SFO Recommended Airport Development Plan

San Francisco Planning
Case No. **2017-007468ENV**

State Clearinghouse No. 201905001

Public Draft EIR	*Draft EIR Publication Date:*	April 16, 2025	*Written comments should be sent to:*
	Draft EIR Public Hearing Date:	May 22, 2025	**Kei Zushi** 49 South Van Ness Ave, Suite 1400 San Francisco, CA 94102 or cpc.sforadp@sfgov.org
	Draft EIR Public Comment Period:	April 16, 2025–June 2, 2025	

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Kei Zushi
49 South Van Ness Ave, Suite 1400
San Francisco, CA 94102
or cpc.sforadp@sfgov.org

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ABBREVIATIONS

Abbreviation	Definition
ACEIT	Airport Construction Emissions Inventory Tool
ADP	Draft Final Airport Development Plan
air board	California Air Resources Board
air district	Bay Area Air Quality Management District
Airport	San Francisco International Airport
airport commission	San Francisco Airport Commission
Airport Rules and Regulations	San Francisco International Airport Rules and Regulations
AirTrain	automated electric people-mover system operated by SFO
ALUC	Airport Land Use Committee
ALUCP	Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport
AOA	air operations area
APEZ	Air Pollutant Exposure Zone
APM	automated people mover system
ASCM	Airport standard construction measure
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
Basin Plan	Water Quality Control Plan for the San Francisco Bay Basin
bay area	San Francisco Bay Area
Bay Trail	San Francisco Bay Trail
bgs	below ground surface
BMP	best management practice
C/CAG	City/County Association of Governments of San Mateo
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CALGreen	California Green Building Standards Code
Caltrans	California Department of Transportation
CAP	clean air plan
CBC	California Building Code
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations

Abbreviation	Definition
City	City and County of San Francisco
CNEL	community noise equivalent level
CO	carbon monoxide
CONRAC	Consolidated Rental Car Center
dB	decibel
dBA	A-weighted decibel
DPM	diesel particulate matter
Draft EIR	draft environmental impact report
EB	eastbound
EMFAC2021	air board's EMission FACtor
ERO	Environmental Review Officer
EV	electric vehicle
FAA	Federal Aviation Administration
fire department	San Francisco Fire Department, Airport Bureau
FTA	Federal Transit Administration
general plan	San Francisco General Plan
GHG	greenhouse gas
HEPA	high-efficiency particulate air
hp	horsepower
HRA	health risk assessment
HVAC	heating, ventilation, and air conditioning
I-280	Interstate 280
I-380	Interstate 380
in/sec	inches per second
ITB	International Terminal Building
L_{10}, L_{50}, L_{90}	statistical description of what sound level is exceeded over some fraction (10, 50, or 90 percent) of a given observation period
lb/day	pounds per day
L_{dn}, or DNL	day-night average sound level (A-weighted)
LEED	Leadership in Energy and Environmental Design
L_{eq}	equivalent noise level
L_{max}	maximum instantaneous noise level registered during a measurement period
LTS	less than significant
LTSM	less than significant with mitigation

Abbreviation	Definition
Master Plan	San Francisco International Airport 1989 Master Plan, Final
MEISR	maximal exposed individual sensitive receptor
MEIW	maximum exposed individual worker
MLTP	Mel Leong Treatment Plant
MOC	United Airlines Maintenance and Operations Center
MOU	memorandum of understanding
mph	miles per hour
MTC	Metropolitan Transportation Commission
Muni	San Francisco Municipal Railway
MW	megawatt
$\mu g/m^3$	micrograms per cubic meter
NAAQS	National Ambient Air Quality Standards
NB	northbound
NCP	Noise Compatibility Program
ng/m^3	nanograms per cubic meter
NO	nitric oxide
NO_2	nitrogen dioxide
NOP	notice of preparation
NO_X	oxides of nitrogen
O&D	originating and destination
OAK	Metropolitan Oakland International Airport
OEHHA	California Office of Environmental Health Hazard Assessment
OFFROAD2017-ORION	air board’s 2017 Off-Road Equipment Model
OSHA	Occupational Safety and Health Administration
PG&E	Pacific Gas and Electric Company
planning commission	San Francisco Planning Commission
planning department	San Francisco Planning Department
PM_{10}	particulate matter
$PM_{2.5}$	fine particulate matter
police department	San Francisco Police Department, Airport Bureau
ppb	parts per billion
ppm	parts per million
PPV	peak particle velocity

Abbreviation	Definition
QTA	Quick Turn-Around
RADP	Recommended Airport Development Plan
RAP	recovery action plan
ROG	reactive organic gas
RON	Remain Over Night
SamTrans	San Mateo County Transit District
SB	southbound
sf	square feet
SFO	San Francisco International Airport
SFO LESS	SFO Lower Emissions via Sustainable Solutions Transportation
SJC	San José Mineta International Airport
SO_2	sulfur dioxide
STN	State Transportation Network
SUM	significant and unavoidable with mitigation
TAC	toxic air contaminant
TOG	total organic gas
TRU	transport refrigeration unit
U.S. 101	U.S. Highway 101
U.S. EPA	U.S. Environmental Protection Agency
VdB	vibration decibel
VMT	vehicle miles traveled
VOC	volatile organic compound
WB	westbound
ZEV	zero-emissions vehicle

GLOSSARY

aircraft apron. An *aircraft apron* is a defined area of an airport intended to accommodate aircraft for loading or unloading of passengers or cargo, refueling, parking, or maintenance.

aircraft operation. An *aircraft operation* is defined as either a takeoff or a landing.

airline yield. *Airline yield* is the average amount of revenue received per paying passenger flown one mile either into or out of the Airport.

airport influence areas. The *airport influence areas* are boundaries defined by the Comprehensive Airport Land Use Compatibility Plan for the Environs of SFO as areas where height, noise, overflight and safety standards, policies, and criteria are applied to certain proposed land use decisions.

aquitard. An *aquitard* is a compacted layer of clay, silt, or rock that acts as a barrier for groundwater. Aquitards can separate aquifers of different depths.

average day of the peak month. The *average day of the peak month* is commonly used for planning purposes. The peak month at SFO has historically and continues to be August.

A-weighted decibel (dBA). The *dBA*, or *A-weighted decibel*, refers to a scale of noise measurement that reflects the different frequencies that humans can hear. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. Except in carefully controlled laboratory experiments, a change of only 1 dBA in sound level cannot be perceived. Outside of the laboratory, a 3 dBA change is considered a perceptible difference while a 5 dBA change is considered readily noticeable. A 10 dBA increase in the level of a continuous noise represents a perceived doubling of loudness.

bearing. *Bearing* refers to a soil's ability to support weight.

bikeway classifications. *Class I bikeways* are bike paths with exclusive rights-of-way for use by people bicycling or people walking. *Class II bikeways* are striped within the paved areas of roadways and are established for the preferential use of people bicycling in separated bicycle lanes. Separated bicycle lanes provide a striped, marked, and signed lane that is buffered from vehicular traffic. These facilities, which are located on roadways, reserve 4 to 5 feet of space exclusively for bicycle traffic. *Class III bikeways* are signed bicycle routes that allow people bicycling to share travel lanes with vehicles and may include shared-lane markings such as "sharrows" that allow bicyclists to share the roadway with vehicles. *Class IV bikeways* are dedicated bicycle facilities that are separated from vehicular traffic by a buffer zone (also referred to as a "cycle track"). The separation from vehicular traffic could be by grade separations, flexible posts, inflexible physical barriers, or on-street vehicular parking.

biogenic gas. *Biogenic gas* is a product of shallow subsurface metabolism by microorganisms. The produced gas is largely methane but can contain up to 2 percent ethane, propane, butane, and pentane.

carbon neutrality; carbon neutral. *Carbon neutrality* means "net zero" emissions of greenhouse gases. In other words, it means that greenhouse gas emissions generated by sources such as transportation, power plants, and industrial processes must be less than or equal to the amount of carbon dioxide that is stored, both in natural sinks and through mechanical sequestration. Assembly Bill 1279 uses the terminology "net zero" and the *2022 Scoping Plan for Achieving Carbon Neutrality* uses the terminology *carbon neutrality* or *carbon neutral*. For purposes of this evaluation, these terms mean the same thing and are used interchangeably.

channeling. *Channeling* is the acceleration of wind as it travels through narrow spaces between buildings.

commercial ground transportation. *Commercial ground transportation* at airports include taxicabs, limousines, ride-booking services such as transportation network companies, shared-ride vans, courtesy vehicles and courtesy shuttles, scheduled vans and buses, charter vans and buses, and flight crew shuttles.

commercial-service airport. A *commercial-service airport* is a publicly owned airport that has at least 2,500 passenger boardings each year and receives scheduled passenger service, as statutorily defined under 49 U.S. Code section 47102(7).

downwashing. *Downwashing* occurs when tall buildings intercept stronger winds and redirect them to ground level.

embodied energy. *Embodied energy* is the total energy required for the extraction, processing, manufacture, and delivery of building materials to the building site.

fine-grained plastic soil. A *fine-grained plastic soil* is one that can accommodate continuous strain and deform under the forces without rupturing. Clay generally has high plasticity.

first flush. The *first flush* of stormwater is runoff generated by the first storm after an extended dry period. Pollutant concentrations tend to be higher in this stormwater because of the accumulation of pollutants during dry periods.

first-mile/last-mile. *First-mile/last-mile* refers to the distance between a transit stop and the beginning/origin or final destination. Transportation options include but are not limited to walking, bicycling, e-scooters, ride-sharing services, bicycle rentals, driving, and transit.

500-year flood zone. The *500-year flood zone* has a 0.2 percent chance of being equaled or exceeded in any given year.

fixed-base operator. A *fixed-base operator* is a commercial business granted the right by the airport sponsor to operate on an airport and provide aeronautical services such as fueling, hangar space, tie-down and aircraft parking, aircraft rental, aircraft maintenance, flight instruction, etc.

flap gate. A *flap gate* is a flow control device that functions as a check valve, allowing water to flow through it in only one direction. The flap gate usually consists of a flat plate that is hinged at the top of a culvert outfall.

greenfield site. A *greenfield site* refers to agricultural or forest land or an undeveloped site earmarked for commercial, residential, or industrial projects.

ground support equipment. *Ground support equipment*, usually found on the apron, is used to service aircraft between flights while on the ground. The role of this equipment generally involves ground power operations, passenger aircraft baggage loading and unloading, aircraft towing, and cargo/passenger loading operations.

Gate holdrooms. Gate *holdrooms, or departure lounge,* are gate seating areas situated in the airport terminal, where departing passengers wait for and ultimately board flights. Typical holdrooms include seating, standing areas, agent gate counter, boarding queue, circulation, technology, and amenities.

kiss-and-fly area. A *kiss-and-fly area* at an airport is a designated drop-off zone, usually outside of the departure terminal, where passengers can be dropped off without the need to park the car.

legacy pollutants. *Legacy pollutants* are water quality constituents that are considered harmful to human health or the environment that were historically emitted by industry or other human activities, and that are in general banned or significantly restricted from current usage. Examples include mercury, lead, polychlorinated biphenyl, and dichloro-diphenyl-trichloroethane.

level of service. *Level of service* is defined as a qualitative and quantitative measurement of comfort experienced by passengers using the airport passenger terminal facility.

managed lane. Unlike a mixed-use travel lane where any vehicle can use the lane at any time, a *managed lane* has a set of rules about who can use the lane and when. Examples of managed lanes include high-occupancy vehicle (HOV) lanes (i.e., carpool lanes) and high-occupancy toll (HOT) lanes (i.e., express lanes).

mean high tide. *Mean high tide* means the average height of all the daily high tides recorded over a specified period at a given location.

mean lower low water. *Mean lower low water* is the lowest of the two low tides per day averaged over a 19-year period.

microgrid. A *microgrid* is a self-sufficient energy system that serves a discrete geographic footprint, such as a college campus, hospital complex, business center, or neighborhood. Within microgrids are one or more kinds of distributed energy (e.g., solar panels, wind turbines, combined heat and power, generators) that produce its power.

moment magnitude. *Moment magnitude* (abbreviated "Mw") is a physical quantity that estimates the size of an earthquake based on the total energy it releases. The scale was developed for very large earthquakes. Moment magnitude gives the most reliable estimate of earthquake size.

movement area. The *movement area* of an airport is controlled by FAA airport traffic control tower and includes runways, taxiways, and other areas of an airport that are used for taxiing, takeoff, and landing of aircraft.

narrowbody aircraft. A *narrowbody aircraft* is an airliner with a fuselage wide enough to accommodate one passenger aisle with up to six seats.

navigational aids. *Navigational aids* are physical devices on the ground that aircraft can detect and fly toward.

navigable waters. *Navigable waters of the United States* refers to nonwetland aquatic features (other waters) that are regulated by the Clean Water Act.

non-movement area. The *non-movement area* of an airport is not controlled by FAA air traffic control and includes taxilanes and ramps or aprons, a defined area for aircraft parking, loading and unloading passengers or cargo, refueling, or maintenance.

ozone. *Ozone* is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROGs), which are also sometimes referred to as volatile organic compounds (VOCs) by some regulatory agencies, and oxides of nitrogen (NO_X) in the presence of sunlight. The main sources of ROG and NO_X, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels.

paleochannels. *Paleochannels* are ancient stream channels that formed when sea level was lower and surface water drainage cut channels in the surface sediments. Deposited sediments eventually covered the channels as sea level rose. Paleochannels can convey groundwater.

parking deficit. *Parking deficit* reflects conditions when the demand for parking spaces cannot be accommodated within the supply.

person trip. A *person trip* is a trip made by one person by any means of transportation (auto, transit, bicycling, walking, etc.).

pH. *pH* (from "potential of Hydrogen") provides a measure on a scale from 0 to 14 of the acidity or alkalinity of a solution, where 7 is neutral, greater than 7 is more basic (or alkaline), and less than 7 is more acidic.

practical airfield capacity. *Practical airfield capacity* is defined as the number of flights and operations the existing airfield can accept without incurring severe and unrecoverable delays. A number of factors derive practical airfield capacity at an airport, including runway configuration and geometry, weather conditions (for wind and visibility), and type of aircraft.

practical capacity. The *practical capacity* is defined as the maximum demand that can be accommodated and sustained without incurring severe or unrecoverable delays.

priority development areas. *Priority development areas* are places near public transit that are planned for new homes, jobs, and community amenities.

public-use airport. A *public-use airport* is an airport available for use by the general public without a requirement for prior approval by the airport owner or operator.

reclaimed water. *Reclaimed water* is wastewater that has been treated and converted to water that can be reused for other purposes.

Remain Over Night. *Remain Over Night aircraft parking areas* are used to store aircraft overnight at the airport, either at remote gates, remote parking stands or hangars.

roadway designations. Roadway designations typically include *freeways*, *major arterials*, *secondary arterials*, *collector streets*, and *local streets*. Each of these roadways has a different potential capacity for mixed-flow traffic. U.S. 101 and I-380 are classified as freeways; North Access Road, South Airport Boulevard, North McDonnell Road, and South McDonnell Road are secondary arterials; and Millbrae and San Bruno avenues are major arterials.

Runway Protection Zone. A *Runway Protection Zone* is a trapezoidal imaginary surface that extends from a runway end and identifies land areas to be kept clear of all above ground objects for safety of aircraft operations.

sand boil. A *sand boil* is sand and water that come out onto the ground surface during an earthquake as a result of liquefaction at shallow depth.

secure automated people mover. A *secure automated people mover* refers to a transit system that operates within an airport's secure area. Passengers using this system have already passed through security screening and are moving between areas where access is controlled, such as different concourses or gates.

sediment-sensitive water body. A *sediment-sensitive water body* is one that appears on the most recent 303(d) list for water bodies as impaired for sediment; has a U.S. Environmental Protection Agency–approved total maximum daily load implementation plan for sediment; or has the beneficial uses of cold freshwater habitat, fish migration, and fish spawning. Lower San Francisco Bay is not listed as impaired for sediment.

service headway. A *service headway* is the number of minutes between buses or trains on a particular bus route or light rail line.

shear strength. *Shear strength* refers to a soil's ability to resist lateral deformation under stress.

skycaps. *Skycaps* are porters employed at an airport who provide services to airline passengers such handling luggage, strollers, and car seats; performing curbside check-in; and assisting disabled or wheelchair-using passengers.

Stage 3 aircraft. A *Stage 3 aircraft* is an airplane that complies with noise standards set by the FAA and meets the more stringent limits established in 1977.

sterile automated people mover. A *sterile automated people mover* is a system that operates exclusively within the sterile or secured areas of an airport, or areas where incoming international passengers have yet to be processed through U.S. Customs and Boarder protection. This type of APM is crucial for international airports where passengers transit between international flights and customs or when connecting with another international flight without entering the host country.

sterile connector. Arriving international passengers must be kept separate from other passengers, visitors, or unauthorized airline employees until they have cleared all Federal Inspection Services by U.S. Customs and Border Protection. The *sterile connector* is required by U.S. Customs and Border Protection and provides a separate passenger corridor system from the aircraft gate to where primary inspection is conducted.

sub-basin. A *sub-basin* is a structural geologic feature where a larger basin is divided into a series of smaller basins with intervening intrabasinal highs.

swing gates. *"Swing" gates* direct arriving passengers either to U.S. Customs and Border Protection or directly into the boarding area, so they are able to serve both domestic and international arrivals. The benefit of a swing gate is the capability of a gate to accommodate both domestic and international flights and reduces overbuilding of facilities.

taxiways. *Taxiways* are routes used by airplanes to move to or from runways.

tenant employees. *Tenant employees* are employed by private companies, including but not limited to airlines, commercial service providers, ground support providers, and rental car companies.

total airline passengers. *Total airline passengers* include total enplaned and deplaned passengers and passengers who fly into and out of SFO on the same aircraft.

total maximum daily load. A *total maximum daily load* is a regulatory term in the U.S. Clean Water Act that describes a plan for restoring impaired waters. The total maximum daily load identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

transit priority area. A *transit priority area* is defined as an area within 0.5 miles of an existing or planned major transit stop. A "major transit stop" is defined in California Public Resource Code section 21064.3 as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service intervals of 15 minutes or less during the morning and afternoon peak commute periods.

Transportation Network Companies. *Transportation Network Companies* (TNCs) are ride-hail services such as Uber and Lyft.

widebody aircraft. A *widebody aircraft* is a jet airliner with a fuselage wide enough to accommodate two passenger aisles with seven or more seats.

worker receptors. *Worker receptors* include on-site Airport workers (SFO employees, airlines, and tenants). Worker receptors do not include construction workers or others who would be covered by worker exposure rules under state and federal Occupational Safety and Health Act mandates for hearing conservation programs.

SUMMARY

S.1 Introduction

This document is a draft environmental impact report (Draft EIR) for the San Francisco International Airport (SFO or the Airport) Recommended Airport Development Plan (RADP). This chapter of the Draft EIR provides a summary of the RADP, a summary of anticipated environmental impacts that could result with implementation of the RADP and identified mitigation measures, a summary of alternatives including identification of the environmentally superior alternative, and areas of controversy to be resolved.

S.2 Project Summary

The project sponsor, SFO, is proposing to implement the RADP, which involves a long-range plan to guide the Airport's development. The San Francisco Airport Commission (the airport commission) operates and manages the Airport as a department of the City and County of San Francisco. The RADP serves as a framework for future development at SFO and identifies various projects, including the improvement and development of terminal facilities, modification of certain non-movement areas of the airfield, and improvements to landside facilities to accommodate long-term aircraft operations and passenger activity levels at the Airport. The RADP provides for long-range development to accommodate activity levels forecast to reach approximately 506,000 annual aircraft operations, which is the estimated annual practical capacity of the existing runways regardless of whether the RADP is implemented.[1] The Federal Aviation Administration (FAA) approved SFO's constrained aviation activity forecast for use in planning in June 2014.[2] Passenger aircraft operations represent the largest portion of the 506,000 annual aircraft operations, which are forecast to accommodate approximately 71.1 million annual passengers considering the forecast passenger aircraft fleet mix.[3] Implementation of the RADP would not induce passenger demand (i.e., induce the public to choose to fly if and/or where they otherwise would not), nor would the RADP increase the capacity of the airfield, change the configuration of the existing runways, change the number of aircraft operations or aircraft types operating at the Airport (including cargo, private jets, and helicopters), or change the volume of annual passengers that choose to fly into and out of SFO (see Appendix C, Airport Facilities to Accommodate Aviation Demand).

S.3 Summary of Impacts and Mitigation Measures

This Draft EIR analyzes the potential environmental effects of the RADP. The initial study, which is included as Appendix B of this Draft EIR, determined that implementation of the RADP would have either no significant impacts, less-than-significant impacts, or impacts that can be reduced to less than significant with mitigation

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[1] The constrained forecast and ultimate airport capacity and delay simulation modeling analysis are contained in the Chapter 2 and Appendix B of the *Draft Final Airport Development Plan*, respectively.

[2] Fernando Yanez, Airport Planner, Federal Aviation Administration, "Federal Aviation Administration (FAA) Approval of San Francisco International Airport's Aviation Activity Forecasts," letter to John Bergener, Airport Planning Director, San Francisco International Airport, June 9, 2014.

[3] Aviation activity forecasts are based on national and regional economic modeling and regression analysis and aviation trends and incorporate FAA-required factors for public-use airports, including airline aircraft fleet mix considerations. Forecasts are initially prepared as unconstrained, assuming no physical or facility constraints would limit increases in aviation activity. At SFO, the practical capacity of the runways constrains the overall capacity of the airport and there is no feasible option for adding runway capacity at SFO. Therefore, the forecast used for the RADP represents a constrained condition reflecting the practical capacity of the runways. The associated forecast of annual passengers was based on an assessment of future airline fleet mix, considering the number of seats per aircraft and the estimated percentage of occupied seats.

for the following resource topic areas: land use and planning, aesthetics, population and housing, cultural resources, tribal cultural resources, greenhouse gas (GHG) emissions, wind, shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, mineral resources, energy, agriculture and forestry resources, and wildfire.[4]

The initial study found that implementation of the RADP could result in significant impacts associated with the resource topic areas listed below. Accordingly, Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, of this Draft EIR presents a detailed discussion and analysis of these resource topic areas.

- Section 3.A, Transportation and Circulation
- Section 3.B, Noise and Vibration
- Section 3.C, Air Quality

Table S-1 and **Table S-2**, p. S-26, summarize the potential impacts of the RADP, identify the significance of each impact, and present the full text of mitigation measures that would avoid or reduce significant impacts and would be required to be implemented if the RADP is approved. Impacts and mitigation measures presented in Chapter 3 of this Draft EIR are summarized in Table S-1. Impacts and mitigation measures presented in the initial study are summarized in Table S-2.

AIR QUALITY

As indicated in Table S-1 and discussed in detail in Section 3.C, Air Quality, the analysis conducted for this Draft EIR determined that implementation of the RADP would result in the following significant and unavoidable impact even after implementation of mitigation measures: During operation of subsequent RADP projects, there would be a cumulatively considerable net increase of the criteria air pollutant ROG, a precursor pollutant for ozone, for which the region is in nonattainment under an applicable federal or state ambient air quality standard (Impact AQ-4).[5]

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[4] The initial study determined that the RADP would have no impacts related to mineral resources, agriculture and forestry resources, and wildfire.

[5] *Ozone* is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROGs), which are also sometimes referred to as volatile organic compounds (VOCs) by some regulatory agencies, and oxides of nitrogen (NO_X) in the presence of sunlight. The main sources of ROG and NO_X, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels.

Table S-1 Summary of Impacts of the Proposed Project Identified in the EIR

Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
EIR Section 3.A, Transportation and Circulation			
Impact TR-1: Construction under the RADP would require a substantially extended duration; however, the effects would not create potentially hazardous conditions for people walking, bicycling, or driving or interfere with emergency access or accessibility for people walking or bicycling, or substantially delay transit.	LTS	No mitigation required.	NA
Impact TR-2: The RADP would not create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations.	LTS	No mitigation required.	NA
Impact TR-3: The RADP would not interfere with the accessibility of people walking or bicycling to and from the project site and adjoining areas, or result in inadequate emergency access.	LTS	No mitigation required.	NA
Impact TR-4: The RADP would not substantially delay public transit.	LTS	No mitigation required.	NA
Impact TR-5: The RADP would not cause substantial additional vehicle miles traveled or substantially induce automobile travel.	LTS	No mitigation required.	NA
Impact TR-6: The RADP would not result in a passenger or freight loading deficit.	LTS	No mitigation required.	NA

IMPACT CODES:
NA = Not applicable
NI = No impact
LTS = Less-than-significant or negligible impact; no mitigation required
LTSM = Less than significant impact with mitigation
S = Significant impact
SUM = Significant and unavoidable impact with mitigation

Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
Impact TR-7: The RADP would not result in a substantial parking deficit.	LTS	No mitigation required.	NA
Impact C-TR-1: Construction of RADP projects, in combination with cumulative projects, would not result in significant construction-related transportation impacts.	LTS	No mitigation required.	NA
Impact C-TR-2: The RADP, in combination with cumulative projects, would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations; would not interfere with the accessibility of people walking or bicycling, or result in inadequate emergency access; would not delay transit; would not cause substantial additional VMT or substantially induce automobile travel, or result in substantial loading or parking deficits.	LTS	No mitigation required.	NA
EIR Section 3.B, Noise and Vibration			
Impact NO-1: Construction of RADP projects could result in a substantial temporary or periodic increase in ambient noise levels at sensitive receptors in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	S	**Mitigation Measure M-NO-1: Nighttime Construction Noise Control.** For all nighttime construction staging activities associated with RADP projects taking place at the Aviador Lot, before issuance of a building permit, or prior to start of construction, the project sponsor shall submit a project-specific construction noise control plan to the ERO or the ERO's designee for approval. The construction noise control plan shall be prepared by a qualified acoustical engineer, with input from the construction contractor, and include all feasible measures to reduce construction noise. The construction noise control plan shall identify noise control measures to meet a performance target for nighttime staging activities at the Aviador Lot to not result in	LTSM

IMPACT CODES:
NA = Not applicable
NI = No impact
LTS = Less-than-significant or negligible impact; no mitigation required
LTSM = Less than significant impact with mitigation
S = Significant impact
SUM = Significant and unavoidable impact with mitigation

Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
		interior noise levels greater than 45 dBA at noise sensitive receptors during the nighttime period. The project sponsor shall ensure that requirements of the construction noise control plan are included in contract specifications. If nighttime construction is required, the plan shall include specific measures to reduce nighttime construction noise. The plan shall also include measures for notifying the public of construction activities, complaint procedures, and a plan for monitoring construction noise levels in the event complaints are received. The construction noise control plan shall include the following measures to the degree feasible, or other effective measures, to reduce construction noise levels: • Use construction equipment that is in good working order, and inspect mufflers for proper functionality; • Select “quiet” construction methods and equipment (e.g., improved mufflers, use of intake silencers, engine enclosures); • Use construction equipment with lower noise emission ratings whenever possible, particularly for air compressors; • Prohibit the idling of inactive construction equipment for more than five minutes; • Locate stationary noise sources (such as compressors) as far from nearby noise sensitive receptors as possible, muffle such noise sources, and construct barriers around such sources and/or the construction site; • Avoid placing stationary noise-generating equipment (e.g., generators, compressors) within noise-sensitive buffer areas (as determined by the acoustical engineer) immediately adjacent to neighbors;	

IMPACT CODES:
NA = Not applicable
NI = No impact
LTS = Less-than-significant or negligible impact; no mitigation required
LTSM = Less than significant impact with mitigation
S = Significant impact
SUM = Significant and unavoidable impact with mitigation

Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
		• Enclose or shield stationary noise sources from neighboring noise-sensitive properties with noise barriers to the extent feasible. To further reduce noise, locate stationary equipment in pit areas or excavated areas, if feasible; and • Install temporary barriers, barrier-backed sound curtains and/or acoustical panels around working powered impact equipment and, if necessary, around the project site perimeter. When temporary barrier units are joined together, the mating surfaces shall be flush with each other. Gaps between barrier units, and between the bottom edge of the barrier panels and the ground, shall be closed with material that completely closes the gaps, and dense enough to attenuate noise. The construction noise control plan shall include the following measures for notifying the public of construction activities, complaint procedures and monitoring of construction noise levels: • Designation of an on-site construction noise manager for the project; • Notification of neighboring noise sensitive receptors within 300 feet of the Aviador Lot at least 30 days in advance of nighttime staging activities that may generate exterior noise levels greater than 80 dBA or interior noise levels greater than 45 dBA at noise sensitive receptors during the nighttime period about the estimated duration of the activity; • A sign posted on-site describing noise complaint procedures and a complaint hotline number that shall always be answered during construction; • A procedure for notifying the planning department of any noise complaints within one week of receiving a complaint; • Conduct noise monitoring (measurements) during high-intensity construction activities to determine the effectiveness of noise	

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Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
		attenuation measures and, if necessary, implement additional noise control measures; and • A list of measures for responding to and tracking complaints pertaining to construction noise. Such measures may include the evaluation and implementation of additional noise controls at sensitive receptors.	
Impact NO-2: Construction of RADP projects could generate excessive groundborne vibration or groundborne noise levels.	S	**Mitigation Measure M-NO-2: Protection of Adjacent Buildings/Structures and Vibration Monitoring during Construction.** *Should a screening-level analysis comparing vibration levels for various pieces of equipment with the distance to adjacent buildings or structures for a subsequent RADP project determine that potential for building damage could occur, SFO would implement this mitigation measure or conduct a detailed vibration study demonstrating that groundborne vibration would not result in building damage.* Before issuance of a building permit or prior to start of construction, the project sponsor shall submit a project-specific Pre-construction Survey and Vibration Management and Monitoring Plan to the ERO or the ERO's designee for approval. The plan shall identify all feasible means to avoid damage to potentially affected buildings at. The project sponsor shall ensure that the following requirements of the Pre-Construction Survey and Vibration Management and Monitoring Plan are included in contract specifications, as necessary. *Pre-construction Survey.* Prior to the start of any ground-disturbing activity, the project sponsor shall engage a consultant to undertake a pre-construction survey of potentially affected buildings. If potentially affected buildings and/or structures are not potentially historic, a structural engineer or other professional with similar qualifications shall document and photograph the existing conditions of the potentially affected buildings and/or structures. The project sponsor shall submit the survey to the ERO or the	LTSM

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Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
		officer's designee for review and approval prior to the start of vibration-generating construction activity. If nearby affected buildings are potentially historic, the project sponsor shall engage a qualified historic preservation professional and a structural engineer or other professional with similar qualifications to undertake a pre-construction survey of potentially affected historic buildings. The pre-construction survey shall include descriptions and photographs of all identified historic buildings, including all facades, roofs, and details of the character-defining features that could be damaged during construction, and shall document existing damage, such as cracks and loose or damaged features (as allowed by property owners). The report shall also include pre-construction drawings that record the pre-construction condition of the buildings and identify cracks and other features to be monitored during construction. The qualified historic preservation professional shall be the lead author of the pre-construction survey if historic buildings and/or structures could be affected by the project. The pre-construction survey shall be submitted to the ERO for review and approval prior to the start of vibration-generating construction activity. *Vibration Management and Monitoring Plan.* The project sponsor shall undertake a monitoring plan to avoid or reduce project-related construction vibration damage to adjacent buildings and/or structures and to ensure that any such damage is documented and repaired. Prior to issuance of the Pre-Construction Environmental Compliance letter, the project sponsor shall submit the Plan to the ERO for review and approval. The Vibration Management and Monitoring Plan shall include, at a minimum, the following components, as applicable:	

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		• *Maximum Vibration Level.* Based on the anticipated construction and condition of the affected buildings and/or structures on adjacent properties, a qualified acoustical/vibration consultant in coordination with a structural engineer (or professional with similar qualifications) and, in the case of potentially affected historic buildings/structures, a qualified historic preservation professional, shall establish a maximum vibration level that shall not be exceeded at each building/structure on adjacent properties, based on existing conditions, character-defining features, soil conditions, and anticipated construction practices (common standards are a peak particle velocity [PPV] of 0.25 inch per second for historic and some old buildings, a PPV of 0.3 inch per second for older residential structures, and a PPV of 0.5 inch per second for new residential structures and modern industrial/commercial buildings). • *Vibration-generating Equipment.* The plan shall identify all vibration-generating equipment to be used during construction (including but not limited to site preparation, clearing, demolition, excavation, shoring, foundation installation, and building construction). • *Alternative Construction Equipment and Techniques.* The plan shall identify potential alternative equipment and techniques that could be implemented if construction vibration levels are observed in excess of the established standard (e.g., drilled shafts [caissons] could be substituted for driven piles, if feasible, based on soil conditions, or smaller, lighter equipment could be used in some cases). • *Pile Driving Requirements.* For projects that would require pile driving, the project sponsor shall incorporate into construction specifications for the project a requirement that the construction contractor(s) use all feasible means to avoid or reduce damage to	

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		potentially affected buildings. Such methods may include one or more of the following: – Incorporate “quiet” pile-driving technologies into project construction (such as drilled shafts, using sonic pile drivers, auger cast-in-place, or drilled-displacement), as feasible; and/or – Ensure appropriate excavation shoring methods to prevent the movement of adjacent structures • *Buffer Distances.* The plan shall identify buffer distances to be maintained based on vibration levels and site constraints between the operation of vibration-generating construction equipment and the potentially affected building and/or structure to avoid damage to the extent possible. • *Vibration Monitoring.* The plan shall identify the method and equipment for vibration monitoring to ensure that construction vibration levels do not exceed the established standards identified in the plan. – Should construction vibration levels be observed in excess of the standards established in the plan, the contractor(s) shall halt construction and put alternative construction techniques identified in the plan into practice, to the extent feasible. – The qualified historic preservation professional (for effects on historic buildings and/or structures) and/or structural engineer (for effects on historic and non-historic buildings and/or structures) shall inspect each affected building and/or structure (as allowed by property owners) in the event the construction activities exceed the vibration levels identified in the plan. – The structural engineer and/or historic preservation professional shall submit monthly reports to the ERO during	

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		vibration-inducing activity periods that identify and summarize any vibration level exceedances and describe the actions taken to reduce vibration. – If vibration has damaged nearby buildings and/or structures that are not historic, the structural engineer shall immediately notify the ERO and prepare a damage report documenting the features of the building and/or structure that has been damaged. – If vibration has damaged nearby buildings and/or structures that are historic, the historic preservation consultant shall immediately notify the ERO and prepare a damage report documenting the features of the building and/or structure that has been damaged. – Following incorporation of the alternative construction techniques and/or planning department review of the damage report, vibration monitoring shall recommence to ensure that vibration levels at each affected building and/or structure on adjacent properties are not exceeded. • *Periodic Inspections.* The plan shall identify the intervals and parties responsible for periodic inspections. The qualified historic preservation professional (for effects on historic buildings and/or structures) and/or structural engineer (for effects on historic and non-historic buildings and/or structures) shall conduct regular periodic inspections of each affected building and/or structure on adjacent properties (as allowed by property owners) during vibration-generating construction activity on the project site. The plan will specify how often inspections shall occur. • *Repair Damage.* The plan shall also identify provisions to be followed should damage to any building and/or structure occur due to construction-related vibration. The building(s) and/or structure(s) shall be remediated to their pre-construction	

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		condition (as allowed by property owners) at the conclusion of vibration-generating activity on the site. For historic resources, should damage occur to any building and/or structure, the building and/or structure shall be restored to its pre-construction condition in consultation with the qualified historic preservation professional and planning department preservation staff, and in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstruction Historic Buildings. • *Vibration Monitoring Results Report.* After construction is complete the project sponsor shall submit to the ERO a final report from the qualified historic preservation professional (for effects on historic buildings and/or structures) and/or structural engineer (for effects on historic and non-historic buildings and/or structures). The report shall include, at a minimum, collected monitoring records, building and/or structure condition summaries, descriptions of all instances of vibration level exceedance, identification of damage incurred due to vibration, and corrective actions taken to restore damaged buildings and structures. The ERO shall review and approve the Vibration Monitoring Results Report.	
Impact NO-3: Operation of RADP projects would not result in a substantial permanent increase in ambient noise levels at sensitive receptors in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	LTS	No mitigation required.	NA
Impact NO-4: Construction and operation of RADP projects would not expose people residing or working in an airport land use plan area to excessive noise levels.	LTS	No mitigation required.	NA

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Impact C-NO-1: Construction of RADP projects, in combination with cumulative projects, would not result in significant noise impacts.	LTS	No mitigation required.	NA
Impact C-NO-2: Construction of RADP projects, in combination with cumulative projects, would not generate excessive groundborne vibration or groundborne noise levels.	LTS	No mitigation required.	NA
Impact C-NO-3: Operation of RADP projects, in combination with cumulative projects, would not result in significant noise impacts.	LTS	No mitigation required.	NA
EIR Section 3.C, Air Quality			
Impact AQ-1 (Plan-Level Analysis): The RADP would not conflict with or obstruct implementation of the Clean Air Plan.	LTS	No mitigation required.	NA
Impact AQ-2 (Plan-Level Analysis): The RADP would not result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard.	LTS	No mitigation required.	NA

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<table>
<tr><th>Environmental Impact</th><th>Level of Significance prior to Mitigation</th><th>Mitigation Measures</th><th>Level of Significance after Mitigation</th></tr>
<tr><td>Impact AQ-3 (Representative Analysis of Subsequent RADP Projects): Construction of subsequent RADP projects could result in a cumulatively considerable net increase of any criteria air pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.</td><td>S</td><td>Mitigation Measure M-AQ-3a: Clean Off-Road Construction Equipment. Should a project-specific analysis determine that a medium or large project would result in a significant criteria air pollutant impact, this mitigation measure would be required. The project sponsor shall comply with the following:
1. Engine Requirements. All off-road equipment greater than 25 horsepower (hp) and operating for more than 20 total hours over the duration of construction shall meet the following requirements:
a. All off-road equipment greater than 25 horsepower and operating for more than 20 total hours over the entire duration of construction activities shall have engines that meet or exceed either U.S. Environmental Protection Agency (U.S. EPA) or California Air Resources Board (air board) Tier 4 Final off-road emission standards.
b. Where access to grid power is available, portable diesel engines (less than 25 horsepower) shall be prohibited.
c. Diesel engines, whether for off-road or on-road equipment, shall not be left idling for more than 2 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 project sponsor 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 2-minute idling limit. If the majority of the project sponsor's construction staff speak a language other than these, then the signs shall be posted in that language as well.
d. The project sponsor shall instruct construction workers and equipment operators on the maintenance and tuning of construction equipment and require that such workers and</td><td>LTSM</td></tr>
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		operators properly maintain and tune equipment in accordance with manufacturers' specifications. e. Any other best available technology in the future may be included, provided that the project sponsor submits documentation to the department demonstrating that (1) the technology would result in emissions reductions and (2) it would not increase other pollutant emissions or result in other additional impacts, such as noise. This may include new alternative fuels or engine technology for off-road or other construction equipment (such as electric or hydrogen fuel cell equipment) that is not available as of 2025. 2. *Waivers.* The environmental review officer (ERO) may waive the requirement of subsection (1)(b) regarding an alternative source of power if an alternative source is limited or infeasible at the project site. If the ERO grants the waiver, the project sponsor must submit documentation that the equipment used for onsite power generation meets the engine requirements of subsection (1)(a). The ERO may waive the equipment requirements of subsection (1)(a) if a particular piece of Tier 4 Final off-road equipment is technically not feasible, the equipment would not produce the desired emissions reduction because of expected operating modes, or a compelling emergency requires the use off-road equipment that is not Tier 4 Final compliant. In seeking a waiver, the project sponsor shall demonstrate that the project shall use the cleanest piece of construction equipment available and feasible and submit documentation that average daily construction emissions of reactive organic gases (ROG), oxides of nitrogen (NO_x), particulate matter of 2.5 microns in diameter or less ($PM_{2.5}$) would not exceed 54 pounds per day, and particulate matter of 10 microns in diameter or less (PM_{10}) emissions would not exceed 82 pounds per day.	

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		3. *Construction Emissions Minimization Plan.* Before starting onsite construction activities, the project sponsor shall submit a construction emissions minimization plan to the ERO for review and approval. The plan shall state, in reasonable detail, how the contractor will meet the requirements of item 1. – The Plan shall include estimates of the construction timeline by phase, with a description of each piece of off-road equipment required for every construction phase. The description may include, but is not limited to, equipment type, equipment manufacturer, equipment identification number, engine model year, engine certification (tier rating), horsepower, engine serial number, and expected fuel use and hours of operation. For off-road equipment using alternative fuels, the description shall also specify the type of alternative fuel being used. – The project sponsor shall ensure that all applicable requirements of the Plan have been incorporated into the project sponsor's contract specifications. The Plan shall include a certification statement that the project sponsor agrees to comply fully with the Plan. – The project sponsor shall make the Plan available to the public for review onsite during working hours. The project sponsor shall post at the construction site a legible and visible sign summarizing the Plan. The sign shall also state that the public may ask to inspect the Plan for the project at any time during working hours and shall explain how to request to inspect the Plan. The project sponsor shall post at least one copy of the sign in a visible location on each side of the construction site facing a public right-of-way. 4. Monitoring: After start of construction activities, the project sponsor shall submit reports every six months to the ERO	

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		documenting compliance with the Plan. After completion of construction activities and prior to receiving a final certificate of occupancy, the project sponsor shall submit to the ERO a final report summarizing construction activities, including the start and end dates, duration of each construction phase, and the specific information required in the Plan. **Mitigation Measure M-AQ-3b: Super-Compliant VOC Architectural Coatings during Construction.** *Should a project-specific analysis determine that a medium or large project would result in a significant ROG impact, the following mitigation measure would be required.* The project sponsor shall use “super-compliant” volatile organic compound (VOC) architectural coatings during construction for all interior and exterior spaces and shall include this requirement in plans submitted for review to the planning department. The project sponsor shall submit a signed certification statement that this requirement has been incorporated into contract specifications. “Super-compliant” refers to paints that meet the more stringent regulatory limits in South Coast Air Quality Management District rule 1113, which requires a limit of 10 grams VOC per liter (http://www.aqmd.gov/home/regulations/compliance/architectural-coatings/super-compliant-coatings).	
Impact AQ-4 (Representative Analysis of Subsequent RADP Projects): Operation of subsequent RADP projects would cause a cumulatively considerable net increase of a criteria air pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.	S	**Mitigation Measure M-AQ-4a: Best Available Emissions Controls for Stationary Emergency Generators.** *Should a project-specific analysis determine that a subsequent RADP project would result in a significant operational criteria air pollutants impact, the project sponsor would be required to implement this mitigation measure.* These features shall be submitted to the ERO for review and approval, and shall be included on the project drawings submitted for the construction-related permit(s) or on other documentation submitted to the City before the issuance of any building permits:	SUM

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		1. Permanent stationary emergency generators installed onsite shall have engines that meet or exceed California Air Resources Board Tier 4 Final Off-Road Compression-Ignition Engine Standards (California Code of Regulations title 13, section 2423). If the air board adopts future emissions standards that exceed the Tier 4 Final requirement, the emissions standards resulting in the lowest ROG emissions shall apply. 2. Non-diesel-fueled emergency generator technology (e.g., battery technology) shall be installed in new buildings, subject to the review and approval of the City fire department for safety purposes, provided that alternative fuels used in generators are demonstrated to reduce ROG emissions compared to diesel fuel. 3. For each new diesel backup generator permit submitted to the Bay Area Air Quality Management District (air district) for the RADP, the project sponsor shall submit the anticipated location and engine specifications to the planning department ERO for review and approval before the issuance of a permit for the generator. Once operational, all diesel backup generators shall be maintained in good working order for the life of the equipment, and any future replacement of the diesel backup generators must be consistent with these emissions specifications. The operator of the facility at which the generator is located shall maintain records of the testing schedule for each diesel backup generator for the life of that diesel backup generator and shall provide this information for review to the planning department within three months of requesting such information. **Mitigation Measure M-AQ-4b: Operational Truck Emissions Reduction.** *Should a project-specific analysis determine that a subsequent RADP project would result in a significant criteria air pollutants impact, this mitigation measure would be required.* The project sponsor shall comply with the following requirements:	

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		1. Prohibit transport refrigeration units (TRUs) from operating at loading docks for more than 30 minutes. Post signs at each loading dock identifying this TRU limit. 2. Prohibit trucks from idling for more than two minutes. Post "no idling" signs at the site entry point, at all loading locations, and throughout the project site. 3. Encourage the use of trucks equipped with TRUs that meet U.S. EPA Tier 4 emission standards. 4. Equip all newly constructed loading docks that can accommodate trucks with TRUs with electric vehicle charging equipment for heavy-duty trucks. This measure does not apply to temporary street parking for loading or unloading. **Mitigation Measure M-AQ-4c: Education of Tenants and Vendors Concerning Low-VOC Consumer Products.** *Should a project-specific analysis determine that a subsequent RADP project would result in a significant criteria air pollutants impact, this mitigation measure would be required.* Before the receipt of any building permit and every five years thereafter, the project sponsor shall develop electronic correspondence to be distributed by email or posted onsite annually to tenants of the project, encouraging the purchase of consumer products and paints that generate fewer VOC emissions. The correspondence shall encourage environmentally preferable purchasing and shall include contact information and links to SF Approved (https://www.sfapproved.org/). **Mitigation Measure M-AQ-4d: Super-Compliant VOC Architectural Coatings during Operations.** *Should a project-specific analysis determine that a subsequent RADP project would result in a significant criteria air pollutants impact, this mitigation measure would be required.* The project sponsor shall use "super-compliant" VOC architectural coatings during building maintenance for all interior	

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		and exterior spaces and shall include this requirement in plans submitted for review to the planning department. The project sponsor shall submit a signed certification statement that this requirement has been incorporated into contract specifications. "Super-compliant" refers to paints that meet the more stringent regulatory limits in South Coast Air Quality Management District rule 1113, which requires a limit of 10 grams VOC per liter (http://www.aqmd.gov/home/regulations/compliance/architectural-coatings/super-compliant-coatings). **Mitigation Measure M-AQ-4e: Electric Landscaping Equipment.** *Should a project-specific analysis determine that a subsequent RADP project would result in a significant criteria air pollutants impact, this mitigation measure would be required.* To reduce ROG emissions associated with the project, the project sponsor shall use only electric landscaping equipment. No landscaping equipment powered by gasoline, diesel, propane, or other fossil fuels shall be used. The project sponsor shall incorporate this requirement into the project design and tenant contracts (as applicable). **Mitigation Measure M-AQ-4f: Offset of Remaining ROG Emissions.** Should a project-specific analysis determine that the subsequent RADP project would result in operational-related ROG emissions that exceed the air district threshold of 10 tons per year (54 pounds per day on average) after implementation of Mitigation Measures M-AQ-4a, M-AQ-4b, M-AQ-4c, M-AQ-4d, and M-AQ-4e, the project sponsor, with the oversight of the planning department, shall implement one or more of the following measures. Alternatively, the project sponsor may submit documentation to the planning department demonstrating that the project has not exceeded the ROG emissions performance standard of 10 tons per year (or 54 lb/day) for each year, or that the required emissions offset is lower than that calculated herein. Such documentation would include a recalculation of the	

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		project's ROG emissions from all sources (including the emissions reductions achieved by the project or mitigation measures) using methods generally consistent with those used in the EIR. The following identifies potential mechanisms to offset ROG emissions that exceed the 10 tons per year performance standard. 1. *Directly fund or implement a specific offset project within the air basin.* Emission reduction projects shall occur in the following locations in order of priority to the extent available and feasible: (1) at the Airport; (2) offsite within the neighborhood surrounding the Airport; (3) within the city and county of San Francisco; and (4) within the air basin. Any offsite emission reduction projects are subject to approval by the City. Such projects could include strategies and control measures such as using zero-emission trucks, upgrading locomotives with cleaner engines, replacing existing diesel stationary and standby engines with Tier 4 diesel or cleaner engines, or expanding or installing energy storage systems (e.g., batteries, fuel cells) to replace stationary sources of pollution. Before the offset project is implemented, it must be approved by the planning department, as consistent with the requirements of this mitigation measure. 2. *Pay mitigation offset fees* to an independent third party approved by the planning department. The mitigation offset fee shall fund one or more emissions reduction projects within the air basin. Emission reduction projects shall occur in the following locations in order of priority to the extent available and feasible: (1) at the Airport; (2) offsite within the neighborhood surrounding the Airport; (3) within the city of South San Francisco, San Bruno, or Millbrae; (4) within San Mateo County; and (5) within the air basin. The fee will be determined through consultation between the project sponsor and the entity and will be based on the type of projects available at the time of the payment.	

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		3. *Memorandum of Understanding.* When paying a mitigation offset fee as described under item (2), the project sponsor shall enter into a memorandum of understanding (MOU) or other binding agreement with the independent third party. The MOU or agreement shall include details regarding the funds to be paid, the administrative fee, and the timing of the emissions reductions project(s). Acceptance of this fee by the independent third party shall serve as acknowledgment and a commitment to implement the emissions reduction project(s) within a time frame agreed upon in the MOU or agreement based on the type of project(s) selected, after receipt of the mitigation fee to achieve the emissions reduction objectives specified above. 4. *Waivers.* The ERO or designee may waive the requirement to achieve annual reductions or offsets of ROG equal to the amount required to reduce emissions below 10 tons per year (54 lb/day) after implementation of Mitigation Measures M-AQ-4a through MM-AQ-4e, and after all feasible offset projects are implemented and offset fees are paid as described above for a specific year of operational ROG emissions, if (1) sufficient ROG emission offset projects within the air basin, as described in item (1), are not available to reduce ROG emissions below 10 tons per year (54 lb/day) when they occur during project operations; (2) the offset projects or the mitigation offset fees, as described in item (3), are determined to be infeasible as defined under CEQA; or (3) the Federal Aviation Administration determines that funding offsets would violate the Airport's grant obligations. 5. *Offset Verification Report.* The project sponsor shall prepare an annual offset verification report as follows: a. *Offset Project Documentation:* Any offset project implemented, or offset fee paid, must result in ROG emission reductions within the air basin that are real, permanent, quantifiable,	

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		enforceable, and surplus as defined in the air district Regulation 2, Rule 2: New Source Review, sections 2-3-301, 2-2-211, 2-2-603, and 2-2-605. The project sponsor shall certify that each specific emission reduction offset project meets these requirements. The documentation shall quantify the ROG reduction(s) achieved by all offset projects to demonstrate that the gap between the project's mitigated emissions and the significance threshold of 10 tons per year (54 lb/day) of ROG has been met through the offset project(s). Each annual offset verification report shall demonstrate, based on substantial evidence, that the project has reduced ROG emissions below the thresholds of significance of 10 tons per year (54 lb/day) for each year of operations. Should the project sponsor choose to recalculate the project's annual ROG emissions and ROG offset requirement to achieve the performance standard of 10 tons per year (54 lb/day on average), the documentation shall quantify the ROG reduction(s) achieved by all offset projects to demonstrate that the gap between the project's mitigated emissions and the significance threshold of 10 tons per year (54 lb/day) of ROG has been met through the offset project(s). For this option, each offset verification report shall demonstrate, based on substantial evidence, that the project has reduced annual ROG emissions below the threshold of significance of 10 tons per year (54 lb/day). The requirement to fund an offset project(s) described in item (1) above and/or to pay mitigation offset fees through the MOU described in items (2) and (3) above shall terminate if the project sponsor is able to demonstrate that the project's operational emissions are less than 10 tons per year (54 lb/day).	

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		b. *Report Submittal.* The report shall be prepared by the project sponsor and submitted to the planning department for review and verification. Documentation of offset projects and mitigation offset payments, as applicable, shall be provided to the planning department for review and approval before the start of operation for the first year when project ROG emissions are predicted to exceed 10 tons per year (54 lb/day). If the planning department determines that the report is reasonably accurate, it shall approve the report; otherwise, the planning department shall identify deficiencies and direct the project sponsor to correct and resubmit the report for approval.	
Impact AQ-5 (Plan-Level and Representative Analysis of Subsequent RADP Projects): Construction and operation of RADP projects, individually or in combination, would not result in emissions of fine particulate matter ($PM_{2.5}$) or toxic air contaminants that would result in exposure of sensitive receptors to substantial air pollutant concentrations.	LTS	No mitigation required.	NA
Impact AQ-6 (Representative Analysis of Subsequent RADP Projects): Construction and operation of RADP projects would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	LTS	No mitigation required.	NA

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Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
Impact C-AQ-1: Construction and operation of the RADP, in combination with cumulative projects, would not result in exposure of sensitive receptors to substantial levels of fine particulate matter ($PM_{2.5}$) and toxic air contaminants under cumulative conditions.	LTS	No mitigation required.	NA
Impact C-AQ-2: Construction and operation of the RADP, in combination with cumulative projects, would not combine with other sources of odors that would adversely affect a substantial number of people.	LTS	No mitigation required.	NA

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Table S-2 Summary of Impacts of the Proposed Project Identified in the Initial Study

Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
Initial Study Section E.1, Land Use and Planning			
Impact LU-1: The RADP would not physically divide an established community.	LTS	No mitigation required.	NA
Impact LU-2: The RADP would not cause a significant physical environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	LTS	No mitigation required	NA
Impact C-LU-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact related to land use and planning.	LTS	No mitigation required	NA
Initial Study Section E.2, Aesthetics			
Impact AE-1: The RADP would not have a substantial adverse effect on a scenic vista or substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway, nor would the RADP substantially degrade the existing visual character or quality of public views of the site and its surroundings or conflict with applicable zoning and other regulations governing scenic quality.	LTS	No mitigation required	NA
Impact AE-2: The RADP would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.	LTS	No mitigation required	NA

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Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
Impact C-AE-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact related to aesthetics.	LTS	No mitigation required	NA
Initial Study Section E.3, Population and Housing			
Impact PH-1: The RADP would not induce substantial unplanned direct or indirect population growth.	LTS	No mitigation required	NA
Impact C-PH-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact related to population and housing.	LTS	No mitigation required	NA
Initial Study Section E.4, Cultural Resources			
Impact CR-1: The RADP could cause a substantial adverse change in the significance of a historical resource pursuant to section 15064.5, including those resources listed in article 10 of the San Francisco Planning Code.	S	**Mitigation Measure M-CR-1a: Identification and Minimization Measure.** *Applicable if a building proposed to be altered or demolished meets the 45-year age criterion and is determined to be a historic resource for purposes of CEQA.* Prior to implementation of a subsequent project, the project sponsor shall consult with the planning department to determine the historic status of any building proposed to be demolished or altered that meets the 45-year age criterion but has not been previously evaluated. Buildings shall be evaluated for eligibility for listing in the California Register and a determination shall be made regarding significance and integrity, and a list of character-defining features shall be identified. If a historic resource is identified, the project sponsor shall consult with the planning department's preservation and design staff on feasible means for avoiding or reducing significant adverse effects to identified historic resources. This could	LTSM

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		include, but is not limited to, retaining a portion of the existing building or retaining specific character-defining features and incorporating them into the project in a manner that is in conformance with the *Secretary of the Interior's Standards for Rehabilitation* (Secretary's Standards). If it is not possible to modify the project to be in conformance with the Secretary's Standards, the project sponsor and planning department will determine if there are modifications to the project that can be made to avoid causing material impairment to the historic resource. This may include changes to the project along with implementation of one or more of the following mitigation measures: M-CR-1b, Documentation; M-CR-1c, Salvage Plan; and M-CR-1d, Interpretation. If it is not possible to modify the project to avoid causing material impairment to the identified historic resource, additional environmental review will be required. **Mitigation Measure M-CR-1b: Documentation.** *Applicable if a building proposed to be altered or demolished meets the 45-year age criterion and is determined to be a historic resource for purposes of CEQA.* Prior to the issuance of demolition, building, or site permits, the project sponsor shall submit to the department for review photographic and narrative documentation of the subject building, structure, object, material, and landscaping. Documentation may apply to individually significant resources as well as district contributors and shall focus on the elements of the property that the project proposes to demolish or alter. The documentation shall be funded by the project sponsor and undertaken by a qualified professional who meets the standards for history, architectural history, or architecture (as deemed appropriate by the department's preservation staff), as set forth by the Secretary of the Interior's Professional Qualification Standards (36 Code of Federal Regulations, part 61). The department's preservation staff will determine the specific scope	

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		of the documentation depending upon the individual property's character-defining features and reasons for significance. The documentation scope shall be reviewed and approved by the department prior to any work on the documentation. A documentation package shall consist of the required forms of documentation and shall include a summary of the historic resource, and an overview of the documentation provided. The types and level of documentation will be determined by department staff and may include any of the following formats: • *HABS/HAER/HALS-Like Measured Drawings* – A set of Historic American Building Survey/Historic American Engineering Record/Historic American Landscape Survey-like (HABS/HAER/HALS-like) measured drawings that depict the existing size, scale, and dimension of the subject property. The department's preservation staff will accept the original architectural drawings or an as-built set of architectural drawings (plan, section, elevation, etc.). The department's preservation staff will assist the consultant in determining the appropriate level of measured drawings. A cover sheet may be required that describes the historic significance of the property. • *HABS/HAER/HALS-Like Photographs* – Digital photographs of the interior and the exterior of the subject property. Large-format negatives are not required. The scope of the digital photographs shall be reviewed by the department's preservation staff for concurrence, and all digital photography shall be conducted according to current National Park Service standards. The photography shall be undertaken by a qualified professional with demonstrated experience in HABS photography.	

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		• *HABS/HAER/HALS-Like Historical Report* – If the department determines that existing survey information or historic resource evaluations of a property do not sufficiently document the historic resource’s significant associations, a written historical narrative and report shall be provided in accordance with the HABS/HALS Historical Report Guidelines. The written history shall follow an outline format that begins with a statement of significance supported by the development of the architectural and historical context in which the structure was built and subsequently evolved. The report shall also include architectural description and bibliographic information. • *Download or Print-on-Demand Book* – The Download or Print-on-Demand book shall be made available to the public for distribution by the project sponsor. The project sponsor shall make the content from the historical report, historical photographs, HABS photography, measured drawings, and field notes available to the public through a preexisting print-on-demand book service or downloadable through the project sponsor’s or a third-party website. Hard copy bound books will be provided to SF Planning and SF Public Library at a minimum. • *Digital Recordation* – In coordination with the department’s preservation staff, the project sponsor may be required to prepare some other form of digital recordation of the historic resource. The most commonly requested digital recordation is video documentation but other forms of digital recordation, include 3D laser scan models or 3D virtual tours, high-resolution immersive panoramic photography, time-lapse photography, photogrammetry, audio/olfactory recording, or other ephemeral documentation of the historic resource may be required. The purpose of these digital records is to	

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		supplement other recordation measures and enhance the collection of reference materials that would be available to the public and inform future research. This digital recordation could also be incorporated into the public interpretation program. Digital recordation shall be conducted by individuals with demonstrated experience in the requested type of digital recordation. If video documentation is required, it shall be conducted by a professional videographer with experience recording architectural resources. The professional videographer shall provide a storyboard of the proposed video recordation for review and approval by the department's preservation staff. • The project sponsor, in consultation with the department, shall conduct outreach to determine which repositories may be interested in receiving copies of the documentation. Potential repositories include but are not limited to, the San Francisco Public Library, the Environmental Design Library at the University of California, Berkeley, the Northwest Information Center, San Francisco Architectural Heritage, the California Historical Society, the SFO Museum, and Archive.org. The final approved documentation shall be provided in electronic form to the department and the interested repositories unless hard copies are requested. The department will make electronic versions of the documentation available to the public for their use at no charge. The professional(s) shall submit the completed documentation for review and approval by the department's preservation staff. All documentation must be reviewed and approved by the department prior to the issuance of any demolition, building or site permit is approved for a proposed project.	

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		Mitigation Measure M-CR-1c: Salvage Plan. *Applicable if a building proposed to be altered or demolished meets the 45-year age criterion and is determined to be a historic resource for purposes of CEQA.* Prior to the issuance of demolition, building, or site permits that would remove character-defining features of a built environment historic resource that would have a significant impact, the project sponsor shall consult with the planning department's preservation staff as to whether any such features may be salvaged, in whole or in part, during demolition or alteration. The project sponsor shall make a good faith effort to salvage and protect materials of historical interest to be used as part of the interpretive program (if required), incorporated into the architecture of the new building that will be constructed on the site, or offered to non-profit or cultural affiliated groups. If this proves infeasible, the sponsor shall attempt to donate significant character-defining features or features of interpretive or historical interest to a historical organization or other educational or artistic group. The project sponsor shall prepare a salvage plan for review and approval by the department's preservation staff prior to issuance of any site demolition permit. If transfer or donation of salvaged materials are declined by groups, then SFO shall have met the intent of the Salvage Plan. **Mitigation Measure M-CR-1d: Interpretation.** *Applicable if a building proposed to be altered or demolished meets the 45-year age criterion and is determined to be a historic resource for purposes of CEQA.* The project sponsor shall facilitate the development of a public interpretive program focused on the history of the project site, its identified historic resources, and its significant historic context. Subject to SFO's procurement protocol, the interpretive program should be developed and implemented by a qualified design professional, historian or architectural historian, community group, or local artist with	

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		demonstrated experience in displaying information and graphics to the public in a visually interesting manner. Additionally, it may be beneficial to the interpretive project to conduct oral histories with select individuals to supplement the interpretive program. The primary goal of the program is to educate visitors and future residents about the property's historical themes, associations, and lost contributing features within broader historical, social, and physical landscape contexts. The interpretive program shall be initially outlined in an interpretive plan subject to review and approval by the department's preservation staff prior to approval of demolition, building, or site permits for the project. The plan shall include the general parameters of the interpretive program including the substance, media, and other elements of the interpretive program. The interpretive program shall include within publicly accessible areas of the terminals permanent display(s) of interpretive materials concerning the history and design features of the affected historic resource. The display shall be placed in a prominent, public setting within, on the exterior of, or in the vicinity of the airport terminals. The interpretive material(s) shall be made of durable all-weather materials and may also include digital media in addition to a permanent display. The interpretive material(s) shall be of high quality and installed to allow for public visibility. Content developed for other mitigation measures, as applicable, including the salvage and documentation programs, may be used to inform and provide content for the interpretive program. The interpretive program may also incorporate documentation completed under Mitigation Measure M-CR-2, Documentation, as applicable to provide a narrated video that describes the materials,	

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		construction methods, current condition, historical use, historic context and cultural significance of the historic resource. The detailed content, media, and other characteristics of such an interpretive program shall be coordinated and approved by the department's preservation staff. The final components of the public interpretation program shall be constructed and an agreed upon schedule for their installation and a plan for their maintenance shall be finalized prior to installation. The interpretive program shall be developed in coordination with the other interpretive programs as relevant, such as interpretation required under archeological resource mitigation measures and tribal cultural resource mitigation measures, Native American land acknowledgments, or other public interpretation programs.	
Impact CR-2: The RADP could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	S	**Mitigation Measure M-CR-2a: Accidental Discovery.** *Alert Sheet.* The project sponsor shall distribute the Planning Department archeological resource "ALERT" sheet to the project prime contractor; to any project subcontractor (including demolition, excavation, grading, foundation, pile driving, etc. firms); or utilities firm involved in soils-disturbing activities within the project site. Prior to any soils-disturbing activities being undertaken, each contractor is responsible for ensuring that the "ALERT" sheet is circulated to all field personnel, including machine operators, field crew, pile drivers, supervisory personnel, etc. The project sponsor shall provide the Environmental Review Officer (ERO) with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) confirming that all field personnel have received copies of the Alert Sheet.	LTSM

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		Stop Work and Notification Upon Discovery. Should any indication of an archeological resource be encountered during any soils-disturbing activity of the project, the project Head Foreman and/or project sponsor shall immediately notify the ERO and shall immediately suspend any soils-disturbing activities in the vicinity of the discovery until the ERO has determined what additional measures should be undertaken. *Discovery Identification, Evaluation, and Treatment Determination.* If the ERO determines that an archeological resource may be present within the project site, the project sponsor shall retain the services of an archeological consultant from the Qualified Archeological Consultant List maintained by the planning department. The archeological consultant shall advise the ERO as to whether the discovery is an archeological resource as well as if it retains sufficient integrity and is of potential scientific/historical/cultural significance. If an archeological resource is present, the archeological consultant shall identify, document, and evaluate the archeological resource. The archeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the ERO may require, if warranted, specific additional measures to be implemented by the project sponsor. Measures might include preservation in situ of the archeological resource; an archeological monitoring program; an archeological testing program; and/or an archeological interpretation program. If an archeological interpretive, monitoring, and/or testing program is required, it shall be consistent with the Environmental Planning Division guidelines for such programs and shall be implemented immediately. The ERO may also require that the project sponsor immediately implement a site security program if	

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		the archeological resource is at risk from vandalism, looting, or other damaging actions. *Consultation with Descendant Communities.* On discovery of an archeological site associated with descendant Native Americans, the Overseas Chinese, or other potentially interested descendant group an appropriate representative of the descendant group and the ERO shall be contacted. The representative of the descendant group shall be given the opportunity to monitor archeological field investigations of the site and to offer recommendations to the ERO regarding appropriate archeological treatment of the site, of recovered data from the site, and, if applicable, any interpretive treatment of the associated archeological site. The local Native American representative or appropriate representative of the descendant group at their discretion shall provide a cultural sensitivity training to all project contractors. As described below in Mitigation Measure M-CR-2b, if a Native American archeological site is discovered, local Native American representative(s) at their discretion may conduct a ceremony that acknowledges the importance of the land to local Native American representatives. This would occur in tandem with the cultural sensitivity training. The ERO and project sponsor shall work with the tribal representative or other representatives of descendant communities to identify the scope of work to fulfill the requirements of this mitigation measure, which may include participation in preparation and review of deliverables (e.g., plans, interpretive materials, artwork). Representatives shall be compensated for their work as identified in the agreed upon scope of work. A copy of the Archeological Resources Report (ARR) shall be provided to the representative of the descendant group.	

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		Archeological Data Recovery Plan. An archeological data recovery program shall be conducted in accordance with an Archeological Data Recovery Plan (ADRP) if all three of the following apply: (1) a resource has potential to be significant, (2) preservation in place is not feasible, and (3) the ERO determines that an archeological data recovery program is warranted. The project archeological consultant, project sponsor, and ERO shall meet and consult on the scope of the ADRP. The archeological consultant shall prepare a draft ADRP that shall be submitted to the ERO for review and approval. The ADRP shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resources if nondestructive methods are practical. The scope of the ADRP shall include the following elements: • *Field Methods and Procedures.* Descriptions of proposed field strategies, procedures, and operations. • *Cataloguing and Laboratory Analysis.* Description of selected cataloguing system and artifact analysis procedures. • *Discard and Deaccession Policy.* Description of and rationale for field and post-field discard and deaccession policies.	

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		• *Security Measures.* Recommended security measures to protect the archeological resource from vandalism, looting, and non-intentionally damaging activities. • *Final Report.* Description of proposed report format and distribution of results. • *Curation.* Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities. • *Coordination of Archeological Data Recovery Investigations.* In cases in which the same resource has been or is being affected by another project for which data recovery has been conducted, is in progress, or is planned, in order to maximize the scientific and interpretive value of the data recovered from both archeological investigations, the following measures shall be implemented: a) In cases where neither investigation has not yet begun, both archeological consultants and the ERO shall consult on coordinating and collaboration on archeological research design, data recovery methods, analytical methods, reporting, curation and interpretation to ensure consistent data recovery and treatment of the resource. b) In cases where archeological data recovery investigation is already under way or has been completed for a prior project, the archeological consultant for the subsequent project shall consult with the prior archeological consultant, if available; review prior treatment plans, findings and reporting; and inspect and assess existing archeological collections/inventories from the site prior to preparation of the archeological treatment plan for the	

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		subsequent discovery, and shall incorporate prior findings in the final report of the subsequent investigation. The objectives of this coordination and review of prior methods and findings will be to identify refined research questions; determine appropriate data recovery methods and analyses; assess new findings relative to prior research findings; and integrate prior findings into subsequent reporting and interpretation. *Human Remains and Funerary Objects.* The treatment of human remains and funerary objects Human Remains and Funerary Objects. discovered during any soil-disturbing activity shall comply with applicable State and Federal laws. This shall include immediate notification of the San Mateo County Coroner's Office (county coroner). The ERO also shall be notified immediately upon the discovery of human remains. As required by Section 7050.5 of the Health and Safety Code, in the event of the county coroner's determination that the human remains are Native American remains, the county coroner shall notify the California State Native American Heritage Commission (NAHC), which will appoint a Most Likely Descendant (MLD). The MLD will complete his or her inspection of the remains and make recommendations or preferences for treatment within 48 hours of being granted access to the site (Public Resources Code section 5097.98(a)). The landowner may consult with the project archeologist and project sponsor and shall consult with the MLD and ERO on preservation in place or recovery of the remains and any scientific treatment alternatives. The landowner shall then make all reasonable efforts to develop an Agreement with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). Per Public	

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		Resources Code section 5097.98(b)(1), the Agreement shall address and take into consideration, as applicable and to the degree consistent with the wishes of the MLD, the appropriate excavation, removal, recordation, scientific analysis, custodianship prior to reinterment or curation, and final disposition of the human remains and funerary objects. If the MLD agrees to scientific analyses of the remains and/or funerary objects, the archeological consultant shall retain possession of the remains and funerary objects until completion of any such analyses unless otherwise specified in the Agreement, after which the remains and funerary objects shall be reinterred or curated as specified in the Agreement. Both parties are expected to make a concerted and good faith effort to arrive at an Agreement, consistent with the provisions of Public Resources Code section 5097.98. However, if the landowner and the MLD are unable to reach an Agreement, the landowner, ERO, and project sponsor shall ensure that the remains and/or mortuary materials are stored securely and respectfully until they can be reinterred on the property, with appropriate dignity, in a location not subject to further or future subsurface disturbance, consistent with state law. Treatment of historic-period human remains and of associated or unassociated funerary objects discovered during any soil-disturbing activity, additionally, shall follow protocols laid out in the project's archeological treatment documents, and in any related agreement established between the Medical Examiner and the ERO. The project archeologist shall retain custody of the remains and associated materials while any scientific study scoped in the treatment document is conducted and the remains shall then be curated or respectfully reinterred by arrangement on a case-by case-basis.	

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		Cultural Resources Public Interpretation Plan. The project archeological consultant shall submit a Cultural Resources Public Interpretation Plan (CRPIP) if a significant archeological resource is discovered during a project. As directed by the ERO, a qualified design professional with demonstrated experience in displaying information and graphics to the public in a visually interesting manner, local artists, or community group may also be required to assist the project archeological consultant in preparation of the CRPIP. If the resource to be interpreted is a tribal cultural resource, the CRPIP shall be prepared in consultation with and developed with the participation of local Native American tribal representatives. The CRPIP shall describe the interpretive product(s), locations or distribution of interpretive materials or displays, the proposed content and materials, the producers or artists of the displays or installation, and a long-term maintenance program. The CRPIP shall be sent to the ERO for review and approval. The CRPIP shall be implemented prior to occupancy of the project. *Curation.* Significant archeological collections and paleoenvironmental samples of future research value shall be permanently curated at an established curatorial facility or Native American cultural material shall be returned to local Native American tribal representatives at their discretion. The facility shall be selected in consultation with the ERO. Upon submittal of the collection for curation the sponsor or archeologist shall provide a copy of the signed curatorial agreement to the ERO. **Mitigation Measure M-CR-2b: Archeological Testing.** *Archeological Testing Program.* The purpose of the archeological testing program will be to determine to the extent possible the presence or absence of archeological resources and to identify	

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		and to evaluate whether any archeological resource encountered on the site constitutes an historical resource under CEQA. The project sponsor shall retain the services of an archeological consultant from the Qualified Archeological Consultants List (QACL) maintained by the planning department or an archeological consultant approved by planning department archeologist. The archeological consultant shall undertake an archeological testing program as specified herein. The archeological consultant's work shall be conducted in accordance with this measure at the direction of the Environmental Review Officer (ERO). All plans and reports prepared by the consultant as specified herein shall be submitted first and directly to the ERO for review and comment and shall be considered draft reports subject to revision until final approval by the ERO. In addition, the consultant shall be available to conduct an archeological monitoring and/or data recovery program if required pursuant to this measure. Archeological monitoring and/or data recovery programs required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction can be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less than significant level potential effects on a significant archeological resource as defined in CEQA Guidelines section 15064.5(a)(c). *Native American Monitoring.* A local Native American representative shall be present during the archeological testing program if the project area is determined to be sensitive for Native American resources. *Archeological Testing Plan.* The archeological testing program shall be conducted in accordance with the approved Archeological Testing Plan (ATP). The archeological consultant	

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		and the ERO shall consult on the scope of the ATP, which shall be approved by the ERO prior to any project-related soils disturbing activities commencing. The ATP shall be submitted first and directly to the ERO for review and comment and shall be considered a draft subject to revision until final approval by the ERO. The archeologist shall implement the testing as specified in the approved ATP prior to and/or during construction. A Programmatic ATP shall be developed for the RADP to identify the property types of the expected archeological resource(s) that potentially could be adversely affected by the proposed project, lay out what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, how the expected data classes would address the applicable research questions, and to summarize previous archeological sensitivity analysis and testing programs undertaken at SFO. The programmatic ATP shall primarily focus on identification of archeologically sensitive areas, primarily Native American archeological sensitivity, within the RADP that require archeological testing programs. RADP project site ATPs shall tier off the programmatic RADP and shall identify the testing method to be used, the depth or horizonal extent of testing, and the locations recommended for testing and shall identify archeological monitoring requirements for construction soil disturbance as warranted. *Paleoenvironmental Analysis of Paleosols.* When a submerged paleosol is identified, irrespective of whether cultural material is present, samples shall be extracted and processed for dating, flotation for paleobotanical analysis, and other applicable special analyses pertinent to identification of possible cultural soils and for environmental reconstruction. The results of analysis of collected samples shall be reported in results reports.	

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		Discovery Treatment Determination. At the completion of the archeological testing program, the archeological consultant shall submit a written summary of the findings to the ERO. The findings memo shall describe and identify each resource and provide an initial assessment of the integrity and significance of encountered archeological deposits. If the ERO in consultation with the archeological consultant determines that a significant archeological resource is present and that the resource could be adversely affected by the proposed project, the ERO, in consultation with the project sponsor, shall determine whether preservation of the resource in place is feasible. If so, the proposed project shall be re-designed so as to avoid any adverse effect on the significant archeological resource and the archeological consultant shall prepare an archeological resource preservation plan (ARPP), which shall be implemented by the project sponsor during construction. The consultant shall submit a draft ARPP to the planning department for review and approval. If preservation in place is not feasible, a data recovery program shall be implemented, unless the ERO determines that the archeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible. The ERO, in consultation with the archeological consultant, shall also determine if additional treatment is warranted, which may include additional testing and/or construction monitoring. *Archeological and Cultural Sensitivity Training.* If it is determined that the project would require ongoing archeological monitoring, the archeological consultant shall provide a training to the prime contractor; to any project subcontractor (including demolition, excavation, grading, foundation, pile driving, etc. firms); or utilities firm involved in soils-disturbing activities within the	

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		project site. The training shall advise all project contractors to be on the alert for evidence of the presence of the expected archeological resource(s), of how to identify the evidence of the expected resource(s), and of the appropriate protocol in the event of apparent discovery of an archeological resource by the construction crew. If the project site is determined to be sensitive for Native American archeological resources or tribal cultural resources, a local Native American representative at their discretion shall provide a Native American cultural sensitivity training to all project contractors. Local Native American representative(s) at their discretion may conduct a ceremony that acknowledges the importance of the land to local Native American representatives. The ceremony would be approximately less than 15 minutes and would occur in tandem with the cultural sensitivity training f. Ceremonies opted on the airfield are subject to airport operations bulletin and SFO Rules & Regulations due to federal regulations and safety requirements. *Consultation with Descendant Communities.* On discovery of an archeological site associated with descendant Native Americans, the Overseas Chinese, or other potentially interested descendant group an appropriate representative of the descendant group and the ERO shall be contacted. The representative of the descendant group shall be given the opportunity to monitor archeological field investigations of the site and to offer recommendations to the ERO regarding appropriate archeological treatment of the site, of recovered data from the site, and, if applicable, any interpretive treatment of the associated archeological site. The local Native American representative or appropriate representative of the descendant group at their discretion shall provide a cultural sensitivity	

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		training to all project contractors. The ERO and project sponsor shall work with the tribal representative or other representatives of descendant communities to identify the scope of work to fulfill the requirements of this mitigation measure, which may include participation in preparation and review of deliverables (e.g., plans, interpretive materials, artwork). Representatives shall be compensated for their work as identified in the agreed upon scope of work. A copy of the Archeological Resources Report (ARR) shall be provided to the representative of the descendant group. *Archeological Data Recovery Plan.* An archeological data recovery program shall be conducted in accordance with an Archeological Data Recovery Plan (ADRP) if all three of the following apply: (1) a resource has potential to be significant, (2) preservation in place is not feasible, and (3) the ERO determines that an archeological data recovery program is warranted. The archeological consultant, project sponsor, and ERO shall meet and consult on the scope of the ADRP prior to preparation of a draft ADRP. The archeological consultant shall submit a draft ADRP to the ERO. The ADRP shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resources if nondestructive methods are practical. The scope of the ADRP shall include the following elements:	

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		• *Field Methods and Procedures.* Descriptions of proposed field strategies, procedures, and operations. • *Cataloguing and Laboratory Analysis.* Description of selected cataloguing system and artifact analysis procedures. • *Discard and Deaccession Policy.* Description of and rationale for field and post-field discard and deaccession policies. • *Security Measures.* Recommended security measures to protect the archeological resource from vandalism, looting, and non-intentionally damaging activities. • *Final Report.* Description of proposed report format and distribution of results. • *Curation.* Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities. *Coordination of Archeological Data Recovery Investigations.* In cases in which the same resource has been or is being affected by another project for which data recovery has been conducted, is in progress, or is planned, in order to maximize the scientific and interpretive value of the data recovered from both archeological investigations, the following measures shall be implemented: a) In cases where neither investigation has not yet begun, both archeological consultants and the ERO shall consult on coordinating and collaboration on archeological research design, data recovery methods, analytical methods, reporting, curation, and interpretation to ensure consistent data recovery and treatment of the resource. b) In cases where archeological data recovery investigation is already under way or has been completed for a prior project,	

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		the archeological consultant for the subsequent project shall consult with the prior archeological consultant, if available; review prior treatment plans, findings and reporting; and inspect and assess existing archeological collections/inventories from the site prior to preparation of the archeological treatment plan for the subsequent discovery, and shall incorporate prior findings in the final report of the subsequent investigation. The objectives of this coordination and review of prior methods and findings will be to identify refined research questions; determine appropriate data recovery methods and analyses; assess new findings relative to prior research findings; and integrate prior findings into subsequent reporting and interpretation. *Human Remains and Funerary Objects.* The treatment of human remains and funerary objects Human Remains and Funerary Objects. discovered during any soil-disturbing activity shall comply with applicable State and Federal laws. This shall include immediate notification of the San Mateo County Coroner's Office (county coroner). The ERO also shall be notified immediately upon the discovery of human remains. As required by Section 7050.5 of the Health and Safety Code, in the event of the county coroner's determination that the human remains are Native American remains, the county coroner shall notify the California State Native American Heritage Commission (NAHC), which will appoint a Most Likely Descendant (MLD). The MLD will complete his or her inspection of the remains and make recommendations or preferences for treatment within 48 hours of being granted access to the site (Public Resources Code section 5097.98(a)). The landowner may consult with the project archeologist and project sponsor and shall consult with the MLD and ERO on preservation in place or recovery of the remains and any	

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		scientific treatment alternatives. The landowner shall then make all reasonable efforts to develop an Agreement with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). Per Public Resources Code section 5097.98 (b)(1), the Agreement shall address and take into consideration, as applicable and to the degree consistent with the wishes of the MLD, the appropriate excavation, removal, recordation, scientific analysis, custodianship prior to reinterment or curation, and final disposition of the human remains and funerary objects. If the MLD agrees to scientific analyses of the remains and/or funerary objects, the archeological consultant shall retain possession of the remains and funerary objects until completion of any such analyses unless otherwise specified in the Agreement, after which the remains and funerary objects shall be reinterred or curated as specified in the Agreement. Both parties are expected to make a concerted and good faith effort to arrive at an Agreement, consistent with the provisions of Public Resources Code section 5097.98. However, if the landowner and the MLD are unable to reach an Agreement, the landowner, ERO, and project sponsor shall ensure that the remains and/or mortuary materials are stored securely and respectfully until they can be reinterred on the property, with appropriate dignity, in a location not subject to further or future subsurface disturbance, consistent with state law. Treatment of historic-period human remains and of associated or unassociated funerary objects discovered during any soil-disturbing activity, additionally, shall follow protocols laid out in the project's archeological treatment documents, and in any	

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		related agreement established between the county coroner and the ERO. The project archeologist shall retain custody of the remains and associated materials while any scientific study scoped in the treatment document is conducted and the remains shall then be curated or respectfully reinterred by arrangement on a case-by case-basis. *Cultural Resources Public Interpretation Plan.* The project archeological consultant shall submit a Cultural Resources Public Interpretation Plan (CRPIP) if a significant archeological resource is discovered during a project. As directed by the ERO, a qualified design professional with demonstrated experience in displaying information and graphics to the public in a visually interesting manner, local artists, or community group may also be required to assist the project archeological consultant in preparation of the CRPIP. If the resource to be interpreted is a tribal cultural resource, the CRPIP shall be prepared in consultation with and developed with the participation of local Native American tribal representatives. The CRPIP shall describe the interpretive product(s), locations or distribution of interpretive materials or displays, the proposed content and materials, the producers or artists of the displays or installation, and a long-term maintenance program. The CRPIP shall be sent to the ERO for review and approval. The CRPIP shall be implemented prior to occupancy of the project. *Archeological Resources Report.* Whether or not significant archeological resources are encountered, the archeological consultant shall submit a written report of the findings of the testing program to the ERO. The archeological consultant shall submit a draft Archeological Resources Report (ARR) to the ERO that evaluates the historical significance of any discovered	

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		archeological resource and describes the archeological, historical research methods employed in the archeological testing/monitoring/data recovery program(s) undertaken, and if applicable, discusses curation arrangements. Formal site recordation forms (CA DPR 523 series) shall be attached to the ARR as an appendix. Once approved by the ERO, copies of the ARR shall be distributed as follows: California Archeological Site Survey Northwest Information Center (NWIC) shall receive one (1) electronic copy and the ERO shall receive a copy of the transmittal of the ARR to the NWIC. The environmental planning division of the planning department shall receive one (1) bound hardcopy of the ARR. Digital files that shall be submitted to the environmental division include an unlocked, searchable PDF version of the ARR, GIS shapefiles of the site and feature locations, any formal site recordation forms (CA DPR 523 series), and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources. The PDF ARR, GIS files, recordation forms, and/or nomination documentation should be submitted via USB or other stable storage device. If a descendant group was consulted during archeological treatment, a PDF of the ARR shall be provided to the representative of the descendant group. *Curation.* Significant archeological collections and paleoenvironmental samples of future research value shall be permanently curated at an established curatorial facility or Native American cultural material shall be returned to local Native American tribal representatives at their discretion. The facility shall be selected in consultation with the ERO. Upon submittal of the collection for curation the sponsor or	

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		archeologist shall provide a copy of the signed curatorial agreement to the ERO. **Mitigation Measure M-CR-2c: Treatment of Submerged and Deeply Buried Resources.** Based on a reasonable presumption that submerged or deeply buried archeological resources may be present within the project site and may be encountered during archeological investigations or construction-related soil disturbance, the following measures shall be undertaken upon discovery of a potentially significant deeply buried or submerged resource to minimize significant effects from deep project excavations, soil improvements, pile construction, or construction of other deep foundation systems. *Treatment Determination.* The preferred treatment for a buried or submerged resource encountered during archeological testing or project construction is preservation in place. When such a resource is identified during construction, the ERO and the project sponsor shall consult to determine whether preservation of all or a part of the resource in place is feasible, as detailed under Mitigation Measure M-CR-2a, above. If the resource cannot feasibly or adequately be preserved in place, in situ documentation and/or archeological data recovery shall be conducted, as described in Mitigation Measures M-CR-2a, Accidental Discovery, and M-CR-2b, Archeological Testing Program, above. However, by definition, such resources sometimes are located deeper than the maximum anticipated depth of project mass excavations and/or under water or may otherwise pose substantial access, safety or other logistical constraints for data recovery; or the cost of providing archeological access to the resource may demonstrably be prohibitive.	

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		In such cases, where physical documentation and data recovery will be limited by the constraints identified above, the ERO, project sponsor, archeological consultant, and descendant/ local Native American representative identified as described above, shall consult to explore alternative documentation and treatment options to be implemented in concert with any feasible archeological data recovery. The appropriate treatment elements, which would be expected to vary with the type of resource and the circumstances of discovery, shall be identified by the ERO based on the results of consultation from among the measures listed below. Additional treatment options may be developed and agreed upon through consultation if it can be demonstrated that they would be effective in amplifying the value of the data recovered from physical investigation of the affected resources by addressing applicable archeological research questions and in disseminating those data and meaningfully interpreting the resource to the public. Each treatment measure or a combination of these treatment measures, in concert with any feasible standard data recovery methods applied as described above, would be effective in mitigating significant impacts to submerged and buried resources. However, some measures are more applicable to one type of resource than the other; to a specific construction method; to the specific circumstances of discovery; and to the stratigraphic position of the resource. Additional treatment options may be considered and shall be adopted, subject to ERO approval, if it can be demonstrated that they would provide further data relevant to the understanding and interpretation of the resource on the project site or to the affected class of resources (e.g., rare submerged and deeply buried prehistoric resources of Early or Middle Holocene age); or	

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		that would otherwise enhance the scientific or historical research value of any data recovered directly from the resource; protect and promote the cultural value of the resource; and/or would enhance public interpretation of the resource, as detailed below. The archeological consultant in coordination with local Native American representative shall document the results of the treatment program consultation with respect to the agreed upon scope of treatment in a treatment program memo, for ERO review and approval. Upon approval by the ERO, the project sponsor shall ensure that treatment program is implemented prior to and during subsequent construction, as applicable. Reporting, interpretive, curation and review requirements are the same as delineated under Archeological Data Recovery Plan in Mitigation Measures M-CR-2a and M-CR-2b, above. The project sponsor shall be responsible for ensuring the implementation of applicable measures, as identified in the treatment program memo. • *Modification of Contractor's Excavation Methods.* As needed to prevent damage to the resource before it has been documented; to assist in exposure and facilitate observation and documentation; and potentially to assist in data recovery; at the request of the ERO the project sponsor shall consult with the project archeologist and the ERO to identify modifications to the contractor's excavation and shoring methods. Examples include improved dewatering during excavation; use of a smaller excavator bucket or toothless bucket; discontinuing immediate offhaul of spoils and providing a location where spoils can be spread out and examined by the archeologist prior to being offhauled; and phasing or benching of deep excavations to facilitate observation and/or deeper archeological trenching.	

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		• *Data Recovery through Open Excavation.* If the project will include mass excavation to the depth of the buried/submerged deposit, archeological data recovery shall include manual (preferred) or controlled mechanical sampling of the deposit. If project construction would not include mass excavation to the depth of the deposit but would impact the deposit through deep foundation systems or soil improvements, the ERO and the project sponsor shall consult to consider whether there are feasible means of providing direct archeological access to the deposit (for example, excavation of portion of the site that overlies the deposit to the subject depth so that a sample can be recovered). The feasibility consideration shall include an estimate of the project cost of excavating to the necessary depth and of providing shoring and dewatering sufficient to allow archeological access to the deposit for manual or mechanical recovery. • *Mechanical Recovery.* If site circumstances limit access to the find in situ, the ERO, archeological consultant, local Native American representative, and project sponsor shall consider the feasibility of mechanically removing the feature or portion of a feature intact for off-site documentation and analysis, preservation and interpretive use. The consultation above shall include consideration as to whether such recovery is logistically feasible and can be accomplished without major data loss. The specific means and methods and the type and size of the sample shall be identified, and the recovery shall be implemented if determined feasible by the ERO. The sponsor shall assist with mechanical recovery and transport and curation of recovered materials and shall provide for an appropriate and secure off-site location for archeological documentation and storage as needed.	

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		• *Data Recovery using Geoarcheological Cores.* If, subsequent to identification and boundary definition of a buried/ submerged resource, it is deemed infeasible to expose the resource for archeological data recovery, geoarcheological coring of the identified deposit shall be conducted. The maximum feasible core diameter shall be used for data recovery coring. However, while geoarcheological coring can provide basic data about a resource (e.g., food sources exploited, date), due to the of the small size of the sample recoverable through geoarcheological coring the recovered sample, even from numerous cores, this method generally cannot recover a sufficient quantity of data to adequately characterize the range of activities that took place at the site. For this reason, if the coring sample constitutes less than 5 percent of the estimated volume of material within the boundaries of the resource that will be directly impacted by project construction, the following additional measures shall be implemented in concert with geoarcheological coring in order to fully mitigate significant impacts to such a resource. • *Scientific Analysis of Data from Comparable Archeological Sites/"Orphaned Collections."* The ERO and the project archeologist shall consult to identify a known archeological site or curated collections or samples recovered during prior investigation of similar sites or features are available for further analysis; and for which site-specific or comparative analyses would be expected to provide data relevant to the interpretation or context reconstruction for the affected site. Appropriate analyses, to be identified in consultation between the ERO, the consultant and the local Native American representative(s), may include reanalysis or comparative analysis of artifacts or archival records; faunal or paleobotanical analyses; dating; isotopes studies; or such	

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		other relevant studies as may be proposed by members of the project team based on the research design developed for the affected site and on data available from affected resource and comparative collections. The scope of analyses would be determined by the ERO based on consultation with the project archeologist, the project sponsor, and local Native American representatives. • *Historical and Paleoenvironmental Reconstruction.* The ERO and project archeologist shall identify existing geoarcheological data and geotechnical coring records; and/or cores extracted and preserved during prior geotechnical or geoarcheological investigations that could contribute to reconstruction of the environmental setting in the vicinity of the identified resource, to enhance the historical and scientific value of recovered data by providing additional data about paleoenvironmental setting and stratigraphic sensitivity; and/or would provide information pertinent to the public interpretation of the significant resource. Objectives of such analyses, depending on the resource type could include (1) placement of known and as-yet undiscovered prehistoric resources more securely in their environmental and chronological contexts; (2) more-accurate prediction of locations that are sensitive for Middle Holocene and earlier resources; (3) increased understanding of changes in San Francisco's historical environmental setting (such as the distribution of inland marshes and ponds and forested areas) and of the chronology of both historic period and prehistoric environmental change and human use. Relevant data may also be obtained through geoarcheological coring at accessible sites identified by the ERO through consultation with San Francisco public agencies and private project sponsors.	

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Impact CR-3: The RADP could disturb human remains, including those interred outside of formal cemeteries.	S	Mitigation Measure M-CR-2a would apply.	LTSM
Impact C-CR-1: The RADP in combination with cumulative projects could result in cumulative impacts on historic resources.	S	Mitigation Measures M-CR-1a, M-CR-1b, M-CR-1c, M-CR-1d, and M-NO-2 would apply.	LTSM
Impact C-CR-2: The RADP in combination with cumulative projects could result in significant cumulative impacts on archeological resources and human remains.	S	Mitigation Measures M-CR-2a, M-CR-2b, and M-CR-2c would apply.	LTSM
Initial Study Section E.5, Tribal Cultural Resources			
Impact TCR-1: The RADP could result in a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code section 21074.	S	Mitigation Measures M-CR-2a through M-CR-2c would apply. **Mitigation Measure M-TCR-1a: Tribal Cultural Resources Public Interpretation Program.** *Preservation in Place. In the event of the identification or discovery of a tribal cultural resource, the Environmental Review Officer (ERO), the project sponsor, and the local Native American representative, shall consult to determine whether preservation in place would be feasible and effective.* If it is determined that preservation-in-place of the tribal cultural resource would be both feasible and effective, then the project sponsor in consultation with local Native American representatives and the ERO shall prepare a tribal cultural resource preservation plan (TCRPP). If the tribal cultural resource is an archeological resource of Native American origin, the archeological consultant shall prepare an archeological resource preservation plan (ARPP) in consultation with the local Native American representative, which shall be implemented by the project sponsor during construction. The consultant shall submit a draft ARPP to the planning department for review and approval.	LTSM

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		Interpretive Program. In the event of the identification or discovery of a tribal cultural resource, the project sponsor, in consultation with local Native American representatives shall prepare a Tribal Cultural Resources Public Interpretation Plan (TCRIP) to guide Tribal Cultural Resource interpretive program. The TCRIP may be prepared in tandem with the Cultural Resources Public Interpretation Plan (CRPIP) if required. The TCRIP shall be submitted to ERO for review and approval prior to implementation of the program. The plan shall identify, as appropriate, proposed locations for installations or displays, the proposed content and materials of those displays or installation, the producers or artists of the displays or installation, and a long-term maintenance program. The interpretive program may include artist installations, preferably by local Native American artists, oral histories with local Native Americans, cultural displays, educational panels, or other interpretive elements agreed upon by the ERO, sponsor, and local Native American representatives. Upon approval of the TCRIP and prior to project occupancy, the interpretive program shall be implemented by the project sponsor. The ERO and project sponsor shall work with the tribal representative to identify the scope of work to fulfill the requirements of this mitigation measure, which may include participation in preparation and review of deliverables (e.g., plans, interpretive materials, artwork). Tribal representatives shall be compensated for their work as identified in the agreed upon scope of work. **Mitigation Measure M-TCR-1b: Tribal Cultural Resources Sensitivity Training.** *SFO environmental affairs staff involved with implementation of RADP during the duration of the RADP will undergo Tribal Cultural Resources Sensitivity Training provided by a local Native American tribal representative in coordination with planning department cultural resources staff regarding tribal*	

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		cultural resources. All SFO environmental affairs staff will receive initial training when RADP project(s) is deemed fiscally feasible by SF Board of Supervisors and approved for implementation by the airport commission. After the initial training, all Environmental Affairs staff will undergo training if/when new environmental affairs staff joins SFO. Otherwise, training will be required every five years (duration of up to two hours). Training curriculum is up to the discretion of the local Native American representative but may include overview of tribal cultural resources in the San Francisco Bay Area, appropriate treatment and information on local Native American history and culture, and land acknowledgment and land honoring. As part of the required five-year sensitivity training, planning department cultural resources staff and SFO Environmental Affairs staff will coordinate with local Native American representatives on updating information on the Alert sheet to ensure it is current (such as updates to types of cultural materials to look for, processes to follow to follow if cultural materials are identified, contact information, etc.) as required above for Mitigation Measures M-CR-2a through M-CR-2c and updates to any tribal cultural resources educational information developed for SFO staff.	
Impact C-TCR-1: The RADP in combination with cumulative projects could result in a significant cumulative impact on tribal cultural resources.	S	Mitigation Measures M-CR-2a, M-CR-2b, M-TCR-1a, and M-TCR-1b would apply.	LTSM

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Initial Study Section E.9, Greenhouse Gas Emissions			
Impact C-GG-1: The RADP would generate greenhouse gas emissions, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing greenhouse gas emissions.	LTS	No mitigation required	NA
Initial Study Section E.10, Wind			
Impact WI-1: The RADP would not create wind hazards in publicly accessible areas of substantial pedestrian use.	LTS	No mitigation required	NA
Impact C-WI-1: The RADP in combination with cumulative projects would not result in a significant cumulative wind impact.	LTS	No mitigation required	NA
Initial Study Section E.11, Shadow			
Impact SH-1: The RADP would not create new shadow in a manner that would substantially and adversely affect the use and enjoyment of publicly accessible open spaces.	LTS	No mitigation required	NA
Impact C-SH-1: The RADP in combination with cumulative projects would not result in a significant cumulative shadow impact.	LTS	No mitigation required	NA

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Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
Initial Study Section E.12, Recreation			
Impact RE-1: The RADP would not result in a substantial increase in the use of existing neighborhood and regional parks and recreation facilities such that substantial physical deterioration or degradation of recreational facilities would occur or be accelerated and would not result in the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.	LTS	No mitigation required	NA
Impact C-RE-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on recreational facilities.	LTS	No mitigation required	NA
Initial Study Section E.13, Utilities and Service Systems			
Impact UT-1: The RADP would not require or result in the relocation or construction of new or expanded water or wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, or the expansion of existing facilities, the construction or relocation of which could cause significant environmental effects.	LTS	No mitigation required	NA
Impact UT-2: Sufficient water supplies are available to serve the RADP and reasonably foreseeable future development in normal, dry, and multiple dry years.	LTS	No mitigation required	NA

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Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
Impact UT-3: The RADP would not result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	LTS	No mitigation required	NA
Impact UT-4: The RADP would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, and would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	LTS	No mitigation required	NA
Impact C-UT-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to utilities and service systems.	LTS	No mitigation required	NA
Initial Study Section E.14, Public Services			
Impact PS-1: The RADP would not result in substantial adverse physical impacts from new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services such as fire protection, police protection, schools, or other public facilities.	LTS	No mitigation required	NA
Impact C-PS-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on public services.	LTS	No mitigation required	NA

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Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
Initial Study Section E.15, Biological Resources			
Impact BI-1: The RADP would not have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	S	**Mitigation Measure M-BI-1a: Nesting Bird Protection Measures.** Nesting birds and their nests shall be protected during construction by use of the following measures: 1. To avoid disruption to nesting birds, initial vegetation removal, ground disturbance, and demolition of buildings shall be performed outside of the bird nesting season (January 15 to August 15), whenever feasible. 2. If vegetation removal, ground disturbance, or demolition of existing buildings will occur during the nesting season, a qualified wildlife biologist shall conduct a pre-construction nesting bird survey within 7 days before the start of such activities or after any construction breaks of 14 days or more. Surveys shall be performed for individual RADP project sites, vehicle and equipment staging areas, and areas within 100 feet to locate any active passerine (perching bird) nests and within 500 feet to locate any active raptor (birds of prey) nests within Airport property. 3. If an active nest is located during the pre-construction nesting bird surveys, the qualified wildlife biologist shall evaluate whether the schedule of construction activities could affect the nest. The following measures shall be implemented based on the biologist's determination: a. If project actions are unlikely to affect the active nest, construction may proceed without restriction; however, at the discretion of the qualified wildlife biologist, the nest may be monitored to confirm that there is no adverse effect from ongoing activities. The frequency of spot-check monitoring shall consider the scale and duration of the proposed activity, proximity to the nest, and presence of	LTSM

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Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
		any physical barriers that may screen the nest from the activity. The qualified biologist may revise their determination at any time during the nesting season in coordination with SFO. b. If project actions may affect an active nest, the qualified biologist shall establish a no-disturbance buffer around the nest and all project work shall halt within the buffer until the qualified biologist determines that the nest is no longer in use. Typically, these buffer distances are 50–150 feet for passerines and 150–500 feet for raptors; however, the buffers may be adjusted if an obstruction, such as a building, is within the line of sight between the nest and construction or if the biologist observes that the nesting bird is tolerant of a smaller buffer due to habituation or other circumstances. c. Modification of nest buffer distances, certain construction activities within the buffer, and/or modification of construction methods near active nests shall occur at the discretion of the qualified biologist and in coordination with SFO, which shall notify the U.S. Fish and Wildlife Service and/or California Department of Fish and Wildlife if necessary. d. Any work that must occur within established no-disturbance buffers around active nests shall be monitored by a qualified biologist. If the biologist observes adverse effects in response to project work within the buffer and such effects could compromise the nest, work within the no-disturbance buffer shall halt until the nest occupants have fledged. 4. Any birds that begin nesting within the project site and survey buffers amid demolition or construction activities shall be	

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		assumed to be habituated to construction-related or similar noise and disturbance levels. In those cases, no work exclusion zones shall be established around active nests. However, should birds nesting nearby begin to show disturbance associated with construction activities, or should the sound levels from the construction activity change substantially, no-disturbance buffers shall be established as determined by the qualified biologist. **Mitigation Measure M-BI-1b: Avoidance and Minimization Measures for Bats.** A qualified biologist who is experienced with bat surveying techniques, behavior, roosting habitat, and identification of local bat species shall be consulted before initiation of demolition/construction activities to conduct a pre-construction habitat assessment of the RADP project site to characterize potential bat habitat and identify potentially active roost sites.[6] Should the pre-construction habitat assessment not identify bat habitat or signs of potentially active bat roosts within the RADP project site (e.g., guano, urine staining, dead bats), no further action shall be required. Should potential roosting habitat or potentially active bat roosts be identified during the habitat assessment within or near the project site, including trees that could be trimmed or removed, the following measures shall be implemented at the individual RADP project site that provides bat habitat: 1. Removal of or disturbance to trees, structures, or buildings identified as potential bat roosting habitat or active roosts shall occur when bats are active, approximately between March 1 and April 15 and between August 15 and October 15,	

[6] Typical qualifications include four years of academic training and a minimum of two years of experience conducting bat surveys that resulted in detections of relevant species, and experience with relevant equipment used to conduct bat surveys.

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		to the extent feasible. These dates avoid bat maternity roosting season (approximately April 15–August 31) and period of winter torpor (approximately October 15–February 28). 2. If removing or disturbing trees, structures, or buildings identified as potential bat roosting habitat or active roosts when bats are active is not feasible, a qualified biologist shall conduct pre-construction surveys within 14 days before disturbance to further evaluate bat activity within the potential habitat or roost site. a. If active bat roosts are not identified in potential habitat during the pre-construction surveys, no further action shall be required before removal of or disturbance to trees and structures in the pre-construction survey area. b. If active bat roosts or evidence of roosting is identified during the pre-construction surveys, the qualified biologist shall determine, if possible, the type of roost and species: i. If special-status bat species or maternity or hibernation roosts are detected during these surveys, the qualified biologist shall develop appropriate species- and roost-specific avoidance and protection measures in coordination with the California Department of Fish and Wildlife. Such measures may include postponing the removal of structures or trees, or establishing exclusionary work buffers while the roost is active. A minimum 100-foot no-disturbance buffer shall be established around maternity or hibernation roosts until the qualified biologist determines that they are no longer active. The qualified biologist may adjust the size of the no-disturbance buffer in coordination with the California Department of Fish and Wildlife,	

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		depending on the species present, roost type, existing screening around the roost site (such as dense vegetation or a building), and the type of construction activity to occur around the roost site, and if construction would not alter the behavior of the adult or young in a way that would cause injury or death to those individuals. Active maternity roosts shall not be disturbed until the conclusion of the maternity roosting season, or until they become inactive based on the professional assessment of a qualified biologist. ii. If a common species' non-maternity roost (e.g., bachelor daytime roost) or hibernation roost is identified, disturbance to or removal of trees, structures, or buildings may occur under the supervision of a qualified biologist as described under part 3 of this mitigation measure, below. 3. The qualified biologist shall be present during disturbance to or removal of a tree, structure, or building if active non-maternity or hibernation bat roosts or potential roosting habitat are present. Trees, structures, or buildings with active non-maternity or hibernation roosts of common species or potential habitat shall be disturbed or removed only under clear weather conditions when precipitation is not forecast for three days and when nighttime temperatures are at least 50 degrees Fahrenheit, and when wind speeds are less than 15 mph. a. Trimming or removal of trees with active (non-maternity or hibernation) or potentially active roost sites of common bat species shall follow a two-step removal process:	

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		i. For removal, use either hand tools or other equipment (e.g., excavator or backhoe). ii. Leave all felled trees on the ground for at least 24 hours before chipping, offsite removal, or other processing to allow any bats to escape, or inspect the trees once felled by the qualified biologist to ensure that no bats remain within the trees and/or branches. b. Disturbance to or removal of structures or buildings containing or suspected to contain active (non-maternity or hibernation) or potentially active common bat roosts shall occur in the evening and after bats have emerged from the roost to forage. Structures or buildings shall be partially dismantled to substantially change the roost conditions, causing bats to abandon and not return to the roost. Removal shall be completed the subsequent day.	
Impact BI-2: The RADP would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	LTS	No mitigation required	NA
Impact BI-3: The RADP would not have a substantial adverse effect on federally protected wetlands (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	LTS	No mitigation required	NA

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Impact BI-4: The RADP would not interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.	LTS	No mitigation required	NA
Impact BI-5: The RADP would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	LTS	No mitigation required	NA
Impact C-BI-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on biological resources.	S	Mitigation Measures M-BI-1a and M-BI-1b would apply.	LTSM
Initial Study Section E.16, Geology and Soils			
Impact GE-1: The RADP would not directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving fault rupture, seismic groundshaking, seismically induced ground failure, or seismically induced landslides.	LTS	No mitigation required	NA
Impact GE-2: The RADP would not result in substantial soil erosion or the loss of topsoil.	LTS	No mitigation required	NA
Impact GE-3: The RADP would not be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project.	LTS	No mitigation required	NA

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Impact GE-4: The RADP would not create substantial risks to life or property as a result of locating buildings or other features on expansive or corrosive soils.	LTS	No mitigation required	NA
Impact GE-5: The RADP would not directly or indirectly destroy a unique geologic feature nor have the potential to destroy a unique paleontological resource.	LTS	No mitigation required	NA
Impact C-GE-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to geology or paleontological resources.	LTS	No mitigation required	NA
Initial Study Section E.17, Hydrology and Water Quality			
Impact HY-1: The RADP would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.	LTS	No mitigation required	NA
Impact HY-2: The RADP would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede the sustainable groundwater management of the basin.	LTS	No mitigation required	NA

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Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
Impact HY-3: The RADP would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion, siltation, or flooding onsite or offsite.	LTS	No mitigation required	NA
Impact HY-4: The RADP would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.	LTS	No mitigation required	NA
Impact HY-5: The RADP would not impede or redirect flood flows.	LTS	No mitigation required	NA
Impact HY-6: The RADP would not risk the release of pollutants from project inundation in flood hazard, tsunami, or seiche zones.	LTS	No mitigation required	NA
Impact HY-7: The RADP would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	LTS	No mitigation required	NA
Impact C-HY-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts on hydrology or water quality.	LTS	No mitigation required	NA

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Initial Study Section E.18, Hazards and Hazardous Materials			
Impact HZ-1: The RADP would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials.	LTS	No mitigation required	NA
Impact HZ-2: The RADP would be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 but would not create a significant hazard to the public or the environment.	LTS	No mitigation required	NA
Impact HZ-3: The RADP would not result in a safety hazard or excessive noise for people residing or working in a project area located within an airport land use plan or within two miles of an airport.	LTS	No mitigation required	NA
Impact HZ-4: The RADP would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LTS	No mitigation required	NA
Impact C-HZ-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to hazards or hazardous materials.	LTS	No mitigation required	NA

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Environmental Impact	Level of Significance prior to Mitigation	Mitigation Measures	Level of Significance after Mitigation
Initial Study Section E.19, Mineral Resources			
Impact MR-1: The RADP would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.	NI	No mitigation required	NA
Impact MR-2: The RADP would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.	NI	No mitigation required	NA
Impact C-MR-1: The RADP in combination with cumulative projects would not result in the loss of valuable mineral resources.	NI	No mitigation required	NA
Initial Study Section E.20, Energy			
Impact EN-1: The RADP would not result in wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LTS	No mitigation required	NA
Impact C-EN-1: The RADP in combination with cumulative projects would increase the use of energy, fuel, and water resources, but not in a wasteful manner.	LTS	No mitigation required	NA

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S.4 Summary of Project Alternatives

CEQA Guidelines section 15126.6(a) states that an EIR must describe and evaluate a reasonable range of alternatives to a proposed project that would feasibly attain most of the project's basic objectives but avoid or substantially lessen any identified significant adverse environmental effects of the project. An EIR is not required to consider every conceivable alternative to a proposed project or alternatives that are infeasible. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation.

Chapter 5 of this EIR presents the alternatives analysis as required by CEQA for the RADP. The discussion includes the methodology used to select alternatives to the RADP for detailed CEQA analysis, with the intent of developing potentially feasible alternatives that could avoid or substantially lessen the significant impacts identified for the RADP while still meeting most of the project's basic objectives. Chapter 5 identifies a reasonable range of alternatives that meet these criteria and evaluates them for their comparative merits with respect to minimizing adverse environmental effects. Each alternative is summarized below.

S.4.1 Alternative A: No Project Alternative

As required by CEQA Guidelines section 15126.6(e), this Draft EIR evaluates a No Project Alternative to allow decision-makers to compare the environmental effects of approving the project with the effects of not approving the project. Alternative A, the No Project Alternative, represents what would reasonably be expected to occur in the foreseeable future if the RADP were not approved and implemented. The No Project Alternative assumes that none of the RADP projects would be constructed. The No Project Alternative also assumes implementation of ongoing[7] and cumulative projects, as well as the estimated SFO employee background growth of 9,400 between 2019 and 2045 anticipated to occur regardless of implementation of the RADP (see Table 3-1, p. 3-6).

As the No Project Alternative assumes that none of the subsequent RADP projects would be constructed, this alternative would eliminate RADP projects designed to accommodate long-term aircraft operations and passenger activity levels at the Airport. Moreover, SFO's long-term operations and passenger activity levels are forecast to reach approximately 506,000 annual aircraft operations, based on the estimated capacity of the existing runways, regardless of whether the RADP is implemented. Passenger aircraft operations represent the largest portion of the 506,000 annual aircraft operations, which are forecast to accommodate approximately 71.1 million annual passengers considering the forecast passenger aircraft fleet mix. This growth would still occur under the No Project Alternative; however, RADP projects developed to accommodate the long-term increased aircraft operations and passenger activity levels would not be implemented.

[7] An ongoing project is defined in the Draft Final Airport Development Plan as a project that has been authorized to proceed by the San Francisco Airport Commission or has been identified by Airport management as needing to be implemented in the near future, subject to Airport Commission and other necessary approvals. Reasonably foreseeable ongoing projects are identified as cumulative projects and are listed in Table 3-2, p. 3-8, and mapped on Figure 3-1, p. 3-11. Other ongoing projects would undergo environmental review, as needed, at such time they are proposed. City and County of San Francisco, San Francisco International Airport, Draft Final Airport Development Plan, September 2016, https://planning.flysfo.com/sfo-tomorrow/, accessed April 19, 2024.

S.4.2 Alternative B: Reduced Development Alternative

This alternative is intended to eliminate the identified significant adverse effect from implementation of the RADP related to air quality, specifically operational ROG emissions, and to reduce other identified less-than-significant and less-than-significant-with-mitigation impacts related to implementation of the RADP. This alternative would remove the Boarding Area H, International Terminal Building (ITB) Main Hall Expansion, and Aircraft Maintenance Hangar projects (RADP Projects #1, #3, and #18, respectively) from the RADP.

The Reduced Development Alternative would reduce the approximately 6.4 million square feet of demolition under the RADP to approximately 6.1 million square feet of demolition (an approximately 5 percent reduction). The Reduced Development Alternative would reduce the approximately 8 million square feet of net new construction under the RADP to approximately 6.1 million square feet (an approximately 23 percent reduction). The 375,000 square feet of net new paving that would occur under the RADP would also occur under the Reduced Development Alternative. The Reduced Development Alternative would result in approximately 1,550 new SFO employees, compared to the approximately 2,700 new employees with implementation of the RADP.[8]

The Reduced Development Alternative assumes implementation of ongoing and cumulative projects, as well as the estimated SFO employee background growth of 9,400 between 2019 and 2045 anticipated to occur regardless of implementation of the RADP (see Table 3-1, p. 3-6). The Reduced Development Alternative would entail less construction than the RADP and would result in a reduction in the duration and intensity of construction activities. By removing key RADP projects designed to accommodate long-term aircraft operations and passenger activity levels at the Airport, the Reduced Development Alternative would be less effective in comparison to the RADP in accommodating forecast passenger demand and aviation activity.

S.4.3 Alternative C: Boarding Area H Only Alternative

This alternative is intended to eliminate the identified significant adverse effect from implementation of the RADP related to air quality, specifically operational ROG emissions, and to reduce other identified less-than-significant and less-than-significant-with-mitigation impacts related to implementation of the RADP. This alternative would remove all RADP projects except Boarding Area H (RADP Project #1) from the RADP.

