationary sources is not necessary as the stationary sources emissions will be created by emergency generators that would only be used in an emergency.

additional appropriate reduction measures are adopted. Even though these studies did not provide an exact regulatory and technological roadmap to achieve the 2030 and 2050 goals, they demonstrated that various combinations of policies could allow the statewide emissions level to remain very low through 2045, suggesting that the combination of new technologies and other regulations not analyzed in the studies could allow the state to meet the 2045 target.

Table 5
Consistency Analysis—2022 Scoping Plan Update

Sector	Actions and Strategies	Statutes, Executive Orders, Other Direction	Project Consistency Analysis
Smart Growth / Vehicle Miles Traveled (VMT)	VMT per capita reduced 25% below 2019 levels by 2030, and 30% below 2019 levels by 2045	SB 375: Reduce demand for fossil transportation fuels and GHG	No Conflict. The Project represents an infill development within an urbanized area that would concentrate new residences and jobs within an HQTa and reduce per capita VMT and GHG emissions. The Project would be consistent with SB 375 and its VMT reduction goals, as well as the GHG and transportation goals of the 2020-2045 RTP/SCS. The Project Site is located in both a High Quality Transit Area (HQTa) and a Transit Priority Area due to the level of local bus service.
Light-duty Vehicle (LDV) Zero Emission Vehicles (ZEVs)	100% of Light Duty Vehicle sales are ZEV by 2035	EO N-79-20: Reduce demand for fossil transportation fuels and GHGs, and improve air quality. In November 2022, the Advanced Clean Cars II regulations took effect, setting ZEV and plug-in hybrid vehicle sales requirements for model years 2026 to 2035 (ZEV program) and increasingly stringent emission standards (LEV program) to ensure automakers phase out sales of internal combustion engine vehicles.	No Conflict. Emissions from vehicle engines from the Project would be regulated by State regulations governing technology and cleaner emissions.
Truck ZEVs	100% of medium-duty (MDV)/HDV sales are ZEV by 2040 (AB 74 University of California Institute of Transportation Studies [ITS] report)	EO N-79-20: Reduce demand for fossil transportation fuels and GHGs, and improve air quality. CARB's Advanced Clean Truck Regulation accelerates the transition of zero-emission medium- and heavy-duty vehicles from 2024 to 2035.	No Conflict. While the Project would not generate substantial medium- and heavy-duty truck traffic, it would not impede the advancement of cleaner trucks over time.

Table 5
Consistency Analysis—2022 Scoping Plan Update

Sector	Actions and Strategies	Statutes, Executive Orders, Other Direction	Project Consistency Analysis
		CARB also adopted the Innovative Clean Transit measure in 2018 that requires all public transit agencies to transition to zero emission fleets.	
Aviation	20% of aviation fuel demand is met by electricity (batteries) or hydrogen (fuel cells) in 2045. Sustainable aviation fuel meets most or the rest of the aviation fuel demand that has not already transitioned to hydrogen or batteries.	CARB focuses on reducing emissions from ground support equipment and airport transit vehicles. It is also working with national and international entities to tighten aircraft emission standards. AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. This strategy focuses on industry availability of clean fuel alternatives over time. The Project would not impede the advancement of a cleaner aviation industry over time.
Ocean-going Vessels (OGVs)	2020 OGV At-Berth regulation fully implemented, with most OGVs utilizing shore power by 2027. 25% of OGVs utilize hydrogen fuel cell electric technology by 2045.	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory In 2015, Executive Order B-32-15 called. For a less polluting freight transport system that addressed OGVs, transport refrigeration units, and clean trucks.	No Conflict. While the Project would not directly impact trade or OGVs, it would not impede the advancement of a cleaner on- or off-shore sources over time.
Port Operations	100% of cargo handling equipment is zero-emission by 2037. 100% of drayage trucks are zero emission by 2035.	Executive Order N-79-20: Reduce demand for petroleum fuels and GHGs, and improve air quality. AB 197: direct emissions reductions for sources covered by the AB 32 Inventory. In 2015, Executive Order B-32-15 called. For a less polluting freight transport system that addressed OGVs, transport refrigeration units, and clean trucks.	No Conflict. While the Project would not directly impact trade or port operations, it would not impede the advancement of a cleaner on-shore sources over time.
Freight and Passenger rail	100% of passenger and other locomotive sales are ZEV by 2030. 100% of line haul locomotive sales are ZEV by 2035. Line haul and passenger rail rely primarily on hydrogen fuel	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory In 2015, Executive Order B-32-15 called. For a less polluting freight transport system that addressed OGVs, transport refrigeration units, and clean trucks.	No Conflict. While the Project would not directly impact freight or passenger rail, it would not impede the advancement of a cleaner locomotives over time.

Table 5
Consistency Analysis—2022 Scoping Plan Update

Sector	Actions and Strategies	Statutes, Executive Orders, Other Direction	Project Consistency Analysis
	cell technology, and others primarily utilize electricity.		The Project's land uses would not include freight transportation or warehousing that would be subject to the California Sustainable Freight Action Plan. Therefore, the Project would not interfere or impede the implementation of the Sustainable Freight Action Plan.
Oil and Gas Extraction	Reduce oil and gas extraction operations in line with petroleum demand by 2045.	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. While the Project would not directly impact oil extraction, it would help reduce demand for petroleum products from energy, area, and mobile sources.
Petroleum Refining	CCS on majority of operations by 2030, beginning in 2028 Production reduced in line with petroleum demand.	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. While the Project would not directly impact oil extraction, it would help reduce demand for petroleum products that require refining.
Electricity Generation	Sector GHG target of 38 MMTCO ₂ e in 2030 and 30 MMTCO ₂ e in 2035. Retail sales load coverage 20 gigawatts (GW) of offshore wind by 2045. Meet increased demand for electrification without new fossil gas-fired resources.	SB 350 and SB 100: Reduce GHGs and improve air quality. AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. The Project would not directly impact the sources of electricity generation.
New Residential and Commercial Buildings	All electric appliances beginning 2026 (residential) and 2029 (commercial), contributing to 6 million heat pumps installed statewide by 2030.	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. The Project would incorporate appliances that are consistent with Title 24 and Green Building requirements and consistent with the reduction of residential and commercial energy use.
Existing Residential Buildings	80% of appliance sales are electric by 2030 and 100% of	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. The Project would comply with Title 24 and Green

Table 5
Consistency Analysis—2022 Scoping Plan Update

Sector	Actions and Strategies	Statutes, Executive Orders, Other Direction	Project Consistency Analysis
	appliance sales are electric by 2035. Appliances are replaced at end of life such that by 2030 there are 3 million all-electric and electric-ready homes—and by 2035, 7 million homes—as well as contributing to 6 million heat pumps installed statewide by 2030.		Building requirements during construction and any future retrofit or appliance replacement requirements.
Existing Commercial Buildings	80% of appliance sales are electric by 2030, and 100% of appliance sales are electric by 2045. Appliances are replaced at end of life, contributing to 6 million heat pumps installed statewide by 2030.	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. While the Project is not an existing commercial development, it would not interfere with any future requirements to retrofit commercial appliances.
Food Products	7.5% of energy demand electrified directly and/or indirectly by 2030; 75% by 2045	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. The Project would not directly impact sources of energy for food production.
Construction Equipment	25% of energy demand electrified by 2030 and 75% electrified by 2045	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. The Project would not directly impact sources of energy for construction equipment.
Chemicals and Allied Products; Pulp and Paper	Electrify 0% of boilers by 2030 and 100% of boilers by 2045. Hydrogen for 25% of process heat by 2035 and 100% by 2045 Electrify 100% of other energy demand by 2045.	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. The Project would not directly impact the sources of energy for boilers.
Stone, Clay, Glass, and Cement	CCS on 40% of operations by 2035 and on all facilities by 2045 Process emissions reduced through alternative materials and CCS	SB 596: Reduce demand for fossil energy, process emissions, and GHGs, and improve air quality. AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. The Project would not directly impact the sources of energy for stone, clay, glass, and cement facilities.

Table 5
Consistency Analysis—2022 Scoping Plan Update

Sector	Actions and Strategies	Statutes, Executive Orders, Other Direction	Project Consistency Analysis
Other Industrial Manufacturing	0% energy demand electrified by 2030 and 50% by 2045	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. The Project would not directly impact the sources of energy for industrial facilities.
Combined Heat and Power	Facilities retire by 2040.	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. The Project would not affect facilities that produced heat and power.
Agriculture Energy Use	25% energy demand electrified by 2030 and 75% by 2045	AB 197: direct emissions reductions for sources covered by the AB 32 Inventory	No Conflict. The Project would not affect directly agricultural sources of energy.
Low Carbon Fuels for Transportation	Biomass supply is used to produce conventional and advanced biofuels, as well as hydrogen.	<p>AB 197: direct emissions reductions for sources covered by the AB 32 Inventory</p> <p>In November 2022, the Advanced Clean Cars II regulations took effect, setting low emission standards for transportation.</p>	<p>No Conflict. This regulatory program applies to fuel suppliers, not directly to land use development. GHG emissions related to vehicular travel associated with the Project would benefit from this regulation because fuel used by Project-related vehicles would be required to comply with the LCFS. Mobile source GHG emissions estimates were calculated using CalEEMod that includes implementation of the LCFS into mobile source emission factors. The current LCFS targets a 20% reduction in CI from a 2010 baseline by 2030.</p> <p>GHG emissions generated by Project-related vehicular travel would benefit from the Advanced Clean Cars Program.</p>
Low Carbon Fuels for Buildings and Industry	In 2030s biomethane blended in pipeline Renewable hydrogen blended in fossil gas pipeline at 7% energy (~20% by volume), ramping up between 2030 and	SB 350: The Clean Energy and Pollution Reduction Act of 2015 increases the standards of the California RPS program by requiring that the amount of electricity generated and sold to retail customers per year from eligible renewable energy	No Conflict. The Project would comply with this this action/strategy being located within the Southern California Edison (SCE) and Southern California Gas (SCG) service areas

Table 5
Consistency Analysis—2022 Scoping Plan Update

Sector	Actions and Strategies	Statutes, Executive Orders, Other Direction	Project Consistency Analysis
	2040 In 2030s, dedicated hydrogen pipelines constructed to serve certain industrial clusters	<p>resources be increased to 50 percent by 2030. Required measures include increasing RPS to 50 percent of retail sales by 2030, establishing annual targets for statewide energy efficiency that achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030.</p> <p>SB 100: The California Renewables Portfolio Standard Program (2018) requires retail sellers to procure renewable energy that is at least 50 percent by December 31, 2026 and 60 percent by December 31, 2030. It requires local publicly owned electric utilities to procure a minimum quantity of electricity from renewable energy resources of 44 percent of retail sales by December 31, 2024 and 60 percent by December 31, 2030.</p>	<p>and would comply with CalGreen and Title 24 energy efficiency standards. SCE must generate electricity that would increase renewable energy resources to 33 percent by 2020 and 50 percent by 2030. As SCE would provide electricity service to the Project Site, by 2030 the Project would use electricity consistent with the requirements of SB 350. With regard to gas service, SCG has committed to achieving net zero GHG emissions in its operations and delivery of gas by 2045. This would be accomplished with clean fuels and hydrogen technology, renewable natural gas, and hydrogen blends.</p> <p>As required under SB 350, doubling of the energy efficiency savings from retail customers by 2030 would primarily rely on the existing suite of building energy efficiency standards under CCR Title 24, Part 6 (consistency with this regulation is discussed below) and utility-sponsored programs such as rebates for high-efficiency appliances, HVAC systems, and insulation.</p>
Non-combustion Methane Emissions	Increase landfill and dairy digester methane capture. Some alternative manure management deployed for smaller dairies Moderate adoption of enteric	SB 1383 (2016) requires CARB to set 2030 emission reduction targets of 40 percent for methane and hydrofluorocarbons and 50 percent black carbon emissions below 2013 levels. The Project would comply with the CARB SLCP	No Conflict. This program applies to State regulators looking to reduce methane emissions from landfill and dairy facilities and is not directly related to development of the Project.

