# 4.6 Greenhouse Gas Emissions

This section analyzes the greenhouse gas (GHG) impacts that could result from implementation of the project. The analysis in this section is based on statewide GHG emissions reduction goals and GHG inventory data from the Greenhouse Gas Emissions Forecasts Report for the City of Irvine Draft Climate Action and Adaptation Plan (CAAP) dated August 8, 2023 (Appendix E). Additionally two hypothetical projects were modeled; emissions modeling results are included as Appendix F-1 and Appendix F-2.

## 4.6.1 Existing Conditions

### 4.6.1.1 Greenhouse Gases and Climate Change

There are numerous GHGs, both naturally occurring and resulting from human activities. Each GHG has variable atmospheric lifetime and global warming potential (GWP). The atmospheric lifetime of the gas is the average time a molecule stays stable in the atmosphere. Most GHGs have long atmospheric lifetimes, staying in the atmosphere hundreds or thousands of years. GWP is a measure of the potential for a gas to trap heat and warm the atmosphere. Although GWP is related to its atmospheric lifetime, many other factors including chemical reactivity of the gas also influence GWP. GWP is reported as a unitless factor representing the potential for the gas to affect global climate relative to the potential of carbon dioxide ($CO_2$). Because $CO_2$ is the reference gas for establishing GWP, by definition its GWP is 1. Although methane ($CH_4$) has a shorter atmospheric lifetime than $CO_2$, it has a 100-year GWP of 28; this means that $CH_4$ has 28 times more of an effect on global warming than $CO_2$ on a molecule--by-molecule basis.

GHG emissions estimates are typically represented in terms of equivalent metric tons of $CO_2$ (MT $CO_2E$). $CO_2E$ emissions are the product of the amount of each gas by its GWP. The effects of several GHGs may be discussed in terms of MT $CO_2E$ and can be summed to represent the total potential of these gases to warm the global climate. Table 4.6-1 summarizes some of the most common GHGs. All of the gases in Table 4.6-1 are produced by both biogenic (natural) and anthropogenic (human) sources. The GHGs of primary concern in this analysis are $CO_2$, $CH_4$, and $N_2O$.

| Table 4.6-1<br>Global Warming Potentials and Atmospheric Lifetimes<br>(years) | | | |
|---|---|---|---|
| Gas | Atmospheric Lifetime (years) | 100-year GWP | 20-year GWP |
| Carbon dioxide ($CO_2$) | 50–200 | 1 | 1 |
| Methane ($CH_4$) | 12.4 | 28 | 84 |
| Nitrous oxide ($N_2O$) | 121 | 265 | 264 |
| HFC-23 | 222 | 12,400 | 10,800 |
| HFC-32 | 5.2 | 677 | 2,430 |
| HFC-125 | 28.2 | 3,170 | 6,090 |
| HFC-134a | 13.4 | 1,300 | 3,710 |
| HFC-143a | 47.1 | 4,800 | 6,940 |
| HFC-152a | 1.5 | 138 | 506 |
| HFC-227ea | 38.9 | 3,350 | 5,360 |
| HFC-236fa | 242 | 8,060 | 6,940 |
| HFC-43-10mee | 16.1 | 1,650 | 4,310 |
| $CF_4$ | 50,000 | 6,630 | 4,880 |
| $C_2F_6$ | 10,000 | 11,100 | 8,210 |
| $C_3F_8$ | 2,600 | 8,900 | 6,640 |
| $C_4F_{10}$ | 2,600 | 9,200 | 6,870 |
| c-$C_4F_8$ | 3,200 | 9,540 | 7,110 |
| $C_5F_{12}$ | 4,100 | 8,550 | 6,350 |
| $C_6F_{14}$ | 3,100 | 7,910 | 5,890 |
| $SF_6$ | 3,200 | 23,500 | 17,500 |
| SOURCE: Intergovernmental Panel on Climate Change (IPCC) 2007, 2014.<br>GWP = growth warming potential | | | |

### 4.6.1.2 GHG Inventories

#### a. State

The California Air Resources Board (CARB) performs statewide GHG inventories. The inventory is divided into the following sectors of economic activity: electricity generation, transportation, industrial, commercial, residential, agriculture and forestry. Emissions are quantified in million metric tons (MMT) of $CO_2E$. Table 4.6-2 shows the estimated statewide GHG emissions for the years 1990, 2019, and 2021. Although annual GHG inventory data is available for years 2000 through 2021, the years 1990, 2019, and 2021 are highlighted in Table 4.6-2 because 1990 is the baseline year for established reduction targets, 2019 corresponds to the year for which inventory data for the City is available, and 2021 is the most recent data available.

| Table 4.6-2<br>California GHG Emissions by Sector in 1990, 2019, and 2021 | | | |
|---|---|---|---|
| Sector | 1990[1] Emissions in MMT $CO_2E$ (% total)[2] | 2019[3] Emissions in MMT $CO_2E$ (% total)[2] | 2021[3] Emissions in MMT $CO_2E$ (% total)[2] |
| Electricity Generation | 110.5 (25.7%) | 60.4 (14.9%) | 62.6 (16.4%) |
| Transportation | 150.6 (35.0%) | 166.4 (41.2%) | 149.5 (39.2%) |
| Industrial | 105.3 (24.4%) | 92.2 (22.8%) | 85.3 (22.4%) |
| Commercial | 14.4 (3.4%) | 23.0 (5.7%) | 22.5 (5.9%) |
| Residential | 29.7 (6.9%) | 31.0 (7.7%) | 30.5 (8.0%) |
| Agriculture & Forestry | 18.9 (4.4%) | 31.3 (7.7%) | 30.9 (8.1%) |
| Not Specified | 1.3 (0.3%) | -- | -- |
| **TOTAL[4]** | **430.7** | **404.3** | **381.3** |

SOURCE: CARB 2007 and 2023.
[1]1990 data was obtained from the CARB 2007 source and are based on IPCC fourth assessment report GWPs.
[2]Percentages may not total 100 due to rounding.
[3]2019 and 2021 data was retrieved from the CARB 2023 source and are based on IPCC fourth assessment report GWPs.
[4]Totals may vary due to independent rounding.

As shown in Table 4.6-2, statewide GHG source emissions totaled about 430.7 MMT $CO_2E$ in 1990, 404.3 MMT $CO_2E$ in 2019, and 381.3 MMT $CO_2E$ in 2021. Many factors affect year-to-year changes in GHG emissions, including economic activity, demographic influences, environmental conditions such as drought, and the impact of regulatory efforts to control GHG emissions. However, transportation-related emissions consistently contribute the most GHG emissions, followed by electricity generation and industrial emissions.

## b. Local

A 2019 GHG emissions inventory was conducted in conjunction with preparation of the City's CAAP. The inventory covers GHG emissions from ten sectors within the boundaries of the City. The results are summarized in Table 4.6-3.

| Table 4.6-3<br>City GHG Emissions in 2019 | | |
|---|---|---|
| | 2019 Baseline Emissions | |
| Source | MT $CO_2E$ | % |
| On-Road Transportation | 1,144,205 | 51 |
| Nonresidential Building Energy | 550,138 | 24 |
| Residential Building Energy | 291,405 | 13 |
| Solid Waste | 160,626 | 7 |
| Off-Road Vehicles and Equipment | 68,756 | 3 |
| Water Supply | 30,798 | 1 |
| Wastewater Treatment | 5,665 | <1 |
| **TOTAL** | **2,251,593** | **100** |

SOURCE: City of Irvine 2023.

## 4.6.2 Applicable Regulatory Requirements

In response to rising concern associated with increasing GHG emissions and global climate change impacts, several plans and regulations have been adopted at the international, national, and state levels with the aim of reducing GHG emissions. The following is a discussion of the federal, state, and local plans and regulations most applicable to the project.

### 4.6.2.1 Federal Regulations

#### a. U.S. Environmental Protection Agency

In 2009, the U.S. Environmental Protection Agency (U.S. EPA) issued its science-based finding that the buildup of heat-trapping GHGs in the atmosphere endangers public health and welfare. The "Endangerment Finding" reflects the overwhelming scientific evidence on the causes and impacts of climate change. It was made after a thorough rulemaking process considering thousands of public comments and was upheld by the federal courts.

The U.S. EPA has many federal level programs and projects to reduce GHG emissions. The U.S. EPA provides technical expertise and encourages voluntary reductions from the private sector. One of the voluntary programs applicable to the project is the Energy Star program. Energy Star products such as appliances, building products, heating and cooling equipment, and other energy-efficient equipment would be utilized by the project.

Energy Star is a joint program of U.S. EPA and the U.S. Department of Energy, which promotes energy-efficient products and practices. Tools and initiatives include the Energy Star Portfolio Manager, which helps track and assess energy and water consumption across an entire portfolio of buildings, and the Energy Star Most Efficient 2020, which provides information on exceptional products which represent the leading edge in energy-efficient products in the year 2020 (U.S. EPA 2024a).