The Boarding Area H Only Alternative would reduce the approximately 6.4 million square feet of demolition under the RADP to approximately 205,600 square feet of demolition (an approximately 97 percent reduction). The Boarding Area H Only Alternative would reduce the approximately 8 million square feet of net new construction under the RADP to approximately 1.4 million square feet (an approximately 82 percent reduction). The 375,000 square feet of net new paving that would occur under the RADP would not occur under the Boarding Area H Only Alternative. The Boarding Area H Only Alternative would result in approximately 190 new SFO employees, compared to approximately 2,700 new employees with implementation of the RADP.[9]

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[8] Appendix D, Employee Growth Assumptions Memorandum, to this Draft EIR provides a detailed breakdown of estimated employment generation for implementation of the RADP. The estimated number of employees for this alternative is based on the combined projected employment for the 17 subsequent RADP projects that would be developed under this alternative, as presented in Table 2 of Appendix D.

[9] The approximately 190 new SFO employees estimated for this alternative are based on the projected employment for the Boarding H project, as presented in Table 2 of Appendix D.

The Boarding Area H Only Alternative assumes implementation of ongoing and cumulative projects, as well as the estimated SFO employee background growth of 9,400 between 2019 and 2045 anticipated to occur regardless of implementation of the RADP (see Table 3-1, p. 3-6). The Boarding Area H Only Alternative would entail substantially less construction than the RADP and would result in a substantial reduction in the duration and intensity of construction activities (i.e., about six years rather than over a period of approximately 20 years under the RADP). By removing all the key terminal projects except Boarding Area H, all ground access and parking projects, and support facilities projects proposed under the RADP, the Boarding Area H Only Alternative would be substantially less effective in comparison to the RADP in accommodating forecast passenger demand and aviation activity.

S.4.4 Summary of Impacts

Table S-3 compares each alternative to the RADP and its respective impacts in a summary manner.

Table S-3 Comparison of Environmental Impacts of the RADP to Impacts of the Alternatives

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Environmental Impact Report				
3.A. Transportation and Circulation				
Impact TR-1: Construction under the RADP would require a substantially extended duration; however, the effects would not create potentially hazardous conditions for people walking, bicycling, or driving or interfere with emergency access or accessibility for people walking or bicycling, or substantially delay transit.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact TR-2: The RADP would not create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
Impact TR-3: The RADP would not interfere with the accessibility of people walking or bicycling to and from the project site and adjoining areas, or result in inadequate emergency access.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
Impact TR-4: The RADP would not substantially delay public transit.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
Impact TR-5: The RADP would not cause substantial additional vehicle miles traveled or substantially induce automobile travel.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
Impact TR-6: The RADP would not result in a passenger or freight loading deficit.	LTS	Increased compared to the RADP (LTS)	Similar to the RADP (LTS)	Increased compared to the RADP (LTS)
Impact TR-7: The RADP would not result in a substantial parking deficit.	LTS	Increased compared to the RADP (LTS)	Similar to the RADP (LTS)	Increased compared to the RADP (LTS)
Impact C-TR-1: Construction of RADP projects, in combination with cumulative projects, would not result in significant construction-related transportation impacts.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact C-TR-2: The RADP, in combination with cumulative projects, would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations; would not interfere with the accessibility of people walking or bicycling, or result in inadequate emergency access; would not delay transit; would not cause substantial additional VMT or substantially induce automobile travel, or result in substantial loading or parking deficits.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
3.B. Noise and Vibration				
Impact NO-1: Construction of RADP projects could result in a substantial temporary or periodic increase in ambient noise levels at sensitive receptors in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact NO-2: Construction of RADP projects could generate excessive groundborne vibration or groundborne noise levels.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact NO-3: Operation of RADP projects would not result in a substantial permanent increase in ambient noise levels at sensitive receptors in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact NO-4: Construction and operation of RADP projects would not expose people residing or working in an airport land use plan area to excessive noise levels.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
Impact C-NO-1: Construction of RADP projects, in combination with cumulative projects, would not result in significant noise impacts.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-NO-2: Construction of RADP projects, in combination with cumulative projects, would not generate excessive groundborne vibration or groundborne noise levels.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-NO-3: Operation of RADP projects, in combination with cumulative projects, would not result in significant noise impacts.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
3.C. Air Quality				
Impact AQ-1 (Plan-Level Analysis): The RADP would not conflict with or obstruct implementation of the Clean Air Plan.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact AQ-2 (Plan-Level Analysis): The RADP would not result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact AQ-3 (Representative Analysis of Subsequent RADP Projects): Construction of subsequent RADP projects could result in a cumulatively considerable net increase of any criteria air pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact AQ-4 (Representative Analysis of Subsequent RADP Projects): Operation of subsequent RADP projects would cause a cumulatively considerable net increase of a criteria air pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.	**SUM**	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact AQ-5 (Plan-Level and Representative Analysis of Subsequent RADP Projects): Construction and operation of RADP projects, individually or in combination, would not result in emissions of fine particulate matter ($PM_{2.5}$) or-toxic air contaminants that would result in exposure of sensitive receptors to substantial air pollutant concentrations.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact AQ-6 (Representative Analysis of Subsequent RADP Projects): Construction and operation of subsequent RADP projects would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-AQ-1: Construction and operation of the RADP, in combination with cumulative projects, would not result in exposure of sensitive receptors to substantial levels of fine particulate matter ($PM_{2.5}$) and toxic air contaminants under cumulative conditions.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact C-AQ-2: Construction and operation of the RADP, in combination with cumulative projects, would not combine with other sources of odors that would adversely affect a substantial number of people.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Initial Study				
E.1. Land Use and Planning				
Impact LU-1: The RADP would not physically divide an established community.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact LU-2: The RADP would not cause a significant physical environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-LU-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact related to land use and planning.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.2. Aesthetics				
Impact AE-1: The RADP would not have a substantial adverse effect on a scenic vista or substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway, nor would the RADP substantially degrade the existing visual character or quality of public views of the site and its surroundings or conflict with applicable zoning and other regulations governing scenic quality.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact AE-2: The RADP would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-AE-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact related to aesthetics.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.3. Population and Housing				
Impact PH-1: The RADP would not induce substantial unplanned direct or indirect population growth.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact C-PH-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact related to population and housing.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.4. Cultural Resources				
Impact CR-1: The RADP could cause a substantial adverse change in the significance of a historical resource pursuant to section 15064.5, including those resources listed in article 10 or article 11 of the San Francisco Planning Code.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact CR-2: The RADP could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact CR-3: The RADP could disturb human remains, including those interred outside of formal cemeteries.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact C-CR-1: The RADP, in combination with cumulative projects, could result in cumulative impacts on historic resources.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact C-CR-2: The RADP, in combination with cumulative projects, could result in significant cumulative impacts on archeological resources and human remains.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
E.5. Tribal Cultural Resources				
Impact TCR-1: The RADP could result in a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code section 21074.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact C-TCR-1: The RADP, in combination with cumulative projects, could result in a significant cumulative impact on tribal cultural resources.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
E.9. Greenhouse Gas Emissions				
Impact C-GG-1: The RADP would generate greenhouse gas emissions, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing greenhouse gas emissions.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
E.10. Wind				
Impact WI-1: The RADP would not create wind hazards in publicly accessible areas of substantial pedestrian use.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-WI-1: The RADP in combination with cumulative projects would not result in a significant cumulative wind impact.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.11. Shadow				
Impact SH-1: The RADP would not create new shadow in a manner that would substantially and adversely affect the use and enjoyment of publicly accessible open spaces.	LTS	Less than the RADP (LTS)	Similar to the RADP (LTS)	Less than the RADP (LTS)
Impact C-SH-1: The RADP in combination with cumulative projects would not result in a significant cumulative shadow impact.	LTS	Less than the RADP (LTS)	Similar to the RADP (LTS)	Less than the RADP (LTS)
E.12. Recreation				
Impact RE-1: The RADP would not result in a substantial increase in the use of existing neighborhood and regional parks and recreation facilities such that substantial physical deterioration or degradation of recreational facilities would occur or be accelerated and would not result in the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-RE-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on recreational facilities.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.13. Utilities and Service Systems				
Impact UT-1: The RADP would not require or result in the relocation or construction of new or expanded water or wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, or the expansion of existing facilities, the construction or relocation of which could cause significant environmental effects.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact UT-2: Sufficient water supplies are available to serve the RADP and reasonably foreseeable future development in normal, dry, and multiple dry years.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact UT-3: The RADP would not result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact UT-4: The RADP would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, and would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-UT-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to utilities and service systems.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.14. Public Services				
Impact PS-1: The RADP would not result in substantial adverse physical impacts from new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services such as fire protection, police protection, schools, or other public facilities.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-PS-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on public services.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.15. Biological Resources				
Impact BI-1: The RADP would not have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact BI-2: The RADP would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact BI-3: The RADP would not have a substantial adverse effect on federally protected wetlands (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact BI-4: The RADP would not interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact BI-5: The RADP would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-BI-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on biological resources.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
E.16. Geology and Soils				
Impact GE-1: The RADP would not directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving fault rupture, seismic groundshaking, seismically induced ground failure, or seismically induced landslides.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact GE-2: The RADP would not result in substantial soil erosion or the loss of topsoil.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact GE-3: The RADP would not be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact GE-4: The RADP would not create substantial risks to life or property as a result of locating buildings or other features on expansive or corrosive soils.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact GE-5: The RADP would not directly or indirectly destroy a unique geologic feature nor have the potential to destroy a unique paleontological resource.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-GE-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to geology or paleontological resources.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.17. Hydrology and Water Quality				
Impact HY-1: The RADP would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HY-2: The RADP would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede the sustainable groundwater management of the basin.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HY-3: The RADP would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion, siltation, or flooding onsite or offsite.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HY-4: The RADP would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HY-5: The RADP would not impede or redirect flood flows.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HY-6: The RADP would not risk the release of pollutants from project inundation in flood hazard, tsunami, or seiche zones.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HY-7: The RADP would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-HY-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts on hydrology or water quality.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
E.18. Hazards and Hazardous Materials				
Impact HZ-1: The RADP would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HZ-2: The RADP would be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 but would not create a significant hazard to the public or the environment.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HZ-3: The RADP would not result in a safety hazard or excessive noise for people residing or working in a project area located within an airport land use plan or within two miles of an airport.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HZ-4: The RADP would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-HZ-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to hazards or hazardous materials.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.20. Energy				
Impact EN-1: The RADP would not result in wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-EN-1: The RADP in combination with cumulative projects would increase the use of energy, fuel, and water resources, but not in a wasteful manner.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

S.4.5 Comparison of Alternatives and their Ability to Meet Project Objectives

A comparison of each alternative and its ability to meet the project objectives compared to the RADP is summarized below in **Table S-4**.

Table S-4 Summary of Ability of Alternatives to Meet Project Objectives

Project Objective	Alternative A: No Project	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
1. Provide a long-range development plan that elevates the passenger experience at the Airport and accommodates forecast passenger demand and aviation activity in a safe, cost-effective, operationally efficient, environmentally conscious, and flexible manner.	No	Partially, due to reduction in development	Partially, due to reduction in development
2. Maximize practical airfield capacity and operational efficiency in the existing physical geometry of the runways; there would be no changes to the existing runways geometry and configuration under the RADP.	No	Partially, due to reduction in development	Partially, due to reduction in development
3. Maximize gate capacity, geometry, and flexibility of airline use to efficiently accommodate forecast aviation activity, without relying on remote gates/hard stands that would require bussing operations to accommodate boarding/deplaning passengers on the airfield.	No	Partially, due to reduction in development	Partially, due to reduction in development
4. Optimize passenger processing areas including terminal lobby and security check point flows to meet future needs and incorporate new technologies.	No	No	No
5. Maximize shared-use facilities in the terminal areas and Airport and airline support facilities, as well as enable shared use by providing technology, bag claim flexibility, and connectivity for passengers and baggage across all terminals.	No	No	No
6. Achieve industry standards and airport planning principles by prioritizing efficient flow of aircraft, passengers, and goods through the Airport, through optimizing flows in the following order of priority: Airport operations area/airside; Airport facilities that are passenger facing such as terminals and gate areas, and associated passenger/aircraft support facilities (e.g., ground service equipment); landside Airport facilities including ground transportation, passenger parking, and rental car facility; other Airport and airline support facilities within the Airport property; and off-Airport uses such as catering, warehousing, and remote passenger parking.	No	Partially, due to reduction in development	No

Project Objective	Alternative A: No Project	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
7. Provide sufficient on-Airport parking to accommodate passenger demand and transport passengers and employees to/from the terminal areas using AirTrain to the greatest extent possible.	No	Yes	No

S.4.6 Environmentally Superior Alternative

The CEQA Guidelines require the identification of an environmentally superior alternative among the alternatives (CEQA Guidelines section 15126.6(e)). Based on the analysis and comparison of the impacts of the alternatives presented above, Alternative A (No Project Alternative) is the environmentally superior alternative. As described above, Alternative A would eliminate the significant-and-unavoidable-with-mitigation impact and reduce the less-than-significant and less-than-significant-with-mitigation impacts associated with implementation of the RADP given that no construction or operation of subsequent projects would occur.

The CEQA Guidelines state that if the “no project” alternative would be the environmentally superior alternative, then the EIR shall also identify an environmentally superior alternative among the other project alternatives (CEQA Guidelines section 15126.6(e)(2)). Based on the evaluation above, Alternative C (Boarding Area H Only Alternative), is the environmentally superior alternative. Under Alternative C, the significant-and-unavoidable-with-mitigation impact related to emissions of the criteria air pollutant ROG during operation identified for the RADP would be reduced to less than significant with mitigation as a result of the reduced extent of development (Impact AQ-4). While the significant-and-unavoidable-with-mitigation impact of the RADP related to operational emissions of the criteria air pollutant ROG would also be reduced to less than significant with mitigation under Alternative B (Reduced Development Alternative), the reduction would be greater under Alternative C due to the substantially reduced extent of development compared to Alternative B. In addition, by retaining implementation of the primary terminal project under the RADP, Alternative C would more effectively (though still only partially) meet most of the RADP project objectives in comparison to Alternatives A and B. However, under Alternative C, the full range of new and expanded terminal facilities and aircraft maintenance facilities proposed under the RADP to accommodate long-term operations and passenger activity would not be implemented. Nevertheless, Alternative C is the environmentally superior alternative.

S.5 Areas of Controversy and Issues to Be Resolved

Based on the comments received on the notice of preparation of an EIR, potential areas of controversy for the RADP include:

- Potential construction and operational impacts related to local and regional air quality
- Potential noise, vibration, air quality, health risk, safety, and other impacts related to aircraft operations
- Potential impacts related to greenhouse gas emissions from air traffic, vehicle miles traveled, and ground support vehicles and equipment

- Potential impacts related to ground-based noise and vibration from demolition, new construction, and Airport configuration, including the proposed realignment of Taxiways A and B
- Potential hydrological impacts related to impervious services
- Potential impacts related to traffic congestion

CHAPTER 1
INTRODUCTION

This chapter presents a summary of the San Francisco International Airport (SFO) Recommended Airport Development Plan (RADP), outlines the purpose of this draft environmental impact report (Draft EIR), summarizes the environmental review process, and describes the intended use and organization of the Draft EIR.

This Draft EIR analyzes potential environmental effects associated with implementation of the RADP at a programmatic level, which is being proposed by the project sponsor, San Francisco International Airport (SFO or Airport). SFO prepared the Draft Final Airport Development Plan (Draft Final ADP) to set forth a long-range plan to modernize SFO, increase the efficiency of Airport operations, and enhance the passenger experience.[10] The Draft Final ADP studies forecast passenger demand and recommended landside facility requirements through development of long-range projects, collectively called the Recommended Airport Development Plan in Chapter 6 of the Draft Final ADP. The RADP projects described in Chapter 6 were derived from conducting an inventory assessment of existing facilities and ongoing projects,[11] preparing an aviation activity forecast, analyzing the facilities requirements to meet the aviation activity forecast, and developing alternatives analyses.

The RADP involves a long-range plan to guide development at the Airport, which is intended to accommodate forecast passenger demand at SFO through the following measures:[12] maximizing gate capacity, geometry, and flexibility; optimizing lobby and security flows and incorporating new technology for passenger screening; maximizing shared-use facilities and baggage claim flexibility; and maximizing transfer connectivity for passengers and baggage.

SFO is geographically located primarily in unincorporated San Mateo County, California, approximately 13 miles south of downtown San Francisco, with portions of the Airport within the city boundaries of South San Francisco to the north, Millbrae to the south, and San Bruno to the west.[13] The U.S. Coast Guard San Francisco Air Station[14] and the United Airlines Maintenance and Operations Center[15] are located on Airport land but are excluded from consideration in the RADP because they are fixed, on-Airport land uses. The

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[10] City and County of San Francisco, San Francisco International Airport, *Draft Final Airport Development Plan*, September 2016, https://planning.flysfo.com/sfo-tomorrow/, accessed April 19, 2024. Note the Draft Final Airport Development Plan represents the final document developed after a two-year planning process; however, the San Francisco Airport Commission will not take action on the ADP until completion of the CEQA process. As such, the ADP is referred to as the Draft Final Airport Development Plan.

[11] An ongoing project is defined in the Draft Final ADP as a project that has been authorized to proceed by the San Francisco Airport Commission or has been identified by Airport management as needing to be implemented in the near future, subject to Airport Commission and other necessary approvals. Reasonably foreseeable ongoing projects are identified as cumulative projects and are listed in Table 3-2, p. 3-8, and mapped on Figure 3-1, p. 3-11. Other ongoing projects would undergo environmental review, as needed, at such time they are proposed. Employee generation associated with ongoing projects is included in the background growth presented in Table 3-1, p. 3-6. City and County of San Francisco, San Francisco International Airport, *Draft Final Airport Development Plan*, September 2016, https://planning.flysfo.com/sfo-tomorrow/, accessed April 19, 2024.

[12] See Chapter 1, Introduction, of the Draft Final ADP for an overview of the process and SFO goals and objectives that guided the ADP planning process.

[13] SFO, owned by the City and County of San Francisco, is not subject to the land use requirements of other jurisdictions, even if the land use occurs within the geographical boundaries of another jurisdiction. California Government Code sections 53090 and 53091 grant a city or county intergovernmental immunity from complying with another governmental body's zoning and building permit laws.

[14] The U.S. Coast Guard station is located entirely on federal land; the facilities are owned, maintained, and operated by the federal government.

[15] United Airlines maintains a land lease and the facilities developed, operated, and maintained within the Maintenance and Operations Center leasehold are owned by United Airlines.

Airport is owned by the City and County of San Francisco (the City), and operated by and through the San Francisco Airport Commission (the airport commission).

1.A Purpose of This EIR

This EIR is intended as an informational document that in and of itself does not determine whether the RADP or any component of it will be approved. Rather, the Draft EIR and Response to Comments document, which together constitute the Final EIR, aids the planning and decision-making process by disclosing the potential for significant adverse impacts. In conformance with the California Environmental Quality Act (CEQA; codified in California Public Resources Code section 21000 et seq.), this Draft EIR provides objective information addressing the environmental consequences of the RADP and identifies the means of reducing or avoiding its significant impacts where feasible.

The CEQA Guidelines help define the role and expectations of this EIR as follows:

- **Informational Document.** An EIR is an informational document that will inform public agency decision-makers and the public of the significant environmental effect(s) of a project, identify feasible ways to avoid or minimize significant effects, and describe reasonable alternatives to the project. The public agency shall consider the information in the EIR along with other information contained in the administrative record (CEQA Guidelines section 15121(a)).
- **Degree of Specificity.** An EIR on an individual development project necessarily will be more detailed in its analysis of the effects of the project than will an EIR on the adoption of a local general plan or a plan like the RADP because the effects of the construction and operation of an individual building or buildings can be predicted with greater accuracy than can the effects of a plan for a large geographic area that contains broad parameters that would apply to numerous individual projects. Therefore, an EIR on a plan should focus on the secondary effects—including the likely effects from subsequent projects that could occur with implementation of the RADP—that can be expected to follow from plan adoption, but the EIR need not be as detailed as an EIR on the specific construction and operation of projects that might follow (CEQA Guidelines section 15146 (a) and (b)).
- **Standards for Adequacy of an EIR.** An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information that enables them to make a decision that intelligently takes account of the environmental consequences of the project under consideration. An evaluation of the environmental effects of a proposed plan need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of such disagreement. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure (CEQA Guidelines section 15151).

CEQA Guidelines section 15382 defines a significant effect on the environment as “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.” Therefore, in identifying the significant impacts of the RADP, this Draft EIR concentrates on its substantial physical effects and on mitigation measures to avoid or reduce those effects.

1.A.1 Programmatic Review of Potential Impacts

This Draft EIR analyzes the RADP at a programmatic level, in accordance with CEQA Guidelines section 15168. A programmatic analysis is appropriate for a project that will involve a series of actions that are (1) related geographically, (2) logical parts in a chain of contemplated actions, (3) connected as part of a continuing program, and (4) carried out under the same authorizing statute or regulatory authority and have similar environmental impacts that can be mitigated in similar ways. To the extent that RADP projects that could occur with implementation of the RADP could result in significant adverse effects on the physical environment that were not anticipated in the Draft EIR, those projects would require further environmental review. CEQA Guidelines section 15168 also notes that the use of a program EIR can "ensure consideration of cumulative impacts that might be slighted in a case-by-case analysis; avoid duplicative reconsideration of basic policy considerations; allow the lead agency to consider broad policy alternatives and program-wide mitigation measures at an early time when the agency has greater flexibility to deal with basic problems or cumulative impacts; and allow for a reduction in paperwork."

1.A.2 Analysis Assumptions

Passenger Activity Levels

The purpose of the RADP is to accommodate forecast passenger demand at SFO by achieving the project objectives identified in Chapter 2, Project Description, of this Draft EIR. Implementation of the RADP would facilitate the development of terminal and *non-movement areas*[16] of the airfield, as well as landside facilities to accommodate long-term *aircraft operations*[17] and passenger activity levels at the Airport of approximately 506,000 annual aircraft operations, which is the estimated annual practical capacity of the existing runways regardless of whether the RADP is implemented.[18] The Federal Aviation Administration (FAA) approved SFO's constrained aviation activity forecast for use in planning in June 2014.[19] Passenger aircraft operations represent the largest portion of the 506,000 annual aircraft operations, which are forecast to accommodate approximately 71.1 million annual passengers considering the forecast passenger aircraft fleet mix.[20] As discussed in more detail in Chapter 2, Project Description, and in Appendix C, Airport Facilities to Accommodate Aviation Demand, of this Draft EIR, implementation of the RADP would not induce passenger demand, nor would the RADP increase the capacity of the airfield, change the configuration of the existing runways, change the number of aircraft operations or aircraft types operating at the Airport (including cargo, private jets, and helicopters), or change the volume of annual passengers that choose to fly into and out of SFO. Rather, development of the terminal and non-movement areas of the airfield and landside facilities identified in the RADP would ensure that SFO is able to maintain an acceptable level of service for passengers

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[16] The *non-movement area* of an airport is not controlled by FAA air traffic control and includes ramps or aprons, a defined area for aircraft parking, loading and unloading passengers or cargo, refueling, or maintenance. The *movement area* of an airport is controlled by FAA air traffic control and includes runways, taxiways, and other areas of an airport that are used for taxiing, takeoff, and landing of aircraft.

[17] An *aircraft operation* is defined as either a takeoff or a landing.

[18] The constrained forecast and ultimate airport capacity and delay simulation modeling analysis are contained in the Chapter 2 and Appendix B of the *Draft Final Airport Development Plan*, respectively.

[19] Fernando Yanez, Airport Planner, Federal Aviation Administration, "Federal Aviation Administration (FAA) Approval of San Francisco International Airport's Aviation Activity Forecasts," letter to John Bergener, Airport Planning Director, San Francisco International Airport, June 9, 2014.

[20] Aviation activity forecasts are based on national and regional economic modeling and regression analysis and aviation trends and incorporate FAA-required factors for public-use airports, including airline aircraft fleet mix considerations. Forecasts are initially prepared as unconstrained, assuming no physical or facility constraints would limit increases in aviation activity. At SFO, the practical capacity of the runways constrains the overall capacity of the airport and there is no feasible option for adding runway capacity at SFO. Therefore, the forecast used for the RADP represents a constrained condition reflecting the practical capacity of the runways. The associated forecast of annual passengers was based on an assessment of future airline fleet mix, considering the number of seats per aircraft and the estimated percentage of occupied seats.

and accommodate aircraft operations without causing severe or unrecoverable delays. As such, this Draft EIR analyzes projected employment growth (as described in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures) pertaining to the development of terminal and non-movement areas of the airfield and landside facilities (subsequent projects) that could occur with implementation of the RADP. This Draft EIR bases the analyses of impacts on reasonably conservative assumptions to avoid understating the RADP's overall environmental effects.

CEQA Baseline

In general, this Draft EIR uses the physical conditions in the area of the RADP at the time of NOP publication (May 22, 2019) as the baseline condition to evaluate most construction, operational, and cumulative impacts of the RADP. However, in some cases, comparing existing conditions as of May 2019 to future conditions would be incorrect and would overestimate the impacts caused by implementation of the RADP and thus would be misleading to the public and decision makers. Comparing and assessing the environmental effects of subsequent projects that could occur under the RADP to the 2019 existing conditions would mislead the public and decision makers into believing that (1) there would be no or few changes to existing conditions regarding passenger and employment growth anticipated to occur by 2045 regardless of implementation of the RADP; and (2) all or most of the environmental impacts that could occur by 2045 are attributable solely to the RADP, rather than, for example, the passenger and employment growth anticipated to occur by 2045 regardless of implementation of the RADP. For this reason, this Draft EIR considers future 2045 (i.e., the anticipated RADP buildout year) baseline conditions to assess operational (including cumulative) environmental impacts for air quality, noise, and transportation to account for the passenger and employment growth anticipated to occur regardless of implementation of the RADP to present a reasonable worst-case analysis.[21] For all other construction, operational, and cumulative impacts, the 2019 existing conditions baseline is used to analyze impacts related to implementation of the RADP. This is because, for those environmental topics, there is no substantial evidence indicating that the physical environmental conditions that existed in May 2019 as presented in this Draft EIR would change in the future in a way that would substantially change the magnitude and nature of physical environmental impacts resulting from the implementation of the RADP.

1.A.3 Alternatives to the Project

Chapter 5, Alternatives, of this Draft EIR considers a reasonable range of feasible alternatives that would avoid or substantially lessen potential significant impacts of the RADP, while still feasibly meeting most of the project sponsor 's objectives. The three alternatives studied in this Draft EIR include a **No Project Alternative (Alternative A)**, a **Reduced Development Alternative (Alternative B)**, and a **Boarding Area H Only Alternative (Alternative C)**.

1.B Environmental Review Process

The San Francisco Planning Department (planning department), serving as lead agency responsible for administering the environmental review on behalf of the City, determined that preparation of an EIR was needed to evaluate potentially significant effects that could result from implementation of the RADP. CEQA

[21] This future baseline includes the anticipated future regional land use, population, and employment growth; the increase to approximately 71.1 million annual passengers at the Airport based on the estimated capacity of the existing runways; and the future projections of Airport employment through 2045, not including subsequent projects that could occur with implementation of the RADP.

requires that before a decision can be made to approve a project (or in this case, a plan) that would result in a potential significant effect on the environment, an EIR must be prepared that describes the environmental effects of the project. An EIR is a public information document for use by governmental agencies and the public to identify and evaluate potential environmental impacts of a project, to identify feasible mitigation measures to lessen or eliminate significant adverse impacts, and to examine a reasonable range of feasible alternatives to the project. The information contained in the Final EIR will be reviewed and considered by the decision-makers prior to approval, disapproval, or modification of the RADP.

CEQA generally prohibits the lead agency from approving or implementing a project unless its significant environmental effects have been reduced to less-than-significant levels, essentially "eliminating, avoiding, or substantially lessening" the expected impact(s), except when certain findings are made.[22] If the lead agency approves a project that would result in the occurrence of significant adverse impacts that cannot be mitigated to less-than-significant levels, the agency must state the reasons for its action in writing, demonstrate that its action is based on the EIR or other information in the record, and adopt a statement of overriding considerations. A statement of overriding considerations provides substantial evidence of the balance of the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable environmental risks when determining whether to approve the project.

1.B.1 Notice of Preparation of an Environmental Impact Report and Public Scoping Meetings

In accordance with CEQA Guidelines section 15082, the planning department, as lead agency, published and distributed a Notice of Preparation (NOP) to governmental agencies, organizations, and persons who may have an interest in the RADP on May 22, 2019.[23] Publication of the NOP initiated a 30-day public review and comment period that began on May 22, 2019, and ended on June 21, 2019 (see Appendix A). The NOP requested that agencies and interested parties comment on environmental issues that should be addressed in the Draft EIR. Scoping meetings were held on May 30, 2019, in San Francisco and on June 4, 2019, in Millbrae, to explain the environmental review process for the RADP and to provide opportunity to take public comment and concerns related to the RADP's environmental issues. The planning department considered the public comments received at the scoping meeting and prepared an initial study to focus the scope of the Draft EIR by assessing which of the RADP's environmental topics would not result in significant impacts on the environment. The initial study is included as an appendix to this Draft EIR (see Appendix B) and is considered part of this Draft EIR. The initial study determined that the RADP would not result in significant environmental effects (in some cases, with mitigation identified in the initial study) for the following environmental topics:

- Land Use and Planning
- Aesthetics
- Population and Housing
- Cultural Resources
- Tribal Cultural Resources
- Greenhouse Gas Emissions
- Wind
- Shadow
- Recreation
- Utilities and Service Systems

[22] The planning department is the lead agency for the CEQA process, but the airport commission is the approving agency for the RADP.
[23] Due to the COVID-19 pandemic, long-range planning was suspended and SFO continued to refine the RADP.

- Public Services
- Biological Resources
- Geology and Soils
- Hydrology and Water Quality
- Hazards and Hazardous Materials
- Mineral Resources
- Energy
- Agriculture and Forestry Resources
- Wildfire
- Mandatory Findings of Significance

During the review and comment period, comments were submitted to the planning department by interested parties. The planning department has considered the comments made by the public and agencies in preparation of this Draft EIR, as summarized in **Table 1-1**. Comments on the NOP that relate to environmental issues and potential physical environmental impacts of the RADP are addressed and analyzed throughout this Draft EIR and initial study (see Appendix B), which is considered part of this Draft EIR. The table lists the commenter and section of the Draft EIR or initial study in which each comment is addressed. The scoping comments, as summarized in this table, also indicate areas of controversy known to the lead agency and issues to be resolved, per CEQA Guidelines section 15123.[24]

Table 1-1 Summary of Scoping Comments

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
	Agencies	
Bay Area Air Quality Management District (Greg Nudd, Deputy Air Pollution Control Officer	• Evaluate the Project's consistency with the most recent draft of the Senate Bill 32 Scoping Plan by the California Air Resources Board and with the state's 2030 and 2050 climate goals. • Evaluate the Project's consistency with the City and County of San Francisco Climate Change Goals and Action Plan. • Evaluate the Project's consistency with the Air District's 2017 Clean Air Plan (2017 CAP). • Quantify the Project's potential construction and operational impacts to local and regional air quality. • Estimate and evaluate the potential health risk to existing and future sensitive receptors, within the Project, including worker receptors, from toxic air contaminants (TAC) and fine particulate matter (PM2.5) as a result of the Project's construction and operation. • Evaluate all feasible mitigation measures, both onsite and offsite, for all potentially significant air quality and GHG impacts identified in the DEIR. • The Project may require Air District permits for demolitions/renovations, internal combustion engines greater than 50 horsepower, boilers, and other stationary equipment that may cause air pollution.	• **Section 3.C**, Air Quality • **Appendix B**, **Section E.9**, Greenhouse Gas Emissions

[24] Note that public comments received on the NOP have not been edited to retain the integrity of the comment. Any suggested edits included for clarity are shown in brackets.

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
	• Include a description of the cleanup and remediation at the Project Site, including the nature of the contamination, and any remaining site cleanup/ remediation. • Include all appendices or technical documents relating to the air quality, toxic air contaminant and GHG analysis, such as emissions assessment calculation and the health risk assessment files.	
California Department of Transportation District 4 (Wahida Rashid, Acting District Branch Chief)	• Address sea level rise through geotechnical and hydrological studies conducted in coordination with Caltrans and pursuant to Executive Order S-13-08.	• **Appendix B**, **Section E.17**, Hydrology and Water Quality
	• Any major increase of square footage due to construction may impact existing floodplains and local neighbors. Additional mitigation measures will be needed to maintain current hydrologic conditions or mitigate any increase in flood flow.	
	• Any work or traffic control that encroaches onto the State ROW requires an encroachment permit that is issued by Caltrans.	• **Section 3.A**, Transportation and Circulation
	• As the Lead Agency, the City and County of San Francisco is responsible for all project mitigation, including any needed improvements to the State Transportation Network (STN). The project's financing, scheduling, implementation responsibilities and monitoring should be fully discussed for all proposed mitigation measures, prior to the submittal of an encroachment permit. Potential mitigation measures that include the requirements of other agencies—such as Caltrans—are fully enforceable through permit conditions, agreements, or other legally-binding instruments under the control of the Lead Agency.	• **Chapter 3**, Environmental Setting, Impact, and Mitigation Measures
City of Millbrae (Bradley Misner, Community Development Director)	• It is unclear how the proposed RADP would not result in an increase in air traffic arrivals and departures and ground-based noise, especially since the plan seems to suggest new, larger aircraft would be accommodated.	• **Chapter 2**, Project Description • **Appendix C**, Airport Facilities to Accommodate Aviation Demand
	• EIR should include analysis to determine whether the proposed RADP would promote additional air traffic associated with any diverted flights to SFO, cargo planes, private jets, and/or helicopters.	
	• Analyze the cumulative noise and vibration impacts of arriving and departing aircraft, including an analysis of how noise travels and bounces within the built environment, if possible. The analysis should include methods for monitoring noise and vibration to determine the real-time impacts and an identification of locations where noise monitoring equipment may be located.	• **Section 3.B**, Noise and Vibration

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
	• Analyze ground-based noise and vibration impacts from demolition, new construction, final configuration (including the Taxiway A and B shifts) and impacts associated with accommodating new and larger aircraft. Also, specific attention should be focused on impacts to Lomita Park School, Marina Vista and Bayside Manor neighborhoods.	
	• Analyze increased ground-based noise impacts due to increased airport operations, including but not limited to, baggage handling, maintenance, catering trucks and personnel vehicles and whether electric operation vehicles would substantially decrease noise impacts.	
	• Identify locations for the placement of modern noise monitoring equipment that can provide real-time data.	
	• Analyze the effects of greenhouse gas (GHG) emissions, including additional air traffic, vehicle miles traveled (VMT) from arriving and departing passengers traveling in automobiles (including airport employees), and ground support vehicles and equipment servicing the increased air traffic.	• **Appendix B**, **Section E.9**, Greenhouse Gas Emissions
	• Analyze construction-related impacts, including identification of proposed off-site staging areas, storage areas, vehicle hauling routes, supply vehicles, and construction worker parking areas.	• **Chapter 3**, Environmental Setting, Impacts, and Mitigation Measures
	• Analyze air quality impacts to the Millbrae community and specifically to Lomita Park School (this area may be the site of a future community garden) and the two neighborhoods mentioned above.	• **Section 3.C**, Air Quality
	• Analyze Transportation Network Company (TNC) vehicles along with shuttle, limousine, and other automobile travel patterns, staging areas, and drop-off/pickup routes.	• **Section 3.A**, Transportation and Circulation
	• Analyze traffic impacts along the Millbrae Avenue Corridor including both U.S. 101 on- and off-ramps due to spill over traffic from the Airport.	
	• The City urges a Zero Waste approach to the demolition and recycling/reuse of materials on-site.	• **Appendix B**, **Section E.13**, Utilities and Service Systems
City of Pacifica (Kevin Woodhouse, City Manager)	• Although SFO claims that the expansion will not "change aircraft operations," it is difficult to see how such a large expansion in the Airport's ground-based facilities would not result in a corresponding increase in air traffic arriving at and departing from SFO on a 24-hour basis, seven days per week.	• **Chapter 2**, Project Description • **Appendix C**, Airport Facilities to

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
	• The NOP does not acknowledge all arriving and departing flights, including not just passenger flights but, in addition, cargo aircraft, private jets, and helicopters. The forthcoming EIR analysis should evaluate all such aircraft, not just commercial passenger flights.	Accommodate Aviation Demand
	• There is no mention in the NOP of arriving and departing flights from other Bay Area airports, such as Oakland or San Jose, which obviously will contribute to the ground-level noise and vibration impacts.	• **Section 3.B**, Noise and Vibration
	• The EIR should include enhanced measures to monitor the noise and vibration impacts of arriving and departing aircraft. It is not clear what types of noise and vibration monitoring systems will be in place in surrounding communities to determine the actual impacts of the Airport expansion and potential increases in arriving and departing flights on the people who live and work in the many communities who are members of the Roundtable. Pacifica, in particular, is topographically higher than many communities surrounding SFO and is uniquely impacted by noise from low-flying aircraft. We understand that, although the Airport proposes new, state-of-the-art monitors, nothing in the NOP addresses the number or location of these monitors. Due to ever-increasing flights and revised flight paths, more monitors are needed and they need to be located in areas over which the new flight paths are located.	
	• The EIR should include an analysis of the direct and indirect effects of greenhouse gas (GHG) emissions from the Airport expansion, including how they may contribute to increased sea level rise along Pacifica’s coastline. Increased GHG emissions will reasonably be expected to result from the additional air traffic at the Airport, additional vehicle miles traveled (VMT) from arriving and departing passengers traveling in automobiles, additional VMT from new airport employees commuting in automobiles, and Airport ground support equipment servicing the increased air traffic.	• **Appendix B**, **Section E.9**, Greenhouse Gas Emissions
City of Palo Alto (Ed Shikada, City Manager)	• The EIR should consider noise impacts on Palo Alto and other cities within at least a 50-mile radius of SFO and display noise contours starting at 45 dB CNEL and in increments of 5 dB. Consider the cumulative impact of noise of all current and anticipated air traffic operations (private or commercial arrivals and departures, passenger and cargo planes, helicopters, etc.) at all three of the Bay Area's international airports (SFO, Oakland, and San José).	• **Section 3.B**, Noise and Vibration

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
	• The EIR should include/evaluate improved and expanded noise monitoring of all arriving and departing aircraft. Monitors should be deployed in communities within at least a 50-mile radius of SFO. Permanent noise monitoring stations should be located in communities beyond the SFO Roundtable member communities, as several jurisdictions that are part of the Santa Clara/Santa Cruz Roundtable are impacted by SFO's operations. Specifically, more noise monitoring stations should be located directly under or nearby current flight paths (vectored and non-vectored) of departures and arrivals.	
	• The EIR should consider greenhouse gas emissions and air quality impacts on Palo Alto and other cities within at least 50 miles of the airport. Include measurement of emissions on the ground, specifically the level of ultra-fine particles, in locations where aircraft fly below 5,000 feet. Consider the cumulative impact of emissions of all current and anticipated air traffic operations (private or commercial arrivals and departures, passenger and cargo planes, helicopters, etc.) at all three of the Bay Area's international airports (SFO, Oakland, and San José).	• **Section 3.C**, Air Quality • **Appendix B**, **Section E.9**, Greenhouse Gas Emissions
City of San Bruno (Jovan Grogan, City Manager)	• The RADP projects will exacerbate increasing traffic gridlock along U.S. Highway 101 and local access roads that serve both the Airport and the City's residents and businesses. For example, San Bruno Avenue is a key important local access road that serves both the Airport and San Bruno. The RADP projects could result in cumulative traffic volumes that exceed the capacity of certain ramps and cause significant queue impacts if the EIR does not identify adequate mitigation measures to relieve critical traffic movements.	• **Section 3.A**, Transportation and Circulation
	• The City is concerned about the RADP's proposed addition of 10,000 parking spaces and the related to transportation and circulation impacts on City streets, El Camino Real, and adjacent major freeways including Highway 101, Interstate 280 and Interstate 380.	
	• These transportation and circulation concerns are only one of many concerns the City has with respect to the Airport's proposed RADP and variant. Accordingly, the City respectively requests that the Planning Department consult with the City of South San Francisco's Planning Department on the analysis of potential transportation and circulation, noise, and air quality impacts on the City's residents, businesses, and public infrastructure and facilities while it is preparing the Draft EIR prior to public release. *Such consultation should be completed prior to the EIR public release. In addition, please include the City on the notice list for the final EIR release and the RADP*.	

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
	• The City's General Plan states that the City should aim to "protect the health and comfort of residents by reducing the impact of noise from … San Francisco International Airport, … " The General Plan policies also encourage the City to actively participate in any SFO expansion and development process via the SFO/ Community Roundtable, an environmental review process and/or working closely with San Mateo County Airport Land Use Committee (ALUC) in identifying shared concerns to achieve fullest noise mitigation possible (General Plan Policy HS-39 through 52). Further, the RADP should demonstrate full compliance to the City's Noise Ordinance.	• **Section 3.B**, Noise and Vibration
City of South San Francisco (Mike Futrell, City Manager)	• South San Francisco is particularly concerned about the negative impacts the RADP projects will have on transportation and circulation in the Highway 101 corridor. The RADP projects will exacerbate increasing traffic gridlock along U.S. Highway 101 and local access roads that serve both the Airport and the City's residents and businesses. For example, North Access Road and South Airport Boulevard are important local access roads that serve both the Airport and South San Francisco. The RADP projects could result in cumulative traffic volumes that exceed the capacity of certain ramps and cause significant queue impacts if the EIR does not identify adequate mitigation measures to relieve critical traffic movements.	• **Section 3.A**, Transportation and Circulation
San Mateo County (Dave Pine, District 1 Supervisor)	• The most critical omission in the NOP is the absence of any reference to climate change or the potential for significant sea level rise from the San Francisco Bay. The EIR should cross-reference to the Shoreline Protection Program so that the environmental impacts of both projects can be considered holistically. Moreover, given anticipated sea level rise along the Bay, it seems likely that some components of the RADP may need to be adjusted over the course of their useful lives in order to address sea level rise and the impact of such likely adjustments should be identified and analyzed in the EIR.	• **Appendix B**, **Section E.17**, Hydrology and Water Quality
	• The breadth and depth of projects in the RADP will surely increase SFIA-related noise impacts in our communities. The EIR should evaluate both temporary noise impacts caused by construction work, as well as any long-term noise impacts from additional air traffic. It should also analyze Low Frequency Noise (also referred to as Ground-Based Noise) resulting from the RADP.	• **Section 3.B**, Noise and Vibration

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
	• Movement of taxiways has the potential to change the dynamics of low-frequency/ground-based noise, and its impact on nearby communities. The EIR should analyze low-frequency noise from taxiing aircraft, and reference earlier changes in the taxi footprint at SFO, as well as other low-frequency impacts from other construction projects within the RADP.	
Town of Hillsborough (Elizabeth Cullinan, Director of Building and Planning)	• Construction projects at the Airport over the years have changed past vegetated and lowered pervious surfaces into raised hardened impervious services [surfaces] with added impervious buildings, particularly over the last 12 years. The EIR should consider the cumulative effects of construction projects with the added hardened impervious services.	• **Appendix B**, **Section E.17**, Hydrology and Water Quality
	Individuals	
Darlene Yaplee	• The EIR should consider noise and emissions impacts to the communities surrounding SFO, including Santa Clara and Santa Cruz counties, that may arise from the planned SFO expansion and development, and accompanying increases in air traffic arrivals and departures, and changes in runway and air traffic operations. Specifically, we request that a study be conducted to consider noise and emissions impacts on Palo Alto and other cities within at least a 50-mile radius from SFO. Display noise contours starting at 40 dB CNEL and in increments of 5 dB.	• **Section 3.B**, Noise and Vibration • **Section 3.C**, Air Quality
	• The EIR should consider the cumulative impact of noise and emissions of all private or commercial air traffic operations (arrivals and departures, passenger and cargo planes, helicopters) at Bay Area airports (SFO, Oakland, San Jose, San Carlos, and Palo Alto) on San Francisco and other cities within a 50-mile radius of SFO.	
	• Request more noise monitoring stations be located directly under the current flight paths (vectored and non-vectored) of departures and arrivals. We propose that monitors be deployed in communities within at least a 50-mile radius from SFO, including cities that are not part of the SFO Roundtable.	
	• Measurement of emissions on the ground, specifically the level of ultra-fine particles, is needed in locations where aircraft fly below 5,000 feet.	

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
Elizabeth Lopez	• The EIR should consider high frequency noise, low frequency noise, vibration, ground-based noise from aircraft and noise bouncing off new structures constructed at SFO. Address impacts to the communities surrounding SFO that may arise from the planned SFO expansion and development, and accompanying increases in air traffic arrivals and departures, and changes in runway and air traffic operations. Specifically, we request that a study be conducted to consider noise and emissions impacts on San Francisco and other cities within at least a 50-mile radius from SFO. Display noise contours starting at 40 dB CNEL and in increments of 5 dB.	• **Chapter 2**, Project Description • **Section 3.B**, Noise and Vibration • **Section 3.C**, Air Quality • **Appendix C**, Airport Facilities to Accommodate Aviation Demand
	• The EIR should consider the cumulative impact of noise and emissions of all private or commercial air traffic operations (arrivals and departures, passenger and cargo planes, helicopters) at Bay Area airports (SFO, Oakland, San Jose, San Carlos, and Palo Alto) on San Francisco and other cities within a 50-mile radius of SFO.	
	• Set noise monitors to capture low frequency noise and vibration along all flight paths, including standard vectored paths of all arriving and departing aircraft, regardless of decibel level, as well as incorporate monitors in communities near SFO airport, that are experiencing ground-based noise and vibration.	
	• Request more noise monitoring stations be located directly under the current flight paths (vectored and non-vectored) of departures and arrivals. We propose that monitors be deployed in communities within at least a 50-mile radius from SFO, including cities that are not part of the SFO Roundtable.	
	• Appoint universities with a specialization in environmental research to measure emissions from aircraft, specifically at the level of ultra-fine particles, in all locations where aircraft fly below 12,000 feet, including areas outside of the 65 dB CNEL.	
Jennifer Tasseff	• The proposed expansions in SFO airport operations will significantly increase the level of traffic congestion on highways and roads adjacent to the airport and down the peninsula. Increased highway traffic impacts air quality in the overall Bay Area, and means more carbon emissions. Any SFO expansion needs to consider the additional traffic congestion that will be created on highways such as 101, 380, and 280, in addition to the added traffic diverted onto other surface streets and alternate highways in the Bay Area. These environmental impacts should be considered based on the already congested Bay Area metroplex, and	• **Section 3.A**, Transportation and Circulation • **Section 3.C**, Air Quality

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
	continued expansions of SFO will simply worsen an already serious traffic problem in the area.	
	• Any changes to emissions or aircraft noise caused by SFO expansions will impact hundreds of thousands of residents if these changes impact the heavily populated Silicon Valley strip from Los Gatos through to Sunnyvale.	• **Section 3.C**, Air Quality • **Section 3.B**, Noise and Vibration
Peter Grace	• The NOP indicates that the justification for the expansion is the increase in traffic. This is the wrong way around. The expansion creates the demand. If SFO had one small terminal and the facilities were unable to process the passengers, passengers would seek other alternatives and there would be no need for the expansion. • Eight of the top ten SFO destinations are within California and take 58% of the departures. LAX is the top destination with over 25% of all the flights. How do the projections factor in the other alternatives that passengers can or will be able to take to destinations within California?	• **Chapter 2**, Project Description • **Appendix C**, Airport Facilities to Accommodate Aviation Demand
	• The EIR should consider noise, emissions and health impacts and display noise contours starting at 45 dB CNEL and in increments of 5 dB in both A weighted and C weighted, and include private passenger and cargo aircraft as well as helicopters.	• **Section 3.B**, Noise and Vibration • **Section 3.C**, Air Quality
	• The EIR should consider the cumulative impact of noise, emissions and on health of all private or commercial air traffic operations (arrivals and departures, passenger and cargo planes, helicopters) at Bay Area airports (SFO, Oakland, San Jose, San Carlos, and Palo Alto)	
	• Better noise monitoring coverage to reflect actual current flight paths and not just the FAA published procedures or FAA noise model.	
	• Measurement of emissions on the ground, specifically the level of ultra-fine particles, is needed in locations where aircraft fly below 5,000 feet.	
	• The FAA has constantly stated that the SSTIK and south bound Oakland procedure, CNDEL cannot be flown without manual involvement at the current departure levels. We see this with the constant vectoring i.e., not following the published procedures. The current departure levels are a safety issue and encouraging more departures will exacerbate the safety problem.	• **Chapter 4**, Other CEQA Considerations

1.B.2 Changes to the RADP since Publication of the Notice of Preparation

Since publication of the NOP, the following projects were recategorized or removed from the RADP:

- **Central Utility Plant (NOP Project #7)** – The central utility plant was identified as an optional project in the RADP to advance the Airport's long-term sustainability initiatives. However, the existing central utility plant could accommodate the forecast passenger demand and could be retrofitted in place to meet current California Building Code requirements. The Airport may separately pursue a standalone central utility plant project to address long-term sustainability initiatives and the San Francisco All-Electric New Construction Ordinance,[25] which would undergo its own environmental review at such time the project is proposed.
- **Boarding Area F Expansion (NOP Project #8)** – The Boarding Area F Expansion (widening of boarding area for passenger amenities) is renamed to Boarding Area F Modernization (RADP Project #2[26]) and includes the project components formerly associated with the Boarding Area F Extension Variant (extension of boarding area for additional domestic gates) that is now part of RADP Project #5.
- **The Boarding Area F Extension Variant (NOP Projects V1 through V5)** – The components of the former Boarding Area F Extension Variant are now part of the Boarding Area F Modernization project (RADP Project #2).
- **Emergency Rescue Fire Fighting Facility (Fire House) #1 (NOP Project #11)** – The Airport conducted a facility assessment of Fire House #1 (Building 650) due to mildew present in the fire department's living quarters. Areas with mildew have been sealed off and temporary trailers have been placed adjacent to the Fire House to provide temporary living quarters for fire fighters until a replacement facility can be built and the existing Fire House is demolished. The replacement facilities are needed, regardless of whether the RADP is approved, and would address an immediate human health concern. The Fire House would be demolished and replaced within an existing facility at the Airport and would undergo its own environmental review at such time the project is proposed; therefore, it has been removed as one of the projects proposed under the RADP.
- **West Field Cargo Facility (Buildings 710, 730, and 750) Reconstruction Projects (NOP Projects #14 and #15)** – The Airport has an immediate need to replace dilapidated and unused facilities for cargo and ground support equipment support functions and needs to proceed with these deferred redevelopments in the West Field. These projects have already undergone environmental review and were evaluated as part of the West Field Cargo Redevelopment Addendum, planning department Case No. 2020-008656ENV, issued on May 17, 2021.[27]
- **Superbay Hangar Employee Parking Lot (NOP Project #27)** – The existing aircraft *Remain Over Night (RON) parking*[28] apron is already paved and there would be no repaving required to convert aircraft parking to the Superbay Hangar Employee parking lot under the RADP. Therefore, this project is removed from the RADP. Restriping of the existing aircraft RON parking apron to employee vehicle parking is moved to RADP project #19, Aircraft Maintenance Hangar, which would displace the existing Superbay Hangar employee parking lot and necessitate relocation to the aircraft parking apron.

[25] City of San Francisco Ordinance No. 237-20, November 10, 2020.
[26] See Table 2-5, p. 2-39, for a complete listing of RADP project numbers.
[27] Note that the West Field Cargo Redevelopment Addendum also included demolition of Buildings 602, 606, 612, and 624; however, these buildings were not part of the West Field Cargo Facility Reconstruction Projects (NOP Project #14) identified in the NOP.
[28] *Remain Over Night (RON) parking areas* are used to store aircraft overnight at the airport, either at remote gates, remote parking stands or hangars.

- **Garage G/BART AirTrain Station Expansion (NOP Project #30) and West Field Road AirTrain Station Expansion (NOP Project #32)** – The Garage G/BART AirTrain Station Expansion project has been removed because the station could be renovated to berth the four-car train and would not require a platform extension. The West Field Road AirTrain Station Expansion project has been removed because the station would be expanded with pedestrian bridges as part of the West Field Cargo Redevelopment project evaluated in the West Field Cargo Redevelopment Addendum, planning department Case No. 2020-008656ENV, issued on May 17, 2021.

Since publication of the NOP, the following project was added to the RADP:

- **Terminal 3 Façade Expansion (New RADP Project #5)** – This project could only be implemented if the domestic terminal viaduct and the Central Hub (NOP Project #2; RADP Project #7) are developed. Currently, Terminal 3 lobby depth is shallow and unable to accommodate passenger ticket counter queuing space, pre-security screening checkpoints and associated passenger queues, and other modern terminal lobby facility requirements since it was originally designed and constructed. Realignment of the domestic terminal viaduct would provide more physical space at the front of the terminal façade to increase the terminal lobby depth—to accommodate passenger ingress/egress, cross flow, and passenger processing queue space. As such, this project is added to the RADP.

In addition, since publication of the NOP and due to significant changes in travel patterns attributed to the COVID-19 pandemic, prioritization of RADP projects have changed. SFO anticipates full buildout of RADP projects to occur by 2045 as opposed to 2035 as noted in the NOP.

1.B.3 Draft EIR and Initial Study Public Review Process

The CEQA Guidelines and San Francisco Administrative Code chapter 31 encourage public participation in the planning and environmental review processes. The San Francisco Planning Department provides opportunities for the public to present comments and concerns regarding this Draft EIR and its appendices, including the initial study (see Appendix B), which is considered part of this Draft EIR. These opportunities include a public review and comment period and a public hearing on the Draft EIR and initial study before the San Francisco Planning Commission.

The Draft EIR and initial study is available for public review and comment on the planning department's Environmental Review Documents webpage (https://sfplanning.org/environmental-review-documents). The Draft EIR and initial study is also available for review on the 2nd floor of the 49 South Van Ness permit center. A USB or paper copy of the Draft EIR and initial study will be mailed upon request. Referenced materials will also be made available for review upon request. Contact the EIR Coordinator, Kei Zushi, at cpc.sforadp@sfgov.org: or 628.652.7495 to make a request.

The public review period for the Draft EIR and initial study is from April 16 to June 2, 2025. The planning commission will hold a public hearing on the Draft EIR and initial study during the 45-day public review and comment period to solicit public comment on the information presented in the Draft EIR and initial study. The public hearing will be held on May 22, 2025, at San Francisco City Hall beginning at noon or later. Additional information may be found on the planning department's website at www.sfplanning.org.

Written comments should be emailed to cpc.sforadp@sfgov.org or sent to Kei Zushi, San Francisco Planning Department, 49 South Van Ness Avenue, Suite 1400, San Francisco, CA 94103, by 5 p.m. on June 2, 2025. If attachments are provided as part of an email comment on the Draft EIR and initial study, please provide them in a text-searchable pdf format, if possible.

Comments on the Draft EIR and initial study are most helpful when they address the environmental analysis itself or suggest specific alternatives and/or additional measures that would better mitigate significant environmental impacts of the RADP.

Members of the public are not required to provide personal identifying information when they communicate with the planning commission. All written or oral communications, including submitted personal contact information, may be made available to the public for inspection and copying upon request and may appear on the planning department's website or in other public documents.

1.B.4 Final EIR and EIR Certification

Following the close of the public review and comment period, the planning department will prepare and publish a document entitled "Responses to Comments on the Draft EIR." This document will contain copies of all written, email, and recorded oral comments received on the Draft EIR as well as the planning department's written responses to substantive comments and any necessary revisions to the Draft EIR, which may also contain any minor staff-initiated changes. Together, the Draft EIR and the Responses to Comments document will constitute the Final EIR. The planning department will issue the Final EIR to persons commenting on the Draft EIR not less than 10 days prior to the San Francisco Planning Commission hearing to consider certification of the Final EIR, and to the San Francisco Airport Commission that will approve the RADP. During an advertised public meeting, the planning commission will consider the documents and, if found adequate, will certify the Final EIR. Certification of the Final EIR by the planning commission represents that the document: (1) has been completed in compliance with CEQA; (2) was presented to the planning commission and the commission reviewed and considered the information contained in the Final EIR prior to taking an approval action on the RADP; and (3) reflects the lead agency's independent judgment and analysis.

CEQA requires that lead agencies shall neither approve nor implement a project unless the project implements all feasible mitigation measures that would reduce significant environmental impacts to a less-than-significant level, essentially avoiding or substantially lessening the potentially significant impacts of the project, except when certain findings are made. If an agency approves a project that would result in the occurrence of significant adverse impact(s) that cannot feasibly be mitigated to less-than-significant levels (that is, significant and unavoidable impacts), the agency must state the reasons for its action in writing, demonstrate that even with implementation of all feasible mitigation, the impact would still exceed significance thresholds based on the Final EIR or other information in the record, and adopt a statement of overriding considerations.

1.B.5 Mitigation Monitoring and Reporting Program

At the time of project approval, CEQA and the CEQA Guidelines require agencies to adopt a mitigation monitoring and reporting program that it has made a condition of project approval to mitigate or avoid significant impacts on the environment (CEQA section 21081.6; CEQA Guidelines section 15097). This Draft EIR identifies and presents mitigation measures that would form the basis of such a mitigation monitoring and reporting program.

1.C Intended Uses of This EIR

1.C.1 Environmental Review of Subsequent Projects

CEQA Guidelines section 15168(c) states that later activities in the program must be examined in light of the program EIR to determine whether an additional environmental document must be prepared as follows:

1. If a later activity would have effects that were not examined in the program EIR, a new initial study would need to be prepared leading to either an EIR or a negative declaration. That later analysis may tier from the program EIR as provided in section 15152.
2. If the agency finds that pursuant to section 15162, no subsequent EIR would be required, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required. Whether a later activity is within the scope of a program EIR is a factual question that the lead agency determines based on substantial evidence in the record. Factors that an agency may consider in making that determination include, but are not limited to, consistency of the later activity with the type of allowable land use, overall planned density and building intensity, geographic area analyzed for environmental impacts, and covered infrastructure, as described in the program EIR.
3. An agency shall incorporate feasible mitigation measures and alternatives developed in the program EIR into later activities in the program.
4. Where the later activities involve site specific operations, the agency should use a written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were within the scope of the program EIR.
5. A program EIR will be most helpful in dealing with later activities if it provides a description of planned activities that would implement the program and deals with the effects of the program as specifically and comprehensively as possible. With a good and detailed project description and analysis of the program, many later activities could be found to be within the scope of the project described in the program EIR, and no further environmental documents would be required.

Thus, this Draft EIR assumes that all subsequent projects in the RADP would be subject to environmental review at such time that those projects are proposed to determine whether or not they would result in physical environmental effects that were not examined in the program EIR. The analysis of subsequent projects would be based on existing conditions at the site and vicinity, at such time a project is proposed, and would take into account any updated information relevant to the environmental analysis of the subsequent project (e.g., changes to the environmental setting or updated forecasts or models).

1.D Organization of the Draft EIR

This Draft EIR has been organized as follows:

- **Summary.** This chapter summarizes the contents of the entire Draft EIR, including an overview of the project description and, in a tabular format, a summary of the environmental impacts that would result from project implementation and the mitigation measures identified to reduce or avoid significant impacts. It also briefly describes the alternatives to the RADP and the areas of controversy.

- **Chapter 1, Introduction.** This chapter describes the purpose of the Draft EIR, the environmental review process, the public and agency comments received on the scope of the Draft EIR, and the organization of the Draft EIR.
- **Chapter 2, Project Description.** This chapter provides a detailed description of the RADP—including project background, objectives, location, existing site land use characteristics, project components and characteristics, construction schedule (including anticipated construction activities)—and identifies required project approvals.
- **Chapter 3, Environmental Setting, Impacts, and Mitigation Measures.** This chapter covers a comprehensive range of environmental resource topics that have a potential for significant adverse impacts and/or known sensitivity. Each environmental topic is discussed in a separate section within this chapter, and each section describes the existing and/or baseline conditions relative to that resource; applicable regulatory framework; significance criteria used to assess the severity of the impacts; approach to and methodologies used in the impact analysis; and individually numbered impact statements and associated discussion of project-specific and cumulative impacts of the RADP and a determination of the significance of each impact. For impacts determined to be significant, mitigation measures that would reduce or avoid those impacts are presented. This chapter contains the following subsections and environmental resource topics:
  - Transportation and Circulation
  - Noise and Vibration
  - Air Quality
- **Chapter 4, Other CEQA Considerations.** Pursuant to CEQA Guidelines section 15126.2, this chapter summarizes any growth-inducing impacts that could result from implementation of the RADP, irreversible changes to the environment, and significant and unavoidable environmental impacts. This chapter presents areas of controversy to be resolved.
- **Chapter 5, Alternatives.** This chapter presents and evaluates alternatives to the RADP that could feasibly attain most of the project objectives as well as reduce identified significant adverse impacts of the project. It also identifies the environmentally superior alternative and describes other alternatives that were considered but rejected. Alternatives evaluated in this chapter include the following:
  - Alternative A: No Project
  - Alternative B: Reduced Development Alternative
  - Alternative C: Boarding Area H Only Alternative
- **Chapter 6, Report Preparers.** This chapter lists the Draft EIR authors and consultants; project sponsor and consultants; and agencies and persons consulted.
- **Appendices.** The appendices include the Notice of Preparation, the initial study, and supporting technical information for the Draft EIR. The following appendices are included in this Draft EIR:
  - Appendix A: Notice of Preparation and Scoping Comments
  - Appendix B: Initial Study
    - Attachment A: Historic Resource Documentation
  - Appendix C: Airport Facilities to Accommodate Aviation Demand

- Appendix D: Employee Growth Assumptions
- Appendix E: Transportation Technical Appendix
  - E.1. Existing SFO Parking Information
  - E.2. Travel Demand Memorandum
  - E.3. Construction Vehicle Trip Assignment Memorandum
  - E.4. Transit Assessment Information
  - E.5. Parking Supply and Demand for Alternatives
- Appendix F: Noise Technical Appendix
  - Noise Technical Memorandum
- Appendix G: Air Quality Technical Appendix
  - G.1. Air Quality Methodology Memorandum
  - G.2. Air Quality Results Memorandum

CHAPTER 2
PROJECT DESCRIPTION

2.A Project Overview

The project sponsor, San Francisco International Airport (SFO or the Airport), is proposing to implement the SFO Recommended Airport Development Plan (RADP), which involves a long-range plan to guide the Airport's development. The San Francisco Airport Commission (the airport commission) operates and manages the Airport as a department of the City and County of San Francisco. The RADP serves as a framework for future development at SFO and identifies various projects including the improvement and development of terminal facilities, modification of certain non-movement areas of the airfield, and improvements to landside facilities to accommodate long-term aircraft operations and passenger activity levels at the Airport. SFO's long-term operations and passenger activity levels are forecast to reach approximately 506,000 annual aircraft operations based on the estimated capacity of the existing runways regardless of whether the RADP is implemented.[29] The Federal Aviation Administration (FAA) approved SFO's constrained aviation activity forecast for use in planning in June 2014.[30] Passenger aircraft operations represent the largest portion of the 506,000 annual aircraft operations, which are forecast to accommodate approximately 71.1 million annual passengers considering the forecast passenger aircraft fleet mix.[31] As discussed in more detail in this chapter, implementation of the RADP would not induce passenger demand (i.e., induce the public to choose to fly if and/or where they otherwise would not), nor would the RADP increase the capacity of the airfield, change the configuration of the existing runways, change the number of aircraft operations or aircraft types operating at the Airport (including cargo, private jets, and helicopters), or change the volume of annual passengers that choose to fly into and out of SFO (see Appendix C, Airport Facilities to Accommodate Aviation Demand).

2.B Project Sponsor's Objectives

The project sponsor seeks to achieve the following objectives by undertaking the RADP.

1. Provide a long-range development plan that elevates the passenger experience at the Airport and accommodates forecast passenger demand and aviation activity in a safe, cost-effective, operationally efficient, environmentally conscious, and flexible manner.

[29] The constrained forecast and ultimate airport capacity and delay simulation modeling analysis are contained in the Chapter 2 and Appendix B of the *Draft Final Airport Development Plan*, respectively.
[30] Fernando Yanez, Airport Planner, Federal Aviation Administration, "Federal Aviation Administration (FAA) Approval of San Francisco International Airport's Aviation Activity Forecasts," letter to John Bergener, Airport Planning Director, San Francisco International Airport, June 9, 2014.
[31] Aviation activity forecasts are based on national and regional economic modeling and regression analysis and aviation trends and incorporate Federal Aviation Administration-required factors for public-use airports, including airline aircraft fleet mix considerations. Forecasts are initially prepared as unconstrained, assuming that no physical or facility constraints would limit increases in aviation activity. At SFO, the practical capacity of the runways constrains the overall capacity of the Airport and there is no feasible option for adding runway capacity. Therefore, the forecast used for the RADP represents a constrained condition that reflects the practical capacity of the runways. The associated forecast of annual passengers was based on an assessment of future airline fleet mix that considered the number of seats per aircraft and the estimated percentage of occupied seats.

2. Maximize *practical airfield capacity*[32] and operational efficiency in the existing physical geometry of the runways; there would be no changes to the existing runways geometry and configuration under the RADP.
3. Maximize gate capacity, geometry, and flexibility of airline use to efficiently accommodate forecast aviation activity, without relying on remote gates/hard stands that would require bussing operations to accommodate boarding/deplaning passengers on the airfield.
4. Optimize passenger processing areas including terminal lobby and security check point flows to meet future needs and incorporate new technologies.
5. Maximize shared-use facilities in the terminal areas and Airport and airline support facilities, as well as enable shared use by providing technology, bag claim flexibility, and connectivity for passengers and baggage across all terminals.
6. Achieve industry standards and airport planning principles by prioritizing efficient flow of aircraft, passengers, and goods through the Airport, through optimizing flows in the following order of priority: Airport operations area/airside; Airport facilities that are passenger facing such as terminals and gate areas, and associated passenger/aircraft support facilities (e.g., ground service equipment); landside Airport facilities including ground transportation, passenger parking, and rental car facility; other Airport and airline support facilities within the Airport property, including ground transportation and passenger parking; and off-airport uses such as catering, warehousing, and remote passenger parking.
7. Provide sufficient on-Airport parking to accommodate long-term passenger activity levels and transport passengers and employees to/from the terminal areas using AirTrain to the greatest extent possible.

2.C Overview of SFO

SFO is the largest airport serving the San Francisco Bay Area in terms of the number of aircraft operations, enplaned passengers, and domestic and international destinations served. The region is also served by the Metropolitan Oakland International Airport (OAK)[33] and San José Mineta International Airport (SJC). SFO has two sets of parallel runways, one set oriented in a north/south configuration (Runways 1L-19R and 1R-19L) and the other in an east/west configuration (Runways 10L-28R and 10R-28L). The Airport also has supporting airport and airline facilities and infrastructure; a passenger terminal area served by access roads, public parking facilities, and ground transportation facilities; and cargo and other facilities typical of a *commercial-service airport*.[34]

The Airport was constructed in phases beginning in the 1920s by filling portions of San Francisco Bay; the Airport opened in 1927. The Airport is situated within a fully developed, land-constrained site, and is the legacy of incremental changes that occurred over several decades. The majority of the Airport is paved for

[32] *Practical airfield capacity* is defined as the number of flights and operations the existing airfield can accept without incurring severe and unrecoverable delays. Several factors contribute to practical airfield capacity at an airport, including runway configuration and geometry, weather conditions (for wind and visibility), and type of aircraft.
[33] The Port of Oakland changed its airport name from "Metropolitan Oakland International Airport" to "San Francisco Bay Oakland International Airport" in May 2024. The City and County of San Francisco, as owner and operator of San Francisco International Airport, sued the City of Oakland and Port of Oakland, asserting that the new name constitutes trademark infringement. In November, the court granted preliminary injunction to the City and County of San Francisco. *City and County of San Francisco v. City of Oakland, 3:24-cv-02311-TSH (N.D. Cal.)*.
[34] A *commercial-service airport* is a publicly owned airport that has at least 2,500 passenger boardings each year and receives scheduled passenger service, as statutorily defined under 49 U.S. Code section 47102(7).

aeronautical uses such as runways, *taxiways*,[35] *aircraft aprons*,[36] and parking, or occupied by passenger terminal buildings and aircraft hangars. The Airport operates 24 hours a day, 7 days a week as a *public-use airport*.[37] As noted in the Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting published in May 2019, the Airport served approximately 57.8 million annual passengers,[38] with approximately 42,800 airport commission and *tenant*[39] employees in 2018.[40]

2.D Project Location

SFO is geographically located primarily in unincorporated San Mateo County, California, approximately 13 miles south of downtown San Francisco. Portions of the Airport lie within the city boundaries of South San Francisco to the north, Millbrae to the south, and San Bruno to the west. SFO, owned by the City and County of San Francisco, is not subject to the land use requirements of other jurisdictions, even if the land use occurs within the geographical boundaries of another jurisdiction. California Government Code sections 53090 and 53091 grant a city or county intergovernmental immunity from complying with another governmental body's zoning and building permit laws. The runways, the U.S. Coast Guard Air Station San Francisco (U.S. Coast Guard Air Station),[41] and the United Airlines Maintenance and Operations Center (MOC)[42] are located on Airport land but would not be modified by the RADP (see **Figure 2-1**). The Airport is owned by the City and County of San Francisco (the City) and operated by and through the San Francisco Airport Commission (the airport commission).

The Airport's operational area, which includes the RADP project site, is generally bordered by U.S. 101 to the west and San Francisco Bay to the east. Airport property also includes the area west of U.S. 101, referred to as West of Bayshore, comprising approximately 180 acres of undeveloped land with major infrastructure and utility rights-of-way, and aquatic, wetland, and upland habitats for sensitive species present onsite. Of the 5,100 acres comprising Airport property, approximately 2,110 acres are located on land east of U.S. 101, 180 acres are located west of U.S. 101, and 2,810 acres are located in San Francisco Bay.

SFO is accessed regionally by U.S. 101 and Interstate 380 (I-380) with SFO-specific on and off ramps. Locally, the Airport is accessed by North Access Road, South Airport Boulevard, San Bruno Avenue, Millbrae Avenue, North McDonnell Road, South McDonnell Road, and Old Bayshore Highway. Regional rail service is provided by Bay Area Rapid Transit (BART). The San Francisco International Airport BART station (SFO Airport Station) is located adjacent to the International Terminal Building and connects riders to the East Bay, San Francisco, and northern San Mateo County. The SFO Airport Station is accessible from any Airport terminal via the

[35] *Taxiways* are routes used by airplanes to move to or from runways.

[36] An *aircraft apron* is a defined area of an airport intended to accommodate aircraft for loading or unloading of passengers or cargo, refueling, parking, or maintenance.

[37] A *public-use airport* is an airport available for use by the general public without a requirement for prior approval by the airport owner or operator.

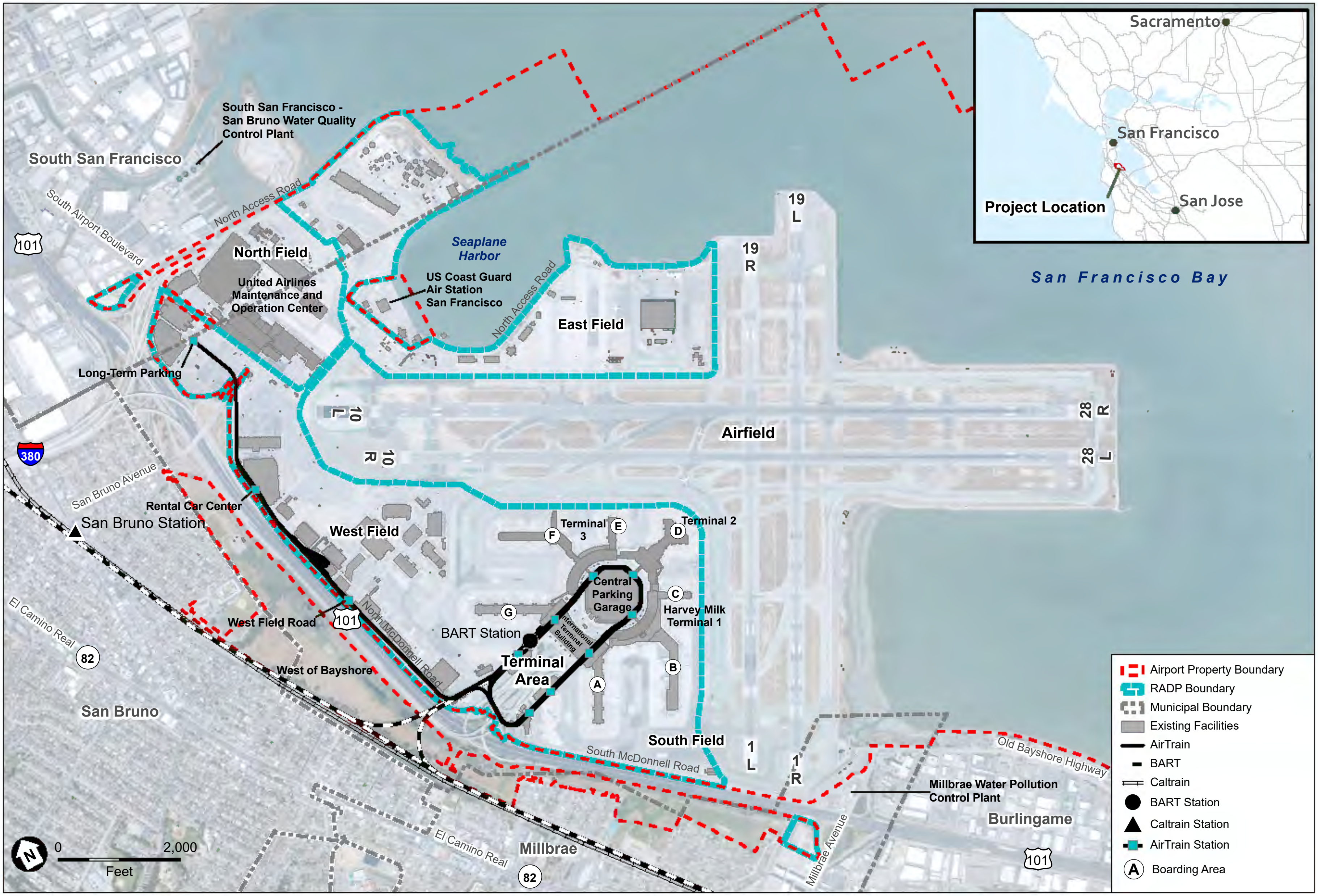
[38] The 57.8 million annual passengers include total enplaned and deplaned passengers and passengers who fly into and out of SFO. San Francisco International Airport, *Analysis of Scheduled Airline Traffic*, December 2018, https://www.flysfo.com/sites/default/files/media/sfo/media/air-traffic/as201812.pdf, accessed September 5, 2023.

[39] *Tenant employees* are employed by private companies, including but not limited to airlines, commercial service providers, ground support providers, and rental car companies.

[40] Number of employees, including airlines, tenants, and airport commission employees, based on a 2015 airport-wide survey and SFO data from FY 2015/2016, *2017 Economic Impact Study of San Francisco International Airport*, July 2017, https://www.flysfo.com/sites/default/files/pdf/2017_SFO_Economic_Impact_Study_Update.pdf, accessed September 5, 2023.

[41] The U.S. Coast Guard Air Station is located entirely on federal land; the facilities are owned, maintained, and operated by the federal government.

[42] The facilities at the United Airlines Maintenance and Operation Center are neither owned nor operated by SFO. The land occupied by these facilities is leased from the City.



SOURCE: Esri, 2024; San Mateo County, 2023; SFO, 2024; ESA, 2024

Note: SFO, owned by the City and County of San Francisco, is not subject to the land use requirements of other jurisdictions, even if the land use occurs within the geographical boundaries of another jurisdiction. California Government Code sections 53090 and 53091 grants a city or county intergovernmental immunity from complying with another governmental body's zoning and building permit laws.

SFO Recommended Airport Development Plan EIR

FIGURE 2-1
PROJECT LOCATION

AirTrain, a fully automated electric people-mover system operated by SFO that runs between the Airport terminals, terminal parking garages, West Field Road, Rental Car Center, the Long-Term Parking Garages #1 and #2, and SFO Airport Station. BART also provides a connection to Caltrain, a commuter rail service running along the San Francisco Peninsula from San Francisco to San Jose, at the Caltrain/BART Millbrae Station. Public bus service to the Airport is operated by the San Mateo County Transit District (SamTrans), which runs a fixed-route bus service connecting the Airport to San Francisco, San Mateo County, and portions of the City of Palo Alto. Airporters, which are privately operated fixed-route scheduled bus service providers, offer service for passengers and Airport commission employees between SFO and North Bay cities and counties.

2.E Project Site Characteristics

The irregularly shaped RADP project site comprises 916 acres and is generally flat. As shown on Figure 2-1, the developed SFO property is divided into six geographic areas: Terminal Area, West Field, North Field, East Field, South Field, and airfield. The RADP does not propose any changes to the runways or South Field, nor does it propose changes to the U.S. Coast Guard Air Station, the United Airlines MOC, West of Bayshore, or the portions of SFO property in the bay. Therefore, these portions of SFO property are not included in the RADP project site.

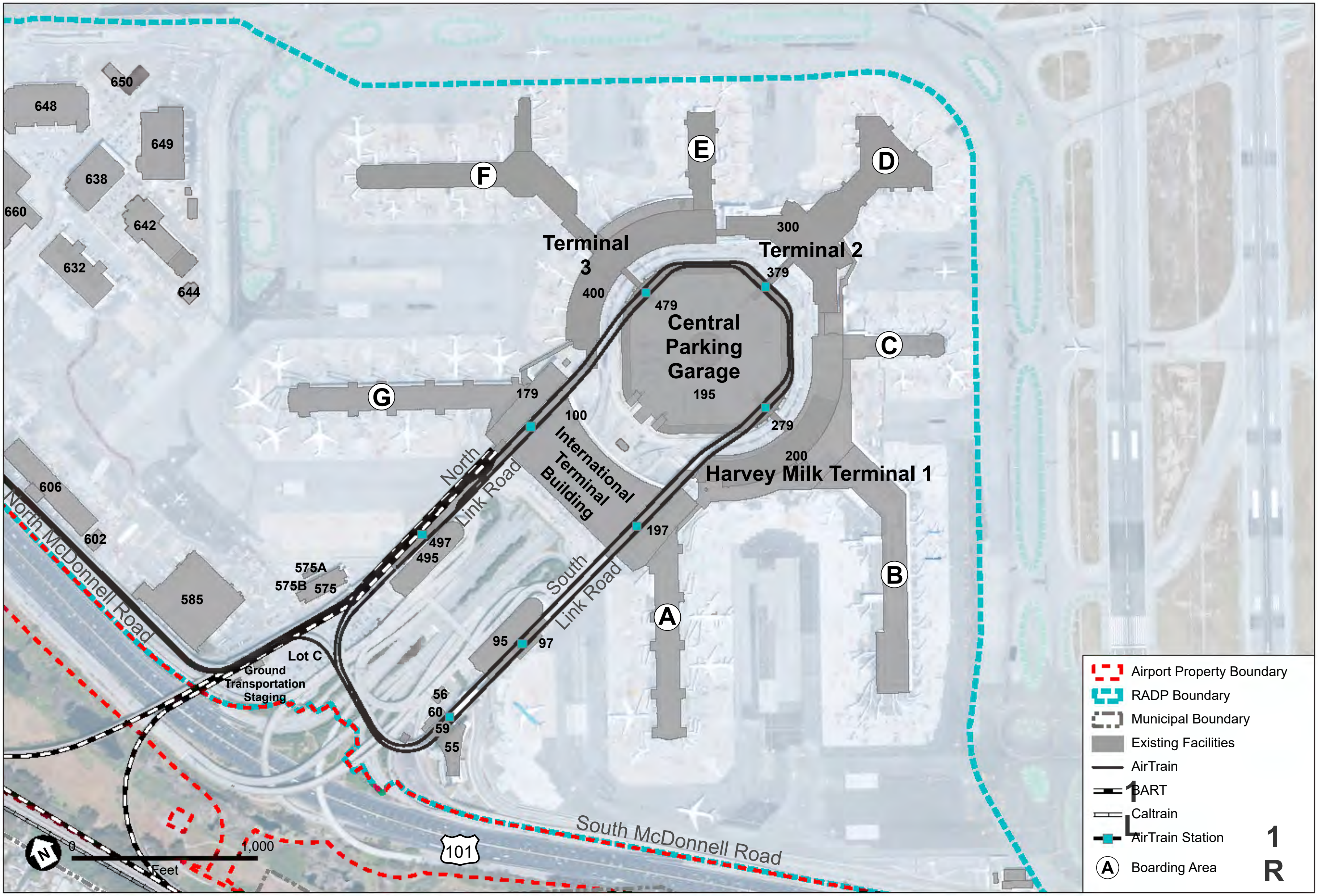
2.E.1 Geographic Areas

Terminal Area

The Terminal Area consists of four passenger terminals with seven aircraft boarding areas (see **Figure 2-2**). The four terminals include the International Terminal Building (ITB; Building 100; Boarding Areas A and G), Terminal 1 (Building 200; Boarding Areas B and C), Terminal 2 (Building 300; Boarding Area D), and Terminal 3 (Building 400; Boarding Areas E and F).

The six-level ITB consists of approximately 2.5 million square feet of total floor area and is the primary processing point for international departures and arrivals with federal immigration and inspections areas solely operated by the U.S. Customs and Border Protection and the U.S. Department of Agriculture. Terminal 1 consists of approximately 1.2 million square feet on three levels. The multi-phase redevelopment of Terminal 1 to upgrade the facility was completed in June 2024 with the opening of the Harvey Milk Terminal 1. The ongoing renovation of Boarding Area C is anticipated to be completed in 2026. Terminal 2 consists of approximately 640,000 square feet on three levels, and Terminal 3 consists of approximately 1.2 million square feet on three levels.

The Terminal Area includes terminal- and outer-side curbsides on both the upper (departures) and lower (arrivals) level roadways. The domestic terminals have three courtyards and the ITB has two courtyards on the ground level. The courtyards at all four terminals are monitored by San Francisco Police Department (police department) aides for designated use, including by drivers of vehicles that are picking up pre-arranged passengers for airline and passenger charter buses, delivery of concessions, and City vehicles. Parking Garage A (Building 95) is located west of the ITB and north of South Link Road and the Garage A AirTrain Station (Building 97). Parking Garage G (Building 495) is located west of the ITB and south of North Link Road and the Garage G BART and AirTrain Station (Building 497). The Central Parking Garage (Building 195), which provides taxi staging on the ground floor, is located in the middle of the Terminal Area and is surrounded by roadways, curbsides, the AirTrain guideway, the International Terminal G AirTrain Station



SOURCE: Esri, 2024; San Mateo County, 2023; SFO, 2024; ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 2-2

TERMINAL AREA EXISTING CONDITIONS

(Building 179), the Terminal 3 AirTrain Station (Building 479), the Terminal 2 AirTrain Station (Building 379), the Terminal 1 AirTrain Station (Building 279), and the International Terminal A AirTrain Station (Building 197). A limited ground transportation staging area and a pilot/airline employee surface parking lot (Lot C) are located west of Building 495 and south of North Link Road. The Grand Hyatt at SFO (Building 55), which was under construction at the time the Notice of Preparation (NOP) of an Environmental Impact Report was published in 2019, is now complete and located West of Building 95 and south of South Link Road.

West Field

The West Field is generally bounded by West Area Drive to the north, the airfield to the east, the Terminal Area to the south, and North McDonnell Road to the west (see **Figure 2-3**). The West Field contains a variety of support facilities, including cargo (Buildings 585, 606, 612, 624, 632, 648, and 710),[43] *ground support equipment*[44] (Buildings 602, 642, and 750), airport maintenance (Buildings 679, 682, and 692), airport administration (Buildings 575, 674, and 676),[45] employee parking (Building 638), and airline support, such as the flight kitchen (Building 649). The West Field also contains the former U.S. Post Office facility (Building 660) that is currently vacant, and an Emergency Rescue Fire Fighting Facility #1 (Building 650), which provides emergency rescue and firefighting services and is staffed by the San Francisco Fire Department – Airport Division.[46] A portion of the Lot D surface parking lot is located south of West Area Drive. The West Field Road AirTrain Station (Building 677) is located at West Field and North McDonnell roads.

North Field

The North Field is generally bounded by North Access Road and San Francisco Bay to the north, San Francisco Bay to the east, West Area Drive to the south, and North McDonnell Road and U.S. 101 to the west (see **Figure 2-4**). The North Field contains two cargo buildings (Buildings 900 and 944), the Mel Leong Treatment Plant (MLTP) (Buildings 908, 918, and 922), Long-Term Parking Garage #1 (Building 795) and Long-Term Parking Garage #2 (Building 794), the Long Term Parking Lot AirTrain Station (Building 797), the Rental Car Center (Building 780) and Rental Car Quick Turnaround Facility (Building 782), the Rental Car Center AirTrain Station (Building 779), the United Airlines MOC, and an access-restricted SFO vehicle fuel station (Building 2001). Building 928, which at the time the NOP was published contained the City College of San Francisco Airport Campus but is currently vacant, is located south of the MLTP. The northern portion of the Lot D surface parking lot is located north of West Area Drive and east and north of Buildings 780 and 782, respectively, and surface parking Lot DD is located south of the long-term parking garages.

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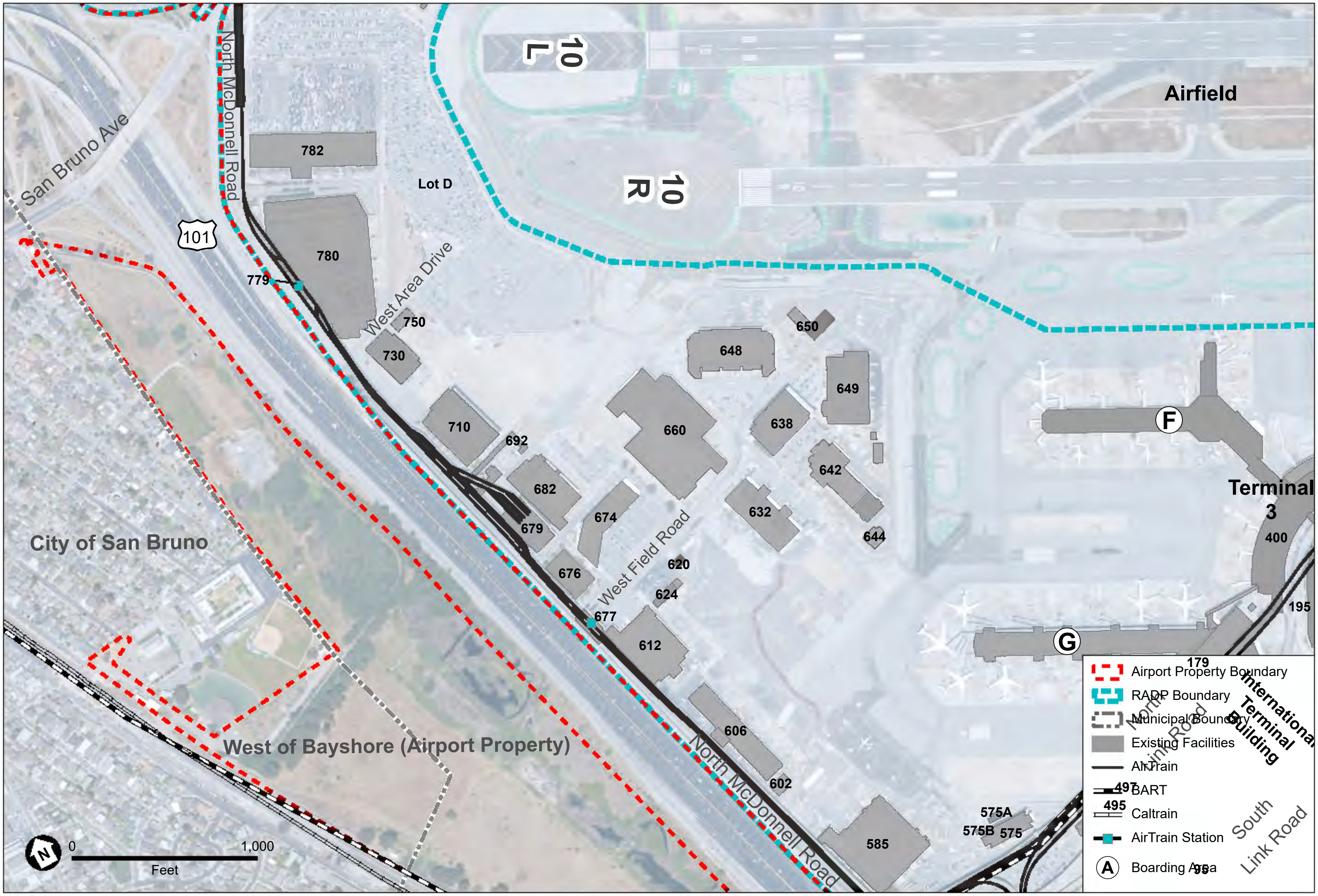
[43] Demolition of cargo Buildings 606, 612, 624, 710 (includes office), and 730, as well as demolition of ground support equipment facilities including Buildings 602 and 750, and construction of two new consolidated cargo/ground support equipment facilities and one ground support equipment facility were approved as part of the West Field Cargo Redevelopment Addendum, Case No. 2020-008656ENV, issued on May 17, 2021.

[44] *Ground support equipment*, usually found on the apron, is used to service aircraft between flights while on the ground. The role of this equipment generally involves ground power operations, passenger aircraft baggage loading and unloading, aircraft towing, and cargo/passenger loading operations.

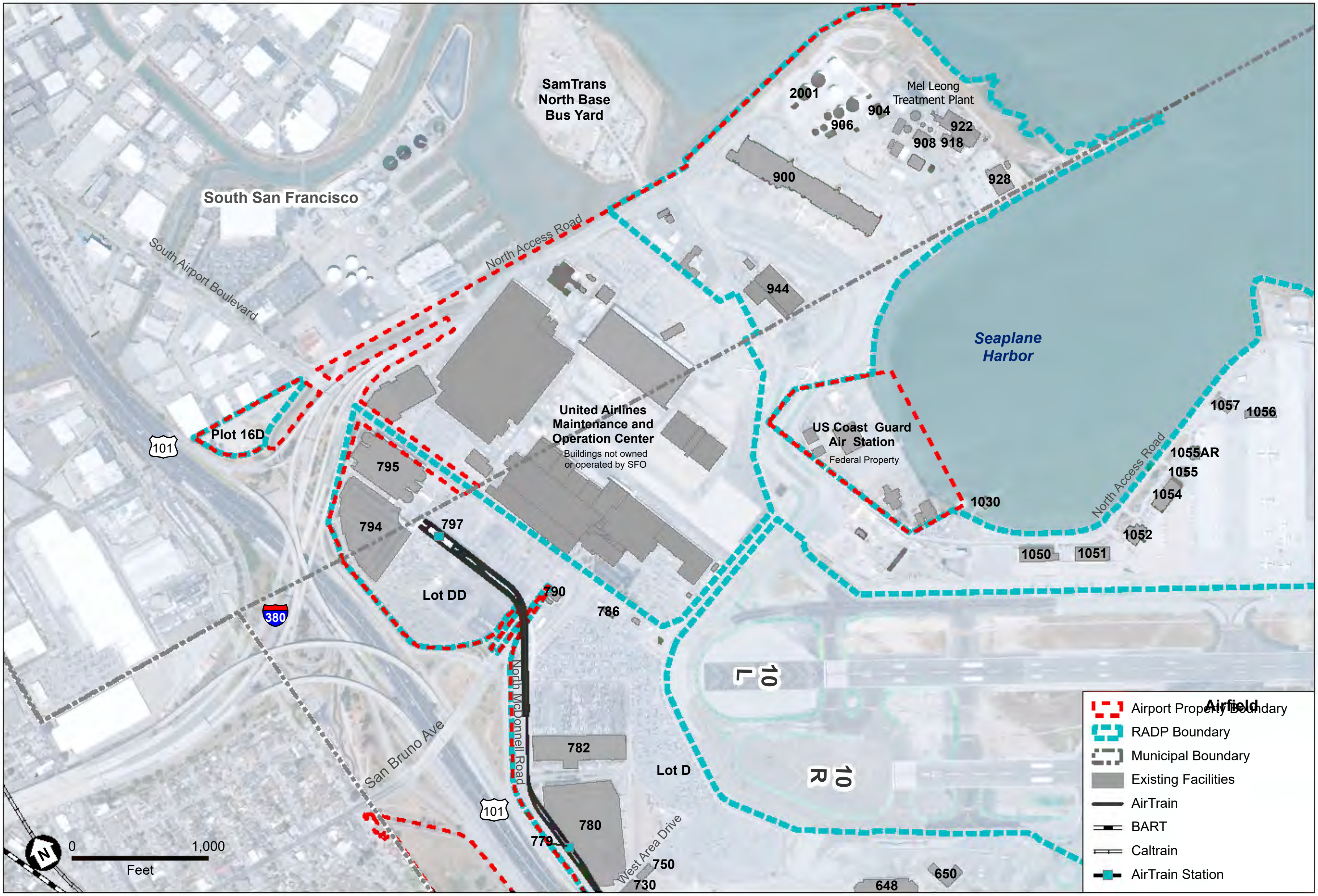
[45] Construction of a new consolidated administration building, demolition of Building 676 and construction of a new parking garage in the same location, expansion of the West Field AirTrain station platform, including relocation of the AirTrain mechanical facility to the first floor of the parking garage, and construction of two pedestrian bridges providing access between the administration building and the AirTrain station was approved as part of the SFO Consolidated Administration Campus Addendum, Case No. 2019-006583ETM, issued on May 17, 2021.

[46] Note Building 650, Emergency Rescue Fire Fighting Facility #1, will be demolished and reconstructed under a separate project that will undergo environmental review.



SOURCE: Esri, 2024; San Mateo County, 2023; SFO, 2024; ESA, 2024

FIGURE 2-3
WEST FIELD EXISTING CONDITIONS



SOURCE: Esri, 2024; San Mateo County, 2023; SFO, 2024; ESA, 2024

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FIGURE 2-4
NORTH FIELD EXISTING CONDITIONS

East Field

The East Field is general bounded by San Francisco Bay and Seaplane Harbor to the north, the airfield to the east and south, and the U.S. Coast Guard Air Station to the west (see **Figure 2-5**). The East Field primarily provides aircraft parking apron with facilities to support general aviation and air taxi[47] activities or operational activity by aviation users other than scheduled commercial flights and military aviation (Buildings 1050, 1051, 1052, and 1054). This includes private aircraft, for-hire charters, flight training activities, aerial observation, police patrol, emergency medical evacuation, and government operations. A fuel and maintenance shop (Building 1055), Airside Operations vehicle garage (Building 1056), and accompanying building (Building 1057) are also located in the East Field. The San Francisco Fire Department (fire department) marine emergency response facility (Building 1030), San Francisco Police Department Airport Bureau training facility (Building 1059), and an aircraft maintenance facility, known as the Superbay Hangar (Building 1060) are in the East Field. A ground support equipment building (Building 1070), an airfield lighting building (Building 1071), water tanks (Building 2002), and an emergency rescue firefighting facility (Building 1064).

Airfield

The airfield encompasses the largest land area of the six geographic areas and comprises the runways, taxiways, airfield lighting and signage, FAA navigational aids and associated electrical airfield lighting buildings (see Figure 2-1, p. 2-4). Vehicle access to the airfield is provided via West Field Road, West Cargo Road, and North Access Road. North Access Road also provides access to all facilities on the north side of the airfield, the North Field Security Checkpoint, and South McDonnell Road, which runs parallel to U.S. 101 and provides access to the South Field Security Checkpoint.

2.E.2 Support and Service Facilities

Ground Access and Parking

Parking garages that accommodate short-term public parking are located in the terminal core (Central Parking Garage) and adjacent to the ITB (Garages A and G), as noted above. Long-term public parking is provided in Long-Term Parking Garages #1 and #2 in the North Field and adjacent surface parking in Lot D and Lot DD. Privately operated off-Airport public parking is also available for passengers. Approximately 17,600 public parking spaces are provided on-Airport in the short-term and long-term public parking garages and surface parking lots, which also accommodate employee parking and ground transportation staging.[48]

Emergency Response Facilities

Emergency response facilities include the Emergency Rescue Fire Fighting Facility #1 (Building 650) located in the West Field, the Marine Emergency Response Facility #4 and Emergency Rescue Fire Fighting Facility #2 located in the East Field, and the Emergency Rescue Fire Fighting Facility #3 in the South Field.[49]

[47] Air taxi is a charter or private jet, not an electric vertical take-off and landing aircraft.
[48] The number of public parking spaces includes Long-Term Parking Garage #2, which was completed in 2020 after publication of the NOP.
[49] SFO must provide aircraft rescue and firefighting services during air carrier operations as a Part 139 airport, as described under 14 CFR Part 139 in the FAA regulations. Federal Aviation Administration, Part 139 Airport Certification, https://www.faa.gov/airports/airport_safety/part139_cert, accessed June 6, 2024.

SOURCE: Esri, 2024; San Mateo County, 2023; SFO, 2024; ESA, 2024

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FIGURE 2-5
EAST FIELD EXISTING CONDITIONS

Airport and Airline Support Facilities

Support facilities include air cargo, ground handling, general aviation, RON aircraft parking, and airline/airport support offices. General aviation support facilities include terminals, associated *fixed-base operator*[50] facilities in the East Field, and aircraft hangars. RON aircraft parking areas serve multiple purposes, including remote bus gates where passengers are bused to an aircraft on an apron, park aircraft overnight at the Airport, and/or provide aircraft storage for aircraft awaiting maintenance and service. Other Airport and/or airline support facilities include workshops, offices, and ground support equipment maintenance and operation facilities.

Utilities and Service Systems

The Airport is served by existing public and private utility service systems, including facilities for the collection and treatment of sanitary and industrial wastewater and stormwater; provision of potable and fire water supply; solid waste collection and recycling; heating, ventilation, and air conditioning; jet fuel distribution and storage; and power distribution.

Stormwater Facilities and Industrial Wastewater

The Airport's San Francisco Bay basin area[51] includes approximately 2,100 acres of Airport property east of U.S. 101, divided into eight separate sub-basins. The majority of the basin area is impervious. The limited pervious areas are located mainly in the airfield between the runways and taxiways. Stormwater from the Airport is collected through a series of inlets and collection pipes. The majority of the conveyance for the system operates by gravity. However, 19 existing pump stations are used as part of the stormwater system. The elevation of the Airport is low and flat, averaging about 2.5 feet above the mean high tide elevation of San Francisco Bay.[52] For this reason, stormwater must be discharged to one of the Airport's nine outfall locations via a stormwater pump station. Four detention basins divert the "first flush" of a rainfall event to the industrial wastewater treatment plant at the MLTP. After the first flush, stormwater is conveyed to the bay via stormwater outfalls.

Sanitary Sewer

The MLTP (see Figure 2-4, p. 2-9) is a wastewater and stormwater treatment plant operated by SFO that serves all airport systems and facilities and is located in the northeast portion of the North Field. The MLTP includes two separate and discrete plants: a stormwater and industrial wastewater treatment plant and a sanitary waste treatment plant. The sanitary waste treatment plant treats wastewater from potable uses such as terminal restrooms, restaurants, retail shops, hangars, and cargo facilities.

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[50] A *fixed-base operator* is a commercial business granted the right by the airport sponsor to operate on an airport and provide aeronautical services such as fueling, hangar space, tie-down and aircraft parking, aircraft rental, aircraft maintenance, flight instruction, etc.

[51] Stormwater discharged directly or indirectly to receiving bay waters is required to conform to National Pollutant Discharge Elimination System effluent limitations based on water quality objectives established in the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) to protect the designated beneficial uses for San Francisco Bay. San Francisco Bay Regional Water Quality Control Board, *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*, https://www.waterboards.ca.gov/sanfranciscobay/basin_planning.html, accessed April 23, 2024.

[52] *Mean high tide* means the average height of all the daily high tides recorded over a specified period at a given location.

Potable/Fire Water Supply

Both domestic water and fire water[53] are supplied by infrastructure at SFO. Water is conveyed by the San Francisco Public Utilities Commission from the Hetch Hetchy Aqueduct System through the Crystal Springs and San Andreas Reservoirs. The Airport water supply system connects to the regional water supply in two locations in the West of Bayshore, near U.S. 101 via three supply mains.

Solid Waste Collection and Recycling

At the time of NOP publication, SFO diverted approximately 56 percent of its solid waste from the landfill. Nearly all construction and demolition waste generated at the Airport is tested for contamination according to federal and state regulations; clean debris is recycled, with a consistent recycling rate of more than 90 percent. Solid waste generated at the Airport is collected and transported to a transfer station and material recovery facility in South San Francisco, where recyclable materials are removed. Once processed, the solid waste is transferred to the Recology of the Coast facility in the City of Pacifica.

Heating, Ventilation, and Air Conditioning

The Central Utility Plant, located in the Central Parking Garage, serves Terminals 1, 2, 3, and the ITB. The Central Utility Plant includes a cooling plant with four centrifugal chillers that provide cooling capacity. Heating for the terminals is provided by four natural gas-fired boilers. These boilers were refurbished or replaced between 2007 and 2009. Chilled water piping and hot water piping are routed in a network loop around the Central Parking Garage via a tunnel system, with individual connections to a tertiary pump room in each terminal. Many outlying facilities away from the Terminal Area have their own standalone mechanical systems.

Power Distribution

The Airport is served by two Pacific Gas and Electric Company (PG&E) substations and associated San Francisco Public Utilities Commission transformers conveying power to Airport substations in the West of Bayshore; one is located across U.S. 101 from the South Field, and the other is located across U.S. 101 from the West Field. The Airport is served by a 13.2-kilovolt power distribution system with electrical load centers located throughout the Airport that transform the 13.2-kilovolt system to a 480-volt distribution system for buildings and other facilities. In calendar years 2019 and 2022, the Airport's peak electrical demand was 45.9 megawatts and 42.3 megawatts, respectively.[54] In addition, approximately 47 stationary diesel-powered emergency generators are located throughout the Airport.

2.F Surrounding Land Uses

The Airport is bordered on the east and south by the San Francisco Bay, on the north by the City of South San Francisco, on the west by the City of San Bruno, and on the southwest by the cities of Millbrae and Burlingame. Other jurisdictions in the vicinity of the Airport include the cities of Brisbane, Daly City, Pacifica, San Mateo, and Foster City, and the towns of Colma and Hillsborough.

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[53] Fire water is used at the Airport for firefighting purposes.
[54] San Francisco International Airport, *Climate Action Plan, Fiscal Year 2021*, https://www.flysfo.com/sites/default/files/2022-09/SFO_Climate_Action_Plan_FY21_final.pdf, accessed October 3, 2024.

To the north and across North Access Road, the adjacent areas comprise mostly one-story commercial and industrial buildings, parking structures, and the South San Francisco – San Bruno Water Quality Control Plant. To the west, the Airport is bordered by U.S. 101 and West of Bayshore, which comprises approximately 180 acres of undeveloped land owned by SFO but managed through a partnership with the U.S. Fish and Wildlife Service to balance the long-term conservation of the San Francisco garter snake and California red-legged frog in this biologically sensitive area. The West of Bayshore is bordered on the west by mostly low-density residential areas and public parks in the cities of San Bruno and Millbrae. To the south, the Airport is bordered by the Millbrae Water Pollution Control Plant, mid-rise hotels, and SFO Bayfront Park, a public waterside park commonly used for watching Airport-related activities, including planes landing and taking off.

2.G Planning Context

2.G.1 San Francisco International Airport 1989 Master Plan

The SFO 1989 Draft Final Master Plan was adopted by the airport commission as the Final Master Plan (Master Plan) in 1992.[55] The Master Plan provides a long-range landside development program for the Airport to accommodate growth in cargo and up to approximately 51 million annual passengers based on the planning horizon and forecast at the time the Master Plan was developed. The objective of the Master Plan is to develop improved facilities and circulation patterns to enhance operational efficiency and accommodate forecast growth at SFO.[56] The major Master Plan improvements implemented to date include:

- The new ITB and associated Boarding Areas A and G, completed in 2000.
- Consolidation and redevelopment of cargo facilities in the North and West Field areas (cumulative project #3).
- An Automated People Mover (APM) system (called AirTrain), the first phase of which was completed in 2003; and the extension of the AirTrain system to serve a replacement consolidated rental car center and long-term public parking garages, completed in 2020.
- Roadway and vehicle circulation improvements to the ITB, completed in 2000.
- Development of an on-Airport hotel, construction of which was completed in 2019.
- Renovation of the former International Terminal (Terminal 2) for domestic operations, completed in 2011.
- Redevelopment of the South Terminal (Harvey Milk Terminal 1), Boarding Area B, which was completed in June 2024, and renovation of Boarding Area C, which is anticipated to be completed in 2026 (cumulative project #10).
- New administration/office facilities:
  - The Consolidated Administration Campus Phase 1 building (Building 674) was completed in 2018.
  - Demolition of the former Design & Construction building (Building 676) is scheduled to occur with construction of the Consolidated Administration Campus Phase 2 administration facility and associated parking garage, which is anticipated to begin in 2025 (cumulative project #2).

[55] San Francisco Planning Department, *San Francisco International Airport Master Plan Final Environmental Impact Report*, Case No. 86.638E, State Clearinghouse No. 90030535, May 1992, and San Francisco Airport Commission, Resolution No. 92-0284, adopted November 3, 1992.
[56] The San Francisco International 1989 Airport Master Plan excluded West of Bayshore, the area west of U.S. 101, consisting of approximately 180 acres of undeveloped land with major infrastructure and utility rights-of-way and aquatic, wetland, and upland habitats to maintain the site as a major utility right-of-way for Caltrans, Pacific Gas and Electric Company, Bay Area Rapid Transit, San Francisco International Airport, the San Francisco Public Utilities Commission, and adjacent cities.

2.G.2 Aviation Activity Forecast

Aviation activity forecasts provide the primary input to identifying the facilities needed to accommodate future levels of activity at an airport. In 2014, the FAA approved an updated forecast for SFO, which is referred to as the 2014 forecast.[57] The forecast was developed following standard FAA guidance and industry practice considering a variety of factors such as historical and forecast socioeconomic data, historical air traffic at the Airport (domestic and international), historical shares of originating and destination (O&D) versus connecting passengers, airline economics data regarding service at the Airport, and other drivers of aviation demand. The 2014 forecast report notes that air transportation demand at SFO depends on a combination of trends in the airline industry, national and international economic conditions, and the socioeconomic conditions in the San Francisco Bay Area.[58] The 2014 forecast was prepared considering socioeconomic data and trends for the San José-San Francisco-Oakland Combined Statistical Area consisting of 11 counties, which contain three international commercial service airports: SFO, OAK, and SJC. Socioeconomic data assessed included population, per capita personal income, employment, tourism, gross regional product, and *airline yield*.[59] Historical domestic O&D scheduled passenger traffic was examined based on these socioeconomic variables using multi-linear regression models. The regression models evaluated domestic O&D demand for SFO as well as for OAK and SJC. Three different segments of passenger demand were forecast: domestic O&D, international O&D, and connecting domestic and international passengers. The forecast for air cargo included cargo carried by freighter aircraft or as belly cargo in passenger aircraft. The aircraft operations forecast was then developed based on the forecast of enplaned passengers;[60] forecasts of cargo carried in freighter aircraft; and historical factors, industry trends, and FAA Aerospace Forecasts for General Aviation, air taxi, and military aircraft operations. The 2014 forecast was based on calendar year 2013 data and was developed initially assuming there were no physical or other constraints to increased traffic at SFO. Levels of activity were developed for 2018, 2023, 2028, and 2033.

Recognizing the Draft Final ADP goal of maximizing the practical capacity of the runway system without changing the geometry, the ability for activity to increase beyond certain levels would be constrained by the *practical capacity* of the runway system.[61] Therefore, an airfield/airspace simulation analysis was conducted as part of the Draft Final ADP to quantify the practical capacity of the SFO airfield and therefore identify the appropriate level of aviation activity for planning purposes. This modeling analysis is available as Appendix B of the Draft Final ADP.[62] The simulation analysis accounted for aircraft activity, including airline schedules for the *average day of the peak month*.[63] The analysis also accounted for varying weather conditions and their frequency of occurrence at SFO that affect how the runways can be used and the resulting hourly capacities of the runway system over a typical day. While delays are expected during certain peak periods, especially in poor weather conditions that limit hourly runway capacity, the high peak period delays should dissipate in

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[57] Fernando Yanez, Airport Planner, Federal Aviation Administration, "Federal Aviation Administration Approval of San Francisco International Airport's Aviation Activity Forecasts," letter to John Bergener, Airport Planning Director, San Francisco International Airport, June 9, 2014. Landrum & Brown, Inc., San Francisco International Airport Forecast Update, April 2014.
[58] Ibid., p. 1.
[59] *Airline yield* is the average amount of revenue received per paying passenger flown one mile either into or out of the Airport.
[60] Forecasts of passenger aircraft operations consider enplaned passengers as well as anticipated changes in the types of aircraft serving the airport, the average number of seats per aircraft, and the assumed load factor (the average percentage of seats filled per aircraft departure).
[61] The *practical capacity* is defined as the maximum demand that can be accommodated and sustained without incurring severe or unrecoverable delays.
[62] San Francisco International Airport, *Draft Final Airport Development Plan*, Appendix B, Ultimate Capacity, https://www.flysfo.com/about-sfo/sfo-tomorrow/draft-final-airport-development-plan, accessed June 7, 2024.
[63] The *average day of the peak month* is commonly used for planning purposes. The peak month at SFO has historically and continues to be August.

the following hours to avoid excessive cancellations and missed connections. Extended delays continuing throughout the day during predominant operating conditions are not acceptable.

Using the simulation results, it was determined that the airfield could accommodate and sustain annual activity equivalent to 1,475 operations on the average day of the peak month without incurring severe or unrecoverable delays. This daily demand level is referred to as the Base Constrained demand level, and includes operations by commercial passenger, air cargo, general aviation and air taxi, and military aircraft. Recognizing that more than 1,475 daily aircraft operations could occur during some seasonal and regional peak activity periods and favorable weather conditions, a High Constrained demand level of 1,500 daily operations was identified for planning purposes. The High Constrained demand level included 25 additional operations during off-peak periods. These additional operations would not increase the number of operations during any peak periods of the day and would not be considered as adding to the potential for excessive delays. Even at this level, the Airport could experience more than 1,500 operations on a particular day given ideal weather conditions and an event in the region (e.g., hosting major event) that would increase short term demand.[64] Comparing the results of the simulation analysis results against the 2014 forecast, it was estimated that beyond 2026, aircraft operations would be constrained by the practical capacity of the SFO airfield, given the existing runway configuration and dual set of closely spaced parallel runways.[65] Using the High Constrained demand level for planning ensures that the planned facilities would balance with the practical capacity of the airfield and would not be overbuilt resulting in excess and unused capacity. These demand levels provided an adaptable framework for understanding long-term facility requirements at SFO and helped facilitate development of the RADP.[66]

Understanding the practical capacity of the airfield, a constrained forecast was developed as part of the 2014 forecast representing four future activity levels: forecast 2018 and 2023, and the Base Constrained and High Constrained demand levels.[67] The Base Constrained and High Constrained demand levels were then converted to annual numbers of operations. Because the constrained demand levels represented the average day of the peak month rather than average annual, different factors were considered for each operation type (commercial passenger, air cargo, General Aviation and air taxi, and military) to convert the daily demand levels to total annual operations.[68] For air passengers, it was necessary to then estimate the number of annual passengers that could be accommodated by the commercial passenger aircraft operations, considering aircraft types and frequencies matched to seat departure projections based on historical service patterns, current dominant carriers, aircraft currently in use, aircraft on order, length of flight, and announced plans of current and new entrant airlines. The resulting constrained forecast was approved for planning by the FAA, who acknowledges that the airfield, in its existing physical geometry, limits unconstrained growth in aircraft operations and passenger enplanements.[69]

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[64] SFO, *Aviation Activity Forecasts*, https://planning.flysfo.com/wp-content/uploads/2023/04/Chapter_2_Aviation_Activity_Forecasts_Draft_Final.pdf, accessed June 5, 2024.
[65] U.S. Department of Transportation, Federal Aviation Administration, *Advisory Circular 150/5300-13B, Airport Design*, August 16, 2024, AC 150/5300-13B, Airport Design, March 31, 2022 Consolidated to include Change 1, August 16, 2024, accessed January 31, 2025.
[66] Aviation forecasts and facility requirements are requisite components to a FAA recommended master plan process for airports. Federal Aviation Administration, Advisory Circular 150/5070-6B, Airport Master Plans, https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_150_5070-6B_with_chg_1&2.pdf, accessed September 5, 2023.
[67] Fernando Yanez, Airport Planner, Federal Aviation Administration, "Federal Aviation Administration Approval of San Francisco International Airport's Aviation Activity Forecasts," letter to John Bergener, Airport Planning Director, San Francisco International Airport, June 9, 2014. Landrum & Brown, Inc., San Francisco International Airport Forecast Update, April 2014.
[68] Ibid.
[69] Fernando Yanez, Airport Planner, Federal Aviation Administration, "Federal Aviation Administration (FAA) Approval of San Francisco International Airport's Aviation Activity Forecasts," letter to John Bergener, Airport Planning Director, San Francisco International Airport, June 9, 2014.