Table 5
Consistency Analysis—2022 Scoping Plan Update

Sector	Actions and Strategies	Statutes, Executive Orders, Other Direction	Project Consistency Analysis
	strategies by 2030 Divert 75% of organic waste from landfills by 2025. Oil and gas fugitive methane emissions reduced 50% by 2030 and further reductions as infrastructure components retire in line with reduced fossil gas demand	Reduction Strategy by using HVAC equipment with lower GWP refrigerants.	However, the Project would not interfere or impede efforts to reduce such pollutants.
High GWP Potential Emissions	Low GWP refrigerants introduced as building electrification increases, mitigating HFC emissions	SB 605 (2014) directed CARB to develop a comprehensive Short-Lived Climate Pollutant (SLCP) strategy.	No Conflict. This program applies to State regulators looking to reduce high GWP refrigerants and is not directly related to development of the Project. However, the Project would not interfere or impede efforts to reduce such pollutants.
Natural and Working Lands	Conserve 30% of the state's NWL and coastal waters by 2030. Implement near- and long-term actions to accelerate natural removal of carbon and build climate resilience in our forests, wetlands, urban greenspaces, agricultural soils, and land conservation activities in ways that serve all communities—and in particular low-income, disadvantaged, and vulnerable communities.	EO N-82-20 and SB 27: CARB to include an NWL target in the Scoping Plan. AB 1757: Establish targets for carbon sequestration and nature-based climate solutions. SB 1386: NWL are an important strategy in meeting GHG reduction goals.	No Conflict. This program applies to State regulators governing Natural and Working Lands and is not directly related to development of the Project. However, the Project would not interfere or impede implementation of the Integrated Natural and Working Lands Implementation Plan, EO N-82-20, SB 27, or SB 1386.
Forests and Shrublands	At least 2.3 million acres treated statewide annually in forests, shrublands/chaparral, and grasslands, comprised of regionally specific management strategies that include prescribed	Restore health and resilience to overstocked forests and prevent carbon losses from severe wildfire, disease, and pests. Improve air quality and reduce health costs related to wildfire emissions. Improve water quantity and quality and improve rural	No Conflict. This program applies to State regulators governing forest and shrubland management and is not directly related to development of the Project. However, the Project would not interfere or impede implementation

Table 5
Consistency Analysis—2022 Scoping Plan Update

Sector	Actions and Strategies	Statutes, Executive Orders, Other Direction	Project Consistency Analysis
	fire, thinning, harvesting, and other management actions. No land conversion of forests, shrublands/chaparral, or grasslands.	economies. Provide forest biomass for resource utilization. EO B-52-18: CARB to increase the opportunity for using prescribed fire. AB 1504 (Skinner, Chapter 534, Statutes of 2010): CARB to recognize the role forests play in carbon sequestration and climate mitigation.	of EO B-52-18, AB 1504, or the Forest Carbon Plan.
Grasslands	At least 2.3 million acres treated includes increased management of grasslands interspersed in forests to reduce fuels surrounding communities using management strategies appropriate for grasslands. No land conversion of forests, shrublands/chaparral, or grasslands.		No Conflict. This program applies to State regulators of grasslands and is not directly related to development of the Project. However, the Project would not interfere or impede efforts to reduce fuels in grasslands surrounding communities.
Croplands	Implement climate smart practices for annual and perennial crops on ~80,000 acres annually. Land easements/ conservation on annual crops at ~5,500 acres annually. Increase organic agriculture to 20% of all cultivated acres by 2045 (~65,000 acres annually).	SB 859: Recognizes the ability of healthy soils practices to reduce GHG emissions from agricultural lands.	No Conflict. This program applies to State regulators overseeing croplands and is not directly related to development of the Project. However, the Project would not interfere or impede SB 859 and efforts to increase organic agriculture and conserve croplands.
Developed Lands	Increase urban forestry investment by 200% above current levels and utilize tree watering that is 30% less sensitive to drought. Establish defensible space that accounts for property boundaries.	AB 2251 (Calderon, Chapter 186, Statutes of 2022): Increase urban tree canopy 10% by 2035.	No Conflict. This program applies to State regulators addressing urban forestry and is not directly related to development of the Project. However, the Project would not interfere or impede implementation of AB 2251

Table 5
Consistency Analysis—2022 Scoping Plan Update

Sector	Actions and Strategies	Statutes, Executive Orders, Other Direction	Project Consistency Analysis
			and efforts to increase the urban canopy.
Wetlands	Restore 60,000 acres of Delta wetlands		No Conflict. This program applies to State regulators restoring Delta wetlands and is not directly related to development of the Project. However, the Project would not interfere or impede efforts to restore wetland ecologies.
Sparsely Vegetated Lands	Land conversion at 50% of the Reference Scenario land conversion rate.		No Conflict. This program applies to State regulators slowing the conversion of sparsely vegetated lands and is not directly related to development of the Project. However, the Project would not interfere or impede efforts to slow urban conversion of such lands.
Cap-and-Trade Program	Implement the post-2020 Cap-and-Trade Program with declining annual caps.	AB 398 was enacted in 2017 to extend and clarify the role of the state's Cap-and-Trade Program from January 1, 2021, through December 31, 2030. As part of AB 398, refinements were made to the Cap-and-Trade program to establish updated protocols and allocation of proceeds to reduce GHG emissions.	Not Applicable. This applies to the market-based program to reduce GHG emissions over time and is not applicable to a development project.
Source: DKA Planning, 2023 based on California Air Resources Board, 2022 Scoping Plan for Achieving Carbon Neutrality, Scoping Plan Scenario.			

Based on the analysis in Table 5, the Project would be consistent with the State's 2022 Climate Change Scoping Plan's objective of achieving carbon neutrality statewide by 2045 and reducing 2030 GHG emissions in accord with SB 32.

The Project would also benefit from statewide and utility-provider efforts towards increasing the portion of electricity provided from renewable resources. SCE has committed to increasing renewable sources that exceed the Renewables Portfolio Standard requirements. The Project would include energy efficient mechanical systems, energy efficient glazing and window frames, Energy-Star appliances to be installed on-site, and the use of high-efficiency lighting. The Project would also benefit from statewide efforts to improve fuel economy of vehicles. The Project would also help reduce VMT growth given its design and complementary mix of uses at an infill site that is accessible to existing public transit.

As summarized in Table 6, the Project's attributes for reducing GHG emissions consistent with many of the 2022 Scoping Plan's suggested attributes for housing and mixed-use projects that are evaluated under CEQA.

Table 6
Consistency Analysis—2022 Scoping Plan Update
(Key Residential and Mixed-Use Project Attributes That Reduce GHGs)

Priority Area	Key Project Attribute	Project Consistency
Transportation Electrification	Provides EV charging infrastructure that, at minimum, meets the most ambitious voluntary standard in the California Green Building Standards Code at the time of project approval.	Not Consistent. The Project would provide 90 spaces with electric vehicle charging equipment. CalGreen's Tier 2 voluntary standards include 40 percent of spaces with Level 2 EV charging receptacles, 15 percent of spaces equipped with Level 2 chargers, and one receptacle per dwelling unit. While the Project would not satisfy Tier 2 voluntary standards, it would further the expansion of the EV charging network.
VMT Reduction	Is located on infill sites that are surrounded by existing urban uses and reuses or redevelops previously undeveloped or underutilized land that is presently served by existing utilities and essential public services (e.g., transit, streets, water, sewer).	Consistent. The Project is located on an urban infill site along a major regional arterial that is served by two public transit bus lines (OCTA local Lines 64 and 71), Metrolink's Santa Ana station, as well as water and sewer service.
	Does not result in the loss or conversion of natural and working lands	Consistent. The Project is located on an urban infill site that is currently unused. There are no natural or working lands on the Project Site.
	Consists of transit-supportive densities (minimum of 20 residential dwelling	Consistent. The Project would be fully consistent with this attribute, as

Table 6
Consistency Analysis—2022 Scoping Plan Update
(Key Residential and Mixed-Use Project Attributes That Reduce GHGs)

Priority Area	Key Project Attribute	Project Consistency
	units per acre), or is in proximity to existing transit stops (within a half mile), or satisfies more detailed and stringent criteria specified in the region's SCS.	it would provide a density of 56.5 residences per acre and would be located on an urban infill site along a major regional arterial that is served by two public transit bus lines (OCTA local Lines 64 and 71), Metrolink's Santa Ana station.
	Reduces parking requirements by: Eliminating parking requirements or including maximum allowable parking ratios (i.e., the ratio of parking spaces to residential units or square feet); or Providing residential parking supply at a ratio of less than one parking space per dwelling unit; or for multifamily residential development, requiring parking costs to be unbundled from costs to rent or own a residential unit.	Not Consistent. The Project provides two parking spaces per apartment unit (including guest spaces) and 2.2 units per townhouse.
	At least 20 percent of units included are affordable to lower-income residents	Not Consistent. The Project would be a market-rate residential development with no units dedicated to affordable housing for lower-income residents.
	Results in no net loss of existing affordable units	Consistent. The Project would not remove any affordable housing units; rather, it would increase the housing stock of market-rate and affordable housing units.
Building Decarbonization	Uses all-electric appliances without any natural gas connections and does not use propane or other fossil fuels for space heating, water heating, or indoor cooking.	Not Consistent. The Project would comply with Title 24 and CalGreen standards for appliances, but not provide all-electric appliances. It would also use fossil fuels for space and water heating.
Source: <i>Priority Areas and Key Project Attributes from California Air Resources Board, 2022 Scoping Plan for Achieving Carbon Neutrality, Appendix D (Local Actions) Table 3; November 2022.</i>		

Table 7 provides a comparison of the Project against the GHG-related performance measures of the 2020-2045 RTP/SCS.

