FINAL

Prepared for
Mineta San Jose International Airport
San Jose, California

Prepared by
Ramboll US Corporation
San Francisco, California

Project Number
1690010078-004

Date
August 2019

MINETA SAN JOSE INTERNATIONAL AIRPORT
ENERGY FINAL TECHNICAL REPORT
SAN JOSE, CALIFORNIA

RAMBOLL

CONTENTS

TABLES

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ARB	California Air Resources Board
ATCM	Airborne Toxic Control Measure
BAAQMD	Bay Area Air Quality Management District
BAU	business-as-usual
BTU	British Thermal Unit
CalEEMod®	California Emissions Estimator Model
CAPCOA	California Air Pollution Control Officers Association
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA*	California Environmental Quality Act
CNG	compressed natural gas
CPUC	California Public Utilities Commission
DOORS	Diesel Off-Road Online Reporting System
DOT	Department of Transportation
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
GHG	Greenhouse Gas
GUP	General Use Permit
GWh	Gigawatt Hours
hp	horsepower
ISO	Independent System Operator
ISTEA	Intermodal Surface Transportation Efficiency Act
LCFS	Low Carbon Fuel Standard
LPG	Liquefied Petroleum Gas
MMBTU	Million British Thermal Units
MMT CO_2e	Million Metric Ton of Carbon Dioxide-Equivalent
mpg	Miles per Gallon
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transportation Commission

ACRONYMS AND ABBREVIATIONS *(CONTINUED)*

MWh	megawatt-hour
NHTSA	National Highway Traffic Safety Administration
NO_x	oxides of nitrogen
OPR	Office of Planning and Research
PG&E	Pacific Gas & Electric
PM	particulate matter
RPS	Renewable Portfolio Standards
RTPs	regional transportation plans
SB	Senate Bill
SCS	sustainable communities strategy
SJC	Mineta San Jose International Airport
TDV	time dependent valuation
TEA-21	Transportation Equity Act for the 21st Century
USEPA	United States Environmental Protection Agency
VMT	vehicle miles traveled

1. INTRODUCTION

This technical report has been prepared to address the potential energy impacts associated with the Amendment to the Norman Y. Mineta San Jose International Airport Master Plan ("the Proposed Project"). The City of San Jose, as the proprietor of the Norman Y. Mineta San Jose International Airport ("the Airport" or "SJC"), is the project proponent and the Lead Agency.

This Energy Technical Report analyzes the Proposed Project's impacts on energy demand from construction and operations. In conformance with the Bay Area Air Quality Management District's (BAAQMD) California Environmental Quality Act (CEQA), this analysis identifies and assesses the potential individual energy usage that would result from construction and operation of the Project. In particular, this report describes the existing setting of the Project site, describes the relevant regulatory setting, discusses the methodology used to evaluate energy resources related to the Project, describes relevant Project design features, and evaluates potential impacts related to those energy resources that would be affected as a result of implementation of the Proposed Project.

The analysis evaluates the potential energy-related usage of the Proposed Project, which would construct improvements to SJC's airside (e.g., runway and taxiway improvements, general aviation facilities) and landside (e.g., new parking garage, Terminal B expansion, new hotel) facilities; and accommodate the 2037 forecasted activity levels for air passenger, air cargo, and general aviation services.

In addition to the Proposed Project, this technical report also evaluates Baseline/Existing energy usage for year 2018, and two No Project scenarios. These scenarios are described in more detail in **Section 4.2** of this report. Aspects of the energy inventory, such as the EMFAC2017 emissions factors for mobile sources, are representative of project conditions at full buildout. The analysis provided by this report is conservative because further beneficial changes to California's regulatory framework, serving to reduce energy consumption and enhance energy efficiency, are reasonably anticipated with the passage of time. For example, California revises its building energy standards (as set forth in Title 24 of the California Code of Regulations) on a periodic basis. California's building codes are published in their entirety every three years. Intervening Code Adoption Cycles produce Supplement pages half-way (18 months) into each triennial period. The current Title 24 code was adopted in May 2018 and will take effect in January 2020. Each subsequent building code has required more energy efficiency than the previous codes.

1.1 Existing Conditions

The Airport is one of three primary airports that serve the San Francisco Bay Area of Northern California. The Airport is located on an approximately 1,000-acre site in Santa Clara County at the southerly end of San Francisco Bay, approximately two miles north of downtown San José. The Airport is generally bounded by U.S. 101 to the north, the Guadalupe River and State Route 87 to the east, Interstate 880 to the south, and Coleman Avenue and De la Cruz Boulevard to the west.

The Airport primarily serves Santa Clara, Alameda, Santa Cruz, Monterey, and San Benito counties, and is the primary airport serving the Silicon Valley. The Airport accommodated 12.5 million passengers in 2017, or 16 percent of the Bay Area passenger volume.

The Airport has two passenger terminals, Terminal A with 16 gates and Terminal B with 14 gates.[1] There are two 11,000 feet-long runways at the Airport, 12R/30L and 12L/30R. A third runway, 11/29 with a length of 4,600 feet, is presently used as a taxiway; when operated as a runway, it was used by small general aviation aircraft. The Airport serves most major commercial airlines with statewide, national, and international destinations, as well as air cargo airlines. The Airport also serves 133 based general aviation aircraft, 39% of which are corporate jets.

The vicinity of the Airport and the general San Jose area is predominantly urban in character. A highway and local street system surround the Airport site. The Airport vicinity includes industrial, commercial, and residential land uses, as well as certain special purpose noise sensitive uses, such as churches and schools. A regional map showing the Airport is provided in **Figure 1.1-1**.

Currently, the Airport has approval to implement its 2018 approved Airport Master Plan, which consists of airside and landside facilities improvements to accommodate the 2027 forecasted demand for air passenger, air cargo, and general aviation services. Many of these capital improvement projects have been completed. The remaining Master Plan capital projects include several taxiway upgrades/extensions, new air cargo facilities on the east side of the Airport, construction of the South Concourse of Terminal B, upgrades and expansion of various support facilities (e.g., maintenance, flight kitchen), and the buildout of general aviation facilities on the west side of the Airport.

1.2 Proposed Project

As a result of the 2017 Runway Incursion Mitigation/Design Standards Analysis Study,[2] the City of San Jose is proposing to amend the 2018 approved Airport Master Plan as follows:

- Shift the horizon year from 2027 to 2037.
- Modify future facilities requirements at the Airport to reflect updated demand forecasts.
- Modify certain components of the airfield to reduce the potential for runway incursions.

The implementation of these amendments to the 2018 approved Airport Master Plan constitute "the Proposed Project," with full build-out and start of operations in year 2037.

The study area boundary for this analysis includes the full extent of the Airport site. This boundary will not change with the Proposed Project. The Proposed Project would construct new development as defined in Project Phasing for Proposed Major Amendment to Airport Master Plan within the existing Airport site.

The Airport has committed to the following energy efficiency and energy reduction initiatives:

- Install additional ground power units, battery recharge facilities and preconditioned air units at all terminal gates to facilitate the conversion of GSE to electric power and phaseout diesel fuel usage, as well as to minimize the use of aircraft APUs.

[1] Up to six (6) additional interim gates will be constructed in 2019 at the southerly end of Terminal B. The interim gates received CEQA clearance in July 2018. These gates would be replaced with permanent facilities when the planned South Concourse of Terminal B is constructed.

[2] Typically referred to as the "RIM Study," this study was completed in 2017 as part of an FAA grant-funded program to reduce the risk of runway incursions, defined as the unauthorized presence of an aircraft, vehicle, or person on a surface designated for the landing and take-off of aircraft. The RIM Study provided aviation demand forecasts for year 2037 and recommended airfield configuration modifications.

- Implement policy to purchase only alternate-fuel vehicles for airport operations and maintenance vehicle fleet.
- Replace existing lighting at airport facilities and in airport buildings to use energy-efficient lighting.
- Construct new facilities following energy efficiency guidelines of the Leadership in Energy and Environmental Design (LEED) standards.
- Purchase electric-powered shuttle buses to reduce fuel usage.
- Provide all employees with free transit passes to reduce the energy associated with single-occupant vehicles.
- Co-sponsor free shuttle service from the Airport to the nearby Metro/Airport Light Rail Transit Station and the nearby Santa Clara Caltrain Station to reduce the energy associated with single-occupant vehicles.

The Proposed Project would construct improvements to SJC's airfield, terminals, parking garages, air cargo facilities, and general aviation and aviation support facilities. These capital projects are known as the Master Plan Projects. Construction would take place from 2019 through 2037. Proposed Project construction energy usage is quantified in **Section 4.1**.

To analyze the energy impacts from operation of the Proposed Project, this technical report evaluates operational energy consumption in the full build-out year of 2037. This operational scenario assumes completed construction of all Master Plan Projects and the accommodation of forecasted aviation demand for year 2037. Forecasted aviation demand includes forecasted activity levels for air passenger, air cargo, and general aviation services. Proposed Project operational emissions are quantified in **Section 4.2**.

In addition to the Proposed Project, two No Project scenarios for year 2037 are evaluated. The No Project/Buildout under Existing Approved Master Plan scenario assumes only those facilities approved in the existing 2018 Master Plan have been constructed. The No Project/No New Facilities scenario assumes no new facilities have been constructed, and only evaluates energy impacts from facilities existing in 2018. Both of the No Project scenarios assume forecasted aviation demand for year 2037. Operational energy usage for both No Project scenarios are quantified in **Section 6**.

2. ENERGY ENVIRONMENTAL AND REGULATORY OVERVIEW

2.1 General Setting

2.1.1 Energy Production and Distribution

Among the states, California ranks fourth in the nation in production of crude oil, 15th in production of natural gas, second in generation of hydroelectric power, 15th in electricity generation from nuclear power, second in net electricity generation from all other renewable energy sources besides hydroelectric, and first as a producer of electricity from biomass, geothermal, and solar energy.[3] California's energy system provides approximately 10% of the natural gas to the state; approximately 90% of the state's natural gas is imported from Canada, the Southwest, and the Rocky Mountains region of the United States. Over half of the crude oil refined in California is from foreign countries, including Saudi Arabia, Ecuador, and Colombia. Additional crude oil is imported from Alaska. Over one-fourth of California's electricity is from out-of-state locations in the Pacific Northwest and the Southwest.[4]

Electricity and Natural Gas Supply

The production of electricity requires the combustion, consumption, or conversion of other energy resources, including water, wind, oil, natural gas, coal, solar, geothermal, and nuclear. Of the electricity that is generated within the state, 55% is generated by natural gas-fired power plants, 11% by nuclear power plants, 8% by hydroelectric, and a remaining 27% by other renewables.[5]

Natural gas ultimately supplies the largest portion of California's electricity market; natural gas-fired power plants in California meet approximately 31% of the in-state electricity demand.[5] In addition to the generation of electricity, natural gas is also widely used for industrial, commercial, and residential heating. Most of the natural gas consumed in California comes from the Southwest, the Rocky Mountains, and Canada, while the remainder is produced in California. Although contractually California can receive natural gas from any producing region in North America, it can only take supplies from the three producing regions due to the current pipeline configuration.

For Santa Clara County, Pacific Gas & Electric (PG&E) is the primary supplier of electricity and natural gas to businesses and residents of the area, excluding San Jose (except for natural gas).[6] PG&E's service area extends from Eureka to Bakersfield (north to south), and from the Sierra Nevada to the Pacific Ocean (east to west). Electricity production facilities include natural gas-fired, coal-fired, and hydroelectric plants. PG&E obtains its energy supplies from power plants and natural gas fields in northern California and from electricity

---

[3] U.S. Energy Information Administration. 2018. California State Profile and Energy Estimates: Quick Facts. Available online at: http://www.eia.gov/state/?sid=CA. Accessed: February 19, 2019.

[4] U.S. Energy Information Administration. 2018. California State Profile and Energy Estimates: Profile Analysis. Available online at: https://www.eia.gov/state/analysis.cfm?sid=CA. Accessed: February 19, 2019.

[5] U.S. Energy Information Administration. 2018. Total System Electric Generation. Available online at: https://www.energy.ca.gov/almanac/electricity_data/total_system_power.html . Accessed: February 27, 2019. This percentage total sums to more than 100 due to rounding.

[6] PG&E is the primary supplier of natural gas to the City of San Jose. San Jose receives electricity from San Jose Clean Energy (SJCE).

and natural gas purchased outside its service area and delivered through high-voltage transmission lines of the power grid and through gas pipelines.

As of Fall 2018, SJC receives electricity from San Jose Clean Energy (SJCE), which is a newly established Community Choice Aggregation (CCA) program for the City of San Jose.[7,8] Electricity sourced by SJCE is expected to be 80 percent carbon free, with options to upgrade to 100 percent renewable energy. While SJCE will source cleaner energy from various carbon-free options like solar, wind, and hydropower, it is expected to supply the electricity to the California State's electricity grid, which will then be transmitted and delivered by PG&E.[9]

Transportation Fuels Supply

Most petroleum fuel refined in California is for use in on-road motor vehicles and is refined within California to meet state-specific formulations required by the Air Resources Board (ARB). The major categories of petroleum fuels are gasoline and diesel for passenger vehicles, transit, and rail vehicles; and fuel oil for industry and emergency electrical power generation. Other fuels include kerosene, compressed natural gas (CNG), jet fuel, and residual fuel oil for marine vessels.

California's oil fields comprise the fourth-largest petroleum-producing area in the United States, behind federal offshore production, Texas, and North Dakota. Crude oil is moved from area to area within California through a network of pipelines that carry it from both onshore and offshore oil wells to the refineries that are located in the San Francisco Bay Area, the Los Angeles area, and the Central Valley. Currently, 16 petroleum refineries operate in California, processing approximately 2.0 million barrels per day of crude oil.[10]

Other transportation fuel sources are alternative fuels, such as methanol and denatured ethanol (alcohol mixtures that contain no less than 70% alcohol), natural gas (compressed or liquefied), liquefied petroleum gas (LPG), hydrogen, and fuels derived from biological materials (i.e., biomass).

---

[7] Based on US EPA, Community Choice Aggregation (CCA) are programs that allow local governments to procure power on behalf of their residents, businesses, and municipal accounts from an alternative supplier while still receiving transmission and distribution service from their existing utility provider. Available at: https://www.epa.gov/greenpower/community-choice-aggregation. Accessed: April 2019.

[8] San Jose Clean Energy was created in May 2017 and began servicing residents and businesses in February 2019. Available at: https://www.sanjosecleanenergy.org/about. Accessed: April 2019.

[9] City of San Jose. Community Energy, San Jose Community Energy Department. Available at: http://www.sanjoseca.gov/index.aspx?NID=5119. Accessed: April 2019.

[10] U.S. Energy Information Administration. 2019. California State Profile and Energy Estimates: Reserves and Supply. Available online at: http://www.eia.gov/state/data.cfm?sid=CA#ReservesSupply. Accessed: February 19, 2019.

2.1.2 Energy Consumption

Electricity and Natural Gas Consumption

Californians consumed 257,268 gigawatt hours (GWh) of electricity in 2017, which is the most recent year for which data is available.[11,12] Of this total, Santa Clara County consumed 17,190 GWh.[13]

Californians consumed 12,571 million therms of natural gas in 2017.[14,15] Of this total, Santa Clara County consumed 445 million therms of natural gas.[16]

Transportation Sector Fuels Consumption

The transportation sector is a major end use of energy in California, accounting for approximately 39.8% of total statewide energy consumption in 2016.[17] In addition, energy is consumed in connection with construction and maintenance of transportation infrastructure, such as streets, highways, freeways, rail lines, and airport runways. California's 30 million vehicles consume more than 15 billion gallons of gasoline and more than 4 billion gallons of diesel each year.[18,19]

2.2 Regulatory Overview

2.2.1 Federal Programs

2.2.1.1 Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 was established in response to the oil crisis of 1973, which increased oil prices due to a shortage of reserves. The Act required that all vehicles sold in the U.S. meet certain fuel economy goals, known as the Corporate Average Fuel Economy standards. The National Highway Traffic Safety Administration (NHTSA) of the Department of Transportation (DOT) administers the Corporate Average Fuel Economy program, and the United States Environmental Protection Agency (USEPA) provides the fuel economy data.

---

[11] A watt hour is a unit of energy equivalent to one watt of power expended for one hour. For example, a typical light bulb is 60 watts, meaning that if it is left on for one hour, 60 watt-hours have been used. One kilowatt equals 1,000 watts. The consumption of electrical energy by homes and businesses is usually measured in kilowatt hours (kWh). Some large businesses and institutions also use megawatt hours (MWh), where one MWh equals 1,000 kWh. One gigawatt equals one thousand (1,000) megawatts, or one million (1,000,000) kilowatts. The energy output of large power plants over long periods of time, or the energy consumption of jurisdictions, can be expressed in gigawatt hours (GWh).

[12] U.S. Energy Information Administration. 2019. California Electricity Profile 2017. Available online at: https://www.eia.gov/electricity/state/california/. Accessed: February 19, 2019.

[13] California Energy Commission. 2019. Energy Consumption Data Management Service. Electricity Consumption by County. Available online at: http://www.ecdms.energy.ca.gov/elecbycounty.aspx. Accessed: March 4, 2019.

[14] A British Thermal Unit (BTU) is the amount of energy needed to raise the temperature of one pound of water by one degree Fahrenheit. A kBTU is 1,000 BTUs. A MMBtu is 1,000,000 BTUs. A therm is 100,000 BTUs.

[15] California Energy Commission. 2019. Energy Consumption Data Management Service. Gas Consumption by County. Available online at: http://www.ecdms.energy.ca.gov/gasbycounty.aspx. Accessed: March 4, 2019.

[16] Ibid.

