4.4 GREENHOUSE GAS EMISSIONS

This section evaluates the potential for the General Aviation Improvement Program ("GAIP") to have adverse effects as a result of greenhouse gas emissions ("GHG"). Information in this section is predominately based on the *Greenhouse Gas Technical Report* prepared by Landrum & Brown and included in this Program EIR as Appendix G (Landrum & Brown 2018). Additional information from regional planning programs and other sources has also been incorporated into this section.

4.4.1 BACKGROUND

Global Climate Change and Greenhouse Gases

Climate change is a recorded change in the Earth's average weather measured by variables such as wind patterns, storms, precipitation, and temperature. Historical records show that global temperature changes have occurred naturally in the past, such as during previous ice ages. According to the National Aeronautics and Space Administration ("NASA"), the year 2017 ranks as Earth's second recorded warmest year since 1880, second only to 2016 (NASA 2018). In a separate, independent analysis, scientists at the National Oceanic and Atmospheric Administration ("NOAA") concluded that 2017 was the third-warmest year in their record. The minor difference in rankings is due to the different methods used by the two agencies to analyze global temperatures, although over the long-term the agencies' records remain in strong agreement. Both analyses show that the five warmest years on record all have taken place since 2010. The planet's average surface temperature has risen about 2 degrees Fahrenheit (a little more than 1 degree Celsius) during the last century or so, a change driven largely by increased carbon dioxide and other human-made emissions into the atmosphere. Last year was the third consecutive year in which global temperatures were more than 1.8 degrees Fahrenheit (1 degree Celsius) above late nineteenth-century levels (NASA 2018).

The global atmospheric concentration of carbon dioxide ("CO_2"), measured at Mauna Loa, Hawaii, has increased from a pre-industrial (roughly 1750) value of about 280 parts per million ("ppm") to a peak of 409.65 ppm in May 2017; the average concentration for the week beginning February 4, 2018 was 408.21 ppm (ESRL 2018).

Greenhouse Gases

GHGs are global pollutants and are therefore unlike criteria air pollutants such as ozone ("O_3"), particulate matter ("PM10" and "PM2.5"), and toxic air contaminants ("TACs"), which are pollutants of regional and local concern (see Section 4.2, Air Quality, of this Program EIR). While pollutants with localized air quality effects have relatively short atmospheric lifetimes (generally on the order of a few days), GHGs have relatively long atmospheric lifetimes, ranging from one year to several thousand years. Long atmospheric lifetimes allow for GHGs to disperse around the globe. Therefore, GHG effects are global, as opposed to the local and/or regional air quality effects of criteria air pollutant and TAC emissions.

GHGs, as defined under California's Assembly Bill ("AB") 32, include CO_2, methane ("CH_4"), nitrous oxide ("N_2O"), hydrofluorocarbons ("HFCs"), perfluorocarbons ("PFCs"), sulfur hexafluoride ("SF_6"), and nitrogen trifluoride ("NF_3"). GHGs vary widely in the power of their

climatic effects; therefore, climate scientists have established a unit called global warming potential ("GWP"). The GWP of a gas is a measure of both potency and lifespan in the atmosphere as compared to CO_2. For example, as CH_4 and N_2O are approximately 25 and 298 times (respectively) more powerful than CO_2 in their ability to trap heat in the atmosphere, they have GWPs of 25 and 298, respectively (CO_2 has a GWP of 1). Carbon dioxide equivalent ("CO_2e") is a quantity that enables all GHG emissions to be considered as a group despite their varying GWP. The GWP of each GHG is multiplied by the prevalence of that gas to produce CO_2e. GWP accounts for both the gases' ability to absorb energy and the lifetime of the GHG (the amount of time it remains in the atmosphere). Table 4.4-1 presents the lifetimes and GWP for the primary GHGs. The table divides the GHGs into long-lived, those that persist in the atmosphere for more than 20 years, and short-lived that persist for less than 20 years.

The distinction between short-lived and long-lived climate pollutants is important because controlling the short-lived pollutants is a promising method for limiting climate change. Controlling short-lived GHGs using existing best available control technologies may reduce the probability of exceeding the 2 degrees Celsius ("°C") barrier before 2050 by less than ten percent and by 2100 by less than 50 percent and reduce sea level rise by 25 percent.

TABLE 4.4-1
GHG LIFETIMES AND GLOBAL WARMING POTENTIALS

Pollutant	Lifetime (years)	GWP	
		20-year	100-year[1]
Long-Lived			
Carbon dioxide ("CO_2")	~100[2]	1	1
Nitrous oxide ("N_2O")	114	289	298
Nitrogen trifluoride ("NF_3")	740	12,300	17,200
Sulfur hexafluoride ("SF_6")	3,200	16,300	22,800
Perfluorocarbons ("PFC")	3,000–50,000	5,000–8,000	7,000–11,000
Short-Lived (<20 years)			
Methane ("CH_4")	12	72	25
Hydrofluorocarbons ("HFC")[3]	(<1 to >100)	~100–11,000	~100–12,000

1 The 20- and 100-year GWP estimates are from the IPCC 2007 Fourth Assessment Report (AR4) published in November 2007.

2 CO_2 has a variable atmospheric lifetime and cannot be readily approximated as a single number.

3 HFCs have a wide range of lifetimes—some long, some short by this definition. Correspondingly, they have a wide range of GWPs.

Source: Climate Change Scoping Plan, State of California, 2017

General Environmental Effects of Global Climate Change

Executive Order ("EO") S-3-05 mandates the preparation of biennial science assessment reports on climate change impacts and adaptation options for California. EO S-13-08 relatedly directs the California Natural Resources Agency ("CNRA") to develop a State Climate Adaptation Strategy and to provide State land use planning guidance related to sea level rise and other climate change impacts. Current reports resulting from these directed actions include, but are not limited to, the *Climate Action Team Report Governor Schwarzenegger and the California Legislature* and the *Safeguarding California Plan: 2018 Update* (CalEPA 2010; CNRA 2018). These studies report that global warming in California is anticipated to impact resources, including, but not limited to, those discussed below.

- **Public Health.** Many Californians currently experience the worst air quality in the nation, and climate change is expected to make matters worse. Higher temperatures would increase the frequency, duration, and intensity of conditions conducive to air pollution formation. If global background O_3 levels increase as predicted under some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by more frequent wildfires, which emit fine particulate matter that can travel long distances. Rising temperatures and more frequent heat waves would increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress. Climate change may also increase asthma rates and the spread of infectious diseases and their vectors, as well as challenge food and water supplies. Children, the elderly, people with chronic heart or lung disease, outdoor workers, people who exercise outdoors, and the economically disadvantaged would be particularly vulnerable to these changes. In addition, more frequent extreme weather events could also result in increased injuries and deaths from these phenomena.
- **Energy.** Increasing mean temperature and more frequent heat waves will drive up demand for cooling in summer; this new energy demand will only be partially offset by decreased demand for heating in winter. Hydropower would be threatened by declining snowpack, which serves as a natural reservoir for hydropower generation in the spring and summer. Winter storms, earlier snowmelt, and greater runoff may combine to cause flooding, which could, in turn, damage transmission lines and cause power outages.
- **Water Resources.** Rising temperatures, less precipitation, and more precipitation falling as rain instead of snow could severely diminish snowpack. Because the Sierra Nevada snowpack provides most of California's available water, this potential loss would increase the risk of summer water shortages and would hamper water distribution and hydropower generation. The diminished snowpack would also nearly eliminate all skiing and other snow-related recreation. Rising sea levels would push salt water into California's estuaries, wetlands, and groundwater aquifers, threatening the water quality and reliability in the Sacramento/San Joaquin River Delta—a major California fresh water supply. Extreme precipitation and flooding could also damage water quality by creating sudden increases in runoff. Moreover, warming would increase evapotranspiration rates from plants, soil, and open water surfaces, which would result in greater demand for irrigation. Overall, climate change would reduce California's water supplies even as its growing population requires additional resources.