As shown in **Table 2-1**, in 2013, SFO had 421,400 annual aircraft operations and 44.84 million air passengers. While the number of *total airline passengers*[70] has generally increased over time, global events have had a substantial effect on aviation demand. For example, the COVID-19 pandemic, which led to many commercial airlines reducing capacity and/or eliminating service on a global scale, resulted in a substantial reduction in aircraft operations. SFO is projected to recover to pre-COVID-19 activity levels in 2024 and to reach the practical capacity of its existing physical runway configuration in or about 2026 (see Appendix C, Airport Facilities to Accommodate Aviation Demand). As shown in Table 2-1, the Base Constrained annual demand level comprises approximately 62.2 million annual passengers and 489,900 aircraft operations and the High Constrained annual demand level comprises approximately 71.1 million annual passengers and 506,600 aircraft operations.

Table 2-1 Historical and Current Aviation Activity and Future Forecast

Year	Annual Passengers (millions)	Annual Total Aircraft Operations	Forecast Implications
2013	45.01	421,400	Last full calendar year of activity data used for SFO aviation forecast submitted to FAA for use in developing Draft Final ADP
2018	57.79	470,164	Increased demand on all facilities to accommodate continued growth in air travel demand
2019	57.48	458,496	Onset of COVID-19
2020	16.43	231,163	COVID-19
2021	24.34	265,597	COVID-19
2022	42.28	355,006	COVID-19 recovery
2023	50.20	384,871	COVID-19 recovery
Base Constrained (estimated 2026 to 2030)	**62.22**	**498,900**	**Constrained operational activity, larger aircraft, increased saturation of support facilities**
High Constrained (estimated 2031 to 2045)	**71.07**	**506,600**	**Constrained operational activity, larger aircraft, additional operations during non-peak periods increased saturation of support facilities**

SOURCES: SFO Air Traffic Statistics 2013–2023; Landrum & Brown, Inc., *San Francisco International Airport Forecast Update*, April 2014.

2.G.3 Purpose of the RADP

The sustained increase in passenger activity at SFO coupled with ongoing implementation of projects under the 1992 Master Plan prompted the need to develop a new plan to accommodate future growth at SFO. The purpose of the RADP is to plan for forecast passenger and operations growth at SFO through the following measures: maximizing gate capacity, geometry, and flexibility; optimizing lobby and security flows and incorporating new technology for passenger screening; maximizing shared-use facilities and baggage claim flexibility; and maximizing transfer connectivity for passengers and baggage. The RADP includes projects that would accommodate long-term passenger activity levels at the Airport, forecast to reach approximately

[70] *Total airline passengers* include total enplaned and deplaned passengers and passengers who fly into and out of SFO on the same aircraft.

506,000 annual aircraft operations, which is the estimated annual practical capacity of the existing runways regardless of whether the RADP is implemented. Passenger aircraft operations represent the largest portion of the 506,000 annual aircraft operations, which are forecast to accommodate approximately 71.1 million annual passengers.[71] While the existing facilities could accommodate the forecast demand without implementing the RADP, the goals and objectives of the Draft Final ADP would not be met. SFO's mission is to provide an exceptional airport experience, by providing a world-renowned facility and the passenger-choice as the international gateway to the Pacific, which has been embodied in renovations of Terminals 1 and 2. Therefore, the RADP serves as a roadmap for guiding future Airport development to modernize SFO, increase the efficiency of Airport operations by providing passenger connectivity between boarding areas and flexibility to accommodate domestic or international aircraft, and to overall enhance the passenger experience.

As discussed in more detail in Appendix C, Airport Facilities to Accommodate Aviation Demand, appended to this Draft EIR, implementation of the RADP would not induce passenger demand (i.e., induce the public to choose to fly if and/or where they otherwise would not), nor would the RADP increase the capacity of the airfield, change the configuration of the existing runways, change the number of aircraft operations or aircraft types operating at the Airport (including cargo, private jets, and helicopters), or change the volume of annual passengers that choose to fly into and out of SFO.[72] The projects proposed under the RADP would ensure that the Airport's *level of service*[73] for passengers is maintained as the number of annual passengers is expected to increase based on regional growth projections, up to the practical capacity of the airfield, which would occur independent of implementation of the RADP.[74]

2.H Recommended Airport Development Plan

The RADP serves as a framework for future development at SFO. Implementation of the RADP would facilitate the development of terminal and non-movement areas of the airfield, as well as landside facilities to accommodate long-term aircraft operations and passenger activity levels at the Airport. SFO's long-term operations and passenger activity levels are forecast to reach approximately 506,000 annual aircraft operations based on the estimated capacity of the existing runways regardless of whether the RADP is implemented. Passenger aircraft operations represent the largest portion of the 506,000 annual aircraft operations, which are forecast to accommodate approximately 71.1 million annual passengers considering the forecast passenger aircraft fleet mix. Overall, the projects that could occur with implementation of the RADP would result in approximately 6.4 million square feet of demolition, 14.4 million square feet of new construction, 8.0 million square feet of net new construction, and 375,000 square feet of net new paving over an approximately 20-year buildout period from 2025 to 2045. In addition, projects that could occur under the RADP would result in a net loss of approximately 2,660 employee and tenant parking spaces, 9,930 net new public parking spaces, and 7,240 net new rental car parking spaces.[75]

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[71] Based on historical trends, about 25 percent of passengers are connecting through the Airport; the remaining 75 percent of passengers are originating/departing from the San Francisco Bay Area region.

[72] Transportation Research Board, Airport Cooperative Research Program, *ACRP Synthesis 2, Airport Aviation Activity Forecasting: A Synthesis of Airport Practice*, 2007, https://crp.trb.org/acrpwebresource2/wp-content/themes/acrp-child/documents/075/original/ACRP_2_Airport_Aviation_Activity_Forecasting.pdf, accessed April 26, 2024.

[73] *Level of service* is defined as a qualitative and quantitative measurement of comfort experienced by passengers using the airport passenger terminal facility.

[74] The total number of annual passengers will vary based on the size of aircraft (number of seats per aircraft) and load factor (percentage of seats filled per aircraft operation).

[75] See Attachment D, Parking Summary, of Appendix E.1, Travel Demand Methodology and Assumptions, for a detailed description of public, employee, tenant, and rental vehicle parking spaces proposed under the RADP.

2.H.1 RADP Projects

A summary of the RADP projects is provided below and shown on Figure 2-6 through Figure 2-9, pp. 2-20 through 2-23. Individual RADP projects are grouped under the following categories based on their proposed function, as provided under the Draft Final Airport Development Plan:

- Terminal
- Ground Access and Parking
- Airport/Airline Support Facilities and Utilities

Terminal

Overall, the terminal projects proposed under the RADP would include demolition of eight buildings (Buildings 575 [including 575A and 575B], 585, 638, 642, 648, and 649), the expansion of three buildings (the ITB and Boarding Areas A and G in the Terminal Area), the complete demolition and reconstruction of three buildings (Building 944 in the North Field, Building 682 in the West Field, and Boarding Area F in the Terminal Area), and roadway reconstruction and curbside expansion as shown in **Figure 2-6**, **Figure 2-7**, p. 2-21, and **Figure 2-8**, p. 2-22, and described in more detail below. As shown in **Table 2-2**, p. 2-24, the amount of demolition would total approximately 2.57 million square feet, and the amount of net new construction would total approximately 1.76 million square feet. In addition, approximately 243,000 square feet of landside area would be converted to airside and paved for relocation of what is referred to as the "Remain Over Night (RON)/Race Track." The RON/Race Track is currently located west of Boarding Area G and provides multiple operational functions on the airfield including RON aircraft parking apron, as well as a temporary aircraft hold pad area during the day to accommodate arriving aircraft as they wait for their assigned gates to become available. The RON/Race Track has been sized to continue to provide adequate space for an aircraft to maneuver under its own power into and out of the hold pad without the use of a tug. A more detailed description of each terminal project proposed under the RADP is included below.

(1) Boarding Area H

This project would include construction of a new Boarding Area H with multiple domestic/international-capable swing gates[76] able to accommodate up to 8 widebody[77] or 14 narrowbody[78] aircraft, or some combination thereof, for domestic or international departures. Boarding Area H would extend west from the base of the ITB along North Link Road, then shift north and follow North McDonnell Road. One international gate would be eliminated at Boarding Area G to accommodate the building connection to the new Boarding Area H. The new proposed approximately 1,618,900-square-foot, approximately 100-foot-tall Boarding Area H, including the Automated People Movers (APMs; described in more detail below), would comprise five levels, including a utilidor (a subgrade utility corridor), an apron level, an arrivals level, a departures level, and an airline club level.

- The subgrade utilidor level would include space for utility service conduit and electrical and mechanical systems.

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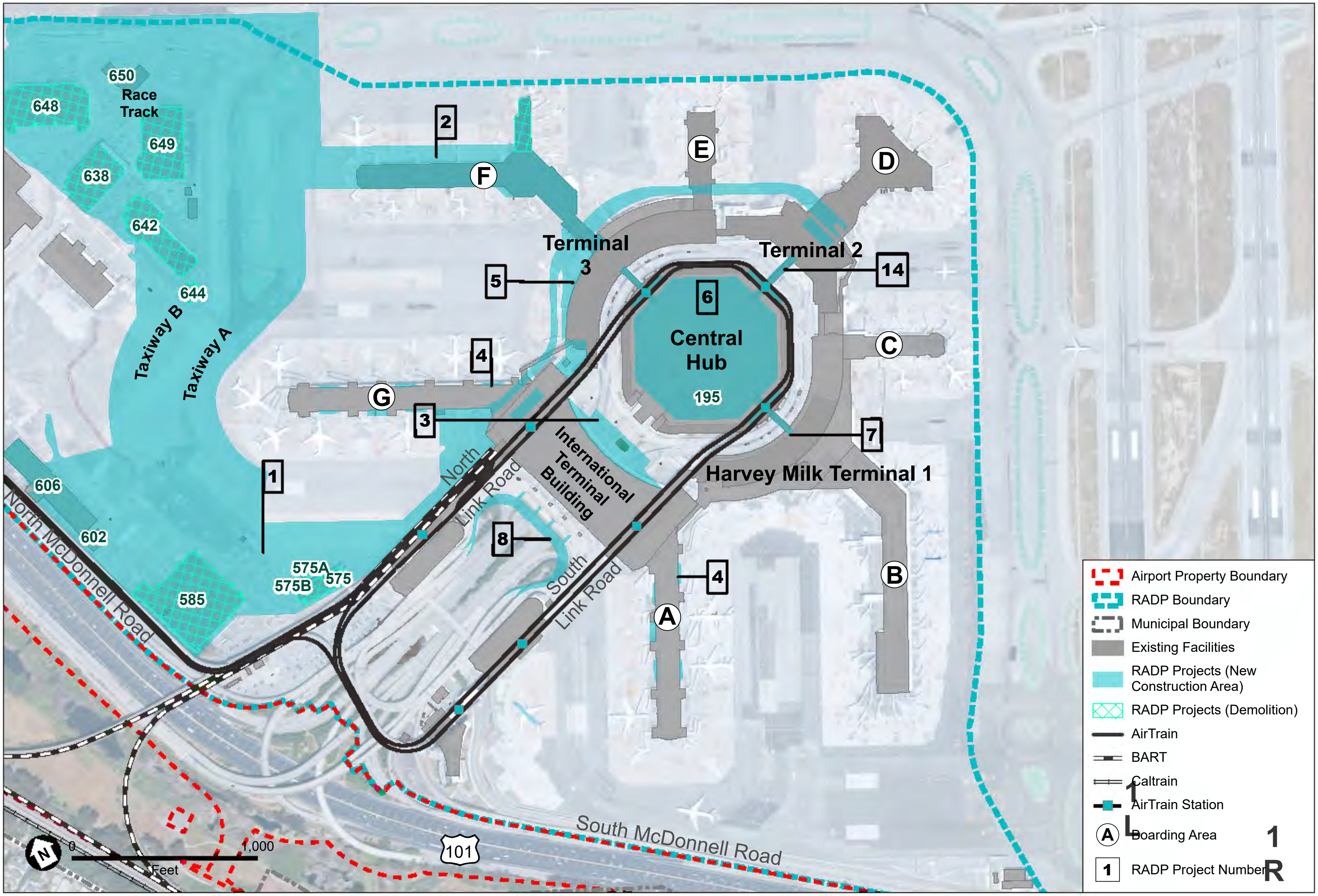
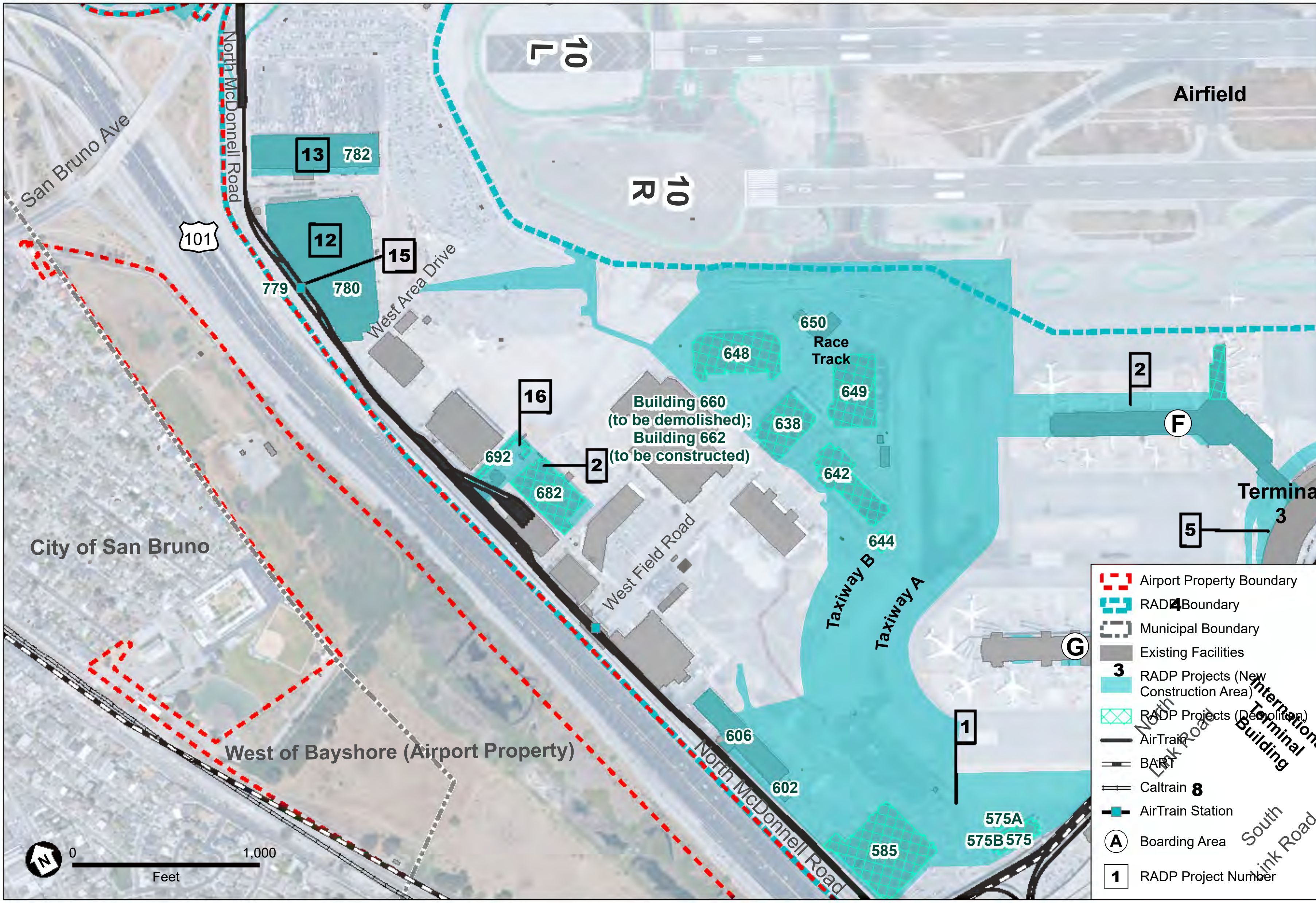
[76] *"Swing" gates* direct arriving passengers either to U.S. Customs and Border Protection or directly into the boarding area, so they are able to serve both domestic and international arrivals. The benefit of a swing gate is the capability of a gate to accommodate both domestic and international flights and reduces overbuilding of facilities.
[77] A *widebody* aircraft is a jet airliner with a fuselage wide enough to accommodate two passenger aisles with seven or more seats.
[78] A *narrowbody* aircraft is an airliner with a fuselage wide enough to accommodate one passenger aisle with up to six seats.



SOURCE: Esri, 2024; San Mateo County, 2023; SFO, 2024; ESA, 2024

Note: Demolition of Buildings 602 and 606 were approved as part of the West Field Cargo Redevelopment Addendum, Case No. 2020-008656ENV, issued on May 17, 2021. Building 650 will be demolished under a separate project that will undergo environmental review.

FIGURE 2-6
TERMINAL AREA RADP PROJECTS

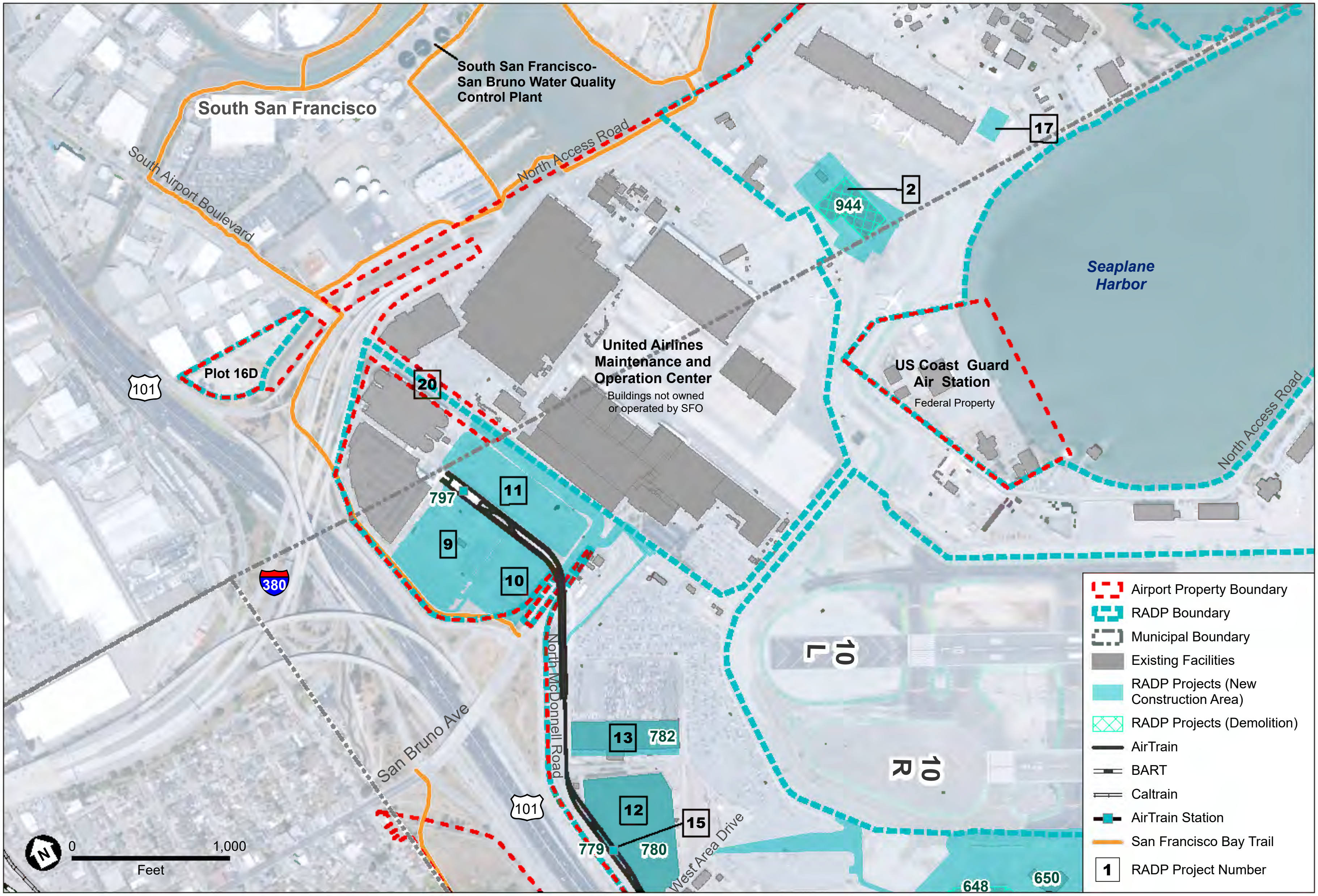


SOURCE: Esri, 2024; San Mateo County, 2023; SFO, 2024; ESA, 2024

Note: Demolition of Buildings 602 and 606 were approved as part of the West Field Cargo Redevelopment Addendum, Case No. 2020-008656ENV, issued on May 17, 2021. Building 650 will be demolished under a separate project that will undergo environmental review. Demolition of Building 660 (the former Airport Post Office) and construction of Building 662 was approved as part of the Plot 10F Demolition and Paving and Cargo Building 662 Addendum, Case No. 2022-003521ENV, issued on December 15, 2022.

SFO Recommended Airport Development Plan EIR

FIGURE 2-7
WEST FIELD RADP PROJECTS



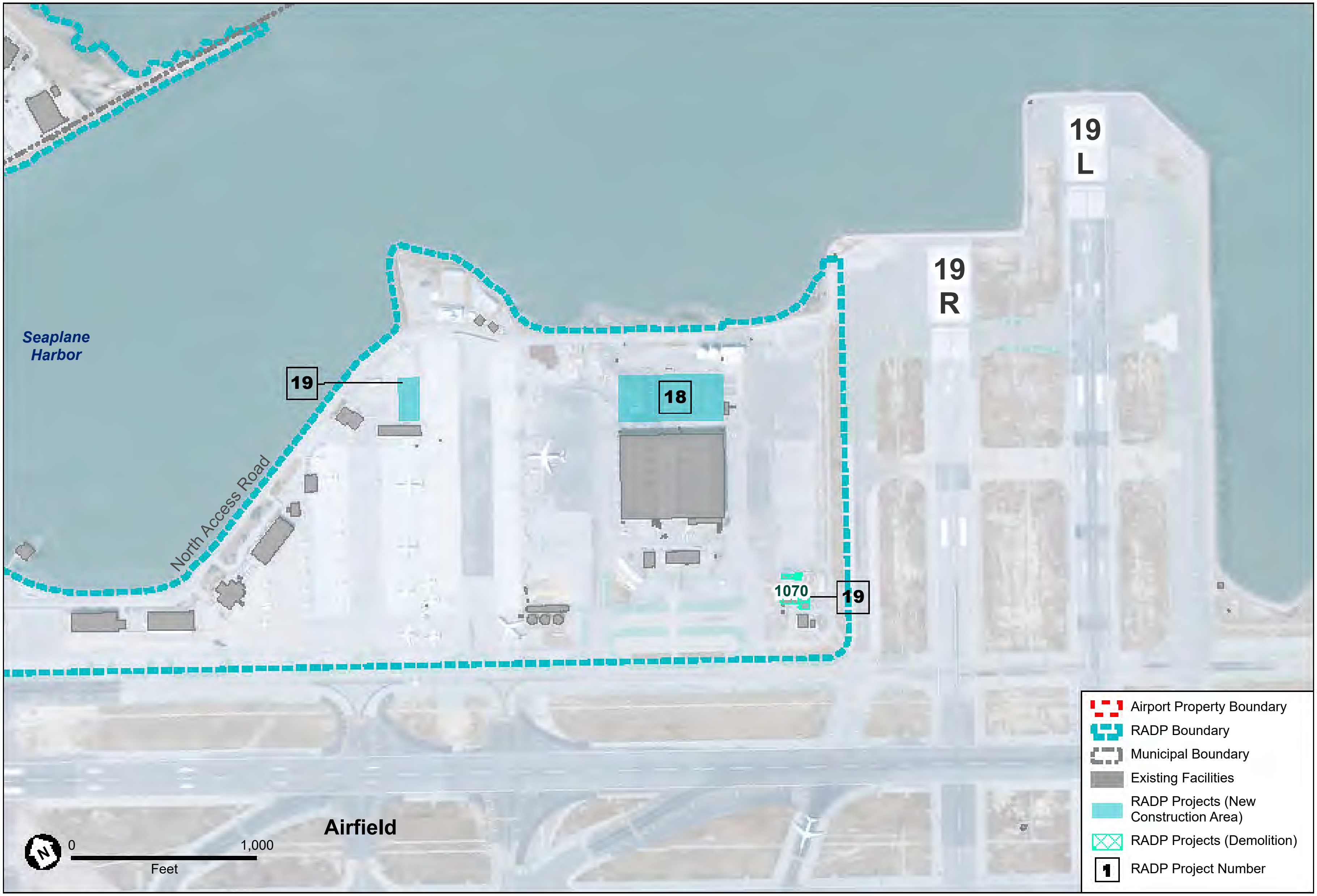
SOURCE: Esri, 2024; San Mateo County, 2023; SFO, 2024; ESA, 2024

Note: Building 650 will be demolished under a separate project that will undergo environmental review.

SFO Recommended Airport Development Plan EIR

FIGURE 2-8

NORTH FIELD RADP PROJECTS



SOURCE: Esri, 2024; San Mateo County, 2023; SFO, 2024; ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 2-9
EAST FIELD RADP PROJECTS

Table 2-2 RADP Terminal Projects Summary

Building	Building Area Demolition (sf)	Existing Function	Proposed Relocation of Existing Function	Reconstruction Function	New Construction (sf)	Net New Construction (sf)	New Paving (sf)
Boarding Area H (RADP Project #1)							
Building 575 **Building 575A** **Building 575B**	69,500 735 2,300 Total: 72,500	Airport maintenance; SFO Business Center; Airport administration; United Airlines Service Center; Building 575A is an automated teller machine kiosk; Building 575B is a ground support equipment maintenance structure	Existing Consolidated Administration Campus (Building 670; to be constructed in the West Field as part of cumulative project #3); existing United Airlines facilities in the North Field	Airport administration and United Airlines service center		-72,500	
Building 585	133,100	Belly cargo operations and ground support equipment storage and staging	West Field Cargo Redevelopment [a]	Same as existing functions		-133,100	
Boarding Area H	N/A			New contact swing gates capable of accommodating international or domestic flights	1,618,900	1,618,900	
SUBTOTAL	*205,600*				*1,618,900*	*1,413,300*	*N/A*
Boarding Area F Modernization (RADP Project #2)							
Building 638	524,000	West Field Employee Parking Garage (tenants)	Proposed garage at existing Building 682 location in the West Field	Same as existing functions		-524,000	

Building	Building Area Demolition (sf)	Existing Function	Proposed Relocation of Existing Function	Reconstruction Function	New Construction (sf)	Net New Construction (sf)	New Paving (sf)
Building 642	82,100	United Airlines ground support equipment maintenance and storage area	Existing United Airlines facilities in the North Field	Same as existing functions		-82,100	
Building 648	125,000	Cargo – Tenants include China Airlines, ANA, Asiana Airlines, Swissport, and US Customs	Proposed reconstructed Building 944 in the North Field	Same as existing functions		-125,000	
Building 649	135,000	On-Airport Flight Kitchen	Proposed Building 662 in the West Field [b]			-135,000	
Building 682 (located in the West Field)	76,000	SFO Facilities Maintenance Center	Existing on-Airport facilities	Parking Garage	71,000	-5,000	
Building 944 (located in the North Field)	78,000	Mercury Air Cargo	Proposed reconstructed Building 944 in the North Field	Cargo	101,000	23,000	
Boarding Area F	1,230,000	Boarding Area	N/A		2,100,000	870,000	
RON/Race Track		RON aircraft parking apron and aircraft hold pad during daytime					243,000
SUBTOTAL	*2,250,100*				*2,272,000*	*21,900*	*243,000*
International Terminal Building Main Hall Expansion (RADP Project #3)							
Building 100	116,400	International Terminal Building (Boarding Areas A and G)			393,000	276,600	

Building	Building Area Demolition (sf)	Existing Function	Proposed Relocation of Existing Function	Reconstruction Function	New Construction (sf)	Net New Construction (sf)	New Paving (sf)
International Terminal Building Boarding Areas A and G Improvements (RADP Project #4)							
Building 100 (Boarding Areas A and G)		International Terminal Building (Boarding Areas A and G)			23,200	23,200	
Terminal 3 Façade Expansion (RADP Project #5)							
Building 400 (Terminal 3)		Building 400 (Terminal 3)			25,000	25,000	
TOTAL FOR ALL TERMINAL PROJECTS	**2,572,100**				**4,332,100**	**1,760,00**	**243,000**

SOURCE: Data provided by SFO Bureau of Planning and Environmental Affairs in 2023

ABBREVIATION: sf = square feet

NOTES:

a. Demolition of cargo Buildings 606, 612, 624, 710 (includes office), and 730, as well as demolition of ground support equipment facilities including Buildings 602 and 750, and construction of two new consolidated cargo/ground support equipment facilities and one ground support equipment facility were approved as part of the West Field Cargo Redevelopment Addendum, Case No. 2020-008656ENV, issued on May 17, 2021 (cumulative project #3).
b. Demolition of Building 660 (the former U.S. Post Office facility) and construction of Building 662 were approved as part of the Plot 10F Demolition and Paving and Cargo Building 662 Addendum, Case No. 2022-003521ENV, issued on December 15, 2022 (cumulative project #9). The building is yet to be constructed.

- The apron level would include airline and Airport support space, including staff support rooms, equipment storage, restrooms, baggage handling equipment, ground support equipment staging, as well as a bus gate holdroom.[79]
- The arrivals level would include a *sterile connector*[80] to Boarding Area G, adjoining international arrivals gates to U.S. Customs and Border Protection at the International Terminal; restrooms; mechanical systems areas; two boarding stations for a sterile automated people mover (APM) line to Customs and Border Protection; and one deboarding station for the secure APM line adjacent to Boarding Area G.
- The departures level would include passenger holdrooms; passenger amenities such as restrooms, airline clubs, and concessions (e.g., retail stores, food, restaurants); additional bus gate space; airline support space; and additional mechanical systems areas.
- The top level would include additional airline club space.
- Boarding Area H would include designated and secure loading docks with multiple bays.
- APMs would be constructed to connect passengers to other Airport terminals and facilities within the terminal complex.
  - The ***secure APM***[81] would connect Boarding Area H to Boarding Area G (at the ITB), Boarding Areas E and F (at Terminal 3), and Boarding Area D (at Terminal 2). The Secure APM guideway would be approximately 5,800 feet in length with one station at each boarding area.
  - The ***sterile APM***,[82] comprising two boarding stations, one deboarding station, and a guideway, would be constructed on the arrivals level of Boarding Area H to connect to existing U.S. Customs and Border Protection Federal Inspection Services facilities at Boarding Area G to accommodate inbound international operations.
  - An **APM Maintenance Facility** would be constructed within Boarding Area H to service both the sterile and secure APM cars and equipment. This facility would occupy two levels (the apron level and the arrivals level) at the northern terminus of Boarding Area H.
  - The secure APM guideway would be aligned above the sterile APM guideway at Boarding Area H. The secure APM guideway would be constructed at approximately 75 feet above grade, with a roofline approximately 100 feet above grade.

This project would require demolition of Buildings 575, 575A, and 575B (approximately 72,500 square feet) and Building 585 (approximately 133,100 square feet). This project would also require relocation of a sanitary sewer pump station, construction of two electrical substations to convert and distribute electrical power to the Terminal Area, and the extension of utility lines to serve the new boarding area. The project would

[79] *Holdrooms* are gate seating areas situated in the airport terminal. Typical holdrooms include seating, standing areas, agent gate counter, boarding queue, circulation, technology, and amenities.
[80] Arriving international passengers must be kept separate from other passengers, visitors, or unauthorized airline employees until they have cleared all Federal Inspection Services by U.S. Customs and Border Protection. The *sterile connector* is required by U.S. Customs and Border Protection and provides a separate passenger corridor system from the aircraft gate to where primary inspection is conducted.
[81] A *secure automated people mover* refers to a transit system that operates within an airport's secure area. Passengers using this system have already passed through security screening and are moving between areas where access is controlled, such as different concourses or gates.
[82] A *sterile automated people mover* is a system that operates exclusively within the sterile or secured areas of an airport, or areas where incoming international passengers have yet to be processed through U.S. Customs and Boarder protection. This type of APM is crucial for international airports where passengers transit between international flights and customs or when connecting with another international flight without entering the host country.

include the new Airport-wide individual carrier baggage handling system backbone to transport checked bags within and between all terminals and boarding areas.[83]

Airline functions (including Airport administration and United Airlines service center) at Building 575 would be relocated to existing facilities at the existing consolidated administrative campus (Building 670; to be constructed as part of cumulative project #2) in the West Field and other existing United Airlines facilities in the North Field. Ground support equipment staging supporting international flights currently located adjacent to Building 575 would be relocated to the apron level of the international gate proposed to be removed at Boarding Area G. The functions of Building 585 would be relocated to planned cargo facilities in the West Field.[84]

(2) Boarding Area F Modernization

Boarding Area F (in its entirety) would be demolished and reconstructed in phases to provide gates for up to 25 narrowbody aircraft or 12 narrowbody and 7 widebody aircraft, or some combination thereof, for domestic arrivals and domestic and international departures. Construction phasing would be conducted to minimize airfield safety risks and impacts to scheduled air carrier operations by reducing as many gates at a time down as possible during multi-phased construction. In general, aircraft would be accommodated at other gates at Boarding Areas G and the new Boarding Area H, which would be operational before the Boarding Area F Modernization project would begin.

The reconstructed Boarding Area F would be slightly longer and wider than the existing boarding area resulting in a net new increase of approximately 870,000 square feet. No change in use is proposed for Boarding Area F; however, passenger facilities, including concession spaces, public restrooms, and other passenger amenities, would be modernized and sized appropriately to improve passenger level of service.

As part of the planned modernization of Boarding Area F, the adjacent Taxiways A and B would be realigned around Boarding Area F to create the taxiway-centerline-to-taxiway-centerline separation to meet FAA design standards for widebody aircraft utilizing these taxiways.[85] Currently, there is insufficient physical separation to allow simultaneous taxiing of two widebody aircraft on Taxiways A and B; currently, taxiing one aircraft must idle and wait for the other aircraft to pass. With the extended length of Boarding Area F, Taxiways A and B would also shift by a total of 265 feet and 272 feet to the northwest, respectively. In addition, a new 243,000-square-foot RON/Race Track, which would accommodate RON aircraft parking apron, as well as a temporary aircraft hold pad area during the day to accommodate arriving aircraft as they wait for their assigned gates to become available, would be constructed to serve the dual purpose of providing a holding area for aircraft waiting for a gate and accommodating RON aircraft parking.

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[83] SFO is currently replacing and upgrading the existing baggage handling system with a new Airport-wide individual carrier system backbone to transport checked bagged within and between all terminals and boarding areas, which would enhance increased baggage processing and transfer efficiency and provide flexibility for airlines to operate at any gate at the Airport. The individual carrier baggage handling system would maximize shared-used facilities and bag claim flexibility between international and domestic flights. This system has already been installed at Terminal 1.

[84] Demolition of cargo Buildings 606, 612, 624, 710 (includes office), and 730, as well as demolition of ground support equipment facilities including Buildings 602 and 750, and construction of two new consolidated cargo/ground support equipment facilities and one ground support equipment facility were approved as part of the West Field Cargo Redevelopment Addendum, Case No. 2020-008656ENV, issued on May 17, 2021.

[85] U.S. Department of Transportation, Federal Aviation Administration, *Advisory Circular 150/5300-13B, Airport Design*, March 31, 2022, https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13B-Airport-Design.pdf, accessed April 28, 2024.

To accommodate the shift of Taxiways A and B and relocation of the RON/Race Track, this project would require demolition of the following buildings:[86]

- Building 638 (approximately 524,000 square feet and approximately 1,700 airline employee parking spaces) – the parking in this building would be relocated to the proposed parking garage at the existing Building 682 location;
- Building 642 (approximately 82,100 square feet)[87] – a United Airlines ground support equipment maintenance and storage area would be relocated to the United Airlines MOC and Building 626 (cumulative project #10);
- Building 648 (approximately 125,000 square feet) – the cargo facilities would be relocated to the proposed reconstructed Building 944 in the North Field;
- Building 649 (approximately 135,000 square feet) – the flight kitchen facility would be relocated to a new facility (Building 662) for which environmental review has already been conducted;[88] and
- Building 682 (approximately 76,000 square feet) – the existing facilities maintenance functions would be relocated to other existing on-Airport facilities and a new parking garage containing approximately 1,700 airline employee parking spaces would be constructed on the site.

The project would also require relocation of vehicle service roads, relocation of a drain and vent structures associated with a jet fuel test vault, and demolition and reconstruction of three security checkpoints.

(3) International Terminal Building Main Hall Expansion

This project would consist of demolition of approximately 116,400 square feet of the rear portion of the ITB (Building 100) and an approximately 393,000-square-foot eastern expansion of three levels of the ITB (103,000 square feet on levels 3 and 4, and 187,000 square feet on level 5) to centralize international passenger security checkpoints, provide additional administrative offices, provide a secure connector for passengers between Boarding Area A and Boarding Area G, and provide additional concession areas in the post security corridor. These improvements are intended to provide operational flexibility and efficiency by allowing airlines to operate out of either Boarding Area A or Boarding Area G depending on gate availability and TSA staffing of the two existing passenger security checkpoints, located on north and south ends of the ITB. Currently, there is no post-security passenger connection between the two boarding areas, so airlines can only operate at the boarding area where their employees, baggage claims, and support equipment are located. In addition, a portion of level 3 (departures) would be removed to allow sunlight to penetrate level 2 (arrivals). The ITB Main Hall Expansion would be elevated over the existing domestic terminal roadways. A U.S. Customs and Border Protection Federal Inspection Station connector bridge providing expanded facilities and a passenger/baggage connector would be constructed between the ITB Main Hall and Central Hub (RADP Project #6, described below).

[86] Note Building 650, Emergency Rescue Fire Fighting Facility #1, will be demolished under a separate project that will undergo environmental review.
[87] The Building 642 designation includes four separate buildings, including Building 644, for United Airlines ground support equipment maintenance.
[88] Demolition of Building 660 (the former U.S. Post Office facility) and construction of Building 662 were approved as part of the Plot 10F Demolition and Paving and Cargo Building 662 Addendum, Case No. 2022-003521ENV, issued on December 15, 2022 (cumulative project #10).

(4) International Terminal Building Boarding Areas A and G Improvements

This project would expand the ITB Boarding Area A by a total of approximately 10,800 square feet and Boarding Area G by a total of approximately 12,400 square feet to integrate the upper level holdroom areas with concessions, expand holdroom seating areas, and integrate the proposed new baggage handling system. The expansions would include a series of small bump outs along each side of the existing boarding areas to enhance passenger level of service.

(5) Terminal 3 Façade Expansion

This project would expand the terminal departures lobby depth by approximately 55 feet outward toward the domestic terminal viaduct, for a total addition of about 25,000 square feet. This project would provide terminal lobby space for passenger flows, ingress and egress, and pre-queueing before reaching airline ticket counters and passenger security screening checkpoints to enhance passenger level of service. Given physical space limitations, this project would be enabled through the redevelopment of the domestic viaduct roadway described below under (RADP Project #7) Domestic Terminal Roadways Reconstruction and would occur after these roadway projects are completed.

Ground Access and Parking

Overall, the ground access and parking projects proposed under the RADP would entail demolition and reconstruction of a building (Central Parking Garage, Building 195 in the Terminal Area); partial demolition of a building (Rental Car Center Quick Turnaround Facility, Building 782 in the North Field); construction of three new buildings (the Consolidated Rental Car Center [CONRAC], the CONRAC Quick Turn-Around [QTA] Facility, and the Long-Term Parking Garage #3 on Lot DD in the North Field); and redevelopment of the existing Rental Car Center Ready Return Parking Garage (Building 780 in the North Field) into Long-Term Parking Garage #4) in the North Field. As shown in **Table 2-3**, the amount of demolition would total approximately 3.8 million square feet, and the amount of net new construction would total approximately 6.0 million square feet. In addition, approximately 132,000 square feet of net new roadway would be constructed around the domestic terminal roadways and ITB curbside in the Terminal Area. In addition, the Terminal 2 and Rental Car Center AirTrain station platforms (located in the Terminal Area and West Field, respectively) would be expanded. A more detailed description of each ground access and parking project proposed under the RADP is included below.

(6) Central Hub

The existing Central Parking Garage (Building 195 in the Terminal Area) would be replaced by a new multi-use building called the Central Hub. The Central Hub would provide up to nine levels of parking spaces with additional clearance provided on Level 1 (or multiple levels) to accommodate all types and sizes of Airport ground transportation and vehicles for passenger drop-off and pick-up. Currently, the domestic terminal viaduct is fixed and cannot be lengthened to provide additional curbside frontage for passenger pickup and drop-off for all ground transportation modes serving the Airport.

Table 2-3 Ground Access and Parking Projects Summary

Building/Area	Building Demolition (sf)	Paving Demolition (sf)	Existing Function	Reconstruction or New Function	New Construction (sf)	New Paved Area (sf)	Net New Construction (sf)	Net New Paved Area (sf)
Central Hub (RADP Project #6)								
Building 195 (located in the Terminal Area)	3,680,000		Parking garage	Parking garage	6,330,000		2,650,000	
Domestic Terminal Roadways Reconstruction (RADP Project #7)								
Domestic Terminal Roadways Reconstruction (located in the Terminal Area)		710,000		Domestic terminal roadways (no change)		790,000		80,000
International Terminal Building Curbside Expansion (RADP Project #8)								
International Terminal Building Curbside Expansion (located in the Terminal Area)				One additional curbside/lane for international terminal modes		52,000		52,000
Consolidated Rental Car Center (CONRAC) Facility (RADP Project #9)								
Lot DD (located in the North Field)			Surface parking lot	CONRAC Ready-Return Garage with customer service counters/lobby with direct connectivity to AirTrain	1,940,000		1,940,000	
Consolidated Rental Car Center (CONRAC) Quick Turn-Around Facility (RADP Project #10)								
Lot DD (located in the North Field)			Surface parking lot	CONRAC support facility for processing/cleaning, and on-site storage of rental cars	1,031,000[a]		1,031,000	

Building/Area	Building Demolition (sf)	Paving Demolition (sf)	Existing Function	Reconstruction or New Function	New Construction (sf)	New Paved Area (sf)	Net New Construction (sf)	Net New Paved Area (sf)
Long-Term Parking Garage #3 (RADP Project #11)								
Lot DD (located in the North Field)			Surface parking lot	Public, Airport commission, and tenant employee parking garage	348,000		348,000	
Long-Term Parking Garage #4 (RADP Project #12)								
Building 780 (located in the North Field)			Rental Car Center Ready-Return Garage	Redesignation and renovation of Rental Car Center Garage to Long-Term Parking Garage #4				
Rental Car Center Short-Term Storage Lot (RADP Project #13)								
Building 782 (located in the North Field)	130,000		Rental Car Quick Turnaround Facility/Staging	Rental Car Center Short-Term Storage Lot			-130,000	
Terminal 2 AirTrain Station Platform Expansion (RADP Project #14)								
Building 379 (located in the Terminal Area)					6,900		6,900	
Rental Car Center AirTrain Station Platform Expansion (RADP Project #15)								
Building 779 (located in the West Field)					2,900		2,900	
AirTrain Maintenance Yard (RADP Project #16)								
Building 692 (located in the West Field)	19,300		Airport facilities maintenance	Airport employee parking; administration; AirTrain vehicle storage and maintenance	171,000		151,700	

Building/Area	Building Demolition (sf)	Paving Demolition (sf)	Existing Function	Reconstruction or New Function	New Construction (sf)	New Paved Area (sf)	Net New Construction (sf)	Net New Paved Area (sf)
TOTAL FOR ALL GROUND ACCESS AND PARKING PROJECTS	**3,829,300**	**710,000**			**9,829,800**	**842,000**	**6,000,500**	**132,000**

SOURCE: Data provided by SFO Bureau of Planning and Environmental Affairs in 2023

ABBREVIATION: sf = square feet

NOTE:

a. 80,000 square feet would be reserved for a customer service lobby and operator office spaces.

The Central Hub project would include demolition of the existing five-level, 81-foot-tall, 3,680,000-square-foot, seismically deficient Central Parking Garage (6,460 parking spaces) in the Terminal Area and construction of a new, nine-level (up to 175 feet tall), 6,330,000-square-foot Central Hub, capable of accommodating up to 10,000 public parking spaces.[89] The net increase in square footage for this project would be approximately 2,650,000 square feet. The Central Hub project would include:

- One level for curbside passenger pickup to augment passenger pick-up/drop-off at domestic terminals and the ITB, as well as interior waiting lounges to provide passenger amenities;
- One to two levels for *commercial ground transportation*[90] staging and passenger curbside pickup areas to alleviate terminal roadway congestion and eliminate go-around driving by ground transportation modes; existing public transit buses would remain on the main terminal roadways as a preferred mode;
- One level would be reserved for Airport commission, federal employees, and tenant employee parking (1,300 spaces);
- Remainder of the Central Hub would be available for passenger public parking.

The Central Hub would offer a more efficient internal layout, and the increased capacity for both parking and curbside is intended to allow for improved levels of customer experience and flexibility. During construction of the Central Hub, passenger parking would be available at Long-Term Parking Garages #1 (Building 795) and #2 (Building 794) in the North Field, as well as Long-Term Parking Garage #3 (RADP Project #11) in the North Field, which would be constructed prior to implementation of this project.

The additional curbside provided within the Central Hub, intended to alleviate the congestion at the existing terminal arrivals and departure curbsides, would be designed to accommodate commercial vehicles, including full-size buses. Lobby areas with check-in kiosks and bag drop facilities would be provided at the curbside level to improve convenience for departing passengers and arriving passengers waiting for pick-up. Passengers using the Central Hub curbside would have access to each of the terminals through existing tunnels and bridges to Terminals 1, 2, and 3, and to the ITB by a new bridge connector.

(7) Domestic Terminal Roadways Reconstruction

This project would include demolition of the existing upper departures roadway in the Terminal Area, and reconstruction of a new roadway that would meet modern structural standards and be a standalone structure decoupled from the terminal curbside but connected with pedestrian bridges to allow access from the terminal to the roadway. The lower arrivals roadway would be repaved to address differential settlement of underlying fill. The project would result in approximately 710,000 square feet of paving demolition and 790,000 square feet of new construction of paved area for a net increase of 80,000 square feet of new construction of paved area.

(8) International Terminal Building Curbside Expansion

This project would include construction of a new ITB arrivals and departures level curbside beyond the existing outer curbsides to relieve congestion along the ITB curbside during peak daily periods. The expansion would provide one additional island curb and six additional lanes on both levels for passenger

[89] Demolition of the Central Parking Garage would not affect the Central Utility Plant located on the ground floor.
[90] *Commercial ground transportation* at airports include taxicabs, limousines, ride-booking services such as transportation network companies, shared-ride vans, courtesy vehicles and courtesy shuttles, scheduled vans and buses, charter vans and buses, and flight crew shuttles.

pick-up and drop-off. Approximately 520 additional feet of curbside would be provided on each level, for a total of 1,040 additional feet. A total of about 52,000 square feet of roadway pavement would be added. Walkway bridges over the existing and proposed curbside and lanes would be constructed to provide designated crossings for passengers/pedestrians.

(9) Consolidated Rental Car Center Facility

This project would involve construction of a new 1,940,000-square-foot Consolidated Rental Car Center (CONRAC) on Lot DD and customer service lobby/offices at the top level linked to the Long-Term Parking AirTrain Station (Building 797). The CONRAC would consist of a Ready-Return Garage for customers to pick up/drop-off rented vehicles and a customer service lobby at the top level. The existing CONRAC facility has inadequate customer service lobby depth to accommodate existing air travelers. This replacement CONRAC and Quick Turn-Around (QTA) Facility (RADP Project #10) would enhance passenger level of service by providing sufficient space for customer queues and passenger ingress/egress and concession amenities, and would be expanded to continue to meet forecast rental car demand. Due to the adjacent runway protection zones[91] and the requirement to adhere to prevailing critical airspace surfaces and maintain safe aircraft operations, the height of the CONRAC would be stepped from about 67 feet at the southeast corner to about 83 feet at the northwest corner of the facility. The CONRAC would be constructed on a portion of the existing surface long-term public parking lot (with a net loss of about 1,200 public parking spaces[92]).

The facilities would provide an 80,000-square-foot customer service lobby and operator office space, approximately 4,640 rental car spaces, a connection/platform to the Long-Term Parking AirTrain Station, and interconnecting ramps for rental cars. In addition, this project would entail roadway improvements along South Airport Boulevard, including restriping and modifying the median to accommodate a left-turn pocket and the addition of bus turnouts on either side of the street at the intersection with the Long-Term Parking Garage #1 entrance roadway for SamTrans buses.

(10) Consolidated Rental Car Center Quick Turn-Around Facility

This project would include construction of a new three-story, 1,031,000-square-foot building immediately south of the proposed CONRAC (RADP Project #9) on Lot DD in the North Field to accommodate 2,880 short-term stacking/staging spaces, 187 car fueling spaces, and 24 car wash spaces. The height of the CONRAC QTA Facility would be stepped to adhere to critical airspace height limits and maintain safe aircraft operations, with height limits at about 60 feet at the southeast corner and about 71 feet at the northwest corner of the facility. The QTA Facility would also provide on-Airport storage by rental car companies and reduce driving rental-ready-return vehicles from off-airport rental car parking lots.

(11) Long-Term Parking Garage #3

This project would include construction of an approximately 348,000-square-foot public parking garage with approximately 3,200 stalls (net increase of 2,140 stalls) on the existing 1,060-stall tenant employee surface parking lot within long-term parking lot (Lot DD) in the North Field. The height of this garage would be

[91] A *runway protection zone* is a trapezoidal imaginary surface that extends from a runway end and identifies land areas to be kept clear of all above ground objects for safety of aircraft operations.
[92] See Attachment D, Parking Summary, of Appendix E.1, Travel Demand Methodology and Assumptions, for a detailed description of public, employee, tenant, and rental vehicle parking spaces proposed under the RADP.

limited to adhere to critical airspace height limits and maintain safe aircraft operations, with height limits at about 53 feet at the southeast corner and about 81 feet at the northwest corner of the garage.

(12) Long-Term Parking Garage #4

The existing 66-foot-tall, 1,488,000-square-foot rental car center (RAC; Building 780) ready-return garage in the North Field with about 2,485 ready-return stalls would be converted to a public parking garage with about 3,700 spaces; as such, this project would not result in any demolition or new construction at this location. The 26,200-square-foot customer service RAC lobby would be converted to tenant support/office facilities; employee and public pedestrian access to the existing AirTrain station would be retained at its existing location on the top level of the lobby. The ground level ready-return stalls located in a surface lot immediately east of the existing RAC garage would be incorporated in the existing employee parking lot. About 950 feet of existing fencing would be replaced with a 680-foot-long air operations area (AOA) perimeter security fence to demarcate the boundary of the public garage and the employee parking lot.

(13) Rental Car Center Short-Term Storage Lot

The existing QTA Facility (Building 782) is a ground-level open air facility in the North Field. The QTA Facility consists of an awning, rental car vehicle fueling facilities, and wash bays, which would be removed, constituting approximately 130,000 square feet of surface parking lot demolition to convert this area to short-term, on-Airport rental car stacking and storage (approximately 2,200 rental car parking spaces). On-airport storage would eliminate the need for rental car companies to drive ready-return vehicles to off-airport storage lots. Existing functions on this site would move to the new QTA Facility (RADP Project #10).

(14) Terminal 2 AirTrain Station Platform Expansion

This station expansion (Building 379) in the Terminal Area would involve a physical expansion of the existing platform to accommodate a fourth car berthing position (a net increase of approximately 6,900 square feet).

(15) Rental Car Center AirTrain Station Platform Expansion

This station expansion (Building 779) in the North Field would involve a physical expansion of the existing platform to accommodate a fourth car berthing position (a net increase of approximately 2,900 square feet).

(16) AirTrain Maintenance Yard

This project would include demolition of Building 692 in the West Field, which is an 18-foot-tall, 19,300-square-foot airport facilities maintenance building and city vehicle parking area. A new 55-foot-tall, two-story-with-mezzanine, approximately 171,000-square-foot building would be constructed in the same location to accommodate airport commission employee parking on the first level underneath the AirTrain maintenance and vehicle storage on the second level. Administrative functions would be located at the east end of the building on the first and second levels as well as a mezzanine. During off-peak periods, extra AirTrain vehicles would be stored in elevated track segments located north of the existing AirTrain Maintenance Yard, and at level two of the AirTrain Maintenance Yard. Additional airport commission employee parking would be accommodated underneath the elevated storage tracks.

Airport/Airline Support Facilities and Utilities

Overall, the support facilities projects proposed under the RADP would entail demolition and reconstruction of one building (Building 1070) and construction of two new buildings (the North Field Ground Support Equipment Facility #1 in the North Field and an Aircraft Maintenance Hangar in the East Field). As shown in **Table 2-4**, the amount of demolition would total approximately 10,000 square feet, and the amount of net new construction would total approximately 252,000 square feet. A more detailed description of each support facility and utility project proposed under the RADP is included below.

(17) North Field Ground Support Equipment Facility #1

This project would construct a new 48,000-square-foot, 55-foot-tall facility on a portion of the aircraft apron serving the adjacent freight cargo facility (Building 900) and an existing tenant employee surface parking lot for new ground support equipment in the North Field. The existing 107 parking spaces (currently used by Building 900 cargo tenant employees) would be accommodated within the existing perimeter parking spaces immediately east of Building 900 and adjacent to North Access Road. About 300 feet of perimeter aircraft jet blast and AOA fence would be removed, and a new 500-foot-long perimeter fence would be installed.

(18) Aircraft Maintenance Hangar

This project would include construction of a new 95-foot-tall, 181,000-square-foot standalone hangar on the existing Superbay Hangar employee surface parking lot in the East Field (approximately 1,000 parking spaces). This hangar would accommodate two additional widebody aircraft for maintenance activities and support functions, including maintenance/workshop, and parts storage space. The new maintenance hangar would meet forecast demand for aircraft maintenance facilities and would meet forecast demand to consolidate hangar functions in the East Field.

(19) East Field Ground Support Equipment Facility #2

This project would include demolition of an existing 26-foot-tall, approximately 10,000-square-foot ground support equipment facility (Building 1070) in the East Field located entirely on the airfield adjacent to active taxiways and runways. The facility is in poor condition and near the end of its useful life. A new 25-foot-tall, approximately 33,000-square-foot replacement facility would be constructed adjacent to North Access Road, with airside access for ground support providers. Note that demolition of Building 1070 would occur after construction of the new East Field Ground Support Equipment Facility #2.

(20) Sanitary Sewer Force Main Line Realignment

The City of Burlingame has installed and maintains a joint-use (with the City of Millbrae) sanitary sewer force main line that connects their respective cities' force main lines through Airport property and terminates at a connection to the City of South San Francisco's water quality control plant located north of North Access Road. The treated effluent is transferred to this plant for final discharge into San Francisco Bay. Construction of the CONRAC and QTA Facility (RADP Projects #9 and #10, respectively) in the North Field would require Burlingame to relocate its force main line. It is anticipated that this project would require some demolition of paved area; however, how much area is not currently known.

Table 2-4 Airport/Airline Support Facilities and Utilities Projects Summary

Building/Area	Building Area Demolition (sf)	Existing Function	Proposed Relocation of Existing Function	Reconstruction Function	New Construction (sf)	Net New Construction (sf)
North Field Ground Support Equipment Facility #1 (RADP Project #17)						
Aircraft apron		Aircraft parking apron		New ground support equipment facility dedicated to North Field area and enhance operational efficiency and reduce ground support equipment travel to West Field area.	48,000	48,000
Aircraft Maintenance Hangar (RADP Project #18)						
Employee surface parking lot		Tenant employee surface parking lot		Aircraft maintenance hangar able to accommodate two additional widebody aircraft for simultaneous maintenance	181,000	181,000
East Field Ground Support Equipment Facility #2 (RADP Project #19)						
Building 1070	10,000	Ground support equipment facility	New East Field Ground Support Equipment Facility #2	New ground support equipment facility dedicated to East Field area and enhance operational efficiency and reduce ground support equipment travel to West Field area.	33,000	23,000
Sanitary Sewer Force Main Line Realignment (RADP Project #20)						
	No construction details are available for this project.					
TOTAL FOR ALL SUPPORT FACILITIES AND UTILITIES PROJECTS SUMMARY	**10,000**				**262,000**	**252,000**

Per the terms of a Final Order of Condemnation filed by Burlingame in San Mateo Superior Court on December 2, 1975, the Airport has notified Burlingame of the Airport's plan for development, which recognized the presence of the force main pipeline, and conducted an analysis for siting the proposed facilities. If Burlingame is unable to relocate the force main line within the Airport's requested timeframe, the Airport could potentially relocate the force main line on Burlingame's behalf and seek reimbursement for the design and/or construction work. There are two feasible and optimal options for realignment of the force main line: beneath the San Francisco Bay Trail (Bay Trail) around the western perimeter of the long-term parking lot or beneath South Airport Boulevard.

2.H.2 RADP Construction Summary

Construction of projects that could occur with implementation of the RADP would occur over an approximately 20-year buildout period from 2025 to 2045. It is anticipated that the construction period for RADP projects would have varying lengths, as shown in **Table 2-5**, depending on the type of project. The new buildings proposed under the RADP would be all-electric, consistent with SFO and City policy.

Table 2-5 RADP Project Phasing

Project No.	RADP Project	Anticipated Start of Construction	Anticipated Completion of Construction
	Boarding Area H		
1	**Building 575 Demolition (includes Buildings 575A and 575B)**	10/2027	3/2028
	Building 585 Demolition	10/2027	3/2028
	Boarding Area H Construction	11/2027	5/2033
	Boarding Area F Modernization		
2	**Building 638 Demolition**	7/2036	1/2039
	Building 642 Demolition	4/2027	1/2028
	Building 648 Demolition	1/2028	1/2029
	Building 649 Demolition	7/2027	1/2028
	Building 682 Demolition and Rebuild	7/2035	7/2036
	Building 944 Demolition and Rebuild	12/2025	4/2027
	Boarding Area F Demolition and Construction	5/2033	11/2039
	RON/Race Track	1/2029	1/2040
	Taxiway A and B Realignment	1/2031	1/2033
3	**ITB Main Hall Expansion**	7/2032	1/2037
4	**ITB Boarding Area A and G Improvements**	11/2039	5/2041
5	**Terminal 3 Façade Expansion**	1/2039	1/2041
6	**Central Hub (phased demolition and construction)**	7/2032	1/2037
7	**Domestic Terminal Roadways Reconstruction**	1/2037	1/2039

Project No.	RADP Project	Anticipated Start of Construction	Anticipated Completion of Construction
8	**ITB Curbside Expansion**	7/2034	12/2036
9	**Consolidated Rental Car Center Facility**	5/2027	5/2031
10	**Consolidated Rental Car Center Quick Turn-Around Facility**	5/2027	5/2031
11	**Long-Term Parking Garage #3**	5/2027	5/2031
12	**Long-Term Parking Garage #4**	5/2031	5/2032
13	**Rental Car Center Short-Term Storage Lot**	5/2031	5/2032
14	**Terminal 2 AirTrain Station Platform Expansion**	5/2029	5/2031
15	**Rental Car Center AirTrain Station Platform Expansion**	5/2031	5/2033
16	**AirTrain Maintenance Yard (Demolition and Rebuild)**	8/2028	5/2031
17	**North Field Ground Support Equipment Facility #1**	7/2027	6/2028
18	**Aircraft Maintenance Hangar**	7/2041	4/2044
19	**East Field Ground Support Equipment Facility #2 (Demolition and Rebuild)**	6/2028	7/2030
20	**Sanitary Sewer Force Main Line Realignment**	7/2027	6/2028

Construction activities associated with implementation of projects that could occur under the RADP include but are not limited to site preparation (clearing, grubbing, excavation, grading), demolition, new construction, repaving, and construction staging management. For purposes of a conservative analysis, it is assumed that construction activities could occur at night.

Construction staging activities could occur at seven potential locations (see **Figure 2-10**). The Aviador Lot is located on Airport property west of U.S. 101 in the City of Millbrae and Plot 16D is located on Airport property north of U.S. 101/I-380 Interchange in the City of South San Francisco. Construction staging activities could also occur on employee parking lots throughout the Airport, when available. Construction of facilities located on the airfield (e.g., Boarding Areas F and G) would require the temporary installation of an AOA fence mounted on K-rail to designate construction activities on the airfield as temporary landside areas, with security enforcement from the Airport (e.g., the San Francisco Police Department Airport Bureau).

SOURCE: SFO, 2024; ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 2-10
CONSTRUCTION STAGING AREAS

2.I Approvals Required

Anticipated approvals required for the RADP include:

2.I.1 Local

San Francisco Board of Supervisors

- Adoption of Resolution finding that possible subsequent projects under the RADP are fiscally feasible and responsible, pursuant to San Francisco Administrative Code Chapter 29 and Ordinance No. 39-17 prior to initiating design of a RADP project

San Francisco Airport Commission

- Adoption of CEQA findings, statement of overriding considerations (if applicable), and a mitigation monitoring and reporting program; approval of the RADP; adoption of the Draft Final Airport Development Plan as Final Airport Development Plan

CHAPTER 3
ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

Introduction to the Analysis

This chapter analyzes the physical environmental effects of implementing the San Francisco International Airport (SFO) Recommended Airport Development Plan (RADP) as described in EIR Chapter 2, Project Description. This chapter also describes the environmental and regulatory framework for topics evaluated under the California Environmental Quality Act (CEQA), assesses project impacts and cumulative impacts, and identifies feasible mitigation measures that would reduce or avoid identified significant environmental impacts. This impact overview section describes the scope of analysis in the initial study and Draft EIR and explains the format and basis for the impact analysis for all resource topics, including the cumulative impact analysis.

Initial Study

As described in Chapter 1, Introduction, the planning department determined that an EIR is required for the RADP and published a Notice of Preparation (NOP) of an EIR (see Appendix A). The initial study prepared for this EIR (see Appendix B) concluded that many of the physical environmental impacts of the RADP would be less than significant, or that mitigation measures agreed to by the project sponsor and required as conditions of approval would reduce significant impacts to a less-than-significant level. CEQA does not require further assessment of the issues covered in the initial study; thus, those issues are not included in this chapter. The topics addressed only in the initial study include Land Use and Planning, Aesthetics, Population and Housing, Cultural Resources, Tribal Cultural Resources, Greenhouse Gas Emissions, Wind, Shadow, Recreation, Utilities and Services Systems, Public Services, Biological Resources, Geology and Soils, Hydrology and Water Quality, Hazards and Hazardous Materials, Mineral Resources, Energy, Agriculture and Forest Resources, and Wildfire.

Scope and Organization of This Chapter

The resource topic areas addressed in this chapter of the EIR are listed below, and the abbreviations for each resource topic that are used in the naming of impact statements and mitigation measures are shown in parenthesis:

- Section 3.A: Transportation and Circulation (TR)
- Section 3.B: Noise and Vibration (NO)
- Section 3.C: Air Quality (AQ)

Each environmental topic listed above is presented within a setting (i.e., a description of physical characteristics applicable to the environmental topic) to compare conditions as they exist without the RADP and then again with anticipated activities (subsequent projects) that could occur under the RADP, which is the basis for the analysis of environmental impacts. Thus, the evaluation of impacts in this chapter under each environmental topic is based on specific "study areas" dictated by the characteristics of the resource being evaluated as well as the type, magnitude, and location of potential environmental effects. The introduction to each resource topic in this chapter defines the setting where the effects of the RADP are considered and clarifies relevant details regarding the definition and location of the study area if different from the RADP boundary shown in Figure 2-1, p. 2-4.

Each section of Chapter 3 contains the following elements, based on the requirements of CEQA:

- **Introduction.** This subsection provides a brief description of the overall contents of the section and a cross-section to other related resource topics.
- **Environmental Setting.** This subsection presents a description of the existing physical environmental conditions in the Plan area with respect to each resource topic as of May 2019, which is the month and year the San Francisco Planning Department issued a NOP initiating environmental review of the RADP. The environmental setting constitutes the baseline physical conditions by which potential impacts of the RADP are assessed for significance for each resource topic. This subsection also presents different analysis baselines (e.g., existing conditions or a future baseline) used to appropriately analyze the environmental effects that could occur with implementation of the RADP for certain resource topics. CEQA Guidelines section 15360 defines the environment (or the setting) as "the physical conditions which exist within the area which will be affected by a proposed project."
- **Regulatory Framework.** This subsection provides an overview of statutory and regulatory considerations that are applicable to the specific environmental topic.
- **Impacts and Mitigation Measures.** This subsection evaluates the potential for the RADP to result in adverse effects on the physical environment described in the setting. As described in more detail below, this subsection identifies the significance criteria specific to that resource topic, which is followed by the approach to the analysis, and concludes with the impact evaluation. For impacts determined to be significant, the impact analysis identifies feasible mitigation measures that would avoid or reduce the severity of the identified impact.

  The Impacts and Mitigation Measures section is further subdivided into the following:

  - **Significance Criteria.** This subsection lists the criteria specific to each resource topic used to identify and determine significant environmental effects of the RADP. Under CEQA, a significant effect is defined as a substantial, or potentially substantial, adverse change in the environment. The guidelines implementing CEQA direct that this determination be based on scientific and factual data, including the entire record for the project, and not on argument, speculation, or unsubstantiated evidence. The significance criteria used in this EIR are based on planning department guidance used to assess the severity of environmental impacts of the RADP. It is based on CEQA Guidelines Appendix G, with procedures as set forth in San Francisco Administrative Code chapter 31.10.
  - **Approach to Analysis.** This subsection describes the general approach and methodology used to apply the significance thresholds in evaluating the impacts of the RADP. The methodology for applying significance criteria provides the basis for the impact analysis, which could be either qualitative or quantitative, depending on the specific impact. The methodology identifies use of applicable regulatory guidelines, thresholds, standards, or accepted professional practices or protocols used to assess construction, operational, and cumulative impacts.

- **Impact Evaluation.** This subsection evaluates the potential for implementation of the RADP to result in significant adverse effects on the existing physical environment. Where applicable, both construction and operational impacts are analyzed at a programmatic level. The section begins with the significance criteria/thresholds, which establish the metric by which significance is determined. The latter part of this section assesses the impacts occurring as a result of project implementation and mitigation measures, if required. The impacts are grouped in individually numbered impact statements (shown in boldface type) that address each significance criterion. If the impact analysis concludes that an impact is significant and that feasible mitigation measures are available that could reduce the severity of the impact, the feasible mitigation measure(s) are presented immediately following the impact analysis, indented and numbered corresponding to the number of the impact analysis. The conclusion of each impact analysis is expressed in terms of the impact significance as no impact, less-than-significant impact, less-than-significant impact with mitigation, significant and unavoidable impact with mitigation, or significant and unavoidable impact, as described in more detail below. RADP-specific impacts are discussed first, followed by cumulative impacts (see Approach to Cumulative Impact Analysis, p. 3-7, for further discussion).

Significance Determinations

For each impact statement and analysis, the impact evaluation provides a conclusion of the impact significance, which is designated as one of the following:

- **No Impact.** A no impact conclusion is reached if there is no potential for impacts or the environmental resource does not occur within the project area or the area of potential effects.
- **Less-than-Significant Impact.** This determination applies if the impact does not exceed the defined significance criteria or would be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws and regulations. No mitigation is required for impacts determined to be less than significant.
- **Less-than-Significant Impact with Mitigation.** This determination applies if the project would or could potentially result in a significant effect, exceeding the defined significance criteria, but feasible mitigation is available that would reduce the impact to a less-than-significant level.
- **Significant and Unavoidable Impact with Mitigation.** This determination applies if the project would result in a significant adverse effect that exceeds the defined significance criteria, and although feasible mitigation might lessen the severity of the impact, the residual impact would still exceed the defined significance criteria. Thus, even with implementation of feasible mitigation, the impact would be significant, and therefore, unavoidable.
- **Significant and Unavoidable.** This determination applies if the project would result in a significant adverse effect that exceeds the defined significance criteria, and there is no feasible mitigation available to lessen the severity of the impact. Therefore, the impact would be significant and unavoidable.

Mitigation Measures

CEQA Guidelines section 15126.4 directs preparers of an EIR to describe feasible measures that could minimize significant adverse impacts. Mitigation measures are developed to avoid, minimize, rectify, reduce, or eliminate an impact or compensate for an impact resulting from project implementation. CEQA Guidelines section 15041 grants authority to the lead agency to require feasible changes in any or all activities involved in a project to substantially lessen or avoid significant effects on the environment. Feasible mitigation measures have been included in this chapter for specific environmental impacts where applicable.

Other Considerations in the Impact Analysis

CEQA Guidelines section 15151 describes standards for the preparation of an adequate EIR. Specifically, the standards under section 15151 state:

- An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information that enables them to make a decision that intelligently takes into account environmental consequences.
- An evaluation of the environmental impacts of a project need not be exhaustive; rather, the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible.
- Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts.

In practice, the above points indicate that EIR preparers should use a reasonable, professionally accepted methodology to assess impacts. This approach sometimes requires making reasonable assumptions using the best information available. In some cases, when information is limited, this EIR employs a “reasonable worst-case analysis” to identify the largest expected potential change from existing baseline conditions that the RADP may create. This approach thus identifies the most-severe impact that could occur, providing a conservative analysis of potential environmental impacts.

Analysis Assumptions

In general, this Draft EIR uses the physical conditions in the area of the RADP at the time of NOP publication (May 22, 2019) as the baseline condition to evaluate most construction, operational, and cumulative impacts of the RADP. As described in Chapter 2, Project Description, 2019 reflects the last calendar year of normal Airport operations before the COVID-19 pandemic and global restrictions to air travel demand. However, in some cases, comparing existing conditions as of May 2019 to future conditions would be incorrect and would overestimate the impacts caused by implementation of the RADP and thus would be misleading to the public and decision makers. Comparing and assessing the environmental effects of subsequent projects that could occur under the RADP to the 2019 existing conditions would mislead the public and decision makers into believing that (1) there would be no or few changes to existing conditions regarding passenger and employment growth anticipated to occur by 2045 regardless of implementation of the RADP, and (2) all or most of the environmental impacts that could occur by 2045 are attributable solely to the RADP, rather than, for example, the passenger and employment growth anticipated to occur by 2045 regardless of implementation of the RADP. For this reason, this Draft EIR considers future 2045 (i.e., the anticipated RADP buildout year) baseline conditions to assess operational (including cumulative) environmental impacts for air quality, noise, and transportation to account for the passenger and employment growth anticipated to occur regardless of implementation of the RADP to present a reasonable worst-case analysis.[93] For all other construction, operational, and cumulative impacts, the 2019 existing conditions baseline is used to analyze impacts related to implementation of the RADP. This is because, for those environmental topics, there is no substantial evidence indicating that the physical environmental conditions that existed in May 2019 as

[93] This future baseline includes the anticipated future regional land use, population, and employment growth; the approximately 71.1 million annual passengers at the Airport based on the estimated capacity of the existing runways; and the future projections of Airport employment through 2045, not including subsequent projects that could occur with implementation of the RADP.

presented in this Draft EIR would change in the future in a way that would substantially change the magnitude and nature of physical environmental impacts resulting from the implementation of the RADP.

Given the EIR's use of two different CEQA baselines to more accurately reflect project impacts, the setting section in each environmental topic in this chapter describes the existing conditions as well as the baseline conditions appropriate for the impact analysis of that topic to guide the reader. Adoption of the RADP would not immediately result in new development or result in direct physical changes in the environment. However, certain uses and activities are considered the logical consequences of adopting and implementing the RADP. This EIR considers the environmental impacts of the activities in the RADP and its components subsequent to RADP adoption, which are the indirect effects of the RADP and are studied at a programmatic level of review.

Employee Growth Projections and Approach to Analysis

Implementation of the RADP would facilitate the development of terminal and non-movement areas of the airfield, as well as landside facilities to accommodate long-term passenger activity levels at the Airport forecast to reach approximately 506,000 annual aircraft operations, which is the estimated annual practical capacity of the existing runways regardless of whether the RADP is implemented.[94] The Federal Aviation Administration (FAA) approved SFO's constrained aviation activity forecast for use in planning in June 2014.[95] Passenger aircraft operations represent the largest portion of the 506,000 annual aircraft operations, which are forecast to accommodate approximately 71.1 million annual passengers, considering the forecast passenger aircraft fleet mix.[96] These enplanements and aircraft operations are forecast to grow reflecting increased demand for air travel, regardless of implementation of the RADP. As discussed in Chapter 2, Project Description, and in Appendix C, Airport Facilities to Accommodate Aviation Demand, implementation of the RADP would not induce passenger demand (i.e., induce the public to choose to fly if and/or where they otherwise would not), nor would the RADP increase the capacity of the airfield, change the configuration of the existing runways, change the number of aircraft operations or aircraft types operating at the Airport (including cargo, private jets, and helicopters), or change the volume of annual passengers that choose to fly into and out of SFO.

Because the RADP is a plan, its approval would not result in direct physical changes in the environment; and because the RADP does not propose any project-level approvals, additional actions and environmental review would be required to implement each subsequent RADP project. As such, the analysis of the RADP's physical impacts in this Draft EIR is based upon estimated demolition and construction assumptions associated with the subsequent projects that could occur with implementation of the RADP, in addition to employee growth projections based on new Airport employee and tenant staff associated with the RADP projects. Employee growth assumptions were developed based on land use assumptions for RADP projects

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[94] The constrained forecast and ultimate airport capacity and delay simulation modeling analysis are contained in the Chapter 2 and Appendix B of the *Draft Final Airport Development Plan*, respectively.

[95] Fernando Yanez, Airport Planner, Federal Aviation Administration, "Federal Aviation Administration (FAA) Approval of San Francisco International Airport's Aviation Activity Forecasts," letter to John Bergener, Airport Planning Director, San Francisco International Airport, June 9, 2014.

[96] Aviation activity forecasts are based on national and regional economic modeling and regression analysis and aviation trends and incorporate FAA-required factors for public-use airports, including airline aircraft fleet mix considerations. Forecasts are initially prepared as unconstrained, assuming no physical or facility constraints would limit increases in aviation activity. At SFO, the practical capacity of the runways constrains the overall capacity of the airport and there is no feasible option for adding runway capacity at SFO. Therefore, the forecast used for the RADP represents a constrained condition reflecting the practical capacity of the runways. The associated forecast of annual passengers was based on an assessment of future airline fleet mix, considering the number of seats per aircraft and the estimated percentage of occupied seats.

(see Appendix D, Employee Growth Assumptions, for a more detailed discussion of the employee growth projections and land use assumptions).

Summary of Growth Projections

Table 3-1 presents the employee information for SFO in 2019 (the baseline year for the analysis or existing conditions), the estimated employee background growth in 2045 associated with the growth in passengers anticipated to occur regardless of implementation of the RADP, and the estimated employee growth attributable to implementation of the RADP. The 2019 existing condition for SFO includes approximately 42,000 employees (column [a] in the table). Future employment growth that could occur with implementation of the RADP amounts to approximately 2,700 additional SFO employees (column [b] in the table; see Appendix D, Employee Growth Assumptions). Some employee growth would be expected to occur regardless of implementation of the RADP, which is shown in column (c) of the table as 2019 to 2045 Background Growth without the RADP.

The total number of employees for the 2045 condition without the RADP, including existing conditions and background growth, is shown in column (d) of the table and would total approximately 52,200 employees. The total number of employees for the 2045 condition with the RADP, including existing conditions, background growth, and the RADP, would total approximately 54,900 employees (column [e] in the table).

Table 3-1 Summary of Employment Growth Projections

	(a) 2019 Existing Conditions (including construction workers)[a]	(b) RADP Growth (excluding construction workers)	(c) Background Growth: 2019–2045 Growth Without RADP (excluding construction workers)[b]	(d) 2045 Condition Without RADP (including construction workers) (a + c)	(e) 2045 Condition With RADP (including construction workers) (a + b + c)[c]
Employment (Jobs)	42,800	2,700	9,400	52,200	54,900

SOURCES: Data provided by SFO in 2019 and compiled by Fehr & Peers and ESA in 2023

Numbers are rounded to the nearest hundred. See Appendix D, Employee Growth Assumptions, for a detailed breakdown of estimated employment generation for implementation of the RADP.

a. Number of existing employees, including airlines, tenants, airport commission employees, and construction workers associated with capital construction projects, based on the 2017 Economic Impact Study of San Francisco International Airport, July 2017, https://www.flysfo.com/sites/default/files/pdf/2017_SFO_Economic_Impact_Study_Update.pdf. Airport commission employees are employed by the City and County of San Francisco; tenant employees are employed by private companies, including but not limited to airlines, commercial service providers, ground support providers, and rental car companies.
b. The 2019 to 2045 Background Growth includes employee growth that is expected to occur regardless of implementation of the RADP. Background employee growth was estimated by applying the ratio of number of passengers per employee (excluding 2,041 construction workers) for the existing condition to the 2045 condition. The 42,828 existing employees minus 2,041 construction workers equals 40,787 employees in 2019. The 57,800,000 million annual passengers per year divided by the 40,787 employees equals 1,417 passengers per employee. The future condition with an estimated 71,100,000 million annual passengers divided by 1,417 passengers per employee equals 50,176 employees by approximately 2045, for a net increase of 9,389 employees. The number of construction workers (2,041 at the time the NOP was published) is assumed to remain constant through buildout of the RADP given that only a certain number of projects at the Airport can be under construction at any given time, such as ongoing capital improvement projects.
c. The increase in employment from existing conditions to full buildout of the RADP would constitute an approximately 27 percent increase in employees at SFO by 2045.

Cumulative Impacts

Defining Cumulative Impacts

CEQA requires an evaluation of a project's potential contributions to cumulative impacts, in addition to proposed project-specific impacts. Cumulative impacts, as defined in CEQA Guidelines section 15355, refer to two or more individual effects that, when taken together, are "considerable" or that compound or increase other environmental impacts. A cumulative impact from several projects is the change in the environment that would result from the incremental impact of the project when added to the impact of other closely related past, present, or reasonably foreseeable future projects. Pertinent guidance for cumulative impact analysis is provided in CEQA Guidelines section 15130:

- An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (i.e., the incremental effects of an individual project are considerable when viewed in connection with the effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
- A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The discussion of impact severity and likelihood of occurrence need not be as detailed as for effects attributable to the project alone.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

An EIR must then determine whether an individual project's contribution to a cumulative impact is considerable. This means that the project's proportional share is deemed to be adverse in conjunction with other similar projects that may combine to result in physical impacts.

The cumulative impact analysis for each individual resource topic is described in each resource section of this chapter, immediately following the description of the project-specific impacts and mitigation measures.

Approach to Cumulative Impact Analysis

The following factors were used to determine an appropriate list of individual projects to be considered in the cumulative analysis:

- **Similar Environmental Impacts**—A relevant project contributes to effects on resources that are also affected by the proposed project. A relevant future project is defined as one that is "reasonably foreseeable," such as a proposed project for which an application has been filed with the approving agency or has approved funding.
- **Geographic Scope and Location**—A relevant project is located within the geographic area within which effects could combine. The geographic scope varies on a resource-by-resource basis. For example, the geographic scope for evaluating cumulative effects to regional air quality consists of the affected air basin.
- **Timing and Duration of Implementation**—Effects associated with activities for a relevant project (e.g., short-term construction or demolition, or long-term operations) would likely coincide in timing with the related effects of the proposed project.

CEQA Guidelines section 15130(b)(1) outlines two approaches to a cumulative impact analysis: (a) the analysis can be based on a list of past, present, and reasonably foreseeable probable future projects producing closely related impacts that could combine with those of a proposed project, or (b) a summary of projections contained in a general plan or related planning document can be used to determine cumulative impacts. The analysis in this EIR employs both the list-based approach and a projections-based approach, depending on which approach is most appropriate for the resource topic being analyzed. For example, the analysis of cumulative noise and vibration impacts uses the list-based approach and considers individual projects that are anticipated in the vicinity of the project site that may affect recreational resources also affected by the proposed project. By comparison, the cumulative air quality analysis relies on a projection of overall growth and other reasonably foreseeable projects, which is the typical methodology the planning department applies to the cumulative analysis of air quality impacts.

For the resource topics using the list-based approach, **Table 3-2** presents a comprehensive list of cumulative development and infrastructure projects[97] generally located within 0.25 mile of the project site that are considered in the various cumulative analyses. The table identifies cumulative projects and provides a figure key (see **Figure 3-1**, p. 3-11), which shows the location of these projects relative to the project site. The table includes a column to list each project's status to indicate when completion is expected to occur. Each cumulative impact analysis considers the projects listed in Table 3-2 as appropriate to the resource topic.

Table 3-2 Cumulative Projects on and within 0.25 Mile of the RADP Project Site

Count	Location	Project Name and Description	Status as of Publication of Draft EIR
1	**On SFO West of Bayshore**	**2019–2029 San Francisco Garter Snake Recovery Action Plan (Case No. 2008.0498ENA)** – The 2008 Recovery Action Plan (RAP) for the San Francisco Garter Snake provides a comprehensive management framework for the conservation of sensitive biological resources on Airport-owned property, known as the West of Bayshore. The 2008 RAP proposed the following types of activities: upland habitat enhancement and vegetation management; fuel abatement and firebreaks; access road maintenance and restoration; wetland deepening; access control; aquatic habitat enhancement; and maintenance and trash management. An addendum to the 2008 RAP that was approved in 2020 authorized the following additional activities at the West of Bayshore: selected non-native tree removal; an alternative canal vegetation maintenance pilot program; minor maintenance of existing infrastructure; feral cat management; and research projects to advance understanding of species.	2020–2029
2	**On SFO Property**	**Consolidated Administration Campus Phase 2 (Case No. 2019-006583ETM)** – Implementation of phase 2 of the Consolidated Administration Campus Program, which includes construction of an approximately 338,000-square-foot office building and a 1,400-stall employee parking garage (1,105 net new parking spaces).	Anticipate construction to begin in 2025
3	**On SFO Property**	**West Field Cargo Redevelopment (Case No. 2020-008656ENV)** – This project would demolish seven buildings and construct two consolidated cargo/ground service equipment facilities and one ground service equipment facility to accommodate current and future air cargo operations.	Anticipate construction to begin after 2025

[97] Cumulative projects are defined as projects for which an application has been filed. A project for which an application has not been filed is not considered reasonably foreseeable and therefore is not included in Table 3-2.

Count	Location	Project Name and Description	Status as of Publication of Draft EIR
4	**On SFO Property**	**Shoreline Protection Program (Case No. 2020-004398ENV)** – This project would install a new seawall that would comply with current Federal Emergency Management Administration requirements for flood protection and incorporate designs for future sea-level rise.	Anticipate construction 2028–2035
5	**On SFO Property**	**Recycled Water Distribution Pipeline System (Case No. 2020-004658ENV)** – Construction and installation of infrastructure necessary to expand the use of reclaimed water at the Airport. The recycled water will be distributed Airport wide for restroom dual plumbing, cooling tower make-up water, irrigation, and other purposes. This project also includes replacement of sanitary sewer headworks and associated electronics and hardware at the SFO Mel Leong Treatment Plant.	Anticipate construction to begin in 2025
6	**On SFO Property**	**Underground Pipeline and Pump Station Upgrades** – Improvements to underground industrial waste, sewer, and drainage pipelines and pump stations across Airport property.	Anticipate construction to begin in 2025
7	**On SFO Property**	**North Field Maintenance Facilities (Case No. 2023-006288ENV)** – This project would consolidate existing maintenance facilities at the Airport in a new 148,000-square-foot building with parking for 420 City vehicles.	Anticipate construction to begin in 2026
8	**On SFO Property**	**Pipeline Replacement to South San Francisco Water Treatment Plant (Case No. 2021-010709ENV)** – Replacement of sewer pipeline from the Mel Leong Treatment Plant to the South San Francisco – San Bruno Water Quality Control Plant.	Anticipate construction to begin in 2026
9	**On SFO Property**	**Plot 10F Demolition and Paving and Cargo Building 662 (Case No. 2022-003521ENV)** – This project will demolish Building 660 (former U.S. Post Office facility) and adjacent paved areas and redevelop the site with interim and permanent RON positions, a new Building 662, and an elevated walkway connecting Building 662 to adjacent Airport buildings.	Anticipate construction to begin in 2027
10	**On SFO Property**	**Boarding Area C Renovation (Case No. 2007.1149E)** – This project would entail a complete renovation of Boarding Area C.	Anticipated to be complete in 2026
11	**On SFO Property**	**Boarding Area G Gate Enhancements (Case No. 2023-009342ENV)** – This project will make enhancements at Boarding Area G gates including replacing aging Passenger Boarding Bridges. Other related components include replacement of associated electrical utilities connected to the Passenger Boarding Bridges, installation of a visual docking guidance system, shifting of aircraft parking envelopes to maximize gate utilization, replacing failing apron pavement, repair and replacement of fire hydrant lines, reconfiguration of fueling hydrant pits, and construction of pedestrian-level access for hard stand operations.	Anticipate construction to begin in 2025

Count	Location	Project Name and Description	Status as of Publication of Draft EIR
12	**401 E Millbrae Ave, 0.1 mile south of SFO property**	**Moxy Hotel, Millbrae** – Construction of a 209-room, six-story hotel in the existing Aloft Hotel parking lot.	Construction has not begun
13	**San Bruno**	**Tanforan** – Redevelopment of the 44-acre Shops at Tanforan site, which will include demolition of the existing mall and construction of a new transit-oriented mixed-use development. The project would retain and upgrade Target and keep and modernize the Century at Tanforan movie theater. The future uses for the site are proposed to include a 2 million-square-foot innovative life science campus, 1,000 housing units, and new modernized retail space.	Application under review
14	**San Bruno**	**1000 San Mateo Avenue** – Demolition of the former SkyPark long-term airport parking facility and construction of a 50-foot-tall warehouse and distribution center containing approximately 97,500 square feet of warehouse space and 9,500 square feet of office space with rooftop and grade-level parking for approximately 440 vehicles.	Published Notice of Preparation of an EIR
15	**Millbrae**	**1100 El Camino Real (El Rancho Inn Redevelopment)** – Demolition of eight residential units and the Best Western El Rancho Inn and development of a new five-story, 384-unit, multi-family apartment building.	Application approved
16	**Millbrae**	**150 Serra Avenue (Millbrae Serra Station)** – Mixed-use development consisting of three buildings containing approximately 444 units, approximately 35,000 square feet of retail, and approximately 295,000 square feet of office space.	Application approved
17	**South San Francisco**	**Terminal 101 Redevelopment** – Development of a six-story research and development campus containing approximately 2.5 million square feet of office, amenity, parking, and open space.	Construction has not yet begun
18	**South San Francisco**	**Infinite 131 Project** – Demolition of an approximately 126,800-square-foot industrial building and construction of an approximately 1.7 million sf of research and development and amenities within six buildings, ranging from two to six stories, along with two parking garages and additional surface parking.	Application under review
19	**South San Francisco**	**A-1 Self Storage** – Development of a new public storage facility consisting of three buildings on a 5.4-acre site.	Application under review
20	**Millbrae/ Burlingame**	**OneShoreline** – The project would include a combination of offshore and shoreline features, including creation of a tidal lagoon and offshore barrier composed of hardened and natural materials, to control offshore water levels, to protect Millbrae and Burlingame from future sea-level rise.	Published Notice of Preparation of an EIR

SOURCES: City of South San Francisco Development and Construction Map, 2023; City of San Bruno Major Development Projects, 2022; City of Millbrae Active Development Projects, 2023; City of Burlingame Major Projects, 2024; and SFO Five-Year Capital Plan, 2015.

SOURCE: ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 3-1
CUMULATIVE PROJECTS ON AND WITHIN 0.25 MILE OF THE RADP PROJECT SITE

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3.A Transportation and Circulation

3.A.1 Introduction

This section describes the existing transportation and circulation setting in the transportation study area, outlines the regulatory framework applicable to the RADP, and analyzes potential impacts on transportation and circulation that would result from implementation of the RADP. Transportation and circulation topics cover issues related to people walking, bicycling, or driving; public transit; emergency access; vehicle miles traveled (VMT); loading (i.e., loading and unloading of goods, services, and passengers); and parking. Supporting detailed technical information is included in Appendix E of this Draft EIR.

3.A.2 Existing Setting

The transportation study area is the area within and near the Airport where implementation of the RADP could affect transportation and circulation, and is generally bounded by North Access Road to the north, U.S. 101 to the west, Millbrae Avenue to the south, and San Francisco Bay to the east (see **Figure 3.A-1**).

Regional and Local Roadways

Regional Roadways

U.S. 101 is a north–south, 8- to 10-lane freeway[98] that connects the Airport with San Francisco and the North Bay to the north and the Peninsula and the South Bay to the south. U.S. 101 connects to Interstate 280 (I-280) north of Millbrae via Interstate 380 (I-380) and to Interstate 80 (I-80) in San Francisco. Local access to U.S. 101 is provided at North Access Road, San Bruno Avenue, and Millbrae Avenue, while access to I-380 is provided at North Access Road and South Airport Boulevard. Both U.S. 101 and I-380 provide direct access to the Airport through a series of ramps and viaducts (see Figure 3.A-1).

In 2023, the San Mateo 101 Express Lanes project was completed.[99] The project provides express lanes in both directions of U.S. 101 between the San Mateo/Santa Clara County line and I-380 in South San Francisco. Express lanes are carpool lanes with the option for non-carpoolers, such as solo drivers, to pay a toll to use the lanes when space is available.

Local Roadways

North Access Road is an east–west roadway with two travel lanes in each travel direction for about 0.5 mile east of the U.S. 101/I-380 ramps, and one lane in each travel direction as the road continues around the Airport shoreline to its terminus.

[98] Roadway designations typically include *freeways*, *major arterials*, *secondary arterials*, *collector streets*, and *local streets*. Each of these roadways has a different potential capacity for mixed-flow traffic. U.S. 101 and I-380 are classified as freeways; North Access Road, South Airport Boulevard, North McDonnell Road, and South McDonnell Road are secondary arterials; and Millbrae and San Bruno avenues are major arterials.
[99] San Mateo 101 Express Lanes. https://dot.ca.gov/caltrans-near-me/district-4/d4-projects/d4-san-mateo-101-express-lane-project, accessed August 6, 2024.

SOURCE: Fehr & Peers, 2024

FIGURE 3.A-1

TRANSPORTATION STUDY AREA AND STUDY ROADWAY SEGMENTS

South Airport Boulevard is a north–south roadway with two travel lanes in each direction with dedicated turn lanes at major intersections (e.g., North Access Road, entrance to the Long-Term Parking Garages, and San Bruno Avenue). Bicycle lanes are provided on both sides of the roadway. South Airport Boulevard provides access to the Long-Term Parking Garages #1 and #2 and the United Airlines Maintenance and Operations Center. South Airport Boulevard becomes North McDonnell Road at the intersection with San Bruno Avenue.

North McDonnell Road is a north–south roadway that parallels U.S. 101 and provides access to facilities west of the airfield, including the Rental Car Center (at Access Road 8) and the administration facilities (via West Field Road). North of Access Road 8, North McDonnell Road has two travel lanes in each direction with left-turn lanes at the intersection of Access Road 8, and has one to two travel lanes each way south of Access Road 8. Bicycle lanes are provided on both sides of the roadway.

South McDonnell Road is a north–south roadway that parallels U.S. 101 and provides access to the transportation network companies (TNC)[100] parking lot at South McDonnell Road and Millbrae Avenue, Emergency Response Facility #3, and the South Field Checkpoint area for truck access to the airfield. South McDonnell Road generally has one travel lane and bicycle lane in each direction with a wider shoulder on the east side of the roadway. The roadway widens to two travel lanes and a bicycle lane in each direction approximately 0.25 mile north of the intersection of South McDonnell Road/Millbrae Avenue.

San Bruno Avenue is an east–west roadway that extends between South Airport Boulevard/North McDonnell Road and Seventh Avenue. Near the Airport, San Bruno Avenue has two travel lanes in each direction with dedicated turn lanes at the interchange with U.S. 101 northbound and southbound on- and off-ramps. West of Seventh Avenue, San Bruno Avenue continues as San Bruno Avenue East.

Millbrae Avenue is an east–west arterial that extends between Bayshore Highway and El Camino Real. West of El Camino Real, Millbrae Avenue is a local street until its terminus near I-280. Near the Airport, Millbrae Avenue generally has two travel lanes in each direction with dedicated turn lanes at the interchange with U.S. 101 northbound and southbound on- and off-ramps.

Table 3.A-1 summarizes the existing weekday daily and a.m. and p.m. peak hour traffic volumes for the roadway study roadway segments (see Figure 3.A-1).[101] The traffic volumes are based on counts conducted in 2018 and 2019 before the COVID-19 pandemic caused changes in travel patterns (i.e., before air travel, public transit service, and peak-period travel by all travel modes declined). The 2018/2019 roadway volumes were compared to 2023 roadway volumes collected by SFO at selected locations within the transportation study area. The vehicle traffic volumes collected in 2023 were 10 to 15 percent lower than those observed in 2018/2019 (see Appendix E.2).

During the weekday a.m. and p.m. peak hours, traffic volumes on local access roadways were highest on Millbrae Avenue east and west of the U.S. 101 ramps, and ranged from approximately 550 to 2,050 vehicles per hour per direction. The weekday a.m. and p.m. peak hour traffic volumes on North Access Road and South McDonnell Road ranged from 170 to 510 vehicles per hour per direction, while traffic volumes on South Airport Boulevard, San Bruno Avenue, and North McDonnell Road were higher, and ranged from 320 to 830 vehicles per hour per direction.

[100] *Transportation network companies (TNCs)* are ride-hail services such as Uber and Lyft.
[101] The highest hourly traffic volumes occur in the morning during the 7 a.m. to 9 a.m. peak period and in the evening during the 4 p.m. to 7 p.m. peak period.

Table 3.A-1 2019 Existing Weekday A.M. and P.M. Peak Hour Traffic Volumes on Study Roadway Segments

	A.M. Peak Hour [a]		P.M. Peak Hour [a]	
Roadway Segment	NB/EB	SB/WB	NB/EB	SB/WB
U.S. 101 North of North Access Road	5,900	6,400	5,600	6,200
U.S. 101 between North Access Road and Millbrae Avenue	6,300	4,800	6,500	4,600
U.S. 101 South of Millbrae Avenue	7,500	7,100	7,000	6,900
Millbrae Avenue east of U.S. 101 ramps	1,140	550	780	1,250
Millbrae Avenue west of U.S. 101 ramps	1,770	1,720	1,810	2,050
North Access Road west of North Field Road	280	300	170	230
San Bruno Avenue east of U.S. 101 ramps	830	320	580	750
South Airport Boulevard south of North Access Road	470	540	650	520
North McDonnell Road between San Bruno Avenue and South McDonnell Road	490	650	740	600
South McDonnell Road between North McDonnell Road and Millbrae Ave	300	210	330	510

SOURCE: Fehr & Peers/LCW Consulting, 2025 (see Appendix E.2).

ABBREVIATIONS: NB/EB = northbound/eastbound; SB/WB = southbound/westbound.

NOTE:

a. The highest hourly traffic volumes occur in the morning during the 7 a.m. to 9 a.m. peak period and in the evening during the 4 p.m. to 7 p.m. peak period.

During field observations conducted in June of 2024, no unusual or potentially hazardous conditions were observed for people driving on transportation study area roadways or on the SFO airport ramps.

Walking Conditions

Most roadways serving the Airport provide vehicular access between the various Airport facilities and are not intended for people walking; for this reason, pedestrian facilities such as sidewalks and/or crosswalks are generally not provided. North Access Road does not have sidewalks on either side of the roadway; however, South Airport Boulevard has sidewalks on the west side of the roadway.

North McDonnell Road has discontinuous sidewalks on the east side of the street, while South McDonnell Road only has a sidewalk on the east side of the roadway that extends about 300 feet north of Millbrae Avenue. San Bruno Avenue has sidewalks on the south side of the roadway and on the north side of the roadway to the west of the driveway to SFO parking Lot DD. Millbrae Avenue has sidewalks only on the south side of the roadway.

In the vicinity of the Aviador Lot construction staging area, sidewalks are provided on the east side of Aviador Avenue adjacent to the site (see Figure 2-10, p. 2-41, for location of construction staging areas). Sidewalks and crosswalks are provided on North Rollins Road and will be provided on Garden Lane as part of the

Gateway project that is currently under construction west of the Aviador Lot construction staging area. Sidewalks are provided on South Airport Boulevard in the vicinity of the Plot 16D construction staging area.

Table 3.A-2 presents counts of the number of people crossing within a given crosswalk at the intersections adjacent to the Airport. The counts were conducted during the 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. peak periods. The number of people crossing at the study intersections was low during the weekday a.m. and p.m. peak hours. The greatest number of people crossing was counted at the intersection of North McDonnell Road/West Field Road, which is the closest signalized intersection to the West Field Road AirTrain Station, Airport administration buildings, and cargo facilities located along West Field Road.

Table 3.A-2 2019 Existing Weekday A.M. and P.M. Peak Hour Counts of People Walking within Crosswalks

Study Intersection	North Crosswalk	South Crosswalk	East Crosswalk	West Crosswalk	Total
Weekday A.M. Peak Hour [a]					
South Airport Blvd/I-380/U.S. 101 ramps	2	0	1	2	**5**
North McDonnell Rd/West Field Rd [b]	19	25	6	—	**50**
South McDonnell Rd/Millbrae Ave [c]	—	2	0	0	**2**
Weekday P.M. Peak Hour [a]					
South Airport Blvd/I-380/U.S. 101 ramps	5	0	1	1	**7**
North McDonnell Rd/West Field Rd [b]	16	19	11	—	**46**
South McDonnell Rd/Millbrae Ave [c]	—	7	0	0	**7**

SOURCE: IDAX, 2018.

NOTES:

a. The a.m. peak hour is 8 a.m. to 9 a.m. and the p.m. peak hour is 5 p.m. to 6 p.m. except at the intersection of North McDonnell Road/West Field Road, which has an earlier a.m. peak hour of 7:15 a.m. to 8:15 a.m. and an earlier p.m. peak hour of 4 p.m. to 5 p.m.
b. At the T intersection of North McDonnell Road/West Field Road there is no sidewalk or crosswalk on the west side of North McDonnell Road south of the north crosswalk, and "—" indicates that a crosswalk does not exist at this location. The north crosswalk connects the east side of North McDonnell Road with the SamTrans bus stop on the west side, while the south crosswalk connects the east side of North McDonnell Road with the center median and the escalator to the West Field Road AirTrain station. "—" indicates the approach that does not exist.
c. At the T intersection of South McDonnell Road/Old Bayshore Highway/Millbrae Avenue (South McDonnell Road/Millbrae Avenue) there is no north crosswalk, indicated by "—." The east crosswalk pedestrian counts reflect people walking on the sidewalk on the east side of South McDonnell Road/Old Bayshore Highway.

During field observations conducted in June 2024, no substantial safety or right-of-way conflicts between pedestrians, bicyclists, and vehicles were observed on South Airport Boulevard, North McDonnell Road, or South McDonnell Road where sidewalks are provided.

Bicycling Conditions

Bicycle facilities are typically classified as class I, class II, class III, or class IV facilities.[102] **Figure 3.A-2** shows the bicycle facilities within and in the vicinity of the RADP project site. As shown in Figure 3.A-2, class IV bicycle lanes are provided on North Access Road north of the San Bruno Channel between South Airport Boulevard and Long-Term Parking Garage #1. Class II bicycle lanes are provided on both sides of North McDonnell and South McDonnell roads and on South Airport Boulevard. South of Millbrae Avenue, a class III signed route is provided on Old Bayshore Highway.

The San Francisco Bay Trail (Bay Trail)[103] runs along the coastline north and south of the Airport and provides regional bicycle access. In the RADP project site vicinity south of SFO, a paved multi-use trail is located east of Old Bayshore Highway; this trail ends in Bayfront Park at Millbrae Avenue. North of San Bruno Avenue on the east side of U.S. 101, the Bay Trail continues north along the western edge of the Airport and under the U.S. 101/I-380 ramps to the intersection of South Airport Boulevard and North Access Road. The Bay Trail continues east within the class IV bicycle lane on North Access Road and continues along the shoreline to SamTrans peninsula where the SamTrans North Base Facility and the Safe Harbor Shelter are located.

Counts of people bicycling were conducted during the weekday p.m. and weekend midday peak periods in July 2019 and are presented in **Table 3.A-3**. The number of people bicycling near the Airport during the weekday a.m. and p.m. peak hours was generally low—fewer than 20 bicyclists in any one direction of travel.

During field observations conducted in June 2024, no substantial safety or right-of-way conflicts between bicyclists and vehicles were observed on North McDonnell and South McDonnell roads or on South Airport Boulevard.

Public Transit Conditions

SamTrans is the primary public transit provider in the project vicinity. SamTrans manages local and regional bus service, paratransit service, and Caltrain commuter rail. There are eight SamTrans bus routes within the transportation study area, as shown on **Figure 3.A-3**. **Table 3.A-4** presents the 2024 scheduled weekday a.m. and p.m. peak period frequencies, general hours of weekday operation, and areas served for the SamTrans bus routes within the transportation study area.

SamTrans routes 142 and EPX stop at the Rental Car Center AirTrain Station off of North McDonnell Road, while SamTrans 120, 292, ECR Owl, 397 Owl, and 713 routes stop on the lower (arrivals) level via South McDonnell Road and/or North McDonnell Road. SamTrans 138 travels on North Access Road between South Airport Boulevard and the SamTrans North Base Facility on SamTrans peninsula.

[102] *Class I bikeways* are bike paths with exclusive rights-of-way for use by people bicycling or people walking. *Class II bikeways* are striped within the paved areas of roadways and are established for the preferential use of people bicycling in separated bicycle lanes. Separated bicycle lanes provide a striped, marked, and signed lane that is buffered from vehicular traffic. These facilities, which are located on roadways, reserve 4 to 5 feet of space exclusively for bicycle traffic. *Class III bikeways* are signed bicycle routes that allow people bicycling to share travel lanes with vehicles and may include shared-lane markings such as "sharrows" that allow bicyclists to share the roadway with vehicles. *Class IV bikeways* are dedicated bicycle facilities that are separated from vehicular traffic by a buffer zone (also referred to as a "cycle track"). The separation from vehicular traffic could be by grade separations, flexible posts, inflexible physical barriers, or on-street vehicular parking.
[103] The San Francisco Bay Trail Project, Map 3, San Francisco Bay Trail Brisbane Lagoon to Bayside Park, https://baytrail.org/get-on-the-trail/map-by-number/brisbane-lagoon-to-bayside-park/, accessed May 3, 2024.

SOURCE: LCW Consulting, 2024

FIGURE 3.A-2

EXISTING BICYCLE ROUTE NETWORK

Table 3.A-3 2019 Existing Weekday A.M. and P.M. Peak Hour Counts of People Bicycling

Study Intersection	Northbound Approach	Southbound Approach	Eastbound Approach	Westbound Approach	Intersection Total
Weekday A.M. Peak Hour[a]					
South Airport Blvd/I-380/U.S. 101 ramps	14	6	0	2	**22**
North McDonnell Rd/West Field Rd[b]	14	19	—	0	**33**
South McDonnell Rd/Millbrae Ave[c]	14	7	7	—	**28**
Weekday P.M. Peak Hour[a]					
South Airport Blvd/I-380/U.S. 101 ramps	1	18	0	0	**19**
North McDonnell Rd/West Field Rd[b]	5	5	—	0	**10**
South McDonnell Rd/Millbrae Ave[c]	7	15	1	—	**23**

SOURCE: IDAX, 2018.

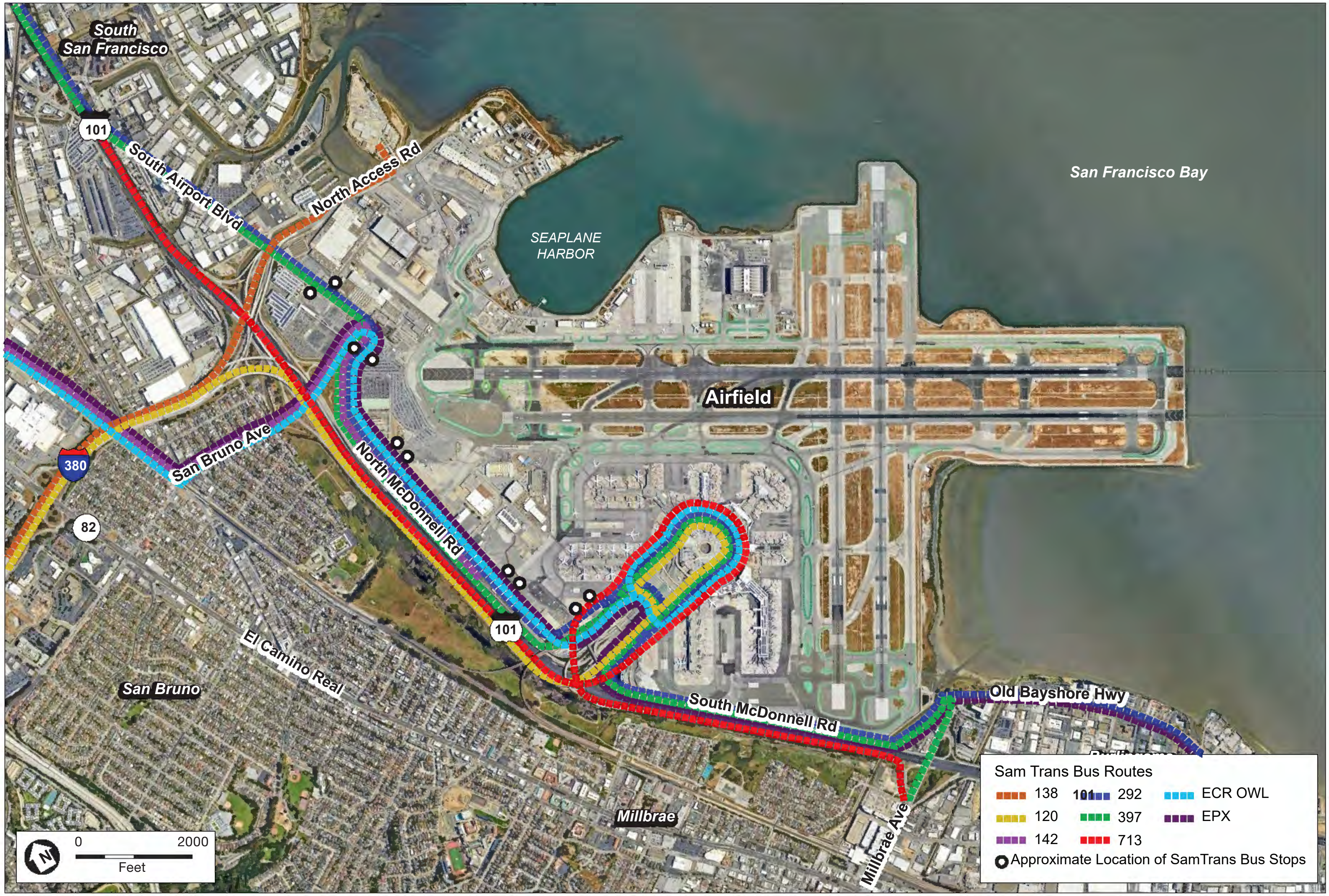
NOTES:

a. The a.m. peak hour is 8 a.m. to 9 a.m. and the p.m. peak hour is 5 p.m. to 6 p.m. except at the intersection of North McDonnell Road/West Field Road, which has an earlier a.m. peak hour of 7:15 a.m. to 8:15 a.m. and an earlier p.m. peak hour of 4 p.m. to 5 p.m.
b. At the T intersection of North McDonnell Road/West Field Road there is no eastbound approach, and "—" indicates that this approach does not exist.
c. At the T intersection of South McDonnell Road//Millbrae Avenue (South McDonnell Road/Millbrae Avenue) there is no westbound approach, and "—" indicates that this approach does not exist.

The Millbrae Transit Center, which is located west of the existing Aviador Lot construction staging area, is the only location that provides an intermodal connection between Caltrain and Bay Area Rapid Transit (BART), and is the southern terminus of BART's Richmond-Millbrae and SFO Airport-Millbrae-Antioch lines. The BART SFO Airport-Millbrae-Antioch line connects the Airport with Caltrain at the Millbrae Transit Center. BART travels to the Airport on an elevated structure; the BART San Francisco International Airport Station is located west of the International Terminal Building (ITB) and near North McDonnell Road.

The SamTrans North Base Facility, located at 301 North Access Road, is one of two SamTrans maintenance and operations facilities. It stores and serves SamTrans' bus and Redi-Wheels paratransit fleets. SamTrans route 138 travels on North Access Road between South Airport Boulevard and the SamTrans North Base Facility.

SFO provides AirTrain, a fully automated people mover on an elevated structure that connects the terminals with their garages, the BART station, and other locations in the Airport. Two AirTrain lines are provided: the Red Line connects all terminals, terminal garages, and the BART station; and the Blue Line connects the Rental Car Center with all terminals, terminal and long-term parking garages, and the BART station. The Blue Line has stations at the intersection of North McDonnell and West Field roads, the Rental Car Center, and the long-term parking garages.



SOURCE: SamTrans; LCW Consulting, 2024

FIGURE 3.A-3
EXISTING TRANSIT NETWORK

Table 3.A-4 Existing (2024) SamTrans Routes in Transportation Study Area

Bus Route	Frequencies (in minutes)[a] A.M. Peak Period[b]	P.M. Peak Period[b]	General Hours of Weekday Operation)[c]	Closest Stops	Areas Served
SamTrans 120	10	10	4:06 a.m.–11:05 p.m.	SFO Terminal – Lower Level	Daly City, San Francisco, Colma, SFO
SamTrans 138[c]	30	40	4:48 a.m.–7:43 p.m.	SamTrans Driveway & North Access Road	SamTrans peninsula, South San Francisco
SamTrans 142	60	60	6:02 a.m.–6:21 p.m.	SFO AirTrain Station/Rental Car Station	SFO, San Bruno
SamTrans 292	20	20	3:55 a.m.–1:25 a.m.	SFO Terminal – Lower Level	San Francisco, Brisbane, South San Francisco, Millbrae, Burlingame, San Mateo
SamTrans 713	NA	NA	4:01 a.m.–5:05 a.m.	SFO Terminal – Lower Level	SF Transit Center, SFO
SamTrans ECR Owl	NA	NA	4:16 a.m.–5:10 a.m.	SFO Terminal – Lower Level	Daly City, South San Francisco, SFO
SamTrans EPX	45	45	5:05 a.m.–6:56 p.m.	SFO AirTrain station/Rental Car Station	East Palo Alto, San Bruno BART, San Francisco
SamTrans 397	NA	NA	1:04 a.m.–2:46 a.m.	SFO Terminal – Lower Level	East Palo Alto, San Bruno BART, San Francisco

SOURCE: SamTrans.com, Schedules & Maps, 2025, https://www.samtrans.com

NOTES:

a. Frequencies represent wait times between transit vehicles.
b. First and last trip during the a.m. peak hour of 8 a.m. to 9 a.m. and the p.m. peak hour of 5 p.m. to 6 p.m.
c. Bus originates as SamTrans routes 130 or 141.