[17] U.S. Energy Information Administration. 2019. California State Profile and Energy Estimates: Consumption by Sector. Available online at: http://www.eia.gov/state/?sid=CA#tabs-2. Accessed: March 4, 2019.

[18] California Energy Commission. 2019. California Gasoline Data, Facts, and Statistics. Available online at: https://www.energy.ca.gov/almanac/transportation_data/gasoline/. Accessed: May 14, 2019.

[19] California Energy Commission. 2019. Diesel Fuel Data, Facts, and Statistics. Available online at: https://www.energy.ca.gov/almanac/transportation_data/diesel.html. Accessed: May 14, 2019.

In April 2010, the USEPA and NHTSA issued a Final Rulemaking establishing new federal fuel economy standards for model years 2012 to 2016 passenger cars and light-duty trucks. For model year 2012, the fuel economy standards for passenger cars, light trucks, and combined cars and trucks were 33.3 miles per gallon (mpg), 25.4 mpg, and 29.7 mpg, respectively.[20] These standards increase progressively up to 37.8 mpg, 28.8 mpg, and 34.1, respectively, for model year 2016. In subsequent rulemakings the agencies extended the national program of fuel economy standards to passenger vehicles and light-duty trucks of model years 2017-2025, culminating in fuel economy of 54.5 mpg by model year 2025,21 as well as to medium- and heavy-duty vehicles of model years 2014-2018, including large pickup trucks and vans, semi-trucks, and all types and sizes of work trucks and buses.[22]

In August 2016, the EPA and NHTSA adopted the next phase (Phase 2) of the fuel economy and GHG standards for medium- and heavy-duty trucks, which apply to vehicles with model year 2018 and later.[23] In response to the EPA's adoption of the Phase 2 standards, California Air Resources Board (ARB) staff brought a proposed California Phase 2 program before its Board in 2017; and the Board approved the program in March 2018.[24]

In 2018, the EPA and NHTSA proposed to amend certain existing Corporate Average Fuel Economy standards for passenger cars and light trucks and establish new standards, covering model years 2021-2026. Compared to maintaining the post-2020 standards now in place, the pending proposal would increase U.S. fuel consumption.[25] California and other states have announced their intent to challenge federal actions that would delay or eliminate GHG reductions. Because the pending proposal is still in the rulemaking phase, and because legal challenges to any future adoption of the proposal is likely, the timing and consequences of the pending proposal are speculative at this time.

2.2.1.2 Energy Policy Act of 2005 and Energy Independence and Security Act of 2007

The Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Energy Policy Act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products. Because driving fuel-efficient vehicles and installing energy-efficient appliances can provide many benefits, such as lower energy bills, increased indoor comfort, and reduced air pollution, businesses are eligible for tax credits for buying

[20] United States Environmental Protection Agency (USEPA) and United States Department of Transportation (DOT). 2010. *Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards*. Final Rule. 75 Fed. Reg. 25324-25728.

[21] United States Environmental Protection Agency (USEPA) and United States Department of Transportation (DOT). 2012. *2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards*; Final Rule. 77 Fed. Reg. 62623.

[22] United States Environmental Protection Agency (USEPA) and United States Department of Transportation (DOT). 2011. *Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles.* 76 Fed. Reg. 57106.

[23] USEPA. Available at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-greenhouse-gas-emissions-and-fuel-efficiency. Accessed: May 2019.

[24] ARB. CA Phase 2 GHG webpage: http://www.arb.ca.gov/msprog/onroad/caphase2ghg/caphase2ghg.htm. Accessed: May 2019.

[25] Federal Register. 2018. *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks*. Available at: https://www.federalregister.gov/documents/2018/08/24/2018-16820/the-safer-affordable-fuel-efficient-safe-vehicles-rule-for-model-years-2021-2026-passenger-cars-and. Accessed: May 2019.

hybrid vehicles, building energy-efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are given for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

The Energy Policy Act of 2005 also established the first renewable fuel volume mandate in the United States. The original Renewable Fuel Standard program required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. Under the Energy Independence and Security Act of 2007, the Renewable Fuel Standard program was expanded to include diesel and to increase the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022.

2.2.1.3 American Recovery and Reinvestment Act

The American Recovery and Reinvestment Act of 2009 was passed in response to the economic crisis of the late 2000s, with the primary purpose of maintaining existing jobs and creating new jobs. Among the secondary objectives of the American Recovery and Reinvestment Act was investment in "green" energy programs, including funding the following through grants, loans, or other funding: private companies developing renewable energy technologies; local and state governments implementing energy efficiency and clean energy programs; research in renewable energy, biofuels, and carbon capture; and development of high efficiency or electric vehicles.[26]

2.2.1.4 Intermodal Surface Transportation Efficiency Act

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 promotes the development of inter-modal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. The Intermodal Surface Transportation Efficiency Act contains factors that metropolitan planning organizations, such as the Association of Bay Area Governments (ABAG), are to address in developing transportation plans and programs, including some energy-related factors. To meet the new Act requirements, metropolitan planning organizations have adopted explicit policies defining the social, economic, energy, and environmental values that guide transportation decisions in their respective metropolitan areas. The planning process for specific projects would then address these policies. Another requirement of the ISTEA is to consider the consistency of transportation planning with federal, state, and local energy goals. Through this requirement, energy consumption is expected to be a decision criterion, along with cost and other values to determine the best transportation solution.

2.2.1.5 Transportation Equity Act for the 21st Century

The Transportation Equity Act for the 21st Century ("TEA-21") was signed into law in 1998 and builds upon the initiatives established in the ISTEA legislation discussed above. TEA-21 authorizes highway, highway safety, transit, and other efficient surface transportation programs. TEA-21 continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of good transportation decisions. TEA-21 also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment

[26] United States Environmental Protection Agency (USEPA). 2009. *Recovery: USEPA Gets Involved.* Accessed: December 3, 2013. http://www.epa.gov/recovery.

of Intelligent Transportation Systems, to help improve operations and management of transportation systems and vehicle safety.

2.2.2 State Programs

2.2.2.1 AB 32 and SB 32 (Statewide GHG Reductions with Energy Co-Benefits)

The California Global Warming Solutions Act of 2006 (AB 32) was signed into law in September 2006.[27] The law instructed ARB to develop and enforce regulations for the reporting and verification of state-wide GHG emissions. The bulk of GHG emissions in California are carbon dioxide that result from fossil fuel consumption. Therefore, a reduction in GHG emissions typically translates into reduced fuel and increased energy efficiency. The bill directed ARB to set a state-wide GHG emission limit based on 1990 levels, to be achieved by 2020. The bill set a timeline for adopting a scoping plan for achieving GHG reductions in a technologically and economically feasible manner.

AB 32 requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions. In December 2008, ARB adopted its Climate Change Scoping Plan: A Framework for Change (Scoping Plan), which included the state's strategies for achieving AB 32's reduction targets. These strategies are implemented with additional rules and regulations pursuant to AB 32 such as Clean Cars, the low carbon fuel standard (LCFS), Title 24 building efficiency standards, and the Renewable Portfolio Standards (RPS). These are discussed further below. Additional information on AB 32 can be found in the **Greenhouse Gas Technical Report**, and additional information about additional rules and regulations under the umbrella of AB 32 is below.

Enacted in 2016, Senate Bill (SB) 32 (Pavley, 2016) codifies a 2030 GHG emissions reduction goal and requires ARB to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030. Similar to AB 32, a reduction in GHG emissions typically corresponds with a reduction in energy usage as the bulk of GHGs result from the combustion of fossil fuel.

2.2.2.2 2018 Integrated Energy Policy Report Update

The 2018 Integrated Energy Policy Report (IEPR) Update provides an assessment of major energy trends and issues for a variety of energy sectors, as well as policy recommendations to address these concerns as required by Senate Bill 1389.[28] Prepared by the California Energy Commission (CEC), this report details the key energy issues and develops potential strategies to address these issues. The 2018 IEPR Update includes a discussion of several strategies to reduce climate change impacts and lessen energy consumption and recommendations for each topic. Examples include a discussion of building decarbonization, strategies to increase energy efficiency, discussion of energy equity, and the impacts of increasing the flexibility of the electricity system. The assessments and forecasted energy demand within this report will be used by the CEC to develop future energy policies.

[27] ARB. Assembly Bill 32 Overview. 2006a. Accessed: July 22, 2016. http://www.arb.ca.gov/cc/ab32/ab32.htm

[28] California Energy Commission. 2018. 2018 Integrated Energy Policy Report Update. Available at: https://www.energy.ca.gov/2018publications/CEC-100-2018-001/Exec_Sumry_CEC-100-2018-001-V2-CMF.pdf. Accessed: May 2019.

2.2.2.3 Title 24 Building Energy Efficiency Standards

The 2019 California Green Building Standards Code, as specified in Title 24, Part 11 of the California Code of Regulations, commonly referred to as CalGreen Building Standards (CalGreen), establishes voluntary and mandatory standards to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. The provisions of this code apply to the planning, design, operation, construction, replacement, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such building structures throughout California. Examples of CalGreen provisions include reducing indoor water use, moisture sensing irrigation systems for landscaped areas, construction waste diversion goals, and energy system inspections. CalGreen is periodically amended; the most recent 2019 standards will become effective on January 1, 2020. Until that time, the 2016 standards remain in effect.

The Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations, were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods for building features such as space conditioning, water heating, lighting, and whole envelope. The 2005, 2008, and 2013 updates to the efficiency standards included provisions such as cool roofs on commercial buildings, increased use of skylights, and higher efficiency lighting, HVAC, and water heating systems. Additionally, some standards focused on larger energy saving concepts such as reducing loads at peak periods and seasons and improving the quality of such energy-saving installations. Past updates to the Title 24 standards have proved very effective in reducing building energy use, with the 2013 update estimated to reduce energy consumption in residential buildings by 25% and energy consumption in commercial buildings by 30%, relative to the 2008 standards.[29] The California Energy Commission (CEC) recently adopted another update in 2019, and these new standards become effective on January 1, 2020.[30] The 2019 updates include a requirement for solar photovoltaic systems for new homes, requirements for newly constructed healthcare facilities, additional high efficiency lighting requirements, high performance attic and walls, higher efficiency water and space heaters, and high efficiency air filters. Relative to the 2016 standards, the 2019 standards are expected to reduce residential electricity consumption by 7% due to energy efficiency measures and a total of 53% when factoring in rooftop solar electricity generation. In addition, the 2019 standards are expected to reduce non-residential electricity by approximately 30%.[31]

[29] CEC. 2012. Energy Commission Approves More Efficient Buildings for California's Future. Available online at: http://www.energy.ca.gov/releases/2012_releases/2012-05-31_energy_commission_approves_more_efficient_buildings_nr.html. Accessed: April 2017.

[30] CEC. 2018. California's Energy Efficiency Standards for Residential and Nonresidential Buildings. Available online at: https://www.energy.ca.gov/title24/2019standards/. Accessed: February 22, 2019.

[31] CEC. 2018. 2019 Building Energy Efficiency Standards FAQ. Available online at: https://www.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf

Given that the 2019 standards will be in effect at the time construction of the proposed project begins, at a minimum, initial phases of project building construction will be subject to the 2019 standards. Over the course of project buildout, future Title 24 standards are likely to apply as the standards are triggered by the filing of building permit applications. Notably, the data needed to quantitatively account for the 2019 standards (or the post-2019, future standards) is not yet available at the time this analysis was prepared, and so the 2016 standards are used in this analysis. As previously discussed, this serves to conservatively over-estimate project energy consumption.

2.2.2.4 Senate Bill 100

Enacted in 2018, SB 100,[32] or The 100 Percent Clean Energy Act of 2018, increases the renewable energy and zero-carbon resources procurement target for retail electricity to 100 percent by 2045. The bill also revises the goals established by SB 350 to increase the renewable energy resource procurement target for retail electricity from 50 percent to 60 percent by 2030 and further establishes incremental goals of 33% by 2020, 44% by 2024, and 52% by 2027. SB 100 further directs the State Energy Resources Conservation and Development Commission, the California Public Utilities Commission, and ARB to incorporate the 2045 target into all relevant planning and report on implementation every four years beginning on January 1, 2021.

2.2.2.5 Renewables Portfolio Standard

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to obtain at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33 percent renewable power by 2020. In September 2009, then-Governor Schwarzenegger continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21-09, which directs the ARB under its AB 32 authority to enact regulations to help the state meet its Renewable Portfolio Standard goal of 33 percent renewable energy by 2020. In April 2011, Governor Brown signed SB 2X, which legislated the prior Executive Order S-14-08 renewable standard. SB 350 further increases the RPS goals to 50 percent renewables by 2030. SB 100 also established a state policy goal to achieve 100 percent renewables by 2045.

In April 2015, Governor Brown issued Executive Order B-30-15, which established a greenhouse gas reduction target of 40 percent below 1990 levels by 2030. SB 350 (Chapter 547, Statutes of 2015) advanced these goals through two measures. First, the law increases the renewable power goal from 33 percent renewables by 2020 to 50 percent by 2030. Second, the law requires the CEC to establish annual targets to double energy efficiency in buildings by 2030. The law also requires the California Public Utilities Commission (CPUC) to direct electric utilities to establish annual efficiency targets and implement demand-reduction measures to achieve this goal.

[32] De León, 2018. Senate Bill 100. The 100 Percent Clean Energy Act of 2018.

2.2.2.6 Mobile Source Regulations

SB 743 (Updates to CEQA Guidelines)

Public Resources Code Section 21099(c)(1), as codified through enactment of SB 743, was enacted with the intent to change the focus of transportation analyses conducted under the California Environmental Quality Act (CEQA). SB 743 reflects a legislative policy to balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of GHG emissions. As finalized in December 2018, amendments to the State CEQA Guidelines adopted in furtherance of SB 743 establish vehicle miles travelled (VMT), in lieu of level of service, as the new metric for transportation analysis. Implementation of SB 743 is anticipated to improve the efficiency of transportation fuels consumption.

SB 375 (Land Use Planning)

SB 375, the Sustainable Communities and Climate Protection Act of 2008, supports the State's climate action goals to reduce GHG emissions through coordinated transportation and land use planning. SB 375 required ARB to establish GHG emission reduction targets (Regional Targets) for each metropolitan planning region. On September 23, 2010, ARB adopted Regional Targets applying to the years 2020 and 2035. In 2011, ARB adopted Regional Targets of 7% for 2020 and 15% for 2035 for the area under the jurisdiction of the Association of Bay Area Governments (ABAG) jurisdiction, which includes the Project. These targets were in place through September 30, 2018. In March 2018, ARB approved updated regional targets of 10% for 2020 and 19% for 2035 for ABAG, which will be applied by ABAG in future planning cycles.

SB 375 requires Metropolitan Planning Organizations (MPO) including ABAG to incorporate a "sustainable communities strategy" (SCS) in their regional transportation plans (RTPs) that will achieve the GHG emission Reduction Targets set by ARB, primarily by reducing VMT from light-duty vehicles through development of more compact, complete, and efficient communities. ABAG prepared Plan Bay Area to fulfill this requirement.

Clean Cars

In January 2012, ARB approved the Advanced Clean Cars Program, which established an emissions control program for cars and light-duty trucks (such as SUVs, pickup trucks, and minivans) of model years 2017-2025. When the program is fully implemented, new vehicles would emit 75% less smog-forming pollutants than the average new car sold today, and greenhouse gas emissions would be reduced by nearly 35%. This program would help reduce fossil fuel usage for internal combustion engine powered vehicles. The requirements for this regulation are described in more detail in the **Greenhouse Gas Technical Report**.

Commercial Motor Vehicle Idling Regulation

On July 22, 2004, ARB initially adopted an Airborne Toxic Control Measure (ATCM) to limit idling of diesel-fueled commercial motor vehicles (idling ATCM) and subsequently amended it on October 20, 2005, October 19, 2009, and December 12, 2013. This ATCM is set forth in Title 13, California Code of Regulations (CCR), Section 2485, and requires, among other things, that drivers of diesel-fueled commercial motor vehicles with gross vehicle weight ratings greater than 10,000 pounds, including buses and sleeper berth equipped trucks, not idle the vehicle's primary diesel engine longer than five minutes at any location. This anti-idling regulation helps to reduce fuel consumption by reducing engine usage. The ATCM also

requires owners and motor carriers that own or dispatch these vehicles to ensure compliance with the ATCM requirements. The regulation consists of new engine and in-use truck requirements and emission performance requirements for technologies used as alternatives to idling the truck's main engine. Under the new engine requirements, 2008 and newer model year heavy-duty diesel engines need to be equipped with a non-programmable engine shutdown system that automatically shuts down the engine after five minutes of idling or optionally meet a stringent oxides of nitrogen idling emission standard.

In-Use Off-Road Diesel Fueled Fleets Regulation

On May 16, 2008, ARB approved the In-Use Off-Road Diesel Fueled Fleets Regulation (Off-Road Regulation), which was later amended on December 31, 2009, July 16, 2010, and December 14, 2011. The overall purpose of the Off-Road Regulation is to reduce emissions of oxides of nitrogen (NOx) and particulate matter (PM) from off-road diesel vehicles operating within California. The regulation applies to all self-propelled off-road diesel vehicles 25 horsepower (hp) or greater used in California and most two-engine vehicles. The Off Road Regulation:

- Imposes limits on idling (i.e., fleets must limit unnecessary idling to 5 minutes), requires a written idling policy, and requires a disclosure when selling vehicles;
- Requires all vehicles to be reported to ARB (using the Diesel Off-Road Online Reporting System, DOORS) and labelled;
- Restricts the adding of older vehicles into fleets starting on January 1, 2014; and
- Requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies, VDECS (i.e., exhaust retrofits).