- **Sea Level and Flooding.** Sea level at California's coasts is expected to rise by 11 to 18 inches above 2000 levels by 2050 and by 23 to 55 inches by 2100. If realized, these increases would create more frequent and higher storm surges; would erode some coastal areas; and would increase pressure on existing levees. These increases would create a greater risk of flooding in previously untouched inland areas. Consequently, continued development in vulnerable coastal areas would put more people and infrastructure at risk.
- **Agriculture.** Although higher CO_2 levels can stimulate plant production and increase plant water-use efficiency, in the long-term, climate change would reduce the quantity and quality of agricultural products Statewide. As temperatures rise, farmers will face greater water demand for crops and a less reliable water supply, as well as increased competition from urban water users. Sea level rise may cause saltwater intrusion in the Delta region, making it difficult to raise certain crops. Rising temperatures will likely aggravate O_3 pollution, interfering with plant growth and making plants more susceptible to disease and pests. In addition, warming would reduce the number of colder hours needed for fruit and nut production; would shift pest and weed ranges; would alter crop-pollinator timing; and would increase the frequency of droughts, heat waves, and floods. Higher average temperatures would also increase mortality and decrease productivity in livestock.
- **Forestry.** California timber production has declined over the past few decades due, in part, to warming and increased wildfires. While further warming may increase production for some species in some locations, climate change is expected to reduce overall forest growth. Increasing average temperatures and drought frequency would result in more wildfires and greater burned areas, while less frequent and more intense rainfall would increase soil erosion and landslides. Higher temperatures and less water would force many tree species to shift their ranges; those that run out of livable habitat may die out. Pests, diseases, and invasive species may also colonize new areas, further challenging forest health and biodiversity.
- **Ecosystems.** Rising average temperatures would subject plants and animals to greater thermal stress, causing some species to adapt or shift their ranges, while others may face extinction. Invasive species may also shift their ranges, threatening native species. Changing temperatures would alter the timing of plant flowering and insect emergence, damaging species' abilities to reproduce. Changing precipitation patterns would impact aquatic and riparian ecosystems by reducing snow pack, stream flow, and groundwater, while increasing the frequency of droughts, floods, and wildfires. As sea levels rise, some coastal habitats may be permanently flooded or eroded, and saltwater intrusion into freshwater resources may threaten terrestrial species. Changes in ocean circulation and temperature, ocean acidification, and increased runoff and sedimentation would threaten pelagic species. In sum, continued global warming would alter natural ecosystems and threaten California's biological diversity.

4.4.2 REGULATORY SETTING

Federal

Federal Aviation Administration

2014 Climate Action Report

According to the 2014 Climate Action Report, the Federal Aviation Administration ("FAA") is pursuing a comprehensive approach to reduce GHG emissions from commercial aviation through aircraft and engine technology development; operational improvements; development and deployment of sustainable alternative jet fuels; and additional policies and measures. The FAA funds diverse programs to improve aviation energy and emissions performance, and coordinates with other agencies as appropriate, including NASA. The following are some examples of FAA programs:

- The Continuous Lower Energy, Emissions, and Noise ("CLEEN") program is a collaborative partnership between the FAA and five aviation manufacturers to develop technologies that will reduce emissions and fuel burn, and to expedite the integration of these technologies into current aircraft.
- The Aviation Climate Change Research Initiative ("ACCRI") is an FAA program that provides guidance to develop mitigation solutions based on state-of-the-art science results. The ACCRI results are key to quantifying cost–benefit analyses of various policy options. The ACCRI has reduced uncertainties, leading to overall improvement in understanding of the climate impacts of aviation. While the ACCRI does not provide mitigation solutions on its own, recently completed ACCRI Phase II results can be used to help identify effective mitigation options.
- The Voluntary Airport Low Emissions Program ("VALE") is a grant program that encourages airport sponsors to use Airport Improvement Program funds and Passenger Facility Charges to finance low-emission vehicles; refueling and recharging stations; gate electrification; and other airport air quality improvements. Under the FAA's most recent reauthorization, VALE's work is supplemented by new programs that reduce airport emissions. The FAA is creating a program where, following an assessment of airport energy requirements, the FAA may make capital grants for airports to increase energy efficiency. The FAA has also established a pilot program under which certain airports may acquire and operate zero-emission vehicles.

In addition, the FAA is a founding member of the Commercial Aviation Alternative Fuels Initiative ("CAAFI"). CAAFI is a public–private partnership established in 2006 with the objective of advancing alternative jet fuels with equivalent safety/performance (drop-in) and comparable cost, environmental improvement, and security of energy supply for aviation. Work through CAAFI has also expanded internationally. Fuel production capability is beginning to emerge, including a recently announced airline and fuel producer agreement (Landrum & Brown 2018).

Aviation Greenhouse Gas Emissions Reduction Plan

The Aviation Greenhouse Gas Emissions Reduction Plan, which was submitted to the International Civil Aviation Organization ("ICAO"), identifies actions and progress toward GHG emission reductions in each of the following areas:

- Aircraft and Engine Technology Improvement: There are multiple technology initiatives dedicated to developing technology with significantly improved fuel burn and lower GHG emissions.
- Operational Improvements: The FAA is overhauling the National Airspace System through the NextGen program to improve efficiency and to reduce aircraft fuel burn.
- Alternative Fuels Development and Deployment: The U.S. has taken significant steps to facilitate the development and deployment of sustainable alternative aviation fuels. Future efforts are aimed at identifying new alternative fuels pathways and on commercializing fuels with up to 80 percent lower lifecycle GHG emissions.
- Policies, Standards, and Measures: The U.S. is pursuing a variety of policies, standards, and measures that will supplement, and in some cases support, efforts on technology, operations, and fuels in order to achieve the carbon neutral growth goal.
- Scientific Understanding and Modeling/Analysis: The U.S. conducts ongoing scientific research to better understand and quantify the impacts of aviation on the climate.

The Aviation Greenhouse Gas Emissions Reduction Plan estimates that these improvements in aircraft technology and air traffic operations will result in an estimated reduction of 47 million metric tons (42.6 million tonnes) of CO_2 in 2020 for all aviation in the United States, relative to a baseline year of 2010 (Landrum & Brown 2018).

U.S. Environmental Protection Agency Findings

In 2009, the U.S. Environmental Protection Agency ("USEPA") Administrator signed two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act ("CAA"). The findings state:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—carbon dioxide ("CO_2"), methane ("CH_4"), nitrous oxide ("N_2O"), hydrofluorocarbons ("HFCs"), perfluorocarbons ("PFCs"), and sulfur hexafluoride ("SF_6")—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the USEPA's GHG emission standards for light-duty vehicles (USEPA 2018). (A light-duty vehicle is defined any motor vehicle with a gross vehicle weight of 6,000 pounds or less (CARB 2018a).)

In furtherance of its understanding of GHG-emitting sources, the USEPA adopted a GHG reporting rule. Based on the applicability criteria listed in the rule (Code of Federal Regulations ["CFR"], Title 40, Part 98), mandatory reporting is only required for certain large industrial and commercial sources of GHGs. Though John Wayne Airport ("JWA") is not required to report GHG emissions at the federal level, JWA does report GHG emissions for the on-site Cogeneration Facility (natural gas use) to the California Air Resources Board ("CARB").

In 2016, the USEPA made two additional findings under Section 231(a)(2)(A) of the CAA that are specific to aircraft: (1) concentrations of six well-mixed GHGs in the atmosphere endanger the public health and welfare of current and future generations (the endangerment finding), and (2) GHGs emitted from certain classes of engines used in certain aircraft are contributing to the air pollution—the mix of those six GHGs in the atmosphere—that endangers public health and welfare (Landrum & Brown 2018). As with the light-duty vehicle findings, the USEPA's adoption of these findings is a prerequisite to its adoption of any GHG emission standards for aircraft.

Of note, Section 233 of the CAA vests the authority to promulgate emission standards for aircraft or aircraft engines exclusively with the USEPA. States and other municipalities are preempted from adopting or enforcing any standard respecting aircraft engine emissions unless such standard is identical to the USEPA's standards. To date, the USEPA has not adopted GHG emission standards for aircraft engines.

However, the USEPA has adopted oxides of nitrogen ("NO_x") emission standards and related provisions for aircraft gas turbine engines with thrusts rated greater than 26.7 kilonewtons that were previously adopted by the ICAO. (These engines are used primarily on commercial passenger and freight aircraft.) Included in the rule are two new tiers of more stringent emission standards for NO_x, which are known as Tier 6 standards and Tier 8 standards. The Tier 6 standards became effective for newly manufactured aircraft engines beginning in 2013. Engine models that were originally certificated beginning on or after January 1, 2014 must comply with the Tier 8 standards. Though these standards are not directly relevant to GHG emissions, these standards can influence and reduce GHG emissions over time as new aircraft engines are phased in because the standards require fuel efficiency improvements that will result in GHG emissions reductions (Landrum & Brown 2018).

Trump Administration

The Trump Administration is taking a different stance than previous administrations on GHG emissions and global climate change. Between January and March 2017, President Trump signed three Executive Orders (EOs) seeking regulatory reform, including the review, repeal, replacement, or modification to existing GHG regulations.

Executive Order 13771

In January 2017, President Trump signed EO 13771 ("Reducing Regulation and Controlling Regulatory Costs"), which reflects the President's policy "to be prudent and financially responsible in the expenditure of funds, from both public and private sources." This includes "managing the costs associated with the governmental imposition of private expenditures required to comply with Federal Regulation." The EO requires that for every one new regulation issued, at least two prior regulations be identified for elimination and that the costs of planned

regulations be prudently managed and controlled through a budgeting process (Landrum & Brown 2018).

Executive Order 13777

In February 2017, President Trump signed EO 13777 ("Enforcing the Regulatory Reform Agenda"), which directs Federal agencies to create a Regulatory Reform Task Force. One duty of the task force is to evaluate existing regulations and make recommendations to the agency head regarding their repeal, replacement, or modification, consistent with applicable law. In April 2017, the USEPA issued a Federal Register notice on evaluation of existing regulations and received over 460,000 comments when the comment period closed (Landrum & Brown 2018).