Table 7
Consistency with the 2020 RTP/SCS

Objectives	Consistency Analysis^a
Increase percentage of region's total household growth occurring within HQTAs.	No Conflict. The Project would result in an increase of 507 households in an HQTA, including both townhomes and attached apartments.
Increase percent of the region's total employment growth occurring within HQTAs.	No Conflict. The Project is an infill development that would create more service-related retail and commercial jobs, consistent with the 2020 RTP/SCS policies and would focus on job growth in HQTAs.
Decrease total acreage of greenfield or otherwise rural land uses converted to urban use.	No Conflict. The Project is an infill development that would reduce the demand for sprawl development in greenfield or rural areas on the fringes of Southern California.
Decrease daily vehicle miles driven per person.	No Conflict. The Project is an infill development amid heavy transit infrastructure that would reduce daily VMT per capita. The Project is served by two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station to the west.
Decrease average daily distance traveled for work and non-work trips (in miles)	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would reduce per capita travel distances.
Increase percentage of work and non-work trips which are less than 3 miles in length.	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would increase the rate of travel less than three miles in length.
Increase share of short trip lengths for commute purposes.	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would shorten commute trips.
Decrease average minutes of delay experienced per capita due to traffic congestion.	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would reduce the rate of growth in auto traffic and congestion by virtue of its transit and active transportation mode share given its location along this major corridor.

Objectives	Consistency Analysis ^a
Decrease excess travel time resulting from the difference between a reference speed and actual speed.	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would reduce the rate of growth in auto traffic and congestion by virtue of its transit and active transportation mode share given its location. As such, the Project would help reduce recurrent traffic congestion delay for general vehicles.
Decrease excess travel time for heavy-duty trucks result from the difference between reference speed and actual speed.	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would reduce the rate of growth in auto traffic and congestion by virtue of its transit and active transportation mode share. As such, the Project would help reduce recurrent traffic congestion delay for heavy-duty trucks.
Increase percentage of PM peak period trips completed within 45 minutes by travel mode.	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would reduce the rate of growth in auto traffic and congestion by virtue of its transit accessibility. Because the Project's location will attract travel to and from the corridor and local community, the share of PM peak period trips that are less than 45 minutes would increase when compared to an urban sprawl location.
Increase percentage of trips that use transit (work and all trips)	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would help increase transit mode share.
Decrease average travel time to work (all modes)	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would reduce the rate of growth in auto traffic and congestion by virtue of its transit and active transportation mode share given its location along the corridor. As such, average travel time to work should be reduced when compared to an urban sprawl location.
Increase percentage of trips using either walking or biking (by trip type)	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would reduce the rate of growth in auto traffic and congestion by virtue of its transit accessibility along the corridor.

Objectives	Consistency Analysis ^a
Reduce per capita GHG emissions (from 2005 levels)	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would reduce the rate of growth in auto traffic and congestion by virtue of its transit accessibility. As such, it is consistent with AB 32, SB 32, SB 375, and other initiatives designed to reduce per capita GHG emissions from 2005 levels.
Increase percentage of trips using a travel mode other than single occupancy vehicle (SOV)	No Conflict. The Project is an infill development in the dense urban corridor with a heavy density of housing and jobs amid transit infrastructure (two OCTA bus lines 64 and 71, as well as the Santa Ana Metrolink station) that would reduce the rate of growth in SOV use and congestion by virtue of its transit accessibility within walking distance of the Project Site.

Locally, the City has several conservation-based plans, programs, and requirements that also indirectly produce GHG reductions. While these are not considered climate action plans, the Proposed Project's consistency with these local initiatives is summarized.

Santa Ana Climate Action Plan

The 2022 CAP provides a summary table of Climate-Ready Development Standards, including mandatory measures that are applicable to development projects. It should be noted that most of the CAP's measures are voluntary, with financial incentives available to promote increased implementation of those measures.

Table 8
Project Consistency with the Santa Ana CAP

Source	Measure	Consistency
Transportation and Land Use Measures	Development of Local Retail Service Nodes	Consistent. The Project includes retail uses along Fourth Street and Cabrillo Town Drive that will serve the Project Site and the larger Santa Ana community that will help reduce VMT associated with travel to retail services.
	Local Residential Nodes Near Retail and Employment	Consistent. The Project includes 507 residences along Fourth Street and Cabrillo Town Drive on a largely commercial corridor that will help reduce VMT associated with travel from residences.
	Local Employment Nodes Near Residential and Retail Areas	Consistent. The Project includes retail and commercial uses along Fourth Street and Cabrillo Town Drive that will serve the Project Site and the larger Santa Ana community that will help reduce VMT associated with travel to retail services.

Table 8
Project Consistency with the Santa Ana CAP

Source	Measure	Consistency
	End of Trip Facilities in New Projects	Consistent. The Project includes short- and long-term parking for bicycles for both residents and commercial tenants.
Community-Wide Energy Measures	Title 24 Energy Efficiency Standards – Commercial.	Consistent. The Project meets energy efficiency requirements for the commercial spaces.
	Title 24 Energy Efficiency Standards – Residential.	Consistent. The Project meets energy efficiency requirements for the residential spaces.
Solid Waste, Water, and Wastewater Measures	AB 341 Commercial and Multifamily Recycling.	Consistent. Residential and commercial tenants will have full-service recycling options consistent with AB 341 that will help increase diversion of waste from landfills.
	Turf Removal.	Consistent. The Project will provide artificial turf in its common areas and courtyards that will reduce water consumption.
Source: City of Santa Ana, Climate Action Plan (Final); December 2015.		

Conclusion

In summary, the plan consistency analysis provided above demonstrates that the Project complies with the applicable plans, policies, regulations and GHG emissions reduction actions/strategies outlined in the *Climate Change Scoping Plan and Update*, the 2020-2045 RTP/SCS, the City's CAP. Consistency with the above plans, policies, regulations, and GHG emissions reduction actions/strategies would reduce the Project's incremental contribution of GHG emissions. Thus, the Project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing emissions of GHG emissions. Furthermore, because the Project is consistent and does not conflict with these plans, policies, and regulations, the Project's incremental increase in GHG emissions as described above would not result in a significant impact on the environment. Therefore, Project-specific impacts regarding climate change would be less than significant.

Project Emissions

In support of the consistency analysis above that describes the Project's compliance with, or exceedance of performance-based standards included in the regulations and policies outlined in the applicable portions of the *Climate Change Scoping Plan*, the 2020-2045 RTP/SCS, the City's CAP, quantitative calculations are provided below.

The Project would generate direct and indirect GHG emissions because of different types of emissions sources, including the following:

- Construction: emissions associated with demolition of the existing uses, shoring, excavation, grading, and construction-related equipment and vehicular activity;
- Area source: emissions associated with landscape equipment;
- Energy source (building operations): emissions associated with electricity and natural gas use for space heating and cooling, water heating, energy consumption, and lighting;
- Stationary source: emissions associated with stationary equipment (e.g., emergency generators);
- Mobile source: emissions associated with vehicles accessing the Project Site;
- Solid Waste: emissions associated with the decomposition of the waste, which generates methane based on the total amount of degradable organic carbon; and
- Water/Wastewater: emissions associated with energy used to pump, convey, deliver, and treat water.
- Refrigerants: These are substances used in equipment for air conditioning and refrigeration. Most refrigerants are HFCs or blends of them, which can have high GWP values.

The Project would generate an incremental contribution to and a cumulative increase in GHG emissions. A specific discussion regarding potential GHG emissions associated with the construction and operational phases of the Project is provided below.

Construction

Project construction is anticipated to be completed in 2027 with occupancy the same year. A summary of construction details (e.g., schedule, equipment mix, and vehicular trips) and CalEEMod modeling output files are provided in the Technical Appendix. The GHG emissions associated with construction of the Project were calculated for each year of construction activity.

Construction of the Project is estimated to generate a total of 3,523 MTCO₂e annually (Table 9). As recommended by the SCAQMD, the total GHG construction emissions were amortized over the 30-year lifetime of the Project (i.e., total construction GHG emissions were divided by 30 to determine an annual construction emissions estimate that can be added to the Project's operational emissions) to determine the Project's annual GHG emissions inventory.⁷⁰ This results in annual Project construction emissions of 117 MTCO₂e. A complete listing of the construction equipment by on-site and off-site activities, duration, and emissions estimation model input

⁷⁰ SCAQMD Governing Board Agenda Item 31, December 5, 2008.

assumptions used in this analysis is included within the emissions calculation worksheets that are provided in the Technical Appendix.

Table 9
Combined Construction-Related Emissions (MTCO₂e)

Year	MTCO ₂ e ^a
2024	293
2025	773
2026	1,517
2027	940
Total	3,523
Amortized Over 30 Years	117
^a CO ₂ e was calculated using CalEEMod version 2022.1.1.14. Detailed results are provided in the Technical Appendix. Source: DKA Planning, 2023.	

Operation

Area Source Emissions

Area source emissions were calculated using the CalEEMod emissions inventory model, which includes landscape maintenance equipment, use of consumer products, and other everyday sources. As shown in Table 9, the Project would result in 19 MTCO₂e per year from area sources.

Table 9
Annual GHG Emissions Summary (Buildout)^a
(metric tons of carbon dioxide equivalent [MTCO₂e])

Year	MTCO ₂ e ^a
Area ^b	19
Energy ^c (electricity and natural gas)	908
Mobile	3,355
Solid Waste ^d	186
Water/Wastewater ^e	53
Refrigerants	1
Construction	117
Total Emissions	4,639
^a CO ₂ e was calculated using CalEEMod and the results are provided in the Technical Appendix. ^b Area source emissions are from landscape equipment and other operational equipment only; hearths omitted. ^c Energy source emissions are based on CalEEMod default electricity and natural gas usage rates. ^d Solid waste emissions are calculated based on CalEEMod default solid waste generation rates. ^e Water/Wastewater emissions are calculated based on CalEEMod default water consumption rates. Source: DKA Planning, 2023.	

Electricity and Natural Gas Generation Emissions

GHG emissions are emitted because of activities in buildings when electricity and natural gas are used as energy sources. Combustion of any type of fuel emits CO₂ and other GHG emissions directly into the atmosphere. When electricity is used in a building, the electricity generation typically takes place off-site at the power plant; electricity use in a building generally causes emissions in an indirect manner.