The anti-idling component of this Off-Road Regulation helps to reduce fuel consumption by reducing engine usage.

Zero-Emission Airport Ground Support Equipment Measure

Airport GSE provide power to aircraft, transport cargo and baggage to aircraft, and support aircraft maintenance and fuelling. The zero-emission airport GSE measure will help ARB achieve the emission reduction strategies laid out in the Mobile Source Strategy, State Implementation Plan and Sustainable Freight Action Plan[33]. The measure is scheduled for Board consideration in 2020.

Tractor-Trailer Greenhouse Gas Regulation

ARB's Tractor-Trailer Greenhouse Gas regulation reduces the energy consumption of large trucks. ARB developed this regulation to make heavy-duty tractors more fuel efficient. Fuel efficiency is improved by requiring the use of aerodynamic tractors and trailers that are also equipped with low rolling resistance tires. The tractors and trailers subject to this regulation must either use United States Environmental Protection Agency SmartWay (SmartWay) certified tractors and trailers or retrofit their existing fleet with SmartWay verified technologies. The SmartWay certification process is part of their broader voluntary program

[33] California Air Resources Board. 2019. Zero-Emission Airport Ground Support Equipment. Available online: https://ww2.arb.ca.gov/our-work/programs/zero-emission-airport-ground-support-equipment/about. Accessed: May 14, 2019.

called the SmartWay Transport Partnership Program. The regulation applies primarily to owners of 53-foot or longer box-type trailers, and owners of the heavy-duty tractors that pull them on California highways. These owners are responsible for replacing or retrofitting their affected vehicles with compliant aerodynamic technologies and low rolling resistance tires. All owners regardless of where their vehicle is registered must comply with the regulation when they operate their affected vehicles on California highways. Besides the owners of these vehicles, drivers, motor carriers, California-based brokers and California-based shippers that operate or use them also share in the responsibility for compliance with the regulation.

2.2.3 Regional Programs

2.2.3.1 ABAG/MTC Sustainable Communities Strategy (SB 375)/Plan Bay Area 2040

As discussed above, SB 375 is intended to help achieve AB 32's goals by coordinating land use and transportation planning, along with funding priorities. SB 375 requires each MPO in California to develop an SCS as part of its RTP that will achieve the GHG reduction targets required by AB 32. The Metropolitan Transportation Commission (MTC) and the ABAG developed an SCS for the San Francisco Bay Area and incorporated it and a new RTP into a "Plan Bay Area." On July 27, 2017, MTC and ABAG updated the plan to Plan Bay Area 2040, which focuses on accommodating the 820,000 projected new households and 1.3 million jobs from 2017-2040. The Plan includes seven goals and thirteen performance targets to measure the plans effectiveness. This includes the goals of SB 375 to 1) reduce per-capita CO2 emissions from cars and light-duty trucks, and 2) provide sufficient housing for the entire region's projected population growth, regardless of income.

2.2.4 Local Programs

2.2.4.1 Climate Smart San Jose (formerly Green Vision)

Climate Smart San Jose was approved in February 2018 by the City Council to replace the San Jose Green Vision Sustainability Plan. Climate Smart San Jose builds on the 15-year Green Vision sustainability plan by charting a path to achieve the GHG emissions reductions contained in the international Paris Agreement on climate change. Climate Smart San Jose focuses on energy, mobility, and water with nine key strategies. The following energy-related strategies are applicable to the Project:

- 1.1- Transitioning to a renewable energy future provides clean electricity that supplies the entire city
- 3.2- Making our commercial buildings high-performance and siting them close to transit lowers water and energy use
- 3.3- Moving commercial goods through our city more efficiently with new technology and fleet management practices

2.2.4.2 Envision San Jose 2040

On November 1, 2011, the Envision San Jose 2040 General Plan was adopted in compliance with the State law requirement that each city and county prepare and adopt a comprehensive and long-range general plan for its physical development (California Government Code Section 65300). Envision San Jose 2040 was more recently amended on February 27, 2018 and represents the City's assessment of the amount, type, and phasing of development needed to achieve its social, economic, and environmental goals. The Plan

includes multiple strategies to improve environmental sustainability including the following energy-related strategies that are applicable to the Project:

- MS-1- Green Building Policy Leadership
- MS-2- Energy Conservation and Renewable Energy Use
- MS-14- Reduce Consumption and Increase Efficiency
- MS-15/16- Renewable Energy and Energy Security

3. SIGNIFICANCE THRESHOLDS

The analysis provided in this report evaluates the significance of the Project's energy by reference to the following questions from Section VI, Energy, of Appendix G of the CEQA Guidelines:[34]

Threshold 1. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Threshold 2. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

While no quantitative thresholds related to energy are included in the CEQA Guidelines, Part I of Appendix F of the CEQA Guidelines states as follows:

"The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:

1. decreasing overall per capita energy consumption,
2. decreasing reliance on fossil fuels such as coal, natural gas and oil, and
3. increasing reliance on renewable energy resources."

Appendix F of the CEQA Guidelines states that an Environmental Impact Report (EIR) should include a discussion of the potential energy impacts of a project, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

For purposes of this analysis, impacts to energy resources will be considered significant if the project would result in the wasteful, inefficient or unnecessary consumption of fuel or energy, and conversely if the project would not incorporate renewable energy or energy efficiency measures into building design, equipment use, transportation or other project features.

To determine whether a project would result in the wasteful, inefficient or unnecessary consumption of fuel or energy, and conversely whether the project would fail to incorporate renewable energy or energy efficiency measures into building design, equipment use, transportation or other project features, Appendix F of the CEQA Guidelines identifies six categories of potential energy-related environmental impacts:

1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate the energy intensiveness of materials may be discussed.
2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.
3. The effects of the project on peak and base period demands for electricity and other forms of energy.
4. The degree to which the project complies with existing energy standards.

[34] CEQA Appendix G: Environmental Checklist Form. Available at: http://resources.ca.gov/ceqa/docs/ab52/final-approved-appendix-G.pdf. Accessed: May 2019.

5. The effects of the project on energy resources.
6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

This report, relative to Threshold 1, assesses the project's electricity, natural gas, and fossil fuel consumption during construction and operation by way of the six questions above. This report, relative to Threshold 2, evaluates the project for consistency with applicable plans related to renewable energy and energy efficiency.

4. METHODOLOGY FOR DEVELOPMENT OF ENERGY PROJECTIONS

This section describes the methodology that Ramboll used to develop the regulatory compliance-based energy projections associated with the proposed project, which include one-time demand from construction and annual operational demand. This section also identifies the results of the energy projections for the proposed project based on compliance with applicable regulatory requirements; energy conservation and efficiency benefits associated with relevant project design feature commitments are discussed in later sections of this report.

As to operational demand, this report evaluates the energy consumption for complete buildout of the proposed project, which is the calendar year 2037. Because various aspects of the applicable regulatory environment do not perfectly align with the 2037 year of study, to be conservative, regulatory inputs from earlier calendar years are utilized. For example, the model used to identify energy consumption rates (CalEEMod) allows for operational years up to 2035; therefore, the mobile emission factors used in this analysis are based on values from EMFAC2017 for operational analysis and EMFAC2014 (as CalEEMod Default) for construction analysis. Mobile emission factors tend to decrease into the future as vehicles are assumed to become more efficient; thus, mobile emissions are conservatively assessed. In addition, the building energy also is conservatively assessed as it is based on the current building code. As previously discussed, California revises its building energy standards (as set forth in Title 24 of the California Code of Regulations) on a periodic basis. California's building codes are published in their entirety every three years. Intervening Code Adoption Cycles produce Supplement pages half-way (18 months) into each triennial period. The current Title 24 code was adopted in May 2018 and will take effect in January 2020. Each subsequent building code has required more energy efficiency than the previous codes.

4.1 Construction Scenarios Evaluated

Ramboll evaluated energy usage associated with the construction of the Proposed Project. The Proposed Project would construct new development as defined in Project Phasing for Proposed Major Amendment to Airport Master Plan. These projects aim to improve SJC's airfield, terminals, parking garages, air cargo facilities, and general aviation and aviation support facilities. List of landside and airside projects proposed under the amended Master Plan are provided in **Table 4.1-1** and **Table 4.1-2**, respectively. Construction activities would take place from 2020 through 2037.

Construction of the Proposed Project would result in electricity demand, such as due to the use of power tools (e.g., drills). However, this electricity demand is supplied by generator sets and thus no additional electricity is required. Construction of the Proposed Project is not anticipated to require natural gas. As such, electricity and natural gas related to construction of the proposed project are not discussed further.

Construction of the Proposed Project requires the use of transportation fuel, including gasoline and diesel use in construction equipment, hauling trucks, vendor vehicles, and construction worker vehicles. Fuel consumed by construction equipment would be the primary energy resource expended over the course of construction, while VMT associated with the transportation of construction materials and construction worker commutes would also result in fuel consumption. Heavy-duty construction equipment and vendor vehicles

associated with construction activities would use diesel fuel. Construction workers would travel to and from the Project site throughout the duration of construction; this analysis assumed that construction workers would primarily use gasoline powered passenger vehicles.

Heavy-duty construction equipment of various types would be used during each phase of construction. CalEEMod was used to calculate construction equipment usage, and results are included in the appendices to the **Greenhouse Gas and Air Quality Technical Reports** for the Proposed Project. Fuel consumption from construction equipment was calculated by converting the total carbon dioxide (CO_2) emissions from each construction phase to gallons using conversion factors for CO_2 to gallons of gasoline or diesel. Fuel consumption from worker and vendor trips are calculated by converting the total CO_2 emissions from each construction phase to gallons using conversion factors for CO_2 to gallons of gasoline or diesel. Worker vehicles are assumed to be gasoline-fueled, and vendor/hauling vehicles are assumed to be diesel-fueled.

Table 4.1-3 and **Table 4.1-4** presents the fuel usage associated with construction of landside and airside projects, respectively.

Table 4.1-5 summarizes the total fuel usage for construction of the Proposed Project. Estimated diesel fuel usage from off-road construction equipment is 730,026 gallons of diesel over the course of the Project construction period. Expected on-road fuel usage is 516,210 gallons of diesel and 410,433 gallons of gasoline.

Additionally, Ramboll also calculated the energy usage associated with the construction of projects under the Existing Approved Master Plan, as shown in **Table 4.1-6**.

Table 4.1-7 presents fuel usage associated with the construction of projects under the Existing Approved Master Plan.

4.2 Operational Scenarios Evaluated

This report evaluates the potential energy impacts of the proposed Project with emphasis on avoiding or reducing inefficient, wasteful, or unnecessary consumption of energy. Ramboll evaluated potential usage for four Scenarios in this Technical Report:

1. Baseline/Existing – calculated existing Airport energy usage in year 2018
2. Proposed Project – calculated Airport energy usage in year 2037, after completion of all Master Plan Projects
3. No Project/No New Facilities – calculated Airport energy usage in year 2037, assuming no new facilities have been constructed
4. No Project/Buildout under Existing Approved Master Plan – calculated Airport energy usage in year 2037, assuming only those facilities approved in the existing 2018 Master Plan have been constructed

Scenarios 3 and 4 are considered Project Alternatives. Energy usage depend on airport activity levels (forecasted number of air passengers, tons of air cargo, and general aviation activity), and facilities operations. Activity levels for each scenario are shown in **Table 4.2-1**. As shown, the activity levels at the Airport under Scenarios 2, 3, and 4 (all for year 2037) will be identical.

Operations of the Proposed Project and each of the Scenarios would result in fuel usage from a variety of sources, including aircraft, auxiliary power units (APUs), ground support equipment, on-road mobile sources on Airport property, stationary sources, and building energy use. This section describes the methodologies used to quantify annual operational fuel usage from these sources.

4.2.1 Aircraft

Ramboll primarily used the Aviation Environmental Design Tool (AEDT) to assist in quantifying operational emissions and fuel usage for aircraft operations**.** General aviation piston aircraft and helicopters were assumed to run on aviation gasoline; business, commercial, commuter, general aviation turboprop, and military aircraft were assumed to run on jet fuel.

Fuel usage was calculated based on AEDT default factors by aircraft type and AEDT default calculations for aircraft performance and times-in-mode (e.g., ground roll, takeoff, climbout, and approach). Stage length (a measure of how far the aircraft flies) is a required input for departing aircraft operations as it influences the weight of the aircraft at takeoff and affects takeoff and climbout performance. Additional information on this tool and assumptions on fleet mix, taxi time, stage length, and other AEDT inputs are tabulated in the **Greenhouse Gas and Air Quality Technical Reports**

Aircraft-related fuel for each of the Scenarios are provided in **Tables 4.2-2**.

4.2.2 Auxiliary Power Units

AEDT does not estimate fuel from APUs. Based on engineering estimates, Ramboll determined that APU energy would not constitute more than 1% of the overall fuel inventory. Further, while at the gates, aircraft currently use electricity provided by SJC.

4.2.3 Ground Support Equipment

Diesel and gasoline fuel usage from GSE equipment including air conditioners, air starts, aircraft tractors, baggage tractors, belt loaders, cabin service trucks, cargo loaders, carts, catering trucks, fork lifts, fuel trucks, generators, ground power units, hydrant trucks, lavatory trucks, lifts, service trucks and water trucks was calculated.

SJC provided fuel use records for 2018 as the basis for this analysis. While AEDT contains default aircraft GSE assignments for fuel type, operating time, horsepower and load factor, it does not provide estimates for GSE fuel use. Project (2037) fuel use was calculated by scaling from baseline (2018) using the operating hours calculated in AEDT for each fuel type. Electrification was conservatively assumed to be constant between the two scenarios. The amount of electricity demand from electric GSE is calculated under the building electricity usage. These data were used to determine overall GSE usage for SJC per year.

Table 4.2-3 presents the fuel attributable to GSE.

4.2.4 Mobile Fuel

Mobile sources associated with the Airport's day-to-day operations include landside and airside vehicles owned and operated by the Airport and by third parties, such as on-site maintenance trucks, shuttle services, employee and passenger transportation, and other off-road equipment not included in GSE above. The fuel usage is based on site-specific data, including a list of equipment/vehicles, horsepower or model year, annual mileage/operating hours, fuel type, and fuel consumption totals.

4.2.4.1 Traffic

Ramboll calculated fuel from traffic by utilizing vehicle miles travelled for airport-related vehicle transportation along with EMFAC2017 fleet average fuel efficiency for each Phase year (2018 and 2037). **Table 4.2-4** summarizes the terminal traffic-related fuel usage for the Proposed Project.

4.2.4.2 Airport Shuttle Buses

SJC currently has 10 electric-powered shuttle buses that were purchased in 2019 to replace the CNG-powered bus fleet. **Table 4.2-5** summarizes fuel from the electrified buses.

A summary of energy from transportation (traffic plus shuttles) is included in **Table 4.2-6.**

4.2.4.3 SJC-Owned Airside Equipment

SJC provided diesel and gasoline fuel usage from SJC-owned and operated (non-GSE) off-road equipment. This usage is summarized in **Table 4.2-3**.

4.2.5 Stationary Sources

Ramboll calculated fuel usage for stationary source equipment, including heaters/boilers and emergency generators as described below.

4.2.5.1 Boilers

The majority of natural gas consumption at the Airport is in three natural gas-fired boilers in the Central Plant. Two boilers are rated at 8.0 million British Thermal Units per hours (MMBtu/hour) and one boiler is rated at 5.2 MMBtu/hour. Natural gas usage at the Central Plant was based on utility readings for 2018. Fuel usage for 2037 was scaled by the change in annual passengers at the airport. **Table 4.2-3** summarizes the fuel usage from the boilers.

4.2.5.2 Miscellaneous Natural Gas Combustion

A small portion of natural gas consumption occurs in miscellaneous sources at the Airport. These could include sources such as small water heaters and kitchens. Natural gas usage for non-Central Plant uses was based on utility readings for 2018. Fuel usage for 2037 was scaled by the change in annual passengers at the airport. **Table 4.2-3** summarizes the fuel usage from this source.

4.2.5.3 Emergency Generators

There are 20 diesel-fired emergency generators and fire pumps at the Airport. Operating hours and horsepower for each generator in 2018 was used for the fuel consumption calculations. The emergency generator operations are based on the maintenance and testing requirements, and therefore are assumed to not increase with the Proposed Project. The Proposed Project does not include any new emergency generators. **Table 4.2-7** summarizes the fuel consumption from emergency generators.

4.2.6 Building Electricity

As described in **Section 2.1.1** above, since SJCE was just recently created, CO_2 emission factors for electricity usage are obtained from PG&E to calculate GHG emissions from electricity usage. For purposes of this analysis, the baseline, project, and no project scenarios are assumed to use PG&E electricity intensity factors. These service providers are described in more detail in the **Greenhouse Gas Technical Report**.

Ramboll calculated projected increase in electricity consumption based on Baseline/Existing (2018) data for SJC and the projected passenger growth in the future, as shown in **Table 4.2-8**. Total electricity use was calculated to be 31,744,725 kWh for the existing conditions and 48,260,562 kWh for the Proposed Project. The energy usage calculation for the Project conservatively does not account for the likely improved energy efficiency design due to the current standards (e.g., the project would be built to the existing Title 24, Part 6 standards which would be the 2019 Title 24 code. However, the baseline data does not incorporate the 2019 Title 24 Code assumptions.), as shown in **Table 4.2-9**.[35]

Table 4.2-9 also presents electricity usage associated with water supply at the Airport.

Additional information and tables regarding electricity usage calculations can be found in the **Greenhouse Gas Technical Reports**.

4.2.7 Energy Usage for Hotel Land Use

Since the new hotel is a new land use type that is not already a part of the Airport's property, energy usage associated with the operations of hotel were calculated separately using CalEEMod® defaults. Energy usage for the hotel are provided in **Table 4.2-10**.