SFO also provides two shuttle services for workers at SFO. The Go>SFO Shuttle is a commuter bus program for all workers at SFO, including airline employees, that runs between SFO and major destinations.[104] The four Go>SFO shuttle bus routes serve Hayward/Castro Valley, Vallejo/El Cerrito, Oakland and San Francisco Mission-Balboa Park. The Hayward/Castro Valley route runs every 30 minutes with limited overnight service, the Vallejo/El Cerrito route runs to coincide with major shift change times, while shuttle bus routes serving Oakland and San Francisco will provide late night service for when BART is not running.[105] The SFO Parking Shuttle transports employees between on-airport employee parking lots (e.g., Lot C, Lot D) and terminal curbsides.

Emergency Access Conditions

The nearest fire stations to the Airport are Fire Station 62 located at 249 Harbor Way in the City of South San Francisco, Fire Station 51 located at 555 El Camino Real in San Bruno, and Fire Station 37 located at 511 Magnolia Avenue in Millbrae.

Within the Airport, emergency response facilities include the Emergency Rescue Fire Fighting Facility #1 (Building 650) located in the West Field (see Figure 2-3, p. 2-8), Emergency Rescue Fire Fighting Facility #2 (Building 1064) located in the East Field (see Figure 2-5, p. 2-10), and the Emergency Rescue Fire Fighting Facility #3 (Building 12) in the South Field. All San Francisco Fire Department facilities at the Airport have direct access to the airfield to meet FAA-required emergency response times on the airfield. In addition, the Marine Emergency Response Facility #4 (Building 1030) is located in the East Field (see Figure 2-5). These facilities provide emergency rescue and firefighting services and are staffed by the San Francisco Fire Department – Airport Division. Airport police services are provided by the San Francisco Police Department – Airport Bureau in accordance with Transportation Security Administration regulations.

Field observations conducted in June 2024 did not identify any emergency vehicles traveling on the study roadway segments or conditions on transportation study area roadways that would impede emergency service providers (e.g., physical barriers that could restrict emergency vehicle access, inadequate turning radii at intersections).

Passenger and Freight Loading Conditions

Passenger Loading

Terminal curbsides are for active passenger pickup and drop-off only. Both the arrivals (lower) and departures (upper) levels of the terminals have inner (terminal-side) and outer (garage-side) curbside for passenger loading/unloading. In addition, courtyards at all four terminals are used by drivers of vehicles that pick up pre-arranged passengers (e.g., limos, shared-ride vans, charter buses). At the ITB, SamTrans buses also pick up and drop off passengers. Drivers waiting to meet arriving passengers can wait in the Cell Phone Waiting Lot until their party is ready to be picked up. The Airport also provides a *kiss-and-fly area*[106] located

[104] Go>SFO Shuttle, https://www.sfoconnect.com/gosfo-shuttle, accessed October 19, 2024.
[105] As of March 2025, the SFO3 Mission-Balboa Nights and the SFO4 Oakland Nights shuttles have not begun service yet. Service on the SFO4 Oakland Nights shuttle is scheduled to start on April 7, 2025, while service on the SFO3 Mission-Balboa shuttle is scheduled to start on April 21, 2025.
[106] A *kiss-and-fly area* at an airport is a designated drop-off zone, usually outside of the departure terminal, where passengers can be dropped off without the need to park the car.

at the Rental Car Center on North McDonnell Road and West Area Drive. After being dropped off, passengers can board the Rental Car Center AirTrain Station to access terminals.

TNC vehicle drop-offs are conducted curbside on the departures level; however, passengers can also request arrivals-level or garage drop-offs to avoid traffic on the departures level during peak times. TNC vehicle pick-ups are conducted on level 5 of the Central Parking Garage (Building 195), although depending on the type of Lyft/Uber ride, pickups could also occur at the terminal curbsides. ITB TNC vehicle pickups and drop-offs occur at the departures/ticketing level center island.

Freight Loading

Deliveries for Airport terminal concessions (e.g., retail stores, food, restaurants) are scheduled and require security checks. Loading docks with multiple bays are located within secure areas on the first level of terminals and/or boarding areas (i.e., within the courtyards) and are separated from the main passenger arrival and departure areas. The loading docks typically operate 24 hours a day and access is controlled by San Francisco Police Service Aid at all times. Concession product deliveries are only allowed through the concession loading docks within the designated time for each approved delivery vendor and are required to undergo security inspection by the San Francisco Police Service Aid and security screening at security checkpoints designated for concession deliveries, in accordance with Rule 7.4(B)(2) of the Airport Rules & Regulations.[107]

Parking Conditions

The current vehicle parking supply at the Airport is about 28,600 spaces, including 17,650 short- and long-term public parking spaces and 10,970 parking spaces for Airport employees/tenants. Short-term and long-term public parking spaces are located within the Central Parking Garage (Building 195), Parking Garages A (Building 95) and G (Building 495; see Figure 2-2, p. 2-6), Long-Term Parking Garages #1 and #2, and surface parking Lots D and DD. Occupancy at public parking facilities varies throughout the year and is typically the highest during the June through August summer travel season. For example, occupancies of on-Airport public parking garages were, on average, about 60 percent in January 2024, 75 percent in February, and 80 to 85 percent in May, June, and July of 2024 (see Appendix E.1).[108]

Employee/tenant parking spaces are provided in short-term garages, the West Field Employee Parking Garage (Building 638; see Figure 2-3, p. 2-8), cargo buildings, and within various surface parking lots throughout the Airport. On a daily basis throughout the year, the employee parking supply is typically close to fully occupied (see Appendix E.2).

In addition to the on-Airport parking facilities, there were approximately 6,300 parking spaces in privately operated, off-Airport parking facilities as of 2023. The largest off-Airport parking facilities include the Park ’N Fly and Park SFO garages in South San Francisco, Aloft SFO in Millbrae, and the Anza Parking SFO, Crowne Plaza SFO Parking, and Burlingame Airport Parking lots in Burlingame. Shuttles into and out of the Airport are offered by these facilities.

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[107] San Francisco International Airport Rules and Regulations, January 2024, p. 68, https://www.flysfo.com/about/airport-operations/policies-regulations/rules-and-regulations, accessed October 15, 2024.
[108] During the winter holiday season, the Airport experiences exceedingly high parking demand.

3.A.3 2045 Future Baseline without RADP Conditions

Implementation of the RADP would not induce passenger demand (i.e., induce the public to choose to fly if and/or where they otherwise would not), nor would the RADP increase the capacity of the airfield, change the configuration of the existing runways, change the number of aircraft operations or aircraft types operating at the Airport (including cargo, private jets, and helicopters), or change the volume of annual passengers that choose to fly into and out of SFO (see Appendix C, Airport Facilities to Accommodate Aviation Demand). Therefore, the transportation and circulation impact analysis uses a 2045 future baseline for analysis of operational impacts for subsequent projects that could occur with implementation of the RADP. See Chapter 3, Analysis Assumptions, p. 3-4.

The 2045 future baseline without RADP transportation conditions were developed using a two-step process that relies on the City/County Association of Governments of San Mateo (C/CAG) travel demand model to identify background travel demand associated with changes in regional housing units and employment consistent with projections included in Plan Bay Area 2050,[109] and an overlay of travel demand associated with projected increases in SFO passengers and employment that would occur regardless of implementation of the RADP. The methodology for developing the 2045 future baseline without RADP is discussed under "Methodology and Thresholds of Significance," p. 3.A-23.

The following presents some of the key assumptions used in the transportation impact analysis for the RADP EIR. These assumptions are related to the SFO employment and passengers used in determining the 2045 future baseline without RADP conditions, the transportation network projects that were assumed, and presents the travel demand for the 2045 future baseline without RADP conditions. A discussion of the 2045 future baseline without RADP conditions relevant to each transportation topic analyzed follows Table 3.A-6, p. 3.A-17.

Land Use Assumptions for 2045 Future Baseline without RADP Conditions

Travel demand forecasts associated with growth in housing units and jobs in the region was estimated based on outputs from the C/CAG travel demand model. The C/CAG travel model uses a future cumulative year of 2040; however, land use inputs were revised to reflect projected housing and job growth consistent with Plan Bay Area 2050. The 2045 future baseline without RADP traffic volumes was calculated by interpolating the projected growth presented in Plan Bay Area 2050 Final Blueprint Growth Patterns between 2015 and 2050 model years.[110] The projected land use growth between 2019 and 2045 in the C/CAG travel demand model includes the cumulative development projects identified in Table 3-2, p. 3-8.

Implementation of the RADP would facilitate the development of terminal and *non-movement areas*[111] of the airfield, as well as landside facilities to accommodate long-term passenger activity levels at the Airport forecast to reach approximately 506,000 annual aircraft operations, which is the estimated annual practical capacity of the existing runways regardless of whether the RADP is implemented. Passenger aircraft operations represent the largest portion of the 506,000 annual aircraft operations, which are forecast to accommodate approximately 71.1 million annual passengers considering the forecast passenger aircraft

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[109] Metropolitan Transportation Commission, *Plan Bay Area 2050*, https://planbayarea.org, accessed August 16, 2024.
[110] Metropolitan Transportation Commission and Association of Bay Area Governments, *Plan Bay Area 2050 Final Blueprint Growth Patterns*, January 2021, https://planbayarea.org/sites/default/files/FinalBlueprintRelease_December2020_GrowthPattern_Jan2021Update.pdf, accessed August 16, 2024.
[111] The *non-movement area* of an airport is not controlled by FAA air traffic control and includes ramps or aprons, a defined area for aircraft parking, loading and unloading passengers or cargo, refueling, or maintenance. The *movement area* of an airport is controlled by FAA air traffic control and includes runways, taxiways, and other areas of an airport that are used for taxiing, takeoff, and landing of aircraft.

fleet mix (see Appendix C, Airport Facilities to Accommodate Aviation Demand).[112] These enplanements and aircraft operations are forecast to grow due to increased demand for air travel, regardless of implementation of the RADP. As such, they are included in the 2045 future baseline without RADP conditions. In addition, air cargo operations are forecast to increase from 417,100 annual cargo tonnage in 2018 to a maximum of 536,700 annual cargo tonnage, regardless of implementation of the RADP.[113]

As shown in Table 3-1, p. 3-6, background employment growth at SFO is projected to increase from 42,800 employees in 2019 to 52,200 employees under the 2045 future baseline without RADP conditions regardless of implementation of the RADP.

Transportation Network Assumptions for 2045 Future Baseline without RADP Conditions

Several planned transportation projects would be completed between the 2019 existing conditions and the 2045 future baseline without RADP conditions. The San Mateo County Transportation Authority and C/CAG propose to add a *managed lane*[114] in each direction of U.S. 101 between the U.S. 101/I-380 interchange in South San Francisco and the San Mateo/San Francisco County Line.[115] A range of alternatives are currently being considered, including the addition of a new managed lane or conversion of an existing lane into a managed lane. The current project schedule anticipates construction on the managed lanes to start at the end of 2028. The managed lanes would connect with the new express lanes on the segment of U.S. 101 between I-380 and Whipple Avenue that opened for tolling in 2023.

High-speed rail planned for California will eventually encompass more than 800 miles of rail and up to 24 stations.[116] The project is split into two phases, with phase 1 connecting San Francisco/Merced with Los Angeles/Anaheim. High-speed rail service along the San Francisco to San Jose section will be a blended service with Caltrain and high-speed rail service sharing tracks.[117] The Millbrae-SFO Caltrain station will be modified to accommodate high-speed rail service; will serve San Mateo County; and will provide connections to BART, Caltrain, and SFO. The California High Speed Rail Authority anticipates completing testing of the electrified high-speed rail system in 2028 and plans to put electrified high-speed trains in service by 2030.[118]

Between the 2019 existing conditions and 2045 future baseline without RADP conditions, several current and planned projects at SFO would be completed (see Table 3-2, p. 3-8); however, none of the projects would change the current transportation network serving the Airport. These projects include infrastructure projects and consolidation and upgrades of existing facilities. Other cumulative projects located outside SFO and listed in Table 3-2 that are also anticipated to be constructed by 2045 do not include transportation network changes within the transportation study area.

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[112] Aviation activity forecasts are based on national and regional economic modeling and regression analysis and aviation trends and incorporate FAA-required factors for public-use airports, including airline aircraft fleet mix considerations. Forecasts are initially prepared as unconstrained, assuming no physical or facility constraints would limit increases in aviation activity. At SFO, the practical capacity of the runways constrains the overall capacity of the airport and there is no feasible option for adding runway capacity at SFO. Therefore, the forecast used for the RADP represents a constrained condition reflecting the practical capacity of the runways. The associated forecast of annual passengers was based on an assessment of future airline fleet mix, considering the number of seats per aircraft and the estimated percentage of occupied seats.
[113] San Francisco International Airport, Airport Development Plan, December 2016, Appendix C, p. 1.
[114] Unlike a mixed-use travel lane where any vehicle can use the lane at any time, a *managed lane* has a set of rules about who can use the lane and when. Examples of managed lanes include high-occupancy vehicle (HOV) lanes (i.e., carpool lanes) and high-occupancy toll (HOT) lanes (i.e., express lanes).
[115] San Mateo 101 Managed Lanes Project North of I-380, https://d4vpm3.wixsite.com/san-mateo101, accessed August 6, 2024.
[116] High-Speed Rail in California – Project Sections, https://hsr.ca.gov/high-speed-rail-in-california/project-sections/, accessed August 8, 2024.
[117] High-Speed Rail in California – San Francisco to San Jose Project Section, https://hsr.ca.gov/high-speed-rail-in-california/project-sections/san-francisco-to-san-jose/, accessed August 5, 2024.
[118] High-Speed Rail in California, https://hsr.ca.gov/high-speed-rail-in-california/statewide/, accessed August 5, 2024.

Travel Demand at SFO for 2045 Future Baseline without RADP Condition

The following discussion summarizes the changes in travel demand at SFO between the 2019 existing conditions and the 2045 future baseline without RADP conditions. **Table 3.A-5** summarizes the number of SFO person and vehicle trips on a daily basis and during the weekday a.m. and p.m. peak hours in the 2019 existing conditions and for the 2045 future baseline without RADP conditions, and summarizes the expected change in the number of person trips and vehicle trips. As shown in Table 3.A-5, on a daily basis, between the 2019 existing conditions and the 2045 future baseline without RADP conditions, total person trips are projected to increase by approximately 31 percent and total vehicle trips are projected to increase by about 34 percent. The greatest percentage increase in person trips by way of travel is projected to be by auto, which includes personal vehicles, taxis/TNCs, and car rentals, which constitutes a 36 percent increase over the number of auto trips under the 2019 existing conditions. Lower percentage increases in-person trips and vehicle trips are projected during the weekday a.m. and p.m. peak hours than for the daily conditions.

Regional and Local Roadway Conditions

The C/CAG model outputs and the vehicle trips associated with projected increases in passengers and employees shown in Table 3.A-5 were used to determine anticipated changes in traffic volumes at the study roadway segments under the 2045 future baseline without RADP conditions. **Table 3.A-6**, p. 3.A-17, presents the changes in traffic volumes at the study roadway segments between the 2019 existing conditions for weekday a.m. and p.m. peak hours.

The greatest increase in weekday a.m. and p.m. peak hour volumes would occur on U.S. 101, and this increase reflects regional growth in housing units and employment regardless of implementation of the RADP. On local roadways, the greatest weekday a.m. and p.m. peak hour traffic volume increases would occur on roadway segments providing access to SFO parking garages, parking lots, and rental car facilities such as San Bruno Avenue and South Airport Boulevard. Peak hour traffic volume increases on Millbrae Avenue west of U.S. 101 are projected to increase due to development projects located west of U.S. 101.

Walking Conditions

Between the 2019 existing conditions and the 2045 future baseline without RADP conditions, the number of trips by walking would minimally increase (see Table 3.A-5, where walk trips are a portion of “other” way of travel) and would be primarily associated with the projected increase in Airport employee background growth. Because none of the cumulative projects would change pedestrian facilities on roadways within the transportation study area, the 2045 future baseline without RADP conditions for people walking would remain similar to the 2019 existing conditions.

Bicycling Conditions

Between the 2019 existing conditions and the 2045 future baseline without RADP conditions, the number of trips by bicycling would minimally increase on transportation area roadways (see Table 3.A-5, where trips by bicycling are a portion of “other” way of travel). The increase in bicycle trips would be primarily related to the projected increase in Airport employee background growth. Because none of the cumulative projects would change bicycle facilities or change the bicycle network within the transportation study area, the 2045 future baseline without RADP conditions for people bicycling would remain similar to the 2019 existing conditions.

Table 3.A-5 Change in SFO Weekday Daily and A.M. and P.M. Peak Hour Travel Demand between the 2019 Existing Conditions and the 2045 Future Baseline without RADP Conditions

Analysis Period/Analysis Scenario	Person Trips by Way of Travel: Auto [a]	Transit [b]	Other [c]	Total	Vehicle Trips [d]
Weekday Daily					
2019 Conditions	163,160	30,304	1,214	**194,678**	137,364
2045 Future Baseline without RADP Conditions	221,560	32,442	1,480	**255,482**	183,786
CHANGE FROM 2019 CONDITIONS	**58,400**	**2,138**	**266**	**60,804**	**46,422**
PERCENT CHANGE FROM 2019	**36%**	**7%**	**22%**	**31%**	**34%**
Weekday A.M. Peak Hour					
2019 Conditions	14,084	2,589	159	**16,832**	12,033
2045 Future Baseline without RADP Conditions	18,531	2,887	193	**21,611**	15,654
CHANGE FROM 2019 CONDITIONS	**4,447**	**298**	**34**	**4,779**	**3,621**
PERCENT CHANGE FROM 2019	**32%**	**12%**	**21%**	**28%**	**30%**
Weekday P.M. Peak Hour					
2019 Conditions	10,167	1,880	91	**12,138**	8,608
2045 Future Baseline without RADP Conditions	13,641	2,045	111	**15,797**	11,398
CHANGE FROM 2019 CONDITIONS	**3,474**	**165**	**20**	**3,659**	**2,790**
PERCENT CHANGE FROM 2019	**34%**	**9%**	**22%**	**30%**	**32%**

SOURCE: Fehr & Peers/LCW Consulting, 2025 (see Appendix E.2).

NOTES:

a. Auto includes travel by private vehicle for drop-off/pick-up or drive-and-park, carpool/vanpools, rental car, and for-hire vehicles (e.g., TNCs, taxis, limousines, and shuttle vans) by SFO passengers and employees. Drive trips could include autonomous vehicles (AV) traveling into and out of SFO in the future. Autonomous for-hire vehicles operate similar to TNCs, except without a driver, and would replace travel by other for-hire vehicles rather than result in a shift from travel by private vehicle or transit. Autonomous privately owned vehicles, which are not currently on the market, would operate similarly to private drop-offs/pick-ups. The San Francisco and San Mateo County transportation authorities (SFCTA and SMCTA, respectively) have both recently prepared AV strategic plans, which outline additional information on AV deployment and the strategies these counties are taking to address the potential, but unknown, long-term effects related to AV deployment. SMCTA's AV strategy is available here: https://www.smcta.com/media/34400, accessed January 28, 2025. SFCTA's AV strategic plan is available here: https://www.sfcta.org/sites/default/files/2022-12/SFCTA_SFTP-2050_STP-AV_2022-12-01.pdf, accessed January 28, 2025.
b. Transit includes trips by BART and SamTrans by SFO passengers and employees.
c. Other person trips by walking and bicycling by SFO employees.
d. Vehicle trips include auto, taxi/TNC as well as vehicle trips made by visitors, commercial cargo and delivery vehicles, buses, and taxis/ride hail vehicles without occupants.

Public Transit Conditions

Between the 2019 existing conditions and the 2045 future baseline without RADP conditions, the number of riders on public transit would increase by 298 riders during the weekday a.m. peak hour and 165 riders during the weekday p.m. peak hour (see Table 3.A-6), with the majority of the new riders traveling on BART (see Appendix E.2). No changes to the local and regional public transit service serving the Airport are anticipated to occur between the 2019 existing conditions and the 2045 future baseline without RADP conditions. As described above, the California High Speed Rail service will stop at the Millbrae-SFO Caltrain

Station, and connections between the station and the Airport would be similar to the 2019 existing conditions (e.g., BART, SamTrans routes 292 and 397). Implementation of California High Speed Rail is not anticipated to substantially change local and regional public transit operations in the transportation study area. Thus, under the 2045 future baseline without RADP conditions, public transit operations would remain similar to the 2019 existing conditions.

Table 3.A-6 Change in SFO Weekday A.M. and P.M. Peak Hour Two-Way Volumes between the 2019 Existing Conditions and the 2045 Future Baseline without RADP Conditions

Analysis Period/Roadway Segment	2019	2045 without RADP	Change between 2019 and 2045 without RADP	% Change
Weekday A.M. Peak Hour				
U.S. 101 North of North Access Road	12,300	17,080	**4,780**	**39%**
U.S. 101 between North Access Rd and Millbrae Ave	11,100	15,010	**3,910**	**35%**
U.S. 101 South of Millbrae Avenue	14,600	18,740	**4,140**	**28%**
Millbrae Avenue east of U.S. 101	1,690	1,760	**70**	**4%**
Millbrae Avenue west of U.S. 101	3,490	4,330	**840**	**24%**
North Access Rd west of North Field Road	580	860	**280**	**48%**
San Bruno Avenue east of U.S. 101	1,150	1,980	**830**	**72%**
South Airport Blvd between North Access and SBA	1,010	1,690	**680**	**67%**
North McDonnell Road south of San Bruno Avenue	1,140	1,380	**240**	**21%**
South McDonnell Road	510	580	**70**	**14%**
Weekday P.M. Peak Hour				
U.S. 101 North of North Access Road	11,800	17,990	**6,190**	**52%**
U.S. 101 between North Access Rd and Millbrae Ave	11,100	16,110	**5,010**	**45%**
U.S. 101 South of Millbrae Avenue	13,900	19,550	**5,650**	**41%**
Millbrae Avenue east of U.S. 101	2,030	2,210	**180**	**9%**
Millbrae Avenue west of U.S. 101	3,860	4,560	**700**	**18%**
North Access Rd west of North Field Road	400	630	**230**	**58%**
San Bruno Avenue east of U.S. 101	1,330	2,540	**1,210**	**91%**
South Airport Blvd between North Access and SBA	1,170	2,060	**890**	**76%**
North McDonnell Road south of San Bruno Avenue	1,340	1,610	**270**	**20%**
South McDonnell Road	840	920	**80**	**10%**

SOURCE: Fehr & Peers/LCW Consulting, 2025 (see Appendix E.2).

Emergency Access Conditions

Between the 2019 existing conditions and the 2045 future baseline without RADP conditions, traffic volumes on transportation study area local roadways would increase, with the greatest increases occurring on Millbrae and San Bruno avenues (which provide access to and from U.S. 101) and South Airport Boulevard (which provides access to Airport parking facilities and serves as a through traffic route for north-south travel for traffic without origins or destinations on South Airport Boulevard between North Access Road and San Bruno Avenue). The increase in vehicles on these roadways would generally increase vehicle delays as compared to the 2019 existing conditions. However, roadways with the greatest projected increase in traffic volumes have multiple travel lanes each way, which allows for drivers to yield to emergency vehicles. In addition, emergency service providers may adjust routes to respond to incidents. None of the cumulative projects would change emergency vehicle travel within the transportation study area. Within the Airport, Emergency Rescue Fire Fighting Facility #1 (Building 650; see Figure 2-3, p. 2-8) is planned to be demolished and reconstructed and therefore would not change emergency access at the Airport.[119] Overall, under the 2045 future baseline without RADP conditions emergency access in the vicinity of the Airport would remain similar to the 2019 existing conditions.

Passenger and Freight Loading Conditions

Between the 2019 existing conditions and the 2045 future baseline without RADP conditions, the increase in passenger trips by auto to the Airport would increase, resulting in an increase in passenger loading/unloading demand at the terminal curbside loading facilities. The increase in passenger loading/unloading demand would result in increased congestion at the curbside during peak drop-off and pick-up periods. As part of standard operating procedures, SFO would update its curbside management program as appropriate to respond to changes in passenger loading/unloading facilities by private vehicles and ground transportation at terminal curbsides and within the Central Parking Garage.

Concessions (i.e., freight) loading demand at the terminals would also increase due to the projected increase in passengers. This demand would be accommodated onsite within the existing designated loading facilities at the terminals. The West Field Cargo Redevelopment project (cumulative project #3) would provide onsite freight loading facilities to accommodate existing and/or new freight loading demand. Overall, under the 2045 future baseline without RADP conditions, loading operations at the Airport would remain similar to the 2019 existing conditions.

Parking Conditions

Between 2019 existing conditions and the 2045 future baseline without RADP conditions, implementation of current and future projects at SFO would result in a net addition of 1,105 employee parking spaces as part of the SFO Consolidated Administrative Campus project (cumulative project #2) and a net reduction of 527 employee parking spaces as part of the West Field Cargo Redevelopment project (cumulative project #3), for a net increase of 580 parking spaces. The total passenger and employee/tenant parking supply would increase from 28,620 (i.e., 17,650 public parking spaces and 10,970 employee/tenant spaces) to 29,200 spaces (i.e., 17,650 public parking spaces and 11,550 employee/tenant parking spaces). The projected increase in passengers and employees between the 2019 existing conditions and the 2045 future baseline without RADP conditions would result in a net increase in vehicular parking demand for 5,050 spaces, for a

[119] Building 650, Emergency Rescue Fire Fighting Facility #1, will be demolished and reconstructed under a separate project that will undergo environmental review. An application has not yet been filed for this project; as such, it is not considered a cumulative project.

total parking demand of 32,260 spaces at SFO parking facilities under the 2045 future baseline without RADP conditions. Under the 2045 future baseline without RADP conditions, parking demand at off-Airport parking facilities catering to SFO passengers is also expected to increase.

Under the 2045 future baseline without RADP conditions, there would be a *parking deficit*[120] of about 3,060 spaces at SFO parking facilities (i.e., a parking supply of 29,200 spaces compared to a parking demand for 32,260 spaces). When the practical operational capacity of the public parking garages (i.e., about 90 percent) is taken into account, the parking deficit would increase to about 4,800 spaces.[121]

3.A.4 Regulatory Framework

State Regulations

CEQA Section 21099(B)(1) (Senate Bill 743)

CEQA section 21099(b)(1) requires the Office of Planning and Research to develop revisions to the CEQA Guidelines that establish criteria for determining the significance of the transportation impacts of projects that "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." CEQA section 21099(b)(2) states that, upon certification of the revised guidelines for determining transportation impacts, pursuant to section 21099(b)(1), automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment under CEQA.

After a five-year public process, the California Natural Resources Agency amended the CEQA Guidelines in 2018 and added section 15064.3, Determining the Significance of Transportation Impacts, and amended Appendix G, Environmental Checklist Form, to remove automobile delay as a measure to determine a project's significance on the environment and to instead require (in most circumstances) analysis of a project's impact on VMT.

Caltrans Responsibilities

California Department of Transportation (Caltrans) manages interregional transportation, including management and construction of the California highway system. In addition, Caltrans is responsible for permitting and regulating the use of state roadways.

Caltrans construction practices require temporary traffic control planning "during any time the normal function of a roadway is suspended," which is presented in the California Manual on Uniform Traffic Control Devices.[122] Caltrans also requires that permits be obtained for transportation of oversized loads, transportation of certain materials, and for construction-related traffic disturbance and encroachment permits for construction activities that occur within the state highway right-of-way. As appropriate, SFO or its contractors would acquire permits from Caltrans to allow oversized vehicles (by weight, height, length, or width) needed to transfer certain construction equipment (e.g., cranes) to travel to the RADP project sites via

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[120] *Parking deficit* reflects conditions when the demand for parking spaces cannot be accommodated within the supply.

[121] Public parking garage occupancies of about 90 percent are usually considered the highest acceptable target since someone looking for a space will not find an empty one easily. This practical capacity reflects the difficulty drivers have in locating the last available space in a large facility, accounts for vehicles circulating in a parking structure, and allows for improperly parked vehicles and other inefficiencies.

[122] Caltrans, *California Manual on Uniform Traffic Control Devices, 2014 Edition*, Revision 8 (January 11, 2024), https://dot.ca.gov/programs/safety-programs/camutcd.

state highways. Construction within the state highway right-of-way is not anticipated for any subsequent projects that could occur with implementation of the RADP.

Regional Regulations

Plan Bay Area 2050

Plan Bay Area 2050 is a state-mandated, integrated long-range transportation and land use plan. As required by Senate Bill 375, all metropolitan regions in California must complete a Sustainable Communities Strategy as part of a Regional Transportation Plan. This strategy integrates transportation and housing to meet greenhouse gas reduction targets set by the California Air Resources Board. The Plan meets those requirements. In addition, the Plan sets a roadmap for future transportation investments and identifies what it would take to accommodate expected growth. The Plan neither funds specific transportation projects nor changes local land use policies.

In the bay area, the Metropolitan Transportation Commission and the Association of Bay Area Governments adopted the latest Plan in 2021. To meet the greenhouse gas reduction targets, the Plan identifies priority development areas.[123] The agencies estimate approximately 72 percent of the household growth and 48 percent of the job growth in the bay area will occur in priority development areas between 2015 and 2050.

San Francisco Bay Trail Plan

The Association of Bay Area Governments administers the San Francisco Bay Trail Plan. The Bay Trail is a multi-purpose recreational trail that, when complete, would encircle San Francisco Bay and San Pablo Bay with a continuous 500-mile network of bicycling and hiking trails. To date, more than 350 miles of the alignment have been completed. The 2005 Gap Analysis Study, prepared by the association for the entire Bay Trail area, attempted to identify the remaining gaps in the Bay Trail system; classify the gaps by phase, county, and benefit ranking; develop cost estimates for individual gap completion; identify strategies and actions to overcome gaps; and present an overall cost and timeframe for completion of the Bay Trail system.

Local Regulations

San Francisco General Plan

The transportation element of the San Francisco General Plan is composed of objectives and policies that relate to the nine aspects of the citywide transportation system: General, Regional Transportation, Congestion Management, Vehicle Circulation, Transit, Pedestrian, Bicycles, Citywide Parking, and Goods Movement. The transportation element contains the following objective and policies that are directly relevant to consideration of the RADP.

> **Objective 5:** Support and enhance the role of San Francisco as a major destination and departure point for travelers making interstate, national, and international trips.
>
> > *Policy 5.1:* Support and accommodate the expansion of San Francisco International Airport, while balancing this expansion with the protection of the quality of life in the communities that surround the Airport.

[123] *Priority development areas* are places near public transit that are planned for new homes, jobs, and community amenities.

Policy 5.2: Develop direct transit connections from downtown to the Airport that will maximize convenience and minimize confusion for airport patrons.

Policy 5.3: Encourage the development of high-speed water transit system from the Airport to the Ferry Building and to Oakland Airport to improve the efficiency and flexibility of the Airport's role in accommodating large numbers of domestic and international air passengers.

Policy 5.4: Encourage the use of public transportation and improve its services between the Airport and all Bay Area communities, for airport employees as well as air passengers.

San Francisco Transit First Policy

The San Francisco Transit First Policy is a set of principles that emphasize the City's commitment that the use of public rights-of-way by pedestrians, bicyclists, and public transit be given priority over the private automobile. These principles are embodied in the policies and objectives of the Transportation Element of the San Francisco General Plan. All City boards, commissions, and departments are required by law to implement the City's Transit First Policy principles in conducting the City's affairs.

Airport Transit First Policy

In 1973, the City and County of San Francisco adopted a Transit First Policy, and in March 1996, by Resolution No. 96-0067, the Airport Commission affirmed that "Transit First" shall be the official policy of the Airport, giving priority access to the Airport's transportation facilities and systems, including terminal complex, Ground Transportation Center, roadways, and curbside loading zones, to transit and high-occupancy vehicles over all other uses, except emergency vehicles.

SFO Lower Emissions via Sustainable Solutions Transportation Policy

In 1996, the Airport Commission adopted a Transit First Policy to encourage high-occupancy vehicle use to minimize traffic congestion at the Airport and to coordinate with BART to develop a transit station at the Airport. The policy gave priority access to the Airport's transportation facilities and systems, including the terminal complex, roadways, and curbside loading zones to transit and high-occupancy vehicles over all other vehicles, except emergency vehicles. This policy was superseded in 2021 with the Airport Commission's adoption of the SFO Lower Emissions via Sustainable Solutions Transportation Policy (SFO LESS Policy) to reflect changes to transit, mobility, passenger demand, sustainability, and other initiatives since 1996. The SFO LESS Policy establishes parameters that would support and promote transit to, from, and within the Airport by employees and air passengers alike, while considering the unique Airport context, and includes consideration of ground transportation and curbside operations policies, electrification of Airport-owned and -operated vehicles, and accessibility of transit.

San Francisco International Airport Rules and Regulations

San Francisco International Airport Rules and Regulations govern the general conduct of the public, tenants, employees, and commercial users of the Airport, and include regulations related to operation of motor vehicles, airside operations, fire and safety, and Airport security. Rules and regulations related to operation of motor vehicles include operation of vehicles on terminal roadways and compliance with curb markings, signage, and direction from traffic control personnel to maintain a safe, secure, and efficient use of curb space in front of the terminals.

3.A.5 Impacts and Mitigation Measures

Significance Criteria

This section analyzes impacts related to transportation and circulation associated with implementation of the RADP. The following criteria were used to determine whether construction and operation of subsequent projects implemented under the RADP would result in a significant impact related to transportation and circulation. Implementation of the RADP would result in a significant effect related to transportation and circulation if it would result in:

- Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities;
- Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b);
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses; or
- Result in inadequate emergency access.

Construction

Construction of any subsequent RADP project would have a significant effect on the environment if it would require a substantially extended duration or intense activity, the effects of which would create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations or interfere with emergency access or accessibility for people walking or bicycling or substantially delay public transit.

Operation

The operational impact analysis addresses the following six significance criteria. Any subsequent RADP project would have a significant effect if it would:

- Create potentially hazardous conditions for people walking, bicycling, or driving or public transit operations
- Interfere with accessibility of people walking or bicycling to and from the project site, and adjoining areas, or result in inadequate emergency access
- Substantially delay public transit
- Cause substantial additional VMT or substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network
- Result in a loading deficit and the secondary effects would create potentially hazardous conditions for people walking, bicycling, or driving or substantially delay public transit
- Result in a parking deficit and the secondary effects would create potentially hazardous conditions for people walking, bicycling, or driving, or interfere with accessibility for people walking or bicycling or inadequate access for emergency vehicles, or substantially delay public transit

Approach to Analysis

The following discussion summarizes the methodology for analyzing transportation and circulation impacts and discusses the information considered in developing the travel forecasts used in the analysis. The impacts of implementation of the RADP on the surrounding transportation network were analyzed using the San Francisco Planning Department's Transportation Impact Analysis Guidelines for Environmental review (SF transportation guidelines)[124] and Planning Commission resolution 19579, which provide direction for analyzing transportation conditions and identifying the transportation impacts of a project. Note that because the RADP is a plan, its approval would not result in direct physical changes in the environment; and because the RADP does not propose any project-level approvals, additional actions and environmental review would be required to implement each subsequent RADP project.

Methodology and Thresholds of Significance

Analysis Periods

The weekday a.m. and p.m. peak periods represent the periods when most travel occurs on roadways near the Airport. The a.m. peak hour is defined as the 60-minute period with the highest traffic volume between 7 a.m. and 9 a.m., while the p.m. peak hour is defined as the 60-minute period with the highest traffic volume between 4 p.m. and 7 p.m.[125] The qualitative analysis of VMT impacts related to implementation of the RADP is for average daily conditions.

Construction-related transportation impacts associated with implementation of the RADP (including cumulative) are analyzed using the 2019 existing conditions, while operational impacts associated with implementation of the RADP (including cumulative) are analyzed using the 2045 future baseline conditions. The 2045 future baseline without RADP conditions includes the projected future regional land use, population, and employment growth, as well as the cumulative projects identified in Table 3-2, p. 3-8, and future passenger, cargo, and employment background growth at the Airport. The 2045 future baseline with RADP conditions includes the subsequent RADP projects. As such, the operational analysis is based on comparing the 2045 future baseline without RADP conditions to the 2045 future baseline with RADP conditions to present those impacts attributable only to subsequent RADP projects. The 2045 future baseline with RADP conditions also represents the cumulative condition.

Travel Demand Methodology and Results

Travel demand refers to new person trips[126] by additional residents, employees and visitors using the various ways of travel (e.g., by automobile, transit, walking, bicycling) that would be generated by expected future changes identified for the analysis scenarios. The 2045 future baseline without RADP and 2045 future baseline with RADP transportation conditions were developed using a two-step process based on the C/CAG travel demand model to identify background travel demand associated with regional housing units and

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[124] San Francisco Planning Department, *Transportation Impact Analysis Guidelines*, October 2019, https://sfplanning.org/project/transportation-impact-analysis-guidelines-environmental-review-update, accessed August 15, 2024.
[125] Traffic destined to and from the Airport (i.e., on ramps connecting U.S. 101 with on-airport roadways) typically peaks on Fridays during the midday (12 p.m. to 1 p.m.), while traffic volumes along U.S. 101 adjacent to the Airport peaks during the a.m. (7 a.m. to 9 a.m.) and p.m. (4 p.m. to 7 p.m.) peak periods. Traffic volumes on U.S. 101 are approximately 10 percent higher during the weekday a.m. and p.m. peaks compared to the Friday midday peak. Therefore, the weekday a.m. and p.m. peak periods represent the greatest amount of traffic on the adjacent roadway network.
[126] A *person trip* is a trip made by one person by any means of transportation (auto, transit, bicycling, walking, etc.).

employment, and an overlay of travel demand associated with projected increases in SFO passengers and employment (see Appendix E.2).

The C/CAG travel demand model is a trip-based travel demand forecasting model that is updated regularly to represent existing and future trip generation and travel characteristics in San Mateo County and the remaining eight bay area counties and commute sheds. The C/CAG travel model is based on the Metropolitan Transportation Commission (MTC) trip-based regional travel model. The travel model predicts person-travel based on assumptions of growth in population, housing units, and employment, and provides forecasts of vehicular traffic on regional freeways, major arterials, and within the transportation study area and local roadways, considering the available roadway capacity, origin-destination demand, and congested travel speeds.

The following summarizes the methodology and results of the travel demand calculations associated with projected growth in passengers and employees, cargo and deliveries. The steps in the analysis include the following:

Step 1: Trip Generation.

SFO Passengers and Employees. Travel demand associated with the projected growth in passengers and employees was estimated for the following conditions:

- The 2045 future baseline without RADP conditions include an increase in total daily passengers from 157,482 in 2019 to 215,377 in 2045.[127] The total daily passengers reflect peak month average day passengers, which typically occurs in August. Approximately 77 percent of the growth of the approximately 57,895 daily passengers would be expected to begin or end their air travel at SFO and would travel to origins or destinations outside of the Airport, while 23 percent would be passengers transferring between flights and who would not leave the Airport. Background employment growth between the 2019 existing conditions and the 2045 future baseline without RADP conditions is estimated at 9,400 employees.
- The 2045 future baseline with RADP condition adds an additional 2,700 employees associated with subsequent RADP projects to the 2045 future baseline without RADP conditions. Daily passenger travel would not change with implementation of the RADP; therefore, the total daily passengers under the 2045 future baseline without RADP conditions is the same as the total daily passengers under the 2045 future baseline with RADP conditions. Because the 2045 future baseline with RADP conditions also include the background regional growth (residential and employment), cumulative projects identified in Table 3-2, p. 3-8, and the growth in passengers and employees that would occur regardless of implementation of the RADP under the 2045 future baseline without RADP conditions, the 2045 future baseline with RADP conditions also represents the cumulative conditions.

Table 3.A-7 presents person trip generation for the peak average month during midweek conditions. As shown between 2019 and 2045, passenger person trips are estimated to grow by approximately 37 percent during daily and weekday a.m. and p.m. peak hour conditions. Employee person trips are estimated to grow by approximately 21 percent between 2019 and the 2045 future baseline without RADP conditions, and by approximately 5 percent between the 2045 future baseline without RADP and the 2045 future baseline with RADP conditions.

[127] The 215,377 total daily passengers under 2045 future baseline without RADP conditions used in the analysis was derived from the peak month total passengers of 6,676,687 passengers included in Appendix C of the SFO ADP, divided by 31 days (i.e., number of days in the peak month of August). The 215,377 total daily passengers also represents the estimated high case design day passengers included in Appendix C of the ADP.

Table 3.A-7 2019, 2045 Future Baseline without RADP, and 2045 Future Baseline with RADP Person Trip Generation – SFO Passengers and Employees

	Daily			AM Peak Hour					PM Peak Hour				
Scenario	No. of Passengers/ Employees	% Passengers with an O/D in SFO or % Employees during the Midweek	No. of Passengers with an O/D in SFO or No. of Employees during the Midweek	% In	% Out	Person Trips In	Person Trips Out	Total	% In	% Out	Person Trips In	Person Trips Out	Total
Passengers													
Existing (2019)	157,482	77%	121,918	6.7%	5.3%	4,096	3,219	**7,315**	4.6%	6.4%	2,816	3,889	**6,705**
2045 Future Baseline without RADP	215,377	77%	166,740	6.7%	5.3%	5,592	4,395	**9,987**	4.6%	6.4%	3,858	5,329	**9,187**
2045 Future Baseline with RADP	215,377	77%	166,740	6.7%	5.3%	5,592	4,395	**9,987**	4.6%	6.4%	3,858	5,329	**9,187**
PERCENT CHANGE BETWEEN EXISTING (2019) AND 2045 FUTURE BASELINE WITHOUT RADP	**37%**	**—**	**37%**	**—**	**—**	**37%**	**37%**	**37%**	**—**	**—**	**37%**	**37%**	**37%**
PERCENT CHANGE BETWEEN 2045 FUTURE BASELINE WITHOUT RADP AND 2045 FUTURE BASELINE WITH RADP	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**

Scenario	Daily			AM Peak Hour					PM Peak Hour				
	No. of Passengers/ Employees	% Passengers with an O/D in SFO or % Employees during the Midweek	No. of Passengers with an O/D in SFO or No. of Employees during the Midweek	% In	% Out	Person Trips In	Person Trips Out	Total	% In	% Out	Person Trips In	Person Trips Out	Total
Employees													
Existing (2019)	42,828	85%	36,680	20.7%	5.5%	7,593	2,017	**9,610**	2.9%	12.0%	1,064	4,402	**5,466**
2045 Future Baseline without RADP	52,200	85%	44,370	20.7%	5.5%	9,185	2,440	**11,625**	2.9%	12.0%	1,287	5,324	**6,611**
2045 Future Baseline with RADP	54,900	85%	46,665	20.7%	5.5%	9,657	2,567	**12,224**	2.9%	12.0%	1,353	5,599	**6,952**
PERCENT CHANGE BETWEEN EXISTING (2019) AND 2045 FUTURE BASELINE WITHOUT RADP	**21%**	**—**	**21%**	**—**	**—**	**21%**	**21%**	**21%**	**—**	**—**	**21%**	**21%**	**21%**
PERCENT CHANGE BETWEEN 2045 FUTURE BASELINE WITHOUT RADP AND 2045 FUTURE BASELINE WITH RADP	**5%**	**—**	**5%**	**—**	**—**	**5%**	**5%**	**5%**	**—**	**—**	**5%**	**5%**	**5%**

SOURCE: Fehr & Peers/LCW Consulting, 2025 (see Appendix E.2).

ABBREVIATION: — = no change

Cargo Trucks. The 2045 future baseline without RADP conditions also includes increases in the number of cargo trucks associated with the projected growth of annual cargo tonnage from 417,100 annual cargo tonnage in 2018 to a maximum of 536,700 annual cargo tonnage, regardless of implementation of the RADP.[128] The methodology used to estimate the number of daily and peak hour cargo truck trips is described in Section 6 of the travel demand memorandum in Appendix E.2. The cargo activity would generate about 21 daily trucks (42 truck trips) and about two trucks (four truck trips) during the a.m. and p.m. peak hours.

Delivery Trucks. The 2045 future baseline with RADP condition adds the additional delivery trucks associated with 12 of the 20 subsequent RADP projects that would generate deliveries of supplies or goods (e.g., supplies for food carts, restaurants and retail stores and supplies for operations and maintenance activities). The methodology used to estimate the number of daily and peak hour cargo truck trips is described in Section 7 of the travel demand memorandum in Appendix E.2.

The 12 subsequent RADP projects that would generate new or additional delivery trucks include: Boarding Area H (RADP Project #1), Boarding Area F Modernization (RADP Project #2), ITB Main Hall Expansion (RADP Project #3), ITB Boarding Areas A and G Improvements (RADP Project #4), Central Hub (RADP Project #6), CONRAC (RADP Project #9), CONRAC Quick Turn-Around Facility (RADP Project #10), Long-Term Parking Garage #3 (RADP Project #11), AirTrain Maintenance Yard (RADP Project #16), North Field Ground Support Equipment #1 (RADP Project #17), Aircraft Maintenance Hangar (RADP Project #18), East Field Ground Support Equipment #2 (RADP Project #19). These subsequent RADP projects would generate about 255 daily trucks (510 truck trips) and about 25 trucks (50 truck trips) during the a.m. and p.m. peak hours.

Step 2: Common Destinations. Common destinations, also known as trip distribution, refers to the estimated number of trips people would take between the Airport and another place in either the inbound to the Airport or outbound from the Airport direction. Common destinations used in the analysis include San Francisco, San Mateo, and Santa Clara counties, the East Bay (i.e., Alameda, Contra Costa and Solano counties), and the North Bay (i.e., Marin, Napa, and Sonoma counties). **Table 3.A-8** summarizes the trip distribution assumptions for the 2019 and 2045 conditions for SFO passengers and employees. The trip distribution for SFO passengers is based on information in the 2018 SFO Customer Survey Report that was adjusted for 2045 conditions by projected job growth in each county by 2045. The trip distribution for SFO employees was based on information in the 2017 SFO BART Ridership, Residence, and Mode Summary that was adjusted for 2045 conditions by projected Plan Bay Area housing growth in each county by 2045. See Section 4 of the travel demand memorandum in Appendix E.2 for additional details on trip distribution assumptions for SFO passengers and employees. As shown on Table 3.A-8, trip distribution patterns for passengers and employees are not projected to change substantially from 2019 to 2045 conditions.

Step 3: Ways People Travel. Ways people travel, also known as mode split or travel mode, refers to the estimated way or method people travel (e.g., driving, transit, bicycling). **Table 3.A-9** summarizes the assumptions related to ways of travel for SFO passengers and employees for the 2019 and 2045 conditions. See Section 5 of the travel demand memorandum in Appendix E.2 for additional details on ways of travel assumptions for SFO passengers and employees.

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[128] San Francisco International Airport, Draft Final e, December 2016, Appendix C, p. 1.

Table 3.A-8 2019 and 2045 Future Year Trip Distribution – SFO Passengers and Employees

Analysis Year	San Francisco	San Mateo	Santa Clara	East Bay	North Bay	Total
Air Passengers						
2019	46%	13%	10%	20%	11%	**100%**
2045	46%	13%	11%	20%	10%	**100%**
Employees						
2019	25%	40%	5%	28%	2%	**100%**
2045	25%	39%	6%	28%	2%	**100%**

SOURCE: Fehr & Peers/LCW Consulting, 2025 (see Appendix E.2).

Table 3.A-9 2019 and 2045 Future Year Ways of Travel – SFO Passengers and Employees

Analysis Year	Auto [a]	Transit – BART	Transit – Bus	Other [b]	Total
Passengers					
2019	84%	9%	7%	0%	**100%**
2045	88%	8%	4%	0%	**100%**
Employees					
2019	83%	13%	2%	2%	**100%**
2045	83%	13%	2%	2%	**100%**

SOURCE: Fehr & Peers/LCW Consulting, 2025 (see Appendix E.2).

NOTES:

a. Auto includes travel by private vehicle for drop-off/pick-up or drive-and-park, carpool/vanpools, rental car, and for-hire vehicles (e.g., TNCs, taxis, limousines, and shuttle vans). Drive trips could include autonomous vehicles (AV) traveling into and out of SFO in the future. Autonomous for-hire vehicles operate similar to TNCs, except without a driver, and would replace travel by other for-hire vehicles rather than result in a shift from travel by private vehicle or transit. Autonomous privately owned vehicles, which are not currently on the market, would operate similarly to private drop-offs/pick-ups.

b. Other includes bicycles, walking, or other ways of travel.

The ways of travel for SFO passengers for the 2045 future baseline without RADP conditions were developed by extending ways of travel trends from passenger surveys collected between 2011 to 2018 through to 2045. Extending ways of travel trends through 2045 yields a more conservative analysis, as the trend results in more passengers driving (i.e., as shown in Table 3.A-9, an increase in auto mode from 84 percent for the 2019 existing condition to 88 percent for the 2045 conditions). However, the percentage of passengers using transit would decrease compared to 2019 conditions. The ways of travel developed for 2045 were applied to passenger travel demand for the 2045 future baseline without RADP conditions and for the 2045 future baseline with RADP conditions.

The ways of travel for SFO employees were based on information in the 2017 SFO BART Ridership, Residence, and Mode Summary. There are no foreseeable transportation projects that would alter an employee's way of travel between 2019 and 2045 conditions, no changes to SFO parking policy in the long term, and no changes to the availability of transit or *first-mile/last-mile*[129] options in the foreseeable future. Therefore, ways of travel for employees were assumed to remain constant in the future and were applied to employee/tenant travel demand for both the 2045 future baseline without RADP and for the 2045 future baseline with RADP conditions.

Table 3.A-10 summarizes the number of SFO person and vehicle trips on a daily basis and during the weekday a.m. and p.m. peak hours for the 2045 future baseline without RADP and for the 2045 future baseline with RADP conditions, and summarizes the change in the number of person trips and vehicle trips that would be generated by subsequent RADP projects. Between the 2045 future baseline without RADP and the 2045 future baseline with RADP conditions, total person and vehicle trips are projected to increase by approximately 2 percent on a daily basis and during the weekday p.m. peak hour, by about 3 percent during the weekday a.m. peak hour. As noted above, the increase in person and vehicle trips under the 2045 future baseline with RADP conditions is due to the projected increase in employees and delivery trucks associated with subsequent RADP projects.

Step 4: Vehicle Trip Assignment. Assignment refers to assignment of project vehicles to adjacent roadways. The directional distribution obtained in the previous steps were used as the basis for assigning the change in vehicle trips related to SFO passengers and employment during the weekday a.m. and p.m. peak hours to U.S. 101 and to the local roadways in the transportation study area for the 2045 future baseline without RADP and 2045 future baseline with RADP conditions.

For both the 2045 future baseline without RADP and 2045 future baseline with RADP conditions, forecasts of background traffic volumes on the transportation study area roadways were developed using the C/CAG Travel Demand Model. Future forecasts of traffic volumes from the travel demand forecasting model were converted to roadway segment volume forecast using a set of post-processing techniques detailed in the National Cooperative Highway Research Program Report 255 – Highway Traffic Data for Urbanized Area Project Planning and Design.[130] Specifically, roadway segment traffic volume forecasts were developed by adding the growth in vehicle trips between the travel demand model's existing baseline and future 2045 forecasts to existing counts at the study roadway segments.[131]

For the 2045 future baseline without RADP conditions, the vehicle trips associated with the increases in passengers and employees as presented in Table 3.A-5, p. 3.A-16, and increase in cargo truck trips were assigned to the transportation study area roadways, and then added to the existing traffic volumes on the study roadway segments. Passengers were assigned to travel to or from the terminals, the rental car facility, and parking facilities. Employees were assigned to travel to or from the terminals, parking facilities, and the airport commission and tenant buildings. Cargo truck trips were assigned to travel to or from the West Field cargo facilities.

[129] *First-mile/last-mile* refers to the distance between a transit stop and the beginning/origin or final destination. Transportation options include but are not limited to walking, bicycling, e-scooters, ride-sharing services, bicycle rentals, driving, and transit.
[130] Transportation Research Board, National Research Council, *National Cooperative Highway Research Program Report 255*, Highway Traffic Data for Urbanized Area Project Planning and Design, December 1982.
[131] 2045 future baseline without RADP conditions traffic volumes were calculated by interpolating the projected growth presented in Plan Bay Area 2050 Growth Patterns between Year 2015 and Year 2050.

Table 3.A-10 Change in SFO Weekday Daily and A.M. and P.M. Peak Hour Travel Demand between 2045 Future Baseline without RADP and 2045 Future Baseline with RADP Conditions

Analysis Period/Analysis Scenario	Person Trips by Way of Travel				Vehicle Trips [d]
	Auto [a]	Transit [b]	Other [c]	Total	
Weekday Daily					
2045 Future Baseline without RADP	221,560	32,442	1,480	**255,482**	183,786
2045 Future Baseline with RADP	225,388	33,128	1,556	**260,072**	187,164
CHANGE FROM 2045 FUTURE BASELINE WITHOUT RADP	**3,828**	**686**	**76**	**4,590**	**3,378**
PERCENT CHANGE FROM 2045 FUTURE BASELINE WITHOUT RADP	**2%**	**2%**	**5%**	**2%**	**2%**
Weekday A.M. Peak Hour					
2045 Future Baseline without RADP	18,531	2,887	193	**21,611**	15,654
2045 Future Baseline with RADP	19,031	2,976	203	**22,210**	16,143
CHANGE FROM 2045 FUTURE BASELINE WITHOUT RADP	**500**	**89**	**10**	**599**	**489**
PERCENT CHANGE FROM 2045 FUTURE BASELINE WITHOUT RADP	**3%**	**3%**	**5%**	**3%**	**3%**
Weekday P.M. Peak Hour					
2045 Future Baseline without RADP	13,641	2,045	111	**15,797**	11,398
2045 Future Baseline with RADP	13,926	2,096	116	**16,138**	11,696
CHANGE FROM 2045 FUTURE BASELINE WITHOUT RADP	**285**	**51**	**5**	**341**	**298**
PERCENT CHANGE FROM 2045 FUTURE BASELINE WITHOUT RADP	**2%**	**2%**	**5%**	**2%**	**3%**

SOURCE: Fehr & Peers/LCW Consulting, 2025 (see Appendix E.2).

NOTES:

a. Auto includes travel by private vehicle for drop-off/pick-up or drive-and-park, carpool/vanpools, rental car, and for-hire vehicles (e.g., TNCs, taxis, limousines, and shuttle vans) by SFO passengers and employees. Drive trips could include autonomous vehicles (AV) traveling into and out of SFO in the future. Autonomous for-hire vehicles operate similar to TNCs, except without a driver, and would replace travel by other for-hire vehicles rather than result in a shift from travel by private vehicle or transit. Autonomous privately owned vehicles, which are not currently on the market, would operate similarly to private drop-offs/pick-ups.
b. Transit includes trips by BART and SamTrans by SFO passengers and employees.
c. Other person trips by walking and bicycling by SFO employees.
d. Vehicle trips include auto, taxi/TNC as well as vehicle trips made by visitors, commercial delivery and cargo vehicles, buses, and taxis/ride hail vehicles without occupants.

For the 2045 future baseline with RADP conditions, the weekday a.m. and p.m. peak hour vehicle trips associated with the increase in employees (i.e., the additional 2,700 employees associated with subsequent projects that could occur with implementation of the RADP) as presented in Table 3.A-10, p. 3.A-30, and the 51 additional weekday a.m. and p.m. peak hour delivery truck trips were assigned to the transportation study area roadways and then added to the traffic volumes developed for the study roadway segments under 2045 future baseline without RADP conditions. In addition, the vehicle assignment for the 2045 future baseline with RADP conditions includes reassignment of some passenger and employee vehicle trips to reflect changes in Airport facilities that could occur with implementation of the RADP (e.g., increased parking supply at the Central Hub [RADP Project #6], the new Consolidated Rental Car Center (CONRAC) Facility [RADP Project #9], conversion of the existing Rental Car Center to a public parking garage [RADP Project #12], and a new long-term parking garage [RADP Project #3]). Delivery trucks were assigned to and from the subsequent RADP projects identified as generating new demand for goods and materials.

Table 3.A-11 summarizes weekday a.m. and p.m. peak hour vehicles at the study roadway segments for the 2045 future baseline without RADP and the 2045 future baseline with RADP conditions and identifies the change in traffic volume between these two conditions (i.e., subsequent RADP projects' contribution to the two-way roadway volumes). Under the 2045 future baseline with RADP conditions, the greatest increases in study roadway segment traffic volumes during both the weekday a.m. and p.m. peak hours would occur on San Bruno Avenue and South Airport Boulevard. In addition, because the 2045 future baseline with RADP conditions is also the cumulative condition, Table 3.A-11 also includes the contribution of traffic volumes associated with subsequent RADP projects to the cumulative traffic volume.

PARKING DEMAND

Weekday peak parking demand for the 2045 future baseline without RADP and the 2045 future baseline with RADP conditions was determined based on available Airport parking occupancy data from June 2016 through May 2017 and parking destination data from the 2018 SFO Customer Survey Report.[132] For passengers, the weekday parking demand for the 2045 future baseline without RADP and the 2045 future baseline with RADP conditions was calculated using an estimated parking demand rate based on peak 2017 data, and accounting for approximately 30 percent of passengers who would continue to use off-Airport parking facilities. The peak passenger parking demand rate was applied to the daily number of passengers driving and parking and passengers using private pickup and drop-off (excludes taxis/TNCs and rental cars). Similarly, the employee parking demand was calculated by applying the peak parking demand rate to the estimated daily number of employees driving and parking. The methodology used to estimate parking demand at SFO is described in Section 9 of the travel demand memorandum in Appendix E.2.

Table 3.A-12 summarizes the estimated weekday parking demand at SFO facilities for the 2045 future baseline without RADP and the 2045 future baseline with RADP conditions. Under the 2045 future baseline with RADP conditions, parking demand would increase by about 658 parking spaces over the 2045 future baseline without RADP conditions.

Construction Impact Analysis Methodology

RADP construction-related transportation and circulation impacts are analyzed under Impact TR-1. Potential short-term construction impacts were assessed qualitatively based on general construction-related information for activities associated with construction of subsequent projects that could occur with implementation of the RADP. The construction impact analysis assesses whether construction of subsequent RADP projects would require a substantially extended construction duration or intense construction activity and, if so, whether the analysis assesses the effects of construction activities on people walking, bicycling, driving, or riding public transit and on emergency vehicle operators.

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[132] Peak parking demand typically occurs between 12 p.m. and 3 p.m.

Table 3.A-11 Change in SFO Weekday A.M. and P.M. Peak Hour Two-Way Volumes between the 2045 Future Baseline without RADP and the 2045 Future Baseline with RADP/Cumulative Conditions

Analysis Period/Roadway Segment	2045 without RADP	2045 with RADP/ Cumulative	Delta between without and with RADP/Cumulative	% Change from without RADP	% Contribution to Cumulative
Weekday A.M. Peak Hour					
U.S. 101 North of North Access Road	17,080	17,170	90	<1%	<1%
U.S. 101 between North Access Rd and Millbrae Ave	15,010	15,020	10	<1%	<1%
U.S. 101 South of Millbrae Avenue	18,740	18,810	70	<1%	<1%
Millbrae Avenue east of U.S. 101	1,760	1,760	0	0%	0%
Millbrae Avenue west of U.S. 101	4,330	4,330	0	0%	0%
North Access Rd west of North Field Road	860	960	100	12%	10%
San Bruno Avenue east of U.S. 101	1,980	2,230	250	13%	11%
South Airport Blvd between North Access and San Bruno Avenue	1,690	1,960	270	16%	14%
North McDonnell Road south of San Bruno Avenue	1,380	1,470	90	7%	6%
South McDonnell Road	580	600	20	3%	3%
Weekday P.M. Peak Hour					
U.S. 101 North of North Access Road	17,990	18,080	90	<1%	<1%
U.S. 101 between North Access Rd and Millbrae Ave	16,110	16,120	10	<1%	<1%
U.S. 101 South of Millbrae Avenue	19,550	19,630	80	<1%	<1%
Millbrae Avenue east of U.S. 101	2,210	2,210	0	0%	0%
Millbrae Avenue west of U.S. 101	4,560	4,560	0	0%	0%
North Access Rd west of North Field Road	630	700	70	11%	10%
San Bruno Avenue east of U.S. 101	2,540	2,690	150	6%	6%
South Airport Blvd between North Access and San Bruno Avenue	2,060	2,320	260	13%	11%
North McDonnell Road south of San Bruno Avenue	1,610	1,710	100	6%	6%
South McDonnell Road	920	930	10	1%	1%

SOURCE: Fehr & Peers/LCW Consulting, 2025 (see Appendix E.2).

Table 3.A-12 2019, 2045 Future Baseline without RADP, and 2045 Future Baseline with RADP Parking Demand at SFO Facilities – Passengers and Employees

Air Passengers/Employees	2019	2045 Baseline without RADP	Change between 2019 and 2045 without RADP	2045 Baseline with RADP/ Cumulative	Change between 2045 without RADP and 2045 with RADP/Cumulative
Passengers	16,767	19,522	2,755	19,522	**0**
Employees	10,427	12,733	2,306	13,391	**658**
TOTAL	**27,194**	**32,255**	**5,061**	**32,913**	**658**

SOURCE: Fehr & Peers/LCW Consulting, 2025 (see Appendix E.2).

Operational Impacts Analysis Methodology

RADP operational transportation and circulation impacts are analyzed under Impacts TR-2 through TR-7. The following describes the methodology for analysis of operational impacts, by significance criterion.

POTENTIALLY HAZARDOUS CONDITIONS

As used in this section, the term hazard refers to a project-generated vehicle potentially colliding with a person walking, bicycling, or driving or with a public transit vehicle such that serious or fatal physical injury could result, accounting for the aspects described below. Human error or non-compliance with laws, weather conditions, time of day, and other factors can affect whether a collision could occur. However, for purposes of CEQA, hazards refer to engineering aspects of a project (e.g., speed, turning movements, complex designs, substantial distance between street crossings, sight lines) that may cause a greater risk of collisions that result in serious or fatal physical injury than a typical project. This analysis focuses on hazards that could reasonably stem from subsequent RADP projects beyond collisions that may result from aforementioned non-engineering aspects or the transportation system as a whole.

Therefore, the methodology qualitatively addresses the potential for subsequent projects that could occur with implementation of the RADP to exacerbate an existing or create a new potentially hazardous condition to people walking, bicycling, or driving, or public transit operations. The methodology accounts for the number, movement type, sightlines, and speed of project vehicle trips and potential changes to the public right-of-way as part of subsequent RADP projects in relation to the presence of people walking, bicycling, or driving.

ACCESSIBILITY

The methodology qualitatively addresses the potential for subsequent RADP projects to interfere with accessibility for people walking or bicycling or to result in inadequate emergency access. The methodology accounts for the number, movement type, sightlines, and speed of project vehicle trips and project changes to the public right-of-way as part of subsequent RADP projects in relation to the presence of people walking and bicycling or to emergency service operator facilities.

PUBLIC TRANSIT DELAY

The San Francisco Planning Department uses quantitative thresholds of significance and qualitative criteria to determine whether a project would substantially delay public transit. For example, for individual San Francisco Municipal Railway (Muni) routes, if a project would result in transit delay greater than or equal to four minutes, then it might result in a significant impact.[133] For individual Muni routes with service headways[134] less than eight minutes, the planning department may use a one-half headway threshold. For example, for a bus route with a headway of six minutes, the threshold would be half of six minutes, or three minutes. Should a project result in a transit delay of three minutes or more, then it might result in a significant impact. For individual surface routes operated by regional agencies, such as SamTrans, if a project would result in a transit delay greater than one-half headway, then it might result in a significant impact. The planning department considers the following criteria for determining whether such delay exceeding-thresholds would result in significant impacts due to a substantial number of people who are riding transit switching to riding in private or for-hire vehicles: transit service headways and ridership, origins and destinations of trips, availability of other transit and modes, and competitiveness with private vehicles.

A qualitative assessment rather than a quantitative analysis of transit travel time changes was determined appropriate considering the location of the RADP project site, the level of travel activity by the various ways of travel, the roadways used to access the Airport, and the proximity of transit routes to the Airport.

The transit delay assessment qualitatively considered three quantitative factors associated with changes to transit travel times:

- **Traffic Congestion Delay** – Increases in vehicles slowing down transit vehicles and increasing transit travel times.
- **Transit Reentry Delay** – Delays to transit vehicles pulling out of a bus stop while waiting for gaps in adjacent street traffic. As traffic volumes on roadways increase, reentering the flow of traffic becomes more difficult and transit vehicles experience increased delays.
- **Passenger Boarding Delay** – The additional amount of time a transit vehicle has to wait at a stop to pick up and drop off passengers.[135]

VMT ANALYSIS

The methodology used to assess the potential VMT impacts associated with implementation of the RADP is consistent with CEQA section 21099(b)(1), CEQA Guidelines section 15064.3, technical advisories prepared by the California Office of Planning and Research,[136,137] and the SF transportation guidelines, as described below.

CEQA Guidelines section 15064.3 requires implementation of Senate Bill 743, which identifies VMT as the primary metric for evaluating a project's environmental impact on a transportation system. CEQA Guidelines section 15064.3(b)(2) identifies criteria for analyzing transportation projects. The Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA provided advice and

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[133] The threshold uses the adopted Transit-First Policy, City Charter section 8A.103, percent on-time performance service standard for Muni. The charter considers transit vehicles arriving more than four minutes beyond a published schedule time as late.
[134] A *service headway* is the number of minutes between buses or trains on a particular bus route or light rail line.
[135] Per the SF transportation guidelines, the amount of time that a public transit vehicle must stop to pick up and drop off passengers (i.e., the transit vehicle dwell time) is correlated to the number of passengers boarding and disembarking from the vehicle. As general transit ridership grows, transit vehicles spend more time at stops while passengers enter and exit the vehicle, which increases travel times on a route or light rail line.
[136] California Office of Planning and Research, *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA*, Implementing Senate Bill 743 (Steinberg, 2013), January 20, 2016, https://opr.ca.gov/docs/Revised_VMT_CEQA_Guidelines_Proposal_January_20_2016.pdf, accessed August 15, 2024.
[137] California Office of Planning and Research, *Technical Advisory on Evaluating Transportation Impacts in CEQA*, December 2018, https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf, accessed August 15, 2024.

recommendations to lead agencies for analyzing transportation impacts in CEQA, including the effects of transportation project on vehicle travel.

The SF transportation guidelines identify the criteria, methodology, and thresholds of significance for assessing VMT impacts under review by the planning department. These guidelines are consistent with the CEQA statute and guidelines, and expand upon the Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA. These transportation guidelines state that a project will result in a significant VMT impact if it causes substantial additional VMT or substantially induces additional automobile travel by increasing physical roadway capacity in congested areas or by adding new roadways to the network.

The SF transportation guidelines focus on traditional residential, office, and retail land uses, and do not specifically address unique land use uses such as an airport.[138] Nor do the SF transportation guidelines or the Office of Planning and Research's technical advisory address airports and the role that they serve in the transportation network. VMT analyses are typically based on VMT metrics[139] derived from outputs from a travel demand model and are presented as light-duty (e.g., passenger cars, vans, pickups, SUVs) VMT per capita for a land use project and effect on regional VMT for transportation projects. The SF transportation guidelines denote that a land use project would result in an impact if the project would exceed the existing regional VMT per capita minus 15 percent.

While the planning department and the Office of Planning and Research guidance for evaluation of land uses focuses on light-duty vehicle travel,[140] total VMT also captures the movement of heavy vehicles used for the regional and statewide logistics network, of which SFO is a major node.[141] Total VMT metrics are also used for transportation projects, which would result in a significant impact if they substantially induced additional automobile travel.

The light-duty VMT associated with SFO is generated by passengers and employees. Other VMT associated with SFO would include the VMT generated by its role in the regional and statewide logistics network. The Airport operates 24 hours a day and does not align with the typical travel characteristics of traditional land uses (residential, office, and retail land uses) included in the SF transportation guidelines. The MTC and C/CAG maintain regional travel demand models that include SFO and a detailed roadway and land use network in surrounding San Mateo County communities. These regional models treat the Airport as a special generator based on user input and not regional trends. The San Francisco County Transportation Authority's SF-CHAMP model is based on MTC's model outside of San Francisco city limits and has similar limitations to MTC's model. Therefore, regional travel demand models that are calibrated and validated to estimate how implementation of the RADP would change VMT per capita or affect total regional VMT are unavailable.

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[138] *San Francisco Transportation Impact Analysis Guidelines*, Appendix F, Travel Demand, pp. F-12 and F-13, allows the planning department to use different analysis methodology for atypical land uses, https://citypln-m-extnl.sfgov.org/SharedLinks.aspx?accesskey=82302da822dc09578cdfd7b729d9e60243c1cf906fecdabc85bd4ab98c4c4a47&VaultGUID=A4A7DACD-B0DC-4322-BD29-F6F07103C6E0, accessed October 22, 2024.

[139] VMT metrics are used to measure the amount of VMT generated by a project or by all people within a region. VMT metrics fall into two general categories: total VMT and VMT per capita.

[140] California Governor's Office of Planning and Research, *Technical Advisory on Evaluating Transportation Impacts in CEQA*, December 2018, p. 4, https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf, accessed August 15, 2024.

[141] In logistics and supply chain management, a *node* refers to a point or location within a network, such as a warehouse, distribution center, transportation hub, or production facility, where goods, information, or services are received, processed, stored, or transferred as they move through the supply chain.

Under CEQA Guidelines section 15064.3(b)(4), a lead agency has the discretion to choose the most appropriate methodology to evaluate a project's VMT, including whether to express the change in absolute terms, per capita, per household, or any other measure. Furthermore, CEQA Guidelines section 15064.3(b)(3) allows lead agencies to analyze the project's VMT qualitatively if existing models or methods are not available to quantitatively estimate the project's VMT. Thus, given the limitations of available travel demand models, the VMT impact analysis for implementation of the RADP was evaluated qualitatively considering the number of trips that people take, the way people travel (e.g., drive versus transit), and the distance of the vehicle trip. Consistent with the SF transportation guidelines, the qualitative VMT analysis was evaluated based on the average VMT per capita of the people traveling into and out of the airport (i.e., average VMT per passenger and average VMT per employee). In addition, consistent with the SF transportation guidelines, as SFO is a node in a transportation network rather than a traditional residential, office, and retail land use project, implementation the RADP would be considered to result in a significant impact if it would substantially induce additional automobile travel. Thus, the methodology qualitatively assesses whether implementation of the RADP would substantially induce additional automobile travel and thus result in a substantial increase in average VMT per passenger and average VMT per employee.

PASSENGER AND FREIGHT LOADING

The methodology qualitatively assesses whether subsequent RADP projects would change commercial freight or passenger loading/unloading facilities, and qualitatively assesses the effect of the changes on loading conditions. If it is determined that loading activities could not be accommodated within the existing and proposed loading zones, then the methodology qualitatively addresses the potential for the subsequent projects that could occur with implementation of the RADP to exacerbate an existing or create a new potentially hazardous condition for people walking, bicycling, or driving, or to substantially delay public transit.

VEHICULAR PARKING

California Senate Bill 743 amended CEQA by adding California Public Resources Code section 21099 regarding the analysis of parking impacts for certain urban infill projects in transit priority areas.[142] Public Resources Code section 21099(d), effective January 1, 2014, provides that "… parking impacts of a residential, mixed-use residential, or employment center project on an infill site located within a transit priority area shall not be considered significant impacts on the environment." Accordingly, parking is no longer to be considered in determining if a project on an infill site located within a transit priority area has the potential to result in significant environmental effects for projects that meet all three criteria established in the statute.

The Airport is predominately located within a transit priority area.[143] However, the Airport may not be considered an "infill site" and the RADP itself may not be considered a "residential, mixed-use residential, or employment center project" consistent with Public Resources Code section 21099. Thus, for conservative purposes, a qualitative analysis was conducted to determine whether implementation of the RADP would result in a substantial parking deficit (i.e., if the demand for parking spaces exceeds the available supply by 600 vehicle parking spaces), and whether the substantial parking deficit would result in secondary effects

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[142] A *transit priority area* is defined as an area within 0.5 miles of an existing or planned major transit stop. A "major transit stop" is defined in California Public Resource Code section 21064.3 as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service intervals of 15 minutes or less during the morning and afternoon peak commute periods. A map of Transit Priority Areas in the Bay Area is available online at https://opendata.mtc.ca.gov/datasets/370de9dc4d65402d992a769bf6ac8ef5_1/explore?location=37.773000%2C-122.191730%2C9.82, accessed August 15, 2024.

[143] See the map of Transit Priority Areas at https://www.arcgis.com/apps/mapviewer/index.html?layers=370de9dc4d65402d992a769bf6ac8ef5.

related to potentially hazardous conditions or interfere with accessibility for people walking or bicycling, or inadequate access for emergency vehicles, or substantial delay to public transit.

The methodology qualitatively assesses how subsequent RADP projects would change the Airport parking supply and/or demand, and assesses whether any parking deficit (i.e., the demand for parking spaces cannot be accommodated within the supply and therefore results in a parking deficit) would be considered substantial. If implementation of the RADP is found to result in a substantial parking deficit, then the methodology qualitatively addresses the potential for subsequent RADP projects to exacerbate an existing or create a new potentially hazardous condition or interfere with accessibility for people walking, bicycling, or driving, or inadequate access for emergency vehicles, or substantial delay to public transit.

Cumulative Impacts Analysis Methodology

The discussion of cumulative transportation impacts assesses whether implementation of the RADP, in conjunction with overall regional growth and other cumulative projects, would significantly affect the transportation network, and if so, whether the RADP's contribution to the cumulative impact would be considerable. As described in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, the operational analysis of implementation of the RADP under the 2045 future baseline with RADP conditions is a cumulative analysis in that it includes the regional changes in housing units and employment, the increase in passengers, and the transportation network projects that would occur by 2045 with or without implementation of the RADP. The cumulative impact analysis assesses whether implementation of the RADP, in conjunction with overall regional growth and cumulative projects, would significantly affect the transportation network and if so, whether the RADP's contribution to the cumulative impact would be considerable.

Impacts and Mitigation Measures

Impact TR-1: Construction under the RADP would require a substantially extended duration; however, the effects would not create potentially hazardous conditions for people walking, bicycling, or driving or interfere with emergency access or accessibility for people walking or bicycling, or substantially delay transit. *(Less than Significant)*

In general, the analysis of construction impacts is specific to individual projects and typically includes a discussion of temporary roadway and sidewalk closures; relocation of bus stops; effects on roadway circulation due to construction trucks; and the increase in vehicle trips, transit trips, and vehicular parking demand associated with construction workers. Subsequent RADP projects are assessed for each component of the significance criteria, including construction duration and intensity, and impacts related to potentially hazardous conditions, accessibility, and transit delays. The impact analysis considers the context of the subsequent RADP project location. See Figure 2-6 through Figure 2-9, pp. 2-23 through 2-26, for locations of subsequent RADP projects discussed in this analysis.

Construction activities are temporary in nature and usually do not result in permanent changes to the transportation network. It is possible that construction of subsequent RADP projects may require temporary use of the transportation-related public right-of-way, including activities such as staging of construction materials or equipment on the sidewalk or within adjacent parking and/or travel lanes (e.g., RADP Project #20, Sanitary Sewer Force Main Realignment). Construction-related vehicles traveling to and from the construction work area would share travel lanes with other vehicles and bicyclists. In general, increased construction traffic from any subsequent RADP project could result in potential conflicts between construction trucks (which have slower speeds and wider turning radii than automobiles) and automobiles, bicyclists, and people walking. In addition, construction activities from any subsequent RADP project could result in physical obstructions or temporary changes to the public right-of-way that could conflict with other users of the public right-of-way. Conflicts during construction could occur when construction vehicles or activities block adjacent travel lanes, transit-only lanes, bicycle lanes, sidewalks, or crosswalks without accommodation for detours or maintenance of protected travel adjacent to the site or use of flaggers to direct construction vehicles adjacent to the site.

In general, construction-related activities at the Airport would typically occur Monday through Friday between 7 a.m. and 7 p.m. (daytime construction work shifts at the Airport are typically between 7 a.m. and 4 p.m.). In addition, some construction activities could occur overnight or on weekends, generally on an as-needed basis to maintain schedule or to accommodate Airport operations. The Aviador Lot, located on Airport property west of U.S. 101 in the city of Millbrae, and Plot 16D, located on Airport property north of the U.S. 101/I-380 interchange, would be the primary construction staging areas (see Figure 2-10, p. 2-41). These larger construction staging areas would receive deliveries from offsite locations; store new construction materials prior to delivery to the work site; receive and store demolished and excavated materials; and export demolished and excavated materials to offsite locations. These construction staging areas would also be locations for concrete batching (i.e., preparing concrete by mixing cement, other aggregate materials, and water). Other smaller construction staging areas would be located at various sites throughout the Airport (see Figure 2-10, p. 2-41).

Construction truck trips to and from the Plot 16D construction staging area would use U.S. 101, I-380, the North Access Road ramps, North Access Road, and South Airport Boulevard. Construction truck trips to and from the Aviador Lot construction staging area would use U.S. 101 and the U.S. 101 northbound and southbound ramps at Millbrae Avenue and North Rollins Road. Construction truck trips between the other construction staging areas and subsequent RADP project sites would use U.S. 101 for projects that would be accessed via the terminal roadways (e.g., Central Hub [RADP Project #6], Domestic Terminal Roadways Reconstruction [RADP Project #7], and ITB Main Hall Expansion [RADP Project #8]), North Access Road for projects in the North Field and East Field (e.g., North Field Ground Support Equipment Facility #1 [RADP Project #17], Aircraft Maintenance Hangar [RADP Project #18], East Field Ground Support Equipment Facility #2 [RADP Project #19]), and South Airport Boulevard and North McDonnell Road for projects in the North Field and West Field (e.g., CONRAC Facility and CONRAC Quick Turn-Around Facility [RADP Projects #9 and #10, respectively], Long-Term Parking Garages #3 and #4 [RADP Projects #11 and #12, respectively]).

During a subsequent RADP project's construction period, temporary and intermittent traffic and transit impacts may result from truck movements to and from the work areas. Truck movements during periods of peak traffic flow would have a greater potential to create conflicts than truck movements during non-peak hours because of the greater number of vehicles on the roadways. Temporary vehicular parking demand associated with construction workers' vehicles would occur in proportion to the number of construction workers as most construction workers at the Airport drive to work. Vehicular parking associated with construction workers' vehicles would temporarily increase occupancy levels in SFO parking facilities.

Construction activities at the Airport are subject to the Airport Standard Construction Measures. In compliance with Airport Standard Construction Measures Division 01 35 43.01, Demolition, and Division 01 55 26, Traffic Regulation, SFO or its contractors would prepare and implement a traffic control plan that conforms to the California Manual of Uniform Traffic Control Devices and is consistent with SFO traffic regulations and the policies of the police department's Airport Bureau. The elements of the traffic control plan would include, as appropriate, circulation and detour routes; advance warning signage; construction truck routes; maintenance of pedestrian and bicycle access and circulation; vehicle, pedestrian, or bicycle detour routes; designation of sufficient staging areas; scheduling and monitoring of construction vehicle movement; and coordination with public service providers such as transit, fire, police, schools, and hospitals. The traffic control plan would serve to inform city, state, and federal agencies of construction and minimize temporary transportation effects in the vicinity of the construction area. Any construction within the right-of-way of adjacent jurisdictions, such as the City of South San Francisco, City of San Bruno, or City of Millbrae would voluntarily comply with local encroachment permits.[144] In addition, as appropriate, construction activities affecting state roadways are subject to Caltrans encroachment permits.

As shown in Table 2-5, p. 2-39, the construction schedules of subsequent projects that could occur with implementation of the RADP would overlap during the 20-year implementation period. The Airport's Standard Construction Measures require contractors to coordinate with SFO's Airport Operations division. Thus, the traffic control plans for all subsequent RADP projects would be coordinated, similar to the ongoing coordination activities for the multiple concurrent projects under construction at the Airport at any given time. Furthermore, the number of subsequent RADP projects under construction at the same time would be limited due to constraints related to the availability of equipment for large-scale projects so that construction projects do not interfere with Airport operations, and the availability of construction staging areas; the Aviador Lot and the Plot 16D construction staging areas are the two largest staging areas that would be used for most construction projects at the Airport. However, as under the 2019 existing conditions, it is anticipated that two or more projects at the Airport could be under construction at the same time, depending on their size, location, and phase of construction.

CONSTRUCTION DURATION AND INTENSITY

Construction of subsequent projects that could occur with implementation of the RADP would occur over an approximately 20-year building period between 2025 and 2045, which is considered an extended duration by the planning department (i.e., more than 30 months). As shown in Table 2-5, p. 2-39, the construction duration of subsequent RADP projects would vary depending on the type of project and its location, with ranges between about one year (e.g., North Field Ground Support Equipment Facility #1 [RADP Project #17], Sanitary Force Main Line Realignment [RADP Project #20]) and 14 years (e.g., Boarding Area F Modernization [RADP Project #2]). The construction duration would be less than three years for 13 of the 20 subsequent RADP projects, between four and six years for six projects, and 14 years for one project. The Airport would remain in operation throughout the construction period for all of the subsequent RADP projects.

During construction of subsequent RADP projects, the number of weekday daily and peak hour vehicle trips on transportation study area roadways would vary depending on the type of project and its location. For smaller projects (e.g., East Field Ground Support Equipment Facility #2 [RADP Project #19]) there would be an average of about seven construction trucks and 18 construction workers per day; for medium projects (e.g., ITB Main Hall Expansion [RADP Project #3]) there would be an average of about 37 construction trucks and 59 construction workers per day; and for larger projects (e.g., Central Hub [RADP Project #6], CONRAC Facility [RADP Project #9]) there would be between 286 and 721 construction trucks and 73 and 148

[144] SFO, owned by the City and County of San Francisco, is not subject to the zoning and building permit laws of other jurisdictions. California Government Code sections 53090 and 53091 grant a city or county intergovernmental immunity from complying with another governmental body's zoning and building permit laws.

construction workers per day. The number of construction trucks and construction worker vehicles on the local roadway network would generally range between 15 vehicles per hour in both directions of travel for small projects and 160 vehicles per hour in both directions of travel for larger projects (see Appendix E.3). These increases in traffic volumes on transportation study area roadways would not be considered substantial given the multiple travel lanes each way and existing volume of vehicles on these roadways (i.e., between 170 and 830 vehicles per hour per direction as shown in Figure 3.A-1, p. 3.A-2).

IMPACTS RELATED TO POTENTIALLY HAZARDOUS CONDITIONS AND ACCESSIBILITY DURING CONSTRUCTION

In general, most construction activities associated with subsequent RADP projects would occur entirely within the Airport and would not involve any construction activities within the local roadway network. Therefore, the adjacent local roadway network would not be substantially affected by construction activities.

As described above, a traffic control plan would be developed for each subsequent RADP project. The elements of the traffic control plan would include circulation and detour routes, temporary travel lane and/or bicycle lane closures, temporary bus stop relocations, location and type of advance warning signage, construction truck routes, maintenance of pedestrian and bicycle access, safety and phasing plans, and scheduling and monitoring of construction vehicle movements, as appropriate. See Figures 2-6 through 2-9, pp. 2-23 through 2-26, regarding the location of the subsequent RADP projects noted below.

Construction of the projects in the terminal area (Boarding Area H [RADP Project #1], Boarding Area F Modernization [RADP Project #2], ITB Main Hall Expansion [RADP Project #3], ITB Boarding Areas A and G Improvements [RADP Project #4], Terminal 3 Façade Expansion [RADP Project #5], Central Hub [RADP Project #6], Domestic Terminal Roadway Reconstruction [RADP Project #7], ITB Curbside Expansion [RADP Project #8]) would occur entirely within the Airport and would not affect the adjacent roadway network.

Construction of the new Boarding Area H may require temporary bicycle and/or travel lane closures on North McDonnell Road depending on the location of the security fencing (e.g., edge of sidewalk or east of the support columns for the elevated AirTrain structure). However, due to the short duration of the temporary closure that would be needed to erect the fence, the two northbound travel lanes, and the traffic volumes on this segment of North McDonnell Road, the temporary closure of one northbound travel lane would not create potentially hazardous conditions for people walking or bicycling, or impede emergency access. Therefore, construction of the terminal projects would not create potentially hazardous conditions or otherwise interfere with accessibility for people walking or bicycling, nor would it interfere with emergency access.

Construction of most of the ground access and parking and Airport/airline support facilities projects (CONRAC Facility [RADP Project #9], CONRAC Quick Turn-Around Facility [RADP Project #10], Long-Term Parking Garage #3 [RADP Project #11], Long-Term Parking Garage #4 [RADP Project #12], Rental Car Short-Term Storage Lot [RADP Project #13], Terminal 2 AirTrain Station Platform Expansion [RADP Project #14], Rental Car Center AirTrain Station Platform Expansion [RADP Project #15], AirTrain Maintenance Yard [RADP Project #16], North Field Ground Support Equipment Facility #1 [RADP Project #17], Aircraft Maintenance Hangar [RADP Project #18], East Field Ground Support Equipment #2 [RADP Project #19]) would occur on Airport property and would not involve any construction activities within the local roadway network. However, some of these project sites are adjacent to roadways (e.g., Long-Term Parking Garage #3 project site borders South Airport Boulevard) and may require temporary sidewalk or travel lane closures to reconstruct sidewalks. Construction activities associated with sidewalk reconstruction would be of short duration and would comply with the traffic control plan requirements of the Airport Standard Construction Measures. These requirements include preparation of a pedestrian detour routing plan to maintain access and safety for people walking. Therefore, the construction of the ground access and parking and airport/airline support facilities projects would not create potentially hazardous conditions or otherwise interfere with accessibility for people walking or bicycling, nor would it interfere with emergency access.

The Sanitary Sewer Force Main Realignment project [RADP Project #20] could be constructed within the Bay Trail or within South Airport Boulevard (see Figure 2-3, p. 2-8). If the sewer was located within the South Airport Boulevard right-of-way, construction could require temporary sidewalk, bicycle lane, and travel lane closures depending on the location within the right-of-way. Construction along the sewer alignment would likely occur in segments, and would proceed along the alignment in that fashion. Typically, lane closures would only occur during daytime hours, and steel plates would be used to restore vehicle access at the end of each workday. If the sewer alignment occurs within the Bay Trail, temporary closure of the Bay Trail would be required. The traffic control plan would indicate the use of flaggers and installation of warning and detour signs advising motorists of changed conditions and/or to follow appropriate detour routes well in advance of the temporary closures. On South Airport Boulevard, advance warning signs stating “Share the Road” would be posted for the safety of bicyclists. Construction activities within South Airport Boulevard would be conducted in accordance with the Airport Standard Construction Measures and City of South San Francisco encroachment permit requirements. The traffic control plan would include measures to maintain safety and accessibility throughout construction for all means of travel. Any temporary travel lane closures would be reviewed so that emergency access was not impaired. Therefore, the realignment of the sewer force main would not create potentially hazardous conditions or otherwise interfere with accessibility for people walking or bicycling, nor would it interfere with emergency access.

IMPACTS RELATED TO POTENTIAL TRANSIT DELAYS DURING CONSTRUCTION

Construction of some subsequent RADP projects may require construction within public roadways (e.g., CONRAC, Sanitary Sewer Force Main projects), while other projects may require short-term temporary sidewalk, bicycle lane, or travel lane closures as part of their construction within public roadways on which SamTrans bus routes travel (i.e., South Airport Boulevard, North McDonnell Road). Figure 3.A-3, p. 3.A-9. presents the SamTrans bus routes that operate on the transportation study area roadways.

The CONRAC Facility includes restriping and modifying the median on South Airport Boulevard, which would require some construction within the roadway. In addition, it is possible that the Sanitary Sewer Force Main Line Realignment project would occur within South Airport Boulevard (i.e., instead of within the Bay Trail located directly west of the CONRAC Facility and CONRAC Quick Turn-Around Facility project sites). Construction within South Airport Boulevard would require temporary travel lane closures that would result in additional vehicles in the remaining lanes along the construction work area, which could temporarily increase transit travel times during construction. The increased transit travel times would be temporary and for a limited distance, and would not represent a substantial increase in overall transit travel times for the SamTrans 292 route, which operates on South Airport Boulevard.

The Long-Term Parking Garage #3 project site borders on South Airport Boulevard and San Bruno Avenue. While construction of the garage would not generally require staging or construction with the adjacent travel lanes, the project would likely include sidewalk reconstruction on South Airport Boulevard. Reconstruction of the sidewalk may require temporary and short-term travel lane closures, which may increase travel times for the SamTrans 292 route that operates on South Airport Boulevard. The increased transit travel times on

South Airport Boulevard during sidewalk reconstruction would be for a short duration and for a limited distance, and would not represent a substantial increase in overall transit travel times for the SamTrans 292 route.

The Boarding Area H, Long-Term Parking Garage #4, and Rental Car Center Short-Term Storage Lot project sites are located east of the AirTrain tracks that run along North McDonnell Road. Some construction activities may require temporary sidewalk, travel lane, and/or bicycle lane closures on northbound North McDonnell Road (e.g., installation of security fencing). These temporary closures could increase transit travel times on the SamTrans 120, 142, and 292 routes that operate on North McDonnell Road; however, due to the short duration and limited distance, the temporary and localized congestion would not substantially delay the SamTrans routes.

The North Field Ground Support Equipment Facility #1, Aircraft Maintenance Hangar, East Field Ground Support Equipment Facility #2 projects, and the reconstruction of Building 944 in the North Field as part of the Boarding Area F Modernization project would use North Access Road for travel between the construction staging areas and the work areas. These projects would increase traffic volumes on this roadway but would not involve any construction within the roadway. The additional construction vehicle trips generated by these projects would not be substantial (e.g., eight construction trucks during the weekday a.m. peak hour for construction of the East Field Ground Support Equipment Facility #2) and would not substantially delay the SamTrans 138 route, which operates on North Access Road.

Within the Airport terminals, the Central Hub, Domestic Terminal Roadway Reconstruction, and ITB Curbside Expansion projects along the domestic and international terminals' lower-level curbside areas would involve temporary median and/or lane closures that could affect SamTrans 292, ECR Owl, 120, 297 and 713 routes that operate within the Airport. SFO would coordinate with SamTrans on center median and/or travel lane closures, temporary bus stop relocations, and/or potential alternative routing during construction of the Central Hub (RADP Project #6), Domestic Terminal Roadway Reconstruction (RADP Project #7), and ITB Curbside Expansion (RADP Project #8) projects. The traffic control plan for each subsequent RADP project would include procedures for phasing of travel lane closures, detours, and bus stop relocations, as necessary. Some temporary delays to public transit and other ground transportation services would be expected during construction; however, because provisions to accommodate traffic and SamTrans bus routes within the Airport would be provided, the temporary delays would not be considered substantial.

CONCLUSION

Construction of subsequent projects that could occur with implementation of the RADP would be phased over an extended duration; however, construction-related activities would not involve a substantial intense activity that would adversely affect the transportation right-of-way. Construction would be conducted in accordance with the Airport's Standard Construction Measures, which would require preparing and implementing a traffic control plan, and subsequent RADP projects that overlap would be required to coordinate their traffic control plans with SFO's Landside Operations. In addition, SFO would coordinate with SamTrans during construction of subsequent RADP projects that could affect their transit operations (e.g., travel lane closures, temporary bus stop relocations, and/or potential alternative routing). By implementing these measures, construction of subsequent projects that could occur with implementation of the RADP would not create potentially hazardous conditions for people walking, bicycling, driving, or for public transit operations; would not interfere with emergency access; and would not interfere with accessibility for people walking or bicycling, or substantially delay transit. Therefore, the RADP's construction-related transportation impacts would be ***less than significant***.

Impact TR-2: The RADP would not create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations. ***(Less than Significant)***

A “hazard” refers to a project-generated vehicle potentially colliding with a person walking, bicycling, or driving or public transit vehicle that could cause serious or fatal physical injury, accounting for the aspects described below. Human error or non-compliance with laws, weather conditions, time-of-day, and other factors can affect whether a collision could occur. However, for purposes of CEQA, hazards refer to engineering aspects of a project (e.g., speed, turning movements, complex designs, distance between street crossings, sightlines) that may cause a greater risk of collisions that result in serious or fatal physical injury than a typical project. This analysis focuses on roadway hazards that could reasonably stem from subsequent RADP projects, beyond collisions, which may result from non-engineering aspects or the transportation system as a whole.

Subsequent projects that could occur with implementation of the RADP would add vehicle trips traveling into and out of the Airport and would redistribute traffic volumes estimated under the 2045 future baseline without RADP conditions. The redistribution of traffic volumes would be due to relocation of some current facilities. For example, the Boarding Area F Modernization (RADP Project #2) project would demolish Building 638 containing 1,700 airline employee parking spaces and construct a replacement parking structure at the existing Building 682 location (see Figure 2-7, p. 2-24), while the existing rental car center ready-return garage (Building 780) would be converted to Long-Term Parking Garage #4 (RADP Project #12) and the existing rental car center activities would be relocated to the new CONRAC Facility (RADP Project #9; see Figure 2-8, p. 2-25. The weekday a.m. and p.m. peak hour vehicle trips on the study roadway segments for 2045 future baseline with RADP conditions are presented in Table 3.A-11, p. 3.A-32, and were considered in the qualitative assessment of the potential hazards.

The following projects that could occur with implementation of the RADP would be completely within the fenced-in/access-restricted areas of the Airport and would not create new connections within the local roadway network or the freeway ramp system serving the Airport: Boarding Area H, Boarding Area F Modernization (including the replacement cargo building in reconstructed Building 944 in the North Field), ITB Main Hall Expansion, ITB Boarding Areas A and G Improvements, Terminal 3 Façade Expansion, Central Hub, Domestic Terminal Roadways Reconstruction, ITB Curbside Expansion, Terminal 2 AirTrain Station Platform Expansion, Rental Car Center AirTrain Station Expansion, North Field Ground Support Equipment Facility #1, Aircraft Maintenance Hangar, and East Field Ground Support Equipment Facility #2. Thus, these projects would not exacerbate an existing or create a new potentially hazardous condition to people walking, bicycling, or driving, or public transit operations. The Boarding Area H project would remove driveways/curb cuts along North McDonnell Road serving Buildings 575, 585, 602, and 606, which would be demolished (see Figure 2-3, p. 2-8. Removal of the driveways would remove locations of potential conflicts between vehicles and bicyclists in the bicycle lane on northbound North McDonnell Road.

The Sanitary Sewer Force Main Line Realignment project, as an underground infrastructure project under a portion of the South Airport Boulevard or the Bay Trail right-of-way, would not affect the transportation network once construction is completed and therefore would not create potentially hazardous conditions for people walking, bicycling, or driving, or for public transit operations.

The following six projects would be accessed directly from South Airport Boulevard or North McDonnell Road and could affect the local transportation network:

- The CONRAC Facility, CONRAC Quick Turn-Around Facility, and Long-Term Parking Garage #3 projects would be accessed via the existing signalized intersection(s) at South Airport Boulevard/Long-Term Parking Garage #1 Driveway and/or South Airport Boulevard/Cell Phone Lot Driveway. Similar to the existing intersections, entrances for these projects would include multiple inbound and outbound lanes, with access controls (e.g., ticket machines, entry gates) set back within the site. The CONRAC Facility project would change the configuration of South Airport Boulevard adjacent to the project site. These changes include restriping and modifying the median to accommodate a left-turn pocket to accommodate vehicles turning into the site and to provide additional bus turnouts for the SamTrans 292 route on either side of South Airport Boulevard at the intersection with the Long-Term Parking Garage #1 entrance roadway. The bus turnouts would be designed consistent with the recent SamTrans Bus Stop Improvement Plan and would include rider amenities as well as features that would result in operational improvements.[145] Thus, these projects would not create potentially hazardous conditions for people walking, bicycling or driving, or public transit operations on South Airport Boulevard.
- The Long-Term Parking Garage #4 and Rental Car Center Short-Term Storage Lot projects would be accessed via the existing signalized intersection at North McDonnell Road/Access Road 8. At this intersection, Access Road 8 has two inbound (eastbound lanes) and three outbound (westbound) lanes, and in the southbound direction two exclusive left turn lanes are provided. Thus, the conversion of the ready-return garage into a public parking garage and the replacement of the existing QTA facility with short-term, on-Airport rental car stacking and storage would not create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations on North McDonnell Road.
- The AirTrain Maintenance Yard project would use the existing driveway on North McDonnell Road that serves the Airport facilities maintenance building that would be demolished, and therefore would not create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations on North McDonnell Road.

Any changes to the intersection of access roadways/driveways on South Airport Boulevard or North McDonnell Road would be designed to Caltrans design standards[146] so that the changes would not represent potentially hazardous conditions for people walking, bicycling or driving.

CONCLUSION

Subsequent RADP projects would be located within the Airport and would use existing roadways to access the sites (i.e., would not result in new connections with the local roadway network). Plans for restriping of the travel lanes, the new bus turnouts for SamTrans on South Airport Boulevard, and any modifications to existing driveways would conform with applicable design standards and undergo review prior to implementation. Thus, for the above reasons, the RADP would not create potentially hazardous conditions for people walking, bicycling, or driving, or for public transit operations, and the impacts of implementation of the RADP related to potentially hazardous conditions would be ***less than significant***.

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[145] *SamTrans Bus Stop Improvement Plan*, April 2024, https://www.samtrans.com/projects/bus-stop-improvement-plan, accessed August 12, 2024.
[146] Design standards are objective, quantifiable measures of design attributes (i.e., specifications) that govern specific elements of design to promote consistency, quality, safety and efficiency.

Impact TR-3: The RADP would not interfere with the accessibility of people walking or bicycling to and from the project site and adjoining areas, or result in inadequate emergency access. *(Less than Significant)*

Most subsequent projects that could occur with implementation of the RADP do not include any specific changes to the transportation study area roadway network that would interfere with walking or bicycling or result in inadequate emergency access, as described below. Also, as described below, some subsequent RADP projects could include modifications to existing driveways, minor restriping of roadways to accommodate access to parking facilities, and reconstructed sidewalks. The majority of the subsequent RADP projects would be located within the fenced-in areas of the Airport and would not interface with the local surface street network. The impact of the 20 subsequent RADP projects on accessibility is assessed below:

- The following 13 subsequent RADP projects would not include any specific changes to the roadway network because existing roadways would be used to access these projects: Boarding Area H, Boarding Area F Modernization, ITB Main Hall Expansion, ITB Boarding Areas A and G Improvements, Terminal 3 Façade Expansion, Central Hub, Domestic Terminal Roadways Reconstruction, ITB Curbside Expansion, Terminal 2 AirTrain Station Platform Expansion, Rental Car Center AirTrain Station Platform Expansion, North Field Ground Support Equipment Facility #1, Aircraft Maintenance Hangar, and East Field Ground Support Equipment Facility #2. Therefore, these projects would not interfere with accessibility of people walking, bicycling, or driving. In addition, these subsequent RADP projects would be designed consistent with federal design standards for airports with respect to maintaining emergency vehicle access within the Airport.
- The following six subsequent RADP projects would have driveways that would connect with South Airport Boulevard, North McDonnell Road, or other internal Airport roadways via existing or reconfigured driveways/access roads: CONRAC Facility, CONRAC Quick Turn-Around Facility, Long-Term Parking Garage #3, Long-Term Parking Garage #4, Rental Car Short-Term Storage Lot, and AirTrain Maintenance Yard. Driveways would not interfere with accessibility of people walking, bicycling, or driving and would not change or impede emergency vehicle travel compared to the 2045 future baseline without RADP conditions.

  The Long-Term Parking Garage #3 project would also reconstruct sidewalks on South Airport Boulevard adjacent to the project site, and would therefore enhance accessibility for people walking on South Airport Boulevard.

  The CONRAC Facility project would also include changes to South Airport Boulevard between North Access Road and San Bruno Avenue in the form of restriping and modifying the median to accommodate a left-turn pocket and the addition of bus turnouts on either side of the street at the intersection with the Long-Term Parking Garage #1 entrance roadway for SamTrans buses. The bus turnouts would enhance accessibility for people taking transit.
- There are two options for realignment of the Sanitary Sewer Force Main Line Realignment: beneath the Bay Trail around the western perimeter of the long-term parking lot or beneath South Airport Boulevard. Under either alignment option, after construction is completed, the Bay Trail or South Airport Boulevard would be restored to the 2045 future baseline without RADP conditions and therefore this subsequent RADP project would not interfere with accessibility of people walking, bicycling, or driving or impede emergency access.

CONCLUSION

A few subsequent RADP projects would include modifications to intersections with driveways/access roads and reconstructed walkways for employees and passengers; however, these changes would not affect access for people walking or bicycling, or impede emergency access compared with the 2045 future baseline without RADP conditions. Subsequent RADP projects within the Airport would be designed in a manner consistent with applicable federal design standards for airports with respect to maintaining emergency vehicle access within the Airport. As such, subsequent projects that could occur with implementation of the RADP would not interfere with accessibility of people walking or bicycling or result in inadequate emergency access. Thus, for the above reasons, implementation of the RADP would not interfere with the accessibility of people walking or bicycling, nor result in inadequate emergency access, and impacts related to accessibility would be ***less than significant***.

Impact TR-4: The RADP would not substantially delay public transit. *(Less than Significant)*

Subsequent projects that could occur with implementation of the RADP would generate new employee and delivery vehicle trips into and out of the Airport as shown on Table 3.A-10, p. 3.A-30. Between 2045 future baseline without RADP and 2045 future baseline with RADP conditions, vehicle trips into and out of the Airport are projected to increase by 489 vehicles during the a.m. peak hour and 298 vehicles during the p.m. peak hour. In addition, some subsequent RADP projects would result in a redistribution of the traffic volumes estimated under the 2045 future baseline without RADP conditions due to changes in location of rental car facilities (i.e., the existing rental car center ready-return garage (Building 780) would be converted to a public parking garage (Long-Term Parking Garage #4) and the existing rental car center activities would be relocated to the new CONRAC facility) and public and employee vehicle parking (e.g., the Boarding Area F Modernization project would demolish Building 638 containing 1,700 airline employee parking spaces and construct a replacement parking structure at the existing Building 682 location) and new public parking facilities. The changes in weekday a.m. and p.m. peak hour vehicle trips on the study roadway segments between the 2045 future baseline without RADP and 2045 future baseline with RADP conditions is presented in Table 3.A-11, p. 3.A-32, and were considered in the qualitative assessment of the transit delay impacts on the following four SamTrans bus routes:[147]

- SamTrans 120 route accesses the Airport terminal lower-level roadways via U.S. 101.
- SamTrans 138 route travels on North Access Road to the SamTrans peninsula and does not directly serve the Airport.
- SamTrans 142 and EPX routes travels on San Bruno Avenue and North McDonnell Road to the SFO AirTrain/Rental Car station.
- SamTrans 292 route travels on South Airport Boulevard, North McDonnell Road, South McDonnell Road, and Millbrae Avenue to the terminal lower-level roadways.

As shown on Table 3.A-4, p. 3.A-10, SamTrans routes EPX, 120, 138, 142, and 292 travel during the weekday a.m. and p.m. peak hours, and have headways of between 20 and 60 minutes during the peak periods, except for the 120 route that has 10-minute headways during the peak hours. SamTrans ECR Owl, 397, and 713

[147] The information considered in the transit assessment to determine potential increases to transit travel times that could result from traffic congestion delay, transit reentry delay, and rider boarding delay is summarized in Appendix E.4.

routes do not travel during the weekday peak periods and therefore are not included in the qualitative assessment of impacts on transit delay.

Subsequent RADP projects would not change transit operations at the Millbrae Transit Center or affect BART or Caltrain service. BART and Caltrain service are not affected by vehicular traffic and therefore are also not included in the qualitative assessment of impacts on transit delay.

TRAFFIC CONGESTION DELAY

During the weekday a.m. and p.m. peak hours, the increase in the number of vehicles between the 2024 future baseline without RADP conditions and 2045 future baseline with RADP conditions on North Access Road, South Airport Boulevard, San Bruno Avenue, South McDonnell Road, and Millbrae Avenue would be between 0 and 270 vehicles per hour in both travel directions (see Table 3.A-11, p. 3.A-32), with the greatest increase on South Airport Boulevard and San Bruno Avenue. Because most of the roadways on which SamTrans routes operate have two travel lanes each way, plus turn lanes, the additional delay associated with subsequent RADP project vehicles on these roadways would be minimal and would not substantially delay bus operations (i.e., additional congestion would not result in transit delays of 10 or more minutes).[148] Airport-related vehicle travel on these roadways would primarily be between the freeway network and parking facilities or rental car centers, and therefore only a short segment of the transit route would be affected by Airport-related increases in traffic volumes.

The Central Hub project and the ITB Curbside Expansion projects would increase the amount of curbside space for all types and sizes of airport ground transportation, including buses, and vehicles for passenger drop-off and pickup. Implementation of these subsequent RADP projects would alleviate roadway congestion on the main terminal roadways and accommodate SamTrans bus operations and could reduce travel times from the 2045 future baseline without RADP conditions for the SamTrans 120, 292, ECR Owl, and 397 routes that access the Airport terminal roadways. For these reasons, implementation of the RADP would not result in substantial congestion that would delay public transit.

REENTRY DELAY

With implementation of the RADP, the expected increase in the number of vehicles on roadways where SamTrans operates, as described above, would not substantially affect transit operations or cause substantial traffic congestion or delay to public transit service. As shown on Figure 3.A-3, p. 3.A-9, within the transportation study area there is one SamTrans bus stop in each direction on South Airport Boulevard, four bus stops in each direction on North McDonnell Road, and no bus stops on North Access Road, San Bruno Avenue, South McDonnell Road, or Millbrae Avenue. South Airport Boulevard and North McDonnell Road have two travel lanes each way that allow for vehicles to change lanes to bypass transit vehicles pulling out of bus stops. In addition, due to the limited distances where both subsequent RADP project vehicles and transit routes would operate, the number of bus stops potentially affected by vehicles associated with subsequent RADP projects would be limited. In addition, at some stops, buses stop within the travel lane/bicycle lane to drop off and pick up riders (e.g., northbound and southbound bus stops on North

[148] For individual surface routes operated by regional agencies, such as SamTrans, a project would result in a significant impact if it would cause a transit delay greater than one-half headway. SamTrans bus routes 120, 138, 142, and 292 that operate during the weekday peak periods have headways of 20 to 60 minutes.

McDonnell Road at West Field Road) and therefore would not experience transit delay. Therefore, implementation of the RADP would not result in substantial reentry delay.

TRANSIT PASSENGER BOARDING DELAY

As shown in Table 3.A-10, p. 3.A-30, the number of new transit riders associated with subsequent RADP projects would be low; of the 89 new transit trips during the weekday a.m. peak hour, 12 trips would be on SamTrans routes, and of the 51 new transit trips during the weekday p.m. peak hour, seven trips would be on SamTrans.[149] These additional riders would not result in substantial passenger boarding delay to any one bus route because the additional riders would be spread among the multiple bus routes depending on their origin and destinations, time of travel, and direction of travel (i.e., inbound to the Airport versus outbound from the Airport). Therefore, implementation of the RADP would not result in substantial passenger boarding delay.

CONCLUSION

The increase in the number of vehicles on transportation study area roadways with implementation of the RADP would not substantially affect transit operations or cause substantial traffic-congestion-related delay to SamTrans bus routes or BART or Caltrain services. In addition, the expected increases in riders due to additional ridership generated by employees would not substantially delay SamTrans, BART, or Caltrain services. Thus, for the reasons described above, implementation of the RADP would not substantially delay transit. Therefore, the transit impacts related to implementation of the RADP would be ***less than significant***.

Impact TR-5: The RADP would not cause substantial additional vehicle miles traveled or substantially induce automobile travel. *(Less than Significant)*

CEQA Guidelines section 15064.3 requires implementation of Senate Bill 743, which identifies VMT as the primary metric for evaluating a project's environmental impact on a transportation system. CEQA Guidelines section 15064.3(b)(2) identified criteria for analyzing transportation projects. The State Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA provided advice and recommendations to lead agencies for analyzing transportation impacts in CEQA, including the effects of transportation projects on vehicle travel. As described under "Approach to Analysis," p. 3.A-23, given the limitations of available travel models, the VMT impact analysis for the RADP was evaluated qualitatively to determine if implementation of the RADP would substantially increase average VMT per capita (i.e., average VMT per passenger and average VMT per employee).

The RADP serves as a framework for future development at SFO and identifies various projects that would facilitate the development of terminal and non-movement areas of the airfield, as well as landside facilities needed to accommodate the Airport's long-term passenger activity levels. The subsequent RADP projects include improvements to landside facilities to accommodate long-term airport operations and anticipated passenger growth, regardless of implementation of the RADP. The RADP does not propose any vehicle roadway improvements that would increase vehicle capacity, nor would the RADP generate new passenger trips; however, new employee trips are anticipated to operate the improved facilities. Below describes the RADP's passenger and employee travel demand assumptions (including trip generation, ways of travel, and

[149] During the weekday a.m. peak hour, 77 of the new transit trips would be by BART and 12 trips would be by SamTrans, while during the weekday p.m. peak hour, 44 of the new transit trips would be by BART and seven trips would be by SamTrans.

trip length), changes to these associated with implementation of the RADP, any subsequent RADP project's changes to the regional transportation and logistics network, and VMT conclusions.

VMT is a factor of the number of trips that people take, the ways that people travel (e.g., how many people drive versus take transit or other modes), and the length of vehicle trips. Each of these factors is evaluated below for passengers and employees to support the qualitative assessment of VMT.

PASSENGER INCREASE IN VEHICLE MILES TRAVELED

Implementation of the RADP is intended to improve operational conditions at the Airport and would not increase the number of passengers traveling to or from the Airport since the number of passengers (2019 and future 2045 conditions) is based on the Airport's runway capacity (see Appendix C of this Draft EIR). Subsequent projects in the RADP do not propose changes to runways; thus, the subsequent RADP projects would not change the Airport's ability to serve more passengers. Therefore, projects that could occur with implementation of the RADP would not increase the total number of trips generated by passengers from 2045 future baseline without RADP conditions (see Table 3.A-7, p. 3.A-25).

The ways that people choose to travel is typically a factor of convenience (e.g., travel times, accessibility, reliability), available options, and cost. The ways people travel into and out of the Airport include driving and parking (private vehicle pick-up/drop off, for-hire vehicles, drive and park) and public transit (surface transit and BART). Implementation of the RADP would not change public transit operations such as transit travel times, availability of transit operators, and routes. The RADP also does not include any projects that would change operations relating to the use of for-hire vehicles or transit. A discussion related to the proposed changes in parking supply is presented below.

The RADP includes seven projects that would affect the employee/tenant and/or public parking supply at the Airport.[150] As presented in Table 3.A-13, the subsequent RADP projects would result in a surplus of about 3,550 parking spaces at the Airport. Changes to parking supply may affect the way that people travel to the Airport affecting the total amount of VMT if parking becomes more convenient and therefore more people decide to drive and park. However, the change in parking supply resulting from the subsequent RADP projects is not anticipated to substantially affect the primary factors that influence a passenger's way of travel for the following reasons:

- Walking distance after parking: Parking facilities would be constructed and demolished throughout SFO. The net change would not result in new passenger parking located substantially closer to or further from the terminals than existing parking locations.
- Driving time to parking: The RADP does not propose any transportation network changes that would substantially change driving time to/from the Airport.
- Parking price/payment frequency: The RADP does not propose changes to parking price or payment policies.
- Time to find parking: As more parking spaces are provided for passengers, the time that it takes to find parking could decrease and thus make driving more convenient. However, parking supply and passenger

[150] The subsequent RADP projects that include changes to employee/tenant and/or public parking supply at the Airport include the Central Hub, CONRAC, Long-Term Parking Garage #3, Long-Term Parking Garage #4, AirTrain Maintenance Yard, North Field Ground Support Equipment Facility #1, and Aircraft Maintenance Hangar projects. See Appendix E.1, Attachment D.

growth would increase at the same rate between 2019 and 2045 conditions and therefore the time it would take to find parking would be similar to today.