Electricity and natural gas emissions were calculated for the Project using the CalEEMod emissions inventory model, which multiplies an estimate of the energy usage by applicable emissions factors chosen by the utility company. GHG emissions from electricity use are directly dependent on the electricity utility provider. In this case, GHG emissions intensity factors for Southern California Edison (SCE) were selected in CalEEMod. The carbon intensity ((pounds per megawatt an hour (lbs/MWh)) for electricity generation was calculated for the Project buildout year based on SCE projections. A straight-line interpolation was performed to estimate the SCE carbon intensity factor for the Project buildout year. SCE's carbon intensity projections also consider SB 350 RPS requirements for renewable energy.

This approach is conservative, given the 2018 chaptering of SB 100 (De Leon), which requires electricity providers to provide renewable energy for at least 60 percent of their delivered power by 2030 and 100 percent use of renewable energy and zero-carbon resources by 2045. SB 100 also increases existing renewable energy targets, called Renewables Portfolio Standard (RPS), to 44 percent by 2024 and 52 percent by 2027.

The 2022 Title 24 standards contain more substantial energy efficiency requirements for new construction, emphasizing the importance of building design and construction flexibility to establish performance standards that substantially reduce energy consumption for water heating, lighting, and insulation for attics and walls.

Energy use in buildings is divided into energy consumed by the built environment and energy consumed by uses that are independent of the construction of the building, such as in plug-in appliances. CalEEMod calculates energy use from systems covered by Title 24 (e.g., HVAC system, water heating system, and lighting system); energy use from lighting; and energy use from office equipment, appliances, plug-ins, and other sources not covered by Title 24 or lighting.

CalEEMod electricity and natural gas usage rates are based on the CEC-sponsored California Commercial End-Use Survey (CEUS) and the California Residential Appliance Saturation Survey (RASS) studies.⁷¹ The data are specific for climate zones; therefore, Zone 11 was selected for the Project Site based on the zip code tool.

⁷¹ California Energy Commission, Commercial End-Use Survey, March 2006, and California Residential Appliance Saturation Survey, October 2010.

As shown in Table 9, Project GHG emissions from electricity and natural gas usage would result in a total of 908 MTCO₂e per year.

Mobile Source Emissions

Mobile-source emissions were calculated using the SCAQMD-recommended CalEEMod emissions inventory model. CalEEMod calculates the emissions associated with on-road mobile sources associated with residents, employees, visitors, and delivery vehicles visiting the Project Site based on the number of daily trips generated and VMT. Mobile source operational GHG emissions were calculated using CalEEMod and are based on the Project's VMT analysis.

The Project represents an infill development within an urbanized area that would concentrate mixed residential and commercial uses within an HQTa.⁷² The Project Site is in a dense mixed-use corridor with proximity to two OCTA local bus lines and the Metrolink Santa Ana station to the west. The Project would also incorporate characteristics that would reduce trips and VMT as compared to standard ITE trip generation rates. The Project characteristics listed below are consistent with the CAPCOA guidance document, *Quantifying Greenhouse Gas Mitigation Measures*, which provides emission reduction values for transportation related design techniques.⁷³ These techniques would reduce vehicle trips and VMT associated with the Project relative to the standard ITE trip generation rates, which would result in a comparable reduction in VMT and associated GHG emissions. Techniques applicable to the Project include the following (a brief description of the Project's relevance to the measure is also provided):

- **CAPCOA Measure LUT-1 – Increase Density:** Increased density, measured in terms of persons, jobs, or dwelling units per unit area, reduces emissions associated with transportation as it reduces the distance people travel for work or services and provides a foundation for the implementation of other strategies, such as enhanced transit services.
- **CAPCOA Measure LUT-3 – Increase Diversity of Urban and Suburban Developments (Mixed-Use):** The Project would introduce new uses on the Project Site, including new residences and retail uses. The increases in land use diversity on the Project Site would reduce vehicle trips and VMT by encouraging visitors to walk and use non-automotive

⁷² The Project Site is also located in Transit Priority Area as defined by Public Resources Code Section 21099. Public Resources Code Section 21099 defines a "transit priority area" as an area within 0.5 miles of a major transit stop that is "existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program adopted pursuant to Section 450.216 or 450.322 of Title 23 of the Code of Federal Regulations." Public Resources Code Section 21064.3 defines "major transit stop" as "a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods." Also refer to the City's ZIMAS System regarding the location of the Project Site within a Transit Priority Area..

⁷³ CAPCOA, *Quantifying Greenhouse Gas Mitigation Measures*, 2010.

forms of transportation (i.e., public transit, biking), which would result in corresponding reductions in transportation-related emissions.

- **CAPCOA Measure LUT-4 – Increase Destination Accessibility:** The Project Site is in a dense corridor, which is easily accessible by public transportation. Access to multiple destinations, and commercial and retail uses in proximity to the Project Site would reduce vehicle trips and VMT compared to the statewide average and encourage walking and non-automotive forms of transportation and would result in corresponding reductions in transportation-related emissions because of the Project.
- **CAPCOA Measure LUT-5 – Increase Transit Accessibility:** The Project would be located near two OCTA bus routes and the Metrolink Santa Ana station. The Project would also provide bicycle parking spaces to encourage utilization of alternative modes of transportation.
- **CAPCOA Measure LUT-9 – Improve Design of Development:** The Project would enhance the pedestrian and bicycle environment through an attractive open space component and improved sidewalk and streetscape, which would enhance walkability in the Project vicinity. The Project would also locate a development with a high level of street access, which improves street accessibility and connectivity.
- **CAPCOA Measure SDT-2 – Traffic Calming Measures:** Providing traffic calming measures encourages people to walk or bike instead of using a vehicle. This mode shift results in a decrease in VMT. Streets within a half mile of the Project Site are equipped with sidewalks, and several of the intersections include marked crosswalks and/or count-down signal timers that calm traffic.

CalEEMod calculates VMT based on the type of land use, trip purpose, and trip type percentages for each land use subtype in the project (primary, diverted, and pass-by). As shown in Table 9, the Project GHG emissions from mobile sources would result in a total of 3,355 MTCO₂e per year. This estimate reflects reductions attributable to the Project's characteristics (e.g., infill project near transit that supports multi-modal transportation options), as described above.

Solid Waste Generation Emissions

Emissions related to solid waste were calculated using the CalEEMod emissions inventory model, which multiplies an estimate of the waste generated by applicable emissions factors provided in Section 2.4 of the USEPA's AP-42, Compilation of Air Pollutant Emission Factors. CalEEMod solid waste generation rates for each applicable land use were selected for this analysis. As

shown in Table 9, the Project scenario is expected to result in a total of 186 MTCO₂e per year from solid waste that accounts for a 50-percent recycling/diversion rate.⁷⁴

Water Usage and Wastewater Generation Emissions

GHG emissions are related to the energy used to convey, treat, and distribute water, and treat wastewater. Thus, these emissions are generally indirect emissions from the production of electricity to power these systems. Three processes are necessary to supply potable water; these include (1) supply and conveyance of the water from the source; (2) treatment of the water to potable standards; and (3) distribution of the water to individual users. After use, energy is used as the wastewater is treated and reused as reclaimed water.

Emissions related to water usage and wastewater generation were calculated for the Project using the CalEEMod emissions inventory model, which multiplies an estimate of the water usage by the applicable energy intensity factor to determine the embodied energy necessary to supply potable water.⁷⁵ GHG emissions are then calculated based on the amount of electricity consumed multiplied by the GHG emissions intensity factors for the utility provider. In this case, embodied energy for Southern California supplied water and GHG emissions intensity factors for SCE were selected in CalEEMod. Water usage rates were calculated consistent with the requirements under the 2022 California Plumbing Code (which is based on the 2021 Uniform Plumbing Code), 2022 CALGreen, and reflect an approximately 20-percent reduction as compared to the base demand.

As shown in Table 9, Project GHG emissions from water/wastewater usage would result in a total of 53 MTCO₂e per year, which reflects a 20-percent reduction in water/wastewater emissions consistent with building code requirements as compared to the Project without sustainability features related to water conservation.

Refrigerants

Emissions related to cooling structures and refrigeration needs were calculated using the CalEEMod emissions inventory model. As shown in Table 9, the Project scenario is expected to result in a total of one MTCO₂e per year from use of refrigerants that used HFCs and have high GWP values.

Combined Construction Emissions

As shown in Table 9, when taking into consideration implementation of project design features, including the requirements set forth in the City's Green Building Code and the full implementation

⁷⁴ AB 341 (2012) increased the Statewide waste diversion goal from 50 to 75 percent from baseline rates established by CalRecycle by 2020 and beyond. Further, SB 1383 (2016) requires jurisdictions to reduce 75 percent of organic waste disposal in landfills by 2030.

⁷⁵ The intensity factor reflects the average pounds of CO₂e per megawatt generated by a utility company.

of current state mandates, the GHG emissions for the Project would equal 117 MTCO₂e annually (as amortized over 30 years) during construction.

Estimated Reduction of Project-Related GHG Emissions Resulting from Consistency with Plans

As noted earlier, one approach to demonstrating a project's consistency with GHG plans is to show how a project will reduce its incremental contribution through a Project Without Reduction Features comparison. The analysis in this section includes potential emissions under a Project Without Reduction Features scenario and from the Project at build-out based on actions and mandates in force in 2027.

As shown in Table 10, the emissions for the Project and its associated CARB 2027 Project Without Reduction Features scenario are estimated to be 4,639 and 6,721 MTCO₂e per year, respectively, which shows the Project would reduce emissions by 31 percent from CARB's 2027 Project Without Reduction Features scenario.

Table 10
Estimated Reduction of Project-Related GHG Emissions
Resulting from Consistency with Plans

Scenario and Source	Project Without Reduction Features Scenario*	As Proposed Scenario	Reduction from Project Without Reduction Features Scenario	Change from Project Without Reduction Features Scenario
Area Sources	19	19	-	0%
Energy Sources	1,566	908	-658	-42%
Mobile Sources	4,779	3,355	-1,424	-30%
Waste Sources	186	186	-	0%
Water Sources	53	53	-	0%
Refrigerants	1	1	-	0%
Construction	117	117	-	0%
Total Emissions	6,721	4,639	-2,082	-31.0%
<i>Daily construction emissions amortized over 30-year period pursuant to SCAQMD guidance. Annual construction emissions derived by taking total emissions over duration of activities and dividing by construction period.</i> <i>* Project Without Reduction Features scenario does not assume 30% reduction in in mobile source emissions from Pavley emission standards (19.8%), low carbon fuel standards (7.2%), vehicle efficiency measures 2.8%); does not assume 42% reduction in energy production emissions from the State's renewables portfolio standard (33%), natural gas extraction efficiency measures (1.6%), and natural gas transmission and distribution efficiency measures (7.4%).</i> <i>Source: DKA Planning, 2023.</i>				

The analysis in this section uses the 2022 Scoping Plan's statewide goals as one approach to evaluate the Project's incremental contribution to climate change. The methodology is to compare the Project's emissions as proposed to the Project's emissions as if the Project were built using a Project Without Reduction Features approach in terms of design, methodology, and technology.