Executive Order 13783

In March 2017, President Trump signed EO 13783 ("Promoting Energy Independence and Economic Growth"), which calls for a review of the Clean Power Plan, related rules, and New Source Performance Standards for Oil and Gas, and all agencies to "review existing regulations, orders, guidance documents, and policies that potentially burden the development or use of domestically produced energy resources." EO 13783 also repealed energy- and climate-related presidential and regulatory actions, including: EO 13653 of November 1, 2013, *Preparing the United States for the Impacts of Climate Change*; The Presidential Memorandum of June 25, 2013, *Power Sector Carbon Pollution Standards*; The Presidential Memorandum of November 3, 2015, *Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment*; and The Presidential Memorandum of September 21, 2016, Climate Change and National Security. The EO also intends to have the two reports rescinded, including: The Report of the Executive Office of the President of June 2013, *The President's Climate Action Plan;* and The Report of the Executive Office of the President of March 2014, *The Climate Action Plan Strategy to Reduce Methane Emissions*.

In April 2017, in accordance with EO 13783, the USEPA submitted the Withdrawal of Proposed Rules: Federal Plan Requirement for Greenhouse Gas Emissions from Electric Utility Generating Units Constructed on or Before January 8, 2014; Model Trading Rules; Amendments to Framework Regulations; and Clean Energy Incentive Program Design Details.

Also in April 2017, the USEPA announced the review of three plans: (1) The Clean Power Plan; (2) Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Station Sources: Electric Generating Units; (3) 2016 Oil and Gas New Source Performance Standards for New, Reconstructed, and Modified Sources. In October 2017, the USEPA issued proposed repeal of The Clean Power Plan (Landrum & Brown 2018).

State

CARB, which is part of the California Environmental Protection Agency ("CalEPA"), is responsible for the coordination and administration of both federal and State air pollution control programs in California. There are numerous State plans, policies, regulations, and laws related to GHGs and global climate change. Following is a brief discussion of the plans, policies, and regulations most relevant to the Proposed Project and Alternative 1.

Executive Order S-3-05

In June 2005, Governor Arnold Schwarzenegger signed EO S-3-05, which proclaims that California is vulnerable to the impacts of climate change. In an effort to avoid or reduce the impacts of climate change, EO S-3-05 establishes a goal of a reduction in GHG emissions to the year 2000 level by 2010, to year 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

The California Global Warming Solutions Act of 2006 (Assembly Bill 32)

In furtherance of the goals established in EO S-3-05, the California Legislature adopted the public policy position that global warming is "a serious threat to the economic well-being, public health, natural resources, and the environment of California" (*California Health and Safety Code,* Section 38501). Further, the State Legislature determined that:

> the potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra Nevada snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious disease, asthma, and other human health-related problems.

The State Legislature also stated that:

> Global warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry. It will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the State (*California Health and Safety Code,* Section 38501).

These public policy statements became law with the enactment of AB 32, the California Global Warming Solutions Act of 2006, signed by Governor Arnold Schwarzenegger in September 2006. AB 32 is now codified as Sections 38500 through 38599 of the *California Health and Safety Code.*

AB 32 requires that Statewide GHG emissions be reduced to 1990 levels by 2020. This reduction is to be accomplished through an enforceable Statewide cap on GHG emissions that was phased in starting in 2012. AB 32 directs CARB to establish this Statewide cap based on 1990 GHG emissions levels; to disclose how it arrived at the cap; to institute a schedule to meet the emissions cap; and to develop tracking, reporting, and enforcement mechanisms. Emissions reductions under AB 32 are to include carbon sequestration projects and best management practices that are technologically feasible and cost effective.

CARB has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. Under AB 32, CARB is also responsible for adopting regulations requiring the reporting and verification of Statewide GHG emissions to monitor and enforce compliance with the established standards. AB 32 allows CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.

As required under AB 32, CARB approved the 1990 GHG emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 million metric tons ("MMT") of CO_2e. In addition to the 1990 emissions inventory, CARB also adopted regulations requiring mandatory reporting of GHGs for the large facilities that account for 94 percent of GHG emissions from industrial and commercial stationary sources in California. About 800 separate sources fall under the new reporting rules and include electricity-generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and other industrial sources that emit CO_2 in excess of specified thresholds. As discussed in more detail below, CARB has also adopted a GHG scoping plan and updates to the same.

California Air Resources Board Climate Change Scoping Plan

In 2008, CARB approved a Climate Change Scoping Plan as required by AB 32. The Climate Change Scoping Plan proposes 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" (CARB 2008). The Climate Change Scoping Plan 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 regulation to fund the program.

The Climate Change Scoping Plan calls for a "coordinated set of solutions" to address all major categories of GHG emissions. Transportation emissions will be addressed through a combination of higher standards for vehicle fuel economy; implementation of the Low Carbon Fuel Standard; and greater consideration for reducing trip length and generation through land use planning and transit-oriented development. A California cap-and-trade program that links with other Western Climate Initiative partner programs also creates a regional market system and caps sources contributing 85 percent of California's GHG emissions. Buildings, land use, and industrial operations will be encouraged and, sometimes, required to use energy more efficiently. Utility energy supplies will change to include at least 33 percent of renewable energy sources in the energy mix through implementation of the Renewables Portfolio Standard ("RPS"). This will be complemented with emphasis on local generation, including rooftop photovoltaics and solar hot water installations. Additionally, the Climate Change Scoping Plan emphasizes opportunities for households and businesses to save energy and money by increasing energy efficiency.

Table 4.4-2 provides a summary of the GHG emission reduction actions identified in the 2008 Scoping Plan.

TABLE 4.4-2
2008 SCOPING PLAN MEASURES

Cap-and-Trade Program: Implement a broad-based California cap-and-trade program to provide a firm limit on emissions. Link the California cap–and-trade program with other Western Climate Initiative Partner programs to create a regional market system to achieve greater environmental and economic benefits for California. Ensure California's program meets all applicable AB 32 requirements for market-based mechanisms.
Light-Duty Vehicle Standards: Implement adopted Pavley standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs with long term climate change goals.
Energy Efficiency: Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts including new technologies, and new policy and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California (including both investor-owned and publicly owned utilities).
Renewables Portfolio Standard: Achieve 33 percent renewable energy mix statewide.
Low Carbon Fuel Standard: Develop and adopt the Low Carbon Fuel Standard.
Regional Transportation-Related GHG Targets: Develop regional GHG emissions reduction targets for passenger vehicles.
Vehicle Efficiency Measures: Implement light-duty vehicle efficiency measures.
Goods Movement: Implement adopted regulations for the use of shore power for ships at berth. Improve efficiency in goods movement activities.
Million Solar Roofs Program: Install 3,000 megawatts of solar-electric capacity under California's existing solar programs.
Medium- & Heavy-Duty Vehicles: Adopt medium- (MD) and heavy-duty (HD) vehicle efficiencies. Aerodynamic efficiency measures for HD trucks pulling trailers 53-feet or longer that include improvements in trailer aerodynamics and use of rolling resistance tires were adopted in 2008 and went into effect in 2010. Future, yet to be determined improvements, includes hybridization of MD and HD trucks.
Industrial Emissions: Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce GHG emissions and provide other pollution reduction co-benefits. Reduce GHG emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.
High Speed Rail: Support implementation of a high-speed rail system.
Green Building Strategy: Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.
High GWP Gases: Adopt measures to reduce high GWP gases.
Recycling and Waste: Reduce methane emissions at landfills. Increase waste diversion, composting and other beneficial uses of organic materials, and mandate commercial recycling. Move toward zero-waste.
Sustainable Forests: Preserve forest sequestration and encourage the use of forest biomass for sustainable energy.
Water: Continue efficiency programs and use cleaner energy sources to move and treat water.
Agriculture: In the near-term, encourage investment in manure digesters and at the five-year Scoping Plan update determine if the program should be made mandatory by 2020.
Source: Landrum & Brown 2018, from California Air Resources Board, 2008

In the 2008 Scoping Plan, CARB also developed a forecast of 2020 emissions in a business-as-usual scenario ("2020 BAU"), which is an estimate of the emissions expected to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. This target was 596 million metric tons of carbon dioxide equivalent ("$MMTCO_2e$"). The 2020 GHG emissions target of 427 $MMTCO_2e$ required the reduction of 169 $MMTCO_2e$, or about 28.5 percent from the 2020 BAU forecast.

First Update to the Climate Change Scoping Plan

In 2014, CARB approved the First Update to the Climate Change Scoping Plan ("First Update" or "2013 Update") (CARB 2014). The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments; defines CARB's climate change priorities for the next five years; and sets the groundwork to reach California's long-term climate goals set forth in EO S-3-05 (CARB 2018b).

The First Update states that California is on track to meet the near-term 2020 GHG limit and is well-positioned to maintain and continue reductions beyond 2020 as required by AB 32. The set of actions the State is taking is driving down GHG emissions and is moving the State steadily in the direction of a cleaner energy economy.

While the original Scoping Plan provided specific GHG reduction measures in nine different economic sectors, the 2014 First Update discusses reductions in six key focus areas (energy, transportation, agriculture, water, waste management, and natural and working lands) as well as short-lived pollutants, green buildings, and the California's Cap and Trade Program. These focus areas include multiple economic sectors and have overlapping and complementary interests that require careful coordination.

As previously discussed, in the 2008 Scoping Plan, CARB established the 1990 Statewide GHG emissions level, which is also the 2020 GHG emissions target at 427 $MMTCO_2e$ and forecasted 2020 BAU emissions to be 596 $MMTCO_2e$. Based on new information and analysis, the First Update recalculated the 2020 BAU condition at 509 $MMTCO_2e$ and the 1990 emissions level at 431 $MMTCO_2e$.[1] Thus, under the First Update, achieving the recalculated 1990 emissions level of 431 $MMTCO_2e$ will require a reduction of 78 $MMTCO_2e$ or an approximately 15.3 percent reduction (compared to a 28.5 percent reduction as set forth in the 2008 Scoping Plan).

Second Update to the Climate Change Scoping Plan

In April 2015, Governor Brown issued EO B-30-15, identifying a goal of establishing a mid-term GHG reduction target for California of 40 percent below 1990 levels by 2030. That goal was then codified via the enactment of SB 32, which is discussed further below. In response to the EO and legislation, CARB adopted its second update to the AB 32 Scoping Plan (referred to herein as the "2017 Scoping Plan") in December 2017, which identifies CARB's strategy for achieving the 2030 reduction target. The 2017 Scoping Plan includes continuation of the Cap-and-Trade Program through 2030, and incorporates a Mobile Source Strategy that includes strategies targeted to increase zero emission vehicle fleet penetration and a more stringent target for the Low Carbon

[1] In 2013, CARB revised GHG calculations to use the GWP values from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4). Previous calculations used the GWPs from the second assessment report (SAR).

Fuel Standard by 2030. The 2017 Scoping Plan also incorporates approaches to reducing short-lived climate pollutants that were set forth in CARB's Short-Lived Climate Pollutant Reduction Strategy, acknowledges the need for reducing emissions in agriculture, and highlights the work underway to ensure that California's natural and working lands increasingly sequester carbon.

Senate Bill 97 and Amendments to the California Environmental Quality Act Guidelines

Senate Bill ("SB") 97 directed the CNRA to adopt amendments to the California Environmental Quality Act ("CEQA") Guidelines that require evaluation of GHG emissions or the effects of GHG emissions by January 1, 2010. The CNRA has done so, with the principle the amendments to the State CEQA Guidelines located in a new Section 15064.4, entitled Determining the Significance of Impacts from Greenhouse Gas Emissions; that Section provides:

a) The determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in Section 15064. A lead agency should make a good-faith effort, based on available information, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

    1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; or

    2) Rely on a qualitative analysis or performance based standards.

b) A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

    1) The extent to which the project may increase or reduce greenhouse gas 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;

    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 greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

The CNRA also amended CEQA Guidelines Section 15126.4 to add a new subdivision addressing the mitigation of GHG emissions. The amended CEQA Guidelines also include two new guidance

questions regarding GHG emissions in the environmental checklist set forth in Appendix G of the State CEQA Guidelines:

- Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The adopted amendments do not establish a GHG emission threshold, instead allowing a lead agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts. The CNRA also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions.

Senate Bill 375

Enacted in 2008, SB 375 provides a planning process to coordinate land use planning and Regional Transportation Plans ("RTPs") and funding priorities in order to help California meet the GHG reduction goals established in AB 32. SB 375 requires Metropolitan Planning Organizations ("MPOs"), including the Southern California Association of Governments ("SCAG"), to incorporate a Sustainable Communities Strategy ("SCS") in their RTPs that will achieve GHG emission reduction targets set by CARB.

In 2010, CARB adopted the initial SB 375 targets for the regional MPOs. For SCAG, the targets are an 8 percent reduction in GHG emissions from automobiles and light trucks per capita by 2020 and a 13 percent reduction by 2035. CARB's most recent reduction targets for the SCAG region, which were adopted in March 2018 and become effective on October 1, 2018, include an 8 percent and 19 percent reduction in per capita passenger vehicle GHG emissions by 2020 and 2035, respectively. All GHG reductions are measured relative to 2005 emission levels.

In April 2016, SCAG adopted an SCS that is estimated to achieve an 8 percent reduction in GHG emissions by 2020 and an 18 percent reduction in GHG emissions by 2035. SCAG's modeling and quantification for these estimated reductions were accepted by CARB on June 28, 2016 (CARB 2018c). See additional discussion of the SCAG plans under Regional Regulations.

Executive Order B-30-15

In April 2015, Governor Brown signed EO B-30-15, which establishes a goal of "[a] new interim statewide greenhouse gas emission reduction target to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030 . . . in order to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050" (COOG 2015). As noted above, EO B-30-15 also directs CARB to update the *Climate Change Scoping Plan* to express the 2030 target in terms of million metric tons of carbon dioxide equivalent.

Senate Bill 32

SB 32, signed into law in September 2016, requires CARB to ensure that statewide greenhouse gas emissions are reduced to at least 40 percent below the 1990 statewide greenhouse gas level no later than December 31, 2030. Per SB 32, CARB is to achieve this 2030 GHG reduction target by "adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions[.]" See Health & Safety Code Section 38566. The SB 32 GHG reduction mandate is the same as the GHG reduction included in EO B-30-15 of 40 percent below 1990 levels by 2030. As discussed above, CARB adopted the 2017 Scoping Plan in December 2017, which builds upon and leverages the framework for achieving California's GHG reduction mandate established in the initial Scoping Plan (2008 Plan) and its first update (2014), and to define the State's climate change priorities for the next 12 years and beyond.

Regional

Southern California Association of Governments

As previously discussed, SB 375 specifically required MPOs, including SCAG, to incorporate an SCS in their RTPs that will achieve GHG emission reduction targets set by CARB. SCAG's first-ever SCS is included in its *2012–2035 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS). The document was adopted by SCAG in April 2012. The goals and policies of the RTP/SCS that reduce GHG emissions focus on transportation and land use planning, recommending building infill projects, locating residents closer to where they work and play and designing communities so there is access to high quality transit service. The 2012–2035 RTP/SCS was expected to reduce per capita transportation emissions by 9 percent by 2020 and by 16 percent by 2035. In June 2012, CARB accepted SCAG's determination that the Final RTP/SCS would meet the region's GHG reduction target.

SCAG's SCS is now included in its 2016–2040 RTP/SCS. The document was adopted by SCAG on April 7, 2016. The 2016–2040 RTP/SCS is expected to reduce per capita transportation emissions by 8 percent by 2020 and by 18 percent by 2035 (SCAG 2016). In June 2016, CARB accepted SCAG's determination that the Final RTP/SCS would meet the region's GHG reduction target.

South Coast Air Quality Management District

The Project site lies within the boundaries of the South Coast Air Quality Management District ("SCAQMD"). The SCAQMD is bound by the Ventura County/Los Angeles County border to the northwest, the Mojave Desert Air Basin to the north, the Riverside County border to the east, and the San Diego County-Riverside County border to the south.

The portion of the Project site under the jurisdiction of the SCAQMD lies within the South Coast Air Basin ("SoCAB"). The mission of the SCAQMD is to clean the air and protect the health of all residents in the South Coast Air District through practical and innovative strategies. (SCAQMD 2018).

Beginning in April 2008, the SCAQMD convened a Working Group to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. In

December 2008, the SCAQMD Governing Board adopted its staff proposal for an interim CEQA GHG significance threshold of 10,000 metric tons of CO_2 equivalent per year ("$MTCO_2e$/year") for industrial projects where the SCAQMD is the lead agency. The policy objective for establishing this significance threshold is to capture projects that represent approximately 90 percent of GHG emissions from new sources and to avoid Environmental Impact Report (EIR)-level analysis for relatively small impacts (SCAQMD 2008).

4.4.3 METHODOLOGY

Construction emissions were calculated using the California Emissions Estimator Model ("CalEEMod", Version 2016.3.2). CalEEMod is a computer program accepted by the SCAQMD that can be used to estimate criteria pollutant and GHG emissions associated with land development projects in California. CalEEMod has separate databases for specific counties and air districts. The Orange County database was used for the proposed Project. CalEEMod defaults were used for equipment and trip generation data.

The CalEEMod model calculates total emissions resulting from each construction activity. Construction estimates (including phase durations and estimated quantities) for the Proposed Project and Alternative 1 were based on the preliminary engineering data available at the time the modeling was completed for this Program EIR. The phasing and duration of the construction of each of the improvements were developed by AECOM in conjunction with Airport staff and provided by the Airport for the purpose of this analysis. The construction phasing plans are provided in Section 3 (Proposed Project is shown in Exhibits 3-3a and 3-3b; Alternative 1 is shown in Exhibits 3-5a and 3-5b) of this Program EIR. The construction emissions analysis reflects full removal and replacement of the aprons and service roads. Detailed assumptions for each of the phases, including activity, duration, and estimated footprint size is provided in the *Greenhouse Gas Technical Report* (see Appendix G of this Program EIR, Table 8 provides the detail for the Proposed Project and Table 9 provides the detail for Alternative 1).

The FAA's Aviation Environmental Design Tool ("AEDT", Version 2d) was used to model operational emissions from aircraft operations, auxiliary power units ("APU"), and ground support equipment ("GSE") at the Airport.[2] AEDT is a software system that models aircraft performance and estimates fuel consumption, emissions, noise, and air quality emissions data. AEDT is a comprehensive tool that provides information to FAA stakeholders on each of these specific environmental impacts. AEDT facilitates environmental review activities by consolidating the modeling of these environmental impacts in a single tool.

Specific aircraft types and times of operation were obtained from the 2016 John Wayne Airport General Aviation Noise Ordinance database and input into AEDT. AEDT Version 2d does not have the capability to calculate GHG emissions for APUs. Therefore, appropriate emission factors, based on estimated annual hours of APU usage at JWA, were applied to calculate GHG emissions. Detail on the aircraft, APU and GSE assumptions are included in Appendix G.

[2] GSE is used to service aircraft between flights. Typical GSE includes air conditioning, air start, baggage tractors, belt loaders, and emergency vehicles that support airport operations. APUs are used at the gate by larger jet aircraft to operate the heating, air conditioning, and electric systems. The APU is also used to 'start up' or restart the aircraft engines before departing from the gate area.

4.4.4 EXISTING CONDITIONS

The AEDT was used to model general aviation aircraft operations only at the Airport, along with GSE and APU usage for the Baseline (2016) Conditions. The model estimates the rate of emissions of the pollutants in metric tons per year. The results of the emission inventory are provided in Table 4.4-3.

TABLE 4.4-3
GHG EMISSIONS INVENTORY – GENERAL AVIATION
BASELINE (2016) CONDITIONS

Source	Annual Emissions $MTCO_2e$
Aircraft	12,148
GSE	688
APU	173
Total MT CO_2e	***13,009***

GSE: Ground Support Equipment; APU: Auxiliary Power Unit; $MTCO_2e$: Metric Ton Carbon Dioxide equivalent;

Note: APU and GSE usage is largely limited to commercial aircraft, but conservatively reported here.

Section 3.0 of Appendix G also provides Airport-wide existing conditions data for 2016. Because the GAIP exclusively pertains to and affects general aviation operations at JWA, the inventory data presented in this Section of the Program EIR is focused on general aviation-related emissions. For additional information on Airport-wide emissions that accounts for commercial aircraft, please see Appendix G.

Source: AEDT version 2d, Landrum & Brown, 2018 (Appendix G).

4.4.5 THRESHOLDS OF SIGNIFICANCE

In accordance with the County's Environmental Analysis Checklist and Appendix G of the CEQA Guidelines, the following two thresholds are used to evaluate the significance of the Project's greenhouse gas emissions:

Threshold 4.4-1 Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Threshold 4.4-2 Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Neither CARB, the SCAQMD, nor the County of Orange have adopted quantitative GHG thresholds of general applicability. However, the SCAQMD has adopted a quantitative GHG threshold for projects where the SCAQMD is the lead agency (primarily stationary source projects). The threshold is 10,000 metric tons carbon dioxide equivalent per year for industrial facilities (10,000 MT CO_2e/year). While the SCAQMD is not the lead agency for the Proposed Project or Alterative 1, because no other quantitative threshold of general applicability is available within this geographic region, it is appropriate to use the SCAQMD's threshold to evaluate the

significance of the GAIP's GHG emissions. In deciding to reference the SCAQMD quantitative GHG threshold, it is noted that the source of the GHG emission is not a relevant factor in determining the significance of the emission. This stationary source threshold will be used as a screening threshold to assess significance of the GHG emissions resulting from the Proposed Project and Alternative 1. Should the emissions caused by the Proposed Project exceed the identified annual threshold, it would be considered to have a potentially significant GHG impact. Non-stationary source projects with emissions greater than this threshold are not necessarily considered significant in CEQA terms.

4.4.6 REGULATORY REQUIREMENTS AND STANDARD CONDITIONS OF APPROVAL

Implementation of the GAIP assumes compliance with existing regulations related to GHG emissions at the Airport. These include the regulatory requirements ("RR") listed below, the relevance of which is described in Appendix G of this Program EIR in further detail. There are no County Standard Conditions of Approval pertaining to GHG emissions that would be applicable to the GAIP.

RR GHG-1 GAIP facilities must be designed in accordance with the applicable Title 24 Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations [CCR], Title 24, Part 6). These standards are updated, approximately every three years, to incorporate improved energy efficiency technologies and methods. The Manager of Building & Safety, or designee shall ensure compliance prior to the issuance of each building permit.

RR GHG-2 GAIP facilities must be designed in accordance with applicable requirements of the California Green Building Standards (CALGreen) Code (24 CCR 11). The Manager of Building & Safety, or designee shall ensure compliance prior to the issuance of each building permit.

4.4.7 IMPACT ANALYSIS

Threshold 4.4-1

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

Proposed Project

Construction

As noted above, construction emission estimates for the Proposed Project were developed using CalEEMod and the preliminary engineering data available at the time the modeling was completed for this Program EIR. Construction for the Proposed Project is anticipated to take slightly more than seven years and is projected to start in 2019 and be completed in 2026.

The Proposed Project's construction emission inventory is shown in Table 4.4-4. The total construction emissions for the Proposed Project is 28,108 $MTCO_2e$. The SCAQMD recommends that construction-related GHG emissions be summed and amortized over the life of the project, defined as 30 years, to determine significance. Therefore, the amortized construction emissions from the Proposed Project would be 937 $MTCO_2e$/year.

TABLE 4.4-4
ESTIMATED GREENHOUSE GAS EMISSIONS FROM CONSTRUCTION PROPOSED PROJECT

Activity/Year	$MTCO_2e$
Construction – 2019	3,672
Construction – 2020	4,128
Construction – 2021	3,357
Construction – 2022	3,543
Construction – 2023	2,372
Construction – 2024	4,062
Construction – 2025	5,464
Construction – 2026	1,510
Total MT CO_2e	**28,108**
Annual Construction Emissions Amortized over 30 Years	***937***

$MTCO_2e$: metric tons of carbon dioxide equivalent
Numbers may not sum as shown, due to rounding.
Source: CalEEMod, Landrum & Brown, 2018 (Appendix G)

Operations

The Proposed Project would result in changes to the Airport's general aviation aircraft operations and fleet mix. The Proposed Project would not change the number of commercial air carrier operations, fleet mix, runway use, flight tracks, or terminal area. Therefore, emission sources related to the change in general aviation aircraft operations and fleet mix were evaluated using the AEDT. These sources include general aviation aircraft operations, APU usage, and GSE usage.[3] The year 2026 is used for the Proposed Project analysis because that is expected completion date of the GAIP improvements and would be reflective of the ultimate fleet mix and number of operations.

[3] As discussed in further detail in Appendix G of this Program EIR, because the Proposed Project would replace less efficient, existing development with more efficient, new development, the Proposed Project would reduce building-related energy consumption and corresponding operational emissions when compared to the existing conditions. Therefore, the building-related emissions (e.g., emissions resulting from electricity and natural gas consumption) of the Proposed Project were not quantified (Landrum & Brown 2018). Similarly, the small increase in the number of persons associated with general aviation facilities under the Proposed Project would be offset by the installation of water-efficient appliances and fixtures. Therefore, water-related emissions were not estimated for the Proposed Project (Landrum & Brown 2018). Finally, as provided in the Traffic Impact Analysis report (see Appendix I of this Program EIR), the Proposed Project is not anticipated to increase the number of average daily trips or trip lengths, or substantially change the quantity of vehicle miles traveled by users of the general aviation facilities. Therefore, operational emissions attributable to the use of passenger vehicles are not estimated in this report.

Impacts from the Proposed Project are evaluated in comparison to the Baseline (2016) Conditions. (The Baseline (2016) emissions inventory is presented above in Table 4.4-3 and provided in Section 4.4.4, Existing Conditions.) Because the Proposed Project only pertains to general aviation activity, the analysis compares the Baseline (2016) general aviation emissions to the Baseline Plus Proposed Project (2026). This is reflective of the CEQA requirement for an "Existing Plus Project" evaluation. The results of the emissions inventory are provided in Table 4.4-5.

TABLE 4.4-5
GHG EMISSIONS INVENTORY – GENERAL AVIATION
BASELINE PLUS PROPOSED PROJECT (2026)

Source	Annual Operational Emissions (Metric Tons) ($MTCO_2e$)
Aircraft	14,813
GSE	599
APU	220
Total MT CO_2e	***15,663***

GSE: Ground Support Equipment; APU: Auxiliary Power Unit; $MTCO_2e$: Metric Ton Carbon Dioxide equivalent;

Note: APU and GSE usage is largely limited to commercial aircraft, but conservatively reported here.

Section 5.0 of Appendix G also provides emissions inventory data that places the Proposed Project's incremental increase in GHG emissions in the context of Airport-wide existing conditions data for 2016. The Proposed Project's incremental increase in GHG emissions is identical when viewed in relation to the background existing general aviation only *or* commercial and general aviation existing conditions data.

Source: AEDT version 2d, Landrum & Brown, 2018 (Appendix G).

Table 4.4-6 provides the net emissions for the Baseline Plus Proposed Project conditions; as shown therein, the net emissions value is below the SCAQMD's 10,000 $MTCO_2e$ significance threshold. Therefore, impacts would be less than significant.

TABLE 4.4-6
GENERAL AVIATION OPERATIONAL EMISSIONS
BASELINE (2016) PLUS PROPOSED PROJECT (2026)

Source	Annual Operational Emissions ($MTCO_2e$)
Incremental Increase in Operational Emissions [a]	2,624
Amortized Construction Emissions (see Table 4.4-4)	937
Annual Net Emissions: Proposed Project	3,561
SCAQMD Threshold	**10,000**
Baseline Plus Proposed Project Exceed SCAQMD Threshold?	***No***

$MTCO_2e$: metric tons of carbon dioxide equivalent

[a] Proposed Project (2026) Operational Total (15,633 MT) minus Baseline (2016) Conditions Operational Total (13,009 MT).

Source: Landrum & Brown 2018 (Appendix G).

Although impacts are less than significant and no mitigation measures are required, minimization measures, discussed under Threshold 4.4-2, would serve to reduce GHG emissions associated with general aviation operations. Additionally, there are mitigation and minimization measures recommended to reduce construction-related criteria air pollutant emissions in Section 4.2, Air Quality, of this Program EIR. The construction mitigation and minimization measures recommended in the air quality analysis are anticipated to result in co-benefits, in the form of GHG emission reductions. As recommended in Section 4.2, all GAIP-related, off-road construction equipment shall be required to meet the USEPA's Tier 4 emission engine standards, per MM AQ-1. Additionally, Minimization Measure (MN) AQ-1, recommends that architectural coating applied to parking lots and roadways shall be low VOC products. CalEEMod currently does not have the capability to estimate GHG reductions directly attributed to the implementation of these mitigation and minimization measures. However, it is anticipated the GHG construction emissions for the Proposed Project would be below the results presented in Table 4.4-3 and 4.4-6 with implementation of the referenced mitigation and minimization measures.

An additional minimization measure also is recommended to reduce operation-related criteria air pollutant emissions in Section 4.2 of this Program EIR. Specifically, Minimization Measure (MN)[4] AQ-2 pertains to a requirement that the FBOs employ Zero Emission Vehicle ("ZEV") GSE where available for 90 percent or greater of the GSE operating hours. MN AQ-2 is expected to result in co-benefits, in the form of GHG emission reductions. Implementation of MN AQ-2 would reduce the total emissions for the Proposed Project from 3,561 annual $MTCO_2e$ to 3,021 annual $MTCO_2e$. This is more than a 15 percent reduction in annual $MTCO_2e$ emissions.

Additionally, the Proposed Project incorporates provisions for the extension of the hydrant fueling system to the full service FBOs on the east side of the Airport. By connecting to the fuel farms located on the west side of the Airport via an underground pipeline, the number of

[4] As defined in Section 4.0, a minimization measure is a condition proposed to reduce an adverse effect of the Project even when that effect does not result in a significant impact.

refueling trucks would be reduced, thereby lowering fueling support vehicle emissions on the airfield.

Impact Conclusion: *Construction activities and the changes in the fleet mix associated with the Proposed Project (2026) would generate greenhouse gas emissions beyond those identified for the Baseline (2016). However, the net emissions would be substantially below the SCAQMD threshold for industrial uses (i.e., 10,000, annual $MTCO_2e$) both prior to and after the implementation of mitigation and minimizations measures recommended in this section and in Section 4.2 of this Program EIR (3,561 annual $MTCO_2e$ and 3,021 annual $MTCO_2e$, respectively). Although no mitigation measures are required, compliance with RR GHG-1 and RR GHG-2, implementation of MN GHG-1, MM AQ-1, MN AQ-1, and MN AQ-2 would further reduce GHG emissions. Therefore, the Proposed Project would not generate greenhouse gas emissions that would have a significant impact on the environment. Impacts of the Proposed Project would be less than significant under Threshold 4.4-1.*

Alternative 1

Construction

Construction emission estimates for Alternative 1 were developed using CalEEMod and the preliminary engineering data available at the time the modeling was completed for this Program EIR. Construction for Alternative 1 is anticipated to take slightly more than seven years and is projected to start in 2019 and be completed in 2026.

Alternative 1's construction emissions inventory is shown in Table 4.4-7. The total construction emissions for Alternative 1 is 30,389 $MTCO_2e$. The SCAQMD recommends that construction-related GHG emissions be summed and amortized over the life of the project, defined as 30 years, to determine significance. Therefore, the amortized construction emissions from the Proposed Project would be 1,013 $MTCO_2e$/year.

TABLE 4.4-7
ESTIMATED GREENHOUSE GAS EMISSIONS
FROM CONSTRUCTION
ALTERNATIVE 1

Activity/Year	$MTCO_2e$
Construction – 2019	4,108
Construction – 2020	4,178
Construction – 2021	3,357
Construction – 2022	4,025
Construction – 2023	3,446
Construction – 2024	3,450
Construction – 2025	5,521
Construction – 2026	2,304
Total MT CO_2e	**30,389**
Annual Construction Emissions Amortized over 30 Years	***1,013***

$MTCO_2e$: metric tons of carbon dioxide equivalent;
Numbers may not sum as shown, due to rounding.
Source: CalEEMod, Landrum & Brown, 2018 (Appendix G)

Operations

As with the Proposed Project, Alternative 1 would result in changes to the Airport's general aviation aircraft operations and fleet mix. Alternative 1 would not change the number of commercial air carrier operations, fleet mix, runway use, flight tracks, or terminal area. Therefore, emission sources related to the change in general aviation aircraft operations and fleet mix were evaluated using the AEDT. These sources include general aviation aircraft operations, APU usage, and GSE usage. The year 2026 is used for the Alternative 1 analysis because that is expected completion date of the GAIP improvements and would be reflective of the ultimate fleet mix and number of operations.

Impacts from Alternative 1 are evaluated in comparison to the Baseline (2016) Conditions. (The Baseline (2016) emissions inventory is presented above in Table 4.4-3 and provided in Section 4.4.4, Existing Conditions.) Because Alternative 1 only pertains to general aviation activity, the analysis compares the Baseline (2016) general aviation emissions to the Baseline Plus Alternative 1 (2026). This is reflective of the CEQA requirement for an "Existing Plus Project" evaluation.

The results of the emission inventory are provided in Table 4.4-8.

TABLE 4.4-8
GHG EMISSIONS INVENTORY – GENERAL AVIATION
BASELINE (2016) PLUS ALTERNATIVE 1 (2026)

Source	Annual Emissions $MTCO_2e$
Aircraft	15,041
GSE	602
APU	226
Total MT CO_2e	***15,868***

GSE: Ground Support Equipment; APU: Auxiliary Power Unit:

$MTCO_2e$: Metric ton carbon dioxide equivalent

Note: APU and GSE usage is largely limited to commercial aircraft.

Section 5.0 of Appendix G also provides emissions inventory data that places Alternative 1's incremental increase in GHG emissions in the context of Airport-wide existing conditions data for 2016. Alternative 1's incremental increase in GHG emissions is identical when viewed in relation to the background existing general aviation only *or* commercial and general aviation existing conditions data

Source: AEDT version 2d, Landrum & Brown, 2018 (Appendix G).

Table 4.4-9 provides the net emissions for general aviation activity for the Baseline Plus Alternative 1 conditions; as shown therein, the net emissions value is below the SCAQMD's 10,000 $MTCO_2e$ significance threshold. Therefore, impacts would be less than significant.

TABLE 4.4-9
GENERAL AVIATION OPERATIONAL EMISSIONS
BASELINE (2016) PLUS ALTERNATIVE 1 (2026)

Source	Annual Operational Emissions ($MTCO_2e$)
Incremental Increase in Operational Emissions [a]	2, 859
Amortized Construction Emissions(see Table 4.4-7)	1,013
Annual Net Emissions: Alternative 1	3,872
SCAQMD Threshold	**10,000**
Baseline Plus Alternative 1 Exceed SCAQMD Threshold?	***No***

$MTCO_2e$: metric tons of carbon dioxide equivalent

Notes:

[a] Alternative 1 (2026) Operational Total (15,868) minus Baseline (2016) Conditions Operational Total (13,009)

Source: Landrum & Brown 2018 (Appendix G).

As discussed above for the Proposed Project, although impacts are less than significant and no mitigation measures are required, the minimization measure discussed under Threshold 4.4-2 (MN GHG-1), would serve to reduce GHG emissions associated with general aviation operations by including compliance with the applicable measures from the JWA Climate Action Plan in the

lease agreements for GAIP-related development. Additionally, there are mitigation and minimization measures recommended to reduce construction-related criteria air pollutant emissions in Section 4.2, Air Quality, of this Program EIR. The construction mitigation and minimization measures recommended in the air quality analysis are anticipated to result in co-benefits, in the form of GHG emissions reductions. As recommended in Section 4.2, all GAIP-related, off-road construction equipment shall be required to meet the USEPA's Tier 4 emission engine standards, per MM AQ-1. Additionally, MN AQ-1 recommends that architectural coating applied to parking lots and roadways shall be low VOC products. CalEEMod currently does not have the capability to estimate GHG reductions directly attributed to the implementation of these mitigation and minimization measures. However, it is anticipated the GHG construction emissions for Alternative 1 would be below the results presented in Table 4.4-3 and 4.4-6 with implementation of the referenced mitigation and minimization measures.

An additional minimization measure is recommended to reduce operation-related criteria air pollutant emissions in Section 4.2 of this Program EIR. Specifically, MN AQ-2 pertains to a requirement that the FBOs employ ZEV GSE where available for 90 percent or greater of the GSE operating hours. MN AQ-2 is expected to result in co-benefits, in the form of GHG emission reductions. Implementation of MN AQ-2 would reduce the total emissions for Alternative 1 from 3,872 annual $MTCO_2e$ to 3,331 annual $MTCO_2e$. This is approximately a 14 percent reduction in annual $MTCO_2e$ emissions.

Additionally, Alternative 1 incorporates provisions for the extension of the hydrant fueling system to the full service FBOs on the east side of the Airport. By connecting to the fuel farms located on the west side of the Airport via an underground pipeline, the number of refueling trucks would be reduced, thereby lowering fueling support vehicle emissions on the airfield

Impact Conclusion: *Construction activities and the changes in the fleet mix associated with Alternative 1 (2026) would generate greenhouse gas emissions beyond those identified for the Baseline (2016). However, the net emissions would be substantially below the SCAQMD threshold for industrial uses (i.e., 10,000, annual $MTCO_2e$) both prior to and after the implementation of mitigation and minimizations measures recommended in this section and Section 4.2 of this Program EIR (3,872 annual $MTCO_2e$ and 3,331 annual $MTCO_2e$, respectively). Although no mitigation measures are required, compliance with RR GHG-1 and RR GHG-2, implementation of MN GHG-1. MM AQ-1, MN AQ-1, and MN AQ-2 would further reduce GHG emissions. Therefore, Alternative 1 would not generate greenhouse gas emissions that would have a significant impact on the environment. Impacts of Alternative 1 would be less than significant under Threshold 4.4-1.*

Threshold 4.4-2

- ***Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?***

Proposed Project and Alternative 1

Executive Order S-3-05, AB 32, and SB 32 are the primary State policies adopted for the purpose of reducing GHG emissions. Statewide regulations adopted in furtherance of those State policies, including GHG emissions standards for vehicles, are being implemented at the statewide level. For example, CARB's Mobile Source Strategy and 2017 Scoping Plan include actions to deploy zero-emission technologies across a broad spectrum of sources, including airport GSE and off-road construction equipment (Landrum & Brown 2018). As noted in the discussion of Threshold 4.4-1, the GHG emissions for both the Proposed Project and Alternative 1 would be less than significant; therefore, it would not conflict with the regulations established for reducing GHG emissions. Both the Proposed Project and Alternative 1 also incorporate additional measures that would further reduce GHG emissions (MN AQ-1 and MN AQ-2), including a requirement that the FBOs employ ZEV GSE where available for 90 percent or greater of the GSE operating hours.

The Airport has developed the *John Wayne Airport Climate Action Plan* ("CAP"), which establishes a framework to minimize Airport-related GHG emissions. The CAP establishes emission reduction goals and a process for implementation, monitoring, and reporting. The CAP was developed in furtherance of mitigation measures provided in the JWA Settlement Agreement Amendment EIR No. 617.

Table 4.4-10 provides a consistency evaluation with the GHG emission reduction measures identified in the CAP. This evaluation pertains to both the Proposed Project and Alternative 1 because the requirements would be applicable to both scenarios. In order to ensure that the CAP measures are implemented, as applicable, to development and uses facilitated by approval of the GAIP, minimization measure MN GHG-1 is recommended for adoption. As demonstrated in Table 4.4-10, the Proposed Project and Alternative 1 are consistent with applicable elements of the CAP.

Finally, with respect to SCAG's RTP/SCS, neither the Proposed Project nor Alternative 1 are expected to increase GHG emissions as a result of the intersection between transportation planning and land use. The GAIP does not propose to change the long-standing land use of the JWA site for aeronautical purposes. And, as shown in Table 4.4-10, the *Climate Action Plan* contains strategies that are relevant to the use of transit and other multi-modal transportation opportunities. It also is noted that the predominant source of surface roadway vehicle traffic at JWA is attributable to the commercial air carrier operations, not the general aviation operations that are the subject of the Proposed Project and Alternative 1.

Since the Proposed Project and Alternative 1 would be consistent with the CAP and would implement applicable emissions-reducing strategies identified in CARB's Mobile Source Strategy and 2017 Scoping Plan Update, to the extent required by law, there would not be a conflict with any applicable plan, policy or regulation to reduce GHG emissions and impacts would be less than significant.

TABLE 4.4-10
JOHN WAYNE AIRPORT CLIMATE ACTION PLAN CONSISTENCY EVALUATION
PROPOSED PROJECT AND ALTERNATIVE 1

No.	Item	Climate Action Plan Measure	GAIP Consistency
E-1	Window Treatments	Install window awnings, sunshades or window tinting in appropriate areas	**Consistent -** Applicable components of the GAIP (e.g., new FBO facilities) shall be required to install window awnings, sunshades, window tinting or equivalent window design treatments in appropriate areas in order to reduce energy demand for conditioned air/cooling.
E-2	Cool roofs and pavements	Install light colored "cool" roofs and cool pavements in any new developments	**Consistent -** Applicable components of the GAIP (e.g., new FBO facilities) shall be required to install light colored "cool" roofs and cool pavements as appropriate in order to reduce energy demand for conditioned air/cooling.
E-3	Baggage handling system motors	Optimize the energy efficiency and control of the conveyor motors in the baggage handling system	**Consistent -** While not anticipated, applicable components of the GAIP (e.g., new FBO facilities) shall be required to optimize the energy efficiency and control of the conveyor motors in the baggage handling system as appropriate in order to reduce energy demand.
E-4	Energy efficiency retrofits	Retrofit and redevelop the existing structures and facilities to maximize energy efficiency	**Consistent -** The GAIP is consistent with this measure because it proposes to replace existing, aging general aviation facilities with new, more energy efficient general aviation facilities.
E-5	Energy efficiency lighting	Continue to install energy-efficient (LED or equivalent) lighting on the airfield, within terminal buildings, and for surface and parking lot security lighting	**Consistent -** The GAIP is consistent with this measure because it proposes to replace existing, aging general aviation facilities with new, more energy efficient general aviation facilities. In addition, applicable components of the GAIP shall be required to install energy-efficient (LED or equivalent) lighting on the airfield, within buildings, and for surface and parking lot security lighting in order to reduce energy demand.
E-6	Energy efficient equipment	Install energy efficient equipment and controls for equipment, as feasible	**Consistent -** Applicable components of the GAIP (e.g., new FBO facilities) shall be required to install energy efficient equipment and controls for equipment, as feasible in order to reduce energy demand.
E-7	Air handling unit motors and control	Install variable speed drives and optimize the control of air handling unit pumps for equipment, as feasible	**Consistent -** Applicable components of the GAIP (e.g., new FBO facilities) shall be required to install variable speed drives and optimize the control of air handling unit pumps for equipment, as feasible in order to reduce energy demand.

TABLE 4.4-10
JOHN WAYNE AIRPORT CLIMATE ACTION PLAN CONSISTENCY EVALUATION
PROPOSED PROJECT AND ALTERNATIVE 1

No.	Item	Climate Action Plan Measure	GAIP Consistency
E-8	Energy efficient elevators and escalators	Install energy efficient elevators and escalators as the existing ones require replacement	**Consistent -** Applicable components of the GAIP (e.g., new FBO facilities) shall be required to install energy efficient elevators and escalators, if included in the project, in order to reduce energy demand.
E-9	Solar panels	Install solar panels and a battery system to support the central utility plant ("CUP")[a]	**Not Applicable -** The GAIP addresses general aviation-related activities at JWA, and does not relate to, address or affect operation of the on-site Central Utility Plant.
E-10	Renewable energy purchases	Consider increasing the purchase and use of renewable energy	**Consistent -** Applicable components of the GAIP (e.g., new FBO facilities) shall be required to install renewable energy systems (e.g. solar) as feasible or purchase renewable energy.
E-11	Third party energy efficiency	Require/support third parties/ vendors to meet more stringent energy efficiency requirements	**Consistent -** JWA is requiring fixed based operators and vendors to meet stringent energy efficiency requirements equivalent of CalGreen Tier 1 and Envision Gold[b] or higher for applicable components of GAIP facilities.
E-12	ENERGY STAR equipment	Require/support that new equipment purchased by JWA or tenants be rated ENERGY STAR or equivalent	**Consistent -** Applicable components of the GAIP (e.g., new FBO facilities) shall be required to employ new equipment rated ENERGY STAR or equivalent to reduce energy demand.
E-13	Paperless tickets	Support the efforts of commercial air carriers to utilize paperless ticket technology	**Not Applicable -** This measure pertains to commercial air carriers, not the general aviation-related activities that are the subject of the GAIP.
E-14	Track energy use	Track energy use every 12 months to assess energy use efficiency and optimization	**Consistent -** JWA, in coordination with its' general aviation-related tenants, will monitor the energy use of development facilitated by the GAIP on an annual basis in order to assess efficiency and optimization opportunities.
AG-1	Alternative fuels for equipment	Maximize use of hybrid or alternatively fueled on-site equipment	**Consistent -** Applicable components of the GAIP shall be required to adopt GHG/Emission reduction measures for airside equipment and sources.
AG-2	Single/reduced engine taxiing	Support single/reduced engine taxiing procedures authorized by the FAA	**Not Applicable -** This measure pertains to the operational procedures used by commercial air carrier aircraft, not general aviation aircraft.

TABLE 4.4-10
JOHN WAYNE AIRPORT CLIMATE ACTION PLAN CONSISTENCY EVALUATION
PROPOSED PROJECT AND ALTERNATIVE 1

No.	Item	Climate Action Plan Measure	GAIP Consistency
AG-3	GSE electrification	Require GSE electrification of 35 percent above 2013 baseline levels by 2021, and 50 percent increase above baseline by 2026	**Not Applicable -** This measure pertains to the operational procedures used by commercial air carrier aircraft, not general aviation aircraft.
AG-4	Anti-idling policy	Require that all tenants develop, implement, and submit to the Airport a fleet-wide, anti-idling policy for their vehicles, and rental vehicles	**Consistent -** JWA shall require that general aviation tenants develop, implement and submit a fleet-wide, anti-idling policy for vehicles used, owned and/or operated in conjunction with their tenancy.
T-1	Electric vehicle chargers	Expand installation of electric vehicle chargers in public parking structures and the employee parking lots. Provide preferential parking for low emission vehicles	**Consistent -** JWA shall require that development facilitated by the GAIP install electric vehicle charging stations at appropriate general aviation facilities, such as passenger vehicle parking areas. JWA also shall require that tenants of facilities developed under the GAIP provide preferential parking for low emission vehicles at the general aviation facilities.
T-2	Public transit opportunities	Support feasible public transit opportunities to the Airport by coordinating with OCTA, Irvine iShuttle, and MetroLink upon the request of the transit providers	**Consistent -** JWA currently supports public transit opportunities to the Airport; these same opportunities are available to general aviation users.
T-3	Bicycle Racks	Support bicycle use by Airport employees and the air traveling public by providing convenient, secure bicycle racks for use on the Airport's premises	**Consistent -** Applicable components of the GAIP (e.g., new FBO facilities) shall be required to provide convenient, secure bicycle racks, as determined appropriate to accommodate bike riders.
SW-1	Waste reduction and recycling	Increase solid waste reduction and recycling	**Consistent -** JWA shall require GAIP facilities to implement waste reduction and recycling practices that exceed or are equivalent to those currently used in the passenger terminals. GAIP tenants shall provide separate receptacles for trash, recyclable and compostable materials.
SW-2	Paperless Tickets	Support the efforts of commercial air carriers to utilize paperless ticket technology	**Not Applicable -** This measure pertains to commercial air carriers, not the general aviation-related activities that are the subject of the GAIP.
M-1	ACI-NA Environmental Benchmark Survey	Support the efforts of the Airport industry to develop AQ//GHG emission benchmarking databases by participating in the biannual ACI-NA Environmental Survey	**Consistent -** JWA shall coordinate with its general aviation-related tenants to ensure that it has the information necessary to accurately respond to the biannual ACI-NA Environmental Survey.

TABLE 4.4-10
JOHN WAYNE AIRPORT CLIMATE ACTION PLAN CONSISTENCY EVALUATION
PROPOSED PROJECT AND ALTERNATIVE 1

No.	Item	Climate Action Plan Measure	GAIP Consistency
M-2	Improvement projects	Evaluate the effects of future Airport-related improvement projects cognizant of and informed by the resulting air quality and GHG emissions in accordance with the requirements of CEQA.	**Consistent -** A program-level EIR is being prepared to evaluate the environmental effects of the GAIP, including those associated with air quality and GHG emissions. General aviation-related development that is facilitated by the GAIP also shall comply with CEQA to ensure that the environmental effects of Airport-related improvement projects are evaluated.
M-3	Carbon offsets	Purchase carbon offset credits through an adopted program such as CAPCOA's Greenhouse Gas Reduction Exchange (Rx) Registry, of which the SCAQMD is a participating air district (www.ghgrx.org)	**Not Applicable -** Based on the information and analysis presented in the EIR, the GAIP's GHG emissions would not result in a significant impact to global climate change. Because no significant impacts would result, the purchase of carbon offset credits, as a form of mitigation is not required.

[a] The Airport started operating its CUP in 2011. The CUP produces electricity as well as heat from excess thermal energy. The heat is used to produce chilled water, which is used for terminal air conditioning. This greatly reduces or eliminates the need for electricity (generated or imported) to operate conventional air-conditioning systems, thereby reducing GHG emissions.

[b] Envision is third party rating system developed and managed by the Institute for Sustainable Infrastructure (ISI). "The Envision sustainable infrastructure rating system is a comprehensive framework of 60 sustainability criteria that address the full range of environmental, social, and economic impacts to sustainability in project design, construction, and operation. These criteria—called "credits"—are arranged in five categories: Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and Risk." (Source: http://sustainableinfrastructure.org/envision/how-it-works/) Envision has levels of achievement or award from Bronze to Platinum. JWA is requiring a level of Envision Gold. For additional information, see http://sustainableinfrastructure.org/envision/.

Source: Landrum & Brown 2018 (Appendix G)

Impact Conclusion: *The GHG emissions for the Proposed Project and Alternative 1 would be less than the quantitative significance threshold (see Threshold 4.4-1) used to evaluate their significance, and are further reduced by mitigation and minimization measures recommended in Section 4.2 of the Program EIR. Additionally, both the Proposed Project and Alternative 1 would implement applicable emissions-reducing strategies identified in CARB's Mobile Source Strategy and 2017 Scoping Plan, to the extent required by law. GAIP-facilitated development and uses, under both the Proposed Project and Alternative 1, also would be required to comply with applicable provisions in JWA's Climate Action Plan, as identified in MN GHG-1. Therefore, the Proposed Project and Alternative 1 would not conflict with any applicable plan, policy or regulation established for reducing GHG emissions impacts and impacts would be less than significant under Threshold 4.4-2.*

4.4.8 CUMULATIVE IMPACTS

In the context of CEQA, "GHG impacts are exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective." This characterization of GHG impacts is consistent with the recognition that climate change is a global phenomenon, and that GHG emissions do not result in localized impacts but rather contribute to overall atmospheric concentrations of GHGs that then influence the global climate. As discussed above under Threshold 4.4-1, the Proposed Project and Alternative 1 would not result in a cumulatively considerable impact associated with estimated GHG emissions as the increment of GHG emissions attributable to implementation of the Proposed Project and Alternative 1 would be below the SCAQMD's significance threshold for GHG emissions.[5]

Further, as disclosed above, the Proposed Project and Alternative 1 would comply with State building codes and other regulatory programs adopted for the purpose of reducing GHG emissions; and would reduce potential Project GHG emissions consistent with the AB 32, SB 32, and the implementing legislative and regulatory efforts. Therefore, cumulative impacts would be less than significant.

4.4.9 MITIGATION PROGRAM

As discussed under Threshold 4.4-1 and Threshold 4.4-2, neither the Proposed Project nor Alternative 1 would result in a significant impact associated with GHG emissions. Therefore, in accordance with CEQA Guidelines Section 15126.4(a)(3), mitigation measures are not required to reduce the estimated GHG emissions.

However, minimization measure MN GHG-1 is recommended in order to ensure that all GAIP-facilitated development and uses comply with applicable provisions of the *John Wayne Airport Climate Action Plan*. Additionally, mitigation and minimization measures are recommended to reduce construction-related criteria air pollutant emissions in Section 4.2, Air Quality, of this Program EIR, and those measures would result in co-benefits in the form of GHG emission reductions.

Minimization Measure

MN GHG-1 JWA shall require that all general aviation-related development and uses facilitated by approval of the GAIP comply with applicable measures set forth in its *Climate Action Plan*. This compliance requirement shall be set forth in all leasehold agreements for GAIP-related development. Additionally, compliance with building design-related measures shall be verified by JWA Deputy Director, Facilities or designee, prior to the issuance of building permits for GAIP-related development.

[5] For informational purposes, the *Greenhouse Gas Technical Report* (Appendix G) does quantify the existing (2016) GHG emissions for both the general aviation and commercial carrier operations at the Airport. As previously explained, neither the Proposed Project nor Alternative 1 would change the number of commercial air carrier operations, fleet mix, runway use, flight tracks, or terminal area. The commercial air carrier operations at JWA are the greatest influence on the emissions while the general aviation operations contribute only a small amount.

4.4.10 LEVEL OF SIGNIFICANCE AFTER MITIGATION

GHG impacts are exclusively cumulative impacts. GHG emissions for the Proposed Project and Alternative 1 would be less than significant. The GAIP (Proposed Project and Alternative 1) also is consistent with plans, policies, and regulations pertaining to reducing GHG emissions.

4.4.11 REFERENCES

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