The U.S. EPA also collaborates with the public sector, including states, tribes, localities and resource managers, to encourage smart growth, sustainability preparation, and renewable energy and climate change preparation. These initiatives include the Clean Energy – Environment State Partnership Program, the Climate Ready Water Utilities Initiative, the Climate Ready Estuaries Program, and the Sustainable Communities Partnership (U.S. EPA 2024b).

#### b. Corporate Average Fuel Economy Standards

The project would generate vehicle trips that would consume fuel and generate GHG emissions. The federal Corporate Average Fuel Economy (CAFE) standards determine the fuel efficiency of certain vehicle classes in the U.S. The first phase of the program applied to passenger cars, new light-duty trucks, and medium-duty passenger cars with model years 2012 through 2016, and required these vehicles to achieve a standard equivalent to 35.5 miles per gallon (mpg). The second phase of the program applies to model years 2017 through 2025 and increased the standards to 54.5 mpg. Separate standards were also established for medium- and heavy-duty vehicles. The first phase applied to model years 2014 through 2018 and the second phase applies to model years 2018

through 2027. With improved gas mileage, fewer gallons of transportation fuel would be combusted to travel the same distance, thereby reducing nationwide GHG emissions associated with vehicle travel.

#### 4.6.2.2 State Regulations

### a. Statewide GHG Emission Targets

#### *S-3-05—Statewide GHG Emission Targets*

This executive order (EO) establishes the following GHG emissions reduction targets for the state of California:

- by 2010, reduce GHG emissions to 2000 levels;
- by 2020, reduce GHG emissions to 1990 levels; and
- by 2050, reduce GHG emissions to 80 percent below 1990 levels.

This EO also directs the secretary of the California Environmental Protection Agency to oversee the efforts made to reach these targets, and to prepare biannual reports on the progress made toward meeting the targets and on the impacts to California related to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. With regard to impacts, the report shall also prepare and report on mitigation and adaptation plans to combat the impacts. The first Climate Action Team Assessment Report was produced in March 2006, and has since been updated every two years.

#### *B-30-15—2030 Statewide GHG Emission Goal*

This EO, issued on April 29, 2015, establishes an interim GHG emission reduction goal for the state of California by 2030 of 40 percent below 1990 levels. This EO also directed all state agencies with jurisdiction over GHG emitting sources to implement measures designed to achieve the new interim 2030 goal, as well as the pre-existing, long-term 2050 goal identified in EO S-3-05. Additionally, this EO directed CARB to update its Climate Change Scoping Plan to address the 2030 goal.

#### *Assembly Bill 1279*

Assembly Bill (AB) 1279, approved in September 2022, requires the state to achieve net zero GHG emissions as soon as possible, but no later than 2045, and achieve and maintain net negative GHG emissions thereafter, and to ensure that by 2045, statewide anthropogenic GHG emissions are reduced to at least 85 percent below 1990 levels. The bill would require the state board to work with relevant state agencies to ensure that updates to the scoping plan identify and recommend measures to achieve these policy goals and to identify and implement a variety of policies and strategies that enable carbon dioxide removal solutions and carbon capture, utilization, and storage technologies.

### b. Assembly Bill 32—California Global Warming Solutions Act of 2006

In response to EO S-3-05, the California Legislature passed AB 32, the California Global Warming Solutions Act of 2006, and thereby enacted Sections 38500–38599 of the California Health and Safety

Code. The heart of AB 32 is its requirement that CARB establish an emissions cap and adopt rules and regulations that would reduce GHG emissions to 1990 levels by 2020. AB 32 also required CARB to adopt a plan by January 1, 2009, indicating how emission reductions would be achieved from significant GHG sources via regulations, market mechanisms, and other actions.

### c. Senate Bill 32—California Global Warming Solutions Act Update

Approved in September 2016, Senate Bill (SB) 32 updates the California Global Warming Solutions Act of 2006 and enacts EO B-30-15. Under SB 32, the state would reduce its GHG emissions to 40 percent below 1990 levels by 2030. This is equivalent to an emissions level of approximately 260 MMT $CO_2E$ for 2030. In implementing the 40 percent reduction goal, CARB is required to prioritize emissions reductions to consider the social costs of the emissions of GHGs; where "social costs" is defined as "an estimate of the economic damages, including, but not limited to, changes in net agricultural productivity; impacts to public health; climate adaptation impacts, such as property damages from increased flood risk; and changes in energy system costs, per metric ton of greenhouse gas emission per year."

### d. Climate Change Scoping Plan

As directed by the California Global Warming Solutions Act of 2006, CARB adopted the Climate Change Scoping Plan: A Framework for Change (Scoping Plan) in 2008, which identifies the main strategies California will implement to achieve the GHG reductions necessary to reduce forecasted business as usual (BAU) emissions in 2020 to the state's historic 1990 emissions level (CARB 2008). In November 2017, CARB released the 2017 Climate Change Scoping Plan Update, the Strategy for Achieving California's 2030 Greenhouse Gas Target (2017 Scoping Plan; CARB 2017). The 2017 Scoping Plan identifies state strategies for achieving the state's 2030 interim GHG emissions reduction target codified by SB 32. Measures under the 2017 Scoping Plan Scenario build on existing programs such as the Low Carbon Fuel Standard, Advanced Clean Cars Program, Renewables Portfolio Standard (RPS), Sustainable Communities Strategy (SCS), Short-Lived Climate Pollutant Reduction Strategy, and the Cap-and-Trade Program. Additionally, the 2017 Scoping Plan proposes new policies to address GHG emissions from natural and working lands. The 2022 Scoping Plan Update for Achieving Carbon Neutrality (2022 Scoping Plan; CARB 2022) was adopted in December 2022. The 2022 Scoping Plan assesses the progress towards the 2030 GHG emissions reduction target identified in the 2017 Scoping Plan and lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045, as directed by AB 1279. The 2022 Scoping Plan identifies strategies related to clean technology, energy development, natural and working lands, and others, and is designed to meet the state's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

### e. Regional Emissions Targets—SB 375

SB 375, the 2008 Sustainable Communities and Climate Protection Act, was signed into law in September 2008 and requires CARB to set regional targets for reducing passenger vehicle GHG emissions in accordance with the Scoping Plan. The purpose of SB 375 is to align regional transportation planning efforts, regional GHG reduction targets, and fair-share housing allocations

under state housing law. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a SCS or Alternative Planning Strategy to address GHG reduction targets from cars and light-duty trucks in the context of that MPO's Regional Transportation Plan (RTP). Southern California Association of Governments (SCAG) is the region's MPO. In 2018, CARB set targets for the SCAG region of an 8 percent reduction in GHG emissions per capita from automobiles and light-duty trucks compared to 2005 levels by 2020 and a 19 percent reduction by 2035. These targets are periodically reviewed and updated.

## f. Renewables Portfolio Standard

The RPS promotes diversification of the state's electricity supply and decreased reliance on fossil fuel energy sources. Renewable energy includes (but is not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas. Originally adopted in 2002 with a goal to achieve a 20 percent renewable energy mix by 2020 (referred to as the "Initial RPS"), the goal has been accelerated and increased by EOs S-14-08 and S-21-09 to a goal of 33 percent by 2020. In April 2011, SB 2 (1X) codified California's 33 percent RPS goal. SB 350 (2015) increased California's renewable energy mix goal to 50 percent by year 2030. SB 100 (2018) further increased the standard set by SB 350 establishing the RPS goal of 44 percent by the end of 2024, 52 percent by the end of 2027, and 60 percent by 2030.

## g. California Building Standards Code (Title 24)

The California Code of Regulations (CCR), Title 24, is referred to as the California Building Code (CBC). It consists of a compilation of several distinct standards and codes related to building construction including plumbing, electrical, interior acoustics, energy efficiency, handicap accessibility and so on. Of particular relevance to GHG emissions reductions are the CBC's energy efficiency and green building standards as outlined below.

### *Title 24, Part 6 – Energy Code*

The California Code of Regulations, Title 24, Part 6 is the California Energy Efficiency Standards for Residential and Nonresidential Buildings (also known as the California Energy Code). This code, originally enacted in 1978, establishes energy-efficiency standards for residential and nonresidential buildings in order to reduce California's energy consumption. The Energy Code is updated periodically to incorporate and consider new energy-efficient technologies and methodologies as they become available, and incentives in the form of rebates and tax breaks are provided on a sliding scale for buildings achieving energy efficiency above the minimum standards.

The current 2022 Title 24 Building Energy Efficiency Standards went into effect on January 1, 2023. The 2022 Energy Code increases on-site renewable energy generation from solar, increases electric load flexibility to support grid reliability, reduces emissions from newly constructed buildings, reduces air pollution for improved public health, and encourages adoption of environmentally beneficial efficient electric technologies.

New construction and major renovations must demonstrate their compliance with the current Energy Code through submission and approval of a Title 24 Compliance Report to the local building permit review authority and the California Energy Commission (CEC). The compliance reports must

demonstrate a building's energy performance through use of CEC approved energy performance software that shows iterative increases in energy efficiency given the selection of various heating, ventilation, and air conditioning; sealing; glazing; insulation; and other components related to the building envelope.