This means the Project's emissions were calculated as if the Project was constructed with project design features to reduce GHG emissions that are not required by state or local code and with several regulatory measures adopted in furtherance of AB 32.

While the AB 32 Scoping Plan's cumulative statewide objectives were not intended to serve as the basis for project-level assessments, this analysis finds that its Project Without Reduction Features comparison based on the Scoping Plan is appropriate, because the Project would contribute to statewide GHG emissions reduction goals. Specifically, the Project's mixed-use nature and location in an existing urban setting provide opportunities to reduce transportation-related emissions. First, it would capture vehicle travel on-site that would have normally been destined for off-site locations. This produces substantial reductions in the amount of vehicle trips and VMT that no longer are made. Second, it would eliminate many vehicle trips, because travel to and from the Project Site could be captured by public transit and active transportation instead. Finally, it would attract existing trips on the street network that would divert to the proposed development.

Post-2030 Analysis

Recent studies show that the state's existing and proposed regulatory framework will put the state on a pathway to reduce its GHG emissions level to 40 percent below 1990 levels by 2030, and to 80 percent below 1990 levels by 2050 if additional appropriate reduction measures are adopted.⁷⁶ Even though these studies did not provide an exact regulatory and technological roadmap to achieve the 2030 and 2050 goals, they demonstrated that various combinations of policies could allow the statewide emissions level to remain very low through 2050, suggesting that the combination of new technologies and other regulations not analyzed in the studies could allow the state to meet the 2050 target. After the findings of these studies, SB 32 was passed on September 8, 2016, and would require the state board to ensure that statewide GHG emissions are reduced to 40 percent below the 1990 level by 2030. As discussed above, the new plan, outlined in SB 32, involves increasing renewable energy use, imposing tighter limits on the carbon content of gasoline and diesel fuel, putting more electric cars on the road, improving energy efficiency, and curbing emissions from key industries.

As discussed above, SCAG's 2020-2045 RTP/SCS establishes a regulatory framework for achieving GHG reductions from the land use and transportation sectors pursuant to SB 375 and

⁷⁶ Energy and Environmental Economics (E3). "Summary of the California State Agencies' PATHWAYS Project: Long-term Greenhouse Gas Reduction Scenarios" (April 2015); Greenblatt, Jeffrey, Energy Policy, "Modeling California Impacts on Greenhouse Gas Emissions" (Vol. 78, pp. 158–172). The California Air Resources Board, California Energy Commission, California Public Utilities Commission, and the California Independent System Operator engaged E3 to evaluate the feasibility and cost of a range of potential 2030 targets along the way to the state's goal of reducing GHG emissions to 80 percent below 1990 levels by 2050. With input from the agencies, E3 developed scenarios that explore the potential pace at which emission reductions can be achieved, as well as the mix of technologies and practices deployed. E3 conducted the analysis using its California PATHWAYS model. Enhanced specifically for this study, the model encompasses the entire California economy with detailed representations of the buildings, industry, transportation, and electricity sectors.

the state's long-term climate policies. The 2020-2045 RTP/SCS ensures VMT reductions and other measures that reduce regional emissions from the land use and transportation sectors.

The Project is the type of land use development that is encouraged by the RTP/SCS to reduce VMT and expand multi-modal transportation options for the region to achieve the GHG reductions from the land use and transportation sectors required by SB 375, which, in turn, advances the state's long-term climate policies. By furthering implementation of SB 375, the Project supports regional land use and transportation GHG reductions consistent with state climate targets for 2020 and beyond. In addition, the Project would be consistent with the Actions and Strategies set forth in the 2020-2045 RTP/SCS. Therefore, the Project would be consistent with the 2020-2045 RTP/SCS.

Conclusion

Given the Project's consistency with state, SCAG, and City GHG emissions reduction goals and objectives, the Project is consistent with applicable plans, policies, and regulations adopted for the purpose of reducing the emissions of GHGs. In the absence of adopted standards and established significance thresholds, and given this consistency, it is concluded that the Project's incremental contribution to GHG emissions and their effects on climate change would not be cumulatively considerable.

TECHNICAL APPENDIX



DOUGLASKIM+ASSOCIATES,LLC

GREENHOUSE GAS EMISSIONS OVERVIEW

Cabrillo Town Center Project
 GHG Emissions Impact Compared to "Project Without Reduction Features" Scenario

Source	Project Without Reduction Features (2027)	As Proposed (2027)	Reduction from Project Without Reduction Features	Change from Project Without Reduction Features Scenario
Area	19	19	-	0%
Energy	1,566	908	(658)	-42%
Mobile	4,779	3,355	(1,424)	-30%
Waste	186	186	-	0%
Water	53	53	-	0%
Refrigerants	1	1	-	0%
Construction	117	117	-	0%
Total Emissions	6,721	4,639	(2,082)	-31.0%

Mobile Source Emissions	Pavley emission standards (19.8% reduction) Low carbon fuel standard (7.2% reduction) Vehicle efficiency measures (2.8% reduction)
Energy Production Assumptions	Natural gas transmission and distribution efficiency measures (7.4% reduction) Natural gas extraction efficiency measures (1.6% reduction) Renewables (electricity) portfolio standard (33% reduction)



DOUGLASKIM+ASSOCIATES,LLC

EXISTING EMISSIONS

Cabrillo Town Center (Existing) Detailed Report

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1.1. Basic Project Information

Data Field	Value
Project Name	Cabrillo Town Center (Existing)
Operational Year	2023
Lead Agency	City of Santa Ana
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	18.6
Location	1901 E 4th St, Santa Ana, CA 92705, USA
County	Orange
City	Santa Ana
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5962
EDFZ	7
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.14

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
General Office Building	173	1000sqft	8.97	173,025	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Unmit.	146	19,778	19,924	15.8	0.76	67.6	20,613
Daily, Winter (Max)	—	—	—	—	—	—	—
Unmit.	146	19,151	19,297	15.9	0.79	2.16	19,931
Average Daily (Max)	—	—	—	—	—	—	—
Unmit.	146	19,333	19,479	15.9	0.79	29.4	20,141
Annual (Max)	—	—	—	—	—	—	—
Unmit.	24.1	3,201	3,225	2.62	0.13	4.87	3,335

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Mobile	—	15,197	15,197	0.69	0.58	67.2	15,453
Area	—	30.9	30.9	< 0.005	< 0.005	—	31.1
Energy	—	4,351	4,351	0.40	0.04	—	4,372
Water	58.9	200	259	6.06	0.15	—	454
Waste	86.7	0.00	86.7	8.67	0.00	—	303
Refrig.	—	—	—	—	—	0.42	0.42

Total	146	19,778	19,924	15.8	0.76	67.6	20,613
Daily, Winter (Max)	—	—	—	—	—	—	—
Mobile	—	14,601	14,601	0.72	0.61	1.74	14,801
Area	—	—	—	—	—	—	—
Energy	—	4,351	4,351	0.40	0.04	—	4,372
Water	58.9	200	259	6.06	0.15	—	454
Waste	86.7	0.00	86.7	8.67	0.00	—	303
Refrig.	—	—	—	—	—	0.42	0.42
Total	146	19,151	19,297	15.9	0.79	2.16	19,931
Average Daily	—	—	—	—	—	—	—
Mobile	—	14,762	14,762	0.72	0.61	29.0	14,990
Area	—	21.2	21.2	< 0.005	< 0.005	—	21.3
Energy	—	4,351	4,351	0.40	0.04	—	4,372
Water	58.9	200	259	6.06	0.15	—	454
Waste	86.7	0.00	86.7	8.67	0.00	—	303
Refrig.	—	—	—	—	—	0.42	0.42
Total	146	19,333	19,479	15.9	0.79	29.4	20,141
Annual	—	—	—	—	—	—	—
Mobile	—	2,444	2,444	0.12	0.10	4.80	2,482
Area	—	3.51	3.51	< 0.005	< 0.005	—	3.52
Energy	—	720	720	0.07	0.01	—	724
Water	9.76	33.1	42.9	1.00	0.02	—	75.1
Waste	14.4	0.00	14.4	1.44	0.00	—	50.2
Refrig.	—	—	—	—	—	0.07	0.07
Total	24.1	3,201	3,225	2.62	0.13	4.87	3,335

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
General Office Building	—	2,945	2,945	0.28	0.03	—	2,962
Total	—	2,945	2,945	0.28	0.03	—	2,962
Daily, Winter (Max)	—	—	—	—	—	—	—
General Office Building	—	2,945	2,945	0.28	0.03	—	2,962
Total	—	2,945	2,945	0.28	0.03	—	2,962
Annual	—	—	—	—	—	—	—
General Office Building	—	488	488	0.05	0.01	—	490
Total	—	488	488	0.05	0.01	—	490

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
General Office Building	—	1,406	1,406	0.12	< 0.005	—	1,409
Total	—	1,406	1,406	0.12	< 0.005	—	1,409
Daily, Winter (Max)	—	—	—	—	—	—	—
General Office Building	—	1,406	1,406	0.12	< 0.005	—	1,409

Total	—	1,406	1,406	0.12	< 0.005	—	1,409
Annual	—	—	—	—	—	—	—
General Office Building	—	233	233	0.02	< 0.005	—	233
Total	—	233	233	0.02	< 0.005	—	233

4.3. Area Emissions by Source

4.3.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	BCO ₂	NBCO ₂	CO ₂ T	CH ₄	N ₂ O	R	CO ₂ e
Daily, Summer (Max)	—	—	—	—	—	—	—
Consumer Products	—	—	—	—	—	—	—
Architectural Coatings	—	—	—	—	—	—	—
Landscape Equipment	—	30.9	30.9	< 0.005	< 0.005	—	31.1
Total	—	30.9	30.9	< 0.005	< 0.005	—	31.1
Daily, Winter (Max)	—	—	—	—	—	—	—
Consumer Products	—	—	—	—	—	—	—
Architectural Coatings	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Consumer Products	—	—	—	—	—	—	—
Architectural Coatings	—	—	—	—	—	—	—
Landscape Equipment	—	3.51	3.51	< 0.005	< 0.005	—	3.52
Total	—	3.51	3.51	< 0.005	< 0.005	—	3.52