4.2.8 Summary

Baseline/Existing (2018) energy usage was calculated using the methodologies described in the sections above. The Baseline/Existing (2018) energy usage incorporated data for actual airport operations including aircraft, vehicle, equipment, fuel use, and utility usage from July 2017 to June 2018. Baseline/Existing (2018) energy usage is presented in **Table 4.2-11**.

Proposed Project energy usage is presented in **Table 4.2-12**.

A summary of operational energy use for the Proposed Project by fuel is presented in **Table 4.2-13**.

[35] Energy intensiveness of materials is not addressed because the California Governor's Office of Planning and Research has explained that "a full 'lifecycle' analysis that would account for energy in building materials and consumer products will generally not be required." Such an analysis runs a substantial risk of double counting energy use and associated greenhouse gas emissions. 2015. Preliminary Discussion Draft. OPR, Proposed Updates to the CEQA Guidelines.

5. PROJECT INVENTORY IN CONTEXT

This section assesses the significance of the Proposed Project's energy demand for purposes of CEQA.

5.1 Threshold 1

Would the Project Result in a Potentially Significant Environmental Impact Due to Wasteful, Inefficient, or Unnecessary Consumption of Energy Resources, during Project Construction or Operation?

5.1.1 Overview

The Project will be constructed in compliance with California's Building Energy Efficiency Standards; California's Green Building Standards; and will implement transportation demand management strategies to reduce vehicle miles traveled and mobile fuel use. Overall, these programs will ensure that the Project reduces wasteful consumption of energy and does not obstruct any plans for renewable energy or energy efficiency.

5.1.2 Energy Requirements and Energy Use Efficiencies

This section addresses the following category of environmental impacts described in Appendix F of the CEQA Guidelines:

> *The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate the energy intensiveness of materials may be discussed.*

5.1.2.1 Construction

Construction of the proposed project would result in fuel usage as shown in **Table 4.1-5**. There are no unusual project characteristics or construction processes that would require the use of equipment that would be more energy intensive than is used for comparable activities, or equipment that would not conform to current emissions standards (and related fuel efficiencies). In fact, the construction plan is designed to minimize fuel usage, for example minimal to negligible hauling activity will occur as the land is fairly uniform.

5.1.2.2 Operations

The Project requires energy in the forms of electricity, natural gas, gasoline, diesel, and jet fuel/aircraft fuel. These energy use requirements are summarized in **Table 4.2-13**

As shown in the table noted above, operational electricity, natural gas, diesel, and jet fuel requirements are projected to increase from the existing conditions to the Project due to the increase in operational activity at the Airport. Gasoline and aviation gasoline are projected to decrease from the existing conditions.

5.1.3 Local and Regional Energy Supplies

This section addresses the following category of environmental impact described in Appendix F of the CEQA Guidelines:

> *The effects of the project on local and regional energy supplies and on requirements for additional capacity.*

The Proposed Project will not have a substantial impact on the local or regional energy supplies or require additional capacity to be constructed. The transition toward electric fuels

for on-site vehicles will result in a small increase in calculated total electricity usage that will not significantly impact overall electricity infrastructure. This small increase may be offset by gains in energy efficiency at the Project that are not quantitatively addressed in the energy usage calculations as noted above.

As shown and discussed in **Section 4** above, the Proposed Project relies on electricity, natural gas, gasoline, diesel, and jet fuel/aircraft fuel consumption associated with mobile operations, emergency generator operations, and construction operations. Total energy use requirements for existing conditions and full project buildout years are summarized in **Tables 4.2-11, 4.2-12, and 4.2-13**.

The Project site is supplied with electricity from SJCE and natural gas through Pacific Gas & Electric (PG&E).

To put the Proposed Project's energy use in context, in 2017, Californians consumed 257,268 GWh of electricity, of which Santa Clara County consumed 17,190 GWh.[36] CEC estimates that state-wide energy demand will increase to 322,266 GWh in 2025 with an average annual growth rate of 1.27%.[37] The Proposed Project's anticipated increase in electricity usage from 33,256 megawatt-hour (MWh) for existing conditions to 58,021 MWh by 2037 Full Buildout reflects an increase of 24,765 MWh in electricity usage. This represents approximately 0.01 percent of the total state-wide electricity usage and 0.14 percent of Santa Clara County electricity usage. Therefore, the Proposed Project will not require additional generation capacity beyond more general state-wide expansion.

The Proposed Project's annual natural gas consumption is estimated to increase by 3,967 MMBtu from 49,828 MMBtu at existing conditions to 53,795 MMBtu at Full Buildout. In comparison, it is projected that California natural gas demand will decrease in 2030 to 2,160,800 MMscf/yr, or 2,230 trillion Btu/yr.[38] The Project's natural gas consumption accounts for less than 0.0003% of the projected statewide annual consumption.

Although natural gas is the most common electricity source in California, 90% of the state's natural gas is imported from the Rocky Mountain region, the Southwest, and Canadian basins.[39] The United States produces 20 trillion scf/yr and had 340 trillion scf of proven reserves in 2014.[40] The Project's natural gas consumption is not substantial in comparison to the national natural gas reserves and comprises a tiny portion of annual national natural gas production.

---

[36] California Energy Commission. 2017. Energy Consumption Data Management Service. Electricity Consumption by County. Available online at: http://www.ecdms.energy.ca.gov/elecbycounty.aspx.

[37] California Energy Commission. 2016. California Energy Demand Updated Forecast, 2017-2027. Available online at: http://docketpublic.energy.ca.gov/PublicDocuments/16-IEPR-05/TN214635_20161205T142341_California_Energy_Demand_Updated_Forecast.pdf

[38] California Energy Commission. 2015. Draft Staff Report: 2015 Natural Gas Outlook. Available online at: http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-03/TN206501_20151103T100153_Draft_Staff_Report_2015_Natural_Gas_Outlook.pdf. Accessed: April 2017.

[39] U.S. Energy Information Administration. 2016. California State Profile and Energy Estimates: Profile Analysis. Available online at: https://www.eia.gov/state/analysis.cfm?sid=CA. Accessed November 30, 2016.

[40] California Energy Commission. 2015. Draft Staff Report: 2015 Natural Gas Outlook. Available online at: http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-03/TN206501_20151103T100153_Draft_Staff_Report_2015_Natural_Gas_Outlook.pdf.

Gasoline and diesel are provided by California's transportation fuels supplier network, as most of the gasoline and diesel fuels are used for transportation to and from the Proposed Project.

Overall, the Proposed Project will not have a substantial impact on the local or regional energy supplies or require additional capacity to be constructed.

5.1.4 Peak and Base Period Demands

This section addresses the following category of environmental impact described in Appendix F of the CEQA Guidelines:

> *The effects of the project on peak and base period demands for electricity and other forms of energy.*

The Proposed Project will not have a substantial impact on the peak and base period demands for electricity or other forms of energy. The Proposed Project's base energy consumption compared to regional and statewide energy consumption is discussed above in **Section 5.1.3**. Further details and reasoning on the peak demand are described below.

In 2016, California's peak grid demand was 46,193 MW. On the same day, PG&E reached a maximum demand of 23,752 MW.[41] In comparison, the Proposed Project's maximum demand is expected to be 5.5 MW in 2037. This number was derived by conservatively summing the peak demand for all individual land use subtypes, although the peak is unlikely to occur at the same time for all land uses. This also conservatively excludes the benefits of improvements in demand response due to the Title 24 energy standards, which would further reduce peak demand. Title 24 Building Energy Efficiency Standards include measures that encourage load-shifting and demand-response. Title 24 energy use performance standards are based on the time dependent valuation (TDV) of energy, which uses the value of the electricity or natural gas used at every hour of the year to incentivize load shifting off of the peak. In addition, the mixed-use nature of the Project site naturally allows for a balanced energy load, as not all uses will be occupied at the same time of day.

5.1.5 Existing Energy Standards

This section addresses the following category of environmental impact described in Appendix F of the CEQA Guidelines:

> *The degree to which the project complies with existing energy standards.*

The Proposed Project complies with existing energy standards. During implementation of the Proposed Project, the Proposed Project will continue to adhere to State, Regional, and Local standards designed to minimize use of fuel in construction vehicles, ensure that buildings employ strict energy efficiency techniques, and deploy transportation improvement initiatives such as improved vehicle efficiency, zero emission technologies and lower carbon fuels, as described further below.

5.1.5.1 Construction Vehicles and Electricity Usage

Project construction requires use of on-road trucks for hauling and vendor deliveries, and off-road equipment such as excavators, cranes, forklifts, and pavers. The Proposed Project would comply with state and local requirements designed to minimize idling and associated

[41] California ISO. 2017. 2016-2017 Transmission Plan. Available online at: http://www.caiso.com/Documents/Board-Approved_2016-2017TransmissionPlan.pdf

emissions, which also minimizes use of fuel. Specifically, idling of commercial vehicles and off-road equipment would be limited to five minutes in accordance with the Commercial Motor Vehicle Idling Regulation and the Off-Road Regulation, and the trucks used would be compliant with the requirements of the Tractor-Trailer Greenhouse Gas Regulation.

5.1.5.2 Building Efficiency

The Proposed Project's anticipated electricity and natural gas use in buildings is shown in the sections above. New building construction is subject to California's Title 24. California's Title 24 reduces energy use in residential and commercial buildings through progressive updates to both the Green Building Standards Code (Title 24, Part 11) and the Energy Efficiency Standards (Title 24, Part 6). Provisions added over the years include consideration and possible incorporation of new energy efficiency technologies and methods for building features such as space conditioning, water heating, lighting, and whole envelope, as well as construction waste diversion goals. Additionally, some standards focus on larger energy saving concepts such as reducing loads at peak periods and seasons, improving the quality of energy-saving installations, and performing energy system inspections. Past updates to the Title 24 standards have proved very effective in reducing building energy use, with the 2013 update to the energy efficiency standards estimated to reduce energy consumption in residential buildings by 25% and energy consumption in commercial buildings by 30%, relative to the 2008 standards.[42] The 2019 standards are expected to further reduce energy consumption.

5.1.6 Energy Resources

This section addresses the following category of environmental impact described in Appendix F of the CEQA Guidelines:

The effects of the project on energy resources.

California has a statewide goal of 75% waste diversion by 2020, while the City of San Jose has a Zero Waste goal by 2022 and a goal to maintain 100% diversion through 2040 per Envision San Jose 2040. Furthermore, the airport has a matching Zero Waste Goal by 2022 in its operations.[43] Thus, the Proposed Project will comply with these goals by implementing waste diversion policies and infrastructure. The Proposed Project's use of energy will not have a substantial effect on statewide or regional energy resources. The Proposed Project's energy use is discussed in **Section 3** above, including electricity, natural gas, and gasoline, diesel, and jet fuel/aircraft fuel consumption associated with mobile operations, emergency generator operations, and construction operations. The change in energy use requirements from the existing conditions to Full Buildout is summarized in **Table 4.2-13**.

5.1.7 Transportation Energy Use

This section addresses the following category of environmental impact described in Appendix F of the CEQA Guidelines:

The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

[42] CEC. 2012. Energy Commission Approves More Efficient Buildings for California's Future. Available online at: http://www.energy.ca.gov/releases/2012_releases/2012-05-31_energy_commission_approves_more_efficient_buildings_nr.html. Accessed: April 2017.

[43] City of San Jose. 2018, February. Envision San Jose 2040 General Plan. Available online at: http://www.sanjoseca.gov/DocumentCenter/View/474.

The Proposed Project uses efficient transportation alternatives to reduce its transportation energy use requirements, as described in **Section 1.3 of the Greenhouse Gas Technical Report**.

Conventional gasoline and diesel vehicles consume gasoline or diesel fuel, whereas EVs consume electricity that can be sourced by fossil fuels or renewables. EVs, including battery-electric vehicles and plug-in hybrid electric vehicles, comprise a growing fraction of the passenger vehicles on the roads in California. EV adoption is expected to increase over the upcoming decades due in part to improvements in battery technology and public initiatives and goals. Additionally, in early 2019, SJC purchased 10 electric-powered shuttle buses to replace a fleet that ran on compressed natural gas (CNG) fuel. This increase in EV adoption will decrease the fuel requirements due to transportation.

New state-wide regulations. such as Truck and Bus Rule (Title 13 CCR Section 2025), On-Road Heavy-Duty Vehicle Program (Title 13, CCR Section 1956.8), Pavley Clean Car Standards and the Advanced Clean Cars (ACC) program have been instated which reduce emissions and fuel requirements from trucks and cars.

As shown in **Table 4.2-6**, fuel usage per passenger for the Project (2037) decreases compared to the Baseline (2018) as fleets become more fuel efficient and switch to more electric vehicles/shuttles.

5.1.8 Summary

The Proposed Project will not have a substantial impact on the local or regional energy supplies or require additional capacity to be constructed. Furthermore, the Proposed Project adequately incorporates energy efficiency measures into building design and other project features.

Thus, based on the above analysis of each of the environmental impact factors identified in CEQA Guidelines Appendix F, the potential for the Proposed Project to result in wasteful, inefficient, or unnecessary consumption of fuel or energy is **less than significant.**

5.2 Threshold 2

Would the Project Conflict with or Obstruct a State or Local Plan for Renewable Energy or Energy Efficiency?

The Proposed Project would comply with any applicable state plans for renewable energy or energy efficiency to the extent required by law. Further, the Proposed Project is consistent with the renewable energy and energy efficiency provisions of Climate Smart San Jose and Envision San Jose 2040. See **Section 1.2** for Airport's energy efficiency and energy reduction initiatives. The Airport has already implemented the following initiatives:

- Installed some ground power units, battery recharge facilities and preconditioned air units at all terminal gates to facilitate the conversion of GSE to electric power and phaseout diesel fuel usage.
- Consolidated all rental car operations to a new facility to reduce fuel usage of rental vehicles and shuttle buses.
- Constructed 1 megawatt photovoltaic system on the roof of the consolidated rental facility to provide 20% of the power used at the facility from solar energy.

More details are provided in the consistency summary tables for the various State, Regional, and Local plans in **Tables 5.2-1** through **5.2-4**. As such, Proposed Project energy impacts are less than significant.

6. ALTERNATIVES

Since the operational activity levels, i.e. the number of annual aircraft operations and annual passengers, at the Airport are identical for all scenarios (see **Section 4.2** of this report), energy impacts associated with the operations of No Project/No New Facilities (2037) scenario and No Project/Buildout under Existing Master Plan (2037) scenario are expected to be less than Proposed Project. Additionally, the Proposed Project contains various taxiway enhancements that could result in improved efficiency of aircraft movement at the airport, which could potentially lead to a reduction in taxi delays and lower operational energy impacts relative to the two No Project alternatives.

However, the construction energy usage under these scenarios would be different. Construction-related energy usage under No Project/No New Facilities (2037) scenario would be zero, as there would be no new construction of landside or airside projects at the Airport. The Construction-related energy usage under the No Project/Buildout under Existing Master Plan (2037) scenario would be lower than the Proposed Project (see **Section 4.1** of this report) because there would be fewer capital improvement projects.

TABLES

Table 4.1-1. Landside Construction Project Description
Mineta San Jose International Airport
San Jose, California

Project ID[1]	Construction Duration[1]	Project Description[2]		Land Area (acres)	Building Area (sqft)	Project Under Existing Master Plan[3]
T-4	2022 - 2023	Parking Structure	5,000 spaces	11.5	2,500,000	X
T-6 (part)	--	Remove City office structures at 1311 Airport Blvd. *(demolition activity only)*	11 TSF	0.25	11,000	X
T-8 (part)	2020 - 2021	Parking Structure	6,000 spaces	10.7	2,335,000	X
T-13	2024 - 2026 (gates 29-40)	Terminal B - 14 carrier gates, building space, and associated passenger processing facilities	375 TSF	4.6	375,000	X
	2033 - 2034 (gates 41-42)	Terminal B - 14 carrier gates, building space, and associated passenger processing facilities	375 TSF	4.6	375,000	X
T-16	2026 - 2027	Hotel	330 rooms	2.3	150,000	
		Hotel Parking	300 spaces	2.3	150,000	
C-2	--	Expand cargo airline facilities	35 TSF	4.6	35,000	X
C-3	2021 - 2022	Relocate Belly-freight facilities	35 TSF	3.4	35,000	X
C-4	--	Remove existing Air Freight Building and vehicle parking/movement area. *(demolition activity only)*	150 TSF	3.4	150,000	X
G-5 (part)	2020	Convert former San Jose State University leasehold site at southwest side to aviation support or general aviation facility use	50 TSF	3.5	50,000	X
G-6 (part)	N/A	Establish new FBO leaseholds on west side for reconfiguration of general aviation facilities	no new construction			X
G-8 (part)	2023 - 2025	Expansion of general aviation facilities	150 TSF	10.0	150,000	X
G-9	2023 (north) 2024 (south)	Expansion of west side general aviation apron	496.3 TSF	11.4	496,300	
G-10	N/A	Reconfigure southwest apron tiedown storage facilities (to accommodate Projects A-40, A-41, and G-5)	no new construction			
S-1 (part)	2035 - 2036	Expand fuel storage facility	4.8 TSF	2.3	4,800	X
S-3	N/A	Relocate/expand airport maintenance facilities at new site(s) on east or west sides of Airport.	no new construction			X
S-4	--	Expand flight kitchen facilities at existing or new sites on east side of Airport or relocate/expand off-airport.	125 TSF	8.6	125,000	X
S-5		Relocate/expand airline maintenance/storage facilities at various existing or new sites on east or west sides of Airport.				X
S-6		Remove, relocate, or upgrade existing aviation support facilities on southeast side of Airport (1239-1311 Airport Blvd.) at various existing or new sites on east or west sides of Airport.				X

Notes:

[1] Project IDs and construction duration based on Project Description as provided in the EIR. "--" indicates that proposed construction duration is not known at this time.