#### *Title 24, Part 11 – California Green Building Standards Code*

The California Green Building Standards Code, referred to as CALGreen, was added to Title 24 as Part 11 first in 2009 as a voluntary code, which then became mandatory effective January 1, 2011 (as part of the 2010 CBC). The most recent 2022 CALGreen institutes mandatory minimum environmental performance standards for all ground-up new construction of nonresidential and residential structures. Local jurisdictions must enforce the minimum mandatory Green Building Standards and may adopt additional amendments for stricter requirements. The mandatory measures are related to planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. 2022 CALGreen also includes two tiers of residential and nonresidential voluntary measures that encourage local jurisdictions to raise the sustainability goals: Tier 1 adds additional requirements beyond the mandatory measures, and Tier 2 further increases the requirements.

Similar to the reporting procedure for demonstrating Energy Code compliance in new buildings and major renovations, compliance with the CALGreen mandatory requirements must be demonstrated through completion of compliance forms and worksheets.

### 4.6.2.3 Local

#### a. South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) is the agency responsible for air quality planning and regulation in the South Coast Air Basin. The SCAQMD addresses the impacts to climate change of projects subject to SCAQMD permit as a lead agency if they are the only agency having discretionary approval for the project and acts as a responsible agency when a land use agency must also approve discretionary permits for the project. The SCAQMD acts as an expert commenting agency for impacts to air quality. This expertise carries over to GHG emissions, so the agency helps local land use agencies through the development of models and emission thresholds that can be used to address GHG emissions.

In 2008, SCAQMD formed a Working Group to identify GHG emissions thresholds for land use projects that could be used by local lead agencies in the South Coast Air Basin. The Working Group developed several different options that are contained in the SCAQMD Draft Guidance Document – Interim CEQA GHG Significance Thresholds for Stationary Sources, Rules, and Plans, which could be applied by lead agencies. The working group met again in 2010 to review the guidance. The SCAQMD Board has not approved the thresholds; however, the Guidance Document provides substantial evidence supporting the approaches to significance of GHG emissions that can be considered by the lead agency in adopting its own threshold. The current interim thresholds consist of the following tiered approach (SCAQMD 2008, 2010):

- Tier 1 – The project is exempt from the California Environmental Quality Act (CEQA).

- Tier 2 – The project is consistent with an applicable regional GHG emissions reduction plan. If a project is consistent with a qualifying local GHG reduction plan, it does not have significant GHG emissions.

- Tier 3 – Project GHG emissions represent an incremental increase below or mitigated to less than Significance Screening Levels, where
    - Residential/Commercial Screening Level
        - Option 1: 3,000 MT $CO_2E$ screening level for all residential/commercial land uses
        - Option 2: Screening level thresholds for land use type acceptable if used consistently by a lead agency:
            - Residential: 3,500 MT $CO_2E$
            - Commercial: 1,400 MT $CO_2E$
            - Mixed-Use: 3,000 MT $CO_2E$
    - 10,000 MT $CO_2E$ is the Permitted Industrial Screening Level

- Tier 4 – The project achieves performance standards, where performance standards may include:
    - Option 1: Percent emission reduction target. SCAQMD has no recommendation regarding this approach at this time.
    - Option 2: The project would implement substantial early implementation of measures identified in the CARB's Scoping Plan. This option has been folded into Option 3.
    - Option 3: SCAQMD Efficiency Targets.
        - 2020 Targets: 4.8 MT $CO_2E$ per service population for project-level analyses or 6.6 MT $CO_2E$ per service population for plan level analyses where service population includes residential and employment populations provided by a project.
        - 2035 Targets: 3.0 MT $CO_2E$ per service population for project-level analyses or 4.1 MT $CO_2E$ per service population for plan level analyses.

- Tier 5 – Offsets along or in combination with the above target Significance Screening Level. Offsets must be provided for a 30-year project life, unless the project life is limited by permit, lease, or other legally binding condition.

If a project complies with any one of these tiers, its impacts related to the generation of GHG emissions would be considered less than significant.

The SCAQMD's interim thresholds used the EO S-3-05 year 2050 goal as the basis for the Tier 3 screening level. Achieving the EO's objective would contribute to worldwide efforts to cap $CO_2$ concentrations at 450 parts per million, thus stabilizing global climate.

SCAQMD only has authority over GHG emissions from development projects that include air quality permits. At this time, it is unknown if the project would include stationary sources of emissions subject

to SCAQMD permits. Notwithstanding, if the project requires a stationary permit, it would be subject to the applicable SCAQMD regulations.

SCAQMD Regulation XXVII, adopted in 2009, includes the following rules:

- Rule 2700 defines terms and post global warming potentials.
- Rule 2701, SoCal Climate Solutions Exchange, establishes a voluntary program to encourage, quantify, and certify voluntary, high quality certified GHG emission reductions in the SCAQMD.
- Rule 2702, GHG Reduction Program created a program to produce GHG emission reductions within the SCAQMD. The SCAQMD will fund projects through contracts in response to requests for proposals or purchase reductions from other parties.

## b. Southern California Association of Governments

In September 2020, SCAG adopted Connect SoCal, the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy. The Connect SoCal plan identifies land use strategies that focus on new housing and job growth in areas with a variety of destinations and mobility options that would support and complement the proposed transportation network. The overarching strategy in Connect SoCal is to provide for a plan that allows the southern California region to grow in more compact communities in transit priority areas and priority growth areas; provide neighborhoods with efficient and plentiful public transit; establish abundant and safe opportunities to walk, bike, and pursue other forms of active transportation; and preserve more of the region's remaining natural lands and farmlands (SCAG 2020). The Connect SoCal plan contains transportation projects to help more efficiently distribute population, housing, and employment growth as well as projected development that promotes active transport and reduces GHG emissions.

It should be noted that SCAG is currently in the process of updating this document and recently released the draft Connect SoCal 2024 for review and comment. The final Connect SoCal 2024 document is expected to go to the Regional Council for adoption in April 2024.

## c. Existing General Plan (2000)

The City's current 2000 General Plan does not specifically address GHG emissions. Although the City's existing General Plan does not directly address GHG emissions, various elements include policies supporting GHG emissions including the Land Use, Energy, Solid Waste, and Conservation and Open Space elements. The Land Use Element includes policies supporting efficient land use patterns. Energy efficiency is addressed in the Energy Element, waste reduction and recycling policies are addressed in the Solid Waste Element, and open space and water conservation policies are included in the Conservation and Open Space Element. These elements are being updated and consolidated as part of the project and the proposed General Plan update will include measures to address GHG emissions to support compliance with state mandates.

## d. Climate Action and Adaptation Plan

The City is developing its first CAAP, which will establish a plan to achieve reductions in GHG emissions from City operations and community activities. The CAAP will also recommend ways that the City can adapt to current and future climate-related impacts, like wildfires, extreme heat events, drought, extreme rain, and flooding.

GHG reduction targets to be addressed in the CAAP are informed by the state targets of 40 percent below 1990 levels by 2030 (per the 2022 California Air Resource Board Scoping Plan and SB 32) and 85 percent below 1990 levels by 2045 (per AB 1279).

The GHG Inventory prepared for the CAAP estimates emissions from 2019 and found the three following categories were responsible for the majority of the City's GHG emissions: on-road transportation, building energy, and solid waste sectors. Additional categories addressed in the CAAP include off-road vehicles and equipment, and other miscellaneous category topics including urban forestry, urban heat island reduction, green infrastructure, green business and jobs, and carbon sequestration.

## e. Municipal Code

In Title 1 General Services, Division 13 Irvine Sustainable Community Initiative, Section 1.13.104 Development and implementation of programs and plans, the Code states that the City shall create and implement programs that encourage community members to participate in alternative transportation modes. Such modes include alternative fuel vehicles, reduced emission or zero emission vehicles, mass transit services, carpooling, bicycling, and walking.

## f. Zero-Emission Vehicles Transition Plan

The purpose of the Zero-Emission Vehicles Transition Plan (ZEVTP) is to implement the following policies from the City's Strategic Energy Plan: (TLU-1) reduce emissions from city fleet vehicles; (TLU-3.1) create an infrastructure plan for public and private electric vehicle supply equipment (EVSE) needs citywide. Some of the policies the City considered while creating the plan include AB 32, SB 350, and CARB regulations. AB 32 requires that the state and its political subdivisions reduce carbon emissions by 80 percent from their 1990 levels by 2050. SB 350 requires that the state reduce its carbon emissions by 50 percent from their 1990 levels by 2030. The state's aggressive air quality and climate targets include a reduction GHGs of 40 percent below 1990 levels by 2030, an 80 percent reduction below 1990 levels by 2050, and a 50 percent reduction of petroleum use by 2030 (CARB 2021). The ZEVTP describes technological and infrastructural considerations for implementing ZEV technologies throughout the City and an analysis of fleet electrification needs. It also provides projections for EV needs throughout the community, funding opportunities to implement EV technologies throughout the City, and a monitoring plan.