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
General Office Building	58.9	200	259	6.06	0.15	—	454
Total	58.9	200	259	6.06	0.15	—	454
Daily, Winter (Max)	—	—	—	—	—	—	—
General Office Building	58.9	200	259	6.06	0.15	—	454
Total	58.9	200	259	6.06	0.15	—	454
Annual	—	—	—	—	—	—	—
General Office Building	9.76	33.1	42.9	1.00	0.02	—	75.1
Total	9.76	33.1	42.9	1.00	0.02	—	75.1

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
General Office Building	86.7	0.00	86.7	8.67	0.00	—	303
Total	86.7	0.00	86.7	8.67	0.00	—	303
Daily, Winter (Max)	—	—	—	—	—	—	—
General Office Building	86.7	0.00	86.7	8.67	0.00	—	303
Total	86.7	0.00	86.7	8.67	0.00	—	303
Annual	—	—	—	—	—	—	—
General Office Building	14.4	0.00	14.4	1.44	0.00	—	50.2
Total	14.4	0.00	14.4	1.44	0.00	—	50.2

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	0.42	0.42
Total	—	—	—	—	—	0.42	0.42
Daily, Winter (Max)	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	0.42	0.42
Total	—	—	—	—	—	0.42	0.42
Annual	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	0.07	0.07
Total	—	—	—	—	—	0.07	0.07

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	1,876	1,876	1,876	684,740	18,760	18,760	18,760	6,847,400

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	259,538	86,513	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Office Building	3,083,355	349	0.0330	0.0040	4,385,573

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Office Building	30,752,382	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Office Building	161	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
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5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
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5.17. User Defined

Equipment Type	Fuel Type
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5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	9.03	annual days of extreme heat

Extreme Precipitation	3.50	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	1.31	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	0	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	0	0	0	N/A
Wildfire	0	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	1	1	2
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	57.8
AQ-PM	73.8
AQ-DPM	85.3
Drinking Water	53.8
Lead Risk Housing	71.1
Pesticides	0.00

Toxic Releases	90.8
Traffic	98.3
Effect Indicators	—
CleanUp Sites	91.8
Groundwater	0.00
Haz Waste Facilities/Generators	82.8
Impaired Water Bodies	0.00
Solid Waste	22.1
Sensitive Population	—
Asthma	55.8
Cardio-vascular	47.8
Low Birth Weights	41.7
Socioeconomic Factor Indicators	—
Education	75.4
Housing	48.1
Linguistic	66.9
Poverty	54.4
Unemployment	28.2

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	55.40870012
Employed	82.72808931
Median HI	52.89362248
Education	—

Bachelor's or higher	35.41639933
High school enrollment	100
Preschool enrollment	31.82343128
Transportation	—
Auto Access	58.09059412
Active commuting	62.68446041
Social	—
2-parent households	93.16052868
Voting	23.85474143
Neighborhood	—
Alcohol availability	53.74053638
Park access	48.29975619
Retail density	98.84511741
Supermarket access	72.33414603
Tree canopy	38.34210189
Housing	—
Homeownership	37.89298088
Housing habitability	43.38508918
Low-inc homeowner severe housing cost burden	27.93532658
Low-inc renter severe housing cost burden	78.69883229
Uncrowded housing	20.37726165
Health Outcomes	—
Insured adults	24.71448736
Arthritis	67.1
Asthma ER Admissions	50.7
High Blood Pressure	72.3
Cancer (excluding skin)	55.0

Asthma	49.0
Coronary Heart Disease	61.0
Chronic Obstructive Pulmonary Disease	53.7
Diagnosed Diabetes	54.0
Life Expectancy at Birth	67.7
Cognitively Disabled	95.5
Physically Disabled	83.0
Heart Attack ER Admissions	78.0
Mental Health Not Good	41.5
Chronic Kidney Disease	45.1
Obesity	51.8
Pedestrian Injuries	60.5
Physical Health Not Good	44.3
Stroke	58.2
Health Risk Behaviors	—
Binge Drinking	15.4
Current Smoker	44.4
No Leisure Time for Physical Activity	40.3
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	64.0
Elderly	60.7
English Speaking	29.3
Foreign-born	72.2
Outdoor Workers	33.6
Climate Change Adaptive Capacity	—

Impervious Surface Cover	46.9
Traffic Density	99.3
Traffic Access	23.0
Other Indices	—
Hardship	66.1
Other Decision Support	—
2016 Voting	58.2

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	71.0
Healthy Places Index Score for Project Location (b)	57.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
 b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
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Land Use	Project plan
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DOUGLASKIM+ASSOCIATES,LLC

FUTURE EMISSIONS

Cabrillo Town Center (Future) Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Cabrillo Town Center (Future)
Construction Start Date	9/2/2024
Operational Year	2027
Lead Agency	City of Santa Ana
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	18.6
Location	1901 E 4th St, Santa Ana, CA 92705, USA
County	Orange
City	Santa Ana
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5962
EDFZ	7
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.14

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
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Apartments Mid Rise	449	Dwelling Unit	11.8	839,447	8,000	—	2,066	—
Strip Mall	5.80	1000sqft	0.13	5,800	500	—	—	—
Enclosed Parking with Elevator	898	Space	8.08	312,051	0.00	—	—	—
Parking Lot	11.0	Space	0.10	0.00	0.00	—	—	—
Enclosed Parking Structure	116	Space	1.04	46,400	0.00	—	—	—
General Office Building	11.4	1000sqft	0.26	11,400	500	—	—	—
Condo/Townhouse	58.0	Dwelling Unit	3.63	150,530	1,000	—	267	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Unmit.	—	14,100	14,100	0.45	0.80	36.2	14,382
Daily, Winter (Max)	—	—	—	—	—	—	—
Unmit.	—	12,673	12,673	0.45	0.78	0.94	12,916
Average Daily (Max)	—	—	—	—	—	—	—
Unmit.	—	8,982	8,982	0.26	0.56	10.2	9,165
Annual (Max)	—	—	—	—	—	—	—
Unmit.	—	1,487	1,487	0.04	0.09	1.68	1,517

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—
2024	—	7,496	7,496	0.45	0.65	8.91	7,709
2025	—	13,006	13,006	0.38	0.78	36.2	13,284
2026	—	12,814	12,814	0.36	0.78	33.0	13,088
2027	—	14,100	14,100	0.37	0.80	33.9	14,382
Daily - Winter (Max)	—	—	—	—	—	—	—
2024	—	7,523	7,523	0.45	0.65	0.23	7,693
2025	—	12,673	12,673	0.40	0.78	0.94	12,916
2026	—	12,488	12,488	0.37	0.78	0.85	12,730
2027	—	12,312	12,312	0.36	0.75	0.77	12,546
Average Daily	—	—	—	—	—	—	—
2024	—	1,737	1,737	0.09	0.09	0.55	1,767
2025	—	4,590	4,590	0.15	0.24	4.79	4,670
2026	—	8,982	8,982	0.26	0.56	10.2	9,165
2027	—	5,568	5,568	0.15	0.33	5.87	5,675
Annual	—	—	—	—	—	—	—
2024	—	288	288	0.01	0.02	0.09	293
2025	—	760	760	0.02	0.04	0.79	773
2026	—	1,487	1,487	0.04	0.09	1.68	1,517
2027	—	922	922	0.03	0.05	0.97	940

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Unmit.	362	26,509	26,871	37.7	0.91	71.7	28,155
Daily, Winter (Max)	—	—	—	—	—	—	—
Unmit.	362	25,575	25,937	37.7	0.94	8.83	27,169
Average Daily (Max)	—	—	—	—	—	—	—
Unmit.	362	25,690	26,052	37.7	0.94	35.0	27,311
Annual (Max)	—	—	—	—	—	—	—
Unmit.	60.0	4,253	4,313	6.24	0.16	5.80	4,522

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Mobile	—	20,555	20,555	0.86	0.76	64.5	20,868
Area	0.00	355	355	0.01	< 0.005	—	355
Energy	—	5,459	5,459	0.51	0.04	—	5,485
Water	41.2	139	181	4.23	0.10	—	317
Waste	321	0.00	321	32.1	0.00	—	1,123
Refrig.	—	—	—	—	—	7.15	7.15
Total	362	26,509	26,871	37.7	0.91	71.7	28,155
Daily, Winter (Max)	—	—	—	—	—	—	—
Mobile	—	19,765	19,765	0.89	0.80	1.67	20,026
Area	0.00	211	211	< 0.005	< 0.005	—	211
Energy	—	5,459	5,459	0.51	0.04	—	5,485
Water	41.2	139	181	4.23	0.10	—	317
Waste	321	0.00	321	32.1	0.00	—	1,123

Refrig.	—	—	—	—	—	7.15	7.15
Total	362	25,575	25,937	37.7	0.94	8.83	27,169
Average Daily	—	—	—	—	—	—	—
Mobile	—	19,978	19,978	0.88	0.80	27.8	20,266
Area	0.00	113	113	< 0.005	< 0.005	—	113
Energy	—	5,459	5,459	0.51	0.04	—	5,485
Water	41.2	139	181	4.23	0.10	—	317
Waste	321	0.00	321	32.1	0.00	—	1,123
Refrig.	—	—	—	—	—	7.15	7.15
Total	362	25,690	26,052	37.7	0.94	35.0	27,311
Annual	—	—	—	—	—	—	—
Mobile	—	3,308	3,308	0.15	0.13	4.61	3,355
Area	0.00	18.7	18.7	< 0.005	< 0.005	—	18.8
Energy	—	904	904	0.08	0.01	—	908
Water	6.82	23.1	29.9	0.70	0.02	—	52.5
Waste	53.1	0.00	53.1	5.31	0.00	—	186
Refrig.	—	—	—	—	—	1.18	1.18
Total	60.0	4,253	4,313	6.24	0.16	5.80	4,522

3. Construction Emissions Details

3.1. Demolition (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	3,425	3,425	0.14	0.03	—	3,437

Demolition	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	—	413	413	0.02	< 0.005	—	414
Demolition	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	—	68.4	68.4	< 0.005	< 0.005	—	68.6
Demolition	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	—	203	203	< 0.005	0.01	0.83	206
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	3,867	3,867	0.31	0.62	8.08	4,066
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	—	193	193	< 0.005	0.01	0.02	196
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	3,868	3,868	0.31	0.62	0.21	4,060
Average Daily	—	—	—	—	—	—	—
Worker	—	23.6	23.6	< 0.005	< 0.005	0.04	24.0
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	466	466	0.04	0.07	0.42	490

Annual	—	—	—	—	—	—	—
Worker	—	3.91	3.91	< 0.005	< 0.005	0.01	3.97
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	77.2	77.2	0.01	0.01	0.07	81.1