- Origin/Destination and trip purpose: The location of the Airport and passenger origin/destinations and trip purposes would not change with implementation of the RADP.

Therefore, the RADP does not include any subsequent projects that would result in a change to the ways that passengers travel into and out of the Airport as compared to 2045 future baseline without RADP conditions. As noted above, implementation of the RADP would not change the location of the Airport nor passengers' origin/destinations, therefore the trip lengths for passengers would not change.

Since implementation of the RADP would not change passenger trip generation, ways of travel, and trip length, implementation of the RADP would not increase VMT per passenger. Therefore, implementation of the RADP would not induce substantial additional VMT associated with passenger travel.

EMPLOYEE INCREASE IN VEHICLE MILES TRAVELED

Implementation of the RADP would result in an increase of approximately 2,700 employees at the Airport. The increase in employment is due to the additional support needed to facilitate the operational improvements anticipated with implementation of subsequent RADP projects. While implementation of the RADP would increase employee trip generation as more employees would travel to the Airport, it would not influence where an employee is traveling to or from (e.g., between the Airport and the home location; see Table 3.A-8, p. 3.A-28). Therefore, the average employee trip length would not change between the 2045 future baseline without RADP and 2045 future baseline with RADP conditions.

A review of employee travel surveys show that a majority of Airport employees drive to work.[151] The primary factors that influence an employee's decision to drive include price and payment frequency, time/availability of public transit, and first-mile/last-mile transit options. As described above for passengers, the RADP includes several projects that would affect parking supply; however, the change in parking supply is not anticipated to substantially affect an employee's decision to drive or use another way of travel for the following reasons:

- Price and payment frequency: Parking policy changes are not included in the RADP.
- Time/Availability of transit: Headway, pricing, and public transit route changes are not included in the RADP.
- First-mile/last-mile transit options: The RADP does not include any changes to transit routes and/or their origins or destinations, and public transit is not influenced by SFO.

As such, employee ways of travel are not anticipated to change with implementation of the RADP (see Table 3.A-8, p. 3.A-28). While implementation of the RADP would increase total employee trip generation due to the increase in employees, the RADP would not change the number of trips per employee, the ways that employees travel, nor trip length for people driving, and therefore, would not increase average VMT per employee. Therefore, implementation of the RADP would not induce substantial additional VMT associated with employee travel.

[151] San Francisco International Airport, *SFO BART Ridership, Residence, and Mode Summary*, 2017.

INDUCED ADDITIONAL AUTOMOBILE TRAVEL RELATED TO TRANSPORTATION NETWORK CHANGES

The RADP primarily includes changes to the onsite transportation network to support onsite circulation and operations, although the CONRAC Facility project also includes minimal changes to South Airport Boulevard. The CONRAC Facility project would change the configuration of South Airport Boulevard by restriping and modifying the median to accommodate a left-turn pocket and to provide additional bus turnouts for SamTrans buses on either side of the street at the intersection with the Long-Term Parking Garage #1 entrance roadway. These types of features fit with the general types of projects identified by the planning department that would not induce automobile travel.[152] The Central Hub and the ITB Curbside Expansion projects would provide a more efficient layout of the curbside frontage and would increase curbside capacity at the terminals; however, enhancements to existing curbside capacity would not alter the existing regional roadway capacity bottlenecks nor change roadway constraints for vehicles entering or exiting the Airport. Therefore, implementation of the RADP would not change regional roadway capacities that would substantially induce regional VMT. Therefore, implementation of the RADP would not induce VMT.

REGIONAL LOGISTICS ACTIVITY INCREASE IN VEHICLE MILES TRAVELED

SFO is a part of the regional logistics system[153] and generates VMT associated with freight and supply-chain infrastructure. MTC's Plan Bay Area 2050 acknowledges that "Industries in the goods movement sector are a key component of the region's economic strategy" and that the "goods movement sector is growing…[and] projected to double by 2040." The Plan explains "strategic investment on freight infrastructure would support supply-chain efficiencies, allowing the megaregion to maintain its economic competitiveness." MTC's Northern California Megaregion Goods Movement Study[154] acknowledges that outdated logistics facilities are causing operational inefficiencies. Similarly, the Bay Area Goods Movement Plan[155] acknowledges "growing e-commerce demands from West Coast facilities is leading to growing demand for air cargo services in the Bay Area and strong demand for warehouse space near the region's airports from third-party logistics providers serving e-commerce needs of major retailers." Consequently, logistics-related VMT will continue to increase from regional demand regardless of the implementation of the RADP. The RADP would update outdated facilities to improve efficiencies but would not change the total amount of logistics activity in the region. Therefore, implementation of the RADP would not substantially increase regional VMT related to freight or logistics activity.

CONCLUSION

Implementation of the RADP would not induce additional passenger travel demand or where they travel from, nor would it change the way they travel into and out of the Airport. Implementation of the RADP would increase employee travel demand; however, it would not change where an employee travels to and from, nor would it change the way they travel. Thus, the average VMT per passenger and average VMT per employee

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[152] *San Francisco Transportation Impact Analysis Guidelines*, Appendix L, Vehicle Miles Traveled (VMT)/Induced Automobile Travel, pp. L-15 and L-16, https://citypln-m-extnl.sfgov.org/SharedLinks.aspx?accesskey=d7846dda8f994e3e1e72b28eb245c5834c80aab64f63a21eab9a41f82b4af63e&VaultGUID=A4A7DACD-B0DC-4322-BD29-F6F07103C6E0, accessed October 16, 2024.

[153] The regional logistics system is based around a freight transportation network that includes the regional highway network, intermodal facilities, and cargo-handling airports, including SFO. The regional logistics system serves as a domestic trade gateway to other regions in California and the U.S., as well as serving the daily needs of local consumers in the bay area.

[154] Metropolitan Transportation Commission, *Northern California Megaregion Goods Movement Study*, June 2019, p. 7. https://mtc.ca.gov/sites/default/files/Northern_California_Megaregion_Goods_Movement_Study.pdf, accessed August 16, 2024.

[155] Metropolitan Transportation Commission, *Bay Area Goods Movement Plan*, February 2016, p. 34. https://mtc.ca.gov/sites/default/files/RGM_Full_Plan.pdf, accessed August 16, 2024.

would not increase between the 2045 future baseline without RADP and the 2045 future baseline with RADP conditions. In addition, implementation of the RADP would not increase regional travel due to changes to the transportation network or logistics network change. For these reasons, impacts of implementation of the RADP related to VMT would be ***less than significant***.

Impact TR-6: The RADP would not result in a passenger or freight loading deficit. *(Less than Significant)*

PASSENGER LOADING

None of the subsequent projects that could occur with implementation of the RADP would generate passenger loading demand; however, the Central Hub and ITB Curbside Expansion projects would expand the existing passenger loading facilities, as follows:

- The Central Hub project would include one level for curbside passenger pickup to augment passenger pick-up/drop-off at domestic terminals and the ITB. In addition, one to two levels for commercial ground transportation staging and passenger curbside pickup areas to alleviate terminal roadway congestion and eliminate go-around driving by ground transportation modes.
- The ITB Curbside Expansion project would construct a new ITB arrivals and departures level curbside beyond the existing outer curbsides to relieve congestion along the ITB curbside during peak periods. The expansion would provide one additional island curb and six additional lanes on both levels for passenger pickup and drop-off.

The expanded passenger loading facilities would accommodate the growth in passenger loading demand discussed under the 2045 future baseline without RADP conditions. The current practice of managing curb space and staging lots used by private autos and ground transportation such as taxis, limos, TNC vehicles, public transit, and privately operated charter buses would continue to occur under 2045 future baseline with RADP conditions. Thus, subsequent projects that could occur with implementation of the RADP would not result in a substantial passenger loading deficit that could result in secondary impacts (i.e., create a new potentially hazardous condition for people walking, bicycling, or driving, or substantially delay public transit).

FREIGHT LOADING

The following ten subsequent projects that could occur with implementation of the RADP would not generate freight loading demand: Terminal 3 Façade Expansion, Central Hub, Domestic Terminal Roadway Reconstruction, ITB Curbside Expansion, Long-Term Parking Garage #3, Long-Term Parking Garage #4, Rental Car Short-Term Storage Lot, Terminal 2 AirTrain Station Platform Expansion, Rental Car Center AirTrain Station Platform Expansion, and Sanitary Sewer Force Main Realignment projects. Therefore, the assessment of freight loading focuses on the following ten subsequent projects that could occur with implementation of the RADP:

- The new Boarding Area H project would include airport concessions (e.g., retail stores, food, restaurants) for passengers. The new boarding area would include designated and secure loading docks with multiple bays. Therefore, deliveries for the concessions as well as other deliveries required for operations and maintenance of the new boarding area would be accommodated onsite within designated access-restricted loading docks that would be accessed via North Link Road.

- The Boarding Area F Modernization, ITB Main Hall Expansion, and ITB Boarding Areas A and G Improvement projects would increase the number of existing concessions, which could minimally increase deliveries. The expansion of these additional deliveries would be accommodated within the existing loading docks (e.g., more supplies on the same truck making existing deliveries as well as additional deliveries). Similar to 2045 future baseline without RADP conditions, because access to the loading facilities would continue to be controlled by San Francisco Police Service Aid at all times and deliveries required to be scheduled, a loading deficit would not result. The CONRAC Facility project would include some space for concession amenities, and the adjacent Consolidated Rental Car Quick Turn-Around Facility project would require deliveries of supplies for operations. These projects would include onsite loading areas to accommodate deliveries required for operations and maintenance.
- The AirTrain Maintenance Yard, North Field Ground Support Equipment #1, Aircraft Maintenance Hangar, and East Field Ground Support Equipment #2 projects would require deliveries of supplies for operations and maintenance activities. Deliveries for these projects would be accommodated within the facility.

Thus, subsequent projects that could occur with implementation of the RADP would not result in a commercial vehicle loading deficit that could result in secondary impacts (e.g., create a new potentially hazardous condition for people walking, bicycling, or driving).

CONCLUSION

Subsequent projects that could occur with implementation of the RADP would expand the existing passenger loading facilities and accommodate freight loading demand within existing and proposed loading facilities and would not result in a passenger or commercial freight loading deficit. For these reasons, impacts from implementation of the RADP related to passenger and freight loading would be ***less than significant***.

Impact TR-7: The RADP would not result in a substantial parking deficit. *(Less than Significant)*

Under the 2045 future baseline without RADP condition the combined passenger and employee parking demand at the Airport would exceed the total supply of public parking and dedicated employee parking, resulting in a parking deficit of about 3,060 spaces. When the practical operational capacity of public parking facilities[156] is taken into account, the parking deficit at the Airport would be about 4,800 spaces under the 2045 future baseline without RADP condition.

Table 3.A-13 presents the parking supply, demand, and capacity utilization, and identifies the parking spaces surplus or deficit for the 2045 future baseline without RADP and the 2045 future baseline with RADP conditions.

Under 2045 future baseline with RADP conditions, implementation of the RADP would not change the passenger parking demand (i.e., the number of passengers would not increase due to implementation of the RADP; see Appendix C, Airport Facilities to Accommodate Aviation Demand). However, subsequent projects that could occur with implementation of the RADP would increase the public parking supply from 17,643 spaces under the 2045 future baseline without RADP conditions to 27,569 spaces under the 2045 future

[156] Public parking garage occupancies of about 90 percent are usually considered the highest acceptable target since someone looking for a space will not find an empty one easily. This practical capacity reflects the difficulty drivers have in locating the last available space in a large facility, accounts for vehicles circulating in a parking structure, and allows for improperly parked vehicles and other inefficiencies.

baseline with RADP conditions (i.e., an increase of 9,926 public parking spaces). Therefore, as shown in Table 3.A-13, p. 3.A-54, with implementation of the RADP, the parking deficit identified for public parking under the 2045 future baseline without RADP condition would be eliminated, and there would be a surplus of public parking spaces. Subsequent RADP projects providing public parking spaces would be constructed as passenger parking demand is realized.

Table 3.A-13 Comparison of SFO Parking Supply, Demand, and Utilization for 2045 Future Baseline without RADP and 2045 Future Baseline with RADP Conditions

	Supply	Demand	Surplus/Deficit	Capacity Utilization
2045 Future Baseline without RADP				
Public parking	17,643	19,522	-1,879	111%
Employee parking	11,550	12,733	-1,183	110%
TOTAL	**29,193**	**32,255**	**-3,062**	**110%**
2045 Future Baseline with RADP				
Public parking	27,569	19,522	8,047	71%
Employee parking	8,892	13,391	-4,499	151%
TOTAL	**36,461**	**32,913**	**3,548**	**90%**

SOURCE: Fehr & Peers/LCW Consulting, 2025 (see Appendix E.2),

Under the 2045 future baseline with RADP conditions, implementation of the RADP would increase the employee parking demand by 658 spaces due to the additional 2,700 employees added to the project site and would reduce employee parking supply by 2,658 parking spaces. Thus, implementation of the RADP would increase the employee parking deficit from 1,183 spaces under the 2045 future baseline without RADP condition to 4,499 spaces under the 2045 future baseline with RADP condition.

This increase in the employee parking deficit would not result in secondary effects such as potentially hazardous conditions for people walking, bicycling, or driving; or interfere with accessibility for people walking or bicycling or inadequate access for emergency vehicles; or substantially delay transit for the following reasons: all employee parking would occur within the Airport and not on adjacent roadways; employees could park within the public parking garages, which would have a surplus of 8,047 parking spaces under the 2045 future baseline with RADP condition; and transit options are available. As described above under Local Regulations (p. 3.A-20), the SFO Less Policy establishes parameters that support and promote transit to, from, and within the Airport by employees and passengers. For example, the Go>SFO commuter bus program, which provides shuttles between SFO and major destinations, could reduce employee travel by private auto and reduce employee parking demand.

Overall, as shown in Table 3.A-13, p. 3.A-54, under 2045 future baseline with RADP conditions, the combined parking supply of 36,461 spaces (i.e., public parking plus employee spaces) would accommodate the combined passenger and employee demand of 32,913 spaces. Thus, implementation of the RADP would eliminate the parking deficit that would occur under 2045 future baseline without RADP conditions and result in a surplus of 3,548 parking spaces at SFO. The resulting overall capacity utilization of 90 percent would be within the practical operational capacity of the parking facilities.

Thus, implementation of the RADP would not cause a substantial vehicular parking deficit that would result in secondary effects, and impacts from implementation of the RADP related to a substantial parking deficit would be ***less than significant***.

Cumulative Impacts

The travel demand projections for the 2045 future baseline without RADP and 2045 future baseline with RADP conditions consider the regional changes in housing units, employment, and passengers that would occur by 2045 regardless of implementation of the RADP. Therefore, the operational environmental impact analysis of implementation of the RADP presented under Impacts TR-2 through TR-7 is largely a cumulative impact analysis by nature. In addition, routine Airport infrastructure repair, maintenance, and improvement projects (e.g., repaving, infrastructure repair and replacements, upgrades) are ongoing at the Airport under existing conditions. It is anticipated that such projects will continue to be implemented through 2045 and are therefore considered in this cumulative analysis.

The discussion of cumulative transportation impacts analyzes whether implementation of the RADP, in conjunction with overall regional growth and cumulative projects listed in Table 3-2, p. 3-8, and mapped on Figure 3-1, p. 3-11, would significantly affect the transportation network and, if so, whether the RADP's contribution to the cumulative impact would be considerable.

Impact C-TR-1: Construction of RADP projects, in combination with cumulative projects, would not result in significant construction-related transportation impacts. *(Less than Significant)*

The construction schedules of the Tanforan (cumulative project #13), 1000 San Mateo Avenue (cumulative project #14), 1100 El Camino Real (cumulative project #15), Millbrae Serra Station (cumulative project #16), the Terminal 101 Redevelopment (cumulative project #17), and the Infinite 131 (cumulative project #18) projects are not currently known. In addition, these projects would not overlap spatially with subsequent projects that could occur with implementation of the RADP, and therefore construction of these cumulative projects would not combine with the less-than-significant construction-related transportation impacts of the RADP.

Construction of the Moxy Hotel in Millbrae (cumulative project #12) would occur over a 16-month period and would occur within a site that currently contains two hotels. Construction vehicles would access the Moxy Hotel site via the existing driveway on Millbrae Avenue between U.S. 101 and South McDonnell Road/Old Bayshore Highway. Construction of the Moxy Hotel would not include any changes to the access driveway or travel lanes on Millbrae Avenue. Construction of the A-1 Self Storage (cumulative project #19) facility on SamTrans peninsula would not occur over an extended duration. Construction vehicles would use North Access Road to access the island and could overlap with Airport projects using North Access Road for access (e.g., North Field Ground Support Equipment Facility #1; Aircraft Maintenance Hangar; East Field Ground Support Equipment Facility #2; and Building 944, which is part of Boarding Area F Modernization) and/or that would have construction within the roadway (i.e., SFO's Shoreline Protection Program project for a short duration on North Access Road). Due to the low traffic volumes on North Access Road and two travel lanes each way on the segment west of SamTrans peninsula, any overlap of construction traffic with temporary travel lane closures would not substantially affect access to SamTrans peninsula. The OneShoreline (cumulative project #20) project along the shoreline from south of the Airport to Coyote Point would connect with SFO's Shoreline Protection Program. Construction trucks would use the U.S. 101 Millbrae ramps for access to and from the shoreline in the northern portion of the project; however, construction activities would not be in proximity to subsequent RADP projects. Therefore, construction of these cumulative projects would not combine with the less-than-significant construction-related transportation impacts of the RADP to result in a significant cumulative construction-related transportation impact.

Eleven cumulative projects would be on Airport property (one at West of Bayshore and ten within the RADP project site). These projects may partially or completely overlap with subsequent RADP projects and could use similar access roadways such as North Access Road, South Airport Boulevard, and the U.S. 101 access ramps. As with subsequent RADP projects, these cumulative projects would be required to comply with the Airport's Standard Construction Measures. SFO or its contractors would also be required to coordinate with Caltrans if project construction activities encroach onto the state highway right-of-way or for transportation of oversized loads and certain materials, as appropriate. The Airport's Standard Construction Measures require contractors to coordinate with SFO's Airport Operations division. Thus, the traffic control plans for all SFO projects under cumulative conditions would be coordinated, similar to the ongoing coordination activities for the multiple concurrent projects occurring at the Airport. To the extent that construction activities affect the transportation network, the traffic control plans would help maintain the safety of public roadways for people walking, bicycling, or driving, emergency access, accessibility for people walking or bicycling, and public transit operations. For these reasons, implementation of the RADP would not combine with cumulative projects to result in significant construction-related cumulative transportation impacts; therefore, cumulative construction-related transportation impacts would be ***less than significant***.

Impact C-TR-2: The RADP, in combination with cumulative projects, would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations; would not interfere with the accessibility of people walking or bicycling, or result in inadequate emergency access; would not delay transit; would not cause substantial additional VMT or substantially induce automobile travel, or result in substantial loading or parking deficits. *(Less than Significant)*

All of the cumulative projects identified in Table 3-2, p. 3-8, would exist in both the 2045 future baseline without RADP and 2045 future baseline with RADP conditions. Therefore, the analysis of the environmental impacts associated with operation of subsequent RADP projects under Impacts TR-2 through Impact TR-7 is a cumulative impact analysis.

POTENTIALLY HAZARDOUS CONDITIONS AND ACCESSIBILITY

Cumulative development and infrastructure projects listed in Table 3-2, p. 3-8, would conform to SFO standards or South San Francisco, San Bruno, Millbrae, and Burlingame development standards and code requirements, as applicable. With the exception of the changes to the travel lanes on South Airport Boulevard to provide for left turn pockets and bus pullouts for SamTrans as part of the CONRAC Facility project, no other subsequent RADP projects would result in permanent changes to the transportation network. As described under Impact TR-2, the CONRAC Facility project would restripe South Airport Boulevard adjacent to the site and provide additional bus turnouts on either side of South Airport Boulevard at the intersection with the Long-Term Parking Garage #1 entrance roadway. These changes would not create potentially hazardous conditions for people walking, bicycling or driving, or public transit operations on South Airport Boulevard, and no cumulative projects would combine with the CONRAC Facility project to create potentially hazardous conditions on South Airport Boulevard. Therefore, subsequent RADP projects, in combination with cumulative projects, would not create potentially hazardous conditions for people bicycling, walking, or driving, or for transit operations, or impede access for people walking or bicycling, or for emergency vehicles. Thus, a significant cumulative impact would not occur and cumulative impacts related to potentially hazardous conditions and accessibility would be ***less than significant***.

TRANSIT DELAY

The transit delay analysis under Impact TR-4 is a cumulative analysis in that it includes traffic generated by cumulative projects traveling on these roadways. As discussed under Impact TR-4, implementation of the RADP would not delay transit. Therefore, implementation of the RADP, in combination with cumulative projects, would not result in substantial transit delay. Thus, a significant cumulative impact would not occur and significant cumulative impacts related to transit delay would be ***less than significant***.

VMT

As discussed under Impact TR-5, with implementation of the RADP both VMT per passenger and VMT per employee would not increase between 2045 future baseline without RADP and 2045 future baseline with RADP conditions. In addition, the RADP would not include any projects that would induce automobile travel and would not substantially increase regional VMT related to freight or logistics activity. Therefore, the RADP would not combine with cumulative projects to result in significant cumulative VMT impacts and the impact would be ***less than significant***.

LOADING

Any passenger and freight loading activities associated with the cumulative projects would be localized in the vicinity of the cumulative projects and would not combine with subsequent RADP projects to result in a substantial loading deficit. Thus, a significant cumulative impact would not occur and cumulative impacts related to loading would be ***less than significant***.

PARKING

Any parking demand associated with the off-Airport cumulative projects would be localized in the vicinity of the cumulative projects and would not combine with subsequent RADP projects to result in a substantial parking deficit. As described under 2045 future baseline without RADP conditions, two cumulative projects within the Airport would change parking supply: the SFO Consolidated Administrative Campus Phase 2 project would add 1,105 net-new vehicle parking spaces, while the West Field Cargo Redevelopment project would eliminate 527 vehicle parking spaces, resulting in a net increase in employee/tenant parking supply of 578 vehicle parking spaces. These spaces were assumed as part of the parking analysis for 2045 future baseline with RADP conditions under Impact TR-7. Thus, subsequent RADP projects, in combination with cumulative projects, would not create a parking deficit. Therefore, a significant cumulative would not occur and cumulative impacts related to parking would be ***less than significant***.

For these reasons, implementation of the RADP would not combine with cumulative projects to result in significant cumulative transportation and circulation impacts. As such, cumulative transportation and circulation impacts would be ***less than significant***.

3.B Noise and Vibration

3.B.1 Introduction

This section describes the existing noise setting; outlines the regulatory framework applicable to the RADP; evaluates the potential for construction and operation of projects implemented under the RADP to cause adverse noise and vibration impacts; and identifies mitigation measures to avoid or reduce potential adverse impacts. Noise and vibration topics consist of temporary or permanent increases in ambient noise levels, generation of excessive groundborne vibration or noise, and exposure to excessive noise levels near airports. Supporting detailed technical information is included in Appendix F of this Draft EIR. Implementation of the RADP would not induce passenger demand (i.e., induce the public to choose to fly if and/or where they otherwise would not), nor would the RADP increase the capacity of the airfield, change the configuration of the existing runways, change the number of aircraft operations or aircraft types operating at the Airport (including cargo, private jets, and helicopters), or change the volume of annual passengers that choose to fly into and out of SFO. Therefore, given that implementation of the RADP would not result in changes related to aircraft or the configuration of the existing runways, aircraft noise is not analyzed. This analysis focuses on construction and operational noise impacts from implementation of subsequent RADP projects that would provide the terminal and landside facilities needed to accommodate long-term passenger and aircraft demand at the Airport.

3.B.2 Environmental Setting

General Characteristics of Noise

Sound is characterized by parameters that describe the rate of *oscillation* (frequency) of sound waves, the distance between successive troughs or crests in waves, the speed that they travel, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize how loud a sound is, and the decibel (dB) scale is used to quantify sound intensity. Because the human ear is not equally sensitive to all sound frequencies, human response is factored into sound descriptions in a process called *A-weighting*, expressed as *dBA*. The dBA, or A-weighted decibel, refers to a scale of noise measurement that reflects the different frequencies that humans can hear. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. Except in carefully controlled laboratory experiments, a change of only 1 dBA in sound level cannot be perceived. Outside of the laboratory, a 3 dBA change is considered a perceptible difference while a 5 dBA change is considered readily noticeable. A 10 dBA increase in the level of a continuous noise represents a perceived doubling of loudness.[157] **Table 3.B-1** presents representative noise sources and their corresponding noise levels in dBA at varying distances from the noise sources.

[157] California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, pp. 2-44 to 2-45, http://www.dot.ca.gov/env/noise/docs/tens-sep2013.pdf, accessed August 1, 2024.

Table 3.B-1 Representative Environmental Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock band
Jet fly-over at 100 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck going 50 mph at 50 feet		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area during daytime		
Gas lawnmower at 100 feet	**70**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**60**	
		Large business office
Quiet urban area during daytime	**50**	Dishwasher in next room
Quiet urban area during nighttime	**40**	Theater, large conference room (background)
Quiet suburban area during nighttime		
	30	Library
Quiet rural area during nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

SOURCE: California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013, p. 2–20

Noise Descriptors

Noise is generally defined as sound that is loud, disagreeable, unexpected, or unwanted. Variations in noise exposure over time are typically expressed in terms of a steady-state energy level (called L_{eq}) that represents the acoustical energy of a given measurement, or alternatively as a statistical description of what sound level is exceeded over some fraction (10, 50, or 90 percent) of a given observation period (e.g., L_{10}, L_{50}, L_{90}). L_{max} is the maximum instantaneous noise level registered during a measurement period.

Noise metrics assess community response to noise by including the loudness of the noise, total number of noise events, duration, and time of day that the noise events occur in one single number rating scale. Day-

Night Average Sound Level (DNL), also referred to as L_{dn}, is expressed in dBA and represents the noise level over a 24-hour period. DNL is a 24-hour average of hourly L_{eq} noise levels, but with penalties to account for the increase in sensitivity to noise events that occur during more sensitive nighttime periods. Specifically, DNL adds a penalty of 10 dB to the measured noise levels during the nighttime period (10 p.m. to 7 a.m.). The Federal Aviation Administration (FAA) has adopted DNL as the noise metric for measuring cumulative aircraft noise under 14 Code of Federal Regulations (CFR) part 150, Airport Noise Compatibility Planning. The Department of Housing and Urban Development, the Department of Defense, and the Federal Transit Administration (FTA) have also adopted DNL.

Community Noise Equivalent Level (CNEL), also referred to as L_{dn}, is expressed in dBA and is used in California to represent cumulative noise exposure. Similar to DNL, CNEL is a 24-hour average of hourly L_{eq} noise levels. Unlike DNL, CNEL includes penalties applied to noise events occurring in the evening, which is defined as after 7 p.m. and before 10 p.m., when noise is considered more intrusive. Both metrics contain nighttime (10 p.m. to 7 a.m.) penalties. When a noise event occurs in the evening, a penalty of 4.77 dBA is added to the measured sound level. A 10 dBA penalty is added to nighttime noise events. The evening weighting is the only difference between CNEL and DNL. For purposes of aircraft noise analysis in California, the FAA recognizes the use of CNEL.

Health Effects of Environmental Noise

The World Health Organization is a recognized source of current knowledge regarding health impacts, including those generated by noise. According to the World Health Organization, one health effect is sleep disturbance, which can occur when continuous indoor noise levels exceed 30 dBA (L_{eq}) or when intermittent interior noise levels reach or exceed 45 dBA (L_{max}), particularly if background noise is low. With a bedroom window slightly open (a reduction from outside to inside of 15 dB), the World Health Organization criteria suggest that acceptable nighttime ambient noise levels should be 45 dBA (L_{eq}) or below, and short-term events should not generate noise in excess of 60 dBA (L_{max}). The World Health Organization also notes that maintaining noise levels within the recommended levels during the first part of the night helps people to fall asleep.[158]

Other potential health effects identified by the World Health Organization include decreased performance on complex cognitive tasks, such as reading, attention, problem solving, and memorization; physiological effects such as hypertension and heart disease (after many years of constant exposure, often by workers, to high noise levels); and hearing impairment (generally after long-term occupational exposure, but also after shorter-term exposure to very high noise levels, for example, exposure several times a year to a concert with noise levels at 100 dBA). Noise can also disrupt speech intelligibility at relatively low levels; for example, in a classroom setting, a noise level as low as 35 dBA can disrupt clear understanding. Finally, noise can cause annoyance and can trigger emotional reactions like anger, depression, and anxiety. The World Health Organization reports that during daytime hours, few people are seriously annoyed by activities with noise levels below 55 dBA, or moderately annoyed by activities with noise levels below 50 dBA.

Vehicle traffic and continuous sources of machinery and mechanical noise contribute to unhealthy ambient noise levels. Short-term noise sources, such as large vehicle audible warnings, the crashing of material being loaded or unloaded, car doors slamming, and engines revving, contribute very little to 24-hour noise levels but are capable of causing sleep disturbance and annoyance. The effect of noise on receptors depends on both

[158] World Health Organization, *Guidelines for Community Noise*, April 1999, Chapter 3, p. 46.

time and context. For example, long-term high noise levels from large traffic volumes can make conversation at a normal voice level difficult or impossible, while short-term peak noise levels at night can disturb sleep.

Vibration and Groundborne Noise

Groundborne noise typically refers to noise generated by vibrations from outside a structure but experienced inside the structure. Groundborne noise can be a problem in situations where the primary airborne noise path is blocked, such as in the case of a subway tunnel passing near homes or other sensitive structures. Vibration is an oscillatory motion through a solid medium. Typically, groundborne vibrations generated by man-made activities attenuate rapidly with the distance from the source of the vibration. The effects of vibration on structures are typically measured by peak particle velocity (PPV) in inches per second (in/sec). Vibration decibels (VdB) are the units used to assess the effects of vibrations on people. VdB is used to distinguish vibration decibels from sound decibels (dB).

With the exception of long-term occupational exposure, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that can affect concentration or disturb sleep. Vibration that results in sleep disturbance may result in health effects related to that sleep disturbance.

People may tolerate infrequent, short-duration vibration levels, but human annoyance to vibration becomes more pronounced if the vibration is continuous or occurs frequently. High levels of vibration can damage fragile buildings or interfere with sensitive equipment. Depending on the age of the structure and type of vibration (transient, continuous, or frequent intermittent sources), vibration levels as low as 0.5 to 2.0 in/sec PPV can damage a structure.[159]

Typical sources of groundborne vibration in urban areas are large-scale construction projects that involve pile driving, vibratory construction equipment, or underground tunneling. Vibration is also caused by transit rail vehicles, including Caltrain and Bay Area Rapid Transit (BART) trains. In general, such vibration is only an issue when there are sensitive receptors located nearby. Because rubber tires and suspension systems mitigate vibrations, rubber tire vehicles such as buses, trucks, and automobiles rarely create substantial vibration absent discontinuities in the road surface.[160]

Existing Conditions

Existing Noise Sources

All of the subsequent RADP projects would be located on Airport property where the primary noise sources consist of aircraft operations and vehicle traffic on U.S. 101 and airport roadways. Secondary noise sources include vehicle traffic on arterial roadways such as Millbrae Avenue, San Bruno Avenue, and North Access Road. Noise from commercial activities and ongoing construction staging activities at the Aviador Lot construction staging area contribute to the ambient noise environment in the vicinity. Similarly, noise associated with ongoing construction staging activities at Plot 16D, commercial activities to the north, and noise from U.S. 101, Interstate 380, and North Access Road contribute to the ambient noise environment in the

[159] California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, April 2020, Table 19, p. 38, https://dot.ca.gov/programs/environmental-analysis/noise-vibration/guidance-manuals, accessed August 1, 2024.
[160] U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018, p. 116, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-NO-0123_0.pdf, accessed August 1, 2024.

vicinity. The study area for potential noise and vibration impacts is 900 feet from subsequent RADP project sites.[161] Because groundborne vibration attenuates more rapidly with distance than airborne noise, this distance conservatively accounts for vibration impacts that could occur in the study area with construction of subsequent RADP projects. **Figure 3.B-1** shows the location of RADP projects and the 900-foot study area.

Ambient Noise Measurements

The land uses in the noise study area consist primarily of commercial hotel uses to the south, residential uses to the west across U.S. 101 in the cities of Millbrae and San Bruno, and industrial uses to the north in the City of South San Francisco. To characterize the background noise environment at sensitive receptors[162] in the vicinity of subsequent RADP projects, a combination of noise data was collected, including ground-level noise monitoring data from SFO, which was supplemented with long-term (24-hour) and short-term (approximately 20-minute) noise measurements conducted by ESA (see **Figure 3.B-2**).

SFO operates a network of noise monitoring sites to focus on measuring aircraft noise throughout the *airport influence area*,[163] which includes San Mateo County as a whole. Long-term data from SFO monitoring stations were collected in 2019 prior to Covid-19 shelter-in-place orders and the associated economic downturn, which have affected local roadway volumes and aircraft operations (the primary noise sources in the area). To supplement the data collected by SFO, ESA conducted one long-term (24-hour) sound level measurement along Old Bayshore Highway across the street from the Westin Hotel[164] (LT-3) to the south of the Airport from February 8, 2021 (Monday) to February 10, 2021 (Wednesday). One long-term (24 hour) sound level measurement was also collected near the Residence Inn by Marriott San Francisco Airport (LT-9) west of the Aviador Lot on November 29, 2023 (Wednesday). Short-term measurements were initially collected in the vicinity of the Airport in October of 2019 and updated in 2021[165] at locations where offsite sensitive receptors may be impacted by construction haul and delivery trucks, including at the nearest offsite sensitive receptors to RADP projects (ST-6, and ST-7) and the Lot near Tanks construction staging area (ST-5). A short-term measurement was also conducted at the Grand Hyatt at SFO (ST-2), the only sensitive receptor located on Airport property.

A summary of noise measurement results is presented in **Table 3.B-2**. Long-term data from the SFO locations in Table 3.B-2 are from weekend days and mid-weekdays (Tuesdays and Wednesdays), which were selected to represent typical weekly variations in travel patterns. As shown in Table 3.B-2, noise measurements indicate that daytime noise levels in the study area range from 58 to 73 dBA, L_{eq}, while nighttime noise levels range from 56 to 68 dBA, L_{eq}. Noise sources vary by monitoring location, but generally consist of aircraft operations and vehicle traffic on highways and local roadways.

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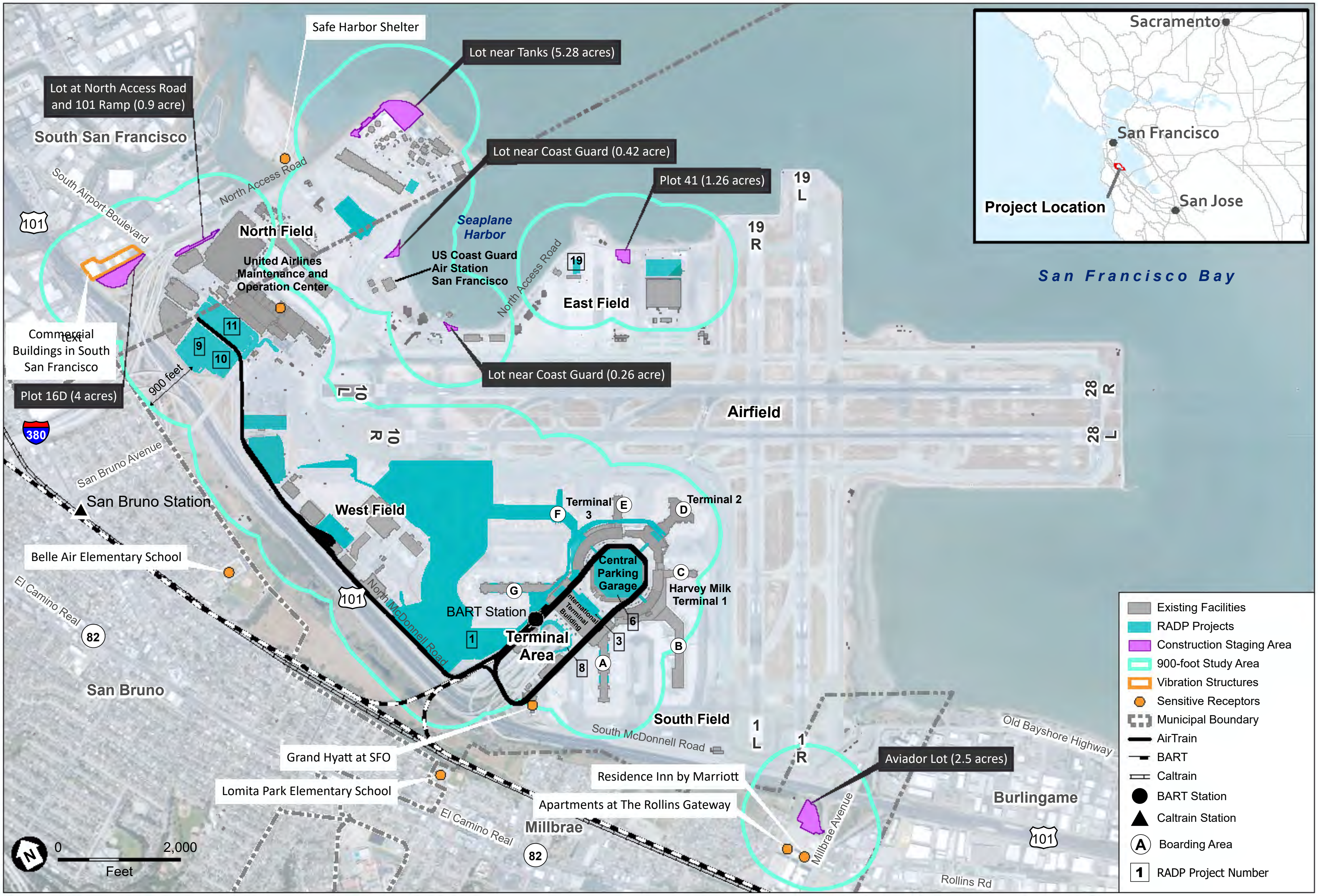
[161] This distance accounts for typical construction noise levels that can affect a sensitive receptor if there is a direct line-of-sight between a noise source and a sensitive receptor (e.g., a piece of equipment generating 85 dBA would attenuate to 60 dBA over a distance of 900 feet). An exterior noise level of 60 dBA will typically attenuate to an interior noise level of 35 dBA with the windows closed and 45 dBA with the windows open.

[162] Some land uses are more sensitive to noise levels because of the types of activities typically associated with those uses. Residences, hotels, schools, childcare facilities, senior care facilities, and hospitals are generally more sensitive to increases in noise levels than commercial and industrial land uses, and therefore are considered sensitive receptors.

[163] The *airport influence areas* are boundaries defined by the Comprehensive Airport Land Use Compatibility Plan for the Environs of SFO as areas where height, noise, overflight and safety standards, policies, and criteria are applied to certain proposed land use decisions.

[164] Hotels are a commercial land use that is not considered noise sensitive during daytime hours; however, as a location where people are reasonably expected to sleep, they are considered a noise-sensitive receptor during nighttime hours.

[165] All monitoring was conducted using a Larson Davis LxT sound level meter, which was calibrated prior to use and operated according to the manufacturer's specifications.



SOURCE: Esri, 2024; San Mateo County, 2023; SFO, 2024; ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 3.B-1
RADP PROJECTS AND CONSTRUCTION STAGING AREAS

SOURCE: Google, 2020; ESA, 2021

SFO Recommended Airport Development Plan EIR

FIGURE 3.B-2
NOISE MONITORING LOCATIONS

Table 3.B-2 Summary of Long-Term and Short-Term Noise Monitoring in the Airport Vicinity

Measurement Location		Time Period	Noise Level [a]	Contributing Noise Sources
Long-Term (LT) Measurements (24 hours or more)				
LT-1	**San Bruno. 4th Avenue between San Bruno Avenue and Walnut Street**	Saturday 10/16/19 Daytime Nighttime 24-hour	 68 dBA (L_{eq}) 68 dBA (L_{eq}) 74 dBA (L_{dn})	Aircraft and vehicle traffic on I-380, U.S. 101, and local roadways
LT-1	**San Bruno. 4th Avenue between San Bruno Avenue and Walnut Street**	Sunday 10/17/19 Daytime Nighttime 24-hour	 69 dBA (L_{eq}) 66 dBA (L_{eq}) 73 dBA (L_{dn})	Aircraft and vehicle traffic on I-380, U.S. 101, and local roadways
LT-1	**San Bruno. 4th Avenue between San Bruno Avenue and Walnut Street**	Wednesday 10/20/19 Daytime Nighttime 24-hour	 68 dBA (L_{eq}) 67 dBA (L_{eq}) 73 dBA (L_{dn})	Aircraft and vehicle traffic on I-380, U.S. 101, and local roadways
LT-3	**Millbrae. Old Bayshore Highway, across from Westin Hotel**	Tuesday 2/9/21 Daytime Nighttime 24-hour	 65 dBA (L_{eq}) 61 dBA (L_{eq}) 68 dBA (L_{dn})	Aircraft and vehicle traffic on Old Bayshore Highway and U.S. 101
LT-3	**Millbrae. Old Bayshore Highway, across from Westin Hotel**	Wednesday 2/10/21 Daytime Nighttime 24-hour	 69 dBA (L_{eq}) 62 dBA (L_{eq}) 71 dBA (L_{dn})	Aircraft and vehicle traffic on Old Bayshore Highway and U.S. 101; an adjacent lawn mower affected 2 hours, driving up daytime L_{eq} and L_{dn}
LT-5	**San Bruno. Easton Avenue approximately 150 feet north of Kaines Avenue**	Saturday 10/16/19 Daytime Nighttime 24-hour	 62 dBA (L_{eq}) 61 dBA (L_{eq}) 68 dBA (L_{dn})	Aircraft, vehicle traffic on local roadways, and Caltrain
LT-5	**San Bruno. Easton Avenue approximately 150 feet north of Kaines Avenue**	Sunday 10/17/19 Daytime Nighttime 24-hour	 64 dBA (L_{eq}) 61 dBA (L_{eq}) 68 dBA (L_{dn})	Aircraft, vehicle traffic on local roadways, and Caltrain
LT-5	**San Bruno. Easton Avenue approximately 150 feet north of Kaines Avenue**	Wednesday 10/20/19 Daytime Nighttime 24-hour	 63 dBA (L_{eq}) 62 dBA (L_{eq}) 68 dBA (L_{dn})	Aircraft, vehicle traffic on local roadways, and Caltrain
LT-8	**Millbrae. Approximately 450 feet east of the intersection of Aviador Avenue and Roblar Avenue**	Saturday 10/16/19 Daytime Nighttime 24-hour	 63 dBA (L_{eq}) 62 dBA (L_{eq}) 69 dBA (L_{dn})	Aircraft, vehicle traffic on U.S. 101 and local roadways, and Caltrain/BART station operations
LT-8	**Millbrae. Approximately 450 feet east of the intersection of Aviador Avenue and Roblar Avenue**	Sunday 10/17/19 Daytime Nighttime 24-hour	 62 dBA (L_{eq}) 60 dBA (L_{eq}) 67 dBA (L_{dn})	Aircraft, vehicle traffic on U.S. 101 and local roadways, and Caltrain/BART station operations

Measurement Location		Time Period	Noise Level[a]	Contributing Noise Sources
LT-8	**Millbrae. Approximately 450 feet east of the intersection of Aviador Avenue and Roblar Avenue**	Wednesday 10/20/19 Daytime Nighttime 24-hour	 63 dBA (L_{eq}) 61 dBA (L_{eq}) 68 dBA (L_{dn})	Aircraft, vehicle traffic on U.S. 101 and local roadways, and Caltrain/BART station operations
LT-9	**Millbrae. Residence Inn by Marriott San Francisco Airport**	Wednesday 11/29/23 Daytime Nighttime 24-hour	 63 dBA (L_{eq}) 61 dBA (L_{eq}) 62 dBA (L_{dn})	Traffic on U.S. 101 and local roadways
LT-22	**San Bruno. Santa Dominga Avenue between San Anselmo Avenue and San Antonio Avenue**	Saturday 10/16/19 Daytime Nighttime 24-hour	 59 dBA (L_{eq}) 56 dBA (L_{eq}) 63 dBA (L_{dn})	Aircraft, vehicle traffic on U.S. 101 and local roadways, and Caltrain/BART station operations
LT-22	**San Bruno. Santa Dominga Avenue between San Anselmo Avenue and San Antonio Avenue**	Sunday 10/17/19 Daytime Nighttime 24-hour	 60 dBA (L_{eq}) 56 dBA (L_{eq}) 63 dBA (L_{dn})	Aircraft, vehicle traffic on U.S. 101 and local roadways, and Caltrain/BART station operations
LT-22	**San Bruno. Santa Dominga Avenue between San Anselmo Avenue and San Antonio Avenue**	Wednesday 10/20/19 Daytime Nighttime 24-hour	 58 dBA (L_{eq}) 59 dBA (L_{eq}) 65 dBA (L_{dn})	Aircraft, vehicle traffic on U.S. 101 and local roadways, and Caltrain/BART station operations
Short-Term (ST) Measurements (approximately 20 minutes)				
ST-1	**San Bruno. San Bruno Avenue east of 7th Avenue**	Friday 10/15/19 1:12 p.m. to 1:32 p.m.	72 dBA (L_{eq})	Vehicle traffic on San Bruno Avenue and U.S. 101
ST-1	**San Bruno. San Bruno Avenue east of 7th Avenue**	Monday 2/8/21 12:15 p.m. to 12:30 p.m.	73 dBA (L_{eq})	Vehicle traffic on San Bruno Avenue and U.S. 101
ST-2	**Grand Hyatt at SFO**	Friday 10/15/19 10:16 a.m. to 10:36 a.m.	66 dBA (L_{eq})	Aircraft and vehicle traffic on South McDonnel Road and U.S. 101
ST-3	**Millbrae. Aloft Hotel on Millbrae Avenue**	Friday 10/15/19 11:01 a.m. to 11:21 a.m.	68 dBA (L_{eq})	Aircraft and vehicle traffic on Millbrae Avenue and U.S. 101
ST-4	**Millbrae. Condominiums on El Camino Real south of Millbrae Avenue**	Friday 10/15/19 11:40 a.m. to 12:00 p.m.	68 dBA (L_{eq})	Aircraft and vehicle traffic on El Camino Real and Millbrae Avenue
ST-4	**Millbrae. Condominiums on El Camino Real south of Millbrae Avenue**	Monday 2/8/21 11:43 a.m. to 11:58 a.m.	68 dBA (L_{eq})	Aircraft and vehicle traffic on El Camino Real and Millbrae Avenue
ST-5	**South San Francisco, Safe Harbor Shelter (295 North Access Road)**	Friday 5/21/21 10:05 a.m. to 10:25 a.m.	59 dBA (L_{eq})	Vehicle traffic on North Access Road, aircraft, and public address system of Safe Harbor Shelter
ST-6	**Millbrae. Residential area south of Bay Street**	Thursday 7/1/21 10:32 a.m. to 10:52 a.m.	64 dBA (L_{eq})	Traffic on U.S. 101 and distant Caltrain horns

Measurement Location		Time Period	Noise Level [a]	Contributing Noise Sources
ST-7	**San Bruno. Residential area south of San Antonio Avenue**	Thursday 7/1/21 11:06 a.m. to 11:36 a.m.	60 dBA (L_{eq})	Distant traffic on U.S. 101 (blocked by sound wall); Caltrain and BART pass-by events (no sound wall); traffic on San Antonio Avenue

SOURCES: ESA, 2019, 2021, and 2023; SFO, 2019.

ABBREVIATIONS: LT = long term; ST = short term; L_{eq} = equivalent sound level over the period of interest; dBA = A-weighted decibels

NOTE:

a. Ambient noise levels were monitored at the ground level and include noise from aircraft and vehicle traffic in addition to noise from other sources as detailed above.

Existing Groundborne Noise and Vibration Sources

Groundborne vibration and noise sources on Airport property include arriving and departing aircraft and operations of the elevated BART rail system. The nearest sources of groundborne vibration from the study area are operations along the Caltrain tracks, which are located approximately 1,000 feet to the southwest from the closest Airport property line. Given the distance and surface location, Caltrain operations are not considered a substantial source of groundborne noise or vibration in the project vicinity.[166]

Table 3.B-3 shows generalized ground-surface vibration levels for locomotive-powered passenger and freight trains published by the FTA. While many Caltrain trains stop at Millbrae Station, express and bullet trains do not. Hence, train speeds along the rail line can vary from 10 to 50 miles per hour (for a bullet train) on approach.

Table 3.B-3 Generalized Vibration Levels from Locomotive-Powered Passenger or Freight Trains (VdB)

	Distance from Tracks					
Train Speed	**30 Feet**	**50 Feet**	**100 Feet**	**150 Feet**	**200 Feet**	**300 Feet**
10 mph	74	71	64	61	58	53
20 mph	80	77	70	67	64	59
30 mph	84	81	74	71	68	63
50 mph	88	85	78	75	72	67

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

ABBREVIATIONS: mph = miles per hour; VdB = vibration decibels

NOTE: These levels reflect generalized diesel locomotive activity and do not reflect potential future reductions from electrification of Caltrain.

[166] U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018, Section 4.3, Noise Screening Procedure, pp. 33–36 (noise 175 feet with intervening buildings) and p. 136 (vibration 150 feet for residential), https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-NO-0123_0.pdf, accessed August 1, 2024.

FTA also has published generalized ground-surface vibration levels for rapid transit and light rail vehicles similar to trains run by BART, which are presented in **Table 3.B-4**.[167] At a distance of 300 feet, attenuated vibration levels from BART trains of 42 to 56 VdB would be similar to background vibration levels in urban areas and would not be perceptible to receptors.

Table 3.B-4 Generalized Vibration Levels from Light Rail Passenger Trains (VdB)

	Distance from Tracks					
Train Speed	30 Feet	50 Feet	100 Feet	150 Feet	200 Feet	300 Feet
10 mph	63	59	54	50	47	42
20 mph	69	65	60	56	53	48
30 mph	73	69	64	60	57	52
50 mph	77	73	68	64	61	56

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
ABBREVIATIONS: mph = miles per hour; VdB = vibration decibels

Sensitive Receptors

Noise-Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication; physiological and psychological stress; and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Consistent with the Governor's Office of Planning and Research's General Plan Guidelines 2017, residences, schools, libraries, churches, hospitals, nursing homes, auditoriums, parks and other outdoor recreation areas, and sensitive wildlife habitat generally are more sensitive to noise. In addition, the planning department considers hotels and motels as sensitive receptors during the nighttime period. Though commercial and industrial uses are considered less sensitive to noise, the analysis presented below also considers the impact of noise on *worker receptors*[168] who could spend up to eight hours a day in the vicinity of RADP projects under construction.

All subsequent RADP projects are located on Airport property at a distance of at least 1,000 feet from offsite noise-sensitive receptors outside of the 900-foot noise study area for subsequent RADP projects (see Figure 3.B-1, p. 3.B-6). However, hotel, residential, and commercial uses are located in the vicinity of construction staging areas. The Grand Hyatt at SFO is located on Airport property between South McDonnell Road and the U.S. 101 northbound offramps. Outside of the RADP project site, residential uses are located to the south and west of U.S. 101 in the cities of Millbrae and San Bruno. The Safe Harbor Shelter is located to the north in the City of South San Francisco (see Figure 3.B-1).

[167] U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018, Figure 6-4, p. 137, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-NO-0123_0.pdf, accessed August 1, 2024.
[168] *Worker receptors* include on-site Airport workers (SFO employees, airlines, and tenants). Worker receptors do not include construction workers or others who would be covered by worker exposure rules under state and federal Occupational Safety and Health Act mandates for hearing conservation programs.

Based on the location of subsequent RADP projects relative to noise-sensitive receptors, the single-family residential receptors along 7th Avenue in the City of San Bruno would be the closest noise-sensitive receptors from RADP project locations during daytime. These receptors are located approximately 1,000 feet from the CONRAC Facility (RADP Project #9). Hotels are commercial land uses that are not considered noise sensitive during daytime hours; however, as a location where people are reasonably expected to sleep, they are considered a noise-sensitive receptor during nighttime hours. Therefore, for nighttime analysis, guests at the Grand Hyatt at SFO would be the closest noise-sensitive receptors at a distance of approximately 770 feet and 990 feet from the ITB Curbside Expansion (RADP Project #8) and Boarding Area H (RADP Project #1) projects, respectively.

Sensitive receptors closest to the off-Airport Aviador Lot construction staging area are residences on Roblar and Aviador avenues, located approximately 200 feet north of the Aviador Lot. Apartments at The Rollins Gateway at Millbrae Station and the Residence Inn by Marriott are both located approximately 360 feet southwest of the Aviador Lot. The Safe Harbor Shelter is located approximately 1,050 feet to the northwest of the Lot near Tanks construction staging area. All other construction staging areas for subsequent RADP projects are located approximately 1,000 to 6,800 feet from the nearest sensitive receptors. The Belle Air Elementary School and the Lomita Park Elementary School, both in San Bruno, are located approximately 1,100 feet and 1,400 feet from the RADP project site boundary, respectively. There are no existing daycare facilities, senior care facilities, or hospitals located within 1,500 feet of subsequent RADP projects or construction staging areas.

In addition, on-site Airport worker receptors are located in buildings near RADP projects and offsite worker receptors are located adjacent to the Aviador Lot and Plot 16D construction staging areas.

Vibration-Sensitive Receptors

Groundborne vibration could disturb, damage, or interfere with activities at vibration-sensitive receptors. Vibration-sensitive receptors from a human annoyance perspective include residences and other buildings such as hotels, motels, and hospitals where people sleep. Guests at the Grand Hyatt at SFO would be the closest vibration sensitive receptors at a distance of approximately 770 feet and 990 feet from the ITB Curbside Expansion and Boarding Area H projects, respectively. As discussed above, residences are located at least 1,000 feet away from subsequent RADP projects; however, residential and hotel uses are located in the vicinity of the Aviador Lot construction staging area.

Buildings are also considered sensitive to vibration due to the potential for structural damage. Due to the location of subsequent RADP projects on Airport property, adjacent Airport buildings would be the nearest vibration-sensitive receptors that could be affected. Vibration from pile driving and other construction activities also has the potential to affect land uses that engage in vibration-sensitive research and manufacturing, hospitals with vibration-sensitive equipment, special buildings as defined by the FTA[169] (e.g., concert halls, TV and recording studios, and theaters), and research operations. However, none of these land uses exist within 1,000 feet of the construction areas for RADP projects. Navigational aids used to direct aircraft in the areas adjacent to the runways are not vibration sensitive.

[169] Ibid., Table 6-1, p. 124, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-NO-0123_0.pdf, accessed August 1, 2024.

3.B.3 Regulatory Framework

Federal Regulations

Federal Noise Standards

U.S. ENVIRONMENTAL PROTECTION AGENCY

In 1972, Congress passed the Noise Control Act (42 United States Code section 4901, et seq.) to promote limited noise environments in support of public health and welfare. It also established the U.S. Environmental Protection Agency (U.S. EPA) Office of Noise Abatement and Control to coordinate federal noise control activities. The U.S. EPA established guidelines for noise levels that would be considered safe for community exposure without the risk of adverse health or welfare effects, which are summarized in **Table 3.B-5**.

Table 3.B-5 Summary of Noise Levels Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety

Effect	Level	Area
Hearing loss	<70 dBA [a] (L_{eq}, 24 hour)	All areas
Outdoor activity interference and annoyance	<55 dBA (L_{dn})	Outdoor residential areas and farms as well as other outdoor areas where people spend varying amounts of time and places where quiet is a basis for use
Outdoor activity interference and annoyance	<55 dBA (L_{eq}, 24 hour)	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	<45 dBA (L_{dn})	Indoor residential areas
Indoor activity interference and annoyance	<45 dBA (L_{eq}, 24 hour)	Other indoor areas with human activities, such as schools, etc.

SOURCE: U.S. EPA, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974, http://nepis.epa.gov/Exe/ZyPDF.cgi/2000L3LN.PDF?Dockey=2000L3LN.pdf, accessed August 1, 2024.

NOTE:

a. Yearly average equivalent sound levels in decibels; the exposure period that results in hearing loss at the identified level is 40 years.

The U.S. EPA found that to prevent hearing loss over the lifetime of a sensitive receptor, the yearly average L_{eq} should not exceed 70 dBA, and the L_{dn} should not exceed 55 dBA in outdoor activity areas or 45 dBA indoors to prevent interference and annoyance.[170] In 1982, noise control was largely passed to state and local governments.

[170] U.S. Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974.

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

The U.S. Department of Housing and Urban Development has set the following guidelines[171] for acceptable exterior noise levels in residential areas:

- Acceptable – 65 dBA L_{dn} or less
- Normally unacceptable – exceeding 65 dBA L_{dn} but not exceeding 75 dBA L_{dn}
- Unacceptable – exceeding 75 dBA L_{dn}

These guidelines are consistent with those provided in the San Francisco General Plan, Environmental Protection Element, Land Use Compatibility Chart for Community Noise (see below). Housing and Urban Development regulations also include a goal (not a standard) that interior noise levels should not exceed 45 dB L_{dn}.[172] Sound-attenuating features such as barriers or sound-attenuating building materials shall be used to achieve the interior noise goal where feasible. An acoustically well-insulated building with windows and doors closed can provide 30–35 dB of noise attenuation, while more-conventional residential construction provides 20–25 dB of noise reduction with windows closed and only about 15 dB of noise reduction when windows are open; therefore, if the exterior noise environment is classified as "acceptable," according to Housing and Urban Development standards, the interior noise environment should not exceed 45 dB L_{dn}. Housing and Urban Development regulations also encourage the use of quieter construction equipment and methods.[173]

U.S. DEPARTMENT OF TRANSPORTATION

NOISE

FEDERAL TRANSIT ADMINISTRATION

The FTA's Transit Noise and Vibration Impact Assessment Manual[174] identifies general assessment construction noise criteria. For residential uses, it identifies a 1-hour L_{eq} of 90 dBA during daytime and 80 dBA during nighttime. For commercial and industrial uses, the criterion is a 1-hour L_{eq} of 100 dBA for both daytime and nighttime.

Federal regulations also establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR part 205, subpart B. The federal truck pass-by noise standard is 80 dB at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

The Occupational Safety and Health Administration enforces regulations to safeguard the hearing of workers exposed to occupational noise. It has established worker noise exposure limits that vary with the duration of the exposure and require implementation of a hearing conservation program if employees are exposed to noise levels in excess of 85 dBA.

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[171] U.S. Department of Housing and Urban Development, *Noise Assessment Guidelines*, https://www.hudexchange.info/sites/onecpd/assets/File/Noise-Guidebook-Chapter-5.pdf, accessed August 1, 2024.
[172] Ibid.
[173] Ibid.
[174] U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-NO-0123_0.pdf, accessed August 1, 2024.

FEDERAL AVIATION ADMINISTRATION

14 CFR Part 36

FAA regulates the maximum noise level that an individual civil aircraft can emit by requiring aircraft to meet certain noise certification standards. Each noise certification standard is designated as a different stage in the United States. Stages and noise standards are defined in 14 CFR 36, Noise Standards: Aircraft Type and Airworthiness Certification.[175] In 1990, Congress passed the Aviation Noise and Capacity Act, which required that by the year 2000, all jet aircraft over 75,000 pounds at civilian airports be *Stage 3 aircraft*.[176] Furthermore, the FAA Modernization and Reform Act of 2012, section 513, had a prohibition on operating certain aircraft weighing 75,000 pounds or less not complying with Stage 3 noise levels. On July 2, 2013, the FAA published a final rule for the adoption of statutory prohibition of operation of aircraft weighing 75,000 pounds or less that are not Stage 3 compliant.

On July 5, 2005, the FAA issued a final rule establishing a Stage 4 noise standard requiring all applications for new aircraft designs after January 1, 2006 to demonstrate compliance with Stage 4 noise levels. Stage 4 represents a 10-decibel reduction from Stage 3 and would ensure that the latest available noise reduction technology is incorporated into new aircraft designs. However, this is a reduction over the three different phases of flight testing (fly-over, lateral, and approach). Many aircraft manufactured today meet Stage 4 with little or no adjustment. The FAA's imposition of Stage 4 is consistent with international efforts by the International Civil Aviation Organization.

14 CFR Part 150

In recognition of the national aircraft noise issue, Congress passed the Aviation Safety and Noise Abatement Act of 1979, which mandated that the FAA establish a single system for measuring noise around airports and determining noise exposure to individuals. The Act also required the FAA to identify land uses that are normally compatible with various noise levels. These regulations are codified in 14 CFR part 150, Airport Noise Compatibility Planning.[177]

14 CFR part 150 establishes the average annual DNL to determine cumulative noise exposure from airports. Section 14 CFR part 150 also established compatibility guidelines for aircraft noise exposure levels with land uses in the vicinity of an airport. These guidelines consider all land uses to be compatible with noise levels less than 65 DNL (or CNEL/L_{dn} in California). Some land uses, such as residences, schools, hospitals, and places of worship, are considered noise-sensitive and non-compatible with aircraft noise exposure levels at and above 65 DNL/CNEL. Governmental services, transportation, parking, and some outdoor recreational uses are considered compatible with noise levels up to 70 DNL/CNEL. However, the FAA guidelines indicate that ultimately "the responsibility for determining the acceptability and permissible land uses remains with the local authorities."

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[175] 14 CFR Part 36, *Noise Standards: Aircraft Type and Airworthiness Certification*, https://www.ecfr.gov/current/title-14/chapter-I/subchapter-C/part-36, accessed August 1, 2024.

[176] A *Stage 3 aircraft* is a newer aircraft or has modified engine types that complies with noise standards set by the FAA and meets the more stringent limits established in 1977. By December 31, 2015, all civil jet aircraft, regardless of weight must meet Stage 3 or Stage 4 to fly within the contiguous U.S. Aircraft at or under 75,000 pounds maximum take-off weight must meet Stage 2, 3, or 4 to operate within the U.S.

[177] 14 CFR Part 150, *Airport Noise Compatibility Planning*, https://www.ecfr.gov/cgi-bin/text-idx?SID=f8e6df268e3dad2edb848f61b9a0fb51&mc=true&node=pt14.3.150&rgn=div5, accessed August 1, 2024.

Federal Aviation Administration Order 1050.1F

The FAA provides guidance for evaluating noise impacts of aircraft operations in FAA Order 1050.1F, Environmental Impacts: Policies and Procedures.[178] FAA Order 1050.1F states that a project would have a significant noise impact if it would cause a noise-sensitive land use that is already located within the 65 CNEL[179] contour to experience an increase in noise of 1.5 dB or greater, or if it would newly expose a noise-sensitive land use to 65 CNEL due to a 1.5 dB or greater increase.

Federal Vibration Standards

FEDERAL TRANSIT ADMINISTRATION

The FTA has also developed guidelines for the assessment of vibration impacts. **Table 3.B-6** provides the transit administration's recommended vibration damage criteria for buildings.

Table 3.B-6 Federal Transit Administration General Assessment Criteria for Vibration Damage

Structure Type and Condition	PPV (in/sec)	Approximate VdB (microinch per second)
I. Reinforced concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Table 7-5, p. 186, September 2018

ABBREVIATIONS:

in/sec = inches per second; PPV = peak particle velocity

Table 3.B-7 shows the FTA's general assessment criteria related to human annoyance for groundborne vibration impacts for the following three land use categories: Vibration Category 1, High Sensitivity; Vibration Category 2, Residential; and Vibration Category 3, Institutional. The Administration defines these categories as follows:

- **Category 1:** Buildings where vibration would interfere with operations within the building, including vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. Vibration-sensitive equipment includes but is not limited to electron microscopes, high-resolution lithographic equipment, and normal optical microscopes.
- **Category 2:** All residential land uses and any buildings where people sleep, such as hotels and hospitals.
- **Category 3:** Institutional land uses such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference.

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[178] U.S. Department of Transportation, Federal Aviation Administration, Order 1050.1F, *Environmental Impacts: Policies and Procedures*, July 16, 2015, https://www.faa.gov/documentLibrary/media/Order/FAA_Order_1050_1F.pdf, accessed August 1, 2024.
[179] FAA guidance allows for the use of CNEL to evaluate effects of aircraft noise in California.

Table 3.B-7 Federal Transit Administration General Assessment Criteria for Groundborne Vibration

Land Use Category	Impact Levels (VdB; relative to 1 micro-inch per second) Frequent Events [a]	Occasional Events [b]	Infrequent Events [c]
Category 1: Buildings where vibration would interfere with interior operations	65[d]	65[d]	65[d]
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime use	75	78	83

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

NOTES:

a. "Frequent events" is defined as more than 70 vibration events from the same source per day.
b. "Occasional events" is defined as 30 to 70 vibration events from the same source per day.
c. "Infrequent events" is defined as fewer than 30 vibration events from the same source per day.
b. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define the acceptable vibration levels.

State Regulations

Noise

CALIFORNIA BUILDING STANDARDS CODE

The California Building Standards Code (California Code of Regulations, Title 24) requires that walls and floor/ceiling assemblies separating dwelling units from each other, or from public or service areas, have a Sound Transmission Class of at least 50, meaning they can reduce noise by a minimum of 50 dB.[180] It also specifies a maximum interior noise limit of 45 CNEL in habitable rooms.[181]

CALIFORNIA AIRPORT NOISE REGULATIONS

California Code of Regulations title 21, subchapter 6 (California Airport Noise Standard), defines incompatible noise levels as exposure of nearby communities to aircraft noise levels of 65 CNEL or greater. Land use incompatibility is most likely to occur for most types of noise-sensitive uses when they are within the 65 CNEL contour. One of the suggested measures for controlling and reducing noise problems within Title 21 is to develop compatible land uses within the 65 CNEL contour. If residences are sound insulated or refuse sound insulation as part of a residential sound insulation program, they are considered a compatible land use under Title 21.

[180] California Code of Regulations section 1206.2.
[181] California Code of Regulations section 1206.4.

Vibration

CALIFORNIA DEPARTMENT OF TRANSPORTATION

There are no state regulations related to construction-induced vibration. However, the California Department of Transportation (Caltrans) consolidated vibration criteria from various sources for assessing the potential damage to structures from ground vibration induced by construction equipment, and these criteria are included in their Transportation and Construction Vibration Guidance Manual[182] and summarized in **Table 3.B-8**. As shown in this table, the building damage criteria for continuous vibration sources is about half of the criteria for transient sources. In general, the planning department uses the Caltrans vibration damage potential to structures for evaluating vibration impacts on structures.

Table 3.B-8 Vibration Guidelines for Potential Damage to Structures

	Maximum PPV (in/sec)	
Structure Type and Condition	Transient Sources [a]	Continuous/Frequent Intermittent Sources [b]
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

SOURCE: Caltrans, *Transportation and Construction Vibration Guidance Manual*, April 2020.

ABBREVIATIONS: in/sec = inches per second; PPV = peak particle velocity

NOTES:

a. Transient sources create a single, isolated vibration event, such as blasting or drop balls.
b. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Groundborne vibration and noise can also disturb people, who are generally more sensitive to vibration during the nighttime hours when sleeping than during daytime waking hours. Numerous studies have been conducted to characterize the human response to vibration. **Table 3.B-9** provides Caltrans' guidelines regarding vibration annoyance potential (expressed here as PPV).

[182] Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013, Table 19, p. 27, http://www.dot.ca.gov/env/noise/docs/tcvgm-sep2013.pdf, accessed August 1, 2024.

Table 3.B-9 Caltrans Guidelines for Vibration Annoyance Potential

	Maximum PPV (in/sec)	
Human Response	Transient Sources [a]	Continuous/Frequent Intermittent Sources [b]
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.9	0.10
Severe	2.0	0.4

SOURCE: Caltrans, *Transportation and Construction Vibration Guidance Manual*, April 2020.

ABBREVIATIONS: in/sec = inches per second; PPV = peak particle velocity

NOTES:

a. Transient sources create a single, isolated vibration event, such as blasting or drop balls.
b. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Local Regulations

Local general plans and noise ordinances establish standards and procedures for addressing specific noise sources and activities. Portions of the Airport lie within the city boundaries of South San Francisco, Millbrae, and San Bruno. San Francisco's Noise Ordinance does not apply to the Airport because it is outside of the jurisdiction of the City and County of San Francisco. However, the standards of the San Francisco Noise Ordinance do apply as standards that are relevant to analyze noise under CEQA. Relevant noise and vibration policies and standards in the general plans and municipal codes of South San Francisco, Millbrae, and San Bruno are also provided below as they are considered in the analysis presented in this section.

City and County of San Francisco

SAN FRANCISCO GENERAL PLAN

The Environmental Protection Element of the San Francisco General Plan contains Land Use Compatibility Guidelines for Community Noise for determining the compatibility of various land uses with different noise levels. These guidelines, which are similar to the state guidelines set forth by the Governor’s Office of Planning and Research, indicate maximum acceptable noise levels for various land uses. The maximum *satisfactory* noise level is 60 dBA (L_{dn}) for residential and hotel uses; 65 dBA (L_{dn}) for school classrooms, libraries, churches, and hospitals; 70 dBA (L_{dn}) for playgrounds, parks, office uses, retail commercial uses, and sensitive manufacturing/communications uses; and 77 dBA (L_{dn}) for other commercial uses such as wholesale establishments, some retail, industrial/manufacturing, transportation, communications, and utilities.

SAN FRANCISCO MUNICIPAL CODE – NOISE ORDINANCE

The Airport is subject to the noise ordinance for the City and County of San Francisco, which is codified in the San Francisco Police Code article 29 (noise ordinance). The noise ordinance states the City’s policy is to prohibit unnecessary, excessive, and offensive noises from all sources subject to police power. Noise ordinance section 2900 states the following with regard to community noise levels: “It shall be the policy of San Francisco to maintain noise levels in areas with existing healthful and acceptable levels of noise and to reduce noise levels, through all practicable means, in those areas of San Francisco where noise levels are above acceptable levels as defined by the World Health Organization’s Guidelines on Community Noise.”

CONSTRUCTION NOISE

Noise ordinance article 29, sections 2907 and 2908, regulate construction equipment and construction work at night. Sections 2907 and 2908 are enforced by the San Francisco Department of Public Works.

Noise ordinance section 2907 applies to noise generated by any construction equipment on a permitted construction site, and limits noise from powered construction equipment to a maximum allowable level of 80 dBA when measured at a distance of 100 feet from the equipment or 100 feet from the construction site boundary. Exemptions to this requirement include impact tools with approved mufflers, pavement breakers, and jackhammers with approved acoustic shields, and construction equipment used in connection with emergency work. This section limits construction activities to the daytime hours (7 a.m. to 8 p.m.) every day of the week unless permits allow for nighttime construction.

Noise ordinance section 2908 prohibits nighttime construction (between 8 p.m. and 7 a.m.) that generates noise exceeding the ambient noise level by 5 dBA at the nearest property line unless a special permit has been issued by the City.

FIXED MECHANICAL NOISE

Noise ordinance section 2909 governs noise from fixed mechanical equipment noise. Noise ordinance section 2909(b) restricts the maximum allowable cumulative level of exterior noise, produced from any combination of mechanical device(s) and music or entertainment originating from an exclusively commercial or industrial property or from or serving a commercial use located within a mixed-use property to 8 dBA above the ambient at any point outside of the property plane.

Noise ordinance section 2909(c) applies to noise generated from a source located on public property, such as a park or public plaza and limits the maximum allowable cumulative level of noise produced from any combination of mechanical device(s) and implied sound system(s) originating on a public property to 10 dBA above the ambient at a distance greater than 25 feet from the noise source(s). Motor vehicles on local roads, construction equipment, refuse collection equipment, and other noise sources under the control of the City or serving to maintain public property are exempt from the standard.

Section 2909(d) sets the maximum allowable interior noise within a dwelling unit from fixed noise sources to 45 dBA between the hours of 10 p.m. and 7 a.m. and 55 dBA between the hours of 7 a.m. and 10 p.m. These are the absolute maximum allowable levels of interior noise produced from any combination of mechanical device(s) and audio systems(s) under one ownership/use originating from outside the dwelling unit. The standards in this section may not apply to areas in which the ambient noise level exceeds the limits.

San Mateo County

SAN MATEO COUNTY GENERAL PLAN

There are no land use compatibility standards for community noise in the current San Mateo County General Plan. The new general plan, which has not yet been adopted, identifies 60 dB L_{dn} as the maximum normally acceptable level for residential uses.

SAN MATEO COUNTY MUNICIPAL CODE – NOISE ORDINANCE

The San Mateo County Noise Ordinance (chapter 4.88) specifies exterior noise standards for uses adjacent to residences, schools, hospitals, churches, or public libraries. The ordinance specifies standards for maximum allowable exterior and interior noise levels. The ordinance exempts construction noise from its noise standards, provided that activities involving noise sources associated with demolition, construction, repair, remodeling, or grading of any real property do not take place between 6 p.m. and 7 a.m. on weekdays, between 5 p.m. and 9 a.m. on Saturdays, or at any time on Sundays, Thanksgiving, and Christmas.[183]

For operational noise sources within the unincorporated area of the county, the ordinance establishes exterior noise standards at any school, hospital, church, public library, or single- or multiple-family residence situated in either the incorporated or unincorporated area. **Table 3.B-10** presents these exterior noise standards.

Table 3.B-10 San Mateo County Exterior Noise Standards at Receiving Land Uses: Residential, School, Hospital, Church, or Public Library Properties

Cumulative Number of Minutes (in any 1-hour period)	Noise Level Standards, dBA	
	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
30	55	50
15	60	55
5	65	60
1	70	65
0	75	70

SOURCE: San Mateo County, 1982

NOTES:

In the event the measured background noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted in 5 dBA increments so as to encompass the background noise level.

Each of the noise level standards specified above shall be reduced by 5 dBA for simple tone noises consisting primarily of speech or music, or for recurring or intermittent impulsive noises.

If the intruding noise source is continuous and cannot reasonably be stopped for a period of time whereby the background noise level can be measured, the noise level measured while the source is in operation shall be compared directly to the noise level standards in Table 3.B-9.

City of Millbrae

CITY OF MILLBRAE GENERAL PLAN

The Aviador Lot construction staging area lies within the City of Millbrae. The City of Millbrae's General Plan includes goals and policies related to noise. The Health, Safety, and Hazardous Materials Element of the General Plan identifies exterior noise compatibility standards for various land uses. A maximum exterior noise level of 60 dB L_{dn} is considered normally acceptable for single-family, duplex, and mobile homes. Townhomes, multifamily apartments, condominiums, and temporary lodging are considered normally acceptable in exterior noise environments of up to 65 dB L_{dn}. Urban residential infill and mixed-use projects, schools, libraries, churches, hospitals, nursing homes, playgrounds and parks, and office buildings are considered normally acceptable in up to 70 dB L_{dn}. Industrial uses are considered normally acceptable in

[183] San Mateo County, San Mateo County Noise Ordinance, Chapter 4.88, Noise Control, 1982, https://www.municode.com/library/ca/san_mateo_county/codes/code_of_ordinances?nodeId=TIT4SAHE_CH4.88NOCO_4.88.300LEOF, accessed August 1, 2024.

exterior noise environments of up to 75 dB L_{dn}. In addition, the general plan includes California's interior noise standard of 45 dBA (L_{dn}) for interior habitable rooms of hotels.

CITY OF MILLBRAE MUNICIPAL CODE – NOISE ORDINANCE

Municipal code chapter 6.25, section 6.25.050.F.9.b, prohibits emanation of noise or vibrations on a continuous and regular basis of such a loud, unusual, unnecessary, penetrating, lengthy, or untimely nature as to unreasonably disturb, annoy, injure or interfere with or endanger the comfort, repose, health, peace, safety or welfare of users of a neighboring property by restricting hours of construction. Construction, alteration, or repair work are to occur only during the following hours: Monday through Friday from 7:30 a.m. to 7 p.m., Saturday from 8 a.m. to 6 p.m., and Sunday and holidays from 9 a.m. to 6 p.m. Any work outside these hours is prohibited without prior written permission of the administrative authority. The Municipal Code does not specify criteria for construction noise or operational noise or vibration.

City of San Bruno

CITY OF SAN BRUNO GENERAL PLAN

Receptors closest to subsequent RADP projects are located within the City of San Bruno. San Bruno's General Plan includes goals and policies related to noise. The Health and Safety Element of the San Bruno General Plan provides land use compatibility standards for community noise environments. Single-family residential uses are considered normally acceptable in noise environments of up to 60 dB L_{dn}. For multifamily residential uses and transient lodging, up to 65 dB L_{dn} is considered normally acceptable. Schools, libraries, churches, hospitals, nursing homes, playgrounds and parks, and office buildings are considered normally acceptable in noise environments up to 70 dB L_{dn}, while up to 75 dBA L_{dn} is considered normally acceptable for industrial uses.

CITY OF SAN BRUNO MUNICIPAL CODE – NOISE ORDINANCE

City of San Bruno Municipal Code section 6.16.070 restricts noise from construction activities within any residential zone, or within a radius of 500 feet, to a level of 85 dB as measured at 100 feet between the hours of 7 a.m. and 10 p.m., or a noise level of 60 dB as measured at 100 feet between the hours of 10 p.m. and 7 a.m.

Section 6.16.050 prohibits any noise exceeding the ambient base level at the property plane of any property or exceeding the zone ambient base level on any adjacent residential area zone line or at any place of other property (or, if a condominium or apartment house, within any adjoining apartment) by more than 10 dB. However, during the period of 7 a.m. to 10 p.m., the ambient base level may be exceeded by 20 dB for a period not to exceed 30 minutes during any 24-hour period.

City of South San Francisco

CITY OF SOUTH SAN FRANCISCO GENERAL PLAN

Adjacent receptors to the northern RADP project site boundary are located within the City of South San Francisco. The City of South San Francisco's General Plan includes goals and policies related to noise. The noise element establishes land use compatibility categories for community noise exposure. For residential uses, the City identifies noise levels up to 65 dBA as satisfactory and noise levels between 60 and 70 dBA as requiring analysis for the applicability of noise reduction requirements.

Per the City of South San Francisco 2040 General Plan Policies NOI-2.1 and NOI-3.1, a vibration analysis is required if residential or other sensitive receptors are located within 100 feet of construction activities that include high vibration generating activities such as pile driving. Vibration analysis for protecting historic structures is required for construction activities that include pile driving within 150 feet and use of mobile construction equipment within 50 feet of the historic structure. Vibration levels at historic structures are limited to 0.12 in/sec PPV.

CITY OF SOUTH SAN FRANCISCO MUNICIPAL CODE – NOISE ORDINANCE

Chapter 8.32 of the South San Francisco Municipal Code establishes maximum permissible sound levels (section 8.32.030) within the City. However, section 8.32.050(d) exempts construction noise from these limits during the hours of 8 a.m. to 8 p.m. Monday through Friday, 9 a.m. to 8 p.m. on Saturdays, and 10 a.m. to 6 p.m. on Sundays and holidays, or at other hours authorized by a permit, if they meet at least one of the following noise limitations:

1. No individual piece of equipment shall produce a noise level exceeding 90 dB at a distance of 25 feet. If the device is housed within a structure or trailer on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible.
2. The noise level at any point outside of the property plane of the project shall not exceed 90 dB.

City of South San Francisco Municipal Code section 8.32.030 restricts operation of any source of sound at any location within the City that causes the noise level when measured on any other residential property to exceed an L_{50} of 60 dB during daytime and 50 or 55 dB during nighttime hours, depending on land use category.

Existing Airport Programs

SFO Airport Land Use Compatibility Plan

SFO's land use compatibility plan, the Comprehensive Airport Land Use Compatibility Plan for the Environs of the San Francisco International Airport,[184] is designed to ensure that land uses around the Airport are compatible with its operations and addresses the following areas:

- **Noise Compatibility:** The plan includes measures to mitigate noise impacts on surrounding communities, ensuring that residential and other sensitive areas are protected.
- **Safety Zones:** It delineates safety zones around the airport to minimize risks associated with aircraft operations. These zones restrict certain types of development to enhance safety.
- **Land Use Designations:** The plan aims to balance land use development needs with airport operations by outlining specific land use designations for areas around the airport, including commercial, industrial, and residential uses.
- **Community Involvement:** The plan involves input from local governments and communities to address regional development pressures and housing needs.
- **Environmental Considerations:** The plan includes provisions for protecting open spaces, parks, and recreational areas, ensuring that development does not negatively impact the environment[1]

[184] City/County Association of Governments of San Mateo County, *Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport*, November 2012, https://ccag.ca.gov/wp-content/uploads/2014/10/Consolidated_CCAG_ALUCP_November-20121.pdf, accessed August 1, 2024.

SFO Noise Compatibility Program

SFO has a comprehensive Noise Compatibility Program (NCP) as part of its land use compatibility plan to manage and mitigate the impact of aircraft noise on surrounding communities. As part of the NCP, SFO has developed noise exposure maps to identify areas affected by aircraft noise. These maps help in planning and implementing noise reduction measures. The most recent update to the noise exposure maps was accepted by the FAA on January 29, 2016.

The NCP is developed in accordance with FAA regulations (14 CFR part 150), ensuring that the airport's noise mitigation efforts meet federal standards and includes various noise abatement procedures, such as flight path adjustments and operational restrictions, to minimize aircraft noise impacts on surrounding communities. SFO offers sound insulation programs for homes and schools within high noise exposure areas to reduce indoor noise levels. The Airport engages with local communities through public meetings and workshops to address noise concerns and gather feedback on noise abatement and mitigation strategies. The SFO NCP, first developed in 1983, was most recently updated and approved by the FAA on April 1, 2019.

SFO Noise Insulation Program

SFO has an extensive noise insulation program. Since 1983, more than 15,200 eligible properties in Daly City, Millbrae, Pacifica, San Bruno, South San Francisco, and unincorporated areas of San Mateo County have been provided with acoustical improvements at no cost to property owners. FAA and SFO have funded installation of treatments such as new windows, doors, and ventilation systems in eligible incompatible structures within the 65 CNEL contour to mitigate aircraft noise impacts. SFO continues to offer noise insulation for eligible structures where the previous homeowners were offered but declined insulation (and therefore are not considered to be incompatible land uses under California Code of Regulations title 21, section 5014(a)(4)). Property owners located inside the contour whose homes have not been included in previous phases of the SFO Noise Insulation Program may also be eligible to receive insulation improvements under this Initiative.

SFO Noise Abatement Procedures[185]

SFO has worked collaboratively with stakeholders (using elements of the 14 CFR part 150) and air traffic control requirements to develop noise abatement procedures, particularly for nighttime operations.

In 1988, SFO developed the Nighttime Preferential Runway Use program, which aims to maximize flights over water and minimize flights over land and populated areas between 1 a.m. and 6 a.m. to lower nighttime noise levels in the Airport's surrounding communities. In addition, high-power run-ups of mounted aircraft engines for maintenance or test purposes are prohibited between the hours of 10 p.m. and 7 a.m. unless special permission is granted by the Airport Operations Supervisor. The Airport also has restrictions regarding the use of auxiliary power units to reduce ground-based noise from aircraft. Auxiliary power units are used when the aircraft is on the ground to provide power to start its main engines and electrical/air conditioning systems. To reduce the impact of noise and jet fuel emissions on the environment as well as to improve safety conditions for airfield personnel, SFO encourages airlines to limit the time auxiliary power units are used by using ground power and pre-conditioned air.

[185] San Francisco International Airport, Noise Abatement Procedures, https://www.flysfo.com/about/community-noise/noise-office/making-sfo-quieter/noise-abatement-procedures, accessed August 1, 2024.

3.B.4 Impacts and Mitigation Measures

Significance Criteria

This section analyzes the noise and vibration impacts from the implementation of the RADP. The following criteria were used to determine whether construction and operation of subsequent projects implemented under the RADP would result in a significant impact related to noise or vibration. Implementation of the RADP would result in a significant effect related to noise and vibration if it would result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies
- Generation of excessive groundborne vibration or groundborne noise levels
- For a project located within the vicinity of a private airstrip or an airport land use plan area, or where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels

Criteria Used for Evaluation

Local general plans and noise ordinances establish standards and procedures for addressing specific noise sources and activities. As noted above, portions of the Airport lie within the city boundaries of South San Francisco, Millbrae, and San Bruno; however, per California Government Code sections 53090 and 53091, the Airport is not subject to the building and zoning ordinances of other jurisdictions, even if the land use occurs within the geographical boundaries of another jurisdiction. Nevertheless, criteria from these jurisdictions were considered along with the standards of these cities, and the most stringent criteria were applied in the analysis.

Table 3.B-11 summarizes the criteria used in the evaluation of noise and vibration impacts from construction staging areas and implementation of RADP projects. See Appendix F, Noise Technical Appendix, of this Draft EIR for a more detailed description of noise and vibration standards from the jurisdictions mentioned above.

Approach to Analysis

Methodology for Analysis of Construction Noise and Vibration Impacts

Construction-related noise and vibration impacts (including cumulative impacts) associated with implementation of the RADP were analyzed using the 2019 existing conditions. The programmatic analysis presented below focuses on four representative RADP projects to analyze the worst-case construction noise and vibration impacts and operational noise impacts to determine whether subsequent RADP projects would result in impacts related to noise and vibration of existing receptors (see Appendix F of this Draft EIR for supporting detailed technical information). The representative projects chosen for analysis are those located closest to sensitive receptors, including worker receptors, or are the largest of the RADP projects, which would require the greatest amount of construction equipment or activity such as pile driving, as well as the longest duration of construction. For purposes of a conservative analysis that generally yields greater noise or vibration impacts than could actually result from subsequent RADP projects, the analysis considers using both standard construction equipment and impact pile drivers at the chosen representative projects.

Table 3.B-11 Criteria Used for the Evaluation of Noise and Construction Vibration Impacts

<table>
<tr><th rowspan="2">Receptor</th><th colspan="2">Evaluation Criteria</th></tr>
<tr><th>Daytime</th><th>Nighttime</th></tr>
<tr><td colspan="3">Construction Noise – Construction Equipment</td></tr>
<tr><td>Noise-sensitive receptors (residential and hotel uses)</td><td>1-hour L_{eq} of 90 dBA
10 dBA above ambient noise levels</td><td>1-hour L_{eq} of 80 dBA
Interior noise level of 45 dBA</td></tr>
<tr><td>Worker receptors</td><td>1-hour L_{eq} of 100 dBA
90 dBA at 25 feet or any point outside the property plane of the project site in South San Francisco</td><td>N/A</td></tr>
<tr><td colspan="3">Construction Noise – Traffic</td></tr>
<tr><td>Noise-sensitive receptors</td><td colspan="2" rowspan="2">A 5 dBA increase in ambient noise level in noise environments designated as “Satisfactory” or “Normally Acceptable” based on the Land Use Compatibility Chart for Community Noise in the General Plan of the jurisdiction within which the roadway is located. A 3 dBA increase in noise environments categorized as “Conditionally Acceptable,” “Normally Unacceptable,” or “Clearly Unacceptable” based on the Land Use Compatibility Chart for Community Noise in the General Plan of the jurisdiction within which the roadway is located.</td></tr>
<tr><td>Worker receptors</td></tr>
<tr><td colspan="3">Construction Vibration</td></tr>
<tr><td>Vibration-sensitive receptors (residential and hotel uses)</td><td>N/A</td><td>80 VdB during paving and compaction; 72 VdB for pile driving per the FTA vibration annoyance criterion</td></tr>
<tr><td>Buildings and Structures</td><td colspan="2">PPV of 0.5 in/sec for modern industrial/commercial buildings and new residential structures, PPV of 0.3 in/sec for older residential structures, and PPV of 0.25 in/sec for historic and old buildings per Caltrans vibration structural damage criteria for nearby structures</td></tr>
<tr><td colspan="3">Operational Noise – Stationary Sources</td></tr>
<tr><td>Noise-sensitive receptors</td><td rowspan="2">Greater than 10 dBA above the local ambient noise level at a distance of 25 feet or more</td><td>Interior noise level of 45 dBA</td></tr>
<tr><td>Worker receptors</td><td>N/A</td></tr>
<tr><td colspan="3">Operational Noise – Traffic</td></tr>
<tr><td>Noise-sensitive receptors</td><td colspan="2" rowspan="2">A 5 dBA increase in ambient noise level in noise environments designated as “Satisfactory” or “Normally Acceptable” based on the Land Use Compatibility Chart for Community Noise in the General Plan of the jurisdiction within which the roadway is located. A 3 dBA increase in noise environments categorized as “Conditionally Acceptable,” “Normally Unacceptable,” or “Clearly Unacceptable” based on the Land Use Compatibility Chart for Community Noise in the General Plan of the jurisdiction within which the roadway is located.</td></tr>
<tr><td>Worker receptors</td></tr>
</table>

SOURCE: Noise Technical Appendix (see Appendix F of this Draft EIR).

ABBREVIATION: N/A = not applicable

The CONRAC Facility was chosen as a representative project because it is located closest to offsite noise-sensitive residential receptors located in San Bruno approximately 1,000 feet west across U.S. 101. The ITB Curbside Expansion and Boarding Area H projects were selected because they are located closest to the Grand Hyatt at SFO, which is considered a sensitive noise receptor during the nighttime period, located on Airport property. In addition, an analysis of the Central Hub (RADP Project #6) is also provided to analyze the potential worst-case construction noise impacts on worker receptors for subsequent projects under the RADP. Additionally, the Central Hub would involve the greatest amount of demolition and the greatest amount of square footage of new construction of any subsequent RADP project; therefore, it would be the most construction intensive and longest duration of construction. Construction of the Central Hub also would expose nearby worker receptors to construction noise; these workers include *skycaps*[186] located at the departure terminals and parking enforcement patrols at the arrival terminals. These representative projects are also considered as part of the overlapping scenarios analyzed to account for construction traffic impacts from the simultaneous construction of multiple projects. The high, medium, and low overlapping scenarios analyzed provide the range of impacts that could be expected from simultaneous construction of multiple subsequent RADP projects. Impacts from other RADP projects are considered, as needed, based on the location of receptors. In addition, noise impacts on residential, hotel, and worker receptors in the vicinity of the Aviador Lot and Plot 16D construction staging areas are analyzed.

Table 3.B-12 summarizes the representative RADP projects and construction staging areas considered in the construction noise analysis, the nearest daytime and nighttime receptors evaluated, and the representative noise measurement locations for these receptors (see Figure 3.B-2, p. 3.B-7).

CONSTRUCTION EQUIPMENT NOISE

Noise from construction equipment was estimated using the Federal Highway Administration's Roadway Construction Noise Model and the general assessment approach recommended by the FTA.[187] The FTA's methodology for general assessment of construction noise entails a process for calculating the hourly dBA, L_{eq} for each stage of construction. This calculation considers (1) the reference noise emission level at 50 feet for equipment to be used for each stage of construction; (2) the acoustical usage factor for each piece of equipment; (3) the distance between construction centerline and sensitive receptors; and (4) adjustments for any ground effects, as applicable.[188] This methodology calls for determining the resultant noise levels only for the two noisiest pieces of equipment expected to be used in each stage of construction, then summing the levels for each stage of construction using decibel (logarithmic) addition.[189]

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[186] *Skycaps* are porters employed at an airport who provide services to airline passengers such handling luggage, strollers, and car seats; performing curbside check-in; and assisting disabled or wheelchair-using passengers.

[187] The Federal Transit Administration does not publish a software noise model; as such, the analysis relies on the Federal Highway Administration's model and impacts were assessed using FTA's methodology for assessing impact.

[188] In an urban area such as the developed areas surrounding SFO, which has acoustically non-absorptive ground conditions, the ground factor is zero.

[189] U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018, pp. 174–179, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-NO-0123_0.pdf, accessed August 1, 2024.

Table 3.B-12 Nearest Sensitive and Worker Receptors Analyzed for Representative RADP Projects and Construction Staging Areas

RADP Project/ Staging Area	Nearest Receptor	Location	Minimum Distance from RADP Project/ Construction Staging Area	Representative Noise Monitoring Location
RADP Projects				
CONRAC Facility (RADP Project #9)	Single-family residences	Along 7th Avenue in the City of San Bruno	1,000 feet	LT-1
Central Hub (RADP Project #6)	Single-family residences	South of Bay Street in the City of Millbrae	2,800 feet	ST-6
ITB Curbside Expansion (RADP Project #8)	Grand Hyatt at SFO Hotel	Airport property between South McDonnell Road and U.S. 101 northbound offramps	770 feet	ST-2
Boarding Area H (RADP Project #1)	Grand Hyatt at SFO Hotel	Airport property between South McDonnell Road and U.S. 101 northbound offramps	990 feet	ST-2
Construction Staging Areas				
Aviador Lot Staging Area	Single-family residences	Along Roblar Avenue in the City of Millbrae	200 feet	LT-8
	The Rollins Gateway at Millbrae Station – apartments	181 N. Rollins Road, Millbrae	360 feet	LT-8
	Residence Inn By Marriott	161 N. Rollins Road, Millbrae	360 feet	LT-8
Plot 16D Staging Area	Commercial uses	South of Beacon Street, South San Francisco	20 feet	—

SOURCE: Data compiled by ESA in 2024.

The nearest offsite residential sensitive receptors from RADP projects are single-family residences located in the City of San Bruno, located approximately 1,000 feet west of the CONRAC Facility project. As discussed under Section 3.B.3.3, Regulatory Setting, the City of San Bruno Municipal Code contains daytime and nighttime criteria for construction activity taking place within 500 feet of residential zones. As the residences in San Bruno closest to the CONRAC Facility project are located greater than 500 feet, the San Bruno Municipal Code noise standards would not apply. Daytime construction noise impacts are also evaluated for Central Hub as the RADP project involving the greatest amount of construction. The nearest residential receptors to the Central Hub project are the residences south of Bay Street in the City of Millbrae located approximately 2,800 feet to the south. As discussed under Section 3.B.3.3, Regulatory Setting, the City of Millbrae does not provide quantitative construction noise criteria. For the evaluation of nighttime construction noise, the hotel receptors at the Grand Hyatt at SFO would be located closest to the ITB Curbside Expansion and Building

Area H projects at approximately 770 feet and 960 feet, respectively. The Central Hub project is also evaluated with respect to worker receptors working outside the terminal buildings.

For the reasons noted above, the FTA's general assessment criteria for residential uses of 90 dBA during daytime hours and 80 dBA during nighttime hours were used in the analysis. For a conservative analysis, this residential standard is also applied to other noise-sensitive receptors such as hotels. For commercial land uses, the FTA criterion of 100 dBA was used for both the daytime and nighttime hours, which is consistent with the planning department's approach for assessing construction noise impacts. Construction noise levels were also assessed based on whether ambient noise levels at nearby sensitive receptors would increase by 10 dBA or more. Consistent with FTA and Federal Highway Administration methodology, this increase in construction noise is assessed relative to an hourly L_{eq}, and also accounts for percentage of use for equipment as inventoried by the Federal Highway Administration. As construction could potentially occur at night, nighttime construction noise (10 p.m. to 7 a.m.) is assessed based on its potential to result in sleep disturbance at nearby hotel and residential uses (an increase in interior noise levels above 45 dBA based on a standard 25 dBA exterior to interior noise reduction assumed for typical buildings with windows closed[190] or, if deemed appropriate based on the duration and frequency of nighttime construction activities, a 15 dBA exterior to interior noise reduction assumed for typical buildings with windows open).

This analysis also presents impacts from construction noise activities at the Aviador Lot and Plot 16D staging areas on residential and hotel receptors near the Aviador Lot in the City of Millbrae and worker receptors at commercial uses near Plot 16D in the City of South San Francisco. Therefore, criteria from these jurisdictions were considered in the analysis. As the City of Millbrae does not provide quantitative construction noise criteria, activities at the Aviador Lot construction staging area are evaluated based on the FTA criteria detailed above. Construction noise impacts on nearby workers from activities at the Plot 16D staging area are evaluated using both the City of South San Francisco Municipal Code noise standards (90 dBA at 25 feet or any point outside the property plane of the project site) and the FTA daytime standards for commercial uses discussed above. There are no residential uses in the vicinity of the Plot 16D construction staging area.

If estimated noise levels at the nearest sensitive receptor locations exceed the identified criteria shown in Table 3.B-11, p. 3.B-26, the evaluation then qualitatively considers the frequency, duration, and intensity of noise levels in determining whether the noise increase would be substantial and would warrant noise control measures.

CONSTRUCTION TRAFFIC NOISE

In addition to noise impacts from construction equipment, this analysis evaluates the potential for construction-related traffic to result in noise impacts along local access roads by determining whether noise-sensitive receptors would be located along proposed/likely construction haul routes and the degree of noise increase along these routes from subsequent RADP project-related peak hourly increases in construction truck traffic. The construction traffic noise analysis is based on transportation data provided in the SFO Recommended Airport Development Plan CEQA Analysis – Representative Project Construction Vehicle Trip Assignment (see Appendix E.3 of this Draft EIR).[191] Daily construction truck and worker trip information for

[190] U.S. Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974.
[191] LCW Consulting and Fehr & Peers, *SFO Recommended Airport Development Plan CEQA Analysis – Representative Project Construction Vehicle Trip Assignment*, memorandum to San Francisco Planning Department, March 2025.

the four representative projects was developed as part of the air quality analysis methodology.[192] The four representative projects are Central Hub (large project), the CONRAC Facility (large project), the ITB Main Hall Expansion (medium project), and the East Field Ground Support Equipment Facility #2 (RADP Project #19; small project). Each of the representative project construction phases would generate various types of vehicle trips: haul trucks associated with the transfer and disposal of demolition materials, haul trucks importing fill materials, trucks delivering materials and equipment, and construction workers traveling to and from the construction worker parking lots. For purposes of this analysis, the greatest number of trucks and workers identified for any construction phase was selected (e.g., the maximum number of haul demolition trucks was selected for the demolition phase, while the maximum number of construction workers was selected for the building construction phase). The distribution of the construction worker and truck trips assumes that for each representative RADP project, either the Aviador Lot or the Plot 16D construction staging lot would be designated as the primary staging area, in addition to smaller staging areas in the vicinity of the RADP projects. The analysis assumes that construction of the representative projects would primarily occur during the daytime hours, with the greatest number of representative project-generated trips occurring during the a.m. peak hour.

In addition to construction traffic noise impacts from the four representative projects, the analysis also considers construction traffic noise impacts from multiple projects with overlapping schedules. The analysis considers three overlapping scenarios including the high overlapping scenario, which assumes the simultaneous construction of RADP Projects #3 (ITB Main Hall Expansion), #6 (Central Hub), and #9 (CONRAC Facility) and can be considered to represent the greatest amount of construction traffic that could be generated at any given time. The medium overlapping scenario assumes the simultaneous construction of RADP Projects #3 (ITB Main Hall Expansion) and #19 (East Field Ground Support Equipment Facility #2). The low scenario assumes simultaneous construction of RADP Project #19 (East Field Ground Support Equipment Facility #2) along with another project of similar size.

Roadway segments were selected for analysis based on the presence of adjacent receptors (noise sensitive and worker receptors). Impacts from construction truck traffic are assessed using the same evaluation metrics as for operational roadway traffic. In general, traffic noise increases of less than 3 dBA are barely perceptible to people, while a 5 dBA increase is readily noticeable.[193] The analysis considers a 5 dBA increase in the ambient noise level as a substantial permanent increase in noise environments designated as “satisfactory” or “normally acceptable” based on the Land Use Compatibility Chart for Community Noise in the General Plan Noise Element of the jurisdiction within which the roadway is located. In “conditionally acceptable,” “conditionally unacceptable,” or “unacceptable” noise environments based on the Land Use Compatibility Chart for Community Noise in the General Plan Noise Element of the jurisdiction within which the roadway is located, a traffic noise increase greater than 3 dBA is considered a substantial permanent increase in noise.

Methodology for Analysis of Operational Noise Impacts

The operational analysis for noise impacts uses the projected future condition (2045) as the baseline against which environmental impacts are assessed given that implementation of the RADP is a long-range plan to guide the Airport’s development with an anticipated 20-year construction timeline. Because the RADP is a plan, its approval would not result in direct physical changes in the environment; and because the RADP

[192] To present an approximation of the anticipated construction impacts that could occur with implementation of the RADP, ESA selected four RADP projects that represent large, medium, and small project types. These project types would represent the range of projects that could occur under the RADP
[193] Caltrans, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, pp. 2–44, September 2013, https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf, accessed July 30, 2024.

does not propose any project-level approvals, additional actions and environmental review would be required to implement each subsequent RADP project. As discussed in Chapter 2, Project Description, and in Appendix C, Airport Facilities to Accommodate Aviation Demand, implementation of the RADP would not induce passenger demand (i.e., induce the public to choose to fly if and/or where they otherwise would not), nor would the RADP increase the capacity of the airfield, change the configuration of the existing runways, change the number of aircraft operations or aircraft types operating at the Airport (including cargo, private jets, and helicopters), or change the volume of annual passengers that choose to fly into and out of SFO. As such, the operational noise analysis assesses impacts by comparing the 2045 future baseline without RADP conditions to the 2045 future baseline with RADP conditions to accurately evaluate those impacts attributable only to subsequent RADP projects (including anticipated employment growth; see Chapter 3, Analysis Assumptions, p. 3-4). The 2045 future baseline with RADP conditions also represents the cumulative condition.

NOISE FROM STATIONARY SOURCES

Upon completion of construction, RADP projects could generate noise from stationary sources such as back-up generators and heating, ventilation, and air conditioning (HVAC) equipment, and potentially other sources such as forklift operations, ground support equipment, or other noise sources associated with new or expanded maintenance facilities. Due to the location of subsequent RADP projects relative to sensitive receptors, any operational stationary sources introduced with implementation of RADP projects would be located at least 1,000 feet away from residential sensitive receptors. Similar to the construction noise analysis, the operational noise analysis evaluates impacts assuming the operation of such sources at the representative RADP projects based on their proximity to sensitive receptors or the scale and intensity of the operational noise sources. The analysis of potential noise impacts associated with these new operational noise sources considers available data on the generalized noise levels associated with such equipment along with generalized conservative assumptions regarding their location on subsequent RADP project sites and the presence of intervening structures, as well as the estimated ambient noise levels in 2045 at sensitive receptors potentially affected. All noise from construction staging areas is analyzed under the construction noise impact analysis.

The City of Millbrae has not adopted any quantitative operational noise criteria. The operational noise standard in the City of San Bruno Municipal Code is the same as the City and County of San Francisco Police Code article 29, section 2909(c), which considers an increase of greater than 10 dBA over the local ambient noise level at a distance of 25 feet or more to be significant. Daytime operational noise impacts are evaluated using this standard. In addition, the San Francisco Police Code section 2909(d)'s fixed residential interior noise limit within dwellings of 45 dBA between 10 p.m. to 7 a.m. is used for the evaluation of nighttime and daytime operational noise impacts, respectively.

OPERATIONAL TRAFFIC NOISE

Implementation of subsequent RADP projects would result in employment generation that would increase traffic volumes on local arterial roadways on and in communities surrounding the Airport. Operational traffic includes employee vehicle trips, delivery trucks (vendor trips), and transport refrigeration units. Using data and information developed in support of the transportation analysis, localized increases in traffic noise due to the estimated employee growth (approximately 2,700 employees) attributable to implementation of the RADP is estimated for the most affected roadway segments and compared to standards discussed below to evaluate impacts.

Based on guidance from the San Francisco Noise Element, a 5 dBA increase in the ambient noise level is considered a substantial permanent increase in noise environments designated as satisfactory based on the Land Use Compatibility Chart for Community Noise in the General Plan Noise Element of the jurisdiction within which the roadway is located. In "conditionally acceptable," "conditionally unacceptable," or "unacceptable" noise environments based on the Land Use Compatibility Chart for Community Noise in the General Plan Noise Element of the jurisdiction within which the roadway is located, a traffic noise increase greater than 3 dBA is considered a significant increase. Permanent increases in transportation noise levels from operational traffic along roadway segments are evaluated based on these standards.

Methodology for Analysis of Vibration Impacts

CONSTRUCTION VIBRATION

Operation of construction equipment at subsequent RADP project sites and construction staging areas would result in groundborne vibration levels that could be perceptible to receptors in the vicinity or result in structural damage to adjacent buildings. The main concerns associated with construction-generated vibration include sleep disturbance, building damage, and interference with vibration-sensitive instruments or machinery, such as those used in research laboratories or hospitals. The CEQA Guidelines do not define the levels at which groundborne vibration or groundborne noise is considered "excessive." The City and County of San Francisco has not adopted any criteria for construction or operational groundborne vibration impacts. In addition, the cities of San Bruno and Millbrae within which sensitive receptors closest to the representative RADP projects and the Aviador Lot are located also do not have any adopted quantitative criteria for construction vibration impacts. Policies in the City of South San Francisco General Plan require a vibration analysis if residential or other sensitive receptors are located within 100 feet of construction activities that include high vibration-generating activities such as pile driving. Historic structure protection is required for construction activities that include pile driving within 150 feet and use of mobile construction equipment within 50 feet of historic structures. However, construction activities at the Plot 16D staging area, which is within the boundaries of the City of South San Francisco, would not include high vibration generating activities such as pile driving. In addition, there are no residential or other vibration-sensitive uses or historic structures located in the vicinity of subsequent RADP projects located in the City of South San Francisco. As such, the City of South San Francisco 's vibration analysis requirements would not apply.

With respect to construction-related vibration effects on buildings, Airport buildings adjacent to subsequent RADP construction sites would be the closest structures that could potentially be affected by construction vibration. Impacts to these buildings would depend on the level of vibration generated by construction equipment, the distance between subsequent RADP construction activities and adjacent buildings, and the age and condition of the buildings at the time construction of RADP projects is undertaken. Therefore, construction vibration impacts with respect to structural damage to buildings are addressed at a programmatic level with a quantitative evaluation of vibration levels generated by construction equipment anticipated to be used for subsequent RADP projects and estimating distances within which structural damage could be anticipated based on the vibration standards in Caltrans' Transportation and Construction Vibration Guidance Manual (see Table 3.B-7, p. 3.B-17).

For the evaluation of sleep disturbance impacts from construction vibration, potential vibration levels at nearest sensitive receptor locations (i.e., residences, hotels, and other places where people sleep) resulting from construction of subsequent RADP projects are evaluated against the criteria for human annoyance established in the FTA's Transit Noise and Vibration Impact Assessment (see Table 3.B-6, p. 3.B-16) to determine whether an exceedance of allowable vibration levels would occur and could cause sleep disturbance. If estimated vibration levels at sensitive receptor locations exceed the FTA's Category 2 criteria for residences and locations where people sleep, the evaluation then qualitatively considers the frequency, duration, and intensity of vibration levels in determining whether the resulting vibration would be considered substantial and would warrant vibration control measures. The equations used to estimate vibration propagation take into consideration the specific soil types in underlying bay muds and silty clay in the subsequent RADP project areas as determined by geotechnical reports.[194]

OPERATIONAL VIBRATION

None of the subsequent RADP projects would include any operational sources of vibration. Hence, this topic is not discussed further.

Methodology for Analysis of Cumulative Impacts

The cumulative impacts of subsequent RADP projects that could be constructed simultaneously with other cumulative projects in the vicinity are analyzed qualitatively based on the locations and distances of subsequent RADP and cumulative projects relative to receptors that could be affected. Cumulative stationary source impacts are also addressed qualitatively since specific sources and locations of stationary sources for subsequent RADP and cumulative projects are not known at this time. As the programmatic analysis of operational traffic attributable to subsequent RADP projects relies on the 2045 future baseline, traffic from other development anticipated in the area by 2045 is already included. As such, the cumulative operational analysis for traffic noise would be the same as that discussed for implementation of the RADP under Impact NO-3.

Impact Evaluation

Impact NO-1: Construction of RADP projects could result in a substantial temporary or periodic increase in ambient noise levels at sensitive receptors in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. *(Less than Significant with Mitigation)*

Daytime Construction Noise

Construction of RADP projects would require the use of heavy equipment during demolition, excavation, and general construction activities. For larger projects, pile driving could be used for installation of foundations. Construction activities would also involve the use of smaller power tools, generators, and other sources of noise. Throughout all stages of construction, there would be a changing mix of the equipment and the noise generated would vary both temporally and spatially based on the location and mix of equipment used. Thus, construction activity noise levels at and near RADP project sites would fluctuate depending on the particular type, number, location, and duration of use of the various pieces of construction equipment.

Construction of RADP projects would begin in late 2025 and is anticipated to be completed by 2045. Construction would occur based on a five-day work week; however, work may proceed up to seven days per week. Nighttime construction would occur for several projects as necessary to avoid conflicts with the existing Airport operations, utilities connections and switchovers, and for concrete pours.

[194] ESA, 2021, telephone conversation with Peter Hudson of Sutro Science, July 6, 2021.

Table 3.B-13 shows the maximum noise levels (L_{max}) produced by various types of construction equipment that could be used for construction of RADP projects at a reference distance of 50 feet from the piece of equipment. These L_{max} noise levels associated with the construction equipment would only be generated when equipment is operated at full power. Typically, the operating cycle for a piece of construction equipment would involve 1 or 2 minutes of full power operation followed by operation at lower power settings. Therefore, the L_{max} noise levels shown in Table 3.B-13 would only occur intermittently throughout the construction workday.

NOISE IMPACTS TO NOISE-SENSITIVE RECEPTORS

The FTA has developed criteria for the assessment of noise impacts. For residential land uses, the FTA specifies criteria of 90 dBA during daytime hours and 80 dBA during nighttime hours, which are also conservatively applied to other nonresidential noise-sensitive land uses such as schools and hotels. If these criteria are exceeded, the guidelines note that there may be adverse community reaction.[195]

The FTA methodology for general assessment was applied to each representative RADP project using both standard construction equipment and impact pile drivers for purposes of a conservative analysis to determine the resultant noise levels for the two noisiest pieces of equipment expected to be used simultaneously. While construction activities for each RADP project would involve an array of different equipment, the two noisiest pieces of equipment that could be used would be the same for all, which would include a pile driver and a crane to maneuver piles into place. For subsequent RADP projects that would not involve pile installation, the two noisiest pieces of equipment expected to be used simultaneously would be a concrete saw and grader. The two noisiest pieces of equipment used at the construction staging areas would include an excavator and a forklift. Noise levels were estimated for the CONRAC Facility (closest to noise-sensitive receptors) and the Central Hub (largest project). Additionally, noise levels were estimated for sensitive receptors closest to the Aviador Lot construction staging area. It should be noted that the Aviador Lot is currently used as a construction staging area for other SFO projects; hence, the existing use as a construction staging area is part of the existing environmental setting.

Calculated daytime noise levels for representative RADP projects and staging areas are presented in **Table 3.B-14** for the nearest noise-sensitive receptor locations identified in Table 3.B-12, p. 3.B-28. The attenuated noise level at each sensitive receptor is also presented in the table and compared to the FTA assessment criteria for daytime construction noise. As shown in Table 3.B-14, daytime construction noise from the representative RADP projects and construction staging areas would be below the 90 dBA daytime criterion for the nearest residential receptors. Hotel guests are not considered noise-sensitive receptors during daytime hours. As the representative projects (RADP Projects #6 and #9) provide the most conservative analysis based on the amount and intensity of construction and proximity to daytime noise receptors, noise from daytime construction of all other RADP projects that are smaller in size and farther away from receptors would also be below the 90 dBA daytime criterion at the nearest residential receptors.

[195] U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018. Table 7-2, p. 179.

Table 3.B-13 Maximum Noise Levels from Construction Equipment

Construction Equipment	Noise Level at 50 Feet (dBA, L_{max})	Noise Level at 100 Feet (dBA, L_{max})
Air Compressor	78	72
Backhoe	78	72
Bore/Drill Rig	84	78
Concrete Batch Plant	83	77
Concrete Mixer Truck	79	73
Concrete Pump Truck	81	75
Concrete/ Industrial Saw [a]	90	83
Crane	81	75
Dozer	82	76
Excavator	81	75
Front End Loader	79	73
Generator Set	81	75
Grader	85	79
Haul Truck	77	72
Hoe Ram [b]	90	84
Impact Pile Driver [b]	101	95
Jackhammer [b]	89	83
Paver	77	72
Rock/Concrete Crusher [c]	90	84
Roller	80	74
Rough Terrain Forklift [d]	83	77
Vibratory Compactor	83	77
Vibratory Pile Driver	101	95
Scraper	84	78
Sweeper/Scrubber	73	67
Water Trucks	79	73

SOURCE: U.S. Department of Transportation, Federal Highway Administration, *Construction Noise Handbook*, 9.0, Construction Equipment Noise Levels and Ranges, Table 9.1, Roadway Construction Noise Model Default Noise Emission Reference Levels and Usage Factors, updated August 24, 2017, accessed August 1, 2024, http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm; U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

NOTES:

a. Concrete saws are generally used for relatively detailed demolition work, such as opening up a specific area of street or sidewalk. As such, the duration and frequency of their use is usually not extensive.
b. Impact equipment, such as pile drivers and hoe rams are exempt from the restrictions of police code section 2907 (80 dBA at 100 feet from the noise source) provided they are equipped with approved mufflers or acoustic shields. At a distance of 600 feet, the noise level from a pile driver is about 79 dBA L_{max}, which would not exceed the police code section 2907 requirements of 80 dBA.
c. Noise measurements from various rock and concrete recycling crusher plants indicate that a crusher and conveyor plant can generate noise levels ranging between 81 and 90 dBA (L_{eq}) at 50 feet. This table conservatively presents the higher reference noise level.
d. Used as a proxy for gradall forklift.

Table 3.B-14 Daytime Noise Levels from Construction at Nearest Noise-Sensitive Receptors

Nearest Sensitive Receptor	Existing Daytime Noise Level (dBA, L_{eq})	Loudest Two Noise Sources	Reference L_{max} (dBA)[a]	Distance to Receptor (feet)[b]	Acoustical Usage Factor (%)[c]	Adjusted Construction Noise L_{eq} Level (dBA)[d]	Exceeds 90 dBA Daytime Standard?	Existing Noise Levels + Construction Noise Resultant Noise Level (dBA)	Exceed Ambient + 10 Dba Standard?
RADP Project #9 (CONRAC Facility)									
Residences along 7th Avenue, San Bruno	68	Concrete Saw/Grader	90/85	1,000	20/40	59	No	69	No
RADP Project #9 (CONRAC Facility)									
Residences along 7th Avenue, San Bruno	68	Pile Driver/Crane	101/81	1,000	20/16	68	No	71	No
RADP Project #6 (Central Hub)									
Residences south of Bay Street, Millbrae	64	Concrete Saw/Grader	90/85	2,800	20/40	50	No	64	No
RADP Project #6 (Central Hub)									
Residences south of Bay Street, Millbrae	64	Pile Driver/Crane	101/81	2,800	20/16	59	No	65	No
Aviador Lot Construction Staging Area									
Roblar Avenue Residences, Millbrae	63	Excavator/ Gradall forklift	81/83	200	40/40	69	No	70	No

SOURCE: Data compiled by ESA in 2024; Noise Technical Appendix (see Appendix F of this Draft EIR).

ABBREVIATION: dBA = A-weighted decibels

NOTES:

a. L_{max} at 50 feet.
b. Distance between approximate location of equipment and property line of sensitive receptor.
c. Acoustical usage factor represents the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.
d. The L_{eq} level is adjusted for distance and the acoustical usage factor.

Construction noise impacts may also be assessed with respect to the overall increase in noise from combined construction equipment at a given sensitive receptor compared to existing conditions. This methodology applies a 10 dBA increase over ambient noise levels for sensitive receptors that would reasonably be expected in exterior areas. Table 3.B-14 presents the existing ambient noise level as well as the existing conditions plus construction resultant noise level for each sensitive receptor and identifies whether the resultant noise level would exceed the ambient level by more than 10 dBA. As shown in the table, the resultant noise level increases from daytime construction would not increase by more than 10 dBA for any of the sensitive receptor locations analyzed. As the representative projects (RADP Projects #6 and #9) provide the most conservative analysis based on the amount and intensity of construction and proximity to daytime noise receptors, daytime noise increases from the construction of all other RADP projects that are smaller in size and farther away from receptors would also not increase the ambient noise level at any of the sensitive receptor locations by more than 10 dBA. As such, impacts related to construction of subsequent RADP projects on noise-sensitive receptors would be ***less than significant***.

COMBINED CONSTRUCTION NOISE FROM MULTIPLE RADP PROJECTS

If multiple RADP projects are located close to each other and are constructed simultaneously, this could result in a combined increase in noise levels at sensitive receptor locations. However, due to the distance of more than 1,000 feet separating subsequent RADP projects from the nearest noise-sensitive receptors, this increase would not be audible over existing daytime noise levels influenced primarily by traffic on U.S. 101 and aircraft operations. Therefore, this would not result in an exceedance of construction noise identified criteria. The combined impact of simultaneous construction of subsequent RADP projects to noise-sensitive receptors during the daytime would be ***less than significant***.

NOISE IMPACTS TO WORKERS

Construction activities associated with subsequent RADP projects would take place in proximity to Airport employees.

EMPLOYEES WORKING WITHIN BUILDINGS

Employees working within structures would be shielded from construction noise due to the attenuation provided by the buildings they are within. As discussed above, a standard exterior-to-interior noise reduction for modern buildings is 25 dBA with windows closed, which is the appropriate standard to apply given that most buildings at the Airport do not have operable windows due to the level of aircraft activity. As such, the noisiest construction equipment generating 101 dBA L_{max} at a distance of 50 feet from the construction equipment (as shown in Table 3.B-13, p. 3.B-35) would attenuate to 76 dBA L_{max}, well below the FTA assessment criterion for daytime construction noise for workers (100 dBA).

WORKERS ON THE AIRFIELD

Workers on the airfield such as baggage handlers, ramp workers, fuel truck operators, catering truck workers, and mechanics who work on aircraft while parked at the gates are exposed to consistently high noise levels from aircraft landing and taking off on the runways, taxiing aircraft, and ground support equipment. Noise levels from these sources can often be higher than 90 dBA, which can cause hearing impairment; therefore, the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) requires workers on the airfield to wear hearing protection such as earplugs, earmuffs, communication headsets, or active noise-reduction headsets. These protection devices attenuate noise waves before they reach the eardrum, and most of them are effective at reducing high-frequency noise levels above 1,000 Hz. Any construction activities associated with subsequent RADP projects in the vicinity of these workers would not combine with existing ambient noise levels on the airfield to exceed the 100 dBA FTA criterion. Therefore, construction noise would not be audible over the already high existing background noise levels at the airfield. Furthermore, the use of hearing protection devices reduces exposure to these workers.

WORKERS NEAR CONSTRUCTION SITES

Construction of the Central Hub also would expose nearby worker receptors, such as skycaps located at the departure terminals and parking enforcement patrols at the arrival terminals to construction noise. These worker receptors could be located as close as 200 feet from construction activities at the Central Hub. At this distance, the two noisiest pieces of construction equipment used during pile driving would result in a noise level of 82 dBA, which would be below the FTA criterion of 100 dBA for workers. Noise from standard construction equipment would be lower. Therefore, construction activities associated with the Central Hub would not result in noise exposure to worker receptors that exceed the FTA criterion.

WORKERS IN COMMERCIAL STRUCTURES LOCATED OUTSIDE OF SFO

Commercial uses within the City of South San Francisco are located adjacent to the Plot 16D construction staging area. These commercial buildings are located as close as 20 feet from the boundary of Plot 16D and approximately 60 feet from the stockpiles/storage areas where construction equipment would be used. There are no doors or windows on any of the building facades facing Plot 16D and workers would be located indoors. Therefore, the simultaneous use of an excavator and a forklift at the Plot 16D construction staging area would result in a noise level of 80 dBA L_{eq} at the adjacent property line. This noise level would meet the City of South San Francisco Municipal Code section 8.32.050(d) standard that the noise level at any point outside the property plane of a project site shall not exceed 90 dBA. The indoor exposure to worker receptors within these buildings would be 55 dBA L_{eq}, which would be well below the 100 dBA FTA criterion for daytime construction noise for workers.

Overall, noise impacts from construction of subsequent RADP projects to workers on and off Airport property would be ***less than significant***.

COMBINED CONSTRUCTION NOISE AT WORKER RECEPTORS FROM MULTIPLE RADP PROJECTS

If multiple RADP projects are located close to each other and are constructed simultaneously, this could result in a combined increase in noise levels at worker receptor locations. The affected workers would be located on Airport property and within buildings that provide an attenuation of at least 25 dBA with windows closed. Workers on the airfield would be covered by OSHA requirements that require the use of noise protection devices. Noise from simultaneous construction of RADP projects would also not exceed the City of South San Francisco Municipal Code section 8.32.050(d) standard of 90 dBA at any point outside the property plane of a project site or FTA's 100 dBA standard for worker receptors adjacent to Plot 16D. Therefore, noise impacts from construction of multiple RADP projects to worker receptors on and off Airport property would be ***less than significant***.

Nighttime Construction Noise

Nighttime construction noise impacts are assessed with respect to the potential to result in sleep disturbance. The nighttime construction noise analysis quantitatively evaluates noise from the two loudest pieces of equipment to determine if construction noise during nighttime hours would exceed an interior noise level of 45 dBA at land uses where people would reasonably be expected to sleep (residences, hotels, and hospitals) and result in sleep disturbance.

It is conservatively assumed that the ITB Curbside Expansion project and Boarding Area H, which are located closest to the Grand Hyatt at SFO (a nighttime sensitive receptor), would involve construction during nighttime hours (10 p.m. to 7 a.m.). It is assumed that nighttime construction would use standard equipment (concrete saw and grader) for the ITB Curbside Expansion project, while impact equipment (pile driver and crane) could be used during nighttime hours for construction of Boarding Area H. Additionally, it is assumed that deliveries and transport of materials to subsequent RADP project sites would occur at the Aviador Lot construction staging area during nighttime hours. **Table 3.B-15** presents the construction noise levels from the ITB Curbside Expansion and Boarding Area H projects, and the Aviador Lot staging area at the nearest nighttime noise-sensitive receptors and compares them to the applicable nighttime exterior and interior standards of 80 dBA and 45 dBA, respectively.

As shown in the table above, the exterior nighttime noise standard of 80 dBA is not exceeded at any of the nearby receptors. For the Grand Hyatt at SFO, the interior noise levels are estimated by applying a typical 25 dBA exterior to interior noise reduction attributable to standard building construction with windows closed given that the windows for the hotel are not operable. As shown in Table 3.B-15, nighttime noise from construction activities at the ITB Curbside Expansion and Boarding Area H project sites would not result in interior noise levels that exceed 45 dBA at the Grand Hyatt at SFO. Hotel construction is subject to the noise transmission requirements of Title 24 of the California Building Code, and hotels constructed in the vicinity of airports are constructed with sound-rated materials in walls and windows to meet Title 24 requirements. Title 24 requires that interior noise levels with windows closed shall not exceed an annual noise level of 45 dB in any habitable room in hotels, motels, and multifamily dwelling units due to exterior noise sources. A conservative assumption for standard modern building construction is a 25 dBA exterior-to-interior noise reduction with windows closed. However, given the Grand Hyatt at SFO's location on Airport property with daytime noise levels in the range of 72 dBA, sound-rated materials used for noise abatement likely provide more than the 25 dBA exterior-to-interior noise reduction to meet Title 24 standard. This would result in lower interior nighttime noise levels than those shown in Table 3.B-15. Table 3.B-15 presents the most conservative analysis for subsequent RADP projects closest to nighttime receptors (RADP Projects #1 and #8); therefore, nighttime construction associated with all other RADP projects located farther away would also result in an interior noise level of less than 45 dB at the nearest residential and hotel receptors. For the homes on Roblar Avenue near the Aviador Lot construction staging area, an exterior-to-interior reduction of 15 dBA is applied to account for the possibility that windows could be kept open by residents during the nighttime. As shown in Table 3.B-15, nighttime activities at the Aviador Lot construction staging area would result in an exceedance of the interior noise standard at the residences on Roblar Avenue. Although the Aviador Lot is an existing construction staging area currently being used for construction activities at the Airport, nighttime staging activities associated with construction of RADP projects would increase the frequency of nighttime activities and would result in an exceedance of the interior noise levels at the nearest residential uses, which would be considered a significant impact. Therefore, **Mitigation Measure M-NO-1, Nighttime Construction Noise Control**, is identified to address potential nighttime construction noise impacts on these residences near the Aviador Lot from construction activity associated with subsequent RADP projects.

Table 3.B-15 Nighttime Noise Levels from Construction at Nearest Noise-Sensitive Receptors

Nearest Sensitive Receptor	Loudest Two Noise Sources	Reference L_{max} (dBA)[a]	Distance to Receptor (feet)[b]	Acoustical Usage Factor (%)[c]	Adjusted Construction Noise L_{eq} Level (dBA)[d]	Exceed 80 dBA Nighttime Standard?	Resultant Interior Noise Level (dBA)	Exceed Ambient 45 dBA Interior Standard?
RADP Project #8 (International Terminal Building Curbside Expansion)								
Grand Hyatt at SFO	Concrete Saw/Grader	90/85	770	20/40	61	No	36	No
RADP Project #9 (CONRAC Facility)								
Grand Hyatt at SFO	Pile Driver/Crane	101/81	990	20/16	69	No	44	No
RADP Project #6 (Central Hub)								
Roblar Avenue Residences, Millbrae	Excavator/Gradall forklift	81/83	200	40/40	69	No	**54**	**Yes**
Rollins Gateway Apartments, Residence Inn by Marriott	Excavator/Gradall forklift	81/83	360	40/40	64	No	39	No

SOURCE: Data compiled by ESA in 2024; Noise Technical Appendix (see Appendix F of this Draft EIR).

ABBREVIATION: dBA = A-weighted decibels

NOTES:

a. L_{max} at 50 feet.
b. Distance between approximate location of equipment and property line of sensitive receptor.
c. Acoustical usage factor represents the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.
d. The L_{eq} level is adjusted for distance and percentage of usage.

Mitigation Measure M-NO-1: Nighttime Construction Noise Control. For all nighttime construction staging activities associated with RADP projects taking place at the Aviador Lot, before issuance of a building permit, or prior to start of construction, the project sponsor shall submit a project-specific construction noise control plan to the ERO or the ERO's designee for approval. The construction noise control plan shall be prepared by a qualified acoustical engineer, with input from the construction contractor, and include all feasible measures to reduce construction noise. The construction noise control plan shall identify noise control measures to meet a performance target for nighttime staging activities at the Aviador Lot to not result in interior noise levels greater than 45 dBA at noise sensitive receptors during the nighttime period. The project sponsor shall ensure that requirements of the construction noise control plan are included in contract specifications.

If nighttime construction is required, the plan shall include specific measures to reduce nighttime construction noise. The plan shall also include measures for notifying the public of construction activities, complaint procedures, and a plan for monitoring construction noise levels in the event complaints are received.

The construction noise control plan shall include the following measures to the degree feasible, or other effective measures, to reduce construction noise levels:

- Use construction equipment that is in good working order, and inspect mufflers for proper functionality;
- Select "quiet" construction methods and equipment (e.g., improved mufflers, use of intake silencers, engine enclosures);
- Use construction equipment with lower noise emission ratings whenever possible, particularly for air compressors;
- Prohibit the idling of inactive construction equipment for more than five minutes;
- Locate stationary noise sources (such as compressors) as far from nearby noise sensitive receptors as possible, muffle such noise sources, and construct barriers around such sources and/or the construction site;
- Avoid placing stationary noise-generating equipment (e.g., generators, compressors) within noise-sensitive buffer areas (as determined by the acoustical engineer) immediately adjacent to neighbors;
- Enclose or shield stationary noise sources from neighboring noise-sensitive properties with noise barriers to the extent feasible. To further reduce noise, locate stationary equipment in pit areas or excavated areas, if feasible; and
- Install temporary barriers, barrier-backed sound curtains and/or acoustical panels around working powered impact equipment and, if necessary, around the project site perimeter. When temporary barrier units are joined together, the mating surfaces shall be flush with each other. Gaps between barrier units, and between the bottom edge of the barrier panels and the ground, shall be closed with material that completely closes the gaps, and dense enough to attenuate noise.

The construction noise control plan shall include the following measures for notifying the public of construction activities, complaint procedures and monitoring of construction noise levels:

- Designation of an on-site construction noise manager for the project;

- Notification of neighboring noise sensitive receptors within 300 feet of the Aviador Lot at least 30 days in advance of nighttime staging activities that may generate exterior noise levels greater than 80 dBA or interior noise levels greater than 45 dBA at noise sensitive receptors during the nighttime period about the estimated duration of the activity;
- A sign posted on-site describing noise complaint procedures and a complaint hotline number that shall always be answered during construction;
- A procedure for notifying the planning department of any noise complaints within one week of receiving a complaint;
- Conduct noise monitoring (measurements) during high-intensity construction activities to determine the effectiveness of noise attenuation measures and, if necessary, implement additional noise control measures; and
- A list of measures for responding to and tracking complaints pertaining to construction noise. Such measures may include the evaluation and implementation of additional noise controls at sensitive receptors.

Significance after Mitigation: Mitigation Measure M-NO-1 would reduce noise at sensitive receptors in the vicinity of the Aviador Lot construction staging area associated with nighttime construction. Because the measure includes a performance standard designated to achieve and maintain noise levels consistent with the identified significance criteria, nighttime construction noise impacts would be ***less than significant with mitigation***.

COMBINED CONSTRUCTION NOISE FROM MULTIPLE RADP PROJECTS

If multiple RADP projects are located close to each other and are constructed simultaneously, this could result in a combined increase in noise levels at sensitive receptor locations. However, due to the distance of more than 1,000 feet separating subsequent RADP projects from the nearest noise-sensitive receptors, this increase would not exceed the 80 dBA exterior noise criterion or the 45 dBA interior noise criterion at the nearest nighttime receptor locations. Therefore, the combined impact of simultaneous construction of subsequent RADP projects to noise-sensitive receptors during the nighttime would be ***less than significant***.

Noise Impacts from Construction Truck Traffic

The analysis of noise impacts related to construction truck traffic is based on the trip generation and distribution for four representative projects outlined in Appendix E.3 attached to this Draft EIR.[196] The four representative projects are Central Hub (RADP Project #6; large project), the CONRAC Facility (RADP Project #9; large project), the ITB Main Hall Expansion (RADP Project #3; medium project), and the East Field Ground Support Equipment Facility #2 (RADP Project #19; small project). Ten study segments were included in the construction traffic analysis, of which five roadway segments were chosen for the analysis of construction traffic noise. Roadway segments were selected for analysis based on the presence of adjacent receptors (noise-sensitive and worker receptors).

This analysis evaluates construction traffic noise levels based on algorithms of the Federal Highway Administration Traffic Noise Model, considering the existing conditions plus RADP construction traffic

[196] LCW Consulting and Fehr & Peers, *SFO Recommended Airport Development Plan CEQA Analysis – Representative Project Construction Vehicle Trip Assignment*, memorandum to San Francisco Planning Department, November 27, 2024.

projections presented in Appendix E.3. Modeled weekday noise level estimates for five roadway segments for the four representative projects for the worst-case weekday a.m. peak commute hour are presented in **Table 3.B-16**.

A 3 dBA or 5 dBA standard is applied to impacts based on the location, existing noise level, and land uses located along the roadway segments. Table 3.B-16 shows that the increases in roadside noise levels from the addition of construction worker and truck traffic attributable to the four representative RADP projects would be less than the more restrictive 3 dBA standard along all analyzed roadway segments except for the portion of South Airport Boulevard south of North Access Road during construction of the CONRAC Facility project. The existing modeled noise level along this segment located on Airport property is within the "satisfactory" range according to the land use compatibility designation in the San Francisco General Plan. Therefore, a 5 dBA incremental standard would apply. However, as shown in Table 3.B-16, during construction of the CONRAC Facility project, traffic noise levels along this roadway segment would increase by more than 5 dBA. Land uses along this roadway segment include parking structures and parking lots to the west and the United Airlines Maintenance and Operations Center to the east. As such, there are no noise-sensitive receptors along this roadway segment and worker receptors at the United Airlines Maintenance and Operations Center would be located within a building with no windows facing South Airport Boulevard and therefore would be completely shielded from this noise increase. Therefore, given the non-sensitive nature of land uses along the roadway segments affected by construction traffic noise associated with subsequent RADP projects and the absence of windows in the potentially affected structure, this increase would not result in a significant impact. In addition, this increase in construction traffic noise would be temporary and would not result in a permanent increase in traffic noise. Noise increases from RADP construction traffic along all other analyzed roadway segments for all representative projects analyzed would be below the more restrictive 3 dBA standard and hence would result in a less-than-significant noise impact along those roadway segments. As the four representative projects analyzed show the range of noise impacts subsequent RADP projects could generate from construction traffic, construction traffic noise impacts from all other RADP projects would be lower than those shown in Table 3.B-16. For these reasons, the impact of construction traffic from subsequent RADP projects on roadside noise levels would be ***less than significant***.

COMBINED CONSTRUCTION TRAFFIC NOISE FROM MULTIPLE RADP PROJECTS

Traffic noise impacts from the construction of multiple RADP projects as analyzed under the high, medium, and low overlapping scenarios detailed as described above are presented in **Table 3.B-17**. As shown in the table, the increases in traffic noise levels for the medium and low overlapping scenarios would be less than the more restrictive 3 dBA incremental standard along all analyzed roadway segments and hence would result in less-than-significant impacts associated with construction traffic noise. For the high overlapping scenario, which assumes simultaneous construction of the ITB Main Hall Expansion, the Central Hub, and the CONRAC facility projects, the increase in traffic noise levels would be less than the 3 dBA incremental standard along all analyzed roadway segments except for the segment of South Airport Boulevard south of North Access Road where the noise increase would be 5.4 dBA. As discussed earlier, a 5 dBA standard would apply to this roadway segment based on the existing modeled noise level, which would be exceeded under the high overlapping scenario. However, due to the absence of noise-sensitive and worker receptors along this roadway segment, this temporary increase in noise during construction would not be considered substantial. As the high overlapping scenario is the most conservative analysis for simultaneous construction of RADP projects, construction traffic from the simultaneous construction of any other RADP projects would also not result in substantial noise increases along roadway segments affecting noise-sensitive and worker receptors. The impact of construction traffic from overlapping RADP projects on roadside noise levels would be ***less than significant***.

Table 3.B-16 Traffic Noise Increases along Roadway Segments Affected by Construction of Representative RADP Projects

(Study Segment No.) Roadway Segment	Weekday A.M. Peak Hour[a] Existing Traffic Noise Level (dBA)[b]	Weekday A.M. Peak Hour[a] Existing + RADP Construction Traffic Noise Level (dBA)	Weekday A.M. Peak Hour[a] dBA Difference
RADP PROJECT #6 – CENTRAL HUB			
(4) Millbrae Avenue, east of U.S. 101	68.6	68.6	0.0
(5) Millbrae Avenue, west of U.S. 101	71.8	73.0	+1.2
(6) North Access Road, west of North Field Road	64.0	64.0	0.0
(8) South Airport Boulevard, south of North Access Road	66.4	66.8	+0.4
(9) North McDonnell Road, between San Bruno Avenue and South McDonnell Road	66.9	66.9	0.0
RADP PROJECT #9 – CONRAC FACILITY			
(4) Millbrae Avenue, east of U.S. 101	68.6	68.6	0.0
(5) Millbrae Avenue, west of U.S. 101	71.8	72.0	+0.2
(6) North Access Road, west of North Field Road	64.0	64.0	0.0
(8) South Airport Boulevard, south of North Access Road	66.4	71.6	**+5.2**
(9) North McDonnell Road, between San Bruno Avenue and South McDonnell Road	66.9	66.9	0.0
RADP PROJECT #3 – ITB MAIN HALL EXPANSION			
(4) Millbrae Avenue, east of U.S. 101	68.6	68.6	0.0
(5) Millbrae Avenue, west of U.S. 101	71.8	72.4	+0.6
(6) North Access Road, west of North Field Road	64.0	64.0	0.0
(8) South Airport Boulevard, south of North Access Road	66.4	66.6	+0.2
(9) North McDonnell Road, between San Bruno Avenue and South McDonnell Road	66.9	66.9	0.0
RADP PROJECT #19 – EAST FIELD GROUND SUPPORT EQUIPMENT FACILITY #2			
(4) Millbrae Avenue, east of U.S. 101	68.6	68.6	0.0
(5) Millbrae Avenue, west of U.S. 101	71.8	71.8	0.0
(6) North Access Road, west of North Field Road	64.0	64.6	+0.6
(8) South Airport Boulevard, south of North Access Road	66.4	66.6	+0.2
(9) North McDonnell Road, between San Bruno Avenue and South McDonnell Road	66.9	66.9	0.0

SOURCES: LCW Consulting and Fehr & Peers, *SFO Recommended Airport Development Plan CEQA Analysis – Representative Project Construction Vehicle Trip Assignment*, memorandum to San Francisco Planning Department, November 27, 2024 (see Appendix E.3); data compiled by ESA in 2024; Noise Technical Appendix (see Appendix F).

ABBREVIATION: dBA = A-weighted decibels

a. Morning (a.m.) peak hour refers to the peak hour of the peak period of the weekday a.m. (7 a.m. to 9 a.m.) peak period.
b. Existing noise levels are modeled traffic contributions only and do not reflect aircraft noise.

Table 3.B-17 Traffic Noise Increases along Roadway Segments from Simultaneous Construction of RADP Projects

(Study Segment No.) Roadway Segment	Weekday A.M. Peak Hour[a] Existing Traffic Noise Level (dBA)[b]	Existing + RADP Construction Traffic Noise Level (dBA)	dBA Difference
High Overlapping Scenario: RADP Projects #3 (ITB Main Hall Expansion), #6 (Central Hub), and #9 (CONRAC Facility)			
(4) Millbrae Avenue, east of U.S. 101	68.6	68.6	0.0
(5) Millbrae Avenue, west of U.S. 101	71.8	73.6	+1.9
(6) North Access Road, west of North Field Road	64.0	64.0	0.0
(8) South Airport Boulevard, south of North Access Road	66.4	71.8	**+5.4**
(9) North McDonnell Road, between San Bruno Avenue and South McDonnell Road	66.9	66.9	0.0
Medium overlapping Scenario: RADP Projects #3 (ITB Main Hall Expansion) and #19 (E Field GSE #2)			
(4) Millbrae Avenue, east of U.S. 101	68.6	68.6	0.0
(5) Millbrae Avenue, west of U.S. 101	71.8	72.4	+0.6
(6) North Access Road, west of North Field Road	64.0	64.6	+0.6
(8) South Airport Boulevard, south of North Access Road	66.4	66.7	+0.3
(9) North McDonnell Road, between San Bruno Avenue and South McDonnell Road	66.9	66.9	0.0
Low overlapping Scenario: RADP Projects #19 (E Field GSE #2) and another project similar in size			
(4) Millbrae Avenue, east of U.S. 101	68.6	68.6	0.0
(5) Millbrae Avenue, west of U.S. 101	71.8	71.8	0.0
(6) North Access Road, west of North Field Road	64.0	65.2	+1.2
(8) South Airport Boulevard, south of North Access Road	66.4	66.8	+0.4
(9) North McDonnell Road, between San Bruno Avenue and South McDonnell Road	66.9	66.9	0.0

SOURCES: LCW Consulting and Fehr & Peers, *SFO Recommended Airport Development Plan CEQA Analysis – Representative Project Construction Vehicle Trip Assignment*, memorandum to San Francisco Planning Department, November 27, 2024 (see Appendix E.3); data compiled by ESA in 2024; Noise Technical Appendix (see Appendix F).

ABBREVIATION: dBA = A-weighted decibels

NOTES:

a. Morning (a.m.) peak hour refers to the peak hour of the peak period of the weekday a.m. (7 a.m. to 9 a.m.) peak period.
b. Existing noise levels are modeled traffic contributions only and do not reflect aircraft noise.

Impact NO-2: Construction of RADP projects could generate excessive groundborne vibration or groundborne noise levels. ***(Less than Significant with Mitigation)***

Construction activities that would occur within RADP project sites could include pile driving, drilling, and compaction, which would have the potential to generate groundborne vibration. As such, any existing residential and hotel land uses (where people sleep) located in the immediate vicinity of these activities could be exposed to some degree of groundborne vibration. Vibration at the receptors can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to structural damage at the highest levels. Ground vibration from construction activities can occasionally reach levels that can damage structures.

The potential for construction-related vibration impacts depends on the proximity of construction activities to vibration sensitive receptors (people, buildings, vibration-sensitive equipment, etc.), the number and types of construction equipment, and the duration of construction equipment use. Some subsequent projects under the RADP could use pile drivers, and most projects would at least be expected to use heavy-duty equipment such as a large bulldozer, a hoe ram, or vibratory compactor. Typical vibration levels in peak particle velocity (PPV) associated with heavy-duty construction equipment are shown in **Table 3.B-18**, at various reference distances from the construction equipment, based on attenuation.

Table 3.B-18 Vibration Source Levels for Construction Equipment

	Approximate PPV (inch per second)		
Equipment	25 Feet (reference)	60 Feet	900 Feet
Impact Pile Driver	0.65	0.25	0.013
Vibratory Compactor	0.21	0.056	0.001
Caisson Drill, Hoe Ram, Bulldozer	0.089	0.024	0.0004
Loaded Trucks	0.076	0.020	0.0004

SOURCE: U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
NOTES: PPV = Peak Particle Velocity

Structural Damage from Construction Vibration

Caltrans vibration criteria for structural damage depends on the type of structure potentially impacted as shown in Table 3.B-8, p. 3.B-18. The vibration building damage standard for historic structures and some old structures is a PPV of 0.25 in/sec. The building damage standards for non-historic older residential structures is a PPV of 0.3 in/sec and 0.5 in/sec for new residential structures and modern industrial/commercial structures.

All subsequent RADP projects are located on Airport property at more than 1,000 feet from any offsite structures. It is unknown at this time how close construction activities associated with subsequent projects under the RADP would occur to structures on Airport property. There are currently no structures on the RADP project site older than 45 years that have been identified as historic structures. However, there could be structures that meet the 45-year age criterion and other eligibility requirements for historic structures in the future. The building damage impacts would vary depending on the level of vibration generated, distance of construction areas to structures, and the age and condition of the structures at the time construction is undertaken.

As shown in Table 3.B-18, at a distance of 25 feet, a vibratory compactor would generate groundborne vibration levels of approximately 0.21 in/sec PPV and a large bulldozer would generate groundborne vibration levels of approximately 0.089 in/sec PPV. Therefore, at 25 feet, neither a vibratory roller nor a large bulldozer would exceed the 0.25 in/sec PPV building damage criterion for historic and some old buildings. However, it is possible that non-pile driving equipment (such as vibratory compactors or bulldozers) would be required and used at distances closer than 25 feet from adjacent structures.

Vibration from a large bulldozer at a distance of 12 feet could result in vibration of 0.268 in/sec PPV, and vibration from a vibratory roller at a distance of 22 feet could result in a vibration level of 0.254 in/sec PPV (see **Table 3.B-19**). Therefore, the 0.25 in/sec PPV criterion for historic and some old buildings could be exceeded by non-pile driving equipment at distances of up to 22 feet for a vibratory roller and up to 12 feet for a large bulldozer or a hoe ram, and it is possible that construction could occur within these distances of adjacent structures. Construction activities using equipment besides pile drivers could therefore potentially result in damage-related vibration effects to adjacent susceptible structures, should those structures be located close enough to the construction activity.

Table 3.B-19 Vibration Impact Distances for Construction Equipment

		Criteria by Building Type (Continuous/Frequent Intermittent Sources)[a]		
Distance (feet)	Vibration Level[b] (PPV, in/sec)	Historic and Some Old Buildings	Older Residential Structures	New Residential Structures/Modern Industrial Commercial Buildings
Vibratory Roller				
14	**0.50**	**0.25**	**0.3**	**0.5**
19	**0.32**	**0.25**	**0.3**	0.5
22	**0.25**	**0.25**	0.3	0.5
Large Bulldozer				
7	**0.60**	**0.25**	**0.3**	**0.5**
11	**0.30**	**0.25**	**0.3**	0.5
12	**0.27**	**0.25**	0.3	0.5
Impact Pile Driver				
29	**0.52**	**0.25**	**0.3**	**0.5**
41	**0.30**	**0.25**	**0.3**	0.5
46	**0.26**	**0.25**	0.3	0.5

SOURCE: Table prepared by ESA based on Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

NOTES:

a. **Bolded** criteria are expected to be exceed Caltrans vibration criteria at the applicable distances.
b. Vibration levels estimated using equation published by FTA: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$; where D is distance.

With regard to impact equipment, as shown in Table 3.B-18, p. 3.B-46, a pile driver typically generates a vibration level of 0.65 PPV in/sec at 25 feet. This vibration level exceeds the Caltrans continuous/frequent intermittent source criteria, which are designed to prevent structural damage for the building types shown in

Table 3.B-8, p. 3.B-18, including modern industrial/commercial buildings (the building type shown in this table that is the least susceptible to damage from vibration). Pile driving could result in vibration levels that exceed the damage criteria for historic and some older buildings (0.25 PPV in/sec) at distances of up to 60 feet. At a distance of 32 feet, vibration levels from pile driving activity could exceed the damage criteria for modern industrial/commercial structures (as well as all other categories of buildings shown in Table 3.B-8).

Because pile drivers and other construction equipment could be used for subsequent RADP projects and, if used in proximity to adjacent structures, could exceed the damage criteria for buildings present in their vicinity on Airport property, it is possible that building damage could occur as a result of vibration-generating activities associated with construction of subsequent projects implemented under the RADP. Therefore, potential vibration impacts related to damage to structures could be significant.

As such, subsequent projects would be evaluated at such time they are proposed to determine whether the project could result in building damage from the use of vibration-generating equipment. The initial evaluation would consist of a review of the construction equipment required for the project and determining the distance between construction activities and adjacent buildings or structures. Should vibration-generating construction equipment be required, a screening-level analysis that compares vibration levels for various pieces of equipment with the distance to adjacent buildings or structures may be required to determine if construction activities could result in building damage. If the screening-level analysis reveals the potential for building damage to occur, the project sponsor may either conduct a detailed vibration study demonstrating that groundborne vibration would not result in building damage, or alternatively, implement **Mitigation Measure M-NO-2, Protection of Adjacent Buildings/Structures and Vibration Monitoring during Construction**. Implementation of Mitigation Measure M-NO-2 also would be required should a detailed vibration study indicate the potential for construction activities to result in building damage.

> **Mitigation Measure M-NO-2: Protection of Adjacent Buildings/Structures and Vibration Monitoring during Construction.** *Should a screening-level analysis comparing vibration levels for various pieces of equipment with the distance to adjacent buildings or structures for a subsequent RADP project determine that potential for building damage could occur, SFO would implement this mitigation measure or conduct a detailed vibration study demonstrating that groundborne vibration would not result in building damage.* Before issuance of a building permit or prior to start of construction, the project sponsor shall submit a project-specific Pre-construction Survey and Vibration Management and Monitoring Plan to the ERO or the ERO's designee for approval. The plan shall identify all feasible means to avoid damage to potentially affected buildings at. The project sponsor shall ensure that the following requirements of the Pre-Construction Survey and Vibration Management and Monitoring Plan are included in contract specifications, as necessary.
>
> *Pre-construction Survey.* Prior to the start of any ground-disturbing activity, the project sponsor shall engage a consultant to undertake a pre-construction survey of potentially affected buildings. If potentially affected buildings and/or structures are not potentially historic, a structural engineer or other professional with similar qualifications shall document and photograph the existing conditions of the potentially affected buildings and/or structures. The project sponsor shall submit the survey to the ERO or the officer's designee for review and approval prior to the start of vibration-generating construction activity.
>
> If nearby affected buildings are potentially historic, the project sponsor shall engage a qualified historic preservation professional and a structural engineer or other professional with similar

qualifications to undertake a pre-construction survey of potentially affected historic buildings. The pre-construction survey shall include descriptions and photographs of all identified historic buildings, including all facades, roofs, and details of the character-defining features that could be damaged during construction, and shall document existing damage, such as cracks and loose or damaged features (as allowed by property owners). The report shall also include pre-construction drawings that record the pre-construction condition of the buildings and identify cracks and other features to be monitored during construction. The qualified historic preservation professional shall be the lead author of the pre-construction survey if historic buildings and/or structures could be affected by the project. The pre-construction survey shall be submitted to the ERO for review and approval prior to the start of vibration-generating construction activity.

Vibration Management and Monitoring Plan. The project sponsor shall undertake a monitoring plan to avoid or reduce project-related construction vibration damage to adjacent buildings and/or structures and to ensure that any such damage is documented and repaired. Prior to issuance of the Pre-Construction Environmental Compliance letter, the project sponsor shall submit the Plan to the ERO for review and approval.

The Vibration Management and Monitoring Plan shall include, at a minimum, the following components, as applicable:

- *Maximum Vibration Level.* Based on the anticipated construction and condition of the affected buildings and/or structures on adjacent properties, a qualified acoustical/vibration consultant in coordination with a structural engineer (or professional with similar qualifications) and, in the case of potentially affected historic buildings/structures, a qualified historic preservation professional, shall establish a maximum vibration level that shall not be exceeded at each building/structure on adjacent properties, based on existing conditions, character-defining features, soil conditions, and anticipated construction practices (common standards are a peak particle velocity [PPV] of 0.25 inch per second for historic and some old buildings, a PPV of 0.3 inch per second for older residential structures, and a PPV of 0.5 inch per second for new residential structures and modern industrial/commercial buildings).
- *Vibration-generating Equipment.* The plan shall identify all vibration-generating equipment to be used during construction (including but not limited to site preparation, clearing, demolition, excavation, shoring, foundation installation, and building construction).
- *Alternative Construction Equipment and Techniques.* The plan shall identify potential alternative equipment and techniques that could be implemented if construction vibration levels are observed in excess of the established standard (e.g., drilled shafts [caissons] could be substituted for driven piles, if feasible, based on soil conditions, or smaller, lighter equipment could be used in some cases).
- *Pile Driving Requirements.* For projects that would require pile driving, the project sponsor shall incorporate into construction specifications for the project a requirement that the construction contractor(s) use all feasible means to avoid or reduce damage to potentially affected buildings. Such methods may include one or more of the following:
  - Incorporate "quiet" pile-driving technologies into project construction (such as drilled shafts, using sonic pile drivers, auger cast-in-place, or drilled-displacement), as feasible; and/or

   - Ensure appropriate excavation shoring methods to prevent the movement of adjacent structures

- *Buffer Distances.* The plan shall identify buffer distances to be maintained based on vibration levels and site constraints between the operation of vibration-generating construction equipment and the potentially affected building and/or structure to avoid damage to the extent possible.

- *Vibration Monitoring.* The plan shall identify the method and equipment for vibration monitoring to ensure that construction vibration levels do not exceed the established standards identified in the plan.

   - Should construction vibration levels be observed in excess of the standards established in the plan, the contractor(s) shall halt construction and put alternative construction techniques identified in the plan into practice, to the extent feasible.

   - The qualified historic preservation professional (for effects on historic buildings and/or structures) and/or structural engineer (for effects on historic and non-historic buildings and/or structures) shall inspect each affected building and/or structure (as allowed by property owners) in the event the construction activities exceed the vibration levels identified in the plan.

   - The structural engineer and/or historic preservation professional shall submit monthly reports to the ERO during vibration-inducing activity periods that identify and summarize any vibration level exceedances and describe the actions taken to reduce vibration.

   - If vibration has damaged nearby buildings and/or structures that are not historic, the structural engineer shall immediately notify the ERO and prepare a damage report documenting the features of the building and/or structure that has been damaged.

   - If vibration has damaged nearby buildings and/or structures that are historic, the historic preservation consultant shall immediately notify the ERO and prepare a damage report documenting the features of the building and/or structure that has been damaged.

   - Following incorporation of the alternative construction techniques and/or planning department review of the damage report, vibration monitoring shall recommence to ensure that vibration levels at each affected building and/or structure on adjacent properties are not exceeded.

- *Periodic Inspections.* The plan shall identify the intervals and parties responsible for periodic inspections. The qualified historic preservation professional (for effects on historic buildings and/or structures) and/or structural engineer (for effects on historic and non-historic buildings and/or structures) shall conduct regular periodic inspections of each affected building and/or structure on adjacent properties (as allowed by property owners) during vibration-generating construction activity on the project site. The plan will specify how often inspections shall occur.

- *Repair Damage.* The plan shall also identify provisions to be followed should damage to any building and/or structure occur due to construction-related vibration. The building(s) and/or structure(s) shall be remediated to their pre-construction condition (as allowed by property owners) at the conclusion of vibration-generating activity on the site. For historic resources, should damage occur to any building and/or structure, the building and/or structure shall be restored to its pre-construction condition in consultation with the qualified historic preservation professional and planning department preservation staff, and in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstruction Historic Buildings.

- *Vibration Monitoring Results Report.* After construction is complete the project sponsor shall submit to the ERO a final report from the qualified historic preservation professional (for effects on historic buildings and/or structures) and/or structural engineer (for effects on historic and non-historic buildings and/or structures). The report shall include, at a minimum, collected monitoring records, building and/or structure condition summaries, descriptions of all instances of vibration level exceedance, identification of damage incurred due to vibration, and corrective actions taken to restore damaged buildings and structures. The ERO shall review and approve the Vibration Monitoring Results Report.

Significance after Mitigation: Mitigation Measure M-NO-2 would be required should analysis of a subsequent project under the RADP determine that construction activities would result in vibration at levels that would damage buildings and/or structures. Mitigation Measure M-NO-2 would require the project sponsor to conduct a pre-construction assessment of potentially affected buildings and/or structures, establish vibration limits not to be exceeded based on the condition of the building(s) and/or structure(s), monitor vibration levels during construction, and repair any vibration-related damage to its pre-construction condition. Therefore, with implementation of Mitigation Measure M-NO-2, the impact of subsequent RADP projects related to construction vibration would be reduced to ***less than significant with mitigation***.

COMBINED VIBRATION DAMAGES FROM CONSTRUCTION OF MULTIPLE RADP PROJECTS

Based on vibration levels generated by the highest vibration-generating equipment likely to be used for construction of subsequent RADP projects (an impact pile driver), building damage impacts to historic and non-historic structures would be localized to within 47 feet and 30 feet, respectively, of structures based on the FTA criteria of 0.25 in/sec and 0.5 in/sec PPV for historic and non-historic building damage impacts. Even if other subsequent RADP projects are located within these distances, unlike noise, vibration levels from multiple projects do not combine to increase the intensity of impact. Therefore, vibration levels from the operation of construction equipment associated with multiple projects would not combine and compound the impact discussed above. For these reasons, building damage impacts from construction vibration from simultaneous subsequent RADP projects would be ***less than significant***.

Human Annoyance from Construction Vibration

With respect to human annoyance impacts from construction vibration, people are generally more sensitive to vibration during nighttime hours when sleeping than during daytime waking hours. The planning department relies on the FTA criteria for evaluating vibration effects on people using the category 2 criteria[197] presented in Table 3.B-7, p. 3.B-17, (72 VdB for frequent events, 75 VdB for occasional events, and 80 VdB for infrequent events). Construction vibration would result in sleep disturbance if nighttime construction activities generate vibration levels that meet or exceed the VdB impact levels for category 2 receptors. Should vibration levels meet or exceed the 72 VdB criteria for human annoyance at category 2 receptors (residences and hotels) during nighttime construction, the analysis considers the duration, frequency, and intensity of those exceedances to determine whether the nighttime construction vibration impact is substantial.

[197] Category 2 criteria apply to residential land use and buildings where people normally sleep, such as hotels and hospitals.

Construction activities associated with subsequent RADP projects would have the potential to affect the nearest sensitive receptors to the RADP projects, which include the guests at the Grand Hyatt at SFO on Airport property. This hotel would be the closest sensitive receptor to any pile driving or other construction activity that could occur during nighttime hours, and therefore could have the potential to result in sleep disturbance. The hotel is located approximately 990 feet south of potential pile driving activity associated with construction of Boarding Area H, and approximately 1,950 feet from construction of the Central Hub. The residences along 7th Avenue in San Bruno are located approximately 1,000 feet from construction activities associated with the CONRAC Facility.

As shown in **Table 3.B-20**, the vibration level from pile driving and other vibration-generating construction equipment at all analyzed receptors would be below the 72 VdB criterion; therefore, the potential for human annoyance would not be substantial. Similarly, the maximum vibration level from nighttime truck deliveries at the Aviador Lot construction staging area (at 200 feet) would be 59 VdB, which is also below the 72 VdB criterion. As the projects analyzed in Table 3.B-20 are closest to vibration sensitive receptors for human annoyance, vibration impacts from construction of all other RADP projects would be lower than those shown in the table. Therefore, potential human annoyance impacts from construction vibration would be ***less than significant***, and no mitigation measures are required.

COMBINED VIBRATION (HUMAN ANNOYANCE) FROM CONSTRUCTION OF MULTIPLE RADP PROJECTS

Based on vibration levels generated by the highest vibration-generating equipment likely to be used for construction of subsequent RADP projects (an impact pile driver), human annoyance impacts would be localized to within 300 feet of receptors, based on the FTA criteria of 72 VdB for human annoyance impacts. Even if other subsequent RADP projects are located within these distances, unlike noise, vibration levels from multiple projects do not combine to increase the intensity of impact. Therefore, vibration levels from the operation of construction equipment associated with multiple projects would not combine and compound the impact discussed above. Human annoyance impacts from construction vibration from simultaneous subsequent RADP projects would be ***less than significant***.

Vibration-Sensitive Land Uses and Equipment

There are no land uses such as vibration-sensitive research or manufacturing facilities, hospitals with vibration-sensitive equipment, or research operations within 1,000 feet of construction areas of subsequent RADP projects that could be affected by construction vibration. As such, there would be ***no impact*** to vibration-sensitive equipment from construction activities associated with subsequent projects under the RADP.

Table 3.B-20 Vibration Levels from Construction Equipment

Nearest Building/Receptor	Vibration Inducing Equipment	Reference Vibration Level (VdB)[a]	Distance to Nearest Receptor (feet)[b]	Adjusted Vibration at Receptor (VdB)[c]	Exceeds Frequent Event Criterion for Category 2 Receptors[d] (72 VdB)?
RADP Project #1: Boarding Area H					
Nearest Receptor: Grand Hyatt at SFO	Pile Driver	104	990	56	No
	Vibratory Roller	94	990	46	No
	Caisson Drill	87	990	39	No
	Loaded Trucks	86	990	38	No
RADP Project #6: Central Hub					
Nearest Receptor: Grand Hyatt at SFO	Pile Driver	104	1,950	47	No
	Vibratory Roller	94	1,950	37	No
	Caisson Drill	87	1,950	30	No
	Loaded Trucks	86	1,950	29	No
RADP Project #9: CONRAC Facility					
Nearest Receptor: Residences along 7th Avenue in San Bruno	Pile Driver	104	1,000	56	No
	Vibratory Roller	94	1,000	46	No
	Caisson Drill	87	1,000	39	No
	Loaded Trucks	86	1,000	38	No
Aviador Lot Construction Staging Area					
Nearest Receptor: Roblar Avenue Residences	Loaded Trucks	86	200	59	No

SOURCES: U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018; ESA, 2021, telephone conversation with Peter Hudson of Sutro Science, July 6, 2021; Data compiled by ESA, 2024; Noise Technical Appendix (see Appendix F of this Draft EIR).

NOTES:

a. VdB at 25 feet.
b. Distance between approximate location of equipment and property line of sensitive receptor. Propagation estimates assume a site-specific vibration attenuation rate (“n”) of 1.5 based on FTA guidance, Caltrans guidance, and consultation with a geologist.
c. VdB level adjusted for distance.
d. Category 2 receptors include residential land use and buildings where people normally sleep, such as hotels and hospitals.

Impact NO-3: Operation of RADP projects would not result in a substantial permanent increase in ambient noise levels at sensitive receptors in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. *(Less than Significant)*

Noise Impacts from Stationary Sources

Operation of subsequent RADP projects would increase ambient noise levels in the immediate vicinity of RADP project sites primarily through the use of on-site stationary equipment, such as HVAC systems and emergency generators. Emergency backup generators, if required, would be tested regularly and operated occasionally. Typically, the Bay Area Air Quality Management District permits non-emergency operation of backup generators for testing and maintenance for up to 50 hours per year, or on average about one hour per week. The noise generated by generator testing would be akin to that of a diesel-powered truck engine, and this occasional testing would not result in a substantial permanent increase in noise levels over ambient conditions.

Noise from stationary operational sources would be considered significant if it results in more than a 10 dBA increase above ambient noise levels at a distance of 25 feet or if it results in interior noise levels exceeding 45 dBA between 10 p.m. and 7 a.m. with windows open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

The exact location or specifications of mechanical equipment for subsequent RADP projects is not known. However, based on the location of subsequent RADP projects relative to sensitive receptors, attenuated levels of reference noise levels for potential operational sources shown in **Table 3.B-21** can be estimated. Based on the location of subsequent RADP projects, it can be expected that mechanical equipment could be located as close as approximately 1,000 feet from existing noise-sensitive receptors (refer to Table 3.B-12, p. 3.B-28).

Table 3.B-21 Reference Noise Levels for Potential Operational Stationary Noise Sources At RADP Projects

Stationary Noise Source	Documented Sound Levels (dBA)	Source
HVAC Equipment	72–78 dBA at 30 feet without acoustical treatments	Trane, Sound Data and Application Guide, 2002.
Standby Diesel Generator	75–90 dBA at 23 feet (size dependent) without acoustical enclosure	Cummins Power Generation, Sound Attenuated and Weather Protective Enclosures, 2008.
Parking Lot (four stories)	53–58 dBA, L_{max} at 75 feet	Illingworth and Rodkin, Santana Row Parking Structure Project Noise Assessment, San José, California, 2014.

ABBREVIATIONS: dBA = A-weighted decibels; HVAC = heating, ventilation, and air conditioning.

Based on the table above, the highest attenuated noise levels from operational stationary equipment (90 dBA from a standby diesel generator) at the nearest residential receptor locations along 7th Avenue in San Bruno, which are located 1,000 feet away from the CONRAC Facility, would be 57 dBA, without taking into account any additional attenuation from enclosures or intervening structures. This would not be audible over the existing ambient noise level of 68 dBA, L_{eq} at these receptors, particularly given the intervening presence of vehicle traffic on U.S. 101. Therefore, noise levels at the nearest sensitive receptors would not exceed the noise standard of 10 dBA above the ambient noise level. In addition, it can be reasonably expected that mechanical equipment would be roof-mounted and shielded by screens or parapets, which would further reduce noise levels for receptors. Even assuming a 15 dBA exterior-to-interior noise reduction to account for open windows, noise from operational stationary sources associated with subsequent RADP projects would not result in interior noise levels exceeding 45 dBA between 10 p.m. and 7 a.m. at the nearest offsite sensitive receptors. Therefore, operational noise impacts from stationary sources associated with subsequent RADP projects would be ***less than significant***.

COMBINED NOISE FROM OPERATION OF MULTIPLE RADP PROJECTS

Due to the distance of more than 1,000 feet separating all subsequent RADP projects from the nearest sensitive receptors and due to the already high existing ambient noise levels at these receptors, operational noise from multiple subsequent RADP projects located close to each other would also be ***less than significant***.

Noise Impacts from Aircraft Noise

Implementation of the RADP would not induce passenger demand, nor would the RADP increase the capacity of the airfield, change the configuration of the existing runways, change the number of aircraft operations or aircraft types operating at the Airport (including cargo, private jets, and helicopters), or change the volume of annual passengers that choose to fly into and out of SFO. Implementation of the RADP also would not result in runway closures (see Appendix C, Airport Facilities to Accommodate Aviation Demand). Therefore, there would be no change to the 65 CNEL contour for SFO with implementation of the RADP.

One subsequent RADP project would change the location of gated aircraft. The Boarding Area H project would extend west of the ITB along North Link Road, then would shift north and follow North McDonnell Road. Currently, Boarding Area G is located approximately 2,500 feet from the nearest residential receptor along San Antonio Avenue west of U.S. 101. The Boarding Area H project would be approximately 1,900 feet away from the residences on San Antonio Avenue. As such, gated aircraft at the new Boarding Area H would be approximately 600 feet closer to the residential receptors on San Antonio Avenue. However, this would not constitute a considerable change from existing conditions with respect to noise levels from aircraft as aircraft currently parked in the same location where Boarding Area H would be constructed. Therefore, there would be no considerable change in associated noise levels from aircraft gating at the new Boarding Area H. It should be noted that aircraft turn off their primary engines as they exit the runway and taxi towards the gates and operate only auxiliary engines for lighting and ventilation. Once at the gate, the auxiliary engines are shut down as aircraft run on auxiliary power units or ground-based power, which are much quieter than primary aircraft engines. For departures, a tow tractor pushes the aircraft off the gate and into the taxiway, at which point one engine is used to taxi the aircraft to the runway. Though these procedures are followed for fuel savings, they also result in noise reduction. Regardless, given that aircraft currently apply the same procedures to park in the location of where gated aircraft would park for the Boarding Area H project, there would not be a discernable increase in noise levels at noise-sensitive receptors located on San Antonio Avenue. For these reasons, noise impacts related to aircraft parking at Boarding Area H would be ***less than significant***.

Noise Impacts from Operational Traffic

Implementation of the RADP would result in an increase in vehicular traffic in the vicinity of the Airport, primarily from additional employees and vendors. In addition, traffic on roadways in the vicinity would be redistributed within the portion of the Airport site east of U.S. 101 due to the removal and/or relocation of existing uses with implementation of the RADP. The transportation analysis developed roadway segment link volumes at 10 study locations for the weekday a.m. and p.m. peak hour for the following scenarios: the 2019 existing condition, the 2045 future baseline without RADP condition, and the 2045 Future Baseline with RADP condition (see Figure 3.A-1, p. 3.A-2). Three of 10 study locations are located on U.S. 101 and therefore are not included in this analysis. Two of the 10 study locations—San Bruno Avenue east of U.S. 101 and South McDonnell Road north of Millbrae Avenue—do not have receptors located in the vicinity of the roadway. As such, traffic noise increases along the remaining five roadway segments were quantitatively modeled and the results are presented in **Table 3.B-22**.

Table 3.B-22 P.M. Peak Hour Traffic Noise Levels from the Implementation of RADP in the Vicinity of the Airport

Roadway Segment	Adjacent Land Uses	Jurisdiction of Adjacent Land Uses	Existing (2019) Modeled Traffic Noise Level (dBA, L_{eq})	Land Use Compatibility Designation Based on Existing Noise Level	Applicable Standard for Jurisdiction and Land Use	2045 Future Baseline without RADP Modeled Traffic Noise Level (dBA, L_{eq})	2045 Future Baseline with RADP Modeled Traffic Noise Level (dBA, L_{eq})	Difference between Existing and 2045 with RADP (dBA)	Difference between 2045 without RADP and 2045 With RADP (dBA)
(4) Millbrae Avenue east of U.S. 101	Industrial	Millbrae	69.4	Normally Acceptable	5 dBA	70.5	69.8	+0.4	-0.7
(5) Millbrae Avenue west of U.S. 101	Residential Hotel Commercial	Millbrae	72.2	Conditionally Acceptable	3 dBA	72.9	72.9	+0.7	0.0
(6) North Access Road west of North Field Road	Airport Uses Safe Harbor Shelter	Airport South San Francisco	62.4	Satisfactory	5 dBA	64.3	64.7	+2.3	+0.4
(8) South Airport Boulevard south of North Access Road	Airport Uses	Airport Uses	67.0	Satisfactory	5 dBA	69.5	70.0	+3.0	+0.5
(9) North McDonnell Road between San Bruno Avenue and South McDonnell Road	Airport Uses	Airport Uses	67.6	Satisfactory	5 dBA	68.4	68.6	+1.0	+0.2

SOURCE: Fehr & Peers, 2024; Data compiled by ESA, 2024; Noise Technical Appendix (see Appendix F of this Draft EIR).

ABBREVIATIONS: dBA = A-weighted decibels; L_{eq} = equivalent sound level over the p.m. peak hour

As shown in Table 3.B-22, RADP-generated vehicular traffic (i.e., the total vehicle traffic estimated to be generated from all RADP projects) would increase traffic noise along the modeled (year 2045) roadway segments from 0.0 to 0.5 dBA in the 2045 future baseline with RADP condition over modeled levels for the 2045 future baseline without RADP condition. This analysis considers an increase in traffic noise of greater than 3 dBA or 5 dBA, depending on the existing noise level, to result in a significant noise impact. The applicable noise criterion is based on the land use/noise compatibility standards in the general plan of the jurisdiction within which the study roadway segment is located, the existing noise level, and the land uses located along the segment. As shown in Table 3.B-22, traffic noise increases resulting from implementation of RADP projects would be below the applicable noise increase criteria. Therefore, traffic noise generated by subsequent RADP projects would not result in a substantial permanent increase in ambient noise levels. Due to the relocation of existing facilities with implementation of the RADP to different locations within the Airport and the resulting changes to vehicle access routes, there would be minor decrease in peak hour traffic volumes and associated noise levels along Millbrae Avenue east of U.S. 101. For these reasons, noise impacts associated with operational traffic with implementation of the RADP would be ***less than significant***.

Impact NO-4: Construction and operation of RADP projects would not expose people residing or working in an airport land use plan area to excessive noise levels. *(Less than Significant)*

Airport land use plans are adopted by airport land use commissions and ensure compatibility of airport operations with land use planning in the surrounding communities affected by airport noise and safety concerns. The objectives of compatible land use planning are to encourage land uses that are generally considered to be incompatible with airports (such as residential, schools, and churches) to be located away from airports and to encourage land uses that are more compatible (such as industrial and commercial uses) to be located in the vicinity of airports. The City/County Association of Governments of San Mateo County has adopted the Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport,[198] which identifies the airport influence area with land uses exposed to aircraft noise above CNEL 65 dB and noise compatibility policies. The FAA actively supports programs to minimize aircraft noise impacts, including phasing out of the loudest aircraft, supporting airport noise compatibility programs, and funding of mitigation measures in environmental studies. SFO implements a comprehensive Noise Compatibility Program (per 14 CFR part 150) and an extensive Noise Insulation Program that provides acoustical improvements to single-family residential properties located inside the CNEL 65 dB noise contour for the Airport.

Compatible land use planning is an important consideration during the master planning process that involves changes to aircraft operations thereby resulting in a change in the extent of surrounding land uses affected within the 65 CNEL contour. However, implementation of the RADP (including construction and operation of RADP projects) would not result in any changes to aircraft operations, runway use, or the types or number of aircraft operating at SFO (see Appendix C, Airport Facilities to Accommodate Aviation Demand). Therefore, there would be no change to the extent of incompatible land uses within the CNEL 65 dB contour in the Airport vicinity covered under the airport land use plan with implementation of the RADP, and

[198] City/County Association of Governments of San Mateo County, *Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport*, November 2012, https://ccag.ca.gov/wp-content/uploads/2014/10/Consolidated_CCAG_ALUCP_November-20121.pdf, accessed September 26, 2024.

implementation of the RADP would not result in additional people residing or working in the airport land use plan area who would be exposed to excessive aircraft noise levels.

All of the subsequent RADP projects would be located on Airport property and would not introduce any new residents to the project area. However, implementation of the RADP would result in an increase in employment at the Airport, thereby exposing those new Airport employees to noise from aircraft operations. Under California law, airport land use commissions have no jurisdiction over airport operations.[199] Therefore, the Airport itself is not considered part of the airport land use planning area adopted by airport land use commissions.

In summary, implementation of the RADP would not expose people residing or working in an airport land use plan area to excessive noise levels and this impact would be ***less than significant***.

Cumulative Impacts

Impact C-NO-1: Construction of RADP projects, in combination with cumulative projects, would not result in significant noise impacts. *(Less than Significant)*

CONSTRUCTION EQUIPMENT NOISE

The geographic context for the analysis of potential cumulative impacts related to construction noise consists of the development and infrastructure projects listed in Table 3-2, p. 3-8, and mapped on Figure 3-1, p. 3-11. Cumulative projects located outside of the RADP project site could not combine with subsequent RADP projects to result in a significant construction noise or vibration impact given the distance of those projects from the RADP project site.[200] As such, this analysis focuses only on cumulative projects located within the RADP project site.

There are no cumulative projects located within 1,500 feet of the CONRAC Facility, which is a subsequent RADP project located closest to noise-sensitive receptors (see Figure 3.B-1, p. 3.B-6). However, there are four cumulative projects – the Consolidated Administration Campus Phase 2 (cumulative project #2), the Boarding Area G Gate Enhancements (cumulative project #11), the Plot 10F Demolition/Cargo Building 662 (cumulative project #9), and the West Field Cargo Redevelopment (cumulative project #3) – in the vicinity of the AirTrain Maintenance Yard project and Boarding Area H project. The construction schedules for these projects could overlap; however, these projects are located more than 1,500 feet away from the nearest noise-sensitive receptors in San Bruno. At this distance, construction equipment noise from these projects would attenuate to levels not perceptible over the ambient noise level at the receptors, which are primarily influenced by traffic on U.S. 101 and aircraft operations. Similarly, construction activities associated with cumulative projects in and near the North Field, including the A-1 Self Storage (cumulative project #19), the North Field Maintenance Facilities (cumulative project #7), and the Shoreline Protection Program (cumulative project #4), would be located in the vicinity of subsequent RADP projects. These projects are located even farther away from sensitive receptors; therefore, noise from construction equipment at these cumulative projects would attenuate to below ambient noise levels at the noise-sensitive receptors and would not be audible over the existing ambient noise level. The construction schedules for the cumulative

[199] California Public Utilities Code section 21674(e).

[200] The San Francisco Garter Snake Recovery Plan (2019–2029) cumulative project #1 is located approximately 400 feet west of the CONRAC Facility and Boarding Area H; however, implementation of the Recovery Plan does not involve demolition or construction activities. As such, this project would not combine with RADP projects to result in an increase in construction or operational noise.

off-Airport projects Tanforan (cumulative project #13), 1100 El Camino Real (cumulative project #15), Millbrae Serra Station (cumulative project #16), and Terminal 101 Redevelopment (cumulative project #17) projects are not currently known. In addition, these projects would not overlap spatially with subsequent RADP projects, and therefore construction of these cumulative projects would not combine with construction equipment-related noise impacts related to implementation of subsequent projects under the RADP. There are no cumulative projects located within 1,000 feet of the Aviador Lot; therefore, noise from cumulative projects would not combine with noise from staging activities associated with RADP projects at the Aviador Lot.

Similar to subsequent projects under the RADP, construction activities associated with cumulative projects within the RADP project site could combine to increase noise levels in proximity to worker receptor locations. However, the worker receptors would be located on Airport property and within buildings that provide an attenuation of at least 25 dBA. Cumulative projects would be located more than 1,000 feet from worker receptors adjacent to the Plot 16D staging area. Therefore, an increase in noise from construction of subsequent RADP projects and cumulative projects would not exceed the FTA criterion of 100 dBA for worker receptors.

Overall, due to the minimum 1,000-foot distance separating subsequent RADP projects and cumulative projects from sensitive receptors; the already high ambient noise levels at receptors due to the influence of traffic on U.S. 101; and the fact that worker receptors would be located on Airport property and within buildings that provide an attenuation of at least 25 dBA, construction noise from cumulative projects would not combine with subsequent RADP projects to result in a significant cumulative construction noise impact. As such, cumulative construction noise impacts would be ***less than significant***.

CONSTRUCTION TRAFFIC NOISE

Construction traffic generated by cumulative projects could combine with construction traffic from subsequent RADP projects if their schedules overlap and if they use similar access routes. Of the 20 cumulative projects identified in Table 3-2, p. 3-8, the transportation analysis identified 11 cumulative projects that would be on Airport property (one located at West of Bayshore and 10 within the RADP project site). These projects could partially or completely overlap temporally with subsequent projects that could occur with implementation of the RADP and could use the same staging areas and access roadways such as North Access Road. As with projects that could occur with implementation of the RADP, these cumulative projects would be required to coordinate with Caltrans and local jurisdictions, as appropriate, and SFO cumulative projects would be required to comply with the Airport's Standard Construction Measures, which require contractors to coordinate with SFO's Landside Operations. Thus, the traffic control plans for all SFO projects would be coordinated to ensure that construction activities and associated traffic from multiple projects in the same area would be managed to minimize overlap and avoid disruption to Airport operations. Hence, noise impacts from construction traffic from on-Airport cumulative projects would not combine with subsequent RADP projects to result in a significant cumulative impact. Therefore, the cumulative impact from construction traffic noise would be ***less than significant***.

Impact C-NO-2: Construction of RADP projects, in combination with cumulative projects, would not generate excessive groundborne vibration or groundborne noise levels. *(Less than Significant)*

With regard to the potential for cumulative vibration-related impacts to buildings and receptors because vibration impacts are based on instantaneous PPV levels, worst-case groundborne vibration levels from construction are generally determined by whichever individual piece of equipment generates the highest vibration levels. Unlike the analysis for average noise levels, in which noise levels of multiple pieces of equipment can be combined to generate a maximum combined noise level, instantaneous peak vibration levels do not combine in the same way. Vibration from multiple construction sites, even if they are located close to one another, would not combine to further increase the maximum PPV experienced by the structure/receptor. Therefore, vibration levels from construction of subsequent RADP projects would not combine with cumulative projects to increase vibration levels at structures/receptors.

For these reasons, vibration impacts resulting from construction of subsequent RADP projects would not combine with vibration impacts from cumulative projects to result in a significant cumulative impact. Therefore, cumulative groundborne noise and vibration impacts would be ***less than significant***.

Impact C-NO-3: Operation of RADP projects, in combination with cumulative projects, would not result in significant noise impacts. *(Less than Significant)*

OPERATIONAL STATIONARY SOURCES

Noise from operational stationary sources such as mechanical equipment would be localized (generally within 150 feet).[201] For the subsequent RADP project closest to noise-sensitive receptors (the CONRAC Facility), there are no cumulative projects in the vicinity; therefore, operational noise associated with the CONRAC Facility would not combine with cumulative projects to result in a significant cumulative noise impact at a noise-sensitive receptor. For subsequent RADP projects in the West Field, which are located approximately 300 feet north of the West Field Cargo Redevelopment cumulative project (#3), the nearest noise-sensitive receptor is located approximately 2,000 feet to the west across U.S. 101. Given that noise from operational stationary sources is generally localized and the nearest noise-sensitive receptor is approximately 2,000 feet away, the West Field Cargo Redevelopment cumulative project would not combine with the subsequent RADP projects to result in a significant cumulative noise impact. For these reasons, the cumulative impact from noise from operational stationary sources would be ***less than significant***.

OPERATIONAL TRAFFIC

The operational traffic noise analysis discussed under Impact NO-3 and presented in Table 3.B-22, p. 3.B-56, includes traffic from cumulative projects in the 2045 analysis conditions. Therefore, the 2045 future baseline with RADP condition is also a cumulative analysis. As shown in the table, the increase in cumulative traffic noise from the 2045 future baseline with RADP condition compared to the 2045 future baseline without RADP condition would be less than the applicable noise criteria along all analyzed roadway segments. Therefore, subsequent RADP projects would not combine with cumulative projects to result in a significant cumulative impact, and cumulative operational traffic noise impacts would be ***less than significant***.

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[201] At a distance greater than 150 feet, a rooftop HVAC unit with a specification of 75 dBA at 50 feet would not exceed the nighttime noise limit of San Francisco Police Code section 2909(d) from the nearest building.

3.C Air Quality

3.C.1 Introduction

This section discusses existing air quality conditions in the project area, identifies the regulatory framework for air quality management, and analyzes the potential for the Recommended Airport Development Plan (RADP) to affect local and regional air quality conditions, including temporary impacts from construction-related emissions. The analysis determines whether those emissions would be significant under applicable air quality standards and identifies feasible mitigation measures for significant adverse impacts. This section also assesses potential odor impacts and analyzes cumulative air quality impacts. Supplemental air quality information supporting the analysis in this section is provided in EIR Appendix G, Air Quality Technical Appendix.

The analysis in this section is based on a review of existing air quality conditions in the San Francisco Bay Area (bay area) and air quality regulations administered by the U.S. Environmental Protection Agency (U.S. EPA), the California Air Resources Board (air board), and the Bay Area Air Quality Management District (air district). This analysis includes methodologies identified in the air district's current California Environmental Quality Act (CEQA) Air Quality Guidelines[202] and its companion documentation, the 2025 San Francisco Planning Department Air Quality and Greenhouse Gas Analysis Guidelines,[203] and the health risk assessment (HRA) methodology published by the California Office of Environmental Health Hazard Assessment (OEHHA) in 2015.[204]

3.C.2 Environmental Setting

Climate and Meteorology

San Francisco International Airport (SFO or Airport) is in the San Francisco Bay Area Air Basin (air basin). Air quality in the basin is influenced by such natural factors as topography, meteorology, and climate, in addition to the presence of existing air pollution sources and ambient conditions. The air basin's moderate climate steers storm tracks away from the region for much of the year, although storms often affect the region from November through April. The Airport's proximity to the onshore breezes stimulated by the Pacific Ocean through the Pacifica Gap that flows landward between San Bruno and Santa Cruz mountains provides generally very good air quality at the Airport and in surrounding communities.

Annual temperatures in the project area average in the mid-50s (degrees Fahrenheit), ranging from the low 40s on winter mornings to the mid-70s during summer afternoons. Daily and seasonal oscillations of temperature are small because of the moderating effects of the nearby San Francisco Bay. In contrast to the steady temperature regime, rainfall is highly variable and confined almost exclusively to the "rainy" period from November through April. Precipitation varies widely from year to year as shifts in the annual storm track of a few hundred miles can mean the difference between a very wet year and drought conditions.

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[202] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, updated April 2022, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed July 2, 2024.
[203] San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, February 2025, https://sfplanning.org/air-quality, accessed February 10, 2025.
[204] California Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments*, Air, Community, and Environmental Research Branch, February 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html, accessed July 25, 2024.

Atmospheric conditions such as wind speed, wind direction, and variable air temperatures interact with the physical features of the landscape to influence the movement and dispersal of air pollutants regionally. The Airport is within the Peninsula climatological subregion. Marine air traveling through the Golden Gate and the Pacifica Gap is a dominant weather factor affecting dispersal of air pollutants within the region. The prevailing wind direction at the Airport is from the west at an average annual wind speed of 10.3 miles per hour.[205]

Ambient Air Quality—Criteria Air Pollutants

As required by the 1970 federal Clean Air Act, the U.S. EPA initially identified six air pollutants that are pervasive in urban environments and for which federal and state health-based ambient air quality standards have been established. The U.S. EPA calls these pollutants *criteria air pollutants*, and the agency has regulated them by developing specific public health–based and welfare-based criteria as the basis for setting permissible levels. *Ozone*, *carbon monoxide* (CO), *particulate matter* (PM), *nitrogen dioxide* (NO_2), *sulfur dioxide* (SO_2), and *lead* are the six criteria air pollutants originally identified by the U.S. EPA. Later, subsets of PM were identified and permissible levels were established. These include *PM of 10 microns in diameter or less* (PM_{10}) and *PM of 2.5 microns in diameter or less* ($PM_{2.5}$).

The air district has jurisdiction to regulate air quality within the nine-county air basin. Accordingly, the region's air quality monitoring network provides information on ambient concentrations of criteria air pollutants at various locations in the bay area. **Table 3.C-1** presents a five-year summary (for 2019–2023) of the highest annual concentrations of criteria air pollutants, recorded at the air quality monitoring station located closest to the Airport, operated and maintained by the air district at 16th and Arkansas streets, approximately 10 miles north of the Airport. It also compares these concentrations to the most stringent applicable ambient air quality standards (whether federal or state). Because attainment with air quality standards is determined on a basin-wide basis, it is possible for the basin to be in attainment with federal or state standards for a given pollutant despite an exceedance for a given pollutant standard at a local monitoring station. Concentrations shown in **bold** indicate only a localized exceedance of that standard. Lead and SO_2 are not included in this table because ambient lead concentrations are only monitored on an as-warranted basis; the air basin has never been designated as non-attainment for SO_2.

The National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for each criteria air pollutant and the region's attainment status are summarized in **Table 3.C-2**, p. 3.C-4. It should be noted that the ambient air quality standards—both federal and state—are expressed as airborne concentrations of various pollutants. Compliance with the standards occurs on a regional basis. In the air basin, compliance is demonstrated by ongoing measurements of pollutant concentrations at more than 30 air quality monitoring stations operated by the air district in all nine bay area counties.

[205] Western Regional Climate Center, website query, Prevailing Wind Direction in California, https://wrcc.dri.edu/Climate/west_lcd_show.php?iyear=2008&sstate=CA&stag=sanfrancisco&sloc=San+Francisco, accessed September 25, 2024.

Table 3.C-1 Summary of San Francisco Air Quality Monitoring Data (2019–2023)

Pollutant	Most-Stringent Applicable Standard	Number of Days Standards Were Exceeded and Maximum Concentrations Measured [a] 2019	2020	2021	2022	2023
Ozone						
Days 1-Hour Standard Exceeded		1	0	0	0	0
Maximum 1-Hour Concentration (ppm)	>0.090 ppm [b]	**0.091**	0.088	0.074	0.070	0.057
Days 8-Hour Standard Exceeded		1	0	0	0	0
Maximum 8-Hour Concentration (ppm)	>0.070 ppm [c]	**0.073**	0.055	0.054	0.060	0.046
Carbon Monoxide (CO)						
Days 1-Hour Standard Exceeded		0	0	0	0	0
Maximum 1-Hour Concentration (ppm)	>20 ppm [b]	1.2	1.8	1.2	1.5	4.4
Days 8-Hour Standard Exceeded		0	0	0	0	0
Maximum 8-Hour Concentration (ppm)	>9 ppm [b]	1.0	1.6	0.9	1.0	1.9
Suspended Particulates (PM_{10})						
Days 24-Hour Standard Exceeded		0	2	0	0	0
Maximum 24-Hour Concentration (µg/m³)	>50 µg/m³ [b]	42	**102**	32	34	44
Suspended Particulates ($PM_{2.5}$)						
Days 24-Hour Standard Exceeded		0	8	0	0	0
Maximum 24-Hour Concentration (µg/m³)	>35 µg/m³ [c]	25.4	**147.3**	22.4	29.0	16.7
Annual Average (µg/m³)	>12 µg/m³ [b,c]	7.6	10.5	7.1	6.7	N/A
Nitrogen Dioxide (NO_2)						
Days 1-Hour Standard Exceeded		0	0	0	0	0
Maximum 1-Hour Concentration (ppm)	>0.100 ppm [c]	0.061	0.048	0.050	0.046	0.044

SOURCE: California Air Resources Board, Top 4 Summary for the San Francisco Arkansas Street monitoring site, 2019–2023, https://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed October 17, 2024;
U.S. Environmental Protection Agency, AirData Air Quality Monitors (arcgis.com), San Francisco monitoring site, 2019–2023, https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=5f239fd3e72f424f98ef3d5def547eb5, accessed October 14, 2024.

ABBREVIATIONS: µg/m³ = micrograms per cubic meter; N/A = data not available; ppm = parts per million

NOTES: **Bold** values are in excess of applicable standard.

a. Number of days exceeded is for all days in a given year, except for particulate matter. PM_{10} is monitored every 12 days. Therefore, the number of days exceeded is out of approximately 30 annual samples.
b. State standard, not to be exceeded; also a federal standard, not to be exceeded more than once per year.
c. Federal standard, not to be exceeded.

Table 3.C-2 State and Federal Ambient Air Quality Standards and Attainment Status

		Federal (NAAQS [a])		State (CAAQS [b])	
Pollutant	**Averaging Time**	**Standard**	**Attainment Status**	**Standard**	**Attainment Status**
Ozone	1 hour	NA	— [c]	0.09 ppm	N
	8 hours	0.070 ppm	N	0.07 ppm	N [d]
Carbon monoxide (CO)	1 hour	35 ppm	A	20 ppm	A
	8 hours	9 ppm	A	9 ppm	A
Nitrogen dioxide (NO_2)	1 hour	0.100 ppm	U	0.18 ppm	A
	Annual	0.053 ppm	A	0.030 ppm	NA
Sulfur dioxide (SO_2)	1 hour	0.075 ppm	A	0.25 ppm	A
	24 hours	0.14 ppm	A	0.04 ppm	A
	Annual	0.03 ppm	A	NA	NA
Particulate matter (PM_{10})	24 hours	150 µg/m^3	U	50 µg/m^3	N
	Annual [e]	NA	NA	20 µg/m^3	N
Fine particulate matter ($PM_{2.5}$)	24 hours	35 µg/m^3	N	NA	NA
	Annual	12 µg/m^3	A	12 µg/m^3	N
Sulfates	24 hours	NA	NA	25 µg/m^3	A
Lead	30 days	NA	NA	1.5 µg/m^3	A
	Cal. quarter	1.5 µg/m^3	A	NA	NA
	Rolling 3-month average	0.15 µg/m^3	A	NA	NA
Hydrogen sulfide	1 hour	NA	NA	0.03 ppm	U
Visibility-reducing particles	8 hours	NA	NA	— [f]	A
Vinyl chloride	24 hours	NA	NA	0.010 ppm (26 µg/m^3)	No information available

SOURCE: Bay Area Air Quality Management District, *Air Quality Standards and Attainment Status*, https://www.baaqmd.gov/about-air-quality/research-and-data/air-quality-standards-and-attainment-status, last updated January 5, 2017, accessed July 1, 2024.

ABBREVIATIONS: µg/m^3 = micrograms per cubic meter; A = Attainment; N = Nonattainment; NA = Not Applicable, no applicable standard; ppm = parts per million; U = Unclassified

NOTES:

a. NAAQS = national ambient air quality standards. NAAQS, other than ozone and particulates, and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The 8-hour ozone standard is attained when the 3-year average of the fourth highest daily concentration is 0.08 ppm or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than the standard. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of the 98th percentile is less than the standard.
b. CAAQS = California ambient air quality standards. CAAQS for ozone, CO (except Lake Tahoe), SO_2 (1-hour and 24-hour), NO_2, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All other state standards shown are values not to be equaled or exceeded.
c. The U.S. Environmental Protection Agency revoked the national 1-hour ozone standard on June 15, 2005.
d. This state 8-hour ozone standard was approved in April 2005 and became effective in May 2006.
e. State standard = annual geometric mean; national standard = annual arithmetic mean.
f. Statewide visibility-reducing particle standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

The NAAQS and CAAQS have been set at levels considered safe to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly with a margin of safety, and to protect the public welfare against decreased visibility and damage to animals, crops, vegetation, and buildings. As explained by the air board, "An air quality standard defines the maximum amount of a pollutant averaged over a specified period of time that can be present in outdoor air without any harmful effects on people or the environment."[206] That is, if a region is in compliance with the ambient air quality standards, its regional air quality can be considered protective of public health. The NAAQS are statutorily required to be set by the U.S. EPA at levels that are "requisite to protect the public health."[207] Therefore, the closer a region is to attaining a particular NAAQS, the lower the human health impact is from that pollutant.

A brief description of the health effects of exposure to criteria air pollutants is provided below.

Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving *reactive organic gases* (ROG) (also sometimes referred to by some regulatory agencies as *volatile organic compounds* [VOCs]) and *oxides of nitrogen* (NO_X) in the presence of sunlight. The main sources of ROG and NO_X, often referred to as *ozone precursors*, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the bay area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases, such as asthma, bronchitis, and emphysema.[208]

As shown in Table 3.C-1, p. 3.C-3, the most stringent applicable standards (the state one-hour standard of 0.09 part per million [ppm] and the federal eight-hour standard of 0.07 ppm) were exceeded in San Francisco in 2019.

Carbon Monoxide

CO is an odorless, colorless gas usually formed during the incomplete combustion of fuels. The single largest source of CO is motor vehicles; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue; impair central nervous system function; and induce angina (chest pain) in persons with serious heart disease. Very high levels of CO can be fatal. Table 3.C-1, p. 3.C-3, shows that the CO standards were not exceeded between 2019 and 2023.

Particulate Matter

Particulate matter, or PM, is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from human-made and natural sources. PM regulated by the federal Clean Air Act and the California Clean Air Act is measured in two size ranges: PM_{10} for particles less than 10 microns in diameter and $PM_{2.5}$ for particles less than 2.5 microns in diameter. In the bay area, motor vehicles generate about half of the air

[206] California Air Resources Board, "California Ambient Air Quality Standards (CAAQS)," https://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm, accessed July 2, 2024.
[207] 42 U.S. Code chapter 7409 – National primary and secondary ambient air quality standards, https://www.law.cornell.edu/uscode/text/42/7409, accessed July 2, 2024.
[208] California Air Resources Board, "Ozone & Health," https://ww2.arb.ca.gov/resources/ozone-and-health, accessed July 2, 2024.

basin's particulate matter (particulates) through tailpipe emissions as well as brake pad and tire wear. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of fine particulates. These fine particulates are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. According to the air board, studies in the United States and elsewhere "have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks," and studies of children's health in California have demonstrated that particle pollution "may significantly reduce lung function growth in children."[209] The air board also reports that statewide attainment of PM standards could prevent thousands of premature deaths, lower hospital admissions for cardiovascular and respiratory disease and asthma-related emergency room visits, and avoid hundreds of thousands of episodes of respiratory illness in California. Among the criteria air pollutants that are regulated, particulates appear to represent a serious ongoing health hazard. In 1999, the air district reported in its CEQA Air Quality Guidelines that studies had shown that elevated particulate levels contribute to the death of approximately 200–500 people per year in the bay area. High PM levels can exacerbate chronic respiratory ailments, such as bronchitis and asthma, and have been associated with increased emergency room visits and hospital admissions.

New studies are also showing that long-term average exposure to $PM_{2.5}$ is associated with an increased risk of death from COVID-19 in the United States. One study found that an increase of 1 microgram per cubic meter ($\mu g/m^3$) in $PM_{2.5}$ is associated with an 8 percent increase in the COVID-19 death rate.[210] The increase in wildfire smoke also could have contributed to increased cases of COVID-19.[211] Note that these studies all demonstrate a correlational relationship between exposure to $PM_{2.5}$ and increases in the COVID-19 death rate, not a causal relationship.

Table 3.C-1, p. 3.C-3, shows that the federal 24-hour $PM_{2.5}$ standard was exceeded eight times in 2020 and the state 24-hour PM_{10} standard of 50 $\mu g/m^3$ was exceeded twice in 2020. The state annual-average standard was not exceeded between 2019 and 2023.

Nitrogen Dioxide

NO_2 is a reddish-brown gas that is a byproduct of combustion processes. It is a member of a family of chemicals consisting of nitrogen and oxygen that are collectively known as NO_X. The two most prevalent forms of NO_X are NO_2 and nitric oxide (i.e., NO). Although NO_2 can be directly emitted from combustion sources, much of the NO_2 in the ambient air is formed in the atmosphere through reactions between nitric oxide and other air pollutants in the presence of sunlight.[212] Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as a coloring component on high-pollution days, especially in conjunction with high ozone levels. In 2010, the U.S. EPA implemented a new one-hour NO_2 standard, presented in Table 3.C-2, p. 3.C-4. On November 15, 2012, the air board approved a revision to the State Implementation Plan for implementing the 2010 federal NO_2 standards. All areas in California are designated

[209] California Air Resources Board, *Inhalable Particulate Matter and Health ($PM_{2.5}$ and PM_{10})*, https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health, accessed July 2, 2024.
[210] Wu, X., R. C. Nethery, B. M. Sabath, D. Braun, and F. Dominici, "Exposure to Air Pollution and COVID-19 Mortality in the United States," *Science Advances* 6:45, November 4, 2020, https://pubmed.ncbi.nlm.nih.gov/33148655/, accessed November 22, 2024.
[211] Zhou, X., K. Josey, L. Kamareddine, M. C. Caine, T. Liu, L. J. Mickley, M. Cooper, and F. Dominici, "*Excess of COVID-19 Cases and Deaths Due to Fine Particulate Matter Exposure during the 2020 Wildfires in the United States*," *Science Advances* 7(33), August 13, 2021, https://pubmed.ncbi.nlm.nih.gov/34389545/, accessed July 2, 2024.
[212] California Air Resources Board, "Nitrogen Dioxide & Health," n.d., https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health, accessed October 29, 2024.

as attainment/unclassified for the federal NO_2 standards.[213] Table 3.C-1, p. 3.C-3, shows that the new federal standard was not exceeded at the San Francisco air monitoring station between 2019 and 2023.

Sulfur Dioxide

SO_2 is a colorless acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue, exacerbate asthma, and increase the risk of pulmonary disease.[214] SO_2 monitoring was terminated at the San Francisco air monitoring station in 2009 because the state standard for SO_2 is being met in the bay area and pollutant trends suggest that the air basin will continue to meet this standard for the foreseeable future.

Lead

Leaded gasoline (phased out in the United States beginning in 1973), paint (on older houses and cars), smelters (metal refineries), and the manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has a range of adverse neurotoxic health effects, which put children at special risk. Some lead-containing chemicals cause cancer in animals. Lead levels in the air have decreased substantially since leaded gasoline was eliminated. Ambient lead concentrations are monitored only on an as-warranted, site-specific basis in California. On October 15, 2008, the U.S. EPA strengthened the NAAQS for lead by lowering the standard from 1.5 $\mu g/m^3$ to 0.15 $\mu g/m^3$. Lead monitoring stations in the bay area are located at Arkansas Street (San Francisco), Reid–Hillview Airport (San Jose), and Jackson Street (San Jose).

Air Quality Index

The U.S. EPA developed the Air Quality Index scale to make the public health impacts of air pollution concentrations easily understandable. The index, much like an air quality "thermometer," translates daily air pollution concentrations into a number on a scale between 0 and 500. The numbers in the scale are divided into six color-coded ranges, with numbers 0 through 500:

- **Green (0–50)** indicates "good" air quality. No health impacts are expected when air quality is in the green range.
- **Yellow (51–100)** indicates that air quality is "moderate." Unusually sensitive people should consider limiting prolonged outdoor exertion.
- **Orange (101–150)** indicates that air quality is "unhealthy for sensitive groups." Active children and adults, and people with respiratory disease such as asthma, should limit outdoor exertion.
- **Red (151–200)** indicates that air quality is "unhealthy." Active children and adults, and people with respiratory disease such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.

[213] California Air Resources Board, *State Implementation Plan Revision for Federal Nitrogen Dioxide Standard Infrastructure Requirements*, October 15, 2012, https://ww2.arb.ca.gov/sites/default/files/2022-12/no2isip.pdf, accessed July 2, 2024.
[214] California Air Resources Board, "Sulfur Dioxide & Health," https://ww2.arb.ca.gov/resources/sulfur-dioxide-and-health, accessed July 2, 2024.

- **Purple (201–300)** indicates that air quality is "very unhealthy." Active children and adults, and people with respiratory disease such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit outdoor exertion.
- **Maroon (301–500)** indicates that air quality is "hazardous." This air quality level triggers health warnings of emergency conditions, and the entire population is more likely to be affected.

The Air Quality Index numbers refer to specific amounts of pollution in the air. They are based on the federal air quality standards for ozone, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$. In most cases, the federal standard for these air pollutants corresponds to the number 100 on the index chart. Thus, if the concentration of any of these pollutants rises above its respective standard, air quality conditions can be unhealthy for the public. In determining the air quality forecast, local air districts use the anticipated concentration measurements for each of the major pollutants, convert them into index numbers, and determine the highest index for each zone in a district.

Readings below 100 on the Air Quality Index scale would not typically affect the health of the general public, although readings in the moderate range of 50–100 may affect unusually sensitive people. Wildfires are occurring with increasing frequency in California and the bay area as the climate changes (18 of the state's 20 largest wildfires and 18 of the state's 20 most destructive fires on record have occurred since 2000).[215] As a result, the Air Quality Index may reach the "very unhealthy" and "hazardous" designations, ranging from values of 201 to more than 350. During those periods, the air district issues Spare the Air Alerts and recommends that individuals stay inside with windows closed and refrain from engaging in significant outdoor activity.

Air Quality Index statistics over recent years indicate that air quality in the bay area is predominantly in the "Good" and "Moderate" categories and is healthy on most days for most people. Historical air district data indicate that the air basin experienced air quality at the red level ("unhealthy") on 14 days between 2019 and 2023. As shown in **Table 3.C-3**, the air basin had a total of 61 red-level or orange-level days ("unhealthy" or "unhealthy for sensitive groups") between 2019 and 2023. Some of these days are attributable to the increasing frequency of wildfires. This table also shows that the air basin experienced one purple-level ("very unhealthy") day between 2019 and 2023.

Toxic Air Contaminants and Local Health Risks and Hazards

In addition to criteria air pollutants, individual projects may emit *toxic air contaminants* (TACs). "TACs" collectively refer to a diverse group of air pollutants that may cause chronic (long-duration) and acute (severe but short-term) adverse effects on human health, including carcinogenic effects. Human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Thus, individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

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[215] California Department of Forestry and Fire Protection, Top 20 Largest California Wildfires, October 2, 2024, https://34c031f8-c9fd-4018-8c5a-4159cdff6b0d-cdn-endpoint.azureedge.net/-/media/calfire-website/our-impact/fire-statistics/top-20-largest-ca-wildfires.pdf?rev=037e566cdfd540b9a9fe607b809b855c&hash=D7AC28D89B9F8FE36F3C7E5958CEE016; California Department of Forestry and Fire Protection, Top 20 Most Destructive California Wildfires, March 27, 2024, https://34c031f8-c9fd-4018-8c5a-4159cdff6b0d-cdn-endpoint.azureedge.net/-/media/calfire-website/our-impact/fire-statistics/top-20-destructive-ca-wildfires.pdf?rev=3f619258cab84b34b680ce521d615525&hash=6C6AD8F9377A31117DF437BBDBE68F07, accessed November 22, 2024.

Table 3.C-3 Air Quality Index Statistics for the San Francisco Bay Area Air Basin

AQI Statistics for Air Basin	Number of Days by Year 2019	2020	2021	2022	2023
Unhealthy for Sensitive Groups (Orange) AQI: 101–150	10	13	9	8	7
Unhealthy (Red) AQI: 151–200	0	13	1	0	0
Very Unhealthy (Purple) AQI: 201–300	0	1	0	0	0

SOURCE: Bay Area Air Quality Management District, Air Quality Index, https://www.baaqmd.gov/about-air-quality/current-air-quality/air-monitoring-data/#/aqi-highs?date=2024-11-24&view=hourly, accessed November 22, 2024.

ABBREVIATION: AQI = Air Quality Index

Unlike criteria air pollutants, TACs are not subject to ambient air quality standards; rather, they are regulated by the air district using a risk-based approach to determine which sources and pollutants to control and the degree of control. A *health risk assessment*, or HRA, is an analysis that estimates human health exposure to toxic substances. When considered together with information regarding the toxic potency of the substances, an HRA provides quantitative estimates of health risks.[216]

Exposure assessment guidance published by the air district in January 2016 adopted the assumption that residences would be exposed to air pollution 24 hours a day, 350 days a year, for 30 years.[217] Therefore, assessments of air pollutant exposure to residents typically result in the greatest adverse health outcomes of all population groups.

Exposures to fine PM ($PM_{2.5}$) have been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted-activity days for short-term exposure. Long-term exposure has been linked with premature death, particularly in people who have chronic heart or lung disease, and reduced lung function growth in children.[218] Diesel particulate matter (DPM), a byproduct of diesel fuel combustion, is also of concern. The air board identified DPM as a TAC in 1998, based primarily on evidence demonstrating cancer effects in humans.[219] The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other TAC routinely measured in the region.

In addition to monitoring criteria air pollutants, both the air district and the air board operate TAC monitoring networks in the air basin. These stations measure 10–15 TACs, depending on the specific station. The TACs selected for monitoring are those that traditionally have been found in the highest concentrations in ambient air and therefore tend to produce the most significant risk. The air district's ambient TAC monitoring station nearest to the Airport is the station at 10 Arkansas Street in San Francisco, approximately 10 miles north of the Airport. **Table 3.C-4** presents the ambient concentrations of carcinogenic TACs measured at the Arkansas Street station and the estimated cancer risk from a lifetime exposure (70 years) to

[216] In general, a health risk assessment is required if the air district concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggest a potential public health risk. The applicant is then subject to a health risk assessment for the source in question. Such an assessment generally evaluates chronic, long-term effects, estimating the increased risk of cancer as a result of exposure to one or more TACs.
[217] Bay Area Air Quality Management District, *BAAQMD Air Toxics NSR Program Health Risk Assessment Guidelines*, December 2016, https://www.baaqmd.gov/about-air-quality/current-air-quality/air-monitoring-data/#/aqi-highs?date=2024-11-24&view=hourly, accessed July 2, 2024.
[218] California Air Resources Board, "Inhalable Particulate Matter and Health ($PM_{2.5}$ and PM_{10})," n.d., https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health, accessed July 2, 2024.
[219] California Air Resources Board, *Fact Sheet: The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines*, October 1998, https://ww2.arb.ca.gov/sites/default/files/classic/toxics/dieseltac/factsht1.pdf, accessed July 2, 2024.

these substances. When TAC measurements at this station are compared to ambient concentrations of various TACs for the bay area as a whole, the cancer risks associated with mean TAC concentrations in San Francisco are similar to those for the bay area as a whole. Therefore, the estimated average lifetime cancer risks resulting from exposure to TAC concentrations monitored at the Arkansas Street station in San Francisco do not appear to be any greater than the risks for the bay area as a region.

Table 3.C-4 Annual-Average Ambient Concentrations of Carcinogenic Toxic Air Contaminants Measured in 2023 at the Air District Monitoring Station at 10 Arkansas Street, San Francisco

Substance	Concentration	Cancer Risk per Million
Gaseous TACs (ppb)		
Acetaldehyde	0.35	6
Benzene	0.11	29
1,3-Butadiene	0.025	27
Carbon Tetrachloride	0.075	58
Formaldehyde	1.09	23
Perchloroethylene	0.005	0.6
Methylene Chloride	0.067	0.7
Chloroform	0.017	1
Trichloroethylene	0.01	0.3
Particulate TACs (ng/m^3)		
Chromium (Hexavalent) [a]	0.083	35
TOTAL RISK FOR ALL TACs		**180.6**

SOURCE: California Air Resources Board, Ambient Air Toxics Summary, 2022, http://www.arb.ca.gov/adam/toxics/sitesubstance.html, accessed October 7, 2024.

ABBREVIATIONS: ng/m^3 = nanograms per cubic meter; ppb = parts per billion; TACs = toxic air contaminants

NOTE:

a. Annual-average ambient concentration of hexavalent chromium is for 2022 because there were insufficient or no data available to determine the value for 2023.

Roadway-Related Pollutants

Motor vehicles are responsible for a large share of air pollution, especially in California. Vehicle tailpipe emissions contain diverse forms of particles and gases, and vehicles contribute to particulates by generating road dust and tire wear. Epidemiologic studies have demonstrated that people living close to freeways or busy roadways have poorer health outcomes, including increased asthma symptoms and respiratory infections, and decreased pulmonary function and poor lung development in children. Air pollution monitoring conducted in conjunction with epidemiologic studies has confirmed that roadway-related health effects vary with modeled exposure to PM and NO_2. In traffic-related studies, the additional non-cancer health risk attributable to roadway proximity was seen within 1,000 feet of the roadway and was strongest within 300 feet.[220] As a result, the air board recommends that new sensitive land uses not be located within 500 feet of a freeway or urban roads carrying 100,000 vehicles per day.

Diesel Particulate Matter

The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Mobile sources such as trucks and buses are among the primary sources of diesel emissions, and DPM concentrations are higher near heavily traveled highways. The air board estimated the bay area's average cancer risk from exposure to diesel particulate, based on a population-weighted average ambient diesel particulate concentration, to be about 520 in 1 million as of 2012, which is much higher than the risk associated with any other toxic air pollutant routinely measured in the region. Based on guidance from OEHHA, PM_{10} is the surrogate for whole diesel exhaust, or DPM.

Despite notable emission reductions from regulations (discussed below), the air board recommends considering proximity to sources of DPM emissions in the siting of new sensitive land uses (or sensitive receptors). The air board notes that these recommendations are advisory and should not be interpreted as defined "buffer zones"; it states that local agencies must balance other considerations, such as transportation needs, the benefits of urban infill, community economic development priorities, and other quality-of-life issues. With careful evaluation of exposure, health risks, and affirmative steps to reduce risk where necessary, the air board's position is that infill development, mixed-use, higher density, transit-oriented development, and other concepts that benefit regional air quality can be compatible with protecting the health of individuals at the neighborhood level.

High Background Risk Levels

In an effort to identify the areas of San Francisco most adversely affected by sources of TACs, the San Francisco Planning Department's Environmental Planning Division identified areas with poor air quality based on the following health-protective criteria: (1) excess cancer risk greater than 100 per 1 million population from the contribution of emissions from all modeled sources; (2) cumulative $PM_{2.5}$ concentrations greater than 10 $\mu g/m^3$; or (3) locations within 500 feet of freeways and parcels within 1,000 feet of freeways or roadways with an excess of 100,000 vehicles per day.[221]

The following summarizes the evidence supporting the criteria for areas with high background risk levels, as provided in the 2025 San Francisco Planning Department Air Quality and Greenhouse Gas Analysis Guidelines,[222] followed by a discussion of major sources of emissions within and near the RADP site.

EXCESS CANCER RISK

The greater than 100 per 1 million persons exposed criterion is based on the U.S. EPA's guidance for conducting air toxics analyses and making risk management decisions at the facility and community-scale

[220] California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005, https://ww2.arb.ca.gov/sites/default/files/2023-05/Land%20Use%20Handbook_0.pdf, accessed July 1, 2024.
[221] This approach is consistent with the *San Francisco Citywide Health Risk Assessment: Technical Support Documentation* and the Air Pollutant Exposure Zone. See San Francisco Department of Public Health, San Francisco Planning Department, and Ramboll, *San Francisco Citywide Health Risk Assessment: Technical Support Documentation*, September 2020, https://sfplanning.org/air-quality, accessed November 21, 2024.
[222] San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, February 2025, https://sfplanning.org/air-quality, accessed February 10, 2025.

level.[223] As described by the air district, the U.S. EPA considers a cancer risk of 100 per million to be within the "acceptable" range of cancer risk. Furthermore, in the 1989 preamble to the benzene National Emissions Standards for Hazardous Air Pollutants rulemaking,[224] the U.S. EPA states that it

> *… strives to provide maximum feasible protection against risks to health from hazardous air pollutants by (1) protecting the greatest number of persons possible to an individual lifetime risk level no higher than approximately one in one million; and (2) limiting to no higher than approximately one in ten thousand [100 in one million] the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years.*

The 100 per 1 million excess cancer risk is also consistent with the ambient cancer risk in the most pristine portions of the bay area based on the air district's regional modeling.[225]

FINE PARTICULATE MATTER

In April 2011, the U.S. EPA published *Policy Assessment for the Particulate Matter Review of the National Ambient Air Quality Standards*. In this document, the U.S. EPA concluded that the then-current federal annual $PM_{2.5}$ standard of 15 $\mu g/m^3$ should be revised to a level within the range of 13 to 11 $\mu g/m^3$, with evidence strongly supporting a standard within the range of 12 to 11 $\mu g/m^3$. In December 2012, the U.S. EPA strengthened the annual $PM_{2.5}$ standard from 15 to 12 $\mu g/m^3$ and issued final area designations based on that standard. The U.S. EPA published a final decision to retain the 2012 PM NAAQS in December 2020.[226] In February 2024, the U.S. EPA published a reconsideration for the PM NAAQS standard, which revised primary annual $PM_{2.5}$ standard by lowering the level from 12 $\mu g/m^3$ to 9 $\mu g/m^3$.[227]

High background risk levels are based on the health-protective $PM_{2.5}$ standard of 11 $\mu g/m^3$, as supported by the U.S. EPA's particulate matter policy assessment, though lowered to 9 $\mu g/m^3$ to account for uncertainty in accurately predicting air pollutant concentrations using emissions modeling programs.[228]

PROXIMITY TO FREEWAYS

According to the air board, studies have shown an association between the proximity of sensitive land uses to freeways and a variety of respiratory symptoms, exacerbation of asthma, and decreases in lung function in children. Siting sensitive uses near freeways increases both exposure to air pollution and the potential for adverse health effects. Because evidence shows that sensitive uses in an area within a 500-foot buffer of any freeway or parcels within 1,000 feet of freeways or roadways with an excess of 100,000 vehicles per day are at an increased health risk from air pollution, parcels located within 500 feet of freeways are considered to have high background risk levels. U.S. 101 is a freeway near the Airport with and excess of 100,000 vehicles per

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[223] Bay Area Air Quality Management District, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, October 2009, p. 67.
[224] 54 *Federal Register* 38044, September 14, 1989.
[225] Bay Area Air Quality Management District, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, October 2009, p. 67.
[226] U.S. Environmental Protection Agency, *Review of the National Ambient Air Quality Standards for Particulate Matter*, December 2020, https://www.govinfo.gov/content/pkg/FR-2020-12-18/pdf/2020-27125.pdf, accessed November 21, 2024.
[227] U.S. Environmental Protection Agency, *Reconsideration of the National Ambient Air Quality Standards for Particulate Matter*, March 2024, https://www.federalregister.gov/documents/2024/03/06/2024-02637/reconsideration-of-the-national-ambient-air-quality-standards-for-particulate-matter, accessed November 21, 2024.
[228] San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, February 2025, https://sfplanning.org/air-quality, accessed February 10, 2025.

day; therefore, sensitive land uses within 1,000 feet of this freeway are considered to have high background risk levels.

Air Pollution Sources

Stationary Sources

The air district's inventory of permitted stationary sources of emissions shows nearly 100 permitted stationary emission facilities present within or near 3,280 feet (1,000 meters) of the Airport. The majority of these permitted facilities include stationary diesel engines for power generators and fuel stations.

Mobile Sources

U.S. 101, Millbrae Avenue, and San Bruno Avenue are the freeways and arterial roadways within 3,280 feet (1,000 meters) of the Airport that carry a substantial amount of daily vehicle traffic. This traffic contributes to concentrations of $PM_{2.5}$, DPM, and other air contaminants emitted from motor vehicles near street level. Other major mobile sources of air pollution (e.g., railyards, trucking distribution facilities, and high-volume fueling stations) located within 3,280 feet (1,000 meters) of the Airport include Caltrain operations along the railway and at the Millbrae and San Bruno stations.

Receptors

Sensitive Receptors

Air quality does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects than others. More sensitive population groups include the elderly and the young; people with higher rates of respiratory disease, such as asthma and chronic obstructive pulmonary disease; and those with other environmental or occupational health exposures (e.g., poor indoor air quality) that affect cardiovascular or respiratory disease. The air district defines *sensitive receptors* as children, adults, and seniors occupying or residing in residential dwellings, schools, childcare centers, hospitals, and senior-care facilities.

The proximity of sensitive receptors to motor vehicles is an air pollution concern, especially in urban locations of the bay area where building setbacks are limited and roadway volumes are higher than in suburban locations. Existing sensitive receptors evaluated in this analysis include a representative sample of known residents (child and adult) in the surrounding area, and other sensitive receptors (e.g., schoolchildren, childcare facilities) located in the surrounding community and along the expected travel routes of the on-road delivery and haul trucks within the vicinity. The health risk impact analysis in this document also includes sensitive receptors located within 3,280 feet (1,000 meters) of the Airport, consistent with the 2020 San Francisco Citywide Health Risk Assessment modeling.[229]

Numerous residential receptors are located within 3,280 feet of the Airport, all west of U.S. 101. In addition to the residential sensitive receptors, seven schools, five childcare facilities, and six health care facilities are

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[229] San Francisco Department of Public Health, San Francisco Planning Department, and Ramboll, *San Francisco Citywide Health Risk Assessment: Technical Support Documentation*, September 2020, https://citypln-m-extnl.sfgov.org/SharedLinks.aspx?accesskey=2ec4f5b2368081acba7ca67aea1c803b558c585c5266ccd51a3479d4a9f8f649&VaultGUID=A4A7DACD-B0DC-4322-BD29-F6F07103C6E0, accessed July 16, 2024.

located within 3,280 feet of the Airport. See **Figure 3.C-1** for the locations of nonresidential sensitive receptors. In addition to these sensitive receptors, the Safe Harbor Shelter for homeless individuals is located near the SamTrans north base bus yard directly north of the Airport. Stays at this shelter are limited to 90 days, so the exposure of occupants would not be as long as the school and childcare sensitive receptors shown in Figure 3.C-1. Nevertheless, this location was included as a sensitive receptor in the health risk impact analysis.

Worker Receptors

Workers employed within the Airport's terminals are treated as onsite receptors.[230] These employees are located inside buildings within the RADP project site and could be exposed to air pollution hazards that result from construction and operation of subsequent projects under the RADP. Workers on the airfield are not considered sensitive receptors because they must follow regulations set forth by the U.S. Occupational Safety and Health Administration to ensure their health and well-being. Workers on the airfield would receive training about air pollution hazards as part of their employment, which would include methods to minimize exposure and risk.

Odors

Sources that typically generate odors include wastewater treatment and pumping facilities; landfills, transfer stations, and composting facilities; petroleum refineries, asphalt batch plants, chemical (including fiberglass) manufacturing, and metal smelters; painting and coating operations; rendering plants; coffee roasters and food processing facilities; and animal feed lots and dairies. The only source of odorous emissions within or near the RADP project site is the Mel Leong Treatment Plant, located on the northeast end of the Airport and more than 1 mile from the closest residential sensitive receptor, and the South San Francisco – San Bruno Water Quality Control Plan, located approximately 700 feet north of the United Airlines Maintenance and Operations Center.

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[230] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines Appendix E: Recommended Methods for Screening and Modeling Local Risks and Hazards*, April 2022, p. E-15, https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/appendix-e-recommended-methods-for-screening-and-modeling-local-risks-and-hazards_final-pdf.pdf?rev=b8917a27345a4a629fc18fc8650951e4, accessed July 10, 2024.

SOURCE: Esri, 2024; Google, 2024; SFO, 2024; ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 3.C-1
NON RESIDENTIAL SENSITIVE RECEPTORS

3.C.3 Regulatory Framework

Federal

Federal Clean Air Act

The 1970 Clean Air Act (most recently amended in 1990) requires that each regional planning or air pollution control agency prepare a regional air quality plan to outline the measures by which both stationary and mobile sources of pollutants will be controlled to achieve all standards by the deadlines specified in the law. These *ambient air quality standards* are intended to protect the public health and welfare, and they specify the concentration of pollutants (with an adequate margin of safety) to which the public can be exposed without adverse health effects. They are designed to protect those segments of the public most susceptible to respiratory distress, including asthmatics, the very young, the elderly, people weakened from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels that somewhat exceed ambient air quality standards before adverse health effects are observed.

The current attainment status for the air basin, with respect to the federal standards, is summarized in Table 3.C-2, p. 3.C-4. In general, the basin experiences low concentrations of most pollutants when compared to the federal standards, except for ozone and PM (PM_{10} and $PM_{2.5}$), for which standards are exceeded periodically (see Table 3.C-1, p. 3.C-3).

The air basin is in attainment for other criteria air pollutants, with the exception of the 24-hour standards for PM_{10} and $PM_{2.5}$, for which the bay area is designated as "unclassified" and "non-attainment," respectively. *Unclassified* is defined by the Clean Air Act as any area that cannot be classified, on the basis of available information, as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant. With respect to air quality regulations, areas that are designated as unclassified are treated the same as areas designated as attainment. The air basin is designated as an attainment area with respect to the federal annual-average $PM_{2.5}$ standard.

Non-Road Diesel Equipment

To reduce emissions from non-road diesel equipment, the U.S. EPA established a series of increasingly strict emission standards for new off-road diesel engines. (Code of Federal Regulations title 40, parts 1039, 1065, and 1068; California Code of Regulations title 13, section 2025.) Tier 1 standards were phased in on newly manufactured equipment from 1996 through 2000 (year of manufacture), depending on the engine horsepower (hp) category. Tier 2 standards were phased in on newly manufactured equipment from 2001 through 2006. Tier 3 standards were phased in on newly manufactured equipment from 2006 through 2008. Tier 4 standards, which require the use of advanced emission control technology to attain them, were phased in between 2008 and 2015. The San Francisco Planning Department has been tracking the availability of equipment that meet these emissions standards since 2010 using data from the air board. As of 2023, 55 percent of construction equipment registered in the air basin meets Tier 4 standards.[231]

[231] San Francisco Planning Department, *Off-Road Construction Equipment Vehicle Inventory*, October 2023, https://citypln-m-extnl.sfgov.org/SharedLinks.aspx?accesskey=07bd27912d0a83981dda16f5e8e2e3f3d7b3a75b68f31af27bf29110c7e9fcb8&VaultGUID=A4A7DACD-B0DC-4322-BD29-F6F07103C6E0, accessed January 30, 2025.

On-Road Vehicles

The U.S. EPA Clean Trucks Plan is a federal initiative aimed at reducing emissions from the on-road sector beginning with heavy-duty vehicles.[232] The first rulemaking of this plan was signed on December 20, 2022, which focuses on reducing emissions of NO_X from new heavy-duty vehicles starting in model year 2027. These new NO_X emissions standards also include longer useful life periods, as well as increases in the emissions-related warranty periods. The second rulemaking occurred on March 20, 2024, and focuses on reducing NO_X, $PM_{2.5}$, ROG, and greenhouse gases (GHG) from light- and medium-duty vehicles via new emissions standards. These standards will phase in gradually over model years 2027 through 2032. The third and final rulemaking was announced on March 29, 2024, which sets stronger standards to reduce GHG from heavy-duty vehicles that will phase in from model year 2027 through 2032.

State

California Clean Air Act

Although the federal Clean Air Act established the NAAQS, individual states retained the option to adopt more stringent standards and to include other pollution sources. California had already established its own air quality standards when the federal standards were established, and because of California's unique meteorological conditions, there is considerable diversity between the NAAQS and the CAAQS, as shown in Table 3.C-2, p. 3.C-4. California's ambient standards are at least as protective as the national ambient standards and are often more stringent.

In 1988, California enacted the California Clean Air Act (California Health and Safety Code section 39600 et seq.). Like its federal counterpart, the California Clean Air Act required the designation of areas as in attainment or in nonattainment, but it based these designations on the CAAQS rather than the federal standards. As indicated in Table 3.C-2, p. 3.C-4, the air basin is designated as "nonattainment" for the state ozone, PM_{10}, and $PM_{2.5}$ standards and as "attainment" for the other pollutants.

Toxic Air Contaminants from On-Road Diesel Trucks and Off-Road Diesel Equipment

The air board has adopted rules for new diesel trucks and for off-road diesel equipment. Along with rules adopted by U.S. EPA, these regulations have resulted in substantially more stringent emissions standards for new diesel trucks and new off-road diesel equipment, such as construction vehicles. Effective January 2011, both U.S. EPA and the air board adopted the "Interim Tier 4 standards" for new equipment with diesel engines of 175 hp or greater. The Interim Tier 4 emissions standards for PM are about 85 percent more restrictive than previous PM emissions standards (Tier 2 or Tier 3, depending on the size of the engine[233]) for these larger off-road engines. As a result, using engines that meet the Interim Tier 4 standards would reduce diesel exhaust emissions of PM by approximately 85 percent, compared to new engines produced under the previous standards. Tier 4 Final standards were required for new off-road engines, depending on engine size, for all model years starting in 2014 or 2015. The Tier 4 Final standards are about 80 percent more restrictive than the Interim Tier 4 standards for NO_X emissions and 30 percent more restrictive for PM emissions. As a result, using engines that meet the Tier 4 Final standards would reduce exhaust emissions of NO_X by

[232] U.S. Environmental Protection Agency, *Clean Trucks Plan*, March 2024, https://www.epa.gov/regulations-emissions-vehicles-and-engines/clean-trucks-plan, accessed January 31, 2025.
[233] For most construction equipment other than that with extremely powerful engines (greater than 750 hp), Tier 2 and Tier 3 emissions standards are the same with respect to particulate matter. Therefore, the cancer risk from DPM—a subset of all particulate matter—is essentially the same for Tier 2 and Tier 3 engines.

approximately 80 percent and reduce diesel exhaust emissions of PM by approximately 30 percent compared to new engines produced under the Interim Tier 4 standards.[234]

Tier 2 or Tier 3 engines (for larger equipment, those manufactured since 2006) can achieve generally the same reduction in PM emissions through retrofitting by installing a diesel particulate filter (an air board–certified Level 3 Verified Diesel Emissions Control System). Since 2014, air board regulations have required off-road equipment fleets to begin gradually replacing older engines with newer, cleaner engines, installing exhaust filters on remaining older engines, or some combination of the two to achieve fleet-wide emissions reductions. Because only a certain percentage of each fleet's engines must be replaced or retrofitted annually or periodically to achieve the required emissions reductions, and because fleet turnover of heavy-duty off-road equipment takes many years, the full effect of the regulations on emissions reduction is not anticipated to be realized until sometime before 2030, depending on the engine size and pollutant.[235]

Regarding equipment already in use, the air board adopted rules for in-use off-road diesel vehicles—including construction equipment—in 2007. Those rules also limit idling to five minutes, require a written idling policy for larger vehicle fleets, and require fleet operators to provide information on their engines to the air board and label vehicles with an air board–issued vehicle identification number. The off-road rules require the retrofitting or replacement of diesel engines in existing equipment. This "repowering" was originally to be required beginning in 2010 (for the largest fleets). However, in 2010, the air board delayed the start of repowering to 2014 for large fleets, 2017 for medium-size fleets, and 2019 for small fleets.[236] The air board stated that the delayed implementation was justified because the recession had dramatically reduced emissions, and because the board staff found that the data on which the original rule was based had overestimated emissions. According to the air board, under the revised rules, DPM emissions from off-road equipment would decrease by more than 40 percent from 2010 levels by the year 2020 and by more than 75 percent by 2030.[237]

In 2005, the air board approved a regulatory measure to reduce emissions of toxic and criteria air pollutants by limiting idling by new heavy-duty diesel vehicles. The regulations generally limit idling by commercial motor vehicles (including buses and trucks) within 100 feet of a school or residential area for more than five consecutive minutes or periods aggregating more than five minutes in any one hour. Buses or vehicles also must turn off their engines upon stopping at a school and must not turn their engines on more than 30 seconds before beginning to depart from a school. Also, Senate Bill 352, adopted in 2003, limits locating public schools within 500 feet of a freeway or busy traffic corridor.

The air board's Truck and Bus Regulation applies to heavy-duty on-road diesel vehicles. These regulations mandate fleet turnover to ensure that by January 1, 2023, nearly all on-road diesel trucks would have 2010 model year engines or equivalent (i.e., Tier 4). (California Code of Regulations title 13, section 1956.8.)

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[234] California Air Resources Board, "*Non-road Diesel Engine Certification Tier Chart*," n.d., https://ww2.arb.ca.gov/resources/documents/non-road-diesel-engine-certification-tier-chart, accessed October 28, 2024.

[235] California Air Resources Board, *2017 Off-Road Diesel Emission Factor Update for NO_X and PM*, n.d., https://ww3.arb.ca.gov/msei/ordiesel/ordas_ef_fcf_2017.pdf, accessed October 28, 2024.

[236] Fleet size is based on total horsepower: large fleets are those with more than 5,000 hp, medium fleets have 2,501–5,000 hp, and small fleets are those with less than 2,500 hp.

[237] California Air Resources Board, *Staff Report: Initial Statement of Reasons for Proposed Rulemaking: Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets and the Off-Road Large Spark-Ignition Fleet Requirements*, October 2010, p. 44, http://www.arb.ca.gov/regact/2010/offroadlsi10/offroadisor.pdf, accessed October 28, 2024.

The air board began implementing the Clean Truck Check in January 2023.[238] This program combines periodic vehicle testing requirements with other emissions monitoring techniques and expanded enforcement strategies to identify vehicles in need of emission related repairs and ensure any needed repairs are performed.

The air board's Advanced Clean Fleets program is a regulatory initiative aimed at reducing emissions from medium- and heavy-duty vehicles to protect public health and meet the state's climate goals. Effective as of January 1, 2024, the Advanced Clean Fleets Regulation requires fleets that are well suited for electrification to reduce emissions by adhering to two requirements: targeted fleets must phase in the use of zero-emission vehicles (ZEVs) and fleet truck manufacturers must sell only ZEV trucks in California starting in 2036. The regulation applies to trucks performing drayage operations at seaports and railyards; fleets owned by federal, state, and local government agencies; and high-priority fleets. *High-priority fleets* are those entities that own, operate, or direct at least one vehicle in California, and that either have $50 million or more in gross annual revenue or own, operate, or have common ownership or control of a total of 50 or more vehicles. Affected fleet owners may continue using existing trucks until the end of their useful life as defined in the regulation. New additions to the California fleet must be ZEVs. In January 2025, the air board withdrew requests for Clean Air Act waivers from the U.S. EPA needed to support four recently adopted vehicle emissions regulations, including the Advanced Clean Fleets Regulations. The air board withdrew the waiver requests due to the uncertainty caused by the impending change in federal administration. Until the air board repeals the regulations or they are invalidated by a court, some legal requirements still apply. While certain aspects of the Advanced Clean Fleets program are likely unenforceable absent a Clean Air Act waiver, other portions may not be subject to the Clean Air Act and the waiver requirement, such as the part of the Advanced Clean Fleet regulation that applies to state and local government fleets.

On-Road Passenger Vehicles and Light-Duty Trucks

The air board has developed several regulations to control air pollution from passenger vehicles and light-duty trucks. The Advanced Clean Cars regulation combines several regulations into one package, including the Low-Emission Vehicle criteria and GHG regulations and the ZEV regulation. Advanced Clean Cars I was adopted in 2012 and Advanced Clean Cars II was adopted in 2022. These regulations rapidly scale down emissions of light-duty passenger cars, pickup trucks, and SUVs and require an increased number of ZEVs to meet air quality and climate change emissions goals.[239] The Low-Emission Vehicle regulations consist of increasingly stringent emission standards for criteria air pollutants and GHGs for new passenger vehicles. The ZEV regulation is designed to achieve the state's long-term emission reduction goals through both increased stringency of ZEV sales and associated actions to support wide-scale adoption of ZEVs. The air board adopted the Clean Miles Standard in May 2021, which is a fleet regulation designed to cut vehicle emissions from ride-hailing services referred to as transportation network companies.[240] The Clean Miles Standard will gradually increase zero-emission miles and reduce GHG emissions, ensuring that passenger miles traveled on transportation network company platforms become cleaner.

[238] California Air Resources Board, "Clean Truck Check," n.d., https://ww2.arb.ca.gov/our-work/programs/CTC, accessed January 31, 2025.
[239] California Air Resources Board, "Advanced Clean Cars Program," n.d., https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/about, accessed October 29, 2024.
[240] California Air Resources Board, "Clean Miles Standard," n.d., https://ww2.arb.ca.gov/our-work/programs/clean-miles-standard/about, accessed January 31, 2025.

Transport Refrigeration Units

The air board is developing requirements to transition diesel-powered transport refrigeration units (TRUs) to zero-emission technology in two phases. Part 1 consists of amendments to the TRU air toxic control measure, which the board approved at its February 2022 meeting. The amendments include requirements for diesel-powered truck TRUs (TRUs mounted on the truck itself) to transition to zero-emission, a PM emission standard for newly manufactured non-truck TRUs (TRUs on a trailer, shipping container, or railcar), requirements to use lower global warming potential refrigerants, facility registration and reporting, expanded TRU reporting and labeling, and fees. Air board staff are assessing zero-emission options for non-truck TRUs and plan to take a second rulemaking (Part 2) to the board for consideration in 2025.[241]

Regional

Bay Area Air Quality Management District

The air district is the regional agency with jurisdiction over the nine-county air basin, which includes San Francisco, Alameda, Contra Costa, Marin, San Mateo, Santa Clara, and Napa counties and portions of Sonoma and Solano counties. It is responsible for attaining and maintaining federal and state air quality standards in the air basin. Specifically, it monitors ambient air pollutant levels throughout the basin and develops and implements strategies to attain these standards. The air district has permit authority over most types of stationary emission sources and can require stationary sources to obtain permits, and can impose emission limits, set fuel or material specifications, or establish operational limits to reduce air emissions. The air district also regulates new or expanding stationary sources of TACs and requires air toxic control measures for many sources emitting TACs. It also establishes and enforces local air quality rules and regulations for these purposes. The following air district rules are applicable to construction under the RADP:[242]

- **Regulation 6, Rule 1 (Particulate Matter)** restricts PM emissions darker than No. 1 on the Ringlemann Chart to less than three minutes in any one hour.
- **Regulation 6, Rule 6 (Prohibition of Trackout)** limits the quantity of PM in the atmosphere through control of trackout of solid materials onto paved public roads.
- **Regulation 9, Rule 8 (Stationary Internal-Combustion Engines)** limits emissions of NO_X and CO from stationary internal-combustion engines of more than 50 hp.
- **Regulation 11, Rule 2 (Hazardous Pollutants)** limits emissions of asbestos during demolition, renovation, milling, and manufacturing and establishes appropriate waste disposal procedures.

The air district rules that are most applicable to operation of the RADP pertain mostly to permits for emergency generators and are as follows:

- **Regulation 2, Rule 1 (General Permit Requirements)** includes criteria for the issuance or denial of permits, exemptions, appeals against decisions of the air pollution control officer, and air district actions on applications.

[241] California Air Resources Board, "New Transport Refrigeration Unit Regulation in Development," https://ww2.arb.ca.gov/our-work/programs/transport-refrigeration-unit/new-transport-refrigeration-unit-regulation, accessed September 29, 2022.
[242] Bay Area Air Quality Management District, "Current Rules," https://www.baaqmd.gov/rules-and-compliance/current-rules, accessed November 22, 2024.

- **Regulation 2, Rule 2 (New Source Review)** applies to new or modified sources and contains requirements for best available control technology and emission offsets. Rule 2 implements federal New Source Review and Prevention of Significant Deterioration requirements.
- **Regulation 2, Rule 5 (New Source Review of Toxic Air Contaminants)** applies to new or modified sources of TAC emissions to evaluate potential public exposure and health risk, to mitigate potentially significant health risks resulting from these exposures, and to provide net health risk benefits by improving the level of control when existing sources are modified or replaced.
- **Regulation 9, Rule 8 (Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines)** limits NO_X and CO emissions from stationary internal combustion engines with an output rated by the manufacturer at more than 50 brake hp.

The air district regulates stationary-source emissions of TACs through Rule 2-1 (General Permit Requirements), Rule 2-2 (New Source Review), and Rule 2-5 (New Source Review of Toxic Air Contaminants). Under these rules, all stationary sources that have the potential to emit TACs above a certain level are required to obtain permits from the air district. These rules provide guidance for the review of new and modified stationary sources of TAC emissions, including evaluation of health risks and potential mitigation measures.

Sources must apply best available control technology to reduce emissions. For emergency generators greater than 1,000 hp, the air district's best available control technology requirement is to achieve U.S. EPA Tier 4 standards.[243]

Regulation of Odors

The air district's Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds. The regulation limits the "discharge of any odorous substance which causes the ambient air at or beyond the property line … to be odorous and to remain odorous after dilution with four parts of odor-free air." The air district must receive odor complaints from 10 or more complainants within a 90-day period for the limitations of this regulation to go into effect. If this criterion has been met, an odor violation can be issued by the air district if a test panel of people can detect an odor in samples collected periodically from the source.

Bay Area Air Quality Planning Relative to Federal and State Standards

FEDERAL AIR QUALITY PLAN

Air quality plans developed to meet federal requirements are referred to as *State Implementation Plans*. The federal and California clean air acts require that plans be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM_{10} standard).

BAY AREA AIR QUALITY PLAN

The air district adopted the *2017 Clean Air Plan: Spare the Air, Cool the Climate* (2017 Clean Air Plan) on April 19, 2017, in cooperation with the Metropolitan Transportation Commission, the San Francisco Bay

[243] Bay Area Air Quality Management District, "BACT for Emergency Backup Engines Greater than or Equal to 1,000 Brake-Horsepower," 2021, https://www.baaqmd.gov/permits/apply-for-a-permit/engine-permits, accessed October 29, 2024.

Conservation and Development Commission, and the Association of Bay Area Governments to provide a regional strategy to improve the bay area's air quality and meet public health goals.[244] The 2017 Clean Air Plan includes a wide range of control measures designed to reduce emissions and lower ambient concentrations of harmful pollutants, safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, and reduce GHG emissions to protect the climate.

The 2017 Clean Air Plan addresses four categories of pollutants: ground-level ozone and its key precursors, ROG and NO_X; PM, primarily $PM_{2.5}$, and precursors to secondary $PM_{2.5}$; air toxics; and GHG emissions. The control measures are categorized based on the economic sector framework including stationary sources, transportation, energy, buildings, agriculture, natural and working lands, waste management, and water measures.

The Association of Bay Area Governments, the Metropolitan Transportation Commission, county transportation agencies, cities and counties, and various nongovernmental organizations also participate in the efforts to improve air quality through a variety of programs. These programs include the adoption of regulations and policies and the implementation of extensive education and public outreach programs.

Local

A discussion of regulations and policies of jurisdictions located adjacent to the RADP project site (County of San Mateo, City of Millbrae, City of San Bruno, and City of South San Francisco), as relevant to air quality, as well as San Francisco and SFO regulations and policies related to air quality, is provided below.

County of San Mateo

The following policies and implementing strategies in the Climate Element of the County of San Mateo General Plan address climate change and GHG emissions that could also affect criteria air pollutant and TAC emissions, and are relevant to the RADP:

- **Policy 5.2:** Promote the voluntary transition to clean and low-emissions outdoor equipment through programs and plan review.

  Implementing Strategy 5.2B: Support both the use of low-emissions construction equipment and reduced equipment idling in construction activities through the plan review process, such as through permit requirements or conditions of approval.

- **Policy 6.1:** Continue to expand recycling and reduce landfilled waste.

  Implementing Strategy 6.1G: Consider opportunities to increase mandatory diversion of construction and demolition waste.

- **Policy 9.2:** Integrate ongoing assessment of climate change vulnerabilities into the planning process.

  Implementing Strategy 9.2D: Incorporate potential climate change impacts into the decision-making process when siting new facilities and prioritizing repairs and improvements to critical infrastructure.

[244] Bay Area Air Quality Management District, *2017 Clean Air Plan: Spare the Air, Cool the Climate*, April 19, 2017, http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en, accessed July 2, 2024.

- **Policy 10.1:** Encourage the location and design of new development, remodels, or expansions to anticipate and mitigate climate change risks.

  Implementing Strategy 10.1E: Consistent with statewide standards and guidance from the California Coastal Commission, require all new projects in the coastal zone to account for sea-level rise and the potential for increasing rates of erosion.

- **Policy 10.3:** Protect the built environment from climate change risks through programs and strategic planning.

  Implementing Strategy 10.3A: Establish a strategy for addressing existing development and critical infrastructure that is vulnerable to increased impacts of climate change, identifying decision-making criteria for upgrades and managed retreats from risks.

City of Millbrae

The City of Millbrae General Plan outlines various goals, policies, and actions and implementing programs relevant to air quality in the Natural Resource Conservation Element and the Energy Element.[245] The following policies are relevant to the RADP:

- **NRC-4.1: Ambient Air Quality Standards.** The City [of Millbrae] shall continue to work with the air board and the air district to meet State and Federal ambient air quality standards.
- **NRC-4.2: Reduce Construction and Operational Emissions.** The City shall require new development projects to incorporate design or operational features that reduce construction and operational emissions of ROG, NO_X, and particulate matter (PM_{10} and $PM_{2.5}$) to a less-than-significant level.
- **NRC-4.3: Minimize Sensitive Receptor Exposure.** The City shall work with the air district to evaluate exposure of sensitive receptors to odors, TAC, and $PM_{2.5}$. The City shall also require new development to implement applicable best management practices that will limit exposure of new sensitive receptors to a less-than-significant level (e.g., daycare facilities, elderly housing and convalescent facilities).
- **NRC-4.4: Preferences for Reduced-Emission Equipment.** The City shall give preference to contractors using reduced-emission equipment for City construction projects and contracts for services (e.g., garbage collection), as well as businesses that practice sustainable operations.
- **NRC-4.5: Air Pollution Education.** The City shall continue to work with the air district to educate residents about the health effects of air pollution and continue to support and promote the air district's Spare the Air Day alerts program to inform residents about actions they can take to help improve air quality and reduce GHG emissions, including replacing wood burning fireplaces and stoves with cleaner alternatives.
- **NRC-5.1: Energy Efficient Practices and Operations.** The City shall promote efficient energy use in the design, construction, maintenance, and operation of public and private facilities, infrastructure, and equipment.
- **NRC-5.2: Reduce Heat Island Effect.** The City shall encourage efforts and continually evaluate sustainable measures that reduce the heat island effect, reduce energy consumption, and contribute to carbon mitigation including the planting of trees and other vegetation and installation of cool roofs.

[245] City of Millbrae, *City of Millbrae 2040 General Plan Policy Document*, December 2022, https://www.ci.millbrae.ca.us/268/General-Plan-Update-2022, accessed July 3, 2024.

- **NRC-5.3: Zero Net Energy Building.** The City shall support opportunities to achieve zero net energy use for new buildings or the retrofitting of existing buildings in accordance with State laws and encourage existing buildings to achieve energy efficiencies.
- **NRC-5.4: Renewable Energy Sourcing and Storage.** The City shall encourage and support the generation, transmission, use, and storage of renewable energy and continue its participation and support for Peninsula Clean Energy.
- **NRC-5.5: Electric Vehicles.** The City shall encourage and support expanding electric vehicle (EV) charging stations and the purchase of electric vehicles.
- **NRC-5.6: Green Building Ordinance.** The City shall adopt and apply the most recent Green Building Standards Code (CALGreen) to new municipal, commercial, and residential structures, remodels, and additions. The City shall also consider updates for additional "reach code" mandatory requirements for new development, such as solar hot water systems or cool roofs.
- **NRC-5.10: Energy Audits.** The City shall encourage residential and commercial energy audits.
- **NRC-5.11: Transportation Energy Use Reduction.** The City shall encourage smart development, infill development, transportation demand management, and programs which support alternative modes of transportation, including the City's partnership with Commute.org.
- **M-6.1: Agency Coordination.** The City shall coordinate with San Francisco International Airport, the High-Speed Rail Authority, Caltrans, the Peninsula Corridor Joint Powers Board, Metropolitan Transportation Commission, the San Francisco Bay Area Rapid Transit District, the San Mateo County Transit District, the City/County Association of Governments of San Mateo County and other transit providers and transportation agencies, to meet the travel needs of Millbrae residents, workers, and visitors.

City of San Bruno

The City of San Bruno General Plan has various guiding and implementing policies related to air quality, as well as climate change and sustainability that could affect air quality, in the Transportation Element, the Environmental Resources and Conservation Element, and the Public Facilities and Services Element.[246] The following policies are relevant to the RADP:

- **T-1.** Develop incentives for San Bruno government and private employers to institute staggered working hours, compressed work week, home-based telecommuting, carpooling, use of transit, alternative fuel vehicles, and bicycling to employment centers to reduce vehicle miles traveled and the associated traffic congestion and air pollution.
- **T-4.** Encourage major employers of the city to provide shuttle service for employees from worksite to food service establishments, commercial areas, and transit stations, to reduce the number of automobile trips.
- **ERC-A.** Preserve open space essential for the conservation of San Bruno's natural resources—including vegetation, wildlife, soils, water, and air.
- **ERC-E.** Contribute to regional attainment by improving ambient air quality levels within San Bruno.

[246] City of San Bruno, *San Bruno General Plan*, March 2009, https://www.sanbruno.ca.gov/629/General-Plan, accessed January 31, 2025.

- **ERC-13.** Through environmental review, assure that all projects affecting resources of regional concern (e.g., the San Francisco garter snake habitat, water and air quality, the San Francisco Fish and Game Reserve) satisfy regional, State and federal laws.
- **ERC-25.** Maintain and improve air quality by requiring project mitigation, such as Transportation Demand Management (TDM) techniques, where air quality impacts are unavoidable.
- **ERC-26.** Require dust abatement actions for all new construction and redevelopment projects.
- **ERC-27.** Budget for alternative-fuel vehicles in the City's long-range capital expenditure plans, to replace and improve the existing fleet of gasoline- and diesel-powered vehicles.
- **ERC-28.** Incorporate air quality beneficial programs and policies into local planning and development activities, with a particular focus on subdivision, zoning, and site design measures that reduce the number and length of single-occupant automobile trips.
- **ERC-29.** Promote demonstration projects to develop new strategies to reduce motor vehicle emissions. Projects may include low emission vehicle fleets and LEV refueling infrastructure.
- **ERC-30.** Encourage new residential developments to incorporate measures such as shuttle services to major employment centers, commercial areas and transit areas, and provision of adequate transit facilities.
- **ERC-31.** Prepare a Greenhouse Gas Emissions Reduction Plan, focusing on feasible actions the City can take to minimize the adverse impacts of Plan implementation on climate change and air quality.
- **ERC-32.** Coordinate air quality planning efforts with local, regional, and State agencies. Support the Bay Area Air Quality Management District's efforts to monitor and control air pollutants from stationary sources.
- **ERC-33.** Require all large construction projects to mitigate diesel exhaust emissions through use of alternate fuels and control devices.
- **ERC-34.** Require that adequate buffer distances be provided between odor sources and sensitive receptors, such as schools, hospitals, and community centers.
- **PFS-62.** Develop and implement a Green Building Design Ordinance and design guidelines for climate-oriented site planning, building design, and landscape design to promote energy efficiency.
- **PFS-63.** Require that all new development complies with California's Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6).

City of South San Francisco

The City of South San Francisco's General Plan includes goals and policies related to air quality in the Community Health and Environmental Justice Element and in the Open Space and Conservation Element.[247] The following policies and implementation actions contained in these elements are relevant to the RADP:

- **Policy CHEJ-3.1.** Support regional efforts to improve air quality and protect human health.
- **Policy CHEJ-3.2.** Reduce mobile source pollution. Reduce emissions from mobile sources of air pollution, such as diesel-based trucks and vehicles that travel to from, or through South San Francisco.

[247] City of South San Francisco, *Shape SSF 2040: South San Francisco 2040 General Plan*, October 2022, https://shapessf.com/, accessed July 3, 2024.

Implementation Action CHEJ-3.2.1. Maintain an up-to-date truck routes map that minimizes exposures to sensitive land uses. Prohibit the designation of new truck routes on local neighborhood streets in South San Francisco.

Implementation Action CHEJ-3.2.2. Adopt an ordinance establishing vehicle idling restrictions. Establish a local ordinance that exceeds the state vehicle idling restrictions where appropriate, including restrictions for bus layovers, delivery vehicles, trucks at warehouses and distribution facilities and taxis, particularly when these activities take place near sensitive land uses (schools, healthcare facilities, affordable housing, and elder and childcare centers).

- **Policy CHEJ-3.3.** Support businesses in transitioning their operations to emit fewer air pollutants. Support local business owners in transitioning their operations to emit fewer air pollutants through incentives and development standards.

  Implementation Action CHEJ-3.3.2: Reduce indoor air pollution. Explore opportunities to work with property owners to rehabilitate existing buildings and require that new buildings adjacent to production, distribution, and warehousing uses; highways; or rail to implement appropriate mitigation measures to reduce indoor air pollution such as air filtration/ventilation systems, landscaping, and other physical improvements as recommended by the California Air Resources Board and/or the Bay Area Air Quality Management District.

- **Policy CHEJ-4.3.** Reduce exposure from hazardous materials. Reduce residents' risk of exposure to hazardous materials and toxic wastes.
- **Policy CHEJ-4.4.** Maintain map of hazardous materials transport route. Maintain an up-to-date truck routes map that minimizes exposures to sensitive land uses from vehicles carrying hazardous materials and toxic waste.
- **Policy SA-17.4.** Create standards for housing design that mitigate for air quality impacts. For housing within 500 feet of highways and stationary sources of pollution, require design mitigation actions including:
  - Locate air intake systems for heating, ventilation, and air conditioning (HVAC) systems as far away from existing air pollution sources as possible.
  - Use high-efficiency particulate air (HEPA) filters in the HVAC system and develop a maintenance plan to ensure the filtering system is properly maintained.
  - Use only fixed windows next to any existing sources of pollution.
  - Plant landscape barriers between highways and residential areas to reduce noise and air pollution for residents.
- **Policy CP-2.2.** Reduce emissions associated with natural gas infrastructure. Partner with the Pacific Gas and Electric Company to develop options for reducing greenhouse gas emissions associated with the existing natural gas grid.
- **Policy CP-1.3.** Utilize innovative technologies to reduce emissions. Utilize new technologies as they become available to reduce greenhouse gas (GHG) emissions by regularly evaluating new and emerging technology changes that can help to reduce GHG emissions, and by encouraging the use of such technology when it is demonstrated to be effective at reducing GHG emissions and a fiscally responsible investment.

San Francisco General Plan Air Quality Element

The Air Quality Element of the San Francisco General Plan (general plan) includes the following objectives:

- **Objective 1:** Adhere to state and federal air quality standards and regional programs.
- **Objective 2:** Reduce mobile sources of air pollution through implementation of the Transportation Element of the General Plan.
- **Objective 3:** Decrease the air quality impacts of development by coordination of land use and transportation decisions.
- **Objective 4:** Improve air quality by increasing public awareness regarding the negative health effects of pollutants generated by stationary and mobile sources.
- **Objective 5:** Minimize particulate matter emissions from road and construction sites.
- **Objective 6:** Link the positive effects of energy conservation and waste management to emission reductions.

San Francisco International Airport Standard Construction Measures

The San Francisco Airport Commission (airport commission) operates the Airport on behalf of the City and County of San Francisco (City). The airport commission requires that standard construction measures be included in construction contracts and through the Airport Rules and Regulations; these are referred to as Airport standard construction measures (ASCMs). Additionally, the Airport is obligated by federal, state, and local regulations, including existing resource agency permits, to implement construction measures specific to certain activities, areas, and natural resources.

The majority of projects on Airport property, ranging from routine maintenance to major capital construction projects, are approved by the airport commission or by SFO staff on behalf of the airport commission, and are constructed by contractors. SFO's contracts with contractors include certain Division Documents, which are articles that stipulate materials standards, project management requirements, and construction management practices by which contractors must abide during Airport construction activities. The Division Documents include the ACSMs, which are designed to reduce or eliminate the potential for environmental impacts associated with Airport construction projects.

With respect to air quality, dust control measures are specified for projects involving earthwork; excavation; demolition; or remediation and removal of contaminated soil, sludge, and water, and for activities that may result in the use or discovery of hazardous materials. Division Document 01 57 00 (Temporary Controls) specifies dust control measures. The Temporary Controls require contractors to implement an onsite maintenance program, avoid or minimize emissions from construction vehicles and equipment, and minimize direct and fugitive emissions from coating, blasting, and painting activities through equipment maintenance and BMPs. Activities that may result in discovery of contaminated soils, sludge, or water require compliance with the air district's Particulate Matter Rule (Regulation 6, Rule 1) and preparation of a materials management plan.

The following ASCMs in the Division Documents address air quality impacts:

- **Division 01 33 16: Hazard and Hazardous Material Investigation and Remediation** requires contractors to prepare a project-specific materials management plan, including but not limited to means, methods, and procedures for handling contaminated soil, sludge, and water; site security and fencing; excavation dewatering; dust control; stormwater and erosion control; material tracking, recordkeeping, and disposal; and site plans illustrating the management areas.

- **Division 01 35 13.43: Regulatory Requirements for Hazardous Waste** formalizes implementation of air district Rules and Regulations requirements with respect to fugitive dust control for asbestos demolition (air district Regulation 11, Rule 2-303) and required attainment of permits to treat contaminated soil and groundwater.
- **Division 01 35 43.01: Demolition** addresses dust control by requiring that the amount of dust resulting from demolition be controlled in accordance with Document 01 57 00 (Temporary Controls) to prevent the spread of dust to adjacent occupied areas and to avoid the creation of a nuisance in the surrounding area.
- **Division 01 35 43.06: Earthwork** requires that the contractor take proper and efficient steps to control dust.
- **Division 01 35 43.16 Excavation and Disposal of Contaminated Soil, Sludge, and Water** requires the contractor to suspend work if contractor encounters contaminated material during excavation and disposal.
- **Division 01 57 00: Temporary Controls** requires contractors performing work under Airport projects to assume responsibility for dust control and to furnish the labor, equipment, and means required to carry out proper and efficient measures wherever and whenever dust control is necessary, to prevent operations from producing dust damage, health impacts, and nuisance to persons and property.

3.C.4 Impacts and Mitigation Measures

Significance Criteria

This section provides the air quality impact analysis for implementation of the RADP. The following criteria were used to determine whether the RADP would result in a significant air quality impact. The RADP would have a significant air quality effect if it would do any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Result in a cumulatively considerable net increase of any criteria air pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.
- Expose sensitive receptors to substantial pollutant concentrations.
- Result in other emissions (such as those leading to odors adversely affecting a substantial number of people).

Approach to Analysis

The purpose of the air quality analysis is to assess potential criteria air pollutant emissions, health risks and hazards, and odors that would result from the construction and operation of subsequent RADP projects. The air quality analysis is consistent with the guidelines and methods from air quality agencies—specifically, the San Francisco Planning Department, the air district, the air board, OEHHA, and the U.S. EPA.

Construction-related air quality impacts associated with implementation of the RADP were analyzed using the 2019 existing conditions, while operational conditions are assumed to be the 2045 future baseline conditions, for both the RADP and cumulative analyses. The 2045 future baseline without RADP conditions includes the projected future regional land use, population, and employment growth, as well as the cumulative projects identified in Table 3-2, p. 3-8, and future passenger, cargo, and employment background growth at the Airport. The 2045 future baseline with RADP conditions includes the subsequent RADP projects. Therefore, the operational analysis is based on comparing the 2045 future baseline without RADP conditions to the 2045 future baseline with RADP conditions to present those impacts attributable only to subsequent RADP projects. The 2045 future baseline with RADP conditions also represents the cumulative condition.

Because the RADP is a plan, its approval would not result in direct physical changes in the environment; and because the RADP does not propose any project-level approvals, additional actions and environmental review would be required to implement each subsequent RADP project. As discussed in Chapter 2, Project Description, and in Appendix C, Airport Facilities to Accommodate Aviation Demand, implementation of the RADP would not induce passenger demand (i.e., induce the public to choose to fly if and/or where they otherwise would not), nor would the RADP increase the capacity of the airfield, change the configuration of the existing runways, change the number of aircraft operations or aircraft types operating at the Airport (including cargo, private jets, and helicopters), or change the volume of annual passengers that choose to fly into and out of SFO. Therefore, implementation of the RADP would not result in changes related to aircraft operations or the configuration of the existing runways. For this reason, aircraft-related sources of criteria air pollutant and TAC emissions have not been included or evaluated in this Draft EIR. This analysis focuses solely on construction-related and operational air quality impacts from the implementation of subsequent RADP projects. See Appendix G, Air Quality Technical Appendix, appended to this Draft EIR for a more detailed description of the assumptions and methods used to calculate air quality emissions related to implementation of the RADP.

Criteria Air Pollutants

The air basin experiences low concentrations of most pollutants when compared to federal or state standards; it is designated as either in attainment or unclassified for most criteria air pollutants with the exception of ozone, $PM_{2.5}$, and PM_{10}, for which the air basin is designated as non-attainment for either the federal or state standard. Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_X. For this reason, the air district has identified criteria air pollutant significance thresholds for ROG, NO_X, $PM_{2.5}$, and PM_{10}.

By definition, regional air pollution is largely a cumulative impact, in that no single project is sufficient in size by itself to result in nonattainment of air quality standards. Instead, a project's individual emissions are considered to contribute to existing cumulative air quality conditions. If a project's contribution to cumulative air quality conditions would be considerable, then the project's impact on air quality would be significant.[248]

[248] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, April 2022, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed July 22, 2024.

PLAN-LEVEL ANALYSIS

The significance thresholds for a plan-level analysis of implementation of the RADP include evaluation of whether:

- The RADP would be consistent with the control measures contained in the current regional air quality plan (the 2017 Clean Air Plan). (Impact AQ-1)
- The RADP would support the primary objectives of the 2017 Clean Air Plan and would not hinder implementation of that plan. (Impact AQ-1)
- The RADP's growth in vehicle miles traveled (VMT) or trips would not exceed the plan's population growth. (Impact AQ-2)
- The RADP would not cause localized CO impacts. (Impact AQ-2)

If the foregoing questions can be answered in the affirmative, the RADP would not do either of the following:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard.

Impact AQ-1 analyzes impacts related to implementation of the RADP with respect to a conflict with or obstruction of implementation of the 2017 Clean Air Plan. Impact AQ-2 analyzes the plan-level impact of implementation of the RADP related to criteria air pollutants.

VEHICLE MILES TRAVELED/VEHICLE TRIPS AND EMPLOYMENT GROWTH ANALYSIS

The threshold of significance for evaluation of a plan's emissions of criteria air pollutants is based on consistency with regional air quality planning, including an evaluation of population or employment growth and growth in VMT or vehicle trips. For a proposed plan to result in less-than-significant criteria air pollutant impacts, an analysis must demonstrate that the plan's growth in VMT or vehicle trips would not exceed the plan's population growth.

LOCAL CARBON MONOXIDE ANALYSIS

The air district has demonstrated, based on modeling, that to exceed the CAAQS of 9.0 ppm (eight-hour average) or 20.0 ppm (one-hour average) for CO, project traffic in addition to existing traffic would need to exceed 44,000 vehicles per hour at affected intersections (or 24,000 vehicles per hour where vertical and/or horizontal mixing is limited). Projects or plans that would not result in 44,000 vehicles per hour in combination with background traffic (or 24,000 vehicles per hour where applicable) would not have the potential to result in a significant CO impact. The plan-level analysis assesses the potential for implementation of the RADP to cause intersections to exceed these screening criteria.

PROGRAMMATIC ANALYSIS OF SUBSEQUENT PROJECTS

The RADP includes subsequent projects to accommodate SFO's long-term operations and passenger activity levels based on the estimated capacity of the existing runways regardless of whether the RADP is implemented.[249] Construction of subsequent RADP projects has the potential to create air quality impacts from the use of heavy-duty off-road construction equipment, construction workers' vehicle trips, and vendor truck trips. To address potential program-level impacts from criteria air pollutants generated by construction under the RADP, the analysis accounted for multiple construction scenarios based on anticipated construction schedules and relative project sizes.

Operation of subsequent RADP projects has the potential to create air quality impacts from employee vehicles, delivery trucks, TRUs, consumer products, architectural coatings, landscaping equipment, and emergency generators. To address potential program-level impacts from criteria air pollutants generated by operation of subsequent projects under the RADP, the analysis evaluated full-buildout operations of all of the subsequent RADP projects (see Chapter 2, Project Description).

To disclose the criteria air pollutant impacts of subsequent projects that may be constructed pursuant to the RADP, the analysis contains a programmatic assessment of the potential for such projects to exceed the air district's criteria air pollutant significance thresholds, shown in **Table 3.C-5**. Impact AQ-3 analyzes the criteria air pollutant impacts from construction of subsequent RADP projects. Impact AQ-4 analyzes the criteria air pollutant impacts from operation of full buildout of all subsequent projects under the RADP.

Table 3.C-5 identifies criteria air pollutant significance thresholds adopted by the air district. The table is followed by a discussion of the sources of criteria air pollutants from representative subsequent projects and the methods of analysis. Projects that would result in criteria air pollutant emissions falling below these significance thresholds would not violate an air quality standard, contribute substantially to an air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants within the air basin.

Table 3.C-5 Criteria Air Pollutant Significance Thresholds

	Construction Thresholds	Operational Thresholds	
Pollutant	Average Daily Emissions (lb/day)	Average Daily Emissions (lb/day)	Maximum Annual Emissions (tons per year)
ROG	54	54	10
NO_X	54	54	10
PM_{10}	82 (exhaust)	82	15
$PM_{2.5}$	54 (exhaust)	54	10
$PM_{10}/PM_{2.5}$ (fugitive dust)	Best Management Practices	Not Applicable	

SOURCE: Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, April 2022, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed July 22, 2024.

ABBREVIATIONS: lb/day = pounds per day; NO_X = oxides of nitrogen; PM = particulate matter; $PM_{2.5}$ = PM less than 2.5 microns in diameter; PM_{10} = PM less than 10 microns in diameter; ROG = reactive organic gases

[249] Fernando Yanez, Airport Planner, Federal Aviation Administration, "Federal Aviation Administration Approval of San Francisco International Airport's Aviation Activity Forecasts," letter to John Bergener, Airport Planning Director, San Francisco International Airport, June 9, 2014.

The thresholds of significance for criteria air pollutants are based on substantial evidence presented in the 2025 San Francisco Planning Department Air Quality and Greenhouse Gas Analysis Guidelines[250] and Appendix A of the air district's 2022 CEQA Air Quality Guidelines.[251]

Fugitive dust emissions from land use development projects are associated primarily with construction activities. Studies have shown that the application of BMPs at construction sites can significantly control fugitive dust,[252] and individual measures have been shown to reduce fugitive dust by anywhere from 30 to 90 percent.[253] The air district has identified several BMPs to control fugitive dust emissions from construction activities.[254] SFO's ASCMs require the implementation of fugitive dust control measures to ensure that construction projects do not result in visible dust, and these include the measures in the air district's BMPs. Subsequent projects under the RADP would be subject to the ASCMs, which is the basis for determining the significance of air quality impacts from fugitive dust emissions. The following ASCMs would reduce dust emissions during construction:

- **Division 01 33 16:** Contractor shall prepare a project-specific Materials Management Plan, including but not limited to, means, methods and procedures for handling contaminated soil, sludge, and water; site security and fencing; excavation dewatering; dust control; stormwater and erosion control; material tracking, record keeping, and disposal; and site plans illustrating the management areas, etc. The Plan shall be prepared by competent individuals knowledgeable about handling and disposal of contaminated and hazardous materials. Details for excavation five (5) feet or more in depth are stipulated in Division 01 33 16, Part 1.02(B)(6)(a).
- **Division 01 35 13.43:** Local Agency Requirements include Bay Area Air Quality Management District (BAAQMD), Fugitive Dust Rules; BAAQMD Regulation 11-2-303; and, State Water Resource Control Board, General Construction Activity Storm Water Permit Requirements.
- **Division 01 35 43.01:** Dust Control: The amount of dust resulting from demolition shall be controlled in accordance with Document 01 57 00 (Temporary Controls) to prevent the spread of dust to adjacent occupied areas and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in or create hazardous or objectionable conditions such as ice, flooding, and pollution.
- **Division 01 35 43.06:** Dust Control: Contractor shall take proper and efficient steps to control dust.
- **Division 01 35 43.13:** Fixed objects within the Work Area (e.g., perimeter radiators) shall be precleaned using HEPA vacuum equipment and/or wet cleaning methods as appropriate. Except when otherwise specified, joints of covers or casings shall be sealed with tape, and fixed objects shall be enclosed with a minimum double layer of 6 mil plastic sheeting sealed airtight with duct tape. The Work Area shall be cleaned using HEPA vacuum equipment or wet cleaning methods as appropriate. Contractor shall not

[250] San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, February 2025, https://sfplanning.org/air-quality, accessed February 10, 2025.
[251] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, Appendix A, April 2022, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed July 22, 2024.
[252] Western Governors' Association, *WRAP Fugitive Dust Handbook*, September 7, 2006, https://www.scribd.com/document/107406849/WRAP-Fugutive-Dust-Handbook, accessed July 22, 2024.
[253] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, Appendix A, April 2022, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, page A-45, accessed July 22, 2024.
[254] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, April 2022, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed July 22, 2024.

use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.

- **Division 01 35 43.14:** During demolition, building components shall be wet down and localized dust controls shall be applied. Debris and surfaces shall be cleaned with HEPA-filtered vacuums or wet methods. Dry sweeping shall not be permitted.
- **Division 01 57 00:** During performance of the Work under the Project, assume responsibility for dust control and furnish labor, equipment, and means required to carry out proper and efficient measures wherever and whenever dust control is necessary to prevent operations from producing dust damage, health impacts and nuisance to persons and property. Claims resulting from dust damage or nuisance shall be borne solely by the Contractor.

  Control of dust and other air pollutants caused by, but not limited to, clearing, grubbing, stripping, excavating, compacting, cement and aggregate handling, cement or lime stabilization, hauling, grading or sandblasting, use of herbicides or fertilizers shall be the Contractor's responsibility.

  Sprinkle demolition sites where dust is created with water continuously during demolition activities; sprinkle unpaved construction areas at least twice per day; cover stockpiles of soil, sand, and other fine materials; cover trucks hauling debris, soil, sand, and other fine materials; sweep all roadways surrounding demolition and construction areas, and along haul routes, at least once per day.

CONSTRUCTION ACTIVITIES AND EMISSIONS

Construction activities associated with subsequent projects under the RADP would generate emissions of criteria air pollutants, including ozone precursors and PM, from heavy-duty off-road construction equipment, construction workers' vehicle trips, heavy-duty haul truck trips, and vendor truck trips. These sources emit pollutants from the combustion of fuel in their engines, as well as fugitive PM from brake and tire wear along with entrained dust from movement on ground and road surfaces. In addition, fugitive dust emissions would result from ground-disturbing site preparation, grading, and demolition. Asphalt paving and the use of architectural coatings would be sources of fugitive ROG emissions.

To address potential program-level impacts from criteria air pollutant and TAC emissions generated by construction of subsequent RADP projects, the analysis accounted for multiple construction scenarios considering concurrent construction schedules and relative project sizes.

Representative Subsequent Project Types

Each subsequent RADP project was categorized as small, medium, or large based on the amount of demolition, the project type, and the quantity of net new construction (including new paved areas). This classification provides a rough order of magnitude for potential construction activities and criteria air pollutant emissions for each subsequent RADP project. **Table 3.C-6** is a screening table that identifies each RADP project as small, medium, or large. This table can be used for later screening and streamlining of the construction criteria air pollutant impacts of subsequent projects, as discussed under Impact AQ-3.

Table 3.C-6 Screening Table for Projects under the Recommended Airport Development Plan: Small, Medium, Large

Project Number	Project Size and Project Name	Description	Building Type(s)	Net New Square Feet
	Small Projects			
#8	**International Terminal Building Curbside Expansion**	Addition of one island curbside and six lanes for international terminal modes	Roadway for passenger curbside	52,000
#13	**Rental Car Center Short-Term Storage Lot**	Demolition of portions of the existing Quick Turn-Around Facility and conversion to rental car center short-term storage lot	Parking garage	-130,000
#14	**Terminal 2 AirTrain Station Platform Expansion**	Expansion of station platform	Train platform	6,900
#15	**Rental Car Center AirTrain Station Platform Expansion**	Expansion of station platform	Train platform	2,900
#19	**East Field Ground Support Equipment Facility #2**	Demolition and reconstruction of a new ground support equipment facility in the East Field	Ground support equipment facility	23,000
#20	**Sanitary Sewer Force Main Line Realignment**	Relocation of sanitary sewer force main line	N/A	0
	Medium Projects			
#3	**International Terminal Building Main Hall Expansion**	Partial demolition and expansion of the ITB	Terminal building	276,600
#4	**International Terminal Building Boarding Areas A and G Improvements**	Expansion of ITB boarding areas A and G	Terminal building	23,200
#5	**Terminal 3 Façade Expansion**	Expansion of the terminal departures lobby	Terminal building	25,000
#7	**Domestic Terminal Roadways Reconstruction**	Demolition and reconstruction of the existing upper departures roadway	Roadway	80,000
#11	**Long-Term Parking Garage #3**	Construction of a new parking garage	Parking garage	348,000
#12	**Long-Term Parking Garage #4**	Conversion of existing rental car center into a parking garage	Parking garage	0
#17	**North Field Ground Support Equipment Facility #1**	Construction of a new ground support equipment facility in the North Field	Ground support equipment facility	48,000
#18	**Aircraft Maintenance Hangar**	Construction of a new aircraft maintenance hangar in the East Field	Hangar	181,000

Project Number	Project Size and Project Name	Description	Building Type(s)	Net New Square Feet
Large Projects				
#1	**Boarding Area H (RADP Project #1)**	Construction of a new Boarding Area H	Terminal building	1,413,300
#2	**Boarding Area F Modernization**	Demolition and reconstruction of Boarding Area F	Terminal building	21,900
#6	**Central Hub**	Demolition and reconstruction of parking garage	Parking garage	2,650,000
#9	**Consolidated Rental Car Center Facility**	Construction of a new Consolidated Rental Car Center (CONRAC)	Parking garage, lobby, admin building	1,940,000
#10)	**Consolidated Rental Car Center Quick Turn-Around Facility**	Construction of a new CONRAC Quick Turn-Around Facility	Parking garage, lobby, admin building	1,031,000
#16	**AirTrain Maintenance Yard**	Demolition and reconstruction of a new maintenance building	Parking garage, admin building	151,700

SOURCE: Data provided by SFO Bureau of Planning and Environmental Affairs in 2023

NOTE: See Chapter 2, Project Description, for more detailed descriptions of subsequent RADP projects.

ABBREVIATIONS:

admin = administration; CONRAC = Consolidated Rental Car Center; ITB = International Terminal Building; N/A = not applicable; RADP = Recommended Airport Development Plan

To estimate the anticipated construction impacts associated with subsequent RADP projects, four representative subsequent projects were selected to characterize the range of projects that could occur under the RADP. Two large projects were selected to provide a range for large projects as well as potential maximum impacts since the Central Hub (RADP Project #6) is the largest RADP project with regard to demolition and new construction. These projects are classified as small, medium, and large project types.

- *Large project:* Central Hub (RADP Project #6)
- *Large project:* Consolidated Rental Car Center Facility (RADP Project #9)
- *Medium project:* International Terminal Building Main Hall Expansion (RADP Project #3)
- *Small project:* East Field Ground Support Equipment Facility #2 (RADP Project #19)

These projects were selected to represent the range of project types that could occur under the RADP based on the amount of demolition and net-new construction they would require. Analyzing these four representative projects generally captures the full range of criteria air pollutant construction impacts that could occur with these or any other subsequent RADP projects. Construction criteria air pollutant emissions from these representative projects were quantified to inform the types of construction impacts that could result from the other subsequent RADP projects that were not quantified.

The Airport Construction Emissions Inventory Tool (ACEIT)[255] was used to develop portions of the construction information for the representative project types, which are unique land uses not well represented in the California Emissions Estimator Model (CalEEMod). ACEIT was used to generate vendor trip counts for the large projects and data on off-road equipment activity for each of the project types. CalEEMod was used to generate the remainder of the construction input data. When available, project-specific information related to the square footage of areas to be demolished or built was used in these tools to develop construction activity emissions. Appendix G, Air Quality Technical Appendix, provides specific information about the sources of construction information.

Overlap Scenarios

To account for impacts that could occur with overlapping construction activities for multiple representative projects, three "overlap scenarios" were analyzed. The overlap scenarios account for the combined annual construction-related criteria air pollutant emissions that could occur. The overlap scenarios for the representative projects are:

- *Low Overlap:* Two small projects
- *Medium Overlap:* One medium project and one small project
- *High Overlap:* Two large projects and one medium project

The construction overlap scenario approach for the representative projects accounts for the range of concurrent construction activities that could occur during any given calendar year of RADP buildout. The "high overlap" scenario represents the greatest level of overlapping construction activity that could potentially occur based on logistical limitations at the airport; the amount of construction activity, equipment, and staff available at any given time; market and financial conditions; airport safety concerns; and overall airport operations. This scenario represents a conservative analysis without substantially impacting airport operations. The large representative projects would have the most demolition activity and net-new construction, which would result in the highest levels of construction criteria air pollutant emissions. The high overlap scenario therefore captures the worst-case construction air quality impacts anticipated with buildout of the RADP.

Off-Road Equipment

Various types of off-road construction equipment would be required for construction under the RADP, such as forklifts, cranes, excavators, aerial lifts, bull dozers, and generators. The types of off-road equipment identified were based on the ACEIT and CalEEMod models. Hours of equipment use were acquired from both the ACEIT outputs and CalEEMod defaults. Specific details on how ACEIT outputs and CalEEMod defaults were used in the analysis can be found in Appendix G, Air Quality Technical Appendix. Factors used to calculate emissions from off-road equipment were obtained from the air board's 2017 Off-Road Equipment Model (OFFROAD2017-ORION).[256] The air board has an updated version of the model, OFFROAD2021-ORION, but CalEEMod still uses OFFROAD2017-ORION; therefore, for consistency, the analysis used OFFROAD2017-

[255] Transportation Research Board Airport Cooperative Research Program, *Guidance for Estimating Airport Construction Emissions*, 2014, https://www.trb.org/Publications/Blurbs/170234.aspx, accessed July 23, 2024.
[256] California Air Resources Board, "Off-Road Diesel Models and Documentation," n.d., https://ww2.arb.ca.gov/our-work/programs/msei/road-categories/road-diesel-models-and-documentation, accessed July 22, 2024.

ORION.[257] All off-road equipment was assumed to be diesel-powered. CalEEMod default values were used for each equipment type, including horsepower, load factors, and emission factors (which include engine tier levels). Emission factors were based on the construction years for each representative project's construction schedule.

On-Road Mobile Sources

Construction under the RADP would require on-road vehicles for materials import and export (haul trucks), construction worker commute trips, and vendor trips. These sources emit NO_X, ROG, PM_{10}, and $PM_{2.5}$. Haul trucks and vendor trucks were modeled with emissions for bay area fleet-average fuel types. Construction employee trips were based on CalEEMod default vehicle class and fuel type (gasoline, diesel, and electric). Estimates of haul truck trips were based on demolition quantities and import/export material amounts and the CalEEMod default haul truck capacity of 16 cubic yards per haul truck. Vendor trips were calculated using the ACEIT model and CalEEMod defaults; construction worker trips were obtained from CalEEMod defaults. All trip lengths were based on CalEEMod defaults.

On-road emissions were calculated using the air board's EMission FACtor (EMFAC2021) emission rate program.[258] Additionally, scaling factors provided by the air board that incorporate the Clean Mile Standard, Advanced Clean Cars II, Clean Truck Check (Heavy-Duty Inspection and Maintenance), and Federal Clean Trucks Plan were applied to the EMFAC2021 emission rates because the model does not yet include these regulations. The on-road criteria air pollutant emissions for each construction phase were totaled for each year of construction and, consistent with the air district's guidance, were averaged over the number of workdays in the construction phase for each construction year to determine average daily emissions on an annual basis.

Haul Truck Idling

Idling emissions associated with heavy-duty trucks (e.g., haul trucks, concrete trucks, material delivery trucks, water trucks) were estimated based on the anticipated number of truck trips and idling emission factors for heavy-duty vehicles from EMFAC2021. It was assumed that idling activities would total 15 minutes per trip, representing three separate five-minute idling occurrences: check-in to the site or queuing at the site boundary upon arrival, onsite idling during loading/unloading, and check-out of the site or queuing at the site boundary upon departure. The five-minute limit per idling occurrence is consistent with the air board's Air Toxics Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.[259]

Asphalt Paving

ROG emissions from asphalt paving were estimated with CalEEMod based on the acreage of paving for each representative RADP project involving paving. CalEEMod estimates off-gassing emissions of volatile organic compounds, or VOCs, associated with the paving of asphalt surfaces by using the surface area and an emission factor of 2.62 pounds of VOC per acre paved. VOC is represented as ROG emissions in CalEEMod outputs.

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[257] Environmental Science Associates completed a preliminary assessment comparing model runs from both OFFROAD2017-ORION and OFFROAD2021-ORION and determined it to be neither conservative nor an underestimate. The updated model includes revised inventories where some emission factors are slightly higher and others are slightly lower than the previous version.
[258] California Air Resources Board, "Welcome to EMFAC," n.d., https://arb.ca.gov/emfac/, accessed July 22, 2024.
[259] California Air Resources Board, "Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling," n.d., https://ww2.arb.ca.gov/our-work/programs/atcm-to-limit-vehicle-idling, accessed July 22, 2024.

Architectural Coatings

ROG emissions from architectural coatings were estimated with CalEEMod based on the net-new square footage of RADP facilities. The VOC content of the architectural coatings was based on the air district's Rule 8.3 (Architectural Coatings): 150 grams VOC per liter for nonresidential exterior coatings and 100 grams VOC per liter for nonresidential interior coatings.[260]

OPERATIONAL ACTIVITIES AND EMISSIONS

The operational emissions analysis accounts for full buildout of all of the subsequent projects under the RADP by 2045. Operational emission sources include employee vehicle trips, delivery trucks (vendor trips), TRUs, consumer product use, architectural coatings, landscaping activities, and emergency backup diesel generators. All new buildings would be all-electric, consistent with SFO and City policy, so the analysis does not include emissions from natural gas combustion.

Employee Vehicle Trips

On-road vehicle emissions from employee commutes were estimated using traffic data from the Travel Demand Methodology and Assumptions[261] and emission factors from EMFAC2021. Additionally, scaling factors provided by the air board that incorporate the Clean Mile Standard, Advanced Clean Cars II, Clean Truck Check (Heavy-Duty Inspection and Maintenance), and Federal Clean Trucks Plan were applied to the EMFAC2021 emission rates because the model does not yet include these regulations. Although RADP buildout is expected to occur by 2045, emissions factors for year 2035 were used to capture the maximum annual worst-case emissions of criteria air pollutant from operation of subsequent RADP projects that may occur during a year before full buildout when operational activities are lower than full-buildout operations, but emission factors are higher.[262] Fugitive $PM_{2.5}$ emissions from entrained road dust were calculated using the air board and U.S. EPA AP-42 emissions factors, as stated in the air district's 2022 CEQA Guidelines.[263]

In addition, gasoline on-road vehicles also emit total organic gases (TOG) in their exhaust and through evaporation. Many constituents of TOGs are TACs and were therefore evaluated in the HRA. Estimates of TOG emissions were based on the number of daily and annual vehicles estimated in the Travel Demand Methodology and Assumptions and emissions factors from EMFAC2021.

Delivery Trucks

Operation of projects under the RADP would involve the use of medium- and heavy-duty trucks to deliver materials and goods to the Airport (such as food and vendor trucks). These vehicles were modeled with bay area fleet-average fuel types but were assumed to be diesel-powered for purposes of the HRA. Their emissions were based on EMFAC2021 emissions factors. Additionally, scaling factors provided by the air board that incorporate the Clean Mile Standard, Advanced Clean Cars II, Clean Truck Check (Heavy-Duty Inspection and Maintenance), and Federal Clean Trucks Plan were applied to the EMFAC2021 emission rates because the model does not yet include these regulations. The number of delivery trucks was estimated

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[260] Bay Area Air Quality Management District, Regulation 8 Rule 3: Architectural Coatings, https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-8-rule-3-architectural-coatings/documents/rg0803_0709.pdf?rev=f865de8d8a194eaf96970b766689468a&sc_lang=en, accessed February 2, 2024.
[261] Fehr & Peers & LCW Consulting, *SFO Recommended Airport Development Plan CEQA Analysis – Travel Demand Memorandum*, March 2025.
[262] The year 2035 is the midpoint year of construction and applying 2035 emissions factors to 2045 full-buildout operational traffic provides a conservative estimate of traffic emissions.
[263] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, 2022, Appendix E, Section 9.2, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed February 9, 2024.

based on the Transportation Impact Analysis Guidelines for Environmental Review and the square footage of land uses for each subsequent RADP project.[264]

Transport Refrigeration Units

Some delivery trucks, such as those delivering food and drinks, would have TRUs. TRUs are refrigeration systems that are mounted to container vehicles like delivery trucks and powered by diesel combustion engines. It was conservatively assumed that 50 percent of large semi-truck deliveries and 20 percent of small box truck deliveries to RADP terminal projects would have TRUs.[265] No TRUs were associated with deliveries to the ground access and parking projects or the support facilities projects.

Consumer Products

Consumer products such as solvents, cleaning aerosols, and kitchen supplies would be sources of ROG emissions. ROG emissions from consumer products are based on the square footage of new and modified buildings. An emission factor specific to San Francisco was used to calculate the increase in emissions caused by the increase in building area for non-parking land uses.[266] CalEEMod defaults were used to calculate the increase in emissions caused by the increased square footage for parking land uses.

Architectural Coatings

Operational ROG emissions associated with architectural coatings account for the reapplication of paint and coatings on interior and exterior surfaces, which produces fugitive ROG emissions. Architectural coating ROG emissions were estimated using CalEEMod methods and were based on the total increase in building square footage of all subsequent RADP projects.

Landscaping

Landscaping activities would occur only for the Ground Access and Parking projects and the Support Facilities and Utilities projects. The Terminal projects (Boarding Area H, Boarding Area F Modernization, International Terminal Building Main Hall Expansion, International Terminal Building Boarding Areas A and G Improvements, and Terminal 3 Façade Expansion) would not involve the construction of any new landscaped area; therefore, no emissions associated with landscaping equipment would occur. Landscaping emissions associated with the Ground Access and Parking projects and the Support Facilities and Utilities projects were modeled in CalEEMod using default settings.

Generators

All new buildings were conservatively assumed to require backup emergency generators for supplying electricity when the normal sources of electricity are interrupted. All emergency generators were assumed to be diesel and to meet the air board/U.S. EPA Tier 4 Final standards for generators equal to or greater than 50 hp and the air board/U.S. EPA Tier 2 standards for generators less than 50 hp, consistent with the air district's Best

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[264] San Francisco Planning Department, *Transportation Impact Analysis Guidelines for Environmental Review*, February 2019 (updated October 2019), https://sfplanning.org/project/transportation-impact-analysis-guidelines-environmental-review-update, accessed March 22, 2024.
[265] Environmental Science Associates, *New Flower Market Project Air Quality Technical Report—Final Draft*, January 2018.
[266] San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, February 2025, https://sfplanning.org/air-quality, accessed February 10, 2025.

Available Control Technology workbook.[267] The horsepower was assumed to be the same as for similar existing buildings. Emissions were based on 50 hours of operation per year for testing and emergency use.[268]

Local Health Risks and Hazards

Implementation of the RADP would produce TAC emissions during construction and operation. An HRA was conducted to estimate health risks from exposure to TACs (see Appendix G, Air Quality Technical Appendix).

PLAN-LEVEL ANALYSIS

This analysis responds to the criterion that asks whether subsequent projects under the RADP would:

- Expose sensitive receptors to substantial pollutant concentrations.

The air district does not have specific plan-level significance thresholds. Therefore, the analysis is based solely on project-level thresholds as discussed below.

PROGRAMMATIC ANALYSIS OF SUBSEQUENT PROJECTS

THRESHOLDS OF SIGNIFICANCE

The threshold of significance used to evaluate community health risks and hazards from new sources of TACs is based on the potential for the RADP to contribute cumulatively considerable incremental health risks at sensitive receptor locations. **Table 3.C-7** identifies project-level health risk significance thresholds. Subsequent projects that would result in health risks below these significance thresholds would not expose sensitive receptors to substantial pollutant concentrations. Construction of subsequent projects under the RADP has the potential to create health risk impacts from the use of heavy-duty off-road construction equipment, construction workers' vehicle trips, and vendor truck trips. To address potential program-level impacts from TAC emissions generated by construction under the RADP, the analysis accounted for multiple construction scenarios, considering concurrent construction schedules and relative project sizes.

Table 3.C-7 Excess Cancer Risk and Annual-Average $PM_{2.5}$ Concentration Thresholds

Affected Sensitive Receptors	$PM_{2.5}$ ($\mu g/m^3$)	Excess Cancer Risk (cases per 1 million population)
Threshold for Construction and Operation		
Significance threshold for project contributions to sensitive receptors within high background risk levels [a,b]	0.2	7.0

SOURCE: San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, February 2025, Table 1, https://sfplanning.org/air-quality, accessed February 10, 2025.

ABBREVIATIONS: $\mu g/m^3$ = micrograms per cubic meter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter

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[267] Bay Area Air Quality Management District, *BACT/TBACT Workbook*, 2024, Internal Combustion Engines—Compression Ignition, https://www.baaqmd.gov/permits/permitting-manuals/bact-tbact-workbook, accessed January 17, 2025.

[268] San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, February 2025, https://sfplanning.org/air-quality, accessed February 10, 2025.

Operation of subsequent projects under the RADP also has the potential to create health risk impacts from employee vehicles, delivery trucks, TRUs, and emergency generators. To address potential program-level impacts from TAC emissions generated by RADP operations, the analysis evaluated full-buildout operations of all of the subsequent RADP projects.

To disclose the health risk impacts associated with subsequent RADP projects, the analysis contains a programmatic assessment of the potential for such development to exceed the health risk significance thresholds, shown in Table 3.C-7. Impact AQ-2 analyzes the health risk impacts from construction of subsequent projects and full-buildout RADP operations.

The impact of toxic substances in soil that may become airborne with implementation of the RADP, such as naturally occurring asbestos, is discussed under Section E.17, Hazards and Hazardous Materials, of the initial study (see Appendix B included as an appendix to this Draft EIR).

The HRA was prepared using technical information and HRA guidance and protocol from the air district,[269] OEHHA,[270] and the 2025 San Francisco Planning Department Air Quality and Greenhouse Gas Analysis Guidelines.[271] The HRA evaluates the estimated incremental increase in lifetime cancer risk caused by exposure to emissions of DPM and gasoline TOG emissions associated with combustion (exhaust) and evaporative sources from off-road and on-road equipment for both construction and operational sources. The annual-average $PM_{2.5}$ concentrations are associated with combustion from off-road and on-road equipment and fugitive sources (tire wear, brake wear, and road dust) from on-road equipment for both construction and operational sources. The HRA focuses on the pollutants of concern ($PM_{2.5}$ and DPM/TOG) because these pollutants pose more significant health impacts locally than other types of air pollutants. The emission rates from the criteria pollutant analysis for off-road and on-road equipment for both construction and operational sources are used to determine the pollutant concentrations.

Although DPM is a complex mixture of gases and fine particles that includes more than 40 substances that are listed by the U.S. EPA as hazardous air pollutants and by the air board as toxic air contaminants, the HRA used PM_{10} emissions as a surrogate for DPM emissions.[272] This is a conservative approach; because DPM is a subset of PM_{10}, DPM emissions are expected to be lower. Haul trucks and vendor trucks were conservatively assumed to be diesel-powered for purposes of the HRA. Pollutant concentrations were estimated using the American Meteorological Society/U.S. EPA Regulatory Model Improvement Committee's regulatory air dispersion model (AERMOD version 23132).[273]

Consistent with the 2024 San Francisco Planning Department's *Air Quality and Greenhouse Gas Analysis Guidelines*, health risks from DPM, gasoline TOG, and annual-average $PM_{2.5}$ concentrations were estimated at all

[269] Bay Area Air Quality Management District, *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*, January 2016, http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/workshops/2016/reg-2-5/hra-guidelines_clean_jan_2016-pdf.pdf?la=en, accessed July 25, 2024.
[270] California Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments*, Air, Community, and Environmental Research Branch, February 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html, accessed July 25, 2024.
[271] San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, February 2025, https://sfplanning.org/air-quality, accessed February 10, 2025.
[272] California Office of Environmental Health Hazard Assessment, *For the "Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant," Part B: Health Risk Assessment for Diesel Exhaust*, May 1998, https://www.arb.ca.gov/toxics/dieseltac/part_b.pdf, accessed July 25, 2024.
[273] U.S. Environmental Protection Agency, *AERMOD Implementation Guide*, Office of Air Quality Planning and Standards Air Quality Assessment Division, November 2024, https://gaftp.epa.gov/Air/aqmg/SCRAM/models/preferred/aermod/aermod_implementation_guide.pdf, accessed January 28, 2025.

sensitive receptors located within 3,280 feet (1,000 meters) of the Airport boundary to identify the maximum exposed individual sensitive receptor (MEISR) and the maximum exposed individual worker (MEIW). In addition, health risks at the MEISR and MEIW from existing sources are provided in this analysis for informational purposes, because the health risk thresholds presented below only apply to the RADP's incremental contribution to health risks and do not address existing health risks. The MEISR is the sensitive receptor with the highest modeled health risk. See Appendix G, Air Quality Technical Appendix, for a detailed description of all assumptions and methods used for the HRA.

EXISTING SOURCES OF HEALTH RISK

Existing sources of health risk are those TAC emissions that are located within 1,000 feet of the MEISRs and MEIWs. Therefore, this analysis evaluates community risk impacts from other existing sources near the MEISRs and MEIWs in addition to risk impacts from implementation of the RADP. As discussed below, the MEISRs are in various locations under the different scenarios, all of which are residences located directly west of U.S. 101.

For on-road existing mobile sources, the HRA modeled lifetime excess cancer risk and annual-average $PM_{2.5}$ concentrations from roadway sources of TACs within 1,000 feet of the MEISR. Roadways with average daily traffic volumes exceeding 10,000 were modeled with source parameters consistent with the 2020 Citywide HRA.[274] Stationary sources within 1,000 feet of the MEISR and their associated risk values were acquired through the air district's Permitted Sources Risk and closest sensitive receptor to any subsequent RADP project Hazards Map.[275] Permitted stationary sources include a backup generator and a gasoline dispensing facility. The stationary sources are current as of 2020. The cancer risk and $PM_{2.5}$ values provided represent the risk at each stationary source (i.e., localized). To determine the health risk impact of these sources at the MEISR, an equation based on distance that was acquired from the air district, was used to extrapolate the risk.[276] See Appendix G, Air Quality Technical Appendix, for a detailed description of the modeling methods for existing sources of TAC emissions and associated health risks.

RECEPTOR EXPOSURE ASSESSMENT

For assessing impacts on existing offsite residential receptors from construction-related and operational TAC emissions, human exposure is assumed to begin with exposure by a fetus at the beginning of the third trimester at the start of construction and to continue until age 30. Exposure by both offsite and onsite worker receptors assumes exposure for the age group of 16 years and older to construction-related and operational TAC emissions for 25 years. The EIR evaluates the following receptor populations:

- Offsite residential receptors
- Offsite childcare receptors
- Offsite school receptors
- Onsite worker receptors

[274] San Francisco Department of Public Health and San Francisco Planning Department, *The San Francisco Citywide Health Risk Assessment: Technical Support Documentation*, September 2020.
[275] Bay Area Air Quality Management District, Stationary Source Screening Map, August 2024, https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=845658c19eae4594b9f4b805fb9d89a3, accessed January 28, 2025.
[276] Bay Area Air Quality Management District, Health Risk Calculator (Beta 4.0), 2020, https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/tools/baaqmd-health-risk-calculator-beta-4-0-xlsx.xlsx?la=en.

Because exposure assumptions are more conservative for child residents than for adult residents, the HRA considered all offsite receptors as child residents. Adult exposure parameters were used once child receptors had been exposed for 16 years.

Offsite sensitive receptors are predominantly residential land uses. As noted above, onsite worker receptors were included in the analysis because of their proximity to the TAC and $PM_{2.5}$ emissions that could occur with implementation of the RADP.

Consistency with the Clean Air Plan

The most recently adopted air quality plan for the air basin is the *2017 Clean Air Plan: Spare the Air, Cool the Climate*.[277] The 2017 Clean Air Plan is a road map that demonstrates how the bay area will achieve compliance with the state ozone standards as expeditiously as practicable and how the region will reduce the transport of ozone and ozone precursors to neighboring air basins. Consistency with the 2017 Clean Air Plan is the basis for determining whether implementation of the RADP would conflict with or obstruct implementation of an applicable air quality plan. This analysis is presented under Impact AQ-4.

In determining consistency with the 2017 Clean Air Plan, this analysis considers whether implementation of the RADP would (1) support the primary goals of the 2017 Clean Air Plan, (2) include applicable control measures from the 2017 Clean Air Plan, and (3) avoid disrupting or hindering implementation of the control measures identified in the 2017 Clean Air Plan.

Odors

The RADP would result in a significant impact with respect to odors if it would:

- Create objectionable odors affecting a substantial number of people.

For odors, a proposed land use plan must identify the locations of existing and planned odor sources. The proposed land use plan must also include policies to reduce potential odor impacts if such sources are anticipated from the plan. Typical odor sources of concern include wastewater treatment plants, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing facilities, fiberglass manufacturing facilities, autobody shops, rendering plants, and coffee roasting facilities. The air district identifies a screening distance of 1 or 2 miles, depending on the land use, for new sources of potential odors such as wastewater treatment plants, landfills and transfer stations, refineries, asphalt and chemical plants, and food processing facilities. In general, such setback distances would avoid the potential for significant odor impacts.

Methods for Analysis of Cumulative Impacts

CRITERIA AIR POLLUTANTS

By definition, regional air pollution is largely a cumulative impact in that no single project is sufficient in size, by itself, to cause nonattainment of air quality standards. The contribution of a project's air emissions to regional air quality impacts is, by its nature, a cumulative effect. Emissions from cumulative projects in the vicinity could also contribute to cumulative air quality conditions and potentially adverse regional air quality

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[277] Bay Area Air Quality Management District, *2017 Clean Air Plan: Spare the Air, Cool the Climate*, April 19, 2017, http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en, accessed July 23, 2024.

impacts.[278] Both the plan-level and project-level thresholds for criteria air pollutants identify levels of emissions for new sources that are not anticipated to result in a considerable net increase in nonattainment criteria air pollutants. Therefore, if a project's emissions are below the plan-level and project-level thresholds, the project would not result in a considerable contribution to cumulative regional air quality impacts. For this reason, no separate cumulative criteria air pollutant analysis is warranted, and none is provided below. See Impacts AQ-1 through AQ-4 for analysis of implementation of the RADP's contribution to regional criteria air pollutant impacts.

TOXIC AIR CONTAMINANTS

Cumulative sources of TAC emissions include all reasonably foreseeable Airport projects and other nearby planned or reasonably foreseeable projects off-Airport within 1,000 feet of the MEIW(s) and MEISR(s) identified for the health risk contribution from implementation of the RADP (construction and operation). Quantitative construction-related and/or operational associated health risks from nearby occurring or reasonably foreseeable projects were not included in the cumulative analysis. This analysis was limited by the availability of data for all reasonably foreseeable cumulative projects. For reasonably foreseeable projects that do not have quantitative HRAs, Impact C-AQ-1 qualitatively evaluates their cumulative health risk contribution.

Impact Evaluation

Impact AQ-1 (Plan-Level Analysis): The RADP would not conflict with or obstruct implementation of the Clean Air Plan. *(Less than Significant)*

As discussed previously, the most recently adopted air quality plan for the air basin is the *2017 Clean Air Plan: Spare the Air, Cool the Climate*.[279] The 2017 Clean Air Plan is a road map that demonstrates how the bay area will, in accordance with the requirements of the California Clean Air Act, implement all feasible measures to reduce emissions of ozone precursors (ROG and NO_X) and reduce the transport of ozone and its precursors to neighboring air basins. It also provides a climate and air pollution control strategy to reduce emissions of ozone, PM, TACs, and GHGs that builds upon existing national, state, and regional programs. In determining consistency with the 2017 Clean Air Plan, this analysis considers whether the RADP would (1) support the primary goals of the 2017 Clean Air Plan, (2) include applicable control measures from the 2017 Clean Air Plan, and (3) avoid disrupting or hindering implementation of control measures identified in the 2017 Clean Air Plan.

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[278] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, April 2022, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed July 22, 2024.
[279] Bay Area Air Quality Management District, *2017 Clean Air Plan: Spare the Air, Cool the Climate*, April 19, 2017, http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en, accessed November 22, 2024.

The primary goals of the 2017 Clean Air Plan are to protect public health and protect the climate, and the plan contains 85 measures, some of which address the reduction of GHG emissions.[280] These control strategies are grouped into the following categories:

- Stationary-source measures
- Transportation control measures
- Energy control measures
- Building control measures
- Agricultural control measures
- Natural and working lands control measures
- Waste management control measures
- Water control measures
- Super-GHG control measures

The 2017 Clean Air Plan recognizes that community design largely dictates individual travel mode, and that a key long-term control strategy to reduce emissions of criteria air pollutants, air toxics, and GHGs from motor vehicles is to channel future bay area growth into urban communities where goods and services are close at hand and people have a range of viable transportation options. Many of these control measures address stationary sources and will be implemented by the air district using its permit authority; therefore, such measures are not suited for implementation through local planning efforts or project approval actions. The control measures most applicable to subsequent projects under the RADP are stationary source, energy, transportation, and building control measures.

Implementation of the RADP would support the primary goals of the 2017 Clean Air Plan by supporting the applicable measures that aim to achieve these goals, as discussed below. The vast majority of the control measures included in the 2017 Clean Air Plan do not apply directly to the RADP and its related subsequent projects for one or more of the following reasons: (1) They target facilities or land uses that do not currently exist and are not part of the RADP (e.g., energy generation, waste management, agricultural, forest or pasture lands); (2) they refer to vehicles or equipment that would not be employed (e.g., ships and commercial boats, farming equipment); and (3) they involve rulemaking or other actions under the jurisdiction of agencies not directly involved with design and approval of the RADP. For example, 40 of the 85 measures in the 2017 Clean Air Plan address stationary sources (such as oil refineries and cement kilns, but also large boilers used in commercial and industrial facilities) and will be implemented by the air district using its permit authority and are therefore not suited to implementation through local planning efforts.

The measures in the 2017 Clean Air Plan that seek to control emissions from construction, transportation, energy, and building operations are most relevant to construction of subsequent RADP projects. These include Measures EN1 (energy control measure); BL1, BL2, and BL4 (buildings control measures); SS25, SS32, and SS38 (stationary-source control measures); TR2, TR8, TR9, TR14, TR18, TR19, TR21, TR22, and TR23 (transportation control measures) and WA3 and WA4 (waste management control measures); and WR2 (water control measure). The 2017 Clean Air Plan's transportation measures describe a comprehensive strategy to reduce emissions from medium- and heavy-duty trucks by providing incentives for the use of new trucks with advanced emissions controls, including hybrid and zero-emissions trucks. Implementation of the RADP would not conflict with these transportation control measures.

[280] GHG emissions are addressed in the initial study included as Appendix B of the Draft EIR.

Table 3.C-8 identifies the 2017 Clean Air Plan control measures that are potentially applicable to the RADP. The table identifies each control strategy and correlates it to specific elements of the RADP or explains why the strategy does or does not apply to the RADP.

The RADP's impact with respect to GHGs is addressed in the initial study (see Appendix B included as an appendix to this EIR). The analysis found that implementation of the RADP would comply with San Francisco's Greenhouse Gas Reduction Strategy, and thus would not result in any significant impacts associated with an increase in GHGs or conflict with measures adopted for the purpose of reducing such emissions.

As discussed under Impact AQ-4, implementation of the RADP (at full buildout) would result in a net increase in operational emissions of criteria air pollutants that would exceed significance thresholds for ROG even after implementation of mitigation. This would result in a significant and unavoidable impact with regard to regional criteria air pollutant emissions. However, these emissions do not in and of themselves indicate a conflict with the 2017 Clean Air Plan given the RADP's emphasis on reducing VMT, reducing energy demand, encouraging smart land use and building design, and achieving other objectives.

For the reasons described above, implementation of the RADP would not interfere with, disrupt, or hinder implementation of the Clean Air Plan. Therefore, this impact would be ***less than significant*** and no mitigation is required.

Impact AQ-2 (Plan-Level Analysis): The RADP would not result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard. *(Less than Significant)*

As discussed under Approach to Analysis, p. 3.C-28, for a plan to result in less-than-significant criteria air pollutant impacts, an analysis must demonstrate that the plan would be consistent with the control measures contained in the current regional air quality plan (the 2017 Clean Air Plan), would support the primary objectives of the 2017 Clean Air Plan, and would not hinder implementation of the 2017 Clean Air Plan. That analysis is contained under Impact AQ-1, above. Furthermore, based on the plan-level thresholds identified by the air district in its CEQA Air Quality Guidelines, the analysis must demonstrate that the growth in vehicle trips due to implementation of the RADP would not exceed the employment growth attributable to RADP projects, and the RADP would not cause localized CO impacts. These analyses are provided below.

GROWTH IN EMPLOYEE VEHICLE TRIPS COMPARED TO GROWTH IN POPULATION

Employee growth projections (see Table 3-1, p. 3-6) indicate that employment growth attributed to implementation of the RADP would increase approximately 29 percent from the 2045 future baseline without RADP to the 2045 future baseline with RADP, as shown in **Table 3.C-9**.

Table 3.C-8 RADP Consistency with Applicable Control Measures of the 2017 Clean Air Plan

Control Measure	Measure Description	Elements of the RADP Consistent with the Measure or Explanation of Non-applicability
EN1—Decarbonize Electricity Production	EN1 focuses on lowering carbon emissions by switching the fuel sources used in electricity generation. The measure promotes and will expedite a transition away from fossil fuels used in electricity generation (i.e., natural gas) to a greater reliance on renewable energy sources (e.g., wind, solar). In addition, this measure promotes an increase in cogeneration, which results in useful heat in addition to electricity generation from a single fuel source.	Since 2012, 100 percent of SFO's electricity has been supplied by carbon-free hydropower.[281] All electricity consumed by RADP operations would be supplied with carbon-free electricity. While not an element of the RADP, SFO currently has 12 solar installations online that produce 3 megawatts (MW) annually. In 2022, SFO completed a Distributed Energy Resources study to evaluate the use of solar power and battery storage onsite. The results of the study indicate that 50 MW of new solar generation capacity could be added at the Airport, enabling SFO to generate enough onsite solar electricity to meet 30 percent of Airport annual grid electricity use. Furthermore, SFO's 2023–2028 five-year strategic plan includes Objective 4.4, which directs the Airport to reach net zero energy by 2030 by accelerating distributed energy resources and electrical grid modernization and optimizing the performance of assets across their life cycle. To achieve this objective, SFO plans to install renewable energy and monitoring equipment to increase the Airport's electricity generation by 10 MW from 2022 levels by 2028; improve the efficiency of energy use; and build and operate best-in-class facilities through workforce development and implementation of all the Zero Net Energy Plan's recommendations. Although these projects are not part of the RADP, they would ensure that all electricity consumed during RADP operations would be carbon-free.
BL1—Green Buildings	BL1 seeks to increase energy efficiency and the use of onsite renewable energy—as well as decarbonize existing end uses—for all types of existing and future buildings. The measure includes policy assistance, incentives, diffusion of public information, and targeted engagement and facilitation of partnerships to increase	The RADP would include all-electric buildings with no natural gas combustion. All new buildings would be constructed to meet LEED Gold standards and would incorporate other energy efficiency features. Among these features would be designing new building envelopes to maximize energy performance, including parameters for glazing visible light transmission and light-to-solar-gain ratio; integrating with the Campus-wide Energy Management Control

[281] San Francisco Airport Commission, *Greenhouse Gas Emissions Inventory San Francisco International Airport Fiscal Year 2022*, January 2024, https://sustainability.flysfo.com/wp-content/uploads/2024/01/2022-Greenhouse-Gas-Emissions-Inventory.pdf, accessed February 5, 2025.

Control Measure	Measure Description	Elements of the RADP Consistent with the Measure or Explanation of Non-applicability
	energy efficiency and onsite renewable energy in the buildings sector.	System; and providing a real-time monitoring and diagnostic action plan to reduce energy consumption coordinating with campus-wide systems.
BL2—Decarbonize Buildings	BL2 will reduce criteria air pollutants and GHG emissions from buildings by replacing fossil fuel–powered space and water heating with electric system.	All new buildings associated with the RADP would be all-electric. No natural gas combustion would occur with implementation of the RADP. See also the discussion above for Measure BL1.
BL4—Urban Heat Island	This control measure aims to reduce the "urban heat island" phenomenon by increasing the application of "cool roofing" and "cool paving" technologies, as well as increasing the prevalence of urban forests and vegetation, through voluntary approaches and educational outreach.	SFO must follow SFO Sustainable Planning, Design & Construction Standards for new construction, which includes a design requirement for green roofs.[282] The standard requires, where feasible, installation of solar photovoltaic panels on roofs. Where solar photovoltaic panels are not feasible, vegetated areas on roofs should be considered, subject to wildlife attractant limitations. When roofs cannot support photovoltaic installations or green roofs, then cool roof materials should be installed. Increasing the prevalence of urban forests and vegetation is generally prohibited at the Airport due to trees and many plants being wildlife attractants, a hazard to aircraft activity.
SS25—Coatings, Solvents, Lubricants, Sealants and Adhesives	SS25 will reduce ROG emissions from architectural coatings and other materials by proposing more stringent ROG limits as appropriate.	SFO must follow procurement regulations from the San Francisco Environment Department, which include specifications for paints and primers;[283] carpet and adhesives;[284] and resilient flooring and adhesives.[285] Paints and primers must be certified by one or more of the following standards: (1) Master Painters Institute Extreme Green, (2) Green Wise Gold, and (3) Cradle to Cradle Certified Gold. These standards meet or exceed current BAAQMD standards for VOC limits. Carpet adhesives must meet the Carpet and Rug Institute's standards for very low emissions of VOCs. Flooring adhesives must be certified as meeting low VOC standards of California Department of Public Health Standard Method v1.2-2017, GREENGUARD Gold, SCS Indoor

[282] SFO. 2021. A&E Standards, SFO Sustainable Planning, Design & Construction Standards. Version 1.0, https://www.sfoconnect.com/sites/default/files/2021-12/SFO%20Sustainable%20PDC%20Standards%2012-13-21.pdf, accessed December 5, 2024.
[283] San Francisco Environment Regulation #SFE-20-08-PPO.
[284] San Francisco Environment Regulation #SFE-2018-01-PPO.
[285] San Francisco Environment Regulation #SFE-20-09-PPO.

Control Measure	Measure Description	Elements of the RADP Consistent with the Measure or Explanation of Non-applicability
		Advantage Gold, FloorScore, Blue Angel, or Cradle to Cradle Certified Gold level or higher.
SS32—Emergency Backup Generators	S32 will reduce emissions of DPM, TACs, and criteria air pollutants from emergency backup generators by enforcing Rule 11-18, resulting in reduced health risks to impacted individuals. This measure will also have climate protection benefits through reduced GHG emissions.	All emergency generators would be diesel and meet the air board/U.S. EPA Tier 4 Final standards for generators equal to or greater than 50 hp and the air board/U.S. EPA Tier 2 standards for generators less than 50 hp, consistent with the air district's Best Available Control Technology workbook.
SS38—Fugitive Dust	SS38 will reduce fugitive PM emissions.	All subsequent projects occurring under the RADP must submit a project-specific materials management plan that describes the means, methods, and procedures for dust control as required by Division 01 33 16: Hazard and Hazardous Material Investigation and Remediation. Division 01 35 43.01: Demolition requires that the amount of dust resulting from demolition be controlled to prevent the spread of dust to adjacent occupied areas and to avoid creation of a nuisance in the surrounding area. Division 01 35 43.06: Earthwork requires the contractor to take proper and efficient steps to control dust. Division 01 57 00: Temporary Controls requires that contractors performing work under Airport contracts assume responsibility for dust control and furnish labor, equipment, and means required to carry out proper and efficient measures wherever and whenever dust control is necessary to prevent operations from producing dust damage, health impacts, and nuisance to persons and property. The ASCMs include the air district's Basic Construction Mitigation Measures (Table 5-2 of the 2022 CEQA Air Quality Guidelines).
TR2—Trip Reduction Programs	TR2 implements the regional Commuter Benefits Program (Rule 14-1), which requires employers with 50 or more bay area employees to provide commuter benefits. It encourages trip reduction policies and programs in local plans, e.g., general and specific plans, while providing grants to support trip reduction efforts. Further, TR2 encourages local governments to require mitigation of vehicle travel as part of new development	Compliance with planning code section 155 (bicycle parking and facilities), planning code section 166 (car sharing requirements), and CALGreen Code requirements (green building requirements for bicycle, fuel-efficient vehicles, and carpool parking) would reduce the RADP's transportation-related emissions. These project features would reduce tailpipe emissions from single-occupancy vehicles by promoting the use of alternative transportation modes with zero or lower tailpipe emissions on a per capita basis. The RADP also seeks to

Control Measure	Measure Description	Elements of the RADP Consistent with the Measure or Explanation of Non-applicability
	approval; to adopt transit benefits ordinances to reduce transit costs to employees; and to develop innovative ways to encourage rideshare, transit, cycling, and walking for work trips. It also funds various employer-based trip reduction programs.	reduce employee and tenant vehicle trips and traffic congestion, and to address City climate goals through its parking and transportation management.
TR8—Ridesharing, Last-Mile Connection	TR8 promotes carpooling and vanpooling by providing funding to continue regional and local ridesharing programs, and support the expansion of car sharing programs. It provides incentive funding for pilot projects to evaluate the feasibility and cost-effectiveness of innovative ridesharing and other last-mile-solution trip reduction strategies. In addition, TR8 encourages employers to promote ridesharing and car sharing to their employees.	Compliance with planning code section 166 (car sharing requirements) would reduce the RADP's transportation-related emissions. Measure TR8 is not directly applicable to the RADP because it requires the air district to provide incentives and funding for regional and local programs to reduce commute trips. However, it is possible that RADP employees would participate in regional and local ridesharing and car sharing programs independent of the project sponsor's action. Therefore, the RADP would not conflict with or obstruct implementation of this control measure in the 2017 Clean Air Plan.
TR9—Bicycle and Pedestrian Access and Facilities	TR9 encourages planning for bicycle and pedestrian facilities in local plans (e.g., general and specific plans) and funding for bike lanes, routes, paths, and bicycle parking facilities.	Compliance with planning code section 155 (bicycle parking and facilities), planning code section 166 (car sharing requirements), and CALGreen Code requirements (green building requirements for bicycle, fuel-efficient vehicles, and carpool parking) would reduce the RADP's transportation-related emissions. These project features would reduce tailpipe emissions from single-occupancy vehicles by promoting the use of alternative transportation modes with zero or lower tailpipe emissions on a per capita basis. The RADP also seeks to reduce employee and tenant vehicle trips and traffic congestion, and to address City climate goals through its parking and transportation management.
TR14—Cars and Light Trucks	TR14 summarizes actions by the air district, the Metropolitan Transportation Commission, local businesses, city and county governments, and federal and state agencies to expand the use of ZEVs and plug-in electric passenger vehicles and light-duty trucks within the bay area.	While not an element of the RADP, SFO is implementing a ZEV Readiness Roadmap that presents a strategy for SFO to expand the use of ZEVs campus-wide with associated infrastructure. SFO's 2023–2028 five-year strategic plan includes Objective 4.3, which directs SFO to achieve net zero carbon for SFO-controlled emissions by 2030 and establish a stakeholder emissions reduction target and implementation plan by 2024. Actions to achieve this objective include transitioning 100 percent of SFO-owned light-duty vehicles to electric

Control Measure	Measure Description	Elements of the RADP Consistent with the Measure or Explanation of Non-applicability
		or clean-fuels alternative energy sources by 2030; enabling the decarbonization of landside and airside transit vehicles by providing sufficient infrastructure and incentives; eliminating the use of fossil fuels for building energy by 2030; setting targets for embodied carbon for building materials and construction; and evaluating sequestration potential and developing a carbon sequestration framework. In addition, all passenger cars and light trucks associated with the RADP are required to comply with air district, air board, and U.S. EPA engine emissions standards. SFO offers many electric vehicle charging stations for its employees, encouraging the use of ZEVs and plug-in electric passenger vehicles and light-duty trucks. For these reasons, the use of on-road heavy-duty trucks during RADP construction would not conflict with or obstruct implementation of this control measure in the 2017 Clean Air Plan.
TR19—Medium- and Heavy-Duty Trucks	TR19 directs the air district to directly provide, and encourage other organizations to provide, incentives for the purchase of (1) new trucks with engines that exceed the air board's 2010 NO_X emission standards for heavy-duty engines, (2) new hybrid trucks, and (3) new zero-emission trucks. The air district will work with truck owners, industry, the air board, the California Energy Commission, and others to demonstrate additional battery-electric and hydrogen fuel cell zero-emission trucks.	SFO's heavy-duty vehicles operate on renewable diesel and landfill-derived compressed natural gas, leaving only light-duty vehicles powered by fossil fuels (gasoline). While not an element of the RADP, SFO is implementing a ZEV Readiness Roadmap that presents a strategy for SFO to expand the use of ZEVs campus-wide with associated infrastructure. All trucks associated with the RADP are required to comply with air district, air board, and U.S. EPA engine emissions standards. However, Measure TR19 is not directly applicable to the RADP because it requires the air district to provide incentives for companies to employ cleaner on-road trucks. For these reasons, the use of on-road heavy-duty trucks during RADP construction would not conflict with or obstruct implementation of this control measure in the 2017 Clean Air Plan.
TR22—Construction, Freight and Farming Equipment	TR22 directs the air district to work to reduce emissions from off-road equipment used in the construction, freight handling, and farming industries by pursuing the following strategies: (1) offering financial incentives between 2017 and 2030 to retrofit engines with diesel particulate filters or upgrade to equipment with electric or Tier 4 off-road engines; (2) work with the air board,	Construction contractors are required to use electric equipment where feasible in compliance with SFO's Standard Construction Measure Division 01 57 00. However, Measure TR22 is not directly applicable to the RADP because it requires the air district to provide incentives for companies to employ cleaner construction equipment. For these reasons, the use of off-road equipment during construction of the

Control Measure	Measure Description	Elements of the RADP Consistent with the Measure or Explanation of Non-applicability
	the California Energy Commission, and others to develop more fuel-efficient off-road engines and drive trains; and (3) work with local communities to encourage use of renewable electricity and fuels.	RADP would not conflict with or obstruct implementation of this control measure in the 2017 Clean Air Plan.
TR23—Lawn Care Equipment	TR23 directs the air district to seek funding to expand the Commercial Lawn and Garden Equipment Replacement Program into all nine bay area counties.	Measure TR23 is not directly applicable to the RADP because it requires the air district to provide incentives for replacing fossil fuel–powered commercial lawn and garden equipment with electric options. For these reasons, the use of off-road equipment during construction of the RADP would not conflict with or obstruct implementation of this control measure in the 2017 Clean Air Plan.
WA3—Green Waste Diversion; and WA4—Recycling and Waste Reduction	WA3 seeks to reduce the total amount of green waste being disposed in landfills by supporting the diversion of green waste to other uses, while WA4 seeks to reduce GHG emissions by diverting recyclables and other materials from landfills.	The RADP would not conflict with these measures' goals because it would provide for recycling of construction and demolition materials. This is required by ASCM Division 01 35 43.07, which requires that SFO develop and implement a construction and demolition debris management plan, source separation, mixed-material recycling, source reduction, onsite reuse and/or recycling of materials, and other features to reduce landfilled waste.
WA4—Recycling and Waste Reduction	WA4 promotes model ordinances on community-wide zero-waste goals and recycling of construction and demolition materials in commercial and public construction projects.	The RADP would not conflict with this measure's goals because the RADP would provide for recycling of construction and demolition materials. This is required by ASCM Division 01 35 43.07, which requires that SFO develop and implement a construction and demolition debris management plan, source separation, mixed-material recycling, source reduction, onsite reuse and/or recycling of materials, and other features to reduce landfilled waste. Further, SFO's 2023–2028 five-year strategic plan includes Objective 4.5, which directs SFO to become a zero-waste campus for SFO-controlled municipal solid waste by reducing landfill-bound municipal solid waste generated per passenger by 70 percent; to achieve a 90 percent waste diversion rate; and to achieve a consistent contamination rate less than 5 percent across all waste streams, all by 2028. Therefore, the RADP would not conflict with or obstruct implementation of this control measure in the 2017 Clean Air Plan.

Control Measure	Measure Description	Elements of the RADP Consistent with the Measure or Explanation of Non-applicability
WR2—Support Water Conservation	WR2 seeks to promote water conservation, including reduced water consumption and increased onsite water recycling, in residential, commercial, and industrial buildings for the purpose of reducing GHG emissions.	While not an element of the RADP, SFO's 2023–2028 five-year strategic plan includes Objective 4.6, which directs SFO to become a net-zero-water campus by achieving balance between water consumption and measures that conserve, replenish, and recycle water by 2030. To achieve this objective, SFO will reduce potable water demands, maximize onsite reuse and conservation through onsite infrastructure, optimize the water distribution system through real-time measurement of water quality, and establish an embodied water use reduction target by 2030. SFO aims to conserve water via state and local water conservation requirements and policies and by implementing SFO goals and local requirements for design and installation of infrastructure that reuses recycled water, stormwater, and wastewater in new construction.

SOURCE: Data compiled by Environmental Science Associates in 2024

ABBREVIATIONS: 2017 Clean Air Plan = *2017 Clean Air Plan: Spare the Air, Cool the Climate*; air board = California Air Resources Board; air district = Bay Area Air Quality Management District; Airport = San Francisco International Airport; ASCM = Airport standard construction measure; bay area = San Francisco Bay Area; CALGreen Code = California Green Building Standards Code; CEQA = California Environmental Quality Act; City = City and County of San Francisco; DPM = diesel particulate matter; GHG = greenhouse gas; hp = horsepower; LEED = Leadership in Energy and Environmental Design; MW = megawatts; NO_X = oxides of nitrogen; planning code = San Francisco Planning Code; PM = particulate matter; RADP = Recommended Airport Development Plan; ROG = reactive organic gases; SFO = San Francisco International Airport; TAC = toxic air contaminant; U.S. EPA = U.S. Environmental Protection Agency; ZEV = zero-emission vehicle

Table 3.C-9 Recommended Airport Development Plan Net New Vehicle Trips versus Net New Employment

	2045 Future Baseline without RADP	2045 Future Baseline with RADP	% Increase
Net New Employment [a]	9,400	12,100 [b]	29%
Net New Daily vehicle trips [c]	5,880	7,568	29%

a. Employment numbers represent net new employment from 2019 to 2045 related to background growth not attributable to implementation of the RADP.
b. SOURCE: Table 3-1, p. 3-6. Employment attributable to implementation of the RADP excludes construction workers.
c. SOURCE: VMT data from Table 16 of Fehr & Peers & LCW Consulting, 2024. *SFO Recommended Airport Development Plan CEQA Analysis - Travel Demand Memorandum*, March 2025 (see Appendix E.2).

ABBREVIATION: RADP = Recommended Airport Development Plan

The net new daily vehicle trips (compared to 2019 existing conditions) associated with the 2045 future baseline with RADP would increase to approximately 7,568 from the 2045 future baseline without RADP of approximately 5,880, as shown in Table 3.C-9.[286] This represents a growth rate of 29 percent attributable to implementation of the RADP in 2045. Because the growth in vehicle trips would be no more than the growth in employment, implementation of the RADP would result in a less-than-significant impact with respect to regional criteria air pollutants. In addition, the RADP includes goals and policies that would reduce criteria air pollutant emissions. For example, the RADP seeks to improve transit and pedestrian accessibility and connections, thereby minimizing the need for automobile travel. For these reasons, implementation of the RADP would result in a ***less-than-significant*** impact with respect to regional emissions of criteria air pollutants, and no mitigation measures are required.

CARBON MONOXIDE

Unlike other criteria air pollutants, whose effects are regional, CO impacts are evaluated locally. However, the air district generally recommends intersection-specific modeling of CO concentrations only for intersections where traffic volumes would exceed 44,000 vehicles per hour based on modeling of vehicle emissions that demonstrates that below this volume of traffic, CO concentrations would not exceed the applicable state air quality standards. Based on the traffic analysis completed for the RADP, the maximum peak-hour traffic volume on any roadway segment in the transportation study area (San Bruno Avenue and South Airport Boulevard/North McDonnell Road) with the RADP would be 610 vehicles per hour, and the maximum on any roadway segment under the 2045 cumulative conditions (Millbrae Avenue over U.S. 101) would be 6,770 vehicles per hour.[287] Therefore, modeling of CO concentrations is not required, and implementation of the RADP would not exceed the state one-hour (20 ppm) or eight-hour (9.0 ppm) CO standards. Therefore, impacts related to CO also would be ***less than significant***, and no mitigation measures are required.

Although implementation of the RADP would result in less-than-significant criteria air pollutant impacts, subsequent projects under the RADP could result in significant criteria air pollutant impacts based on the air district's criteria air pollutant thresholds for individual projects. The criteria air pollutant impacts for representative subsequent projects under the RADP are addressed under Impact AQ-3 and Impact AQ-4, below.

[286] Fehr & Peers & LCW Consulting, *SFO Recommended Airport Development Plan CEQA Analysis – Travel Demand Memorandum*, March 2025.
[287] Ibid.

Impact AQ-3 (Representative Analysis of Subsequent RADP Projects): Construction of subsequent RADP projects could result in a cumulatively considerable net increase of any criteria air pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard. ***(Less than Significant with Mitigation)***

Construction of subsequent RADP projects has the potential to create temporary air quality impacts from heavy-duty off-road construction equipment, construction workers' vehicle trips, heavy-duty truck trips, vendor truck trips, paving of asphalt surfaces, and application of architectural coatings. Fugitive dust emissions would result from site disturbance including demolition, excavation, pile driving, grading, trenching, and debris/soil removal. The assessment of construction air quality impacts considers each of these potential sources.

CONSTRUCTION DUST

Construction of subsequent RADP projects has the potential to create temporary air quality impacts through emissions of fugitive dust. Fugitive dust emissions would result from site disturbance including demolition, excavation, pile driving, grading, trenching, and berm/soil removal. RADP construction activities may cause windblown dust, which would contribute particulate matter to the local atmosphere. As discussed above, SFO is required to implement ASCMs specific to dust control. These ASCMs would avoid or minimize impacts of construction-generated fugitive dust.

For all subsequent projects occurring under the RADP, a project-specific materials management plan that describes the means, methods, and procedures for handling contaminated soil and sludge and controlling dust is required by ASCM Division 01 33 16, Hazard and Hazardous Material Investigation and Remediation. ASCM Division 01 35 43.01, Demolition, requires that the amount of dust resulting from demolition be controlled to prevent the spread of dust to adjacent occupied areas and to avoid creating a nuisance in the surrounding area. ASCM Division 01 35 43.06 Earthwork requires the contractor to take proper and efficient steps to control dust. ASCM Division 01 57 00, Temporary Controls, requires that contractors performing work under SFO projects assume responsibility for dust control and furnish labor, equipment, and means required to carry out proper and efficient measures wherever and whenever dust control is necessary to prevent operations from producing dust damage, health impacts, and nuisance to persons and property. The ASCMs include the air district's Basic Construction Mitigation Measures (Table 5-2 of the 2022 CEQA Air Quality Guidelines) that are required to reduce the fugitive dust impact to a less-than-significant level. Therefore, with implementation of SFO's ASCMs, the implementation of the RADP would have a ***less-than-significant*** impact related to fugitive dust during construction.

CONSTRUCTION EQUIPMENT EXHAUST

Demolition and construction activities for subsequent RADP projects would require the use of heavy trucks, excavators, material loaders, cranes, and other mobile and stationary construction equipment. During the RADP's approximately 20-year construction period, construction activities would emit ozone precursors and PM. The amount of construction activity would depend on several factors, including the amount of demolition and excavation required (if any), the building foundation type, and the size of the building being constructed.

The air district, in its CEQA Air Quality Guidelines, developed screening criteria to determine whether construction-related exhaust emissions or operational emissions from individual projects would result in a cumulatively considerable net increase in non-attainment criteria air pollutants. A project that does not meet the screening criteria may require a detailed air quality assessment to determine whether criteria air pollutant emissions would exceed significance thresholds.[288] Projects that meet all screening criteria would not require future analysis and the criteria air pollutant impacts from those projects are presumed to be less than significant. If a project meets all these screening criteria, construction of the project would result in a less-than-significant impact related to criteria air pollutant and precursor emissions.

The air district's CEQA Air Quality Guidelines note that the screening levels are generally representative of new development on *greenfield*[289] sites, without any form of mitigation measures taken into consideration. In addition, the screening criteria do not account for project design features, attributes, or local development requirements that could result in lower emissions. They also do not account for other features that could result in increased average daily construction emissions. Examples of such features include demolition, simultaneous construction of more than two construction phases, or projects that require extensive site preparation or material transport (e.g., greater than 10,000 cubic yards of soil import/export).

Subsequent RADP projects would likely include features that are not accounted for in the air district's screening criteria (e.g., demolition of existing structures); therefore, construction emissions have been quantified for a range of representative project types that could occur with implementation of the RADP. Construction emissions were calculated using the methods summarized above starting on p. 3.C-33. Additional modeling details are provided in Appendix G, Air Quality Technical Appendix.

Table 3.C-10 presents the average daily construction emissions from the four representative projects by year. **Table 3.C-11** shows the average daily construction emissions by overlap scenario.[290]

As shown in Table 3.C-10, no individual representative RADP project, on its own, would exceed air district significance thresholds for construction activities. The maximum average daily emissions for a small project would be 1.6 pounds per day (lb/day) of ROG, 4.7 lb/day of NO_X, 0.2 lb/day of PM_{10}, and 0.1 lb/day of $PM_{2.5}$. The maximum average daily emissions for a medium project would be 16.4 lb/day of ROG, 8.5 lb/day of NO_X, 0.2 lb/day of PM_{10}, and 0.2 lb/day of $PM_{2.5}$. The maximum average daily emissions for any project type would occur for large project #1, the Central Hub, at 41.7 lb/day of ROG, 45.4 lb/day of NO_X, 0.9 lb/day of PM_{10}, and 0.8 lb/day of $PM_{2.5}$. These values are all less than the air district's significance thresholds for construction activities.

As shown in Table 3.C-11, the low- and medium-overlap scenarios would not result in exceedances of air district significance thresholds for construction activities. However, during the high-overlap scenario, construction-related emissions of ROG and NO_X would exceed the significance threshold of 54 lb/day at 61.2 lb/day and 78.3 lb/day, respectively. The largest sources of construction-related ROG emissions during the high-overlap scenario are evaporative emissions associated with applying architectural coatings (62 percent). The largest source of construction NO_X emissions during the high-overlap scenario is off-road equipment fuel combustion (42 percent).

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288 Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, April 2023, Table 4-1, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed November 2, 2024.
289 A *greenfield site* refers to agricultural or forest land or an undeveloped site earmarked for commercial, residential, or industrial projects.
290 Table 3.C-11 presents three overlap scenarios with varying combinations of the representative small, medium, and large projects. Although the actual representative projects may not overlap in time, the overlap scenarios represent the potential for RADP projects to overlap during any given calendar year by adding the maximum year of construction emissions from each of the representative projects as defined by the overlap scenario.

Table 3.C-10 Average Daily Construction Emissions by Representative RADP Project

Representative Project/Year [a]	Average Daily Emissions (pounds per day)			
	ROG	NO_X	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Large Project #1: Central Hub				
2032	3.3	39.0	0.8	0.8
2033	22.8	45.4	0.9	0.8
2034	23.1	42.3	0.8	0.8
2035	25.3	44.3	0.8	0.8
2036	41.7	43.5	0.8	0.7
MAXIMUM	**41.7**	**45.4**	**0.9**	**0.8**
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No
Large Project #2: CONRAC				
2027	3.0	24.3	0.4	0.4
2028	2.9	23.2	0.4	0.4
2029	2.9	22.3	0.4	0.3
2030	2.8	21.5	0.4	0.3
2031	2.8	20.7	0.3	0.3
MAXIMUM	**3.0**	**24.3**	**0.4**	**0.4**
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No
Medium Project: ITB Main Hall Expansion				
2032	0.7	7.4	0.2	0.2
2033	1.1	8.5	0.2	0.2
2034	1.1	8.3	0.2	0.1
2035	1.1	8.1	0.1	0.1
2036	16.4	5.9	0.1	0.1
MAXIMUM	**16.4**	**8.5**	**0.2**	**0.2**
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No

Representative Project/Year [a]	Average Daily Emissions (pounds per day) ROG	NO_X	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Small Project: East Field Ground Support Equipment Facility #2				
2028	0.5	4.7	0.2	0.1
2029	1.6	2.1	0.1	0.1
2030	<0.1	0.2	<0.1	<0.1
MAXIMUM	**1.6**	**4.7**	**0.2**	**0.1**
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No

SOURCE: Data compiled by Environmental Science Associates in 2024

ABBREVIATIONS: CONRAC = Consolidated Rental Car Center; ITB = International Terminal Building; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; RADP = Recommended Airport Development Plan; ROG = reactive organic gases; Draft EIR = draft environmental impact report

NOTES: Due to rounding, numbers in columns may not add to totals.

a. Construction years presented in this table are based on Draft EIR Chapter 2, Project Description, Table 2-5.

This analysis examines a range of project types consistent with the RADP to identify impacts that could occur as an indirect effect of implementation of the RADP. The results shown here do not imply that all projects that are of similar size and scale as the small, medium, and large representative project types would result in the project-level emissions presented in Table 3.C-10. These results also do not imply that overlapping emissions of subsequent RADP projects as analyzed in the large overlap scenario presented in Table 3.C-11 would result in significant NO_X emissions. Rather, this analysis is a generalized assessment of the range of project types that has been conducted in the absence of project-specific information, which cannot be known at this time.

Based on the results of this representative analysis, small subsequent RADP projects would result in less-than-significant criteria air pollutant emissions. The preceding analysis indicates that small subsequent RADP projects would produce emissions one-tenth or less of the significance thresholds. Given the shorter construction duration of small projects, it is unlikely that more than a few would occur at the same time, thereby producing greater overlapping emissions than each small project in isolation. Even multiple overlapping small projects (up to 10 at the same time) would not result in emissions that would exceed significance thresholds. For these reasons, small subsequent projects would result in a ***less-than-significant*** impact and no mitigation measures or future project-level analysis would be required.

The specific characteristics of each subsequent RADP project and information about construction equipment (e.g., year and duration of construction, equipment type, operating hours, horsepower) are not known. Therefore, because the emissions from medium and large subsequent projects could approach or exceed the significance thresholds, each subsequent medium or large project would be required to undergo a project-level assessment of criteria air pollutant emissions at the time the project is proposed. The project-level assessment could either evaluate the subsequent project's characteristics relative to the air district's screening criteria (discussed above), the building types analyzed here, or other similar projects where a quantitative analysis has been conducted, or could present a project-specific criteria air pollutant analysis to determine whether the project would exceed the air district's criteria air pollutant thresholds.

Table 3.C-11 Average Daily Construction Emissions by Overlap Scenario for Representative RADP Projects

Overlap Scenario/Project Size [b]	Average Daily Emissions (pounds per day) [a]			
	ROG	NO_X	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Low Overlap				
Small Project	1.6	4.7	0.2	0.1
Small Project	1.6	4.7	0.2	0.1
LOW-OVERLAP SCENARIO TOTAL	3.1	9.4	0.3	0.3
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No
Medium Overlap				
Medium Project	16.4	8.5	0.2	0.2
Small Project	1.6	4.7	0.2	0.1
MEDIUM-OVERLAP SCENARIO TOTAL	18.0	13.2	0.4	0.3
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No
High Overlap				
Large Project #1	41.7	45.4	0.9	0.8
Large Project #2	3.0	24.3	0.4	0.4
Medium Project	16.4	8.5	0.2	0.2
HIGH-OVERLAP SCENARIO TOTAL	**61.2**	**78.3**	1.5	1.4
Significance Threshold	54	54	82	54
Threshold Exceeded?	**Yes**	**Yes**	No	No

SOURCE: Data compiled by Environmental Science Associates in 2024

ABBREVIATIONS: NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; RADP = Recommended Airport Development Plan; ROG = reactive organic gas

NOTES: Due to rounding, numbers in columns may not add to totals.

a. **Bold** values = threshold exceedance.
b. Projects are defined in Table 3.C-10. Emission factors used in representative project calculations were not adjusted to reflect overlap scenarios.

If a project-specific analysis finds that a subsequent RADP project would result in significant construction-related emissions of criteria air pollutants, implementation of Mitigation Measures M-AQ-3a and M-AQ-3b would be required to reduce the impact. If a project-specific analysis finds that there would not be significant construction-related emissions of criteria pollutants, no further analysis or application of mitigation measure would be required.

MITIGATION MEASURES

To reduce ROG and NO_X emissions that would exceed significance thresholds during construction of medium and large RADP projects, **Mitigation Measures M-AQ-3a and M-AQ-3b** would be required.

Mitigation Measure M-AQ-3a: Clean Off-Road Construction Equipment. *Should a project-specific analysis determine that a medium or large project would result in a significant criteria air pollutant impact, this mitigation measure would be required.* The project sponsor shall comply with the following:

1. *Engine Requirements.* All off-road equipment greater than 25 horsepower (hp) and operating for more than 20 total hours over the duration of construction shall meet the following requirements:
   a. All off-road equipment greater than 25 horsepower and operating for more than 20 total hours over the entire duration of construction activities shall have engines that meet or exceed either U.S. Environmental Protection Agency (U.S. EPA) or California Air Resources Board (air board) Tier 4 Final off-road emission standards.
   b. Where access to grid power is available, portable diesel engines (less than 25 horsepower) shall be prohibited.
   c. Diesel engines, whether for off-road or on-road equipment, shall not be left idling for more than 2 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 project sponsor 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 2-minute idling limit. If the majority of the project sponsor's construction staff speak a language other than these, then the signs shall be posted in that language as well.
   d. The project sponsor 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 manufacturers' specifications.
   e. Any other best available technology in the future may be included, provided that the project sponsor submits documentation to the department demonstrating that (1) the technology would result in emissions reductions and (2) it would not increase other pollutant emissions or result in other additional impacts, such as noise. This may include new alternative fuels or engine technology for off-road or other construction equipment (such as electric or hydrogen fuel cell equipment) that is not available as of 2025.
2. *Waivers.* The environmental review officer (ERO) may waive the requirement of subsection (1)(b) regarding an alternative source of power if an alternative source is limited or infeasible at the project site. If the ERO grants the waiver, the project sponsor must submit documentation that the equipment used for onsite power generation meets the engine requirements of subsection (1)(a).

   The ERO may waive the equipment requirements of subsection (1)(a) if a particular piece of Tier 4 Final off-road equipment is technically not feasible, the equipment would not produce the desired emissions reduction because of expected operating modes, or a compelling emergency requires the use off-road equipment that is not Tier 4 Final compliant. In seeking a waiver, the project sponsor shall demonstrate that the project shall use the cleanest piece of construction equipment available and feasible and submit documentation that average daily construction emissions of reactive organic gases (ROG), oxides of nitrogen (NO_x), particulate matter of 2.5 microns in diameter or less ($PM_{2.5}$) would not exceed 54 pounds per day, and particulate matter of 10 microns in diameter or less (PM_{10}) emissions would not exceed 82 pounds per day.

3. *Construction Emissions Minimization Plan.* Before starting onsite construction activities, the project sponsor shall submit a construction emissions minimization plan to the ERO for review and approval. The plan shall state, in reasonable detail, how the contractor will meet the requirements of item 1.

   - The Plan shall include estimates of the construction timeline by phase, with a description of each piece of off-road equipment required for every construction phase. The description may include, but is not limited to, equipment type, equipment manufacturer, equipment identification number, engine model year, engine certification (tier rating), horsepower, engine serial number, and expected fuel use and hours of operation. For off-road equipment using alternative fuels, the description shall also specify the type of alternative fuel being used.

   - The project sponsor shall ensure that all applicable requirements of the Plan have been incorporated into the project sponsor's contract specifications. The Plan shall include a certification statement that the project sponsor agrees to comply fully with the Plan.

   - The project sponsor shall make the Plan available to the public for review onsite during working hours. The project sponsor shall post at the construction site a legible and visible sign summarizing the Plan. The sign shall also state that the public may ask to inspect the Plan for the project at any time during working hours and shall explain how to request to inspect the Plan. The project sponsor shall post at least one copy of the sign in a visible location on each side of the construction site facing a public right-of-way.

4. Monitoring: After start of construction activities, the project sponsor shall submit reports every six months to the ERO documenting compliance with the Plan. After completion of construction activities and prior to receiving a final certificate of occupancy, the project sponsor shall submit to the ERO a final report summarizing construction activities, including the start and end dates, duration of each construction phase, and the specific information required in the Plan.

Mitigation Measure M-AQ-3b: Super-Compliant VOC Architectural Coatings during Construction. *Should a project-specific analysis determine that a medium or large project would result in a significant ROG impact, the following mitigation measure would be required.* The project sponsor shall use "super-compliant" volatile organic compound (VOC) architectural coatings during construction for all interior and exterior spaces and shall include this requirement in plans submitted for review to the planning department. The project sponsor shall submit a signed certification statement that this requirement has been incorporated into contract specifications. "Super-compliant" refers to paints that meet the more stringent regulatory limits in South Coast Air Quality Management District rule 1113, which requires a limit of 10 grams VOC per liter (http://www.aqmd.gov/home/regulations/compliance/architectural-coatings/super-compliant-coatings).

IMPACT WITH IMPLEMENTATION OF MITIGATION MEASURES M-AQ-3A AND M-AQ-3B

Mitigation Measure M-AQ-3a requires medium and large subsequent RADP projects that would result in a significant criteria air pollutant impact, as determined after a project-specific analysis, to use Tier 4 final off-road construction equipment; limit idling to two minutes; and properly maintain and tune equipment in accordance with manufacturers' specifications. Mitigation Measure M-AQ-3b requires subsequent RADP projects that would result in a significant criteria air pollutant impact, as determined after a project-specific analysis, to use architectural coatings that meet the super-compliant VOC standard of 10 grams VOC per liter.

Mitigated construction emissions for the representative projects were modeled assuming 100 percent compliance with Tier 4 Final off-road emissions standards and a two-minute idling limit for all on-road construction trucks (Mitigation Measure M-AQ-3a); and use of architectural coatings during construction meeting the super-compliant VOC standard of 10 grams VOC per liter (Mitigation Measure M-AQ-3b). With implementation of Mitigation Measures M-AQ-3a and M-AQ-3b, ROG emissions would be reduced by 83 percent and NO_X emissions would be reduced by 32 percent for the high-overlap scenario. See Appendix G, Air Quality Technical Appendix, for a detailed description of the assumptions and modeling methods for the mitigated scenario.

Table 3.C-12 presents average daily mitigated construction emissions from the four representative projects by year. **Table 3.C-13** shows average daily mitigated construction emissions by overlap scenario.

Table 3.C-12 Average Daily Mitigated Construction Emissions by Representative Project

	Average Daily Emissions (pounds per day)			
Representative Project/Year [a]	ROG	NO_X	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Large Project #1: Central Hub				
2032	2.1	24.0	0.5	0.5
2033	4.7	28.9	0.5	0.5
2034	4.6	27.1	0.5	0.4
2035	5.0	28.6	0.5	0.5
2036	7.0	29.3	0.4	0.4
MAXIMUM	7.0	29.3	0.5	0.5
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No

Representative Project/Year [a]	Average Daily Emissions (pounds per day)			
	ROG	NO_X	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Large Project #2: CONRAC				
2027	1.5	17.9	0.2	0.2
2028	1.5	17.3	0.2	0.2
2029	1.5	16.7	0.2	0.2
2030	1.5	16.2	0.2	0.2
2031	1.4	15.7	0.2	0.2
MAXIMUM	1.5	17.9	0.2	0.2
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No
Medium Project: ITB Main Hall Expansion				
2032	0.4	3.6	0.1	0.1
2033	0.6	5.7	0.1	0.1
2034	0.6	5.6	0.1	0.1
2035	0.6	5.6	0.1	0.1
2036	1.8	3.9	0.1	0.1
MAXIMUM	1.8	5.7	0.1	0.1
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No
Small Project: East Field Ground Support Equipment Facility #2				
2028	0.2	0.9	<0.1	<0.1
2029	0.2	0.6	<0.1	<0.1
2030	<0.1	0.1	<0.1	<0.1
MAXIMUM	0.2	0.9	<0.1	<0.1
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No

SOURCE: Data compiled by Environmental Science Associates in 2024

ABBREVIATIONS: CONRAC = Consolidated Rental Car Center; ITB = International Terminal Building; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; RADP = Recommended Airport Development Plan; ROG = reactive organic gases; Draft EIR = draft environmental impact report

NOTES: Mitigation measures include Tier 4 Final off-road construction equipment for engines greater than 25 horsepower, ultra-low volatile organic compounds architectural coatings, and a two-minute idling limit restriction for haul trucks.

Due to rounding, numbers in columns may not add to totals.

a. Construction years presented in this table are based Draft EIR Chapter 2, Project Description, Table 2-5.

Table 3.C-13 Average Daily Mitigated Construction Emissions by Scenario

Overlap Scenario/Project Size [a]	Average Daily Emissions (pounds per day) ROG	NO_X	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Low Overlap				
Small Project	0.2	0.9	<0.1	<0.1
Small Project	0.2	0.9	<0.1	<0.1
LOW-OVERLAP SCENARIO TOTAL	0.4	1.7	0.1	0.1
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No
Medium Overlap				
Medium Project	1.8	5.7	0.1	0.1
Small Project	0.2	0.9	<0.1	<0.1
MEDIUM-OVERLAP SCENARIO TOTAL	2.0	6.6	0.1	0.1
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No
High Overlap				
Large Project #1	7.0	29.3	0.5	0.5
Large Project #2	1.5	17.9	0.2	0.2
Medium Project	1.8	5.7	0.1	0.1
HIGH-OVERLAP SCENARIO TOTAL	10.3	53.0	0.8	0.8
Significance Threshold	54	54	82	54
Threshold Exceeded?	No	No	No	No

SOURCE: Data compiled by Environmental Science Associates in 2024

ABBREVIATIONS: NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; ROG = reactive organic gas

NOTES: Due to rounding, numbers in columns may not add to totals.

Mitigation measures include Tier 4 final off-road construction equipment for engines greater than 25 horsepower, ultra-low volatile organic compounds architectural coatings, and a two-minute idling limit restriction for haul trucks.

a. **Bold** values = threshold exceedance.
b. Projects are defined in Table 3.C-12.

SIGNIFICANCE AFTER MITIGATION

With implementation of Mitigation Measures M-AQ-3a and M-AQ-3b, the impact of ROG and NO_X emissions from construction would be reduced to a less-than-significant level. Mitigation Measure M-AQ-3a requires that diesel engines larger than 25 hp that power construction equipment meet or exceed Tier 4 Final emissions standards and require haul trucks limit their idling time to two minutes or less. Tier 4 Final emissions standards incorporate advanced emission control technologies that result in lower NO_X and ROG emissions compared to the default off-road equipment fleet. Mitigation Measure M-AQ-3b requires the use of super-compliant VOC architectural coatings during construction. Super-compliant VOC coatings result in fewer ROG emissions than standard VOC content coatings because their formulations have lower VOC content than standard coatings.

Depending on the year, Mitigation Measure M-AQ-3a would reduce NO_X emissions from off-road construction equipment by approximately 36 to 85 percent and total NO_X emissions by approximately 19 to 81 percent. The range in NO_X reductions by year is large because off-road construction activity varies substantially by year, and other construction emissions sources such as haul trucks, vendor trucks, and worker trips also vary by year. The measure would reduce significant NO_X emissions to less than significant in all years.

Mitigation Measure M-AQ-3b would reduce ROG emissions from architectural coatings by up to 91 percent and total ROG emissions by up to 87 percent, depending on the year. Similar to NO_X, the range in ROG reductions by year is large because architectural coating activity varies substantially by year, and other construction emissions sources such as haul trucks, vendor trucks, and worker trips also vary by year. The measure would reduce significant ROG emissions to less than significant in all years. See Appendix G, Air Quality Technical Appendix, for a detailed description of construction emissions by source.

Because mitigated emissions would be less than the criteria air pollutant significance thresholds, construction impacts from subsequent RADP projects related to criteria air pollutant emissions would be less than significant. As discussed previously, the air district's project-level criteria air pollutant thresholds are intended to evaluate impacts from individual projects, such as construction of subsequent RADP projects. Plan-level criteria air pollutant impacts are addressed above under Impact AQ-2. Because emissions from the representative project types evaluated would not exceed significance thresholds with implementation of Mitigation Measures M-AQ-3a and M-AQ-3b, this impact would be ***less than significant with mitigation***.

Impact AQ-4 (Representative Analysis of Subsequent RADP Projects): Operation of subsequent RADP projects would cause a cumulatively considerable net increase of a criteria air pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard. *(Significant and Unavoidable with Mitigation)*

Subsequent RADP projects would generate vehicle trips and other operational emissions, such as from emergency diesel generators, landscape maintenance activities, painting, and the use of consumer products.[291] Sufficient detail about subsequent RADP projects is not currently available to allow a quantitative analysis for specific RADP projects. However, operational emissions were quantified for full buildout of the RADP by 2045 using CalEEMod default activity and emission rates. Sources of PM_{10} and $PM_{2.5}$ emissions include vehicle exhaust and fugitive sources such as entrained road dust, brake wear, and tire wear. **Table 3.C-14** presents operational emissions from full buildout of all subsequent RADP projects in 2045.

[291] Natural gas combustion would not be a source of emissions, given the Airport's all-electric building policy. All new buildings would also be constructed to meet Leadership in Energy and Environmental Design (LEED) Gold standards and would incorporate other energy efficiency features.

Table 3.C-14 Full-Buildout RADP Operational Emissions in 2045

	Maximum Average Daily Emissions (pounds per day) [a]			
Source	ROG	NO_X	PM_{10}	$PM_{2.5}$
Delivery Truck Onsite Idling	2.9	3.2	<0.1	<0.1
Delivery Truck Offsite Travel	1.9	5.8	3.4	0.7
Employee Vehicle Travel	6.6	4.0	25.1	6.4
Consumer Products	46.1	<0.1	<0.1	<0.1
Architectural Coatings	9.6	<0.1	<0.1	<0.1
Landscaping	12.3	0.7	0.1	0.1
Emergency Generators	0.3	0.9	<0.1	<0.1
TOTAL	**79.7**	14.7	28.7	7.3
Significance Threshold	54	54	82	54
Threshold Exceeded?	**Yes**	No	No	No
	Maximum Annual Emissions (tons per year) [a]			
Delivery Truck Onsite Idling	0.5	0.6	<0.1	<0.1
Delivery Truck Offsite Travel	0.3	1.1	0.6	0.1
Employee Vehicle Travel	1.2	0.7	4.6	1.2
Consumer Products	8.4	<0.1	<0.1	<0.1
Architectural Coatings	1.8	<0.1	<0.1	<0.1
Landscaping	2.2	0.1	<0.1	<0.1
Emergency Generators	0.1	0.2	<0.1	<0.1
TOTAL	**14.6**	2.7	5.2	1.3
Significance Threshold	10	10	15	10
Threshold Exceeded?	**Yes**	No	No	No

SOURCE: Data compiled by Environmental Science Associates in 2024

ABBREVIATIONS: NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; RADP = Recommended Airport Development Plan; ROG = reactive organic gases

NOTES: Due to rounding, numbers in columns may not add to totals.

a. **Bold** values = threshold exceedance.

As shown in Table 3.C-14, operational ROG emissions from full buildout of the RADP in 2045 would exceed the daily and annual significance thresholds, resulting in a significant impact. During full-buildout operations in 2045, area sources of consumer product use would generate the majority of ROG emissions (58 percent), followed by area sources of architectural coatings (12 percent), landscaping equipment (15 percent), and mobile emissions from employee commutes (8 percent).

HEALTH IMPLICATIONS OF SIGNIFICANT IMPACTS RELATED TO EMISSIONS OF OZONE PRECURSORS

As discussed under *Ambient Air Quality—Criteria Air Pollutants*, p. 3.C-2, air quality standards have been set at levels considered safe to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly with a margin of safety, and to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. As explained by the air board, "An air quality standard defines the maximum amount of a pollutant averaged over a specified period of time that can be present in outdoor air without any harmful effects on people or the environment."[292] That is, if a region is compliant with the ambient air quality standards, its regional air quality can be considered protective of public health. The national air quality standards are statutorily required to be set by the U.S. EPA at levels that are "requisite to protect the public health."[293]

Also discussed above, the U.S. EPA developed the Air Quality Index scale to make the public health impacts of air pollution concentrations easily understandable. Table 3.C-3, p. 3.C-9, shows the Air Quality Index results for the air basin between 2019 and 2023. As shown there, the air basin has averaged between seven and 34 days per year that are considered unhealthy for sensitive groups (orange) and had 18 unhealthy (red) days in the last five years for which data are available. In addition, one day was designated as very unhealthy (purple) during the August/September 2020 wildfires that occurred throughout the bay area. On unhealthy days, persons are recommended to avoid both prolonged and heavy-exertion outdoor activities.

ROG is an ozone precursor, and the main health concern of exposure to ground-level ozone is effects on the respiratory system, especially on lung function. However, several factors, such as age, lung function, and body mass index,[294] influence these health impacts. Given these various factors, it is difficult to predict the magnitude of health effects from operational ROG emissions from implementation of the RADP.

Additionally, ozone is a regional pollutant for which project-specific concentration modeling is not reliable given current modeling limitations. Meteorology, the presence of sunlight, seasonal impacts, and other complex chemical factors all combine to determine the ultimate concentration and location of ozone.[295] Health effects from ozone concentrations are typically evaluated using regional models that include emissions sources from the entire region (i.e., the air basin) and are designed to determine regional, population-wide health impacts. The impacts of a single project on the population of the overall region tend to be small, particularly with emissions exceeding thresholds at the level of the RADP. Given the assumptions about population, meteorology, location of emissions, photochemical atmospheric reactions, and the magnitude of the resulting human health effects, modeling will yield results with compounding uncertainties.[296,297] Consequently, given these current modeling limitations, there is no reliable way to

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[292] California Air Resources Board, "California Ambient Air Quality Standards (CAAQS)," n.d., https://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm, accessed July 2, 2024.
[293] *United States Code* title 42, chapter 7409, National Primary and Secondary Ambient Air Quality Standards, https://www.law.cornell.edu/uscode/text/42/7409, accessed July 2, 2024.
[294] U.S. Environmental Protection Agency, "Health Effects of Ozone in the General Population," May 16, 2024, https://www.epa.gov/ozone-pollution-and-your-patients-health/health-effects-ozone-general-population#response, accessed October 2, 2024.
[295] California Air Resources Board, "Ozone & Health," n.d., https://ww2.arb.ca.gov/resources/ozone-and-health, accessed October 2, 2024.
[296] U.S. Environmental Protection Agency, BenMAP Community Edition v1.5.8.29, 2023, https://www.epa.gov/benmap/benmap-community-edition, accessed January 28, 2025.
[297] U.S. Environmental Protection Agency, *Policy Assessment for the Reconsideration of the National Ambient Air Quality Standards for Particulate Matter*, Office of Air Quality Planning and Standards, Health and Environmental Impacts Division, EPA 452/R-22-004, May 2022, https://www.epa.gov/system/files/documents/2022-05/Final%20Policy%20Assessment%20for%20the%20Reconsideration%20of%20the%20PM%20NAAQS_May2022_0.pdf, accessed October 2, 2024.

connect the RADP's exceedances of ROG emissions to increases in ozone concentrations to meaningfully determine specific human-health impacts related to increases in ozone concentrations.

Nevertheless, the RADP's ROG emissions that exceed thresholds could contribute to new or exacerbated air quality violations in the air basin by contributing to increases in the number of days of ozone exceedance, or they could result in air quality index values that are unhealthy for sensitive groups and other populations.

The specific characteristics of each subsequent RADP project and the required operational activities (e.g., year of initial operations, medium- and heavy-duty vendor and delivery truck trips, size and number of emergency generators, exact square footage by land use type) are not known. Therefore, because predicted emissions for full buildout of the RADP could exceed the significance threshold for ROG, each future subsequent RADP project would be required to undergo a project-level assessment of criteria air pollutant emissions at the time the project is proposed. The project-level assessment could evaluate the project's characteristics relative to the air district's screening criteria (discussed above), the building types analyzed herein, or other similar projects where a quantitative analysis has been conducted, or could present a project-specific criteria air pollutant analysis to determine whether the project would exceed the air district's criteria air pollutant thresholds for operations.

If a project-specific analysis finds that a subsequent RADP project would result in significant operational emissions of criteria air pollutants, implementation of Mitigation Measures M-AQ-4a, M-AQ-4b, M-AQ-4c, M-AQ-4d, M-AQ-4e, and M-AQ-4f would be required to reduce the impact.

MITIGATION MEASURES

To reduce ROG emissions that would exceed significance thresholds during full-buildout operations of the RADP, **Mitigation Measures M-AQ-4a through M-AQ-4f** would be required.

> **Mitigation Measure M-AQ-4a: Best Available Emissions Controls for Stationary Emergency Generators.** *Should a project-specific analysis determine that a subsequent RADP project would result in a significant operational criteria air pollutants impact, the project sponsor would be required to implement this mitigation measure.* These features shall be submitted to the ERO for review and approval, and shall be included on the project drawings submitted for the construction-related permit(s) or on other documentation submitted to the City before the issuance of any building permits:
>
> 1. Permanent stationary emergency generators installed onsite shall have engines that meet or exceed California Air Resources Board Tier 4 Final Off-Road Compression-Ignition Engine Standards (California Code of Regulations title 13, section 2423). If the air board adopts future emissions standards that exceed the Tier 4 Final requirement, the emissions standards resulting in the lowest ROG emissions shall apply.
> 2. Non-diesel-fueled emergency generator technology (e.g., battery technology) shall be installed in new buildings, subject to the review and approval of the City fire department for safety purposes, provided that alternative fuels used in generators are demonstrated to reduce ROG emissions compared to diesel fuel.
> 3. For each new diesel backup generator permit submitted to the Bay Area Air Quality Management District (air district) for the RADP, the project sponsor shall submit the anticipated location and

engine specifications to the planning department ERO for review and approval before the issuance of a permit for the generator. Once operational, all diesel backup generators shall be maintained in good working order for the life of the equipment, and any future replacement of the diesel backup generators must be consistent with these emissions specifications. The operator of the facility at which the generator is located shall maintain records of the testing schedule for each diesel backup generator for the life of that diesel backup generator and shall provide this information for review to the planning department within three months of requesting such information.

Mitigation Measure M-AQ-4b: Operational Truck Emissions Reduction. *Should a project-specific analysis determine that a subsequent RADP project would result in a significant criteria air pollutants impact, this mitigation measure would be required.* The project sponsor shall comply with the following requirements:

1. Prohibit transport refrigeration units (TRUs) from operating at loading docks for more than 30 minutes. Post signs at each loading dock identifying this TRU limit.
2. Prohibit trucks from idling for more than two minutes. Post "no idling" signs at the site entry point, at all loading locations, and throughout the project site.
3. Encourage the use of trucks equipped with TRUs that meet U.S. EPA Tier 4 emission standards.
4. Equip all newly constructed loading docks that can accommodate trucks with TRUs with electric vehicle charging equipment for heavy-duty trucks. This measure does not apply to temporary street parking for loading or unloading.

Mitigation Measure M-AQ-4c: Education of Tenants and Vendors Concerning Low-VOC Consumer Products. *Should a project-specific analysis determine that a subsequent RADP project would result in a significant criteria air pollutants impact, this mitigation measure would be required.* Before the receipt of any building permit and every five years thereafter, the project sponsor shall develop electronic correspondence to be distributed by email or posted onsite annually to tenants of the project, encouraging the purchase of consumer products and paints that generate fewer VOC emissions. The correspondence shall encourage environmentally preferable purchasing and shall include contact information and links to SF Approved (https://www.sfapproved.org/).

Mitigation Measure M-AQ-4d: Super-Compliant VOC Architectural Coatings during Operations. *Should a project-specific analysis determine that a subsequent RADP project would result in a significant criteria air pollutants impact, this mitigation measure would be required.* The project sponsor shall use "super-compliant" VOC architectural coatings during building maintenance for all interior and exterior spaces and shall include this requirement in plans submitted for review to the planning department. The project sponsor shall submit a signed certification statement that this requirement has been incorporated into contract specifications. "Super-compliant" refers to paints that meet the more stringent regulatory limits in South Coast Air Quality Management District rule 1113, which requires a limit of 10 grams VOC per liter (http://www.aqmd.gov/home/regulations/compliance/architectural-coatings/super-compliant-coatings).

Mitigation Measure M-AQ-4e: Electric Landscaping Equipment. *Should a project-specific analysis determine that a subsequent RADP project would result in a significant criteria air pollutants impact,* *this mitigation measure would be required.* To reduce ROG emissions associated with the project, the project sponsor shall use only electric landscaping equipment. No landscaping equipment powered by gasoline, diesel, propane, or other fossil fuels shall be used. The project sponsor shall incorporate this requirement into the project design and tenant contracts (as applicable).

Mitigation Measure M-AQ-4f: Offset of Remaining ROG Emissions. Should a project-specific analysis determine that the subsequent RADP project would result in operational-related ROG emissions that exceed the air district threshold of 10 tons per year (54 pounds per day on average) after implementation of Mitigation Measures M-AQ-4a, M-AQ-4b, M-AQ-4c, M-AQ-4d, and M-AQ-4e, the project sponsor, with the oversight of the planning department, shall implement one or more of the following measures. Alternatively, the project sponsor may submit documentation to the planning department demonstrating that the project has not exceeded the ROG emissions performance standard of 10 tons per year (or 54 lb/day) for each year, or that the required emissions offset is lower than that calculated herein. Such documentation would include a recalculation of the project's ROG emissions from all sources (including the emissions reductions achieved by the project or mitigation measures) using methods generally consistent with those used in the EIR. The following identifies potential mechanisms to offset ROG emissions that exceed the 10 tons per year performance standard.

1. *Directly fund or implement a specific offset project within the air basin.* Emission reduction projects shall occur in the following locations in order of priority to the extent available and feasible: (1) at the Airport; (2) offsite within the neighborhood surrounding the Airport; (3) within the city and county of San Francisco; and (4) within the air basin. Any offsite emission reduction projects are subject to approval by the City. Such projects could include strategies and control measures such as using zero-emission trucks, upgrading locomotives with cleaner engines, replacing existing diesel stationary and standby engines with Tier 4 diesel or cleaner engines, or expanding or installing energy storage systems (e.g., batteries, fuel cells) to replace stationary sources of pollution. Before the offset project is implemented, it must be approved by the planning department, as consistent with the requirements of this mitigation measure.
2. *Pay mitigation offset fees* to an independent third party approved by the planning department. The mitigation offset fee shall fund one or more emissions reduction projects within the air basin. Emission reduction projects shall occur in the following locations in order of priority to the extent available and feasible: (1) at the Airport; (2) offsite within the neighborhood surrounding the Airport; (3) within the city of South San Francisco, San Bruno, or Millbrae; (4) within San Mateo County; and (5) within the air basin. The fee will be determined through consultation between the project sponsor and the entity and will be based on the type of projects available at the time of the payment.
3. *Memorandum of Understanding.* When paying a mitigation offset fee as described under item (2), the project sponsor shall enter into a memorandum of understanding (MOU) or other binding agreement with the independent third party. The MOU or agreement shall include details regarding the funds to be paid, the administrative fee, and the timing of the emissions reductions project(s). Acceptance of this fee by the independent third party shall serve as acknowledgment and a commitment to implement the emissions reduction project(s) within a time frame agreed upon in the MOU or agreement based on the type of project(s) selected, after receipt of the mitigation fee to achieve the emissions reduction objectives specified above.

4. *Waivers.* The ERO or designee may waive the requirement to achieve annual reductions or offsets of ROG equal to the amount required to reduce emissions below 10 tons per year (54 lb/day) after implementation of Mitigation Measures M-AQ-4a through MM-AQ-4e, and after all feasible offset projects are implemented and offset fees are paid as described above for a specific year of operational ROG emissions, if (1) sufficient ROG emission offset projects within the air basin, as described in item (1), are not available to reduce ROG emissions below 10 tons per year (54 lb/day) when they occur during project operations; (2) the offset projects or the mitigation offset fees, as described in item (3), are determined to be infeasible as defined under CEQA; or (3) the Federal Aviation Administration determines that funding offsets would violate the Airport's grant obligations.
5. *Offset Verification Report.* The project sponsor shall prepare an annual offset verification report as follows:
    a. *Offset Project Documentation:* Any offset project implemented, or offset fee paid, must result in ROG emission reductions within the air basin that are real, permanent, quantifiable, enforceable, and surplus as defined in the air district Regulation 2, Rule 2: New Source Review, sections 2-3-301, 2-2-211, 2-2-603, and 2-2-605. The project sponsor shall certify that each specific emission reduction offset project meets these requirements.

       The documentation shall quantify the ROG reduction(s) achieved by all offset projects to demonstrate that the gap between the project's mitigated emissions and the significance threshold of 10 tons per year (54 lb/day) of ROG has been met through the offset project(s). Each annual offset verification report shall demonstrate, based on substantial evidence, that the project has reduced ROG emissions below the thresholds of significance of 10 tons per year (54 lb/day) for each year of operations.

       Should the project sponsor choose to recalculate the project's annual ROG emissions and ROG offset requirement to achieve the performance standard of 10 tons per year (54 lb/day on average), the documentation shall quantify the ROG reduction(s) achieved by all offset projects to demonstrate that the gap between the project's mitigated emissions and the significance threshold of 10 tons per year (54 lb/day) of ROG has been met through the offset project(s). For this option, each offset verification report shall demonstrate, based on substantial evidence, that the project has reduced annual ROG emissions below the threshold of significance of 10 tons per year (54 lb/day). The requirement to fund an offset project(s) described in item (1) above and/or to pay mitigation offset fees through the MOU described in items (2) and (3) above shall terminate if the project sponsor is able to demonstrate that the project's operational emissions are less than 10 tons per year (54 lb/day).

    b. *Report Submittal.* The report shall be prepared by the project sponsor and submitted to the planning department for review and verification. Documentation of offset projects and mitigation offset payments, as applicable, shall be provided to the planning department for review and approval before the start of operation for the first year when project ROG emissions are predicted to exceed 10 tons per year (54 lb/day). If the planning department determines that the report is reasonably accurate, it shall approve the report; otherwise, the planning department shall identify deficiencies and direct the project sponsor to correct and resubmit the report for approval.

IMPACT WITH IMPLEMENTATION OF MITIGATION MEASURES M-AQ-4A THROUGH M-AQ-4E

Mitigated operational emissions for full buildout of the RADP in 2045 were modeled assuming 100 percent compliance with Tier 4 Final off-road compression ignition engine standards for emergency diesel generators (Mitigation Measure M-AQ-4a) and TRUs idling for less than 30 minutes and trucks idling for less than two minutes (Mitigation Measure M-AQ-4b). Mitigation Measures M-AQ-4c, M-AQ-4d, and M-AQ-4e were not modeled given uncertainties in their implementation (see further discussion below). With implementation of Mitigation Measures M-AQ-4a through M-AQ-4e, ROG emissions would be reduced by 4 percent at full buildout. See Appendix G, Air Quality Technical Appendix, for a detailed description of the assumptions and modeling methods for the mitigated scenario.

Table 3.C-15 shows the mitigated operational emissions after implementation of Mitigation Measures M-AQ-4a through M-AQ-4e.

SIGNIFICANCE AFTER MITIGATION

With implementation of Mitigation Measures M-AQ-4a through M-AQ-4e, ROG emissions from full buildout of RADP operations in 2045 would be reduced but would still exceed the air district's significance threshold. Average daily ROG emissions would be reduced by 3.0 lb/day and 0.5 ton per year.

Mitigation Measure M-AQ-4a would reduce ROG emissions from emergency diesel generators by approximately 83 percent. Mitigation Measure M-AQ-4b would reduce ROG emissions from on-road trucks by approximately 32 percent. Mitigation Measure M-AQ-4c would reduce ROG emissions from consumer products, but this was not modeled given the uncertainty in its implementation. Mitigation Measure M-AQ-4d would reduce ROG emissions from architectural coatings, but this was not modeled given the uncertainty in its implementation. Mitigation Measure M-AQ-4e would reduce ROG emissions from landscaping equipment, but this was not modeled. These measures would reduce ROG emissions, but not below the air district's significance threshold.

Therefore, Mitigation Measure M-AQ-4f is identified to further reduce operational emissions. This mitigation measure allows the project sponsor to directly fund or implement a specific ROG offset project within the air basin or to pay mitigation offset fees to an independent third party approved by the planning department, such as the air district or other governmental entity, to reduce ROG emissions within the air basin below the threshold of significance of 10 tons per year (54 lb/day) such that the impact of the implementation of the RADP would be reduced to less-than-significant levels for all years of operation.

Table 3.C-15 Mitigated Full-Buildout RADP Operational Emissions in 2045

Source	Maximum Average Daily Emissions (pounds per day) [a] ROG	NO_X	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Delivery Truck Onsite Idling	1.4	1.5	<0.1	<0.1
Delivery Truck Offsite Travel	1.9	5.8	3.4	0.7
Mobile	6.6	4.0	25.1	6.4
Consumer Products	46.1	<0.1	<0.1	<0.1
Architectural Coatings	9.6	<0.1	<0.1	<0.1
Landscaping	12.3	0.7	0.1	0.1
Generators	0.3	0.9	<0.1	<0.1
TOTAL	**78.2**	13.0	28.7	7.2
Significance Threshold	54	54	82	54
Threshold Exceeded?	**Yes**	No	No	No
Maximum Annual Emissions (tons per year) [a]				
Delivery Truck Onsite Idling	0.3	0.3	<0.1	<0.1
Delivery Truck Offsite Travel	0.3	1.1	0.6	0.1
Mobile	1.2	0.7	4.6	1.2
Consumer Products	8.4	<0.1	<0.1	<0.1
Architectural Coatings	1.8	<0.1	<0.1	<0.1
Landscaping	2.2	0.1	<0.1	<0.1
Generators	0.1	0.2	<0.1	<0.1
TOTAL	**14.3**	2.4	5.2	1.3
Significance Threshold	10	10	15	10
Threshold Exceeded?	**Yes**	No	No	No

SOURCE: Data compiled by Environmental Science Associates in 2024

ABBREVIATIONS: NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; RADP = Recommended Airport Development Plan; ROG = reactive organic gases

NOTES: Due to rounding, numbers in columns may not add to totals.

Mitigation measures include (1) Tier 4 Final emergency generators (Mitigation Measure M-AQ-4a) and (2) 30-minute transport refrigeration unit idling limit and two-minute delivery truck idling limit (Mitigation Measure M-AQ-4b).

a. **Bold** values = threshold exceedance.

However, the exact amount of ROG emission reductions achieved through Mitigation Measure M-AQ-4f is not currently known given the uncertainty regarding implementing a specific offsite emission reduction project and because no offsite emissions reduction project is known to date. In addition, the emissions reduction project(s) could be implemented by the air district or another government entity and is outside the City's jurisdiction- and control and not fully within the control of the project sponsor. Therefore, even with implementation of Mitigation Measures M-AQ-4a through M-AQ-4f, the residual impact of implementation of the RADP related to a cumulatively considerable net increase in criteria air pollutants from ROG emissions would be ***significant and unavoidable with mitigation***. This impact is largely attributable to the uncertainty regarding the implementation of Mitigation Measure M-AQ-4f. Although specific offset projects implemented through Mitigation Measure M-AQ-4f are not known, it is anticipated that implementation of this mitigation measure would not result in any adverse environmental effects. An example offset project might replace older engines with newer, cleaner engines. This would result in lower emissions in the air basin and would not result in any adverse environmental impacts. However, potential adverse environmental effects related to implementation of Mitigation Measure M-AQ-4f would need to be considered at such time it is proposed.

As discussed above, ROG emissions associated with implementation of subsequent RADP projects that exceed thresholds could contribute to new or exacerbated air quality violations in the air basin by contributing to increases in the number of days of ozone exceedance, or they could result in air quality index values that are unhealthy for sensitive groups and other populations. Due to current modeling limitations there is no reliable way to connect the RADP's exceedances of ROG emissions to increases in ozone concentrations to meaningfully determine specific human-health impacts related to increases in ozone concentrations.

Impact AQ-5 (Plan-Level and Representative Analysis of Subsequent RADP Projects): Construction and operation of RADP projects, individually or in combination, would not result in emissions of fine particulate matter ($PM_{2.5}$) or toxic air contaminants that would result in exposure of sensitive receptors to substantial air pollutant concentrations. ***(Less than Significant)***

Site preparation activities such as demolition, excavation, grading, foundation construction, and other ground-disturbing construction activity could contribute to health risks at the locations of nearby sensitive receptors during the construction phases of implementation of the RADP. Short-term construction emissions from equipment would include directly emitted $PM_{2.5}$ and TACs such as DPM. Additionally, the long-term operational emissions from the increase in employee trips, on-road diesel delivery truck trips, idling by diesel delivery trucks in loading zones, and emergency generator operations would include $PM_{2.5}$, gasoline TOG, and DPM. The generation of these short- and long-term emissions could expose sensitive receptors to substantial pollutant concentrations of TACs, resulting in a localized health risk. Therefore, an HRA was conducted for the RADP to identify maximum health risks to offsite sensitive and onsite worker receptors from construction and operational emissions of gasoline TOG, DPM, and $PM_{2.5}$.

The closest sensitive receptors to any subsequent RADP project are residents west of U.S. 101, specifically those west of the North Field area, where the CONRAC (RADP Project #9) and CONRAC Quick Turn-Around Facility (RADP Project #10) projects are located. These residents are located more than 1,000 feet from these RADP projects. Additionally, residential areas west of U.S. 101 are close to the truck delivery routes and employee travel for both construction and operations of subsequent RADP projects.

Because of the proximity to subsequent RADP project construction and operational activities, on-site workers were also included in the analysis. Exposure of on-site Airport employees and tenants' employees located in SFO terminal and administrative buildings to construction and operational TAC emissions was included in the analysis. Worker receptors were considered to be located in physical buildings within the Airport property boundary.

Health risks resulting from implementation of the RADP were analyzed according to the methods described above. Additional information on the health risk methods and assumptions can be found in Appendix G, Air Quality Technical Appendix.

EXISTING SOURCES OF HEALTH RISK

Existing sources of health risk are those producing TAC emissions within 1,000 feet of the MEISRs and MEIWs. Therefore, this analysis evaluates community risk impacts from other existing sources near the MEISRs and MEIWs in addition to risk impacts from implementation of the RADP.

For existing mobile sources, the HRA relied on BAAQMD's Mobile Source Screening Map to gather background roadway and background rail and railyard risk values at the MEISR and MEIW locations.[298] The mobile source information represents conservative health estimates reflective of 2022. Stationary sources within 1,000 feet of the MEISR and MEIW and their associated risk values were acquired through the air district's Permitted Sources Risk and Hazards Map.[299] Permitted stationary sources include a backup generator and a gasoline dispensing facility. The stationary sources are current as of 2022. The cancer risk and $PM_{2.5}$ values provided represent the risk at each stationary source (i.e., localized). To determine the health risk impact of these sources at the MEISR and MEIW, an equation based on distance that was acquired from the air district, was used to extrapolate the risk.[300] See Appendix G, Air Quality Technical Appendix, for a detailed description of the modeling methods for existing sources of TAC emissions and associated health risks.

Table 3.C-16 presents the health risks from combined construction and full buildout operations of the RADP, as well as from operation of full buildout of the RADP starting in 2045.[301] The table includes lifetime excess cancer risk (chances per million) and average annual $PM_{2.5}$ concentrations (µg/m^3) at the MEISRs and MEIWs from exposure to construction-related and operational TAC emissions. The MEISR for combined construction and operation is a residence located southwest of the Central Hub, west of U.S. 101 along Bay Street (see **Figure 3.C-2**, p. 3.C-77). The MEISR for full buildout of the RADP operational cancer risk is a residence located southwest of the U.S. 101 and I-380 interchange, along 7th Avenue. The MEISR for full buildout of the RADP operational annual-average $PM_{2.5}$ concentration is a residence located southwest of the U.S. 101 and Millbrae Avenue interchange, along Adrian Road. The MEIW for combined construction and operation is a worker located in the International Terminal Building (ITB). The MEIW for full buildout of the RADP operations is a worker located east of North McDonnell Road in a United Airlines building.

Health risks associated with implementation of the RADP are combined with background existing TAC emission sources. **Table 3.C-17**, p. 3.C-78, shows the lifetime excess cancer risk and annual-average $PM_{2.5}$ concentrations from the combined construction and operation of the RADP plus existing background sources. **Table 3.C-18**, p. 3.C-79, presents the lifetime excess cancer risk and annual-average $PM_{2.5}$ concentrations from operation at full buildout of the RADP plus existing background sources.

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[298] Bay Area Air Quality Management District, Permitted Sources Risk and Hazards Map, Rail: Cancer Risk and Roadway: Cancer Risk layers, June 2020, https://www.arcgis.com/apps/instant/sidebar/index.html?appid=7397543038c74281bf1eedeedb714dd3, accessed September 25, 2024.
[299] Ibid.
[300] Bay Area Air Quality Management District, Health Risk Calculator (Beta 4.0), 2020, https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/tools/baaqmd-health-risk-calculator-beta-4-0-xlsx.xlsx?la=en, accessed September 25, 2024.
[301] Construction risk includes modeled risk associated with construction of representative projects and estimated risk associated with the entirety of subsequent RADP projects' construction activities. For additional discussion, see Appendix G, Air Quality Technical Appendix.

Table 3.C-16 Lifetime Excess Cancer Risk and Annual-Average $PM_{2.5}$ Concentrations from Combined Construction and Operation and Full-Buildout Operation of the RADP

	Health Risks			
	Lifetime Excess Cancer Risk (chances per million)		Annual-Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)	
Scenario/Receptor Type/Phase	Receptor Location (UTM X, UTM Y)	Project Contribution	Receptor Location (UTM X, UTM Y)	Project Contribution
Combined Construction and Operation				
Resident (MEISR)	(553580, 4162660)		(553580, 4162660)	
Construction		2.2		0.01
Operation		<0.1		—
TOTAL		**2.2**		**0.01**
Threshold for RADP Contribution [a]		7.0		0.2
Threshold Exceeded?		No		No
Worker (MEIW)	(553940, 4163340)		(553940, 4163340)	
Construction		4.9		0.09
Operation		0.1		—
TOTAL		**5.0**		**0.09**
Threshold for RADP Contribution [a]		7.0		0.2
Threshold Exceeded?		No		No
Full-Buildout Operation (2045)				
Resident (MEISR)	(552480, 4165180)	0.7	(554880, 4161660)	0.02
Threshold for RADP Contribution [a]		7.0		0.2
Threshold Exceeded?		No		No
Worker (MEIW)	(553060, 4165500)	1.9	(553060, 4165500)	0.19
Threshold for RADP Contribution [a]		7.0		0.2
Threshold Exceeded?		No		No

SOURCE: Data compiled by Environmental Science Associates in 2024

ABBREVIATIONS: $\mu g/m^3$ = micrograms per cubic meters; MEISR = maximum exposed individual sensitive receptor; MEIW = maximum exposed individual worker; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in aerodynamic diameter; UTM = Universal Transverse Mercator; UTM – X = eastward-measured distance; UTM – Y = northward-measured distance

NOTE: Due to rounding, numbers in columns may not add to totals.

a. The MEISRs and MEIWs are present at locations with poor air quality and high background risk levels. For additional discussion, see Appendix G, Air Quality Technical Appendix.

SOURCE: Esri, 2024; SFO, 2024; ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 3.C-2
MAXIMAL EXPOSED INDIVIDUAL SENSITIVE RECEPTOR (MEISR) AND MAXIMUM EXPOSED INDIVIDUAL WORKER (MEIW) LOCATIONS

Table 3.C-17 Lifetime Excess Cancer Risk and Annual-Average $PM_{2.5}$ Concentrations from Combined Construction and Operation of the RADP Plus Existing Conditions

	Health Risks			
	Lifetime Excess Cancer Risk (chances per million)		Annual-Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)	
Scenario/Receptor Type/Phase	Receptor Location (UTM X, UTM Y)	Project Contribution/ Existing	Receptor Location (UTM X, UTM Y)	Project Contribution/ Existing
Combined Construction and Operation				
Resident (MEISR)	(553580, 4162660)		(553580, 4162660)	
Mobile [d]		22.6		0.69
Rail [d]		44.2		0.06
Stationary [d]		0.3		<0.01
Ambient [a]		—		7.80
TOTAL EXISTING [b]		**67.2**		**8.55**
RADP		2.2		0.01
TOTAL RADP + EXISTING		**69.4**		**8.56**
Threshold for RADP Contribution [c]		7.0		0.2
Threshold Exceeded?		No		No
Worker (MEIW)	(553940, 4163340)		(553940, 4163340)	
Mobile [d]		5.0		0.33
Rail [d]		1.6		0.01
Stationary [d]		7.5		0.16
Ambient [a]		—		7.80
TOTAL EXISTING [b]		**14.1**		**8.30**
RADP		5.0		0.09
TOTAL RADP + EXISTING		**19.2**		**8.39**
Threshold for RADP Contribution [c]		7.0		0.2
Threshold Exceeded?		No		No

SOURCES: Data compiled by Environmental Science Associates in 2024; Bay Area Air Quality Management District, Health Risk Screening and Modeling, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/health-risk-screening-and-modeling, accessed September 9, 2024; Environmental Science Associates, *Oakland International Airport Development Program (ADP) Supplemental Environmental Impact Report*, September 2003, prepared by Environmental Science Associates for the Port of Oakland; San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, February 2025, https://sfplanning.org/air-quality, accessed February 10, 2025.

ABBREVIATIONS: $\mu g/m^3$ = micrograms per cubic meters; MEISR = maximum exposed individual sensitive receptor; MEIW = maximum exposed individual worker; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in aerodynamic diameter; UTM = Universal Transverse Mercator; UTM – X = eastward-measured distance; UTM – Y = northward-measured distance

NOTE: Due to rounding, numbers in columns may not add to totals.

a. Ambient represents difference in measured and modeled $PM_{2.5}$ concentrations from San Francisco Planning Department Guidelines (2025).
b. Total existing sources included in this table do not include health risks associated with toxic air contaminant (TAC) emissions from San Francisco International Airport sources, such as aircraft landing and takeoff, aircraft taxiing, ground support equipment, and auxiliary power units. Data for these TAC emissions and their associated health risks are not readily available, and the addition of these health risks would not result in a new threshold exceedance. For additional discussion, see Appendix G, Air Quality Technical Appendix.
c. The MEISRs and MEIWs are present at locations with poor air quality and high background risk levels. For additional discussion, see Appendix G, Air Quality Technical Appendix.
d. Cancer risk from mobile, rail, and stationary for the worker receptors were scaled from Bay Area Air Quality Management District screening tools to represent worker exposure parameters because the exposure parameters incorporated into the tool are for residential risk.

Table 3.C-18 Lifetime Excess Cancer Risk and Annual-Average $PM_{2.5}$ Concentrations from Full-Buildout Operation of the RADP in 2045 Plus Existing Conditions

Scenario/Receptor Type/Phase	Health Risks: Lifetime Excess Cancer Risk (chances per million) — Receptor Location (UTM X, UTM Y)	Health Risks: Lifetime Excess Cancer Risk (chances per million) — Project Contribution/ Existing	Health Risks: Annual-Average $PM_{2.5}$ Concentrations ($\mu g/m^3$) — Receptor Location (UTM X, UTM Y)	Health Risks: Annual-Average $PM_{2.5}$ Concentrations ($\mu g/m^3$) — Project Contribution/ Existing
Full-Buildout Operation (2045)				
Resident (MEISR)	(552480, 4165180)		(554880, 4161660)	
Mobile [d]		14.5		1.31
Rail [d]		13.6		0.02
Stationary [d]		16.2		0.05
Ambient [a]		—		7.80
TOTAL EXISTING [b]		**44.2**		**9.18**
RADP		0.7		0.02
TOTAL RADP + EXISTING		**44.9**		**9.20**
Threshold for RADP Contribution [c]		7.0		0.2
Threshold Exceeded?		No		No
Worker (MEIW)	(553060, 4165500)		(553060, 4165500)	
Mobile [d]		4.1		0.37
Rail [d]		0.5		<0.01
Stationary [d]		4.3		8.66
Ambient [a]		—		7.80
TOTAL EXISTING [b]		**8.9**		**16.82**
RADP		1.9		0.19
TOTAL RADP + EXISTING		**10.8**		**17.01**
Threshold for RADP Contribution [c]		7.0		0.2
Threshold Exceeded?		No		No

SOURCES: Data compiled by Environmental Science Associates in 2024; Bay Area Air Quality Management District, Health Risk Screening and Modeling, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/health-risk-screening-and-modeling, accessed September 9, 2024; Environmental Science Associates, *Oakland International Airport Development Program (ADP) Supplemental Environmental Impact Report*, September 2003, prepared by Environmental Science Associates for the Port of Oakland; San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, February 2025, https://sfplanning.org/air-quality, accessed February 10, 2025.

ABBREVIATIONS: $\mu g/m^3$ = micrograms per cubic meters; MEISR = maximum exposed individual sensitive receptor; MEIW = maximum exposed individual worker; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in aerodynamic diameter; UTM = Universal Transverse Mercator; UTM – X = eastward-measured distance; UTM – Y = northward-measured distance

NOTES: Due to rounding, numbers in columns may not add to totals.

a. Ambient represents difference in measured and modeled $PM_{2.5}$. Concentrations from San Francisco Planning Department guidance (2024).
b. Total existing sources included in this table do not include health risks associated with toxic air contaminant (TAC) emissions from San Francisco International Airport sources, such as aircraft landing and takeoff, aircraft taxiing, ground support equipment, and auxiliary power units. Data for these TAC emissions and their associated health risks are not readily available, and the addition of these health risks would not result in a new threshold exceedance. For additional discussion, see Appendix G, Air Quality Technical Appendix.
c. The MEISRs and MEIWs are present at locations with poor air quality and high background risk levels.
d. Cancer risk from mobile, rail, and stationary for the worker receptors were scaled from Bay Area Air Quality Management District screening tools to represent worker exposure parameters because the exposure parameters incorporated into the tool are for residential risk.

COMBINED CONSTRUCTION AND OPERATION

LIFETIME EXCESS CANCER RISK

For the MEISR, as shown in Table 3.C-17, p. 3.C-78, implementation of the RADP would increase the lifetime excess cancer risk by 2.2 per 1 million. The MEISR is located west of U.S. 101 along Bay Street, which is within 500 feet of U.S. 101 and thus meets the criteria for high background risk levels (see Figure 3.C-2, p. 3.C-77). Therefore, the threshold of 7.0 per 1 million applies. Because the contribution from the RADP would not exceed the threshold, this impact would be less than significant.

For the MEIW, implementation of the RADP would increase the lifetime excess cancer risk by 5.0 per 1 million. The MEIW is located at the ITB (see Figure 3.C-2, p. 3.C-77). Given the MEIW's proximity to high volume roadways, stationary TAC sources, and Airport TAC sources, the MEIW is considered to meet the criteria for high background risk levels. Therefore, the threshold of 7.0 per 1 million applies. Because the contribution from the RADP would not exceed the threshold, this impact would be less than significant.

ANNUAL-AVERAGE $PM_{2.5}$ CONCENTRATIONS

For the MEISR, as shown in Table 3.C-17, p. 3.C-78, the RADP would increase the annual average $PM_{2.5}$ concentration by 0.01 $\mu g/m^3$. The MEISR is located west of U.S. 101 along Bay Street, which is within 500 feet of U.S. 101 and thus meets the criteria for high background risk levels (see Figure 3.C-2, p. 3.C-77). Therefore, the threshold of 0.2 $\mu g/m^3$ applies. Because the contribution from the RADP would not exceed the threshold, this impact would be less than significant.

For the MEIW, implementation of the RADP would increase the annual average $PM_{2.5}$ concentration by 0.09 $\mu g/m^3$. The MEIW is located at the ITB (see Figure 3.C-2, p. 3.C-77). Given the MEIW's proximity to high volume roadways, stationary TAC sources, and Airport TAC sources, the MEIW is considered to meet the criteria for high background risk levels. Therefore, the threshold of 0.2 $\mu g/m^3$ applies. Because the contribution from the RADP would not exceed the threshold, this impact would be less than significant.

FULL-BUILDOUT OPERATION

LIFETIME EXCESS CANCER RISK

For the MEISR, as shown in Table 3.C-18, p. 3.C-79, implementation of the RADP would increase the lifetime excess cancer risk by 0.7 per 1 million. The MEISR is located southwest of the U.S. 101 and I-380 interchange, along 7th Avenue, which is within 500 feet of U.S. 101 and thus meets the criteria for high background risk levels (see Figure 3.C-2, p. 3.C-77). Therefore, the threshold of 7.0 per 1 million applies. Because the contribution from the RADP would not exceed the threshold, this impact would be less than significant.

For the MEIW, implementation of the RADP would increase the lifetime excess cancer risk by 1.9 per 1 million. The MEIW is located east of North McDonnell Road in a United Airlines building (see Figure 3.C-2, p. 3.C-77). Given the MEIW's proximity to U.S. 101, stationary TAC sources, and Airport TAC sources, the MEIW is considered to meet the criteria for high background risk levels. As such, the threshold of 7.0 per 1 million applies. Because the contribution from the RADP would not exceed the threshold, this impact would be less than significant.

ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS

For the MEISR, as shown in Table 3.C-18, p. 3.C-79, implementation of the RADP would increase the annual-average $PM_{2.5}$ concentration by 0.02 µg/m^3. The MEISR is located southwest of the U.S. 101 and Millbrae Avenue interchange, along Adrian Road, which is within 500 feet of U.S. 101 and thus meets the criteria for high background risk levels (see Figure 3.C-2, p. 3.C-77). Therefore, the threshold of 0.2 µg/m^3 applies. Because the contribution from the RADP would not exceed the threshold, this impact would be less than significant.

For the MEIW, implementation of the RADP would increase the annual-average $PM_{2.5}$ concentration by 0.19 µg/m^3. The MEIW is located east of North McDonnell Road in a United Airlines building (see Figure 3.C-2, p. 3.C-77). Given the MEIW's proximity to U.S. 101, stationary TAC sources, and Airport TAC sources, the MEIW is considered to meet the criteria for high background risk levels. Therefore, the threshold of 0.2 µg/m^3 applies. Because the contribution from the RADP would not exceed the threshold, this impact would be less than significant.

SUMMARY

In summary, Table 3.C-17 and Table 3.C-18, pp. 3.C-78 and 3.C-79, show that for all MEISRs and MEIWs, the excess lifetime cancer risk would not exceed significance thresholds for construction and full-buildout operation of the RADP. In addition, the annual-average $PM_{2.5}$ concentrations do not exceed significance thresholds at any MEISR or MEIW receptor location for construction and full-buildout operation of the RADP. See Appendix G, Air Quality Technical Appendix, for additional detailed health risk results. Lifetime cancer risk and annual-average $PM_{2.5}$ concentrations associated with construction and operation of subsequent RADP projects would be lower than these values because the health risk values presented above represent exposure of receptors to TAC emissions from construction and operation of all of the subsequent RADP projects; therefore, each individual subsequent project would result in lower health risk values. Thus, lifetime cancer risk and annual-average $PM_{2.5}$ concentrations would not exceed significance thresholds at any MEISR or MEIW receptor location for construction and full-buildout operation of any subsequent RADP project. Therefore, construction and operation of the RADP, including construction and operation of subsequent RADP projects, would be ***less than significant***, and no mitigation is required.

Impact AQ-6 (Representative Analysis of Subsequent RADP Projects): Construction and operation of RADP projects would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. *(Less than Significant)*

The occurrence and severity of potential odor impacts depends on numerous factors, such as the nature, frequency, and intensity of the source, wind speed and direction, and the sensitivity of the receiving location. Each factor contributes to the intensity of the impact. Although offensive odors rarely cause any physical harm, they can be unpleasant, cause distress among the public, and generate citizen complaints. Typical odor sources of concern include wastewater treatment plants, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing facilities, fiberglass manufacturing facilities, auto body shops, rendering plants, and coffee roasting facilities.

Existing Airport uses are not sources of odorous emissions, except for those associated with food preparation at restaurants within the terminals. These types of odors are generally minor and not considered offensive. During construction, the various diesel-powered vehicles and equipment would create localized odors while in use. During excavation activities, organic materials could be temporarily exposed to the air. These odors would be temporary and intermittent and are not likely to be noticeable for extended periods of time beyond the boundaries of the Airport. Therefore, the potential for diesel or organic material odor impacts would be less than significant.

Implementation of the RADP is expected to generate only minor sources of odor. Although there may be some potential for small-scale, localized odor issues to emerge around subsequent RADP project sources such as solid waste collection and food preparation, substantial odor sources and consequent effects on onsite worker and offsite sensitive receptors would not occur. Air district Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds if it receives more than a minimum number of complaints. Therefore, because implementation of the RADP would not include substantial sources of odorous emissions and would need to follow applicable regulations with respect to odors, odor impacts would be ***less than significant***.

Cumulative Impacts

As described above under Methods for Analysis of Cumulative Impacts, p. 3.C-43, the project-specific thresholds of significance for criteria air pollutants are based on levels by which new sources would not result in a cumulatively considerable net increase in nonattainment criteria air pollutants. Criteria air pollutant emissions associated with implementation of the RADP are addressed under Impacts AQ-1a, AQ-1b, and AQ-1c. Therefore, no separate cumulative criteria air pollutant analysis is required.

Impact C-AQ-1: Construction and operation of the RADP, in combination with cumulative projects, would not result in exposure of sensitive receptors to substantial levels of fine particulate matter ($PM_{2.5}$) and toxic air contaminants under cumulative conditions. *(Less than Significant)*

This section presents information regarding potential cumulative health risks in combination with the existing plus RADP health risks at the RADP MEISRs and MEIWs. The air district identified a distance of 1,000 feet as an appropriate zone of influence for assessing health risk impacts and specifies that cumulative sources represent the combined total risk values of each individual source within the 1,000-foot evaluation zone.[302] Health risk impacts are localized, and TAC concentrations typically decrease substantially or can even be indistinguishable from upwind background concentrations beyond approximately 1,000 feet from the emissions source.[303] Therefore, the geographic context for cumulative health risk effects is evaluated considering cumulative projects within 1,000 feet of the RADP MEISRs and MEIWs.

Table 3.C-19 lists cumulative projects in the vicinity of the RADP (see Table 3-2, p. 3-8, for a description of each cumulative project). As shown, all but one of the cumulative projects are located at distances greater than 1,000 feet from the project MEISRs and MEIWs. This project is the Moxy Hotel, Millbrae, which is located within 700 feet from the operational annual average $PM_{2.5}$ concentration MEISR. Table 3.C-19 lists the cumulative projects and provides the expected risk sources associated with each project and the project distances from the RADP's MEISRs and MEIWs. Cumulative health risks for these projects were analyzed qualitatively. However, because of the lack of available emissions data for the cumulative projects, cumulative health risks were not evaluated quantitatively.

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[302] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, May 2017, p. 5-2.
[303] Bay Area Air Quality Management District, *Recommended Methods for Screening and Modeling Local Risks and Hazards*, May 2012, https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en&rev=3ed5e81662784057941d97b851900d19, accessed September 29, 2024.

Table 3.C-19 Cumulative Projects

Location	Project Name [a]	Potential Source of Health Risk	Distance from MEISR (feet) [b] CSTN + OPS	Distance from MEISR (feet) [b] FB OPS Cancer	Distance from MEISR (feet) [b] FB OPS $PM_{2.5}$	Distance from MEIW (feet) [b] CSTN + OPS	Distance from MEIW (feet) [b] FB OPS
On Airport-owned West of Bayshore	2019–2029 San Francisco Garter Snake Recovery Action Plan (Case No. 2008.0498EN)	Construction DPM and $PM_{2.5}$	1,000 to 5,000[c]	1,000 to 5,000[c]	6,500 to 10,000+[c]	2,500 to 5,500[c]	2,500 to 9,000[c]
On Airport property	Consolidated Administration Campus Phase 2 (Case No. 2019-006583ETM)	Construction DPM and $PM_{2.5}$; operational emergency generator DPM and $PM_{2.5}$	5,000	4,500	10,000+	3,600	4,900
On Airport property	West Field Cargo Redevelopment (Case No. 2020-008656ENV)	Construction DPM and $PM_{2.5}$; operational emergency generator DPM and $PM_{2.5}$	5,000	4,800	10,000+	3,600	4,900
On Airport property	Shoreline Protection Program (Case No. 2020-004398ENV)	Construction DPM and $PM_{2.5}$	3,300 to 10,000+[c]	2,000 to 10,000+[c]	1,600 to 10,000+[c]	4,200 to 9,800[c]	1,200 to 10,000+[c]
On Airport property	Recycled Water Distribution Pipeline System (Case No. 2020-004658ENV)	Construction DPM and $PM_{2.5}$	1,000 to 10,000+[c]	1,000 to 10,000+[c]	1,600 to 10,000+[c]	4,200 to 9,800[c]	1,200 to 10,000+[c]
On Airport property	Underground Pipeline and Pump Station Upgrades	Construction DPM and $PM_{2.5}$	1,000 to 10,000+[c]	1,000 to 10,000+[c]	1,600 to 10,000+[c]	4,200 to 9,800[c]	1,200 to 10,000+[c]
On Airport property	North Field Maintenance Facilities (Case No. 2023-006288ENV)	Construction DPM and $PM_{2.5}$	10,000+	6,200	10,000+	8,000	3,800
On Airport property	Pipeline Replacement to South San Francisco Water Treatment Plant (Case No. 2021-010709ENV)	Construction DPM and $PM_{2.5}$	1,000 to 10,000+[c]	1,000 to 10,000+[c]	1,600 to 10,000+[c]	4,200 to 9,800[c]	1,200 to 10,000+[c]
On Airport property	Plot 10F Demolition and Paving and Cargo Building 662 (Case No. 2022-003521ENV)	Construction DPM and $PM_{2.5}$	5,000	5,000	10,000	3,600	4,900

Location	Project Name [a]	Potential Source of Health Risk	Distance from MEISR (feet) [b]			Distance from MEIW (feet) [b]	
			CSTN + OPS	FB OPS Cancer	FB OPS $PM_{2.5}$	CSTN + OPS	FB OPS
On Airport property	Boarding Area C Renovation (Case No. 2007.1149E)	Construction DPM and $PM_{2.5}$	3,000	9,000	5,300	1,400	8,700
401 E. Millbrae Avenue, 0.1 mile south of Airport property	Moxy Hotel, Millbrae	Construction DPM and $PM_{2.5}$; operational emergency generator DPM and $PM_{2.5}$	5,000	10,000+	700	5,100	10,000+
San Bruno	Tanforan	Construction DPM and $PM_{2.5}$; operational emergency generator DPM and $PM_{2.5}$	10,000+	3,400	10,000+	10,000+	5,500
San Bruno	1000 San Mateo Avenue	Construction DPM and $PM_{2.5}$; operational emergency generator and warehouse trucking sources DPM and $PM_{2.5}$	10,000+	1,200	10,000+	9,300	3,300
Millbrae	1100 El Camino Real (El Rancho Inn Redevelopment)	Construction DPM and $PM_{2.5}$	1,200	9,200	3,000	3,600	9,900
Millbrae	150 Serra Avenue (Millbrae Serra Station)	Construction DPM and $PM_{2.5}$; operational emergency generator and delivery truck sources DPM and $PM_{2.5}$	5,000	10,000+	2,000	6,600	10,000+
South San Francisco	Terminal 101 Redevelopment	Construction DPM and $PM_{2.5}$; operational emergency generator and delivery truck sources DPM and $PM_{2.5}$	10,000+	3,700	10,000+	10,000+	4,700
South San Francisco	Infinite 131 Project	Construction DPM and $PM_{2.5}$; operational emergency generator and delivery truck sources DPM and $PM_{2.5}$	10,000+	3,700	10,000+	10,000+	4,700

Location	Project Name [a]	Potential Source of Health Risk	Distance from MEISR (feet) [b]			Distance from MEIW (feet) [b]	
			CSTN + OPS	FB OPS Cancer	FB OPS $PM_{2.5}$	CSTN + OPS	FB OPS
South San Francisco	A-1 Self Storage	Construction DPM and $PM_{2.5}$; operational moving truck sources DPM and $PM_{2.5}$	10,000+	8,700	10,000+	10,000+	7,300
Millbrae/Burlingame	OneShoreline	Construction DPM and $PM_{2.5}$	7,700	10,000+	2,900	7,900	10,000+

SOURCES: City of South San Francisco Development and Construction Map, 2023; City of San Bruno Major Development Projects, 2022; City of Millbrae Active Development Projects, 2023; City of Burlingame Major Projects, 2024; and SFO Five-Year Capital Plan, 2015.

ABBREVIATIONS: Airport = San Francisco International Airport; City = City and County of San Francisco; CSTN + OPS = Construction plus operations; DPM = diesel particulate matter; FB OPS = full-buildout operations; MEISR = maximum exposed individual sensitive receptor; MEIW = maximum exposed individual worker; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in aerodynamic diameter; SFO = San Francisco International Airport

NOTE:

a. Project descriptions are provided in Table 3-2, p. 3-8.
b. The distance from the MEISR and MEIW is the distance from the cumulative project to the receptor location from the Plan-level analysis presented in Table 3.C-16 under Impact AQ-5. Each column represents a different receptor location based on different TAC exposure scenarios (e.g., construction plus operational TAC emissions), as defined above.
c. The cumulative project is or will be occurring at multiple locations on Airport property.

Implementation of the RADP would not emit DPM and $PM_{2.5}$ that would lead to a significant health risk impact, as discussed under Impact AQ-5. This impact, combined with the health risk impact from DPM and $PM_{2.5}$ emissions from construction and operation of the cumulative projects discussed above, would not result in a significant cumulative health risk impact.

The next step in the cumulative impact analysis is to determine whether the RADP's health risk contribution would be cumulatively considerable. The thresholds of significance used to evaluate community health risks and hazards from new sources of TACs is based on the potential for the RADP projects to contribute cumulatively considerable incremental health risks at sensitive receptor locations. Therefore, the project-level thresholds are by nature cumulative thresholds. Furthermore, as discussed under Impact AQ-5, the RADP would not result in a significant health risk impact and therefore would not result in a cumulatively considerable health risk impact.

Sensitive receptors close to construction activities associated with the Moxy Hotel, Millbrae may experience high background risk levels. The annual-average $PM_{2.5}$ concentration from operations of the RADP at the MEISR, which is southwest of the U.S. 101 and Millbrae Avenue interchange, along Adrian Road, is 0.01 $\mu g/m^3$. Therefore, although the contribution of the Moxy Hotel, Millbrae project would increase background risk levels, the contribution of the RADP does not exceed the thresholds of significance.

As discussed under Impact AQ-5, for all MEISRs and MEIWs associated with RADP implementation, the excess lifetime cancer risk and annual-average $PM_{2.5}$ concentrations would not exceed significance thresholds. All MEISRs are located within 500 feet of U.S. 101, which means that they meet the high background risk levels criteria without the contribution from the RADP, as shown in Table 3.C-17 and Table 3.C-18, pp. 3.C-78 and 3.C-79. The full-buildout (2045) MEIW also meets the background risk levels criteria because the background annual-average $PM_{2.5}$ concentration is 16.8 $\mu g/m^3$, which exceeds the background risk level criterion of 10 $\mu g/m^3$ without the contribution from the RADP, as presented in Table 3.C-18, page 3.C-79. Additionally, given the proximity of the MEIWs to U.S. 101, stationary TAC sources, and Airport TAC sources, the MEIWs are considered to meet the criteria for high background risk levels.

The contribution from these cumulative projects would increase health risks at the MEISR and MEIW locations. However, as discussed under Impact AQ-5, for all MEISRs and MEIWs, the excess lifetime cancer risk and annual-average $PM_{2.5}$ concentrations would not exceed significance thresholds for the RADP. Therefore, the RADP in combination with cumulative projects, would not result in a considerable contribution to significant cumulative health risk impacts. The cumulative health risk impact would be ***less than significant***, and no mitigation is required.

Impact C-AQ-2: Construction and operation of the RADP, in combination with cumulative projects, would not combine with other sources of odors that would adversely affect a substantial number of people. *(Less than Significant)*

Impact AQ-6 describes the potential for odorous emissions to occur from implementation of the RADP. The Mel Leong Treatment Plant is a source of odorous emissions located at the northeast end of the Airport and more than 1 mile from the closest residential sensitive receptor. The South San Francisco – San Bruno Water Quality Control Plan, located approximately 700 feet north of the United Airlines Maintenance and Operations Center, is another source of odorous emissions located more than 0.5 mile from the closest residential sensitive receptor. Construction activities associated with implementation of the RADP could be a source of odorous emissions, mainly from diesel fuel combustion, but these emissions would be temporary and intermittent. Therefore, the RADP would not combine with cumulative projects to result in a significant cumulative impact and the cumulative impact would be ***less than significant***, and no mitigation is required.

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CHAPTER 4
OTHER CEQA CONSIDERATIONS

4.A Introduction

This chapter discusses the following topics in relation to implementation of the RADP: growth-inducing impacts, significant unavoidable impacts, significant irreversible impacts, and areas of known controversy and issues to be resolved.

4.B Growth-Inducing Impacts

The California Environmental Quality Act (CEQA) Guidelines require that an environmental impact report (EIR) evaluate the growth-inducing impacts of a proposed action (section 15126.2(e)). A growth-inducing impact is defined in CEQA Guidelines section 15126.2(e) as:

> *[T]he ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth … It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.*

A project can have direct and/or indirect growth-inducement potential. Direct growth inducement would result if a project involved construction of new housing that would result in new residents moving to the area. A project can have indirect growth-inducement potential if it would establish substantial new permanent employment opportunities (e.g., commercial, industrial, governmental enterprises) or if it would involve a substantial construction effort with substantial short-term employment opportunities and indirectly stimulate the need for additional housing and services to support the new employment demand. Similarly, under CEQA, a project would indirectly induce growth if it would remove an obstacle to additional growth and development, such as removing a constraint on a required public service (e.g., a wastewater treatment facility). Increases in population could strain existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. The CEQA Guidelines also require analysis of the characteristics of projects that may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively.

As described in Chapter 2, Project Description, the RADP serves as a framework for future development at SFO. It identifies various projects that would facilitate the development of terminal and non-movement areas of the airfield, as well as landside facilities needed to accommodate the Airport's long-term passenger activity levels. The RADP includes no residential uses or extensions of roads or other infrastructure outside of SFO property that could induce substantial unplanned population growth.

As discussed under Section E.3, Population and Housing, of the initial study (included as Appendix B of this Draft EIR), the employment population introduced with implementation of the RADP (approximately 2,700 employees) would constitute approximately 5.26, 1.42, and 0.23 percent of the projected employment increase in San Mateo County, San Francisco, and the bay area region, respectively. The employment growth attributable to implementation of the RADP is anticipated under current regional planning goals. Therefore, implementation of the RADP would not result in substantial unplanned direct or indirect employment population growth.

4.C Significant Unavoidable Environmental Impacts

CEQA Guidelines section 15126.2(c) requires that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible mitigation measures. With the exception of the impact identified below, this Draft EIR and the initial study included as Appendix B of this Draft EIR determined that the RADP would result in either no impacts, less-than-significant impacts, or impacts that can be reduced to less than significant with mitigation.

This Draft EIR identifies that the following impact would be significant and unavoidable even after implementation of mitigation measures.

4.C.1 Air Quality

During operation of the RADP, there would be a cumulatively considerable net increase of the criteria air pollutant reactive organic gas (ROG), a precursor pollutant for ozone, for which the region is in nonattainment under an applicable federal or state ambient air quality standard (Impact AQ-4).

4.D Significant Irreversible Environmental Impacts

In accordance with CEQA section 21100(b)(2)(B) and CEQA Guidelines section 15126.2(d), an EIR must identify any significant irreversible environmental changes that could result from implementation of a proposed project. This may include current or future uses of non-renewable resources, secondary or growth-inducing impacts that commit future uses of non-renewable resources, and secondary or growth-inducing impacts that commit future generations to similar uses. According to the CEQA Guidelines, irretrievable commitments of resources should be evaluated to ensure that such current consumption is justified. In general, irreversible commitments of resources include energy consumed and materials used during construction and operation of a proposed project. Adoption of the RADP would not immediately result in new development or result in direct physical changes in the environment. However, certain uses and activities, referred to as subsequent projects, are considered the logical consequences of adopting and implementing the RADP.

The consumption of nonrenewable resources includes conversion of agricultural lands and lost access to mining reserves. As discussed in the initial study (see Appendix B attached to this Draft EIR), no prime farmland, unique farmland, farmland of statewide importance is located in the RADP study area. Therefore, no existing agricultural lands would be converted to non-agricultural uses. In addition, the RADP study area does not contain known mineral resources and does not serve as a mining reserve; therefore, implementation of the RADP would not result in the loss of access to mining reserves.

No significant environmental damage, such as accidental spills or explosions of hazardous materials, is anticipated with implementation of the RADP. Compliance with federal and state regulations would ensure that this potential impact would be reduced to a less-than-significant level.

Construction of subsequent projects that could occur under the RADP would require a commitment of energy resources, such as gasoline, diesel, and oil, to fuel and maintain construction equipment. Construction of subsequent projects would also require the commitment of materials, such as steel, other metals, concrete, sand, soil, and rock.

As discussed in Section E.8, Greenhouse Gas Emissions, of the initial study in Appendix B of this Draft EIR, implementation of the RADP would not result in any significant impacts associated with an increase in greenhouse gas emissions or conflict with measures adopted for the purpose of reducing such emissions because subsequent RADP projects would comply with the regulations listed in the City's Greenhouse Gas Reduction Strategy. In addition, implementation of the RADP would not require the construction of major new utility lines to deliver natural gas because all RADP buildings and facilities would be constructed as all-electric buildings and would consume no natural gas.

Operational energy consumption pursuant to RADP implementation would include electricity, as well as fuel used by employees. Electricity would be used for building space heating and lighting and for the operation of equipment and machines. New operational sources with implementation of the RADP would also include emergency generators, which would require diesel fuel. However, as discussed in Section E.20, Energy, of the initial study (included as Appendix B of this Draft EIR), as a condition of project approval, all plans, specifications, calculations, and methods of construction for subsequent RADP projects would meet the requirements of the California Building Code in accordance with the Airport Building Regulations (Appendix F of the SFO Rules and Regulations), which would ensure the efficient use of fuel, water, and energy during project construction and operation. As further discussed in Section E.20, Energy, subsequent RADP projects would be constructed and operated in accordance with SFO's Sustainable Planning, Design, and Construction standards and would meet or exceed Leadership in Energy and Environmental Design Gold standards, thereby maximizing energy efficiency. Furthermore, subsequent RADP projects would be subject to the most current energy and water efficiency standards in effect at the time the projects are proposed.

The consumption of nonrenewable resources includes conversion of agricultural lands and lost access to mining reserves. As discussed in Section E.21, Agriculture and Forestry Resources, of the initial study (included as Appendix B of this Draft EIR), the RADP project site does not contain any prime farmland, unique farmland, or farmland of statewide importance. Therefore, no existing agricultural lands would be converted to non-agricultural uses. As discussed in Section E.19, Minerals, of the initial study, the RADP project site does not contain known mineral resources and does not serve as a mining reserve. Therefore, the RADP would not result in the loss of access to mining reserves. Finally, as discussed in Section E.18, Hazards and Hazardous Materials, of the initial study, compliance with federal, state, and local regulations would ensure that RADP construction and operation activities would not result in the release of hazardous materials into the environment. Therefore, no irreversible changes related to hazardous substances would result from implementation of the RADP.

4.E Areas of Known Controversy and Issues to Be Resolved

In accordance with CEQA Guidelines section 15082, the planning department, as lead agency, published and distributed a Notice of Preparation (NOP) to governmental agencies, organizations, and persons who may have an interest in the RADP on May 22, 2019. Publication of the NOP initiated a 30-day public review and comment period that began on May 22, 2019, and ended on June 21, 2019. The NOP requested that agencies and interested parties comment on environmental issues that should be addressed in the Draft EIR. Scoping meetings were held on May 30, 2019, in San Francisco, and on June 4, 2019, in Millbrae, to explain the environmental review process for the RADP and to provide opportunity to take public comment and concerns related to the RADP's environmental issues. During the review and comment period, comments were submitted to the planning department by agencies and members of the public. The NOP and comments on the NOP are included in Appendix A of this Draft EIR.

To the extent the comments received on the NOP relate to environmental issues, they are addressed and analyzed throughout this Draft EIR and initial study (see Appendix B), which is considered part of this Draft EIR. Any comments related to the RADP's merits that cannot be addressed through the CEQA process will be provided to decision-makers as part of the entitlement process.

Comments received on the NOP included the following topics:

- Potential construction and operational impacts related to local and regional air quality
- Potential noise, vibration, air quality, health risk, safety, and other impacts related to aircraft operations
- Potential impacts related to greenhouse gas emissions from air traffic, vehicle miles traveled, and ground support vehicles and equipment
- Potential impacts related to ground-based noise and vibration from demolition, new construction, and Airport configuration, including the proposed realignment of Taxiways A and B
- Potential hydrological impacts related to impervious services
- Potential impacts related to traffic congestion

CHAPTER 5
ALTERNATIVES

5.A Introduction

This chapter presents the alternatives analysis for SFO's Recommended Airport Development Plan (RADP). The discussion includes the methodology used to select alternatives to the RADP for detailed CEQA analysis, with the intent of developing potentially feasible alternatives that could avoid or substantially lessen the significant impacts identified for implementation of the RADP while still meeting most of the project's basic objectives. This chapter identifies a reasonable range of alternatives that meet these criteria, and these alternatives are evaluated for their comparative merits with respect to minimizing adverse environmental effects. Based on this analysis, this chapter then identifies the environmentally superior alternative. Finally, other alternative concepts that were considered but eliminated from detailed consideration are described along with the reasons for their elimination.

5.B CEQA Requirements for Alternatives Analysis

CEQA Guidelines section 15126.6(a) states that an environmental impact report (EIR) must describe and evaluate a reasonable range of alternatives to the proposed project that would feasibly attain most of the project's basic objectives but would avoid or substantially lessen any identified significant adverse environmental effects of the project. An EIR is not required to consider every conceivable alternative to a proposed project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation.

The EIR must evaluate the comparative merits of the alternatives and include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. Specifically, the CEQA Guidelines set forth the following criteria for selecting and evaluating alternatives:

- "An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible" (section 15126.6[a]).
- "[T]he discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly" (section 15126.6[b]).
- "The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects" (section 15126.6[c]).

- “The specific alternative of ‘no project’ shall also be evaluated along with its impact” (section 15126.6[e][1]).
- “The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making” (section 15126.6[f]).

5.C Project Objectives

As presented in Chapter 2, Project Description, the project sponsor identified the following objectives for the RADP, which are presented below for use in the identification, selection, and evaluation of alternatives.

1. Provide a long-range development plan that elevates the passenger experience at the Airport and accommodates forecast passenger demand and aviation activity in a safe, cost-effective, operationally efficient, environmentally conscious, and flexible manner.
2. Maximize *practical airfield capacity*[304] and operational efficiency in the existing physical geometry of the runways; there would be no changes to the existing runways geometry and configuration under the RADP.
3. Maximize gate capacity, geometry, and flexibility of airline use to efficiently accommodate forecast aviation activity, without relying on remote gates/hard stands that would require bussing operations to accommodate boarding/deplaning passengers on the airfield.
4. Optimize passenger processing areas including terminal lobby and security check point flows to meet future needs and incorporate new technologies.
5. Maximize shared-use facilities in the terminal areas and Airport and airline support facilities, as well as enable shared use by providing technology, bag claim flexibility, and connectivity for passengers and baggage across all terminals.
6. Achieve industry standards and airport planning principles by prioritizing efficient flow of aircraft, passengers, and goods through the Airport, through optimizing flows in the following order of priority: Airport operations area/airside; Airport facilities that are passenger facing such as terminals and gate areas, and associated passenger/aircraft support facilities (e.g., ground service equipment); landside Airport facilities including ground transportation, passenger parking, and rental car facility; other Airport and airline support facilities within the Airport property; and off-Airport uses such as catering, warehousing, and remote passenger parking.
7. Provide sufficient on-Airport parking to accommodate passenger demand and transport passengers and employees to/from the terminal areas using AirTrain to the greatest extent possible.

[304] *Practical airfield capacity* is defined as the number of flights and operations the existing airfield can accept without incurring severe and unrecoverable delays. Several factors contribute to practical airfield capacity at an airport, including runway configuration and geometry, weather conditions (for wind and visibility), and type of aircraft.

5.D Summary of Significant Impacts

As described in Draft EIR Chapter 2, Project Description, the RADP would not immediately result in new development. The RADP serves as a framework for future development at SFO and identifies various projects that would provide the terminal and landside facilities needed to accommodate long-term operations and passenger activity levels at the Airport. Therefore, the Draft EIR and the initial study included as Appendix B to the Draft EIR analyze the potential environmental effects of subsequent projects that could occur with implementation of the RADP.

The initial study (Appendix B) determined that subsequent projects that could occur with implementation of the RADP would have either no significant impacts, less-than-significant impacts, or impacts that can be reduced to less than significant with mitigation for the following resource topic areas: land use and planning, aesthetics, population and housing, cultural resources, tribal cultural resources, greenhouse gas (GHG) emissions, wind, shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, mineral resources, energy, agriculture and forestry resources, and wildfire. These topics are analyzed in the initial study and are not analyzed in further detail in this Draft EIR but are incorporated herein by reference, as the initial study is an attachment to and part of this Draft EIR.

The initial study found that implementation of the RADP could result in significant impacts associated with the resource topic areas listed below. Accordingly, Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, of this Draft EIR presents a detailed discussion and analysis of these resource topic areas.

- Section 3.A, Transportation and Circulation
- Section 3.B, Noise and Vibration
- Section 3.C, Air Quality

This Draft EIR determines that implementation of the RADP would result in less-than-significant impacts or impacts that can be reduced to less than significant with mitigation for all impacts related to transportation and circulation and noise and vibration. This Draft EIR determines that implementation of the RADP would result in less-than-significant impacts or impacts that can be reduced to less than significant with mitigation for all but one impact related to air quality.

Specifically, as discussed under Impact AQ-4 in Section 3.C, Air Quality, the analysis determines that, even with implementation of Mitigation Measures M-AQ-4a, M-AQ-4b, M-AQ-4c, M-AQ-4d, M-AQ-4e, and M-AQ-4f, impacts under the RADP related to a cumulatively considerable net increase of the criteria air pollutants from reactive organic gases (ROG) emissions during operation would be significant and unavoidable, and no additional feasible mitigation is available to reduce this impact to a less-than-significant level.[305]

[305] Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG—are also sometimes referred to as *volatile organic compounds* by some regulatory agencies—and oxides of nitrogen (NO_X) in the presence of sunlight. The main sources of ROG and NO_X, often referred to as *ozone precursors*, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels.

5.E Alternatives Screening and Selection

In accordance with CEQA Guidelines section 15126.6(a), this Draft EIR examines a reasonable range of alternatives to the RADP. An alternative selected for analysis must meet three criteria: (1) The alternative would attain most of the project's basic objectives, (2) the alternative would avoid or substantially lessen the significant environmental impacts under the RADP, and (3) the alternative would be potentially feasible. An EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. Furthermore, an EIR need not consider every conceivable alternative, but must consider a reasonable range of alternatives to foster informed decision-making and public participation.

Consideration of the criteria described above resulted in a focused screening of a range of project alternatives that would meet the requirements of CEQA. A key consideration in the screening of alternatives was avoidance or reduction of the identified significant adverse effect on air quality (i.e., operational ROG emissions) that would result with implementation of the RADP. This screening process further considered how alternatives aimed at avoiding or reducing the identified significant air quality impact could also reduce other identified less-than-significant and less-than-significant-with-mitigation effects related to subsequent projects under the RADP (e.g., less-than-significant and less-than-significant-with-mitigation construction and/or operational effects related to air quality, noise, transportation, cultural resources, and biological resources). Finally, and in accordance with CEQA, the screening process considered the feasibility of alternatives and their ability to attain most of the basic project objectives.

5.E.1 Descriptions of Alternatives Selected

Based on the screening process described above, the following alternatives were selected for detailed analysis in this Draft EIR:

- Alternative A: No Project Alternative
- Alternative B: Reduced Development Alternative
- Alternative C: Boarding Area H Only Alternative

As is the case with implementation of the RADP, none of the selected alternatives would induce passenger demand, increase the capacity of the airfield, change the configuration of the existing runways, change the number of aircraft operations or aircraft types operating at the Airport, or change the volume of annual passengers that choose to fly into and out of SFO. With respect to Alternatives B and C, these alternatives comprise reduced versions of the RADP developed to avoid or substantially lessen potential significant impacts related to implementation of the RADP. As with the RADP, the analysis of the alternatives assumes ongoing and cumulative projects would occur regardless of whether any of the alternatives are implemented.[306] As with the RADP, the analysis of the alternatives assumes the estimated SFO employee background growth of 9,400 and the increase to approximately 71.1 million annual passengers between 2019 and 2045 would occur regardless of implementation the RADP or the alternatives (see Table 3-1, p. 3-6).

[306] An ongoing project is defined in the Draft Final Airport Development Plan as a project that has been authorized to proceed by the San Francisco Airport Commission or has been identified by Airport management as needing to be implemented in the near future, subject to Airport Commission and other necessary approvals. Reasonably foreseeable ongoing projects are identified as cumulative projects and are listed in Table 3-2, p. 3-8, and mapped on Figure 3-1, p. 3-11. Other ongoing projects would undergo environmental review, as needed, at such time they are proposed. City and County of San Francisco, San Francisco International Airport, Draft Final Airport Development Plan, September 2016, https://planning.flysfo.com/sfo-tomorrow/, accessed April 19, 2024.

5.E.2 Alternative A: No Project Alternative

As required by CEQA Guidelines section 15126.6(e), this Draft EIR evaluates a No Project Alternative to allow decision-makers to compare the environmental effects of approving the project with the effects of not approving the project. Alternative A, the No Project Alternative, represents what would reasonably be expected to occur in the foreseeable future if the RADP were not approved and implemented. The No Project Alternative assumes that none of the RADP projects would be constructed. The No Project Alternative also assumes implementation of ongoing and cumulative projects, as well as the estimated SFO employee background growth of 9,400 between 2019 and 2045 anticipated to occur regardless of implementation of the RADP (see Table 3-1, p. 3-6).

As the No Project Alternative assumes that none of the RADP projects would be constructed, this alternative would eliminate RADP projects designed to accommodate long-term aircraft operations and passenger activity levels at the Airport. Moreover, SFO's long-term operations and passenger activity levels are forecast to reach approximately 506,000 annual aircraft operations, based on the estimated capacity of the existing runways, regardless of whether the RADP is implemented.[307] The FAA approved SFO's constrained aviation activity forecast for use in planning in June 2014.[308] Passenger aircraft operations represent the largest portion of the 506,000 annual aircraft operations, which are forecast to accommodate approximately 71.1 million annual passengers considering the forecast passenger aircraft fleet mix.[309] This growth would still occur under the No Project Alternative; however, RADP projects developed to accommodate the long-term increased aircraft operations and passenger activity levels would not be implemented.

5.E.3 Alternative B: Reduced Development Alternative

This alternative is intended to eliminate the identified significant adverse effect from implementation of the RADP related to air quality, specifically operational ROG emissions, and to reduce other identified less-than-significant and less-than-significant-with-mitigation impacts related to implementation of the RADP. This alternative would remove the Boarding Area H, International Terminal Building (ITB) Main Hall Expansion, and Aircraft Maintenance Hangar projects (RADP Projects #1, #3, and #18, respectively) from the RADP.

The Reduced Development Alternative would reduce the approximately 6.4 million square feet of demolition under the RADP to approximately 6.1 million square feet of demolition (an approximately 5 percent reduction). The Reduced Development Alternative would reduce the approximately 8 million square feet of net new construction under the RADP to approximately 6.1 million square feet (an approximately 23 percent reduction). The 375,000 square feet of net new paving that would occur under the RADP would also occur under the Reduced Development Alternative. The Reduced Development Alternative would result in

[307] The constrained forecast and ultimate airport capacity and delay simulation modeling analysis are contained in the Chapter 2 and Appendix B of the *Draft Final Airport Development Plan*, respectively.

[308] Fernando Yanez, Airport Planner, Federal Aviation Administration, "Federal Aviation Administration (FAA) Approval of San Francisco International Airport's Aviation Activity Forecasts," letter to John Bergener, Airport Planning Director, San Francisco International Airport, June 9, 2014.

[309] Aviation activity forecasts are based on national and regional economic modeling and regression analysis and aviation trends and incorporate Federal Aviation Administration–required factors for public-use airports, including airline aircraft fleet mix considerations. Forecasts are initially prepared as unconstrained, assuming that no physical or facility constraints would limit increases in aviation activity. At SFO, the practical capacity of the runways constrains the overall capacity of the Airport and there is no feasible option for adding runway capacity. Therefore, the forecast used for the RADP represents a constrained condition that reflects the practical capacity of the runways. The associated forecast of annual passengers was based on an assessment of future airline fleet mix that considered the number of seats per aircraft and the estimated percentage of occupied seats.

approximately 1,550 new SFO employees, compared to the approximately 2,700 new employees with implementation of the RADP.[310]

The Reduced Development Alternative assumes implementation of ongoing and cumulative projects, as well as the estimated SFO employee background growth of 9,400 between 2019 and 2045 anticipated to occur regardless of implementation of the RADP (see Table 3-1, p. 3-6). The Reduced Development Alternative would entail less construction than the RADP and would result in a reduction in the duration and intensity of construction activities. By removing key RADP projects designed to accommodate long-term aircraft operations and passenger activity levels at the Airport, the Reduced Development Alternative would be less effective in comparison to the RADP in accommodating forecast passenger demand and aviation activity.

5.E.4 Alternative C: Boarding Area H Only Alternative

This alternative is intended to eliminate the identified significant adverse effect from implementation of the RADP related to air quality, specifically operational ROG emissions, and to reduce other identified less-than-significant and less-than-significant-with-mitigation impacts related to implementation of the RADP. This alternative would remove all RADP projects except Boarding Area H (RADP Project #1) from the RADP.

The Boarding Area H Only Alternative would reduce the approximately 6.4 million square feet of demolition under the RADP to approximately 205,600 square feet of demolition (an approximately 97 percent reduction). The Boarding Area H Only Alternative would reduce the approximately 8 million square feet of net new construction under the RADP to approximately 1.4 million square feet (an approximately 82 percent reduction). The 375,000 square feet of net new paving that would occur under the RADP would not occur under the Boarding Area H Only Alternative. The Boarding Area H Only Alternative would result in approximately 190 new SFO employees, compared to approximately 2,700 new employees with implementation of the RADP.[311]

The Boarding Area H Only Alternative assumes implementation of ongoing and cumulative projects, as well as the estimated SFO employee background growth of 9,400 between 2019 and 2045 anticipated to occur regardless of implementation of the RADP (see Table 3-1, p. 3-6). The Boarding Area H Only Alternative would entail substantially less construction than the RADP and would result in a substantial reduction in the duration and intensity of construction activities (i.e., about six years rather than over a period of approximately 20 years under the RADP). By removing all the key terminal projects except Boarding Area H, all ground access and parking projects, and support facilities projects proposed under the RADP, the Boarding Area H Only Alternative would be substantially less effective in comparison to the RADP in accommodating forecast passenger demand and aviation activity.

[310] Appendix D, Employee Growth Assumptions Memorandum, to this Draft EIR provides a detailed breakdown of estimated employment generation for implementation of the RADP. The estimated number of employees for this alternative is based on the combined projected employment for the 17 subsequent RADP projects that would be developed under this alternative, as presented in Table 2 of Appendix D.
[311] The approximately 190 new SFO employees estimated for this alternative are based on the projected employment for the Boarding H project, as presented in Table 2 of Appendix D.

5.F Alternatives Analysis

Table 5-1 compares each alternative to the RADP and its respective impacts in a summary manner. Table 5-1 is followed by a discussion comparing each alternative to the RADP and its respective impacts. A detailed alternatives analysis is provided in a narrative form for environmental topics addressed in the technical sections of this Draft EIR: transportation and circulation, noise and vibration, and air quality. Where applicable, and as identified in the analyses, the alternatives analysis considers future 2045 (i.e., the anticipated RADP buildout year) baseline conditions to assess operational (including cumulative) environmental impacts for transportation and circulation, noise and vibration, and air quality (refer to Analysis Assumptions on page 3-4 of Draft EIR Chapter 3 for a discussion of the future baseline). The detailed alternatives analysis is followed by a more concise alternatives analysis for the environmental topics addressed in the initial study (Appendix B to this Draft EIR): land use and planning, aesthetics, population and housing, cultural resources, tribal cultural resources, GHG emissions, wind, shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, mineral resources, energy, agriculture and forestry resources, and wildfire.[312]

5.F.1 Transportation and Circulation

Recommended Airport Development Plan

Impacts related to transportation and circulation that could result from implementation of the RADP are evaluated in Chapter 3, Section 3.A, and are summarized below. See Section 3.A for a more detailed discussion of the impacts.

Construction-related and operational transportation impacts of subsequent projects that could occur with implementation of the RADP are analyzed under Impacts TR-1 through TR-7 and were determined to be less than significant. Each impact is briefly summarized below.

- As described under Impact TR-1, construction of most subsequent RADP projects would occur entirely within the Airport and would not involve any construction activities within the local roadway network. Construction of subsequent RADP projects would be conducted in accordance with the Airport's Standard Construction Measures, and SFO would coordinate with San Mateo County Transit District (SamTrans) during construction of subsequent RADP projects that could affect their transit operations. Therefore, construction of subsequent RADP projects would not create potentially hazardous conditions for people walking bicycling, or driving, or for public transit operations; would not interfere with emergency access; and would not interfere with accessibility for people walking or bicycling or substantially delay transit.
- As described under Impact TR-2, implementation of the RADP would not result in new connections with the local roadway network. Plans for restriping of the travel lanes on South Airport Boulevard, the new bus turnouts for SamTrans on South Airport Boulevard, and modifications to existing driveways along South Airport Boulevard and North McDonnell Road would conform with applicable design standards and undergo review prior to implementation. Therefore, the subsequent RADP projects would not create potentially hazardous conditions.

[312] The initial study determined that the RADP would have no impacts related to mineral resources, agriculture and forestry resources, and wildfire.

Table 5-1 Comparison of Environmental Impacts of the RADP to Impacts of the Alternatives

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Environmental Impact Report				
3.A. Transportation and Circulation				
Impact TR-1: Construction under the RADP would require a substantially extended duration; however, the effects would not create potentially hazardous conditions for people walking, bicycling, or driving or interfere with emergency access accessibility for people walking or bicycling, or substantially delay transit.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact TR-2: The RADP would not create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
Impact TR-3: The RADP would not interfere with the accessibility of people walking or bicycling to and from the project site and adjoining areas, or result in inadequate emergency access.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
Impact TR-4: The RADP would not substantially delay public transit.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
Impact TR-5: The RADP would not cause substantial additional vehicle miles traveled or substantially induce automobile travel.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
Impact TR-6: The RADP would not result in a passenger or freight loading deficit.	LTS	Increased compared to the RADP (LTS)	Similar to the RADP (LTS)	Increased compared to the RADP (LTS)
Impact TR-7: The RADP would not result in a substantial parking deficit.	LTS	Increased compared to the RADP (LTS)	Similar to the RADP (LTS)	Increased compared to the RADP (LTS)

IMPACT CODES:
NI = No impact
LTS = Less-than-significant or negligible impact; no mitigation required
LTSM = Less-than-significant impact with mitigation
SUM = Significant and unavoidable impact with mitigation

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact C-TR-1: Construction of RADP projects, in combination with cumulative projects, would not result in significant construction-related transportation impacts.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
Impact C-TR-2: The RADP, in combination with cumulative projects, would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations; would not interfere with the accessibility of people walking or bicycling, or result in inadequate emergency access; would not delay transit; would not cause substantial additional VMT or substantially induce automobile travel, or result in substantial loading or parking.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
3.B. Noise and Vibration				
Impact NO-1: Construction of RADP projects could result in a substantial temporary or periodic increase in ambient noise levels at sensitive receptors in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact NO-2: Construction of RADP projects could generate excessive groundborne vibration or groundborne noise levels.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact NO-3: Operation of RADP projects would not result in a substantial permanent increase in ambient noise levels at sensitive receptors in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact NO-4: Construction and operation of RADP projects would not expose people residing or working in an airport land use plan area to excessive noise levels.	LTS	Similar to the RADP (LTS)	Similar to the RADP (LTS)	Similar to the RADP (LTS)
Impact C-NO-1: Construction of RADP projects, in combination with cumulative projects, would not result in significant noise impacts.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

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Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact C-NO-2: Construction of RADP projects, in combination with cumulative projects, would not generate excessive groundborne vibration or groundborne noise levels.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-NO-3: Operation of RADP projects, in combination with cumulative projects, would not result in significant noise impacts.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
3.C. Air Quality				
Impact AQ-1 (Plan-Level Analysis): The RADP would not conflict with or obstruct implementation of the Clean Air Plan.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact AQ-2 (Plan-Level Analysis): The RADP would not result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact AQ-3 (Representative Analysis of Subsequent RADP Projects): Construction of subsequent RADP projects could result in a cumulatively considerable net increase of any criteria air pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact AQ-4 (Representative Analysis of Subsequent RADP Projects): Operation of subsequent RADP projects would cause a cumulatively considerable net increase of a criteria air pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.	**SUM**	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)

IMPACT CODES:
NI = No impact
LTS = Less-than-significant or negligible impact; no mitigation required
LTSM = Less-than-significant impact with mitigation
SUM = Significant and unavoidable impact with mitigation

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact AQ-5 (Plan-Level and Representative Analysis of Subsequent RADP Projects): Construction and operation of RADP projects, individually or in combination, would not result in emissions of fine particulate matter ($PM_{2.5}$) or toxic air contaminants that would result in exposure of sensitive receptors to substantial air pollutant concentrations.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact AQ-6 (Representative Analysis of Subsequent RADP Projects): Construction and operation of subsequent RADP projects would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-AQ-1: Construction and operation of the RADP, in combination with cumulative projects, would not result in exposure of sensitive receptors to substantial levels of fine particulate matter ($PM_{2.5}$) and toxic air contaminants under cumulative conditions.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-AQ-2: Construction and operation of the RADP, in combination with cumulative projects, would not combine with other sources of odors that would adversely affect a substantial number of people.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Initial Study				
E.1. Land Use and Planning				
Impact LU-1: The RADP would not physically divide an established community.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact LU-2: The RADP would not cause a significant physical environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

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SUM = Significant and unavoidable impact with mitigation

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact C-LU-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact related to land use and planning.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.2. Aesthetics				
Impact AE-1: The RADP would not have a substantial adverse effect on a scenic vista or substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway, nor would the RADP substantially degrade the existing visual character or quality of public views of the site and its surroundings or conflict with applicable zoning and other regulations governing scenic quality.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact AE-2: The RADP would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact-C-AE-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact related to aesthetics.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.3. Population and Housing				
Impact PH-1: The RADP would not induce substantial unplanned direct or indirect population growth.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-PH-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact related to population and housing.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

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NI = No impact
LTS = Less-than-significant or negligible impact; no mitigation required
LTSM = Less-than-significant impact with mitigation
SUM = Significant and unavoidable impact with mitigation

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
E.4. Cultural Resources				
Impact CR-1: The RADP could cause a substantial adverse change in the significance of a historical resource pursuant to section 15064.5, including those resources listed in article 10 or article 11 of the San Francisco Planning Code.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact CR-2: The RADP could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact CR-3: The RADP could disturb human remains, including those interred outside of formal cemeteries.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact C-CR-1: The RADP, in combination with cumulative projects, could result in cumulative impacts on historic resources.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact C-CR-2: The RADP, in combination with cumulative projects, could result in significant cumulative impacts on archeological resources and human remains.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
E.5. Tribal Cultural Resources				
Impact TCR-1: The RADP could result in a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code section 21074.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact C-TCR-1: The RADP, in combination with cumulative projects, could result in a significant cumulative impact on tribal cultural resources.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)

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NI = No impact
LTS = Less-than-significant or negligible impact; no mitigation required
LTSM = Less than significant impact with mitigation
SUM = Significant and unavoidable impact with mitigation

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
E.9. Greenhouse Gas Emissions				
Impact C-GG-1: The RADP would generate greenhouse gas emissions, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing greenhouse gas emissions.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.10. Wind				
Impact WI-1: The RADP would not create wind hazards in publicly accessible areas of substantial pedestrian use.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-WI-1: The RADP in combination with cumulative projects would not result in a significant cumulative wind impact.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.11. Shadow				
Impact SH-1: The RADP would not create new shadow in a manner that would substantially and adversely affect the use and enjoyment of publicly accessible open spaces.	LTS	Less than the RADP (LTS)	Similar to the RADP (LTS)	Less than the RADP (LTS)
Impact C-SH-1: The RADP in combination with cumulative projects would not result in a significant cumulative shadow impact.	LTS	Less than the RADP (LTS)	Similar to the RADP (LTS)	Less than the RADP (LTS)
E.12. Recreation				
Impact RE-1: The RADP would not result in a substantial increase in the use of existing neighborhood and regional parks and recreation facilities such that substantial physical deterioration or degradation of recreational facilities would occur or be accelerated and would not result in the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

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LTSM = Less-than-significant impact with mitigation
SUM = Significant and unavoidable impact with mitigation

Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact C-RE-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on recreational facilities.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.13. Utilities and Service Systems				
Impact UT-1: The RADP would not require or result in the relocation or construction of new or expanded water or wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, or the expansion of existing facilities, the construction or relocation of which could cause significant environmental effects.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact UT-2: Sufficient water supplies are available to serve the RADP and reasonably foreseeable future development in normal, dry, and multiple dry years.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact UT-3: The RADP would not result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact UT-4: The RADP would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, and would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-UT-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to utilities and service systems.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

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Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
E.14. Public Services				
Impact PS-1: The RADP would not result in substantial adverse physical impacts from new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services such as fire protection, police protection, schools, or other public facilities.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-PS-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on public services.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.15. Biological Resources				
Impact BI-1: The RADP would not have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
Impact BI-2: The RADP would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact BI-3: The RADP would not have a substantial adverse effect on federally protected wetlands (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

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Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact BI-4: The RADP would not interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact BI-5: The RADP would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-BI-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on biological resources.	LTSM	Less than the RADP (LTS)	Less than the RADP (LTSM)	Less than the RADP (LTSM)
E.16. Geology and Soils				
Impact GE-1: The RADP would not directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving fault rupture, seismic groundshaking, seismically induced ground failure, or seismically induced landslides.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact GE-2: The RADP would not result in substantial soil erosion or the loss of topsoil.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact GE-3: The RADP would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact GE-4: The RADP would not create substantial risks to life or property as a result of locating buildings or other features on expansive or corrosive soils.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact GE-5: The RADP would not directly or indirectly destroy a unique geologic feature nor have the potential to destroy a unique paleontological resource.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

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Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact C-GE-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to geology or paleontological resources.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.17. Hydrology and Water Quality				
Impact HY-1: The RADP would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HY-2: The RADP would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede the sustainable groundwater management of the basin.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HY-3: The RADP would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion, siltation, or flooding onsite or offsite.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HY-4: The RADP would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HY-5: The RADP would not impede or redirect flood flows.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HY-6: The RADP would not risk the release of pollutants from project inundation in flood hazard, tsunami, or seiche zones.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

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Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
Impact HY-7: The RADP would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-HY-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts on hydrology or water quality.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
E.18. Hazards and Hazardous Materials				
Impact HZ-1: The RADP would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HZ-2: The RADP would be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 but would not create a significant hazard to the public or the environment.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HZ-3: The RADP would not result in a safety hazard or excessive noise for people residing or working in a project area located within an airport land use plan or within two miles of an airport.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact HZ-4: The RADP would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-HZ-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to hazards or hazardous materials.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

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Impacts	RADP	Alternative A: No Project Alternative	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
E.20. Energy				
Impact EN-1: The RADP would not result in wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)
Impact C-EN-1: The RADP in combination with cumulative projects would increase the use of energy, fuel, and water resources, but not in a wasteful manner.	LTS	Less than the RADP (LTS)	Less than the RADP (LTS)	Less than the RADP (LTS)

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- As described under Impact TR-3, a few subsequent RADP projects would include modifications to intersections with driveways/access roads and reconstructed walkways for employees and passengers; however, these changes would not affect access for people walking or bicycling or impede emergency access on transportation study area roadways. Subsequent RADP projects would be designed in a manner consistent with applicable federal design standards for airports with respect to maintaining emergency vehicle access within the Airport. Therefore, subsequent RADP projects would not interfere with accessibility of people walking or bicycling or result in inadequate emergency access.
- As described under Impact TR-4, the increase in the number of vehicles on transportation study area roadways or increase in transit riders with implementation of the RADP would not substantially affect transit operations or cause substantial traffic congestion-related delay to SamTrans bus routes or Bay Area Rapid Transit (BART) or Caltrain services. Therefore, implementation of the RADP would not substantially delay transit.
- As described under Impact TR-5, implementation of the RADP would not increase the average vehicle miles traveled (VMT) per passenger or average VMT per employee. In addition, implementation of the RADP would not increase regional automobile travel due to changes to the transportation network or logistics network change. Therefore, implementation of the RADP related to VMT would not cause substantial additional VMT or substantially induce automobile travel.
- As described under Impact TR-6, implementation of the RADP would expand the existing passenger loading facilities and would accommodate freight loading demand within existing and proposed loading facilities. Therefore, subsequent RADP projects would not result in a passenger or commercial freight loading deficit.
- As described under Impact TR-7, implementation of the RADP would increase total parking spaces at the Airport, and the estimated SFO passenger and employee parking demand would be accommodated at the Airport. Therefore, implementation of the RADP would not result in a substantial vehicular parking deficit.

The evaluation of cumulative transportation impacts in Section 3.A (Impacts C-TR-1 and C-TR-2) determined that construction-related and operational transportation impacts of subsequent projects that could occur with implementation of the RADP would not combine with cumulative projects to result in significant cumulative construction-related or significant cumulative operational impacts related to potentially hazardous conditions, accessibility of people walking or bicycling or inadequate emergency access, transit delay, VMT, loading, or parking.

Alternative A: No Project Alternative

The No Project Alternative assumes that none of the RADP projects would be constructed. Consequently, the No Project Alternative would not result in any new SFO employees, compared to the 2,700 new employees associated with implementation of the RADP. As discussed above, the No Project Alternative assumes implementation of ongoing and cumulative projects, as well as the estimated SFO employee background growth of 9,400 between 2019 and 2045 anticipated to occur regardless of implementation of the RADP (see Table 3-1, p. 3-6).

Under the No Project Alternative, construction vehicle trips associated with the subsequent RADP projects would not occur, and construction activities at the Airport would be limited to the ongoing projects. The ongoing projects on SFO property would be required to comply with Airport Standard Construction

Measures, similar to subsequent projects under the RADP. Because the No Project Alternative would include limited new development within the Airport, the duration of construction activities at the Airport would be shorter under the No Project Alternative than under the RADP. Therefore, similar to the RADP, the construction-related transportation impacts of the No Project Alternative would be less than significant, albeit also less severe and less intense than those related to implementation of the RADP.

Under the No Project Alternative, the ongoing projects would be required to conform with applicable design standards,[313] would undergo review during final planning and design, and would be designed in a manner consistent with applicable federal design standards for airports, similar to the subsequent RADP projects. Thus, impacts of the No Project Alternative related to potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations and accessibility of people walking or bicycling to and from the project site and emergency access would be similar to those identified for the RADP and would be less than significant.

The No Project Alternative would reduce peak hour vehicle trips as compared to the RADP because it would not include the 2,700 additional employees associated with subsequent RADP projects and would reduce the number of vehicles and associated congestion on transportation study area roadways on which SamTrans buses travel. The No Project Alternative would not include the subsequent RADP projects that would increase the amount of curbside space that would alleviate roadway congestion on the main terminal roadways; therefore, congestion on terminal roadways would remain, similar to 2045 future baseline without RADP conditions (see Section 3.A.3, 2045 Future Baseline without RADP Conditions, p. 3.A-13). Thus, compared to the RADP, the No Project Alternative would likely result in a reduction in SamTrans transit travel times on roadways such as North McDonnell Road and South Airport Boulevard, but this reduction would be offset by increases in transit travel times within the terminal roadways for SamTrans routes. None of the ongoing projects at SFO would change transit operations at the Millbrae Transit Center or affect BART or Caltrain service, and BART and Caltrain service would not be affected by vehicle traffic associated with the ongoing a projects. Thus, transit delay impacts of the No Project Alternative would be similar to those under the RADP and would be less than significant.

Under the No Project Alternative, transportation conditions at SFO would be the same as the 2045 future baseline without RADP conditions (e.g., passenger trips, employees trips, transit service, parking supply), and therefore the average VMT per passenger and average VMT per employee would be the same as under 2045 future baseline without RADP conditions. In addition, the ongoing projects at the Airport that would occur under the No Project Alternative would not induce automobile travel and would not substantially increase regional VMT related to freight or logistics activity. Therefore, VMT impacts of the No Project Alternative would be similar to those identified for the RADP and would be less than significant.

Under the No Project Alternative, freight loading demand and operations would be similar to those described for 2045 future baseline without RADP conditions (see Section 3.A.3, 2045 Future Baseline without RADP Conditions, p. 3.A-13). Freight loading demand would be accommodated within existing designated access-restricted loading docks at the terminals or within existing facilities and therefore would not result in a commercial vehicle loading deficit. The No Project Alternative would not include the subsequent RADP projects that would increase the amount of curbside space for passenger loading/unloading activities at the main terminal; therefore, passenger loading/unloading operations would remain similar to 2045 future

[313] Design standards are objective, quantifiable measures of design attributes (i.e., specifications) that govern specific elements of design to promote consistency, quality, safety, and efficiency.

baseline without RADP conditions, potentially resulting in a passenger loading deficit. As part of standard operating procedures under the No Project Alternative, SFO would update its curbside management program as appropriate to respond to changes in passenger loading/unloading facilities by private vehicles and ground transportation at terminal curbsides and within the Central Parking Garage to accommodate passenger loading/unloading demand. Therefore, impacts of the No Project Alternative related to passenger loading operations would not result in a substantial passenger loading deficit that could result in secondary impacts (i.e., create a new potentially hazardous condition for people walking, bicycling, or driving, or substantially delay transit). Therefore, similar to the RADP, loading impacts related to the No Project Alternative would be less than significant, albeit more severe and more intense than those under the RADP.

Vehicle parking supply and demand conditions under the No Project Alternative would be similar to conditions identified for 2045 future baseline without RADP conditions (see Section 3.A.3, 2045 Future Baseline without RADP, p. 3.A-13), and would result in a parking deficit at SFO facilities. The parking deficit under the No Project Alternative would be about 3,060 spaces, which would be considered substantial. However, this parking deficit would not result in secondary effects such as potentially hazardous conditions for people walking, bicycling, or driving; would not interfere with accessibility for people walking or bicycling or inadequate access for emergency vehicles; and would not substantially delay transit, because passenger and employee parking would be accommodated within SFO parking facilities or within off-Airport parking facilities that cater to SFO passengers, and because transit and rideshare options for travel into and out of SFO by passengers and employees are available. It is possible that some SFO passengers and/or employees may seek on-street parking in nearby jurisdictions. However, convenient on-street parking spaces potentially available for long-term parking are limited and dispersed; therefore, some SFO passengers or employees parking on-street in nearby jurisdictions would not result in the secondary effects noted above. Therefore, similar to the RADP, parking impacts of the No Project Alternative would be less than significant, albeit more severe and more intense than those under the RADP.

As discussed under impacts C-TR-1 and C-TR-2, no significant cumulative impacts were identified for implementation of the RADP. Under the No Project Alternative, ongoing and cumulative projects at the Airport could result in impacts related to transportation and circulation; however, these impacts would occur regardless of the implementation of the RADP. Because the No Project Alternative does not include implementation of subsequent RADP projects, this alternative would not combine with the ongoing and cumulative projects to result in a significant cumulative impact. Therefore, similar to the RADP, the No Project Alternative would have less-than-significant cumulative impacts related to potentially hazardous conditions, accessibility, emergency access, public transit delay, VMT, loading, parking, and construction-related transportation impacts.

Alternative B: Reduced Development Alternative

The Reduced Development Alternative would remove the Boarding Area H, ITB Main Hall Expansion, and Aircraft Maintenance Hangar projects (RADP Projects #1, #3, and #18, respectively) from the RADP. The Reduced Development Alternative would result in approximately 1,550 new SFO employees, compared to 2,700 new employees with implementation of the RADP.

The Reduced Development Alternative would include construction activities similar to those of subsequent RADP projects (e.g., demolition, excavation, building construction, materials delivery) and would be required to comply with the Airport Standard Construction Measures. However, because of the reduced number of subsequent projects under the Reduced Development Alternative, the duration of construction would be shorter than identified for the RADP and the total number of construction vehicles would be less than for the RADP. Thus, like the RADP, the construction-related transportation impacts of the Reduced Development Alternative would be less than significant, albeit less severe and less intense than those under the RADP.

Similar to the RADP, subsequent projects under the Reduced Development Alternative would conform with applicable design standards.[314] Thus, operational impacts of the Reduced Development Alternative related to potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations and accessibility of people walking or bicycling to and from the project site and emergency access would be similar to those identified for the RADP and would be less than significant.

The Reduced Development Alternative would reduce peak-hour vehicle trips compared to the RADP because this alternative would result in approximately 1,150 fewer employees. It also would reduce the number of vehicles and the associated congestion on transportation study area roadways on which SamTrans buses travel. In addition, similar to the RADP, the Reduced Development Alternative would include the subsequent RADP projects that would increase the amount of curbside space for all types and sizes of airport ground transportation, including buses, and would alleviate roadway congestion on the main terminal roadways (i.e., the Central Hub [RADP Project #6] and the ITB Curbside Expansion [RADP Project #8] projects). Because of the reduced number of vehicle trips in the transportation study area and reduced congestion on the main terminal roadways, potential increases in transit travel times on SamTrans routes would be reduced under the Reduced Development Alternative, compared to the RADP. In addition, similar to the RADP, subsequent RADP projects under the Reduced Development Alternative would not change transit operations at the Millbrae Transit Center or affect BART or Caltrain service. Therefore, similar to the RADP, impacts related to transit delay would be similar to those identified for the RADP and would be less than significant.

Similar to the RADP, implementation of the Reduced Development Alternative would not change passenger travel demand, where passengers and employees travel to or from, nor passenger and employee ways of travel into and out of the Airport. Therefore, average VMT per passenger and average VMT per employee is estimated to remain the same as under 2045 future baseline without RADP conditions. In addition, the Reduced Development Alternative would not include any projects that would induce automobile travel and this alternative would not substantially increase regional VMT related to freight or logistics activity. Therefore, VMT impacts would be similar to those identified for the RADP and would be less than significant.

The Reduced Development Alternative would include all of the subsequent RADP projects that would increase the amount of curbside space for all types and sizes of airport ground transportation for passenger drop-off and pickup (i.e., the Central Hub and the ITB Curbside Expansion projects) and would alleviate roadway congestion on the main terminal roadways and accommodate passenger drop-off and pick-up operations. Freight loading demand associated with subsequent projects would be accommodated within new designated access-restricted loading docks or within existing facilities, same as the RADP. Therefore, impacts of the Reduced Development Alternative related to loading would be similar to those identified for the RADP and would be less than significant.

The Reduced Development Alternative would include the subsequent RADP projects that would change the SFO public and employee parking supply, except for the elimination of employee parking spaces as part of

[314] On October 17, 2017, the Airport Building Regulations were adopted by the San Francisco Airport Commission, superseding previous regulatory instruments, such as the 1999 Tenant Improvement Guide. The 1999 Tenant Improvement Guide was the mechanism by which SFO enforced the California Building Standards Code (California Building Code) and served as the Airport design standards for both SFO projects and tenant improvement projects.

the Aircraft Maintenance Hangar project. Thus, under the Reduced Development Alternative, there would be a combined parking supply of about 37,507 spaces (i.e., 27,569 public parking spaces and 9,938 employee parking spaces), compared to about 36,461 spaces under the RADP (see Appendix E.5). Under this alternative, passenger demand would be the same as for the RADP; therefore, similar to the RADP, there would be a surplus of public parking spaces. Under the Reduced Development Alternative, employee parking demand would decrease from conditions anticipated under the RADP because this alternative would result in approximately 1,150 fewer new employees. The decreased employee parking demand under the Reduced Development Alternative would reduce but not eliminate the employee parking deficit identified for the RADP (i.e., a deficit of 3,173 spaces for the Reduced Development Alternative compared to the deficit of 4,499 spaces for the RADP). As with implementation of the RADP, the employee parking deficit under the Reduced Development Alternative would not result in secondary effects such as potentially hazardous conditions for people walking, bicycling, or driving; would not interfere with accessibility for people walking or bicycling or inadequate access for emergency vehicles; and would not substantially delay transit because all employee parking would occur within the Airport and not on adjacent roadways; employees could park within the public parking garages, which would have a surplus of parking spaces; and transit options are available. Thus, under the Reduced Development Alternative the combined