## g. Irvine ACHIEVES

Irvine ACHIEVES, a City Resolution adopted in August 2021, defines the City's goal for a zero-carbon local economy based on the latest climate science. It places a strong emphasis on environmental,

economic, and social justice in all climate initiatives, actively involving community stakeholders and prioritizing the protection of vulnerable communities from environmental harm.

## h. Existing Plans, Programs, and Policies

Compliance measures are regulations imposed uniformly by the approving agency based on the proposed action taken and are required of the project to reduce its potential environmental effects. Because these features are standard requirements, they do not constitute mitigation measures. The following measures are existing plans, programs, or policies (PPP) that apply to the project and will help to reduce and avoid potential impacts related to greenhouse gases:

- PPP GHG-1: Compliance with Title 24, Part 6 – Energy Code
- PPP GHG-2: Compliance with Title 24, Part 11 – California Green Building Standards Code
- PPP GHG-3: Compliance with SCAQMD Regulations
- PPP GHG-4: Compliance with SCAQMD CEQA Thresholds
- PPP GHG-5: Compliance with Irvine Sustainable Community Initiative

### *Proposed General Plan Strategies and Policies*

In addition to the above-listed PPPs, the following proposed Goals, Objectives, Policies, and Implementation Actions are applicable to the analysis of GHGs and would replace existing goals, strategies, and policies outlined in the City's existing General Plan following project approval:

#### *Environmental Protection and Climate Action Element*

Goal 3: Reduce greenhouse gas emissions and mitigate climate change impacts in Irvine to create a more sustainable and resilient community.

*Objective EPCA-3*: Achieve significant reductions in greenhouse gas emissions across all sectors within Irvine by implementing targeted policies and initiatives.

- Policy (a): Promote the transition to renewable energy sources, such as solar, wind, and geothermal, for electricity generation within Irvine.
- Policy (b): Encourage the adoption of energy-efficient technologies and practices in buildings, transportation, and industries to reduce reliance on fossil fuels.
- Policy (c): Prioritize investments in public transit infrastructure, walking and biking paths, and electric vehicle charging stations to reduce emissions from transportation.
- Policy (d): Promote energy conservation measures, such as retrofitting buildings with energy-efficient appliances, insulation, and lighting systems.

Goal 6: Reduce energy consumption and promote energy efficiency in Irvine.

*Objective EPCA-6*. Achieve significant reductions in per capita energy consumption across residential, commercial, and municipal sectors while promoting the adoption of renewable energy sources and energy-efficient technologies.

- **Policy (a)**: Through the efforts of CALGreen, establish and enforce energy efficiency standards and building codes for new construction and major renovations to improve the energy performance of buildings and reduce energy demand.
- **Policy (b)**: Require energy-efficient building design, insulation, HVAC systems, lighting, and appliances to minimize energy consumption and lower utility costs for residents and businesses.
- **Policy (c)**: Promote the adoption of renewable energy systems, such as solar photovoltaic (PV) panels, wind turbines, and geothermal heat pumps, to generate clean and sustainable electricity for onsite consumption or grid injection.
- **Policy (d)**: Streamline permitting processes and provide incentives, rebates, and financing options to encourage residents, businesses, and municipal facilities to invest in renewable energy installations.
- **Policy (e)**: Implement energy conservation programs and public awareness campaigns to educate residents and businesses about the importance of energy conservation, energy-saving practices, and behavioral changes to reduce energy waste.
- **Policy (f)**: Monitor federal, state, regional, and other local governments, utility companies, Irvine Ranch Water District (IRWD), and other private and public agencies energy programs. Obtain information and technical assistance for energy programs and implement federal and state energy programs.
- **Policy (g)**: Promote energy savings in buildings constructed before 1978.
- **Policy (h)**: Encourage voluntary retrofit energy programs for residential, commercial, and industrial buildings including energy conservation measures.
- **Policy (i)**: Maximize energy efficiency of the City's facilities and operations by use of recycled materials, renewable sources, and conservation measures.

## 4.6.3 Significance Determination Thresholds

Thresholds used to evaluate impacts to GHG emissions are based on applicable criteria in the CEQA Guidelines (California Code of Regulations Sections 15000-15387), Appendix G. A significant impact would occur if the project would:

1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs.

State CEQA Guidelines Section 15064.4 states that "the determination of the significance of greenhouse gas emissions (GHG) calls for careful judgment by the lead agency, consistent with the provisions in Section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of greenhouse gas emissions resulting from a project." Section 15064.4(b) further states that a lead agency should consider the following non-exclusive factors when assessing the significance of GHG emissions:

1. The extent to which the 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 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.

State CEQA Guidelines Section 15064(h)(1) states that "the lead agency shall consider whether the cumulative impact is significant and whether the effects of the project are cumulatively considerable." A cumulative impact may be significant when the project's incremental effect, though individually limited, is cumulatively considerable. Therefore, for the purposes of this analysis, the significance of impacts was evaluated using criteria (1) and (3) above. Specifically, the following analysis determines that the Proposed Project would not result in a significant GHG impact because it would result in an overall reduction in GHG emissions per service population, and because it would be consistent with state, regional, and local strategies, goals, and policies to reduce GHG emissions.

## 4.6.4 Methodology

The City utilized a GHG emissions inventory (see Appendix E) that was developed for a the ongoing CAAP effort, which includes a 2019 GHG emissions inventory. The inventory does not account for the land use and population projections that would result from implementation of the General Plan Update; however, a comprehensive emissions inventory of all City emissions sources provides the best available data to estimate future GHG emissions, despite the General Plan Update growth not being included in the inventory. Similarly, the estimate of the GHG emissions projections for the years 2030, 2035, 2040, and 2045 represent best available data. Methodology for preparation of the CAAP baseline inventory and emission forecasts are detailed in Appendix E and summarized below.

The City prepared a 2019 emissions inventory and emission forecasts, as follows:

- The "Business as Usual" or BAU forecast provides an assessment of how emissions generated by community activities will change over time without further local, state, or federal action.
- The legislative adjusted BAU forecast assumes implementation of adopted legislative and regulatory actions at the state and federal levels that would reduce emissions without any local action, such as regulatory requirements to increase vehicle fuel efficiency and increase renewable energy sources in grid electricity portfolios.

Both the BAU and legislative-adjusted BAU emissions forecasts were based on population and employment from the City's land use database and the California State University, Fullerton, Center for Demographic Research Orange County Projections. As those population projections were from 2019, they do not account for the latest population and employment data incorporating land use changes proposed with the project. Although land use changes associated with the project were not incorporated into the emission projections in the 2019 emission inventory, the emission projections conducted for that effort is the best and most comprehensive available estimate of GHG emissions at this time due to the comprehensive nature of the emission inventory. As detailed in the 2019 inventory, population and employment are expected to increase by 21 and 28 percent, respectively, from 2019 to 2045 (Table 4.6-4). These growth factors were used to forecast emissions for most

sectors. Annual vehicle miles traveled (VMT) projections were developed using the origin-destination method using data from the Irvine Transportation Analysis Model (ITAM) Traffic Model 2021. Annual VMT by 2045 is projected to increase by 3.2 percent from 2019. VMT projections were used to scale emissions from the on-road transportation sector. Table 4.6-4 shows growth in population, employment, and annual VMT from 2019 to 2045.

The City also prepared municipal emissions forecasts to identify emissions associated with the City's municipal operations which would facilitate development of steps to reduce municipal emissions to meet statewide reduction mandates; however, communitywide emissions are the focus for project analysis due to future development having capacity to affect communitywide emissions.

**Table 4.6-4**
**City Community Demographic and Vehicle Miles Traveled Forecasts**

| Forecast Factor | 2019 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Population | 291,124 | 317,246 | 329,119 | 340,993 | 352,866 |
| Employment | 250,954 | 280,541 | 293,989 | 307,438 | 320,886 |
| Annual VMT | 2,910,428,375 | 2,950,103,309 | 2,968,137,370 | 2,986,171,431 | 3,004,205,493 |

SOURCE: Appendix E.
VMT = vehicle miles traveled.
NOTE: These projections are based on 2019 CAAP projections for disclosure of potential annual VMT. Data is independent of the General Plan Update and VMT per capita estimates contained in the VMT Traffic Study and is considered a conservative estimate due to the project VMT study (Appendix H) projecting reductions in VMT per capita with the project.

The BAU forecast is detailed in Table 4.6-5 and the legislative adjusted BAU forecasts are shown in Table 4.6-6. As shown, the largest emissions-generating sectors include on-road transportation and nonresidential and residential building energy.