3.3. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	—	72.5	72.5	< 0.005	< 0.005	—	72.8
Dust From Material Movement	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	—	12.0	12.0	< 0.005	< 0.005	—	12.1
Dust From Material Movement	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—

Worker	—	226	226	< 0.005	0.01	0.03	228
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	2,002	2,002	0.16	0.32	0.11	2,101
Average Daily	—	—	—	—	—	—	—
Worker	—	3.13	3.13	< 0.005	< 0.005	0.01	3.18
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	27.4	27.4	< 0.005	< 0.005	0.02	28.8
Annual	—	—	—	—	—	—	—
Worker	—	0.52	0.52	< 0.005	< 0.005	< 0.005	0.53
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	4.54	4.54	< 0.005	< 0.005	< 0.005	4.77

3.5. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	—	697	697	0.03	0.01	—	700
Dust From Material Movement	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—

Off-Road Equipment	—	115	115	< 0.005	< 0.005	—	116
Dust From Material Movement	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	—	258	258	< 0.005	0.01	0.03	261
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	58.2	58.2	< 0.005	0.01	< 0.005	61.1
Average Daily	—	—	—	—	—	—	—
Worker	—	27.6	27.6	< 0.005	< 0.005	0.05	28.0
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	6.15	6.15	< 0.005	< 0.005	0.01	6.46
Annual	—	—	—	—	—	—	—
Worker	—	4.57	4.57	< 0.005	< 0.005	0.01	4.64
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	1.02	1.02	< 0.005	< 0.005	< 0.005	1.07

3.7. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	—

Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	—	400	400	0.02	< 0.005	—	402
Dust From Material Movement	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	—	66.3	66.3	< 0.005	< 0.005	—	66.5
Dust From Material Movement	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	—	253	253	< 0.005	0.01	0.03	256
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	57.2	57.2	< 0.005	0.01	< 0.005	60.1
Average Daily	—	—	—	—	—	—	—
Worker	—	15.5	15.5	< 0.005	< 0.005	0.03	15.7
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	3.47	3.47	< 0.005	< 0.005	< 0.005	3.65
Annual	—	—	—	—	—	—	—
Worker	—	2.57	2.57	< 0.005	< 0.005	< 0.005	2.61
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	0.57	0.57	< 0.005	< 0.005	< 0.005	0.60

3.9. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	—	718	718	0.03	0.01	—	720
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	—	119	119	< 0.005	< 0.005	—	119
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	—	6,917	6,917	0.08	0.25	26.2	7,019
Vendor	—	3,691	3,691	0.21	0.51	10.1	3,859
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	—	6,583	6,583	0.09	0.25	0.68	6,659
Vendor	—	3,693	3,693	0.21	0.51	0.26	3,851
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	—	1,998	1,998	0.03	0.07	3.39	2,024
Vendor	—	1,105	1,105	0.06	0.15	1.30	1,154
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—
Worker	—	331	331	< 0.005	0.01	0.56	335
Vendor	—	183	183	0.01	0.03	0.22	191
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	—	283	283	0.01	< 0.005	—	284
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	—	6,785	6,785	0.08	0.25	23.6	6,885
Vendor	—	3,631	3,631	0.18	0.51	9.38	3,798
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—

Worker	—	6,458	6,458	0.09	0.25	0.61	6,534
Vendor	—	3,633	3,633	0.18	0.51	0.24	3,790
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	—	4,676	4,676	0.07	0.18	7.27	4,737
Vendor	—	2,594	2,594	0.13	0.37	2.90	2,709
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	—	774	774	0.01	0.03	1.20	784
Vendor	—	429	429	0.02	0.06	0.48	449
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	—	994	994	0.04	0.01	—	998
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	—	165	165	0.01	< 0.005	—	165

Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	—	6,671	6,671	0.07	0.25	21.2	6,768
Vendor	—	3,564	3,564	0.18	0.49	8.52	3,722
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	—	6,349	6,349	0.08	0.25	0.55	6,425
Vendor	—	3,566	3,566	0.18	0.49	0.22	3,715
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	—	2,670	2,670	0.03	0.10	3.80	2,705
Vendor	—	1,479	1,479	0.07	0.20	1.52	1,542
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	—	442	442	0.01	0.02	0.63	448
Vendor	—	245	245	0.01	0.03	0.25	255
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	—	273	273	0.01	< 0.005	—	274
Paving	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	—	45.2	45.2	< 0.005	< 0.005	—	45.4
Paving	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	—	199	199	< 0.005	0.01	0.75	202
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Worker	—	34.7	34.7	< 0.005	< 0.005	0.06	35.2
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	—	5.75	5.75	< 0.005	< 0.005	0.01	5.83
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00

3.17. Architectural Coating (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
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Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	—	39.9	39.9	< 0.005	< 0.005	—	40.0
Architectural Coatings	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	—	6.60	6.60	< 0.005	< 0.005	—	6.62
Architectural Coatings	—	—	—	—	—	—	—
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	—	1,334	1,334	0.01	0.05	4.23	1,354
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Worker	—	384	384	< 0.005	0.01	0.55	389
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	—	63.6	63.6	< 0.005	< 0.005	0.09	64.5
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
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3.19. Trenching (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	207	207	0.01	< 0.005	—	208
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	—	207	207	0.01	< 0.005	—	208
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	—	35.8	35.8	< 0.005	< 0.005	—	35.9
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Off-Road Equipment	—	5.93	5.93	< 0.005	< 0.005	—	5.95
Onsite truck	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	—	33.2	33.2	< 0.005	< 0.005	0.13	33.7
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	—	31.6	31.6	< 0.005	< 0.005	< 0.005	31.9
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—
Worker	—	5.53	5.53	< 0.005	< 0.005	0.01	5.60
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	—	0.91	0.91	< 0.005	< 0.005	< 0.005	0.93
Vendor	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Apartments Mid Rise	—	1,561	1,561	0.15	0.02	—	1,570
Strip Mall	—	54.0	54.0	0.01	< 0.005	—	54.3
Enclosed Parking with Elevator	—	1,093	1,093	0.10	0.01	—	1,099
Parking Lot	—	3.58	3.58	< 0.005	< 0.005	—	3.60
Enclosed Parking Structure	—	154	154	0.01	< 0.005	—	155

General Office Building	—	193	193	0.02	< 0.005	—	194
Condo/Townhouse	—	253	253	0.02	< 0.005	—	254
Total	—	3,311	3,311	0.32	0.04	—	3,330
Daily, Winter (Max)	—	—	—	—	—	—	—
Apartments Mid Rise	—	1,561	1,561	0.15	0.02	—	1,570
Strip Mall	—	54.0	54.0	0.01	< 0.005	—	54.3
Enclosed Parking with Elevator	—	1,093	1,093	0.10	0.01	—	1,099
Parking Lot	—	3.58	3.58	< 0.005	< 0.005	—	3.60
Enclosed Parking Structure	—	154	154	0.01	< 0.005	—	155
General Office Building	—	193	193	0.02	< 0.005	—	194
Condo/Townhouse	—	253	253	0.02	< 0.005	—	254
Total	—	3,311	3,311	0.32	0.04	—	3,330
Annual	—	—	—	—	—	—	—
Apartments Mid Rise	—	258	258	0.02	< 0.005	—	260
Strip Mall	—	8.95	8.95	< 0.005	< 0.005	—	9.00
Enclosed Parking with Elevator	—	181	181	0.02	< 0.005	—	182
Parking Lot	—	0.59	0.59	< 0.005	< 0.005	—	0.60
Enclosed Parking Structure	—	25.5	25.5	< 0.005	< 0.005	—	25.7
General Office Building	—	31.9	31.9	< 0.005	< 0.005	—	32.1
Condo/Townhouse	—	41.8	41.8	< 0.005	< 0.005	—	42.1
Total	—	548	548	0.05	0.01	—	551

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
----------	------	-------	------	-----	-----	---	------

Daily, Summer (Max)	—	—	—	—	—	—	—
Apartments Mid Rise	—	1,598	1,598	0.14	< 0.005	—	1,603
Strip Mall	—	11.1	11.1	< 0.005	< 0.005	—	11.2
Enclosed Parking with Elevator	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	—	0.00	0.00	0.00	0.00	—	0.00
General Office Building	—	92.6	92.6	0.01	< 0.005	—	92.9
Condo/Townhouse	—	447	447	0.04	< 0.005	—	448
Total	—	2,149	2,149	0.19	< 0.005	—	2,155
Daily, Winter (Max)	—	—	—	—	—	—	—
Apartments Mid Rise	—	1,598	1,598	0.14	< 0.005	—	1,603
Strip Mall	—	11.1	11.1	< 0.005	< 0.005	—	11.2
Enclosed Parking with Elevator	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	—	0.00	0.00	0.00	0.00	—	0.00
General Office Building	—	92.6	92.6	0.01	< 0.005	—	92.9
Condo/Townhouse	—	447	447	0.04	< 0.005	—	448
Total	—	2,149	2,149	0.19	< 0.005	—	2,155
Annual	—	—	—	—	—	—	—
Apartments Mid Rise	—	265	265	0.02	< 0.005	—	265
Strip Mall	—	1.84	1.84	< 0.005	< 0.005	—	1.85
Enclosed Parking with Elevator	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	—	0.00	0.00	0.00	0.00	—	0.00

General Office Building	—	15.3	15.3	< 0.005	< 0.005	—	15.4
Condo/Townhouse	—	74.0	74.0	0.01	< 0.005	—	74.2
Total	—	356	356	0.03	< 0.005	—	357

4.3. Area Emissions by Source

4.3.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Hearths	0.00	211	211	< 0.005	< 0.005	—	211
Consumer Products	—	—	—	—	—	—	—
Architectural Coatings	—	—	—	—	—	—	—
Landscape Equipment	—	144	144	0.01	< 0.005	—	145
Total	0.00	355	355	0.01	< 0.005	—	355
Daily, Winter (Max)	—	—	—	—	—	—	—
Hearths	0.00	211	211	< 0.005	< 0.005	—	211
Consumer Products	—	—	—	—	—	—	—
Architectural Coatings	—	—	—	—	—	—	—
Total	0.00	211	211	< 0.005	< 0.005	—	211
Annual	—	—	—	—	—	—	—
Hearths	0.00	2.39	2.39	< 0.005	< 0.005	—	2.39
Consumer Products	—	—	—	—	—	—	—
Architectural Coatings	—	—	—	—	—	—	—
Landscape Equipment	—	16.3	16.3	< 0.005	< 0.005	—	16.4
Total	0.00	18.7	18.7	< 0.005	< 0.005	—	18.8