[2] Land-side construction projects as defined in Project Phasing for Proposed Major Amendment to Airport Master Plan (dated Jan 23, 2019).

[3] "X" indicates that the project is part of the Existing Master Plan.

Abbreviations:

FBO - fixed-base operator

N/A - not applicable

sqft - square feet

TSF - thousand square feet

Table 4.1-2. Airside Construction Project Description
Mineta San Jose International Airport
San Jose, California

Project ID[1]	Construction Year[1]	Project Description[2]	Width (ft)	Length (ft)	Count	Land Area (sqft)	Project Under Existing Master Plan[3]
A-17 (part)	2021	Extend parallel Taxiway W south from Taxiway B to Runway 12R-30L (for ADG-III aircraft).	115	413	1	48,800	X
A-23 (part)	--	Widen cross Taxiway J at Runway 12R-30L for higher-speed arrivals exit to west.	80	328	1	26,200	X
A-26	2022	Convert former Runway 11-29 to a new parallel Taxiway V (for ADG-III aircraft) and extend south to Taxiway C and north to a new cross Taxiway V7.	118	1,518	1	179,145	X
	2023		118	808	1	95,355	X
A-27	--	Construct new cross Taxiway V7 from north end of new Taxiway V to Taxiway W (for ADG-III aircraft) .	109	147	1	16,000	X
A-37	--	Close existing Taxiway V and replace with a parallel apron - edge taxilane (for ADG-III aircraft) .	50	3,500	1	175,000	X
	--		75	3,400	1	255,000	X
A-38	--	Construct up to seven new taxiway connectors (V1-V7) between the expanded west side apron (Project G-9) and new Taxiway V (for ADG-III aircraft) .	129	92	7	83,000	
A-39	--	Mitigate direct access from west side apron to taxiways B, C, & D through pavement marking/painting or removal.	no new construction *(mark/paint only)*				
A-40	--	Create up to three new taxiway connectors (W1-W3) between the southwest apron and Taxiway W (for ADG-II aircraft) through pavement marking/painting or removal.	no new construction *(mark/paint only)*				
A-41	--	Relocate existing general aviation run-up pad to southwest apron area (*removal only*).	110	352	--	38,700	
A-42	--	Relocate Runway 12R-30L aircraft hold positions on all cross taxiways to current ADG-V aircraft standard.	30	150	10	45,000	
A-43	--	Widen Runway 12L-30R blast pads, and lengthen blast pad at 12L end, to current ADG-V aircraft standard.	40	210	1	8,389	
	--		40	163	1	6,511	
A-44	--	Realign existing cross taxiways B-F, H, J, & L between taxiways Y and Z to mitigate direct access from east side apron to Runway 12L-30R, and rename realigned segments as taxiways Z1-Z8 & Z10.	150	150	8	180,000	
A-45	--	Close existing segments of cross taxiways B-F, H, J, & L between taxiways Y and Z through pavement marking/painting or removal (upon completion of Project A-44) (removal only).	150	150	8	180,000	
A-46	--	Narrow segment of existing cross Taxiway B between Taxiway Z and Runway 12L-30R through pavement marking/painting.	no new construction *(mark/paint only)*				
A-47	--	Narrow segment of existing cross Taxiway L between Taxiway Y and Runway 12R-30L through pavement marking/painting.	no new construction *(mark/paint only)*				
A-48	--	Close existing segments of cross taxiways F and H between Runway 12R-30L and Runway 12L-30R through pavement marking/painting.	no new construction *(mark/paint only)*				
A-49	--	Add pavement markings to existing parallel taxiways W and Y, lateral to the adjacent runway displaced thresholds, to visually denote their use as taxiways.	no new construction *(mark/paint only)*				

Notes:
[1] Project IDs and construction duration based on Project Description as provided in the EIR. "--" indicates that proposed construction year is not known at this time.
[2] Air-side construction projects as defined in Project Phasing for Proposed Major Amendment to Airport Master Plan (dated Jan 23, 2019).
[3] "X" indicates that the project is part of the Existing Master Plan.

Abbreviations:
ft - feet
sqft - square feet

Table 4.1-3. Energy Usage Associated with Landside Construction Projects
Mineta San Jose International Airport
San Jose, California

Project ID[1]	Landside Project Fuel Consumption[2,3]		
	Diesel		Gasoline
	Off-Road Equipment	On-Road Vehicles	On-Road Vehicles
	(gallons)		
T-4	48,889	151,151	109,694
T-6 (part)	505	0	37
T-8 (part)	48,866	144,845	110,364
T-13 (gates 29-40)	32,709	16,796	12,092
T-13 (gates 41-42)	37,176	16,146	9,305
T-16	32,716	13,324	8,959
C-2	32,686	1,745	1,625
C-3	32,688	1,729	1,568
C-4	3,308	0	112
G-5 (part)	32,686	2,327	2,145
G-8 (part)	38,355	6,926	5,289
G-9	48,898	29,222	21,263
S-1 (part)	28,477	253	223
S-4, S-5 and S-6	35,563	5,812	5,009

Notes:

[1] Based on Project Phasing for Proposed Major Amendment to Airport Master Plan (dated Jan 23, 2019).

[2] Diesel and gasoline fuel consumption are conservatively based on CO_2e emissions as calculated in **Greenhouse Gas Technical Report**. Fuel consumption calculation is conservative as conversion factors are based on CO_2 emissions (see note below).

[3] The conversion factors for gasoline and diesel are 9.13 kg CO_2/gallon and 10.35 kg CO_2/gallon, respectively. The Climate Registry, 2018 Default Emission Factor Document. Available at: https://www.theclimateregistry.org/wp-content/uploads/2018/06/The-Climate-Registry-2018-Default-Emission-Factor-Document.pdf.

Abbreviations:

CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalents
kg - kilograms
MT - metric ton

Conversions:

9.13 kg CO_2/gallon gasoline
10.35 kg CO_2/gallon diesel
1,000 kg CO_2/MT CO_2

Table 4.1-4. Energy Usage Associated with Airside Construction Projects
Mineta San Jose International Airport
San Jose, California

Project ID[1]	Airside Project Fuel Consumption[2,3]		
	Diesel		Gasoline
	Off-Road Equipment	On-Road Vehicles	Equipment and On-Road Vehicles
	(gallons)		
A-17 (part)	16,040	5,177	9,694
A-23 (part)	13,530	2,860	9,690
A-26-1	32,787	19,526	10,056
A-26-2	22,114	10,393	9,702
A-27	12,028	1,746	9,688
A-37-1	36,607	19,076	9,832
A-37-2	45,131	27,797	14,333
A-38	20,428	9,056	9,700
A-42	18,103	4,905	9,695
A-44	32,212	19,621	10,104
A-43-1	11,325	916	9,688
A-43-2	11,009	711	9,687
A-41	919	735	440
A-45	4,272	3,416	440

Notes:

[1] Based on Project Phasing for Proposed Major Amendment to Airport Master Plan (dated Jan 23, 2019).

[2] Diesel and gasoline fuel consumption for on-road vehicles are conservatively based on CO_2e emissions (conversion factors are based on CO_2 emissions - see note below). Fuel consumption for Airside Projects off-road equipment is based on CO_2 emissions as ACEIT does not provide CO_2e emissions. Emissions are calculated in **Greenhouse Gas Technical Report**.

[3] The conversion factors for gasoline and diesel are 9.13 kg CO_2/gallon and 10.35 kg CO_2/gallon, respectively. The Climate Registry, 2018 Default Emission Factor Document. Available at: https://www.theclimateregistry.org/wp-content/uploads/2018/06/The-Climate-Registry-2018-Default-Emission-Factor-Document.pdf.

Abbreviations:

CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalents
kg - kilograms
MT - metric ton

Conversions:

9.13	kg CO_2/gallon gasoline
10.35	kg CO_2/gallon diesel
1,000	kg CO_2/MT CO_2

Table 4.1-5. Total Energy Usage Associated with Construction Projects
Mineta San Jose International Airport
San Jose, California

	Construction Projects Fuel Consumption		
	Diesel		Gasoline
Construction Description	Off-Road Equipment	On-Road Vehicles	Equipment and On-Road Vehicles
	(gallons)		
Landside Projects	453,521	390,275	287,684
Airside Projects	276,505	125,935	122,749
Total	**730,026**	**516,210**	**410,433**

Table 4.1-6. Comparison of Construction Projects under Existing Master Plan vs. Proposed Amendment to Master Plan
Mineta San Jose International Airport
San Jose, California

#	Description Under Existing Airport Master Plan	Description Under Proposed Amendment to Airport Master Plan	Preliminary Phasing		
			Phase 1 (2019-2027)	Phase 2 (2028-2037)	Notes
Airfield Projects					
A-17	Extend/widen parallel **Taxiway W** south from Taxiway C to Runway 12R-30L (for ADG-IV aircraft).	Portion of project between Taxiways B & C already completed. Revised description for remaining portion of A-17 is as follows: Extend parallel **Taxiway W** south from Taxiway B to Runway 12R-30L (for ADG-III aircraft).	X		2021
A-23	Strengthen cross **Taxiway J** west of extended Runway 12L-30R to west of Runway 12R-30L and widen at 12R-30L for higher-speed arrivals exit to west.	**Taxiway J** strengthening already completed. Remaining phase of A-23 to be completed as described in the existing Airport Master Plan.	X		Minor Construction
A-26	Widen/strengthen parallel **Taxiway V** from Taxiway G north to Taxiway W (for ADG-IV aircraft) and patch/restripe south of Taxiway G (for B-II aircraft).	Replace with Following New Project: Convert former **Runway 11-29** to a new parallel Taxiway V (for ADG-III aircraft) and extend south to Taxiway C and north to a new cross Taxiway V7.	X		2021-remove existing; 2022-north; 2023-south
A-27	Extend cross **Taxiway H** between Runway 12R-30L and Taxiway V (for ADG-IV aircraft).	Replace with Following New Project: Construct new cross **Taxiway V7** from north end of new Taxiway V to Taxiway W (for ADG-III aircraft).	X		Minor Construction
A-37	Extend cross **Taxiway K** between Runway 12R-30L and Taxiway V (for ADG-IV aircraft).	Replace with Following New Project: Close existing **Taxiway V** and replace with a parallel apron-edge taxilane (for ADG-III aircraft).	X		Minor Phased Construction
A-38	Proposed new project	Construct up to **seven new taxiway connectors (V1–V7)** between the expanded west side apron (Project G-9) and new Taxiway V (for ADG-III aircraft).	X		Minor Phased Construction
A-39	Proposed new project	Mitigate direct **access from west side apron** to Taxiways B, C, & D through pavement marking/painting or removal.	X		Little or no construction

Table 4.1-6. Comparison of Construction Projects under Existing Master Plan vs. Proposed Amendment to Master Plan
Mineta San Jose International Airport
San Jose, California

#	Description Under Existing Airport Master Plan	Description Under Proposed Amendment to Airport Master Plan	Preliminary Phasing		
			Phase 1 (2019-2027)	Phase 2 (2028-2037)	Notes
A-40	Proposed new project	Create up to **three new taxiway connectors (W1–W3)** between the southwest apron and Taxiway W (for ADG-II aircraft) through pavement marking/painting or removal.	X		Minor Phased Construction
A-41	Proposed new project	Relocate existing **general aviation run-up pad** to southwest apron area.	X		Little or no construction
A-42	Proposed new project	Relocate **Runway 12R-30L aircraft hold positions** on all cross taxiways to current ADG-V aircraft standard.	X		Little or no construction
A-43	Proposed new project	Widen **Runway 12L-30R blast pads**, and lengthen blast pad at 12L end, to current ADG-V aircraft standard.	X		Minor Construction
A-44	Proposed new project	Realign existing cross **Taxiways B-F, H, J, & L** between Taxiways Y and Z to mitigate direct access from east side apron to Runway 12L-30R and rename realigned segments as Taxiways Z1–Z8 & Z10.	X (6 taxiways)	X (2 taxiways)	Minor Phased Construction
A-45	Proposed new project	Close existing segments of cross **Taxiways B-F, H, J, & L** between Taxiways Y and Z through pavement marking/painting or removal (upon completion of Project A-44).	X (6 taxiways)	X (2 taxiways)	Little or no construction
A-46	Proposed new project	Narrow segment of existing cross **Taxiway B** between Taxiway Z and Runway 12L-30R through pavement marking/painting.	X		Little or no construction
A-47	Proposed new project	Narrow segment of existing cross **Taxiway L** between Taxiway Y and Runway 12R-30L through pavement marking/painting.	X		Little or no construction
A-48	Proposed new project	Close existing segments of cross **Taxiways F and H** between Runway 12R-30L and Runway 12L-30R through pavement marking/painting.	X		Little or no construction

Table 4.1-6. Comparison of Construction Projects under Existing Master Plan vs. Proposed Amendment to Master Plan
Mineta San Jose International Airport
San Jose, California

#	Description Under Existing Airport Master Plan	Description Under Proposed Amendment to Airport Master Plan	Preliminary Phasing		
			Phase 1 (2019-2027)	Phase 2 (2028-2037)	Notes
A-49	Proposed new project	Add pavement markings to existing parallel **Taxiways W and Y**, lateral to the adjacent runway displaced thresholds, to visually denote their use as taxiways.	X		Little or no construction
Terminal Projects					
T-4	Construct new public **short-term parking garage** (up to 3,000 spaces) on existing "Red" Hourly Parking lot site opposite new Terminal B.	Construct new public **short-term parking garage** (up to 5,000 spaces) and associated roadway improvements south of existing Rental Car Garage and opposite new Terminal B South Concourse (Project T-13).	X		2022-2023
T-6	Remove former temporary **FIS facility** from ramp south of Terminal C and remove City office structures at 1311 Airport Blvd.	FIS removal already completed. Remaining phase of T-6 to be completed as described in the existing Airport Master Plan.	X		Minor Construction
T-8	Construct new public **long-term parking garage** (up to approx. 9,000 spaces) on existing interim rental car ready/return parking lot site, including interim surface parking at site prior to garage construction, second 2-lane bridge accessing site from Airport Blvd. and, upon completion, removal of public parking from interim west side lot.	Construction of interim surface parking and removal of interim parking from west side already completed. Remaining phase of T-8 will remove the interim surface lot and construct a new **public long-term parking garage** (up to 6,000 spaces) with access from Airport Blvd. using the existing 2-lane bridge.	X		2020-2021
T-13	Expand **Terminal B (South Concourse)** to south onto remainder of demolished Terminal C site, consisting of up to 700,000 ft^2 and 10 air carrier gates (ultimate total of 40 gates and 1.70 million ft^2).	Expand **Terminal B (South Concourse)** to south, including up to an additional 14 air carrier gates and 750,000 ft^2 of building space, and associated passenger processing facilities (ultimate terminal complex total of up to 42 gates and 1.80 million ft^2).	X (12 gates)	X (2 gates)	2024-2026 (12 gates); 2033-2034 (2 gates)
T-16	Proposed new project	Construct new multi-story **business hotel** south of and adjacent to new public short-term parking garage (Project T-4), up to 300,000 ft^2 in size including up to 330 guest rooms and 300 parking spaces.	X		2026-2027

Table 4.1-6. Comparison of Construction Projects under Existing Master Plan vs. Proposed Amendment to Master Plan
Mineta San Jose International Airport
San Jose, California

#	Description Under Existing Airport Master Plan	Description Under Proposed Amendment to Airport Master Plan	Preliminary Phasing		
			Phase 1 (2019-2027)	Phase 2 (2028-2037)	Notes
Air Cargo Projects					
C-2	Construct new **cargo airline facilities** at or adjacent to existing east side cargo airline areas, including up to 1.2 million ft^2 of ramp, building, and vehicle parking/movement space.	Expand **cargo airline facilities** at or adjacent to existing east side cargo airline areas, with up to 200,000 ft^2 of additional ramp, building, and vehicle parking and movement space (cargo airline facility total of up to 500,000 ft^2).	X (100,000 ft2)	X (100,000 ft2)	Minor Phased Construction
C-3	Relocate **belly-freight facilities** to new site(s) on east side of Airport, including up to 93,000 ft^2 building and vehicle parking/movement space.	Relocate **belly-freight facilities** to new site(s) on east side of Airport, including up to 150,000 ft^2 of ramp, building, and vehicle parking and movement space.	X		2021-2022
C-4	Remove existing **Air Freight Building** and vehicle parking/movement area (displaced by Project T-13 and T-15).	No change from the description in the existing Airport Master Plan.	X		Minor Construction
General Aviation Projects					
G-5	Remove **San José State University facilities** at southwest side upon lease expiration in 2010 and convert site to aviation support or general aviation facility use.	Removal of SJSU facilities already completed. Remaining phase of G-5 to be completed as described in the existing Airport Master Plan.	X		Minor Construction
G-6	Establish new **FBO leaseholds** on west side for reconfiguration of general aviation facilities.	Partially complete. Remaining phase of G-6 to be completed as described in the existing Airport Master Plan.	X		Little or no construction
G-8	Expand **general aviation facilities** onto northwest side of Airport (44 acres, upon implementation of Project T-7 and T-8).	Partially complete. Remaining phase of G-8 to be completed as described in the existing Airport Master Plan.	X		2023-2025
G-9	Proposed new project	Expand west side **general aviation apron** out to edge of new parallel taxilane (Project A-37).	X		2023-north; 2024-south
G-10	Proposed new project	Reconfigure **southwest apron tiedown** storage facilities (to accommodate Projects A-40, A-41, and G-5).	X		Little or no construction

Table 4.1-6. Comparison of Construction Projects under Existing Master Plan vs. Proposed Amendment to Master Plan
Mineta San Jose International Airport
San Jose, California

#	Description Under Existing Airport Master Plan	Description Under Proposed Amendment to Airport Master Plan	Preliminary Phasing		
			Phase 1 (2019-2027)	Phase 2 (2028-2037)	Notes
Aviation Support Projects					
S-1	Construct approx. 7-acre **fuel storage facility** (up to 8 tanks, 4.0 million gallons capacity) on vacant parcel north of Hwy. 101, two-acre fuel dispensing facility between Terminal A and north end of airfield, and pipeline connecting storage and dispensing.	Construction of first phase (3 tanks with 2.0-million gallons capacity) & fuel dispensing facility already completed. Remaining phase of S-1 to be completed as described in the existing Airport Master Plan.		X	2035-2036
S-3	Relocate/expand **airport maintenance facilities** at existing or new sites on east side of Airport.	Relocate/expand **airport maintenance facilities** at new site(s) on east or west sides of Airport.	X		Minor Construction
S-4	Expand **flight kitchen facilities** at existing or new sites on east side of Airport or relocate/expand off-airport.	No change from the description in the existing Airport Master Plan.	X		Minor Construction
S-5	Relocate/expand **airline maintenance-storage facilities** at various or new sites on east side of Airport.	Relocate/expand **airline maintenance-storage facilities** at various existing or new sites on east or west sides of Airport.	X	X	Minor Construction
S-6	Remove, relocate, or upgrade existing **aviation support facilities** on southeast side of Airport (1239-1311 Airport Blvd.) to or at various existing or new eastside sites.	Remove, relocate, or upgrade existing **aviation support facilities** on southeast side of Airport (1239-1311 Airport Blvd.) at various existing or new sites on east or west sides of Airport.	X	X	Minor Construction

Note:

Project phasing is estimated based on multiple factors including, but not limited to, existing and forecasted activity levels, construction staging constraints, trends in passenger travel mode (e.g., driving, transit, ridesharing, etc.), and the availability of funding. These factors are subject to change and, therefore, the timing of construction of various projects is also subject to revision.

Table 4.1-7. Energy Usage Associated with Construction Projects Under Existing Approved Master Plan
Mineta San Jose International Airport
San Jose, California

Project ID	Construction Projects Fuel Consumption[1,2]		
	Diesel		Gasoline
	Off-Road Equipment	On-Road Vehicles	Equipment and On-Road Vehicles
	(gallons)		
Landside Projects			
T-4	48,889	151,151	109,694
T-6 (part)	505	0	37
T-8 (part)	48,866	144,845	110,364
T-13	69,885	32,942	21,397
C-2	32,686	1,745	1,625
C-3	32,688	1,729	1,568
C-4	3,308	0	112
G-5 (part)	32,686	2,327	2,145
G-6 (part)[3]	N/A		
G-8 (part)	38,355	6,926	5,289
S-1 (part)	28,477	253	223
S-3[3]	N/A		
S-4	35,563	5,812	5,009
S-5			
S-6			
Airside Projects			
A-17 (part)	16,040	5,177	9,694
A-23 (part)	13,530	2,860	9,690
A-26	54,901	29,919	19,758
A-27	12,028	1,746	9,688
A-37	81,738	46,873	24,164
Total	**550,144**	**434,304**	**330,457**

Notes:

[1] The "--" indicates that the project was not a part of the Existing Master Plan.

[2] Energy usage associated with the construction of the Existing Master Plan are obtained from energy usage of Amendment to Airport Master Plan as shown in prior tables.

[3] Energy impacts associated with Projects G-6 and S-3 were not calculated as the construction was completed.

Table 4.2-1. Activity Levels for Baseline, Project and No Project Scenarios
Mineta San Jose International Airport
San Jose, California

Scenario	Year	MAP	Annual Aircraft Operations[1]			
			Commercial	General Aviation	Military	Total
Baseline	2018	14.8	136,228	59,152	247	195,627
Project	2037	22.5	185,880	51,580	250	237,710
No Project (No New Facilities)[2]	2037	22.5	185,880	51,580	250	237,710
No Project (Buildout Under Existing Master Plan)[2]	2037	22.5	185,880	51,580	250	237,710

Notes:

[1] One aircraft operation is defined as one takeoff or one landing. The number of landing and take-off operations (LTOs) is calculated as the total number of operations divided by 2.

[2] The activity levels for aircraft operations and passenger demand under the No Project (No New Facilities) and No Project (Buildout Under Existing Master Plan) scenarios are assumed to be identical to the Project scenario.

Abbreviations:

LTO - landing and take-off operations

MAP - Million Annual Passengers

Table 4.2-2. Energy Usage Associated with Aircraft Operations
Mineta San Jose International Airport
San Jose, California

Year	Aircraft Category		Energy Usage Below Mixing Height (3,000 feet) [1]			
			Aviation Gasoline[2,4]	Jet Fuel[3,4]	Aviation Gasoline[2]	Jet Fuel[3]
			(gal/day)		(gal/yr)	
2018	Business		--	3,288	--	1,200,069
	Commercial		--	29,990	--	10,946,367
	Commuter		--	5,423	--	1,979,395
	General Aviation	Piston	140	--	51,229	--
		Turboprop	--	264	--	96,406
	Helicopter		40	--	14,722	--
	Military		--	24	--	8,878
	Total		**181**	**38,989**	**65,950**	**14,231,115**
2037	Business		--	4,222	--	1,541,034
	Commercial		--	68,817	--	25,118,112
	Commuter		--	3,066	--	1,118,987
	General Aviation	Piston	56	--	20,411	--
		Turboprop	--	86	--	31,521
	Helicopter		12	--	4,478	--
	Military		--	29	--	10,707
	Total		**68**	**76,220**	**24,889**	**27,820,361**

Notes:

[1] AEDT calculates energy usage in units of g/day. Fuel type was determined based on aircraft category.

[2] Aviation gasoline usage was estimated using the average density for aviation gasoline used by the USEPA in their 2011 National Emissions Inventory, available at: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100LFGL.PDF?Dockey=P100LFGL.PDF, accessed May 2019.

[3] Jet fuel usage was calculated using the average density for jet fuel reported by ExxonMobil, available at: https://www.exxonmobil.com/en/aviation/products-and-services/products/jet-a-jet-a-1, accessed May 2019.

[4] General aviation piston aircraft and helicopters were assumed to run on aviation gasoline; business, commercial, commuter, general aviation turboprop, and military aircraft were assumed to run on jet fuel.

Abbreviations:

AEDT - Aviation Environmental Design Tool

CH_4 - methane

CO_2 - carbon dioxide

gal - gallon

MT/yr - metric tons per year

N_2O - nitrogen dioxide

USEPA - United States Environmental Protection Agency

Table 4.2-3. Energy Usage Associated with Ground Support Equipment, Off-Road Equipment, and Boilers
Mineta San Jose International Airport
San Jose, California

Source	Gasoline		Diesel		Natural Gas	
	2018	2037	2018	2037	2018	2037
	Gallons/year				MMscf/year	
Ground Support Equipment[1]	102,911	148,256	119,545	161,563	--	--
SJC Owned Off-Road Equipment[2]	3,431	5,217	4,585	6,971	--	--
Central Plant Boilers[2]	--	--	--	--	19	29
Non-Central Plant Boilers[2]	--	--	--	--	1.8	2.7
Total	**106,342**	**153,473**	**124,130**	**168,534**	**21**	**32**

Notes:

[1] Baseline (2018) fuel usage is based on site specific usage. Project (2037) fuel usage is calculated by scaling the baseline fuel usage by the change in operating hours per fuel type. Operating hours were estimated in AEDT based on aircraft operations. This table does not include energy usage from electric GSE, which is summarized separately.

[2] Baseline (2018) fuel usage is based on site specific usage. Project (2037) fuel usage is calculated by scaling the baseline fuel usage by the change in million annual passengers.

Abbreviations:

AEDT - Aviation Environmental Design Tool

MMscf - million standard cubic feet

Table 4.2-4. Energy Usage Associated with Traffic
Mineta San Jose International Airport
San Jose, California

From EMFAC2017[1]:

Year	VMT (miles/day)			Fuel Usage[2] (gallons/day)			Fuel Efficiency[2] (miles/gallon)		
	Gasoline	Diesel	Natural Gas	Gasoline	Diesel	Natural Gas	Gasoline	Diesel	Natural Gas
2018	41,775,898	2,472,121	29,344	1,705,409	275,712	9,172	24	9.0	3.2
2037	48,415,408	3,507,951	52,182	1,310,868	262,545	12,787	37	13.4	4.1

Airport Related Traffic:

Year	Annual VMT[3] (miles/year)	Fleet Mix[4] (%)				Fuel Usage[2,5] (gallons/year)			Electricity Usage[6] (kWh/year)
		Gasoline	Diesel	Natural Gas	Electric	Gasoline	Diesel	Natural Gas	Electric
2018	275,845,830	93%	5.5%	0.07%	1.7%	10,443,492	1,688,387	56,167	1,410,745
2037	414,928,350	89%	6.4%	0.10%	4.7%	9,973,819	1,997,592	97,291	5,840,740

Notes:

[1] EMFAC2017 was run for each scenario year. Annual vehicle miles travelled (VMT) and fuel usage was output by vehicle class and fuel for Santa Clara County and averaged across model years for EMFAC 2007 vehicle classes for a specific fuel type. Values shown here are summed over the various vehicle classes to calculate a fleet value. Fuel efficiency was calculated by dividing VMT by fuel usage.

[2] Based on EMFAC2017 User's Guide, NG Fuel Usage and Fuel Efficiency are given in units of DGE/day and miles/DGE, respectively.

[3] Annual VMT is based on airport specific information for 2018 and 2037.

[4] Fleet mix is assumed to be EMFAC2017 default for 2018 and 2037.

[5] Fuel usage is calculated using airport specific VMT and EMFAC2017 default fleet mix and fuel efficiency.

[6] Electric vehicle fuel economy is consistent with the current range of fuel efficiencies of electric cars (0.30 kWh/mile) from US Department of Energy, available at https://www.fueleconomy.gov/feg/PowerSearch.do?action=noform&path=1&year1=1984&year2=2019&vtype=Electric

Abbreviations:
DGE - diesel gallon equivalent
EMFAC2017 - California Air Resources Board EMission FACtor model
kWh - kilowatt hour
VMT - vehicle miles traveled

Source:
ARB. 2017. Emission FACtors Model, 2017 (EMFAC2017). Available online at: https://www.arb.ca.gov/emfac/

Table 4.2-5. Energy Usage Associated with Airport Shuttles
Mineta San Jose International Airport
San Jose, California

Category	Amount	Unit
Airport Shuttle Fuel Consumption (CNG)[1]	**154,522**	**GGE**
Airport Shuttle Fuel Consumption (CNG)[1]	**19,964**	**MMBtu**
Average New Flyer C40LF Fuel Economy[2]	4.8	miles/DGE
Annual Average Shuttle Bus VMT (2018)[3]	652,912	VMT/year
Annual Average Shuttle Bus VMT (2037)[4]	992,602	VMT/year
Fuel Economy of Electric Bus[5]	1.8	(kWh/mile)
Electricity Consumed (2037)	**1,771,795**	**kWh**

Notes:

[1] Shuttle fuel consumption based on 2017 calendar year. Shuttle fuel consumption provided in GGE and converted to MMBtu using the conversion factor listed below, based on the energy content of gasoline fuel. Available at: http://www.nat-g.com/why-cng/cng-units-explained/.

[2] Average fuel economy based on data obtained from the Altoona Bus Research & Testing Center under the Federal Transit Administration's new model bus testing program. Available at: https://mjbradley.com/sites/default/files/CNG%20Diesel%20Hybrid%20Comparison%20FINAL%2005nov13.pdf.

[3] Annual average shuttle bus VMT is calculated based on annual shuttle bus fuel consumption and average fuel economy of shuttle bus model. Miles per DGE are converted to miles per GGE using the conversion factor listed below, based on the relative energy content of gasoline and diesel fuels. Available at: http://www.nat-g.com/why-cng/cng-units-explained/.

[4] Shuttle bus VMT in 2037 is determined by scaling 2018 VMT based on the increase in Million Annual Passengers (MAP) provided by the project sponsor in Table 3.1-4

[5] Based on fuel economy of similar electric buses. (BYD and Proterra). Proterra -- available at: http://www.proterra.com/product-tech/product-portfolio/.
BYD -- available at: http://byd.com/na/ebus/ebus.html.

Abbreviations:

CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalents
CH_4 - methane
DGE - diesel gallon equivalent
EMFAC - California Air Resources Board EMission FACtor model
GGE - gasoline gallon equivalent
GHG - greenhouse gas
MT - metric tonnes
N_2O - nitrous oxide
VMT - vehicle miles traveled

Constants and Conversion Factors:

MT/gram	1.00E-06
CO_2 Global Warming Potential	1
CH_4 Global Warming Potential	25
N_2O Global Warming Potential	298
GGE/DGE	1.136
GGE/MMBtu	7.74

Table 4.2-6. Energy Usage Associated with Transportation
Mineta San Jose International Airport
San Jose, California

Year	Source[1,2]	Fuel Usage			Electricity Usage (kWh/year)
		Gasoline (gallons/year)	Diesel (gallons/year)	Natural Gas (MMBtu/year)[3]	
2018	Traffic[1]	10,443,492	1,688,387	8,248	1,410,745
	Shuttle[2]	--	--	154,522	--
	Total	**10,443,492**	**1,688,387**	**162,770**	**1,410,745**
2037	Traffic[1]	9,973,819	1,997,592	14,286	5,840,740
	Shuttle[2]	--	--	--	1,771,795
	Total	**9,973,819**	**1,997,592**	**14,286**	**7,612,534**

Year	Annual Passengers	Fuel Usage per Passenger			Electricity Usage per Passenger (kWh/passenger)
		Gasoline (gallons/passenger)	Diesel (gallons/passenger)	Natural Gas (MMBtu/passenger)[3]	
2018	14,800,000	0.71	0.11	0.011	0.10
2037	22,500,000	0.44	0.089	0.0006	0.34

Notes:

[1] Traffic energy use is calculated in Table 4.2-3.

[2] Shuttle energy use is calculated in Table 4.2-4. Shuttles will be 100% electric in 2037.

[3] Natural gas fuel usage is converted from DGE to MMBtu using the conversion factor listed below, based on the energy content of diesel fuel. Available at: http://www.nat-g.com/why-cng/cng-units-explained/.

Abbreviations:

DGE - diesel gallon equivalent

kWh - kilowatt hour

MMBtu - One million British Thermal Units

Conversion Factors:

6.81 DGE per MMBtu

Table 4.2-7. Energy Usage Associated with Emergency Generators
Mineta San Jose International Airport
San Jose, California

Standby Diesel Engine ID[1,2]	Horsepower[1]	2018 Operating Hours[1,2,3]	Annual Diesel Fuel Usage[4]
			gal/year
S-1	67	17	58
S-3	1,135	6.5	369
S-6	416	8.1	168
S-8	277	8.5	118
S-9	170	5.2	44
S-10	109	25	136
S-11	109	156	850
S-12	116	7.4	43
S-13	102	0	0
S-14	269	129	1,735
S-15	535	6.4	171
S-16	535	6.5	174
S-18	377	50	943
S-19	2,200	10	1,100
S-20	2,200	16	1,760
S-21	2,200	10	1,100
S-22	375	7.1	133
S-23	2,937	6.1	896
S-24	2,220	9.0	999
S-25	2,206	7.1	783
S-27	145	5.1	37
		Facility Total	**11,617**

Notes:

[1] Generator information is for the existing equipment.

[2] Source S-13 was removed and is no longer operational at the Airport. Airport does not have data on S-18. It was conservatively assumed to operate up to the maximum number of permitted hours.

[3] 2018 operating hours were based on actual usage. Operating hours are expected to stay the same in 2037 and there is no plan to replace the existing generators or add additional generators. Therefore, usage in 2037 is assumed to same as in 2018.

[4] Total horsepower-hours was converted to fuel usage based on a fuel usage rate of 0.05 gallons of diesel per horsepower hour, based on SCAQMD CEQA Air Quality Handbook, Table A9-3E.

Abbreviations:

CEQA - California Environmental Quality Act

gal - gallon

SCAQMD - South Coast Air Quality Management District

Table 4.2-8. Utility Demand per Million Annual Passengers (MAP) (2018)
Mineta San Jose International Airport
San Jose, California

Utility	Demand per MAP	
Water	4,269.9	ccf/MAP
Waste Generated	120.6	tons/MAP
Electricity	2,144.9	MWh/MAP

Notes:

[1] Site specific utility usage for baseline (July 2017- June 2018). The demand per MAP metric was derived by dividing the utility quantity by a MAP of 14.8.

Abbreviations:

ccf - hundred cubic feet

MAP - million annual passengers

MWh - megawatt hours

Table 4.2-9. Energy Usage Associated with Utility Demand
Mineta San Jose International Airport
San Jose, California

	Baseline (2018)	Project[1] (2037)
Purchased Electricity Usage[2] (kWh/yr)	31,744,725	48,260,562
Purchased Water Usage (ccf/yr)	63,194	96,072
Water Electricity (kWh/yr)[3]	100,076	152,142

Notes:

[1] The Project utility demands are calculated by multiplying the demand per MAP in Table 4.2-7 by the projected increase in passengers in 2037.

[2] Purchased electricity includes total terminal and ground service equipment (GSE).

[3] Water Electricity Intensity is 2,117 kWh/million gallons from CalEEMod Table 9.2 for Supply Water in Santa Clara County, California. Available from http://www.aqmd.gov/docs/default-source/caleemod/05_appendix-d2016-3-2.pdf?sfvrsn=4.

Abbreviations:

ccf - hundred cubic feet

GSE - ground service equipment

kWh - kilowatt hour

yr - year

Table 4.2-10. Energy Usage Associated with Hotel
Mineta San Jose International Airport
San Jose, California

Energy Type	Amount[1]	Unit
Natural Gas Usage	6,646,500	kBTU
Electricity Usage	1,993,500	kWh
Mobile Gasoline Usage[2]	118,393	gallons
Mobile Diesel Usage[2]	23,712	gallons
Mobile Natural Gas Usage[2]	170	kBTU
Mobile Electricity Usage[2]	770,353	kWh
Water Electricity[3]	1,969	kWh

Notes:

[1] Energy usage for operations of hotel land use in 2037 were calculated using CalEEMod® version 2016.3.2.

[2] Mobile usage is calculated using the fuel efficiencies noted in **Table 4.2-4** using the annual vehicle miles travelled calculated in CalEEMod®.

[3] Water Electricity Intensity is 2,117 kWh/million gallons from CalEEMod Table 9.2 for Supply Water in Santa Clara County, California. Available at: http://www.aqmd.gov/docs/default-source/caleemod/05_appendix-d2016-3-2.pdf?sfvrsn=4.

Abbreviations:

kBTU - thousand British Thermal Units

kWh - kilowatt hours

Table 4.2-11. Summary of Baseline Energy Usage
Mineta San Jose International Airport
San Jose, California

Source		Baseline Energy Usage (2018)[1]	Units
Aircraft & GSE			
Aircraft	Aviation Gasoline	65,950	Gallons
	Jet Fuel	14,231,115	Gallons
GSE	Gasoline	102,911	Gallons
	Diesel	119,545	Gallons
Mobile Sources			
Traffic	Gasoline	10,443,492	Gallons
	Diesel	1,688,387	Gallons
	Natural Gas	8,248	MMBtu
	Electricity	1,410,745	kWh
Airport Shuttles	CNG	19,964	MMBtu
	Electricity	0	kWh
Airside (Off-Road) Equipment	Gasoline	3,431	Gallons
	Diesel	4,585	Gallons
Stationary Sources			
Central Plant Boilers	Natural Gas	19,772	MMBtu
Non-Central Plant Boilers	Natural Gas	1,844	MMBtu
Emergency Generators	Diesel	11,617	Gallons
Utilities			
Electricity Usage		31,744,725	kWh
Water Electricity		100,076	kWh

Notes:
[1] Baseline (2018) energy usage based on prior tables and the **Greenhouse Gas Technical Report**.

Abbreviations:
kWh - kilowatt hours
MMBtu - One million British Thermal Units
MMscf - One million standard cubic feet

Conversion Factors:
1,020 MMBtu/MMscf

Table 4.2-12. Summary of Project Energy Usage by Source Category
Mineta San Jose International Airport
San Jose, California

Source		Total Energy Usage (2037)[1]	Units	Proposed Project Energy Usage[2]	Units
Aircraft & GSE					
Aircraft	Aviation Gasoline	24,889	Gallons	-41,062	Gallons
	Jet Fuel	27,820,361	Gallons	13,589,246	Gallons
GSE	Gasoline	148,256	Gallons	45,345	Gallons
	Diesel	161,563	Gallons	42,018	Gallons
Mobile Sources					
Traffic	Gasoline	9,973,819	Gallons	-469,673	Gallons
	Diesel	1,997,592	Gallons	309,205	Gallons
	Natural Gas	14,286	MMBtu	6,039	MMBtu
	Electricity	5,840,740	kWh	4,429,995	kWh
Airport Shuttles	Natural Gas	0	MMBtu	-19,964	MMBtu
	Electricity	1,771,795	kWh	1,771,795	kWh
Airside (Off-Road) Equipment	Gasoline	5,217	Gallons	1,785	Gallons
	Diesel	6,971	Gallons	2,386	Gallons
Stationary Sources					
Central Plant Boilers	Natural Gas	30,059	MMBtu	10,287	MMBtu
Non-Central Plant Boilers	Natural Gas	2,803	MMBtu	959	MMBtu
Emergency Generators	Diesel	11,617	Gallons	0	Gallons
Utilities					
Electricity Usage		48,260,562	kWh	16,515,837	kWh
Water Electricity		152,142	kWh	52,066	kWh
New Land Use Type					
Hotel	Natural Gas	6,647	MMBtu	6,647	MMBtu
	Electricity	1,993,500	kWh	1,993,500	kWh
	Mobile Gasoline	118,393	gallons	118,393	gallons
	Mobile Diesel	23,712	gallons	23,712	gallons
	Mobile Natural Gas	0.17	MMBtu	0.17	MMBtu
	Mobile Electricity	770,353	kWh	770,353	kWh
	Water Electricity	1,969	kWh	1,969	kWh

Notes:

[1] Total energy usage (2037) based on prior tables and the **Greenhouse Gas Technical Report**.

[2] Energy usage for the Proposed Project is the difference in Baseline (2018) usage, as shown in Table 4.2-11, and Total energy usage (2037).

Abbreviations:

kBTU - thousand British Thermal Units

kWh - kilowatt hours

MMBtu - One million British Thermal Units

MMscf - One million standard cubic feet

Conversion Factors:

1,020 MMBtu/MMscf

1,000 kBtu/MMBtu

Table 4.2-13. Summary of Project Energy Usage by Fuel Type
Mineta San Jose International Airport
San Jose, California

Fuel	Baseline Energy Usage (2018)	Total Energy Usage (2037)	Proposed Project Energy Usage[2]	Units
Aviation Gasoline	65,950	24,889	-41,062	Gallons
Jet Fuel	14,231,115	27,820,361	13,589,246	Gallons
Gasoline	10,549,835	10,245,685	-304,150	Gallons
Diesel	1,824,135	2,201,455	377,320	Gallons
Natural Gas	49,828	53,795	3,967	MMBtu
Electricity	33,255,546	58,791,060	25,535,514	kWh

Notes:

[1] Baseline (2018) and Total energy usage (2037) as estimated in prior tables and the **Greenhouse Gas Technical Report**.

[2] Proposed Project Energy Usage is equal to the difference between Baseline Energy Usage (2018) and Total Energy Usage (2037).

Abbreviations:

MMBtu - One million British Thermal Units

kWh - kilowatt hours

Table 5.2-1. Consistency with Applicable State Greenhouse Gas Reduction Strategies
Mineta San Jose International Airport
San Jose, California

#	Sector/Source	Strategy Description[1]	Consistency Analysis
Energy			
1	California Renewables Portfolio Standard (RPS) and SB 350	As most recently amended by SB 100 (2018), California's RPS increases the proportion of electricity from renewable sources to 33 percent renewable power by 2020; 50 percent renewable power by 2026; and, 60 percent renewable power by 2030. SB 350 (2015) also requires the State Energy Resources Conservation and Development Commission to double (by 2030) the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.	**Consistent.** The Project would not impair implementation of the state's RPS or the energy efficiency and conservation targets of SB 350. It also is noted that the Airport would use electricity provided by San Jose Clean Energy (SJCE), which is required to meet the state's RPS. SJCE is a non-profit, locally-controlled electricity generation service provider; it is estimated that the City of San Jose will initially see an 18 percent reduction in GHG emissions from electricity generation as a result of its formation. (See https://www.sanjosecleanenergy.org/about.)
2	California Code of Regulations, Title 24, Part 6	Energy efficiency standards for residential and nonresidential buildings that are updated approximately every three years.	**Consistent.** The Project would meet the Title 24 energy efficiency standards in effect at the time of building permit application. In addition, the Project would construct new and upgraded terminal buildings and all buildings with an occupied space greater than 10,000 square feet (ft^2) to achieve Leadership in Energy and Environmental Design (LEED) Silver standards. This is in line with the City of San Jose's New Construction Green Building Requirements. (See http://www.sanjoseca.gov/index.aspx?NID=1517).
3	Assembly Bill 1109	The Lighting Efficiency And Toxics Reduction Act (AB 1109) requires a reduction in average statewide electrical energy consumption by not less than 50 percent from the 2007 levels for indoor residential lighting and not less than 25 percent from the 2007 levels for indoor commercial and outdoor lighting by 2018.	**Consistent.** The Project would meet the applicable requirements of AB 1109. In addition, the Airport would replace existing lighting at Airport facilities and in Airport buildings with energy-efficient lighting.
4	California Code of Regulations, Title 24, Part 11	The California Green (CalGreen) Building Standards Code establishes green building standards for residential and nonresidential buildings to meet the goals of AB 32. Standards include requirements for site development, indoor and outdoor water use reduction, construction waste reduction, disposal and recycling, and building maintenance and operation.	**Consistent.** The Project would meet the CalGreen Building Standards Code in effect at the time of building permit application. In addition, the Project would construct new and upgraded terminal buildings and all buildings with an occupied space greater than 10,000 ft^2 to achieve LEED Silver standards.

Table 5.2-1. Consistency with Applicable State Greenhouse Gas Reduction Strategies
Mineta San Jose International Airport
San Jose, California

#	Sector/Source	Strategy Description[1]	Consistency Analysis
Mobile Sources			
5	AB 1493 (Pavley Regulations)	Reduces GHG emissions in new passenger vehicles from model years 2012-2016 (Phase I) and model years 2017–2025 (Phase II). Also reduces gasoline consumption to a rate of 31 percent of 1990 gasoline consumption (and associated GHG emissions) by 2020.	**Consistent.** The Project would not impair implementation of the AB 1493 regulations.
6	Low Carbon Fuel Standard (LCFS)	Establishes protocols for measuring and reducing the life-cycle carbon intensity of transportation fuels and helps to establish use of alternative fuels.	**Consistent.** The Project would not conflict with implementation of the LCFS. The Project also would construct public accessibly electric vehicle (EV) charging stations, which is consistent with the LCFS because it promotes the purpose of the LCFS to reduce the full fuel-cycle, carbon intensity of the transportation fuel pool used in California. Under the LCFS, electric vehicles carbon intensity are equal to the electricity grid, which is decreasing due to the influx of renewable electricity generation. In addition, the Project adopted a policy to purchase only alternate-fuel vehicles for the airport operations and maintenance vehicle fleet, which reduces emissions associated with conventionally-powered vehicles. Since 2000, 25% of the Airport's vehicle fleet is alternate fuel or clean energy-powered.
7	Advanced Clean Cars (ACC) Program	In 2012, the California Air Resources Board (CARB) adopted the ACC program to reduce criteria pollutant emissions and GHG emissions for model year vehicles 2015 through 2025. ACC includes the Low-Emission Vehicle (LEV) regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the Zero-Emission Vehicle (ZEV) regulations that require manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles (PHEV) in the 2018 through 2025 model years.	**Consistent.** The Project would not conflict with implementation of the ACC program. The Project's installation of publicly-accessible EV charging stations also would be consistent with the objective of the ZEV regulations to facilitate fleet turnover from internal combustion engine vehicles to alternatively fueled vehicles.
8	SB 375	SB 375 establishes mechanisms for the development of regional targets for reducing passenger vehicle GHG emissions. Under SB 375, CARB is required, in consultation with the state's Metropolitan Planning Organizations, to set regional GHG reduction targets for the passenger vehicle and light-duty truck sector for 2020 and 2035.	**Consistent.** Table 5.2-2 demonstrates the Project's consistency with SB 375 through its consistency with the Plan Bay Area 2040. Table 5.2-2 also describes the Project's relevant transportation-related mitigation measures.

Table 5.2-1. Consistency with Applicable State Greenhouse Gas Reduction Strategies
Mineta San Jose International Airport
San Jose, California

#	Sector/Source	Strategy Description[1]	Consistency Analysis
Water			
9	Senate Bill X7-7	The Water Conservation Act of 2009 sets an overall goal of reducing per capita urban water use by 20 percent by December 31, 2020. Each urban retail water supplier shall develop water use targets to meet this goal.	**Consistent.** The Project will meet the CalGreen Building Standards Code in effect at the time of building permit application; these standards include water conservation measures. Also of note, the San Jose Water Company provides water to the Airport and has sufficient supply to meet the projected demands of the Airport over the studied planning horizon. The San Jose Water Company has implemented a robust water conservation program since the early 1990s and encourages customers to reduce water consumption by 20%. It also is noted that the Airport uses recycled water for toilet flushing and landscaping, which consists of primarily native and drought tolerant plants to reduce water use. Recycled water is treated and provided by South Bay Water Recycling (SBWR), which is a City agency with a network of over 100 miles of purple pipes throughout Santa Clara County.
Solid Waste			
10	California Integrated Waste Management Act (IWMA) of 1989 and Assembly Bill (AB) 341.	The IWMA mandated that state agencies develop and implement an integrated waste management plan which outlines the steps to be taken to divert at least 50 percent of their solid waste from disposal facilities. AB 341 directs CalRecycle to develop and adopt regulations for mandatory commercial recycling and sets a statewide goal for 75 percent disposal reduction by the year 2020.	The Project will utilize the Airport's existing recycling and waste diversion programs, and will be served by the City of San Jose's contract with San Jose Green Team and Green Waste. The Airport has a goal for zero waste by 2022 and, by implementing existing recycling programs and waste separation, the Airport currently diverts 85% of its waste from landfill trash. (See https://www.flysanjose.com/node/496.) In accordance with the Zero Waste International Alliance definition that Zero Waste is diverting 90 percent of all discarded materials form landfills, incinerators, and the environment.

Note:
[1] Only the strategies relevant to the GHG emissions inventory are included.

Abbreviations:
AB - Assembly Bill
ACC - Advanced Clean Cars
CalGreen - California Green Building Standards Code
CARB - California Air Resources Board
CCR - California Code of Regulations
EV - Electric Vehicle
GHG - Greenhouse Gas
IWMA - Integrated Waste Management Act
PHEV - Plug-in hybrid electric vehicles
RPS - Renewable Portfolio Standard
SJCE - San Jose Clean Energy
ZEV - Zero Emission Vehicle

Table 5.2-2. Consistency with Applicable Plan Bay Area 2040 Actions and Strategies
Mineta San Jose International Airport
San Jose, California

#	Goal[1]	Consistency Analysis
1	Climate Protection. Transitioning to a post-carbon economy and achieving ambitious greenhouse gas reduction targets for 2030 and 2050 by first reducing per-capita CO2 emissions from passenger vehicles by 2035.	**Consistent.** The SB 743 analysis prepared for the Proposed Project confirms that the project-generated VMT would represent an approximately XX percent reduction from the baseline condition the Airport adopted a policy to purchase only alternate-fuel vehicles for the airport operations and maintenance vehicle fleet, which reduces emissions associated with conventionally-powered vehicles. Since 2000, 25% of the Airport's vehicle fleet has been transitioned to alternate fuel or clean energy power. Furthermore, the Airport has implemented and continues to implement the following strategies to reduce GHG emissions from passenger vehicles: - Completed a consolidated rental car facility in 2010, which has increased the efficiency of rental car movement and shuttle bus service to/from the facility; - Providing free bus and rail passes to Airport employees since 1998; - Converting the shuttle bus fleet to compressed natural gas (CNG) in 2008; - Purchasing ten (10) electric shuttle buses in February 2019; - Upgrading various on-Airport roadways to reduce congestion, delay and queueing; - Providing free shuttle bus service between the Airport and the Metro Light Rail Train (LRT) Station and Santa Clara CalTrain Station since 1998; - Constructing publicly-accessible electric vehicle (EV) charging stations; - Requiring at least 25% of all taxi/van trips to and from the Airport to be by low- or zero-emission vehicles; and, - Disseminating information on public transit systems in the Airport terminals and on the Airport's website.
2	Transportation System Effectiveness. Increasing the use of non-auto modes, such as public transport, walkability, and bikability.	**Consistent.** As described above, the Airport provides free bus/rail passes to employees to allow unlimited use of Santa Clara Valley Transportation Authority's (VTA) bus and LRT systems, provides a free shuttle bus service connecting the Airport with the Metro LRT Station and Santa Clara CalTrain Station, and encourages public transit by disseminating information on public transit systems in Airport terminals and on Airport website. SJC has facilitated bicycle access to the Airport through the construction of a bike lane around the north end of the airfield and construction of a connection to the Guadalupe River Trail at Airport Parkway. The Airport is currently installing two sets of bicycle lockers in the terminal area for public use, one in the Terminal A baggage claim facility, and one in Hourly Parking Lot 3 directly opposite Terminal B. Bicycle parking for employees at the Airport is also provided within individual facilities.
3	Transportation. Reducing transportation-related emissions of greenhouse gases that cause climate change.	**Consistent.** The Airport adopted a policy to purchase only alternate-fuel vehicles for the airport operations and maintenance vehicle fleet, which reduces emissions associated with conventionally-powered vehicles. Since 2000, 25% of the Airport's vehicle fleet has been transitioned to alternate fuel or clean energy power. In addition, the Airport has implemented and continues to implement the following strategies to reduce GHG emissions from passenger vehicles: - Completed a consolidated rental car facility in 2010, which has increased the efficiency of rental car movement and shuttle bus service to/from the facility; - Providing free bus and rail passes to Airport employees since 1998; - Converting the shuttle bus fleet to compressed natural gas (CNG) in 2008; - Purchasing ten (10) electric shuttle buses in February 2019; - Upgrading various on-Airport roadways to reduce congestion, delay and queueing; - Providing free shuttle bus service between the Airport and the Metro Light Rail Train (LRT) Station and Santa Clara CalTrain Station since 1998; - Constructing publicly-accessible electric vehicle (EV) charging stations; - Requiring at least 25% of all taxi/van trips to and from the Airport to be by low- or zero-emission vehicles; - Developing cellphone lots to encourage drivers picking up passengers to wait in the designated lot; - Creating a taxi dispatch system that requires taxis to park in designated areas until they are dispatched; and, - Disseminating information on public transit systems in the Airport terminals and on the Airport's website.

Note:
[1] Only the goals relevant to the GHG emissions inventory are included.

Reference:
Metropolitan Transportation Commission and Association of Bay Area Governments. (2017, July). Plan Bay Area 2040 Regional Transportation Plan and Sustainable Communities Strategy for the San Francisco Bay Area 2017-2040. Available from http://2040.planbayarea.org/cdn/farfuture/u_7TKELkH2s3AAiOhCyh9Q9QlWEZIdYcJzi2QDCZuIs/1510696833/sites/default/files/2017-11/Final_Plan_Bay_Area_2040.pdf.

Abbreviations:

CNG- Compressed natural gas	LRT- light rail transit
EV- Electric vehicle	VTA- Santa Clara Valley Transportation Authority

Table 5.2-3. Consistency with Applicable Climate Smart San Jose Measures
Mineta San Jose International Airport
San Jose, California

#	Strategy[1]	Consistency Analysis
Pillar 1: A Sustainable and Climate Smart City		
1.1	Transitioning to a renewable energy future provides clean electricity that supplies the entire city	**Consistent.** The Airport is expected to receive electricity from San Jose Clean Energy (SJCE). Electricity sourced by SJCE is expected to be 80 percent carbon free, with options to upgrade to 100 percent renewable energy. While SJCE will source cleaner energy from various carbon-free options like solar, wind, and hydropower, it is expected to supply the electricity to the California State's electricity grid, which will then be transmitted and delivered by Pacific Gas & Electric (PG&E). In addition, in 2010, the Airport constructed a 1-megawatt photovoltaic system on the roof of the new consolidated rental car facility, which provides 20% of the rental car facility's power.
1.2	Embracing our Californian climate means creating an urban landscape, in our homes and public places, that is not just low water use, but attractive and enjoyable	**Consistent.** The Airport uses recycled water for toilet flushing and landscaping, which consist of primarily native and drought tolerant plants to reduce water use. Recycled water is treated and provided by South Bay Water Recycling (SBWR), which is a City agency with a network of over 100 miles of purple pipes throughout Santa Clara County.
Pillar 2: A Vibrant City of Connected & Focused Growth		
2.1	Densifying our city in focused growth areas increases walkability and cycling and also makes our neighborhoods more vibrant, distinctive, and enjoyable	**Consistent.** The Airport supports sustainable land use by providing free bus/rail passes to employees to allow unlimited use of Santa Clara Valley Transportation Authority's (VTA) bus & light rail transit (LRT) systems, providing a free shuttle bus service connecting the Airport with the Metro LRT Station and Santa Clara CalTrain Station, and encouraging public transit by disseminating information on public transit systems in Airport terminals and on the Airport's website. SJC has facilitated bicycle access to the Airport through the construction of a bike lane around the north end of the airfield and construction of a connection to the Guadalupe River Trail at Airport Parkway. The Airport is currently installing two sets of bicycle lockers in the terminal area for public use, one in the Terminal A baggage claim facility, and one in Hourly Parking Lot 3 directly opposite Terminal B. Bicycle parking for employees at the Airport is also provided within individual facilities.
2.3	New technology can enable clean, electric, and personalized mobility choices that make it convenient to move between any two points in the city	**Consistent.** The Airport has implemented several initiatives to enable clean, electric, and personalized mobility choices, such as the following: - Publicly-accessible electric vehicle (EV) charging stations - A consolidated rental car facility - A CNG fueling station - A taxi dispatch system - Free shuttle bus service between the Airport and the Metro LRT Station and Santa Clara CalTrain Station In addition, the Airport requires that at least 25% of all taxi/van trips to/from the Airport to be by low- or zero-emission vehicles, as facilitated by grants from the Airport and VTA.

Table 5.2-3. Consistency with Applicable Climate Smart San Jose Measures
Mineta San Jose International Airport
San Jose, California

#	Strategy[1]	Consistency Analysis
2.4	Developing integrated, accessible public and active transport infrastructure reduces the dependency on the car to move within the city	**Consistent.** The Airport supports public transit by providing free bus/rail passes to employees to allow unlimited use of VTA's bus and LRT systems, providing a free shuttle bus service connecting the Airport with the Metro LRT Station and Santa Clara CalTrain Station, and encouraging public transit by disseminating information on public transit systems in Airport terminals and on Airport website.
Pillar 3: An Economically Inclusive City of Opportunity		
3.1	Creating local jobs in our City makes it possible for our residents to work close to where they live, saving time, money, and gas spent commuting	**Consistent.** The expansion of the Airport to accommodate the projected demand for aviation services would lead to more jobs within the City; new Airport employees, like existing employees, would be provided with access to free bus/rail passes, which include unlimited use of VTA's bus & light rail transit (LRT) systems and free shuttle bus service connecting the Airport with the Metro LRT Station and Santa Clara CalTrain Station.
3.2	Making our commercial buildings high-performance and siting them close to transit lowers water and energy use	**Consistent.** The Project would construct new and upgraded terminal buildings and all buildings with an occupied space greater than 10,000 square feet would be designed to achieve Leadership in Energy and Environmental Design (LEED) Silver standards. The Airport also supports public transit use via implementation of the strategies described in concert with the evaluation of Project consistency with strategies considered above.
3.3	Moving commercial goods through our city more efficiently with new technology and fleet management practices	**Consistent.** The Airport facilitates goods movement within the city via cargo operations. Reductions associated with this measure are in line with State's Scoping Plan.

Note:
[1] Only the strategies relevant to the GHG emissions inventory are included.

Reference:
City of San Jose. (2018, February). Climate Smart San Jose. A People-Centered Plan for a Low-Carbon City. Available from http://www.sanjoseca.gov/DocumentCenter/View/75035.

Abbreviations:
LED - Light-emitting diode
LEED- Leadership om Energy and Environmental Design
LRT- Light rail transit
SBWR- South Bay Water Recycling
VTA- Santa Clara Valley Transportation Authority

Table 5.2-4. Consistency with Applicable Envision San Jose 2040 Measures
Mineta San Jose International Airport
San Jose, California

#	Strategy[1]	Consistency Analysis
Measurable Environmental Sustainability		
MS-1	Green Building Policy Leadership	**Consistent.** The Project would be consistent with the City, State, and Regional policies incorporating various green building design and operation principles and sustainable construction practices as discussed in Tables 5.2-1, 5.2-2, and 5.2-3. For example, the Project would construct new and upgraded terminal buildings and all buildings with an occupied space greater than 10,000 square feet (ft^2) to achieve Leadership in Energy and Environmental Design (LEED) Silver standards. In addition, the Airport would replace existing lighting at Airport facilities and in Airport buildings with energy-efficient lighting.
MS-2	Energy Conservation and Renewable Energy Use	**Consistent.** The Project would be consistent with the City, State, and Regional policies incorporating energy conservation and renewable energy use as discussed in Tables 5.2-1, 5.2-2, and 5.2-3. For example, the Airport is served by the San Jose Clean Energy Program; electricity purchased for Airport facilities will be the default GreenSource mix of 45% renewables and 35% hydropower, which is 80% carbon free.
MS-3	Water Conservation and Quality	**Consistent.** In addition to meeting City, State, and Regional policies on water conservation, as described in Tables 5.2-1, 5.2-2, and 5.2-3, the Airport uses recycled water for toilet flushing and landscaping, which consist of primarily native and drought tolerant plants to reduce water use.
MS-5	Waste Diversion	**Consistent.** In addition to meeting City, State, and Regional policies on waste diversion, as described in Tables 5.2-1, 5.2-2, and 5.2-3, the Airport has a goal for zero waste by 2022 in its operations. By implementing composting and recycling programs, the Airport is currently diverting 85% of waste from landfill trash.
MS-6	Waste Reduction	**Consistent.** In addition to meeting City, State, and Regional policies on waste reduction, as described in Tables 5.2-1, 5.2-2, and 5.2-3, the Airport has a goal for zero waste by 2022 in its operations. By implementing composting and recycling programs, the Airport is currently diverting 85% of waste from landfill trash.
MS-7	Environmental Leadership and Innovation	**Consistent.** The Airport has implemented and continues to implement a number of programs that demonstrate it is an environmental leader and furthers innovation. For example, in addition to the programs and strategies described above in Tables 5.2-1, 5.2-2, and 5.2-3, the Airport supports the Guadalupe River Trail, which runs adjacent to the airfield and is part of the San Jose Green Vision Goal of creating 100 miles of interconnected trails. There are 20 storage spaces for bikes that are available near the Airport terminals for customers, travelers, and workers that are easily accessible from the Guadalupe River Park trail. The Airport also was the first airport in the western U.S. to be awarded a Voluntary Airport Low Emissions (VALE) grant by the Federal Aviation Administration (FAA) in 2009. Receipt of that multi-million dollar grant, in conjunction with the Airport's modernization program, allowed for 28 aircraft gates to be equipped with preconditioned air and ground power, which enables airlines to reduce their use of jet and diesel fuel while aircraft are parked at the gate. The VALE grant also enabled the Airport to purchase 11 off-road electric vehicles. (See https://www.flysanjose.com/environment/environment.)

Table 5.2-4. Consistency with Applicable Envision San Jose 2040 Measures
Mineta San Jose International Airport
San Jose, California

#	Strategy[1]	Consistency Analysis
MS-8	Environmental Stewardship	**Consistent.** The Airport has implemented and continues to implement a number of programs that demonstrate a commitment to environmental stewardship. In addition to the programs and strategies described above in Tables 5.2-1, 5.2-2, and 5.2-3, for example, the Airport has secured 84 acres of infield areas that serve as habitat for a resident population of Western Burrowing Owls, a California Species of Concern. (See https://www.flysanjose.com/environment/environment.)
MS-10	Air Pollution Emission Reduction	**Consistent.** The Project is undergoing environmental review under CEQA, including an evaluation of air quality impacts consistent with the Bay Area Air Quality Management District's (BAAQMD) CEQA Guidelines, which incorporate state and federal standards. Feasible air emission reduction measures will be identified and implemented, as applicable. In addition, please see discussion above in Tables 5.2-1, 5.2-2, and 5.2-3 regarding various strategies pertaining to air pollution emission reduction from mobile sources.
MS-13	Construction Air Emissions	**Consistent.** The Project will follow basic construction mitigation measures from the BAAQMD's CEQA Guidelines. In addition, the Airport or Airport's construction contractor will comply with the following engine requirements: 1. All off-road equipment greater than 25 horse power used in construction projects at the Airport shall have engines that meet Tier 4 Final off-road emission standards. 2. Diesel engines, whether for off-road or on-road equipment, shall not be left idling for more than two minutes, at any location, except as provided in exceptions to the applicable state regulations regarding idling for off-road and on-road equipment (e.g., traffic conditions, safe operating conditions). The contractor shall post legible and visible signs in English, Spanish, and Chinese, in designated queuing areas and at the construction site to remind operators of the two-minute idling limit. 3. The contractor shall instruct construction workers and equipment operators on the maintenance and tuning of construction equipment, and require that such workers and operators properly maintain and tune equipment in accordance with manufacturer specifications. 4. The environmental review officer may waive the equipment requirements of Subsection (1)(a) if: a particular piece of off-road equipment with an engine meeting Tier 4 Final emission standards is not regionally available to the satisfaction of the environmental review officer. If seeking a waiver from this requirement, the Airport or construction contractor must demonstrate to the satisfaction of the environmental review officer that the health risks from project construction do not exceed a total of 0.3 $\mu g/m^3$ or an excess cancer risk of 10-in-a-million at a sensitive receptor.

Table 5.2-4. Consistency with Applicable Envision San Jose 2040 Measures
Mineta San Jose International Airport
San Jose, California

#	Strategy[1]	Consistency Analysis
MS-14	Reduce Consumption and Increase Efficiency	**Consistent.** The Project would be consistent with the City, State, and Regional policies incorporating various green building design and operation principles and sustainable construction practices as discussed in Tables 5.2-1, 5.2-2, and 5.2-3. For example, the Project would construct new and upgraded terminal buildings and all buildings with an occupied space greater than 10,000 ft^2 to achieve LEED Silver standards. In addition, the Airport would replace existing lighting at Airport facilities and in Airport buildings with energy-efficient lighting. These types of strategies, and others described above, serve to reduce the Airport's consumption of resources and increase efficiency.
MS-15 and MS-16	Renewable Energy and Energy Security	**Consistent.** The Project would be consistent with the City, State, and Regional policies addressing renewable energy and energy security, as discussed in Tables 5.2-1, 5.2-2, and 5.2-3. For example, the Airport is served by the San Jose Clean Energy Program; electricity purchased for Airport facilities will be the default GreenSource mix of 45% renewables and 35% hydropower, which is 80% carbon free. In addition, in 2010, the Airport constructed a 1-megawatt photovoltaic system on the roof of the new consolidated rental car facility, which provides 20% of the rental car facility's power.
MS-17	Responsible Management of Water Supply	**Consistent.** In addition to meeting City, State, and Regional policies on water conservation, as described in Tables 5.2-1, 5.2-2, and 5.2-3, the Airport uses recycled water for toilet flushing and landscaping, which consist of primarily native and drought tolerant plants to reduce water use.
MS-18	Water Conservation	**Consistent.** In addition to meeting City, State, and Regional policies on water conservation, as described in Tables 5.2-1, 5.2-2, and 5.2-3, the Airport uses recycled water for toilet flushing and landscaping, which consist of primarily native and drought tolerant plants to reduce water use.
MS-21	Community Forest	**Consistent.** The Project would provide appropriate landscaping consistent with San Jose's Community Forest policies.
General Land Use Policies		
LU-1	General Land Use	**Consistent.** The Airport is part of the City's existing land use pattern. This Project would facilitate the ability of the Airport to meet the projected demand for aviation services, and thereby minimize the need for members of the traveling public to utilize other major commercial airports in the Bay Area region (such as SFO and OAK). SJC has facilitated bicycle access to the Airport through the construction of a bike lane around the north end of the airfield and construction of a connection to the Guadalupe River Trail at Airport Parkway. The Airport is currently installing two sets of bicycle lockers in the terminal area for public use, one in the Terminal A baggage claim facility, and one in Hourly Parking Lot 3 directly opposite Terminal B. Bicycle parking for employees at the Airport is also provided within individual facilities.

Table 5.2-4. Consistency with Applicable Envision San Jose 2040 Measures
Mineta San Jose International Airport
San Jose, California

#	Strategy[1]	Consistency Analysis
General City Design		
CD-2, CD-3, and CD-5	Function and Connections	**Consistent**. The Airport supports sustainable land use by providing free bus/rail passes to employees to allow unlimited use of Santa Clara Valley Transportation Authority's (VTA) bus & light rail transit (LRT) systems, providing a free shuttle bus service connecting the Airport with the Metro LRT Station and Santa Clara CalTrain Station, and encouraging public transit by disseminating information on public transit systems in Airport terminals and on Airport website. SJC has facilitated bicycle access to the Airport through the construction of a bike lane around the north end of the airfield and construction of a connection to the Guadalupe River Trail at Airport Parkway. The Airport is currently installing two sets of bicycle lockers in the terminal area for public use, one in the Terminal A baggage claim facility, and one in Hourly Parking Lot 3 directly opposite Terminal B. Bicycle parking for employees at the Airport is also provided within individual facilities.
Balanced Transportation System		
TR-1 thru TR-10	Balanced Transportation System	**Consistent.** See Table 5.2-2 for discussion of the balanced transportation options made available to members of the traveling public, as well as Airport employees. SJC has facilitated bicycle access to the Airport through the construction of a bike lane around the north end of the airfield and construction of a connection to the Guadalupe River Trail at Airport Parkway. The Airport is currently installing two sets of bicycle lockers in the terminal area for public use, one in the Terminal A baggage claim facility, and one in Hourly Parking Lot 3 directly opposite Terminal B. Bicycle parking for employees at the Airport is also provided within individual facilities.

Table 5.2-4. Consistency with Applicable Envision San Jose 2040 Measures
Mineta San Jose International Airport
San Jose, California

#	Strategy[1]	Consistency Analysis
Appendix 8. GHG Reduction Strategy for the City of San Jose, dated June 2011		
1	City Initiated Actions to Reduce Greenhouse Gases	The Project Plan would be consistent with the Climate Smart SJ measures as listed in Table 5.2-3.
2	GHG reductions through implementation of the Land Use Transportation / Diagram	The Project would be consistent with the Envision San Jose 2040 land use (LU) measures by accommodating projected growth in aviation demand at an existing airport facility within the City's jurisdictional boundaries.
3	GHG emission reductions attributed to General Plan policies	The Project would be consistent with the Climate Smart SJ measures as listed in Table 5.2-3 and the Envision San Jose 2040 measures as listed in this table above.

Note:
[1] Only the strategies relevant to the GHG emissions inventory are included.

Reference:
City of San Jose. (2018, February). Envision San Jose 2040 General Plan. Available from http://www.sanjoseca.gov/DocumentCenter/View/474.

Abbreviations:
BAAQMD - Bay Area Air Quality Management
CEQA - California Environmental Quality Act
GHG - greenhouse Gas
LRT - light rail transit
LU - land use
LEED - Leadership om Energy and Environmental Design
SJ - San Jose
SJC - Norman Y. Mineta San Jose International Airport
VMT - Vehicle miles traveled
VTA - Santa Clara Valley Transportation Authority