**Table 4.6-5**
**City Community GHG Emissions Inventory and BAU Forecasts ($MTCO_2E$)**

| Sector | 2019 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| On-Road Transportation | 1,140,206 | 1,155,749 | 1,162,814 | 1,169,879 | 1,176,944 |
| Nonresidential Building Energy | 550,138 | 549,886 | 576,246 | 602,607 | 628,967 |
| Residential Building Energy | 291,405 | 298,338 | 309,504 | 320,670 | 331,836 |
| Solid Waste | 160,626 | 175,038 | 181,590 | 188,141 | 194,692 |
| Off-Road Vehicles & Equipment | 68,756 | 76,077 | 82,144 | 88,210 | 94,276 |
| Water Supply | 30,798 | 43,202 | 44,819 | 46,435 | 48,052 |
| Wastewater Treatment | 5,665 | 6,159 | 6,395 | 6,631 | 6,866 |
| **TOTAL** | **2,247,593** | **2,304,450** | **2,363,511** | **2,422,573** | **2,481,634** |
| Percent Change from 2019 Levels | — | 3% | 5% | 8% | 10% |
| Water Supply | 30,798 | 43,202 | 44,819 | 46,435 | 48,052 |
| Wastewater Treatment | 5,665 | 6,159 | 6,395 | 6,631 | 6,866 |
| **TOTAL** | **2,247,593** | **2,304,450** | **2,363,511** | **2,422,573** | **2,481,634** |
| Percent Change from 2019 Levels | — | 3% | 5% | 8% | 10% |

SOURCE: Appendix E.
NOTES: Total may not sum exactly due to independent rounding.
BAU = business-as-usual; GHG = greenhouse gas; MTCO2e = metric tons of carbon dioxide equivalent.
Note: These projections are based on 2019 CAAP projections for disclosure of estimated GHG emissions at buildout. Emissions estimates are considered a conservative estimate due to the project VMT study (Appendix H) projecting reductions in VMT per capita with the project.

Table 4.6-6
City Community GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts (MTCO2e)

| Sector | 2019 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| On-Road Transportation | 1,140,206 | 793,628 | 602,306 | 410,984 | 219,662 |
| Nonresidential Building Energy | 550,138 | 271,904 | 243,504 | 215,105 | 186,705 |
| Residential Building Energy | 291,405 | 210,707 | 203,991 | 197,276 | 190,561 |
| Solid Waste | 160,626 | 175,038 | 181,590 | 188,141 | 194,692 |
| Off-Road Vehicles & Equipment | 68,756 | 76,077 | 82,144 | 88,210 | 94,276 |
| Water Supply | 30,798 | 9,973 | 6,649 | 3,324 | 0 |
| Wastewater Treatment | 5,665 | 6,173 | 6,399 | 6,625 | 6,851 |
| **TOTAL** | **2,247,593** | **1,543,501** | **1,326,583** | **1,109,665** | **892,747** |
| Percent Change from 2019 Levels | — | -31% | -41% | -51% | -60% |

NOTES: Total may not sum exactly due to independent rounding.
BAU = business-as-usual; GHG = greenhouse gas; MTCO2e = metric tons of carbon dioxide equivalent
Note: These projections are based on 2019 CAAP projections for disclosure of estimated GHG emissions at buildout. Emissions estimates are considered a conservative estimate due to the project VMT study (Appendix H) projecting reductions in VMT per capita with the project.

Emission reduction targets established in state law, include:

- Reduce statewide GHG emissions to 40 percent below 1990 levels by 2030 (SB 32, 2016)
- Achieve net zero GHG emissions statewide as soon as possible, but no later than 2045, and maintain net negative emissions thereafter; and ensure that by 2045, statewide anthropogenic greenhouse gas emissions are reduced to at least 85 percent below the 1990 levels. (AB 1279, 2022)

## 4.6.5 Topic 1: GHG Emissions

*Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?*

### 4.6.5.1 Impact Analysis

Development under the proposed General Plan Update, which includes new residential uses required to meet the City's RHNA goals, nonresidential uses within the Great Park, nonresidential uses at the same intensities associated with the existing General Plan, and the extension of Ada roadway, would contribute to direct and indirect emissions of GHG from land uses within the City. It is important to note that a general plan does not directly result in physical development without additional approvals. Before any development can occur in the City, it must be analyzed for consistency with the General Plan Update, zoning requirements, and other applicable local and state requirements; comply with the requirements of CEQA (when necessary); and obtain all necessary clearances and permits.

## a. Buildout Year 2045 Emissions Forecast

Although the emission inventory and buildout projections detailed in Table 4.6-5 did not account for the General Plan Update, the General Plan Update would allow for residential land uses to occur primarily within areas currently designated for nonresidential development. As a result, due to market conditions and new allowances for residential uses, it is anticipated that buildout of the General Plan Update would result in a shift of existing unbuilt commercial capacity to residential land uses. Adding residential capacity within the City would improve the jobs to housing balance and potentially reduce the number of long commutes that are characteristic of the City's existing employment centers, which could reduce emissions estimates for on-road transportation, the greatest source of GHG emissions in the City. Because the General Plan Update would primarily add residential capacity on sites currently designated for nonresidential use, the 2019 GHG inventory and projections can be considered a reasonable, and potentially conservative, measure of GHG emissions at buildout of the General Plan Update. As detailed in Appendix E, VMT with the General Plan Update is anticipated to decrease by approximately 4 VMT per service population compared to the current General Plan. This demonstrates the General Plan Update would result in a decrease in on-road vehicle emissions compared to the existing plan and the emission projections described in Section 4.6.4.

As shown in Table 4.6-6 and detailed in Appendix E, GHG emissions associated with buildout of the City based on 2019 population and employment forecasts to 2045 would total 892,747 MT $CO_2E$ per year, or 1.33 MT $CO_2E$ per service population. When compared to the baseline 2019 emission inventory, on-road transportation GHG emissions at year 2045, the buildout year for the project, would decrease. The decrease is due to vehicle emission regulations and improved technologies that result in cleaner and more efficient vehicles. Additionally, as discussed previously, implementation of the project is intended to improve the jobs to housing ratio in the City which may reduce work related commutes and further support reductions in on-road vehicle emissions over time.

Development of the project is not forecasted to occur within a specific development timeframe but is assumed to occur over a period of 20 years or more. As such, GHG emissions associated with residential and nonresidential building energy use would decrease over time due to application of California's Building Energy Efficiency Standards (California Code of Regulations Title 24 Part 6, hereafter referred to as "Title 24"). Title 24 standards apply to new residential and nonresidential construction. Therefore, although the projections did not account for the General Plan Update allowances for residential, implementation of the General Plan Update is anticipated to result in a shift from projected commercial growth to more residential growth, based on allowances in the General Plan Update and market trends. The same energy efficiency standards would apply regardless of the land use. While average electricity use in new residential buildings is anticipated to rise (due to an increase in electrical demand associated with electric appliances installed instead of natural gas appliances); emissions from new residential buildings are expected to be lower than they would be under 2019 Title 24 as a result of overall lower building emissions intensities (due to lower emissions factors associated with electricity compared to natural gas).

As detailed in Table 4.6-6, by 2045, there would be a decrease in emissions per service population compared to the existing condition. These emission reductions are based solely on implementation of legislative mandates, and those reductions alone would not be sufficient to meet the statewide reduction targets.

## b. City Reduction Measures

As part of the project, the City's existing General Plan is being updated to reflect City goals related to GHG emission reductions. For example, the Land Use Element aims to support a VMT efficient land use pattern, the updated Land Use Element supports placement of mixed-use cores of higher-density commercial and residential development that are supported by pedestrian activity center with access to services, food, childcare, and transit within walking distance of residences and employment. This approach to land use would support VMT efficiency by providing homes near jobs and goods and services.

As detailed in Section 4.16, Transportation, buildout of the project would result in a more efficient land use pattern, resulting in an overall reduction in VMT per service population (see Table 4.13-2). Compared to the VMT projections that would result from buildout of the existing General Plan, the project would reduce VMT per service population by accommodating more housing within three key focus areas, bringing homes in closer proximity to jobs. Addressing the existing jobs/housing imbalance by supporting more housing in the City is anticipated to support long term reductions in VMT per service population which would reduce GHG emissions per service population.

Future housing development facilitated by the project would also be required to meet the mandatory energy requirements of CALGreen and the Energy Code (CCR Title 24, Part 6) in effect at the time of development. These regulations require that new development incorporate design features to capture energy efficiencies associated with building heating, ventilating, and air conditioning mechanical systems, water heating systems, and lighting.

Additionally, each of the focus areas, where changes to land use would be incorporated through the introduction of a Residential and Residential Mixed-Use Overlay Zone Overlay Zone, which would support a VMT efficient land use pattern that could result in overall reduction in GHG emissions due to reduced mobile source emissions.

As previously noted, the project involves the creation of the Environmental Protection and Climate Action (EPCA) Element, which is an entirely new element of the General Plan. This element reflects the City's goal of reducing GHG emissions to achieve carbon neutrality, consistent with state GHG reduction targets. The EPCA Element includes objectives, policies, and implementation actions aimed at achieving significant reductions in GHGs across all sectors within the City by implementing targeted policies and initiatives. Compliance with Consistency with the Energy Code (PPP GHG-1), CAL California Green Building Standards Code (PPP GHG-2) would promote the transition to renewable resources within the City; the adoption of energy-efficient technologies, and practices in buildings, transportation, and industries to reduce reliance on fossil fuels; investments in public transit infrastructure, walking and biking paths, and electric vehicle charging stations to reduce GHGs

## c. Typical Emissions for Residential Projects

GHG emissions would be generated during construction and operation of future projects implemented under the General Plan and proposed overlays, within the Great Park, and along Ada roadway. Construction activities would emit GHGs primarily through the combustion of fuels in on- and off-road equipment and vehicles. Operational emissions would likely include mobile, energy

(electricity and natural gas), area (landscape maintenance equipment), water and wastewater, solid waste, and refrigerant sources.

In order to identify the likely construction and operation emissions associated with a typical residential project and a worst-case residential project, the following two modeling scenarios were evaluated:

### *Hypothetical Project #1: 440 Unit Residential Development*

Hypothetical project #1 is a 440-unit mid-rise apartment project. Detailed analysis and modeling results are included as Appendix F-1. GHG emissions for this hypothetical scenario were calculated using the California Emissions Estimator Model (CalEEMod) version 2022.1 (California Air Pollution Control Officers Association [CAPCOA] 2022). The CalEEMod program is a tool used to estimate emissions resulting from land development projects based on California specific emission factors. CalEEMod can estimate the required construction equipment when project specific information is unavailable. GHG emission estimates in CalEEMod are based on the duration of construction phases; construction equipment type, quantity, and usage; grading area; season; and ambient temperature, among other parameters.

The hypothetical 440-unit mid-rise apartment project would result in 2,938 MT annually based on an operational year of 2027 and assuming all model defaults. Based on the SCAQMD CEQA Thresholds (see PPP GHG-4), emissions would fall below the screening level threshold established by SCAQMD and impacts would be less than significant.

### *Hypothetical Project #2: 1500-Unit Residential Development Project*

Hypothetical project #2 is a 1,500-unit mid-rise apartment project. Detailed analysis and modeling results are included as Appendix F-2. GHG emissions for this hypothetical scenario were calculated using the CalEEMod version 2022.1 (CAPCOA 2022). The large project would result in 11,321 MT annually based on the operational year of 2027 with the addition of amortized construction emissions and assuming all model defaults. Based on the SCAQMD CEQA Thresholds (see PPP GHG-4), emissions would exceed the screening level threshold established by SCAQMD and impacts would be potentially significant.

## d. Conclusion

While the General Plan includes policy recommendations that would support GHG emission reductions and implementation of the General Plan land use plan would be supportive overall of an efficient land use and transportation, supporting GHG emissions reductions from mobile sources, buildout of the General Plan may still result in emissions that are not consistent with state GHG reduction goals.

Furthermore, the City does not currently have an adopted CAAP. The CAAP that is currently being prepared is intended to demonstrate how the City will reduce GHG emissions in alignment with statewide GHG emission reduction targets. While the draft CAAP is being prepared as a standalone document outside of the project/General Plan Update, the CAAP emission forecasts provide the best available data to estimate emissions through the year 2045, despite the inventory not being

consistent with the buildout year for the General Plan. As a result, at this program level review, impacts related to GHG emissions resulting from General Plan buildout are considered significant and would require mitigation.

### 4.6.5.2 Significance of Impacts

While project implementation would facilitate per capita GHG emission reductions over time as the EPCA Element and other General Plan Element policies are implemented and the land use plan is built out, without a comprehensive Citywide plan to reduce GHG emissions that can demonstrate how the City would meet statewide emission targets, impacts would be considered significant and would require mitigation.

### 4.6.5.3 Mitigation

The following mitigation measure is recommended for future development proposals:

**GHG-1:** Applications for future development, wherein the Director of Community Development or their designee has determined a potential for GHG impacts the City shall evaluate the project to identify the potential for GHG emissions to exceed the SCAQMD thresholds detailed below. If a project may exceed the thresholds, the City shall require a technical assessment evaluating potential project GHG impacts to the City for review and approval. The significance of project-level GHG impacts shall be evaluated using one of the following criteria:

1. In the absence of a City plan to reduce GHG emissions, the evaluation shall be prepared in conformance with SCAQMD methodology for assessing GHG impacts, which consists of the following tiered approach:
   a. Tier 1 – The project is exempt from the California Environmental Quality Act (CEQA).
   b. Tier 2 – The project is consistent with an applicable regional GHG emissions reduction plan. If a project is consistent with a qualifying local GHG reduction plan, it does not have significant GHG emissions.
   c. Tier 3 – Project GHG emissions represent an incremental increase below or mitigated to less than a 3,000 MT $CO_2E$ screening level.
   d. Tier 4 – The project achieves performance standards, where performance standards may include a percent emission reduction target or an efficiency target per service population.
   e. Tier 5 – Offsets along or in combination with the above target Significance Screening Level. Offsets must be provided for a 30-year project life, unless the project life is limited by permit, lease, or other legally binding condition.

If GHG emissions are determined to have the potential to exceed the SCAQMD's recommended thresholds, the City shall require that applicants for new development projects incorporate features to reduce GHG emissions. These identified measures shall be incorporated into all appropriate documents submitted to the City and shall be verified by the City.

#### 4.6.5.4 Significance after Mitigation

Although project implementation would support citywide goals to reduce GHG emissions and the General Plan Update includes goals and polices to support GHG emission reductions, the project does not include a quantified GHG emission reduction strategy to ensure statewide emission goals can be achieved by 2045. Therefore, impacts would remain significant and unavoidable after mitigation.

### 4.6.6 Topic 2: GHG Plans

*Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs?*

#### 4.6.6.1 Impact Analysis

Applicable plans, policies, and regulations include statewide GHG emission targets established by AB 32 and SB 32; a longer-term statewide policy goals established by EO S-3-05; the 2017 Scoping Plan (which establishes a specific statewide plan to achieve the 2030 target); the 2020 Scoping Plan (which establishes targets for carbon neutrality by 2045); SCAG's RTP/SCS; regulations regarding increased use renewables for electricity production (RPS); and the California Energy Code.

##### a. State Plans

The Scoping Plan, approved by CARB on December 12, 2008, provides a framework for actions to reduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. As such, the Scoping Plan is not directly applicable to specific projects. In the Final Statement of Reasons for the Amendments to the CEQA Guidelines, the California Natural Resources Agency observed that "[t]he [Scoping Plan] may not be appropriate for use in determining the significance of individual projects because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping Plan" (California Natural Resources Agency 2009). Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., Low Carbon Fuel Standard), among others. The project would comply with all applicable regulations adopted in furtherance of the Scoping Plan to the extent required by law.

Table 4.6-7 summarizes the project's consistency with 2017 Scoping Plan actions.

| Table 4.6-7<br>Project Consistency with 2017 Scoping Plan | | |
|---|---|---|
| Actions | Responsible Parties | Consistency |
| **Implement SB 350 by 2030** | | |
| Increase the Renewables Portfolio Standard to 50% of retail sales by 2030 and ensure grid reliability. | California Public Utilities Commission, California Energy Commission (CEC), California Air Resources Board (CARB) | **Consistent.** Future development implemented under the project would use energy from Southern California Edison (SCE) which has committed to diversifying the portfolio of energy sources by increasing energy from wind and solar sources. The project would not interfere with or obstruct SCE energy source diversification efforts. Future development would also potentially use renewable energy from the Orange County Power Authority under the Community Choice Aggregation program. |
| Establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030. | | **Consistent.** Future development implemented under the project would be constructed in compliance with current California Building Code requirements. Currently, new buildings must achieve compliance with 2022 Title 24 Building Energy Efficiency Standards and the 2022 CALGreen requirements. Each version of the California Building Code improves the energy efficiency standards. Future development would be consistent with statewide energy requirements. |
| Reduce GHG emissions in the electricity sector through the implementation of the above measures and other actions as modeled in Integrated Resource Planning (IRP) to meet GHG emissions reductions planning targets in the IRP process. Load-serving entities and publicly- owned utilities meet GHG emissions reductions planning targets through a combination of measures as described in IRPs. | | |
| **Implement Mobile Source Strategy (Cleaner Technology and Fuels)** | | |
| At least 1.5 million zero emission and plug-in hybrid light-duty electric vehicles (EVs) by 2025. | CARB, California State Transportation Agency (CalSTA), Strategic Growth Council (SGC), California Department of Transportation (Caltrans), CEC, Governor's Office of Planning and Research (OPR), Local Agencies | **Consistent.** These strategies are a part of the CARB Mobile Source Strategy. The project would not obstruct or interfere with the implementation of these strategies. As these are CARB enforced standards, vehicles within the City are required to comply with the standards, and would therefore comply with these strategies. |
| At least 4.2 million zero emission and plug-in hybrid light-duty EVs by 2030 | | |
| Further increase GHG stringency on all light-duty vehicles beyond existing Advanced Clean cars regulations. | | |
| GHG Phase 2 GHG emission standards for medium-duty/heavy-duty vehicles and trailers, Innovative Clean Transit, Advanced Clean Trucks, Ocean Going Vessels at Berth, Airport Shuttle. | | |

| Table 4.6-7<br>Project Consistency with 2017 Scoping Plan | | |
|---|---|---|
| Actions | Responsible Parties | Consistency |
| Innovative Clean Transit: Transition to a suite of to-be-determined innovative clean transit options. Assumed 20% of new urban buses purchased beginning in 2018 will be zero emission buses with the penetration of zero-emission technology ramped up to 100% of new sales in 2030. Also, new natural gas buses, starting in 2018, and diesel buses, starting in 2020, meet the optional heavy-duty low-$NO_X$ standard. | | **Not Applicable.** This strategy is not specifically applicable to the project. However, the City is served by the Orange County Transit Authority which has plans to convert 100 percent of its fleet to zero-emission technology by 2040. |
| Last Mile Delivery: New regulation that would result in the use of low $NO_X$ or cleaner engines and the deployment of increasing numbers of zero-emission trucks primarily for class 3-7 last mile delivery trucks in California. This measure assumes ZEVs comprise 2.5% of new Class 3–7 truck sales in local fleets starting in 2020, increasing to 10% in 2025 and remaining flat through 2030. | | **Not Applicable.** This strategy is not specifically applicable to the project. This is a CARB Mobile Source Strategy. The project would not obstruct or interfere with CARB efforts to improve last mile delivery emissions. |
| Further reduce VMT through continued implementation of SB 375 and regional Sustainable Communities Strategies; forthcoming statewide implementation of SB 743; and potential additional VMT reduction strategies not specified in the Mobile Source Strategy but included in the document "Potential VMT Reduction Strategies for Discussion." | | **Consistent.** The project would be consistent with Connect SoCal (see Table 4.6-8), which is the region's SCS, and would therefore be consistent with SB 375. The project would support the goals of these strategies by implementing sustainable infill development that reduces VMT and supports walkable, bikeable, transit-oriented communities. |
| Increase stringency of SB 375 Sustainable Communities Strategy (2035 targets). | | |
| Harmonize project performance with emissions reductions and increase competitiveness of transit and active transportation modes (e.g., via guideline documents, funding programs, project selection, etc.). | CalSTA, SGC, OPR, CARB, Governor's Office of Business and Economic Development, California Infrastructure and Economic Development Bank, Department of Finance, California Transportation Commission, Caltrans | **Consistent.** Although this is directed towards CARB and Caltrans, the project would support an increase in the use of transit and active transportation modes. |
| By 2019, develop pricing policies to support low-GHG transportation (e.g., low-emission vehicle zones for heavy duty, road user, parking pricing, transit discounts) | CalSTA, Caltrans, California Transportation Commission, OPR, SGC, CARB | **Not applicable.** This measure is not within the purview of the project. |

**Table 4.6-7**
**Project Consistency with 2017 Scoping Plan**

| Actions | Responsible Parties | Consistency |
|---|---|---|
| **Implement California Sustainable Freight Action Plan** | | |
| Improve freight system efficiency. | CalSTA, California EPA, California Natural Resources Agency, CARB, Caltrans, CEC, Governor's Office of Business and Economic Development | **Not applicable.** These measures are not within the purview of the project. |
| Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize both zero and near-zero emission freight vehicles and equipment powered by renewable energy by 2030. | | |
| Adopt a Low Carbon Fuel Standard with a Carbon Intensity reduction of 18%. | | |
| **Implement the Short-Lived Climate Pollutant Strategy (SLPS) by 2030** | | |
| 40% reduction in methane and hydrofluorocarbon emissions below 2013 levels. | CARB, California Department of Resources Recycling and Recovery, California Department of Food and Agriculture, California State Water Resource Control Board, Local Air Districts | **Not applicable.** These measures are not within the purview of the project. |
| 50% reduction in black carbon emissions below 2013 levels. | | |
| By 2019, develop regulations and programs to support organic waste landfill reduction goals in the SLCP and SB 1383. | | |
| Implement the post-2020 Cap-and-Trade Program with declining annual caps. | | |
| **By 2018, develop Integrated Natural and Working Lands Implementation Plan to secure California's land base as a net carbon sink** | | |
| Protect land from conversion through conservation easements and other incentives. | California Natural Resources Agency, Departments Within California Department of Food and Agriculture, California EPA, CARB | **Not applicable.** These measures are not within the purview of the project. |
| Increase the long-term resilience of carbon storage in the land base and enhance sequestration capacity. | | |
| Utilize wood and agricultural products to increase the amount of carbon stored in the natural and built environments. | | |
| Establish scenario projections to serve as the foundation for the Implementation Plan. | | |
| Implement Forest Carbon Plan | California Natural Resources Agency, California Department of Forestry and Fire Protection, California EPA and Departments Within | |
| Identify and expand funding and financing mechanisms to support GHG reductions across all sectors. | State Agencies & Local Agencies | |
| SOURCE: CARB 2017. | | |

AB 1279, the California Climate Crisis Act, codified the carbon neutrality target as 85 percent below 1990 levels by 2045. The 2022 Scoping Plan lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045, as directed by AB 1279. Appendix D of the 2022 Scoping Plan includes local actions that jurisdictions may take to reduce GHG emissions in line with AB 1279 goals. The following are key project attributes for residential and mixed-use projects (e.g., housing anticipated as part of the project) that can be used to qualitatively determine consistency with the 2022 Scoping Plan. A summary of the 2022 Scoping Plan Priority Strategies and the project's consistency with those strategies is provided in Table 4.6-8.

**Table 4.6-8**
**Project Consistency with 2022 Scoping Plan Key Prioritization Strategies**

| 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. | **Consistent.** The project includes the following implementation measure from the Environmental Protection and Climate Action (EPCA) Element: Promote Low-Emission and Electric Vehicles: Establish EV-friendly policies and regulations, such as streamlined permitting processes, dedicated parking spaces, and EV-ready building codes, to facilitate the installation of EV charging infrastructure in new developments and existing buildings. |
| 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 would support growth near destinations and mobility options. Each of the focus areas would allow residential land use through a Residential and Residential Mixed-Use Overlay Zone which would bring homes closer to job centers. Additionally, the General Plan Update contains several goals, objectives, and policies that promote transit-oriented housing:<br>The following policies in the Housing Element support infill development: HE-C.1: Promote infill development in appropriate areas and HE-C.2: Promote residential development fully served by public services and utilities. |
| | Does not result in the loss or conversion of natural and working lands. | **Consistent.** The General Plan land use and proposed overlays would focus development within infill areas of the City, retaining natural lands as open space. |
| | • Consists of transit-supportive densities (minimum of 20 residential dwelling units per acre), or<br>• Is in proximity to existing transit stops (within a half mile), or<br>• Satisfies more detailed and stringent criteria specified in the region's SCS. | **Consistent.** The proposed housing overlays would increase density through the use of housing overlays within the focus areas, which are approximate to transit. |

| Table 4.6-8<br>Project Consistency with 2022 Scoping Plan Key Prioritization Strategies | | |
|---|---|---|
| Priority Area | Key Project Attribute | Project Consistency |
| | Reduces parking requirements by:<br>• Eliminating parking requirements or including maximum allowable parking ratios (i.e., the ratio of parking spaces to residential units or square feet); or<br>• Providing residential parking supply at a ratio of less than one parking space per dwelling unit; or<br>• For multifamily residential development, requiring parking costs to be unbundled from costs to rent or own a residential unit. | **Consistent.** Future development would be subject to allowances for reduced parking standards in exchange for affordable housing. |
| | At least 20 percent of units included are affordable to lower-income residents. | **Consistent.** Implementation of the City's Housing Element and future residential development facilitated by the project would support provision of affordable housing including providing market rate housing with a 20 percent affordable component. |
| | Results in no net loss of existing affordable units. | **Consistent.** The 2021-2029 Housing Element RHNA allocation for the City is 23,610 units. To ensure consistency with housing statute, including no-net loss and affirmatively furthering fair housing requirements, the 2021-2029 Housing Element identified adequate sites to accommodate 57,656 new residential units.. The proposed General Plan Update and Zoning Ordinance amendments would facilitate the development of these housing units to ensure no-net-loss. |
| 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. | **Consistent.** The General Plan Update includes EPCA objectives aimed at reducing greenhouse gas emissions. Various City policies and PPPs would also apply to future development, supporting all electric appliances. |

## b. Regional Plans

The project was evaluated for consistency with the SCS strategies contained in Connect SoCal. As discussed in Table 4.6-9 below, the project would be consistent with applicable Connect SoCal strategies due to the City's focus on adding housing within three key focus areas that are proximate to transit, and support a better jobs to population ratio.

| Table 4.6-9<br>Project Consistency with Connect SoCal Strategies | |
|---|---|
| Strategy | Project Consistency |
| **Focus Growth Near Destinations and Mobility Options** | |
| • Emphasize land use patterns that facilitate multimodal access to work, educational, and other destinations.<br>• Focus on a regional jobs/housing balance to reduce commute times and distances and expand job opportunities near transit and along center-focused main streets.<br>• Plan for growth near transit investments and support implementation of first/last mile strategies.<br>• Promote the redevelopment of underperforming retail developments and other outmoded nonresidential uses.<br>• Prioritize infill and redevelopment of underutilized land to accommodate new growth, increase amenities and connectivity in existing neighborhoods.<br>• Encourage design and transportation options that reduce the reliance on, and number of, solo car trips (this could include mixed uses or locating and orienting close to existing destinations).<br>• Identify ways to "right size" parking requirements and promote alternative parking strategies (e.g., shared parking or smart parking). | **Consistent.** The project would be consistent with Connect SoCal's strategies to focus growth near destinations and mobility options. Each of the focus areas are proximate to SCAG transit priority areas. Changes to land use will be incorporated through the introduction of a Residential and Residential Mixed-Use Overlay Zone. Additionally, the General Plan Update Land Use Element contains policies that promote transit-oriented housing.:<br><br>**Consistent.** The following policies in the Housing Element support Connect SoCal strategies of promoting infill development.<br>• HE-C.1: Promote infill development in appropriate areas.<br>• HE-C.2: Promote residential development fully served by public services and utilities. |
| **Promote Diverse Housing Options** | |
| • Preserve and rehabilitate affordable housing and prevent displacement.<br>• Identify funding opportunities for new workforce and affordable housing development.<br>• Create incentives and reduce regulatory barriers for building context sensitive accessory dwelling units to increase housing supply.<br>• Provide support to local jurisdictions to streamline and lessen barriers to housing development that supports reduction of greenhouse gas emissions. | **Consistent:** The project would provide for an increased variety of housing options. The project increases mixed-use development in transit priority areas throughout the City.<br><br>Below are some of the policies included in the Housing Element which aim to preserve affordable housing:<br>• HE-A.1: Identify residential zones where allowable density can be increased or suitable Floor Area Ratio (FAR) specified for affordable housing, including for extremely low-income households.<br>• HE-A.2: Identify commercial and institutional zones where zoning can be changed to allow for mixed-use and/or higher-density residential development.<br>• HE-B.1: Expedite the entitlement process for affordable housing developments.<br>• HE-D.1: Monitor affordable rental units at risk of converting to market rents and proactively reach out to property owners to discuss options.<br>• HE-D.4: Work with property owners of existing assisted housing developments for lower-income households to determine methods to extend affordability covenants to preserve affordable units, including assistance from the City. |

| Table 4.6-9<br>Project Consistency with Connect SoCal Strategies | |
|---|---|
| Strategy | Project Consistency |
| | The following Land Use Element policies demonstrate consistency with Connect SoCals goals of providing more affordable housing as well.<br>LU-13.1<br>• Policy (a): Partner with property owners to preserve existing affordable housing units throughout the City.<br>• Policy (b): Utilize available public funding sources, promote density bonuses, and offer feasible incentives to encourage the development of new affordable housing units. |
| Leverage Technology Innovations | |
| • Promote low emission technologies such as neighborhood electric vehicles, shared ride hailing, car sharing, bike sharing and scooters by providing supportive and safe infrastructure such as dedicated lanes, charging and parking/drop-off space.<br>• Improve access to services through technology, such as telework and telemedicine as well as other incentives such as a mobility wallet.<br>• Identify ways to incorporate micro-power grids in communities, for example solar energy, hydrogen fuel cell power storage and power generation. | **Consistent.** By promoting more diverse and denser mixed-use focus areas, the project would include uses that would support low emission technologies include electric vehicle infrastructure, ridesharing services, bike and scooter sharing, and would improve the street infrastructure to create a more walkable and bikeable community. Strategies related to improved access to services through technology and micro-power grids are not directly applicable to the project. The project would not interfere with SCAG's efforts to promote low emission technologies, improve access to telework and telemedicine, or incorporate micro-power grids in communities. |
| Support Implementation of Sustainable Policies | |
| • Pursue funding opportunities to support local sustainable development implementation projects that reduce greenhouse gas emissions.<br>• Support statewide legislation that reduces barriers to new construction and that incentivizes development near transit corridors and stations.<br>• Support local jurisdictions in the establishment of Enhanced Infrastructure Financing Districts, Community Revitalization and Investment Authorities, or other tax increment or value capture tools to finance sustainable infrastructure and development projects including parks and open space.<br>• Work with local jurisdictions/communities to identify opportunities and assess barriers for implementing sustainability strategies.<br>• Enhance partnerships with other planning organizations to promote resources and best practices in the SCAG region.<br>• Continue to support long range planning efforts by local jurisdictions.<br>• Provide educational opportunities to local decisions makers and staff on new tools, best practices and policies related to implementing the Sustainable Communities Strategy. | **Not Applicable.** These strategies are not directly applicable to the project. The project would not interfere with SCAG's efforts to work with local jurisdictions, communities, and other planning organizations to implement sustainable policies. The project would support the goals of these strategies by implementing sustainable infill development that reduces VMT and supports walkable, bikeable, transit-oriented communities. |

| Table 4.6-9<br>Project Consistency with Connect SoCal Strategies | |
|---|---|
| Strategy | Project Consistency |
| **Promote a Green Region** | |
| • Support development of local climate adaptation and hazard mitigation plans as well as project implementation that improves community resiliency to climate change and natural hazards.<br>• Support local policies for renewable energy production, reduction of urban heat islands and carbon sequestration.<br>• Integrate local food production into the regional landscape.<br>• Promote more resource efficient development focused on conservation, recycling and reclamation.<br>• Preserve, enhance and restore regional wildlife connectivity.<br>• Reduce consumption of resource areas, including agricultural land.<br>• Identify ways to improve access to public park space. | **Consistent.** The EPCA Element includes several goals, objectives, and policies supporting GHG reductions (see above). The project would also encourage improvements in street infrastructure to create a safe walkable and bikeable community, reducing VMT and thereby improving air quality and reducing GHG emissions, and creating shaded pedestrian-friendly environments. |
| SOURCE: SCAG 2020. | |

### c. Local Plans

As discussed in Section 4.6.2.3.c, the City's General Plan does not specifically address GHG emissions. However, a draft CAAP is in process and other City sustainability initiatives have been adopted such as the Zero-Emission Vehicles Transition Plan. Implementation of the General Plan would support these policy initiatives by strengthening the City's policy framework around GHG emission reductions as detailed under Topic 1 and Tables 4.6-8 and 4.6-9. Furthermore, the EPCA Element includes objectives, policies, and implementation actions that would further the City's goal of achieving significant reductions in GHGs across all sectors within the City. Therefore, the project would not conflict with an applicable local plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

## 4.6.6.2 Significance of Impacts

Although the General Plan policy framework includes various objectives and implementation measures that would supports GHG emission reductions, the City is not able to demonstrate whether the policy framework would be sufficient to meet state GHG emission reduction goals. Impacts related to conflicts with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs would be considered significant and would require mitigation to identify potential measures that would reduce GHG emissions below the applicable SCAQMD thresholds.

## 4.6.6.3 Mitigation

See mitigation measure GHG-1 above.

#### 4.6.6.4 Significance after Mitigation

Although project implementation would support citywide goals to reduce GHG emissions, the project does not include a comprehensive strategy to ensure statewide emission goals can be achieved by 2045. Therefore, impacts would remain significant and unavoidable after mitigation.

### 4.6.7 Cumulative Analysis

As defined in Section 15130 of the State CEQA Guidelines, cumulative impacts are the incremental effects of an individual project when viewed in connection with the effects of past, current, and probable future projects within the cumulative impact area for greenhouse gas emissions. The issue of global climate change is inherently a cumulative issue, as GHG emissions of individual projects cannot be shown to have a material effect on global climate change. Impacts would be cumulative in nature if they lead to a substantial increase in GHG emissions, when combined with other development. As discussed, the framework for assessing GHG emissions in the state has been created through AB 32, SB 32, EO S-3-05, the 2017 and 2022 Scoping Plan. If a project demonstrates that it is sufficiently reducing its overall GHG emissions consistent with statewide goals, the project's impact can be determined not to be cumulatively considerable as it would contribute to the state's GHG emission reduction targets. As discussed in Section 4.6.5.2 and 4.6.2.2 above, project implementation would support citywide goals to reduce GHG emissions; however, the project does not include a comprehensive strategy to ensure statewide emission goals can be achieved by 2045. Therefore, cumulative impacts would be considered potentially significant. Despite implementation of mitigation measure GHG-1, which requires project-specific GHG evaluations, it is anticipated that citywide impacts related to GHG emissions would remain significant and unavoidable.