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Apartments Mid Rise	32.3	109	142	3.32	0.08	—	249
Strip Mall	0.82	2.81	3.63	0.08	< 0.005	—	6.35
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	—	0.00
General Office Building	3.88	13.1	17.0	0.40	0.01	—	29.8
Condo/Townhouse	4.17	14.1	18.3	0.43	0.01	—	32.1
Total	41.2	139	181	4.23	0.10	—	317
Daily, Winter (Max)	—	—	—	—	—	—	—
Apartments Mid Rise	32.3	109	142	3.32	0.08	—	249
Strip Mall	0.82	2.81	3.63	0.08	< 0.005	—	6.35
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	—	0.00
General Office Building	3.88	13.1	17.0	0.40	0.01	—	29.8
Condo/Townhouse	4.17	14.1	18.3	0.43	0.01	—	32.1
Total	41.2	139	181	4.23	0.10	—	317
Annual	—	—	—	—	—	—	—
Apartments Mid Rise	5.35	18.1	23.5	0.55	0.01	—	41.2

Strip Mall	0.14	0.46	0.60	0.01	< 0.005	—	1.05
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	—	0.00
General Office Building	0.64	2.17	2.81	0.07	< 0.005	—	4.94
Condo/Townhouse	0.69	2.34	3.03	0.07	< 0.005	—	5.32
Total	6.82	23.1	29.9	0.70	0.02	—	52.5

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Apartments Mid Rise	276	0.00	276	27.6	0.00	—	967
Strip Mall	3.28	0.00	3.28	0.33	0.00	—	11.5
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	—	0.00
General Office Building	5.71	0.00	5.71	0.57	0.00	—	20.0
Condo/Townhouse	35.7	0.00	35.7	3.57	0.00	—	125
Total	321	0.00	321	32.1	0.00	—	1,123
Daily, Winter (Max)	—	—	—	—	—	—	—
Apartments Mid Rise	276	0.00	276	27.6	0.00	—	967
Strip Mall	3.28	0.00	3.28	0.33	0.00	—	11.5

Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	—	0.00
General Office Building	5.71	0.00	5.71	0.57	0.00	—	20.0
Condo/Townhouse	35.7	0.00	35.7	3.57	0.00	—	125
Total	321	0.00	321	32.1	0.00	—	1,123
Annual	—	—	—	—	—	—	—
Apartments Mid Rise	45.7	0.00	45.7	4.57	0.00	—	160
Strip Mall	0.54	0.00	0.54	0.05	0.00	—	1.90
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	—	0.00
General Office Building	0.95	0.00	0.95	0.09	0.00	—	3.31
Condo/Townhouse	5.91	0.00	5.91	0.59	0.00	—	20.7
Total	53.1	0.00	53.1	5.31	0.00	—	186

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	6.01	6.01
Strip Mall	—	—	—	—	—	0.04	0.04
General Office Building	—	—	—	—	—	0.03	0.03

Condo/Townhouse	—	—	—	—	—	1.08	1.08
Total	—	—	—	—	—	7.15	7.15
Daily, Winter (Max)	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	6.01	6.01
Strip Mall	—	—	—	—	—	0.04	0.04
General Office Building	—	—	—	—	—	0.03	0.03
Condo/Townhouse	—	—	—	—	—	1.08	1.08
Total	—	—	—	—	—	7.15	7.15
Annual	—	—	—	—	—	—	—
Apartments Mid Rise	—	—	—	—	—	1.00	1.00
Strip Mall	—	—	—	—	—	0.01	0.01
General Office Building	—	—	—	—	—	< 0.005	< 0.005
Condo/Townhouse	—	—	—	—	—	0.18	0.18
Total	—	—	—	—	—	1.18	1.18

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	BCO ₂	NBCO ₂	CO ₂ T	CH ₄	N ₂ O	R	CO ₂ e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	BCO ₂	NBCO ₂	CO ₂ T	CH ₄	N ₂ O	R	CO ₂ e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	9/2/2024	10/31/2024	5.00	44.0	—
Site Preparation	Site Preparation	11/1/2024	11/7/2024	5.00	5.00	—
Grading	Grading	11/8/2024	1/31/2025	5.00	61.0	—

Building Construction	Building Construction	8/1/2025	7/31/2027	5.00	521	—
Paving	Paving	5/1/2025	7/31/2025	5.00	66.0	—
Architectural Coating	Architectural Coating	5/1/2027	9/30/2027	5.00	109	—
Trenching	Trenching	2/3/2025	4/30/2025	5.00	63.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42

Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48
Trenching	Trenchers	Diesel	Average	1.00	8.00	40.0	0.50

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	18.5	LDA,LDT1,LDT2
Demolition	Vendor	—	10.2	HHDT,MHDT
Demolition	Hauling	54.5	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	28.2	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.82	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	521	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	116	10.2	HHDT,MHDT

Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	104	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT
Trenching	—	—	—	—
Trenching	Worker	2.50	18.5	LDA,LDT1,LDT2
Trenching	Vendor	—	10.2	HHDT,MHDT
Trenching	Hauling	0.00	20.0	HHDT
Trenching	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	2,004,703	668,234	43,689	10,588	24,110

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Ton of Debris)	Material Exported (Ton of Debris)	Acres Graded (acres)	Material Demolished (Ton of Debris)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	6,000	—
Site Preparation	—	1,422	7.50	0.00	—
Grading	—	400	183	0.00	—
Paving	0.00	0.00	0.00	0.00	9.22

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Apartments Mid Rise	—	0%
Strip Mall	0.00	0%
Enclosed Parking with Elevator	8.08	100%
Parking Lot	0.10	100%
Enclosed Parking Structure	1.04	100%
General Office Building	0.00	0%
Condo/Townhouse	—	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	349	0.03	< 0.005
2025	0.00	349	0.03	< 0.005
2026	0.00	346	0.03	< 0.005
2027	0.00	346	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	2,751	2,751	2,751	1,004,115	27,510	27,510	27,510	10,041,150

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Apartments Mid Rise	—
Wood Fireplaces	0
Gas Fireplaces	10
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	439
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0

Pellet Wood Stoves	0
Condo/Townhouse	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	58
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
2004703.4249999998	668,234	43,689	10,588	24,110

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
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Apartments Mid Rise	1,645,960	346	0.0330	0.0040	4,986,972
Strip Mall	56,964	346	0.0330	0.0040	34,724
Enclosed Parking with Elevator	1,151,915	346	0.0330	0.0040	0.00
Parking Lot	3,778	346	0.0330	0.0040	0.00
Enclosed Parking Structure	162,466	346	0.0330	0.0040	0.00
General Office Building	203,151	346	0.0330	0.0040	288,950
Condo/Townhouse	266,346	346	0.0330	0.0040	1,393,761

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Apartments Mid Rise	16,849,017	126,724
Strip Mall	429,621	6,480
Enclosed Parking with Elevator	0.00	0.00
Parking Lot	0.00	0.00
Enclosed Parking Structure	0.00	0.00
General Office Building	2,026,165	6,480
Condo/Townhouse	2,176,488	15,840

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Apartments Mid Rise	513	—
Strip Mall	6.09	—
Enclosed Parking with Elevator	0.00	—

Parking Lot	0.00	—
Enclosed Parking Structure	0.00	—
General Office Building	10.6	—
Condo/Townhouse	66.3	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Apartments Mid Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments Mid Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Strip Mall	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Strip Mall	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00
Strip Mall	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Condo/Townhouse	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Condo/Townhouse	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
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5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
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5.17. User Defined

Equipment Type	Fuel Type
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5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	9.03	annual days of extreme heat
Extreme Precipitation	3.50	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	1.31	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
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Temperature and Extreme Heat	0	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	0	0	0	N/A
Wildfire	0	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	1	1	2
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	57.8
AQ-PM	73.8
AQ-DPM	85.3
Drinking Water	53.8
Lead Risk Housing	71.1
Pesticides	0.00
Toxic Releases	90.8
Traffic	98.3
Effect Indicators	—
CleanUp Sites	91.8
Groundwater	0.00
Haz Waste Facilities/Generators	82.8
Impaired Water Bodies	0.00
Solid Waste	22.1
Sensitive Population	—
Asthma	55.8
Cardio-vascular	47.8
Low Birth Weights	41.7
Socioeconomic Factor Indicators	—

Education	75.4
Housing	48.1
Linguistic	66.9
Poverty	54.4
Unemployment	28.2

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	55.40870012
Employed	82.72808931
Median HI	52.89362248
Education	—
Bachelor's or higher	35.41639933
High school enrollment	100
Preschool enrollment	31.82343128
Transportation	—
Auto Access	58.09059412
Active commuting	62.68446041
Social	—
2-parent households	93.16052868
Voting	23.85474143
Neighborhood	—
Alcohol availability	53.74053638
Park access	48.29975619
Retail density	98.84511741

Supermarket access	72.33414603
Tree canopy	38.34210189
Housing	—
Homeownership	37.89298088
Housing habitability	43.38508918
Low-inc homeowner severe housing cost burden	27.93532658
Low-inc renter severe housing cost burden	78.69883229
Uncrowded housing	20.37726165
Health Outcomes	—
Insured adults	24.71448736
Arthritis	67.1
Asthma ER Admissions	50.7
High Blood Pressure	72.3
Cancer (excluding skin)	55.0
Asthma	49.0
Coronary Heart Disease	61.0
Chronic Obstructive Pulmonary Disease	53.7
Diagnosed Diabetes	54.0
Life Expectancy at Birth	67.7
Cognitively Disabled	95.5
Physically Disabled	83.0
Heart Attack ER Admissions	78.0
Mental Health Not Good	41.5
Chronic Kidney Disease	45.1
Obesity	51.8
Pedestrian Injuries	60.5
Physical Health Not Good	44.3

Stroke	58.2
Health Risk Behaviors	—
Binge Drinking	15.4
Current Smoker	44.4
No Leisure Time for Physical Activity	40.3
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	64.0
Elderly	60.7
English Speaking	29.3
Foreign-born	72.2
Outdoor Workers	33.6
Climate Change Adaptive Capacity	—
Impervious Surface Cover	46.9
Traffic Density	99.3
Traffic Access	23.0
Other Indices	—
Hardship	66.1
Other Decision Support	—
2016 Voting	58.2

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	71.0
Healthy Places Index Score for Project Location (b)	57.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No

Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
 b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Project plans and LLG trip generation estimates. Population based on SCAG’s average 2016 persons-per-household rate for the City of 4.6 persons per household.
Construction: Construction Phases	Developer information
Construction: Off-Road Equipment	—
Construction: Trips and VMT	10 CY haul truck capacity during demolition, 14 CY during site preparation and grading.
Operations: Hearths	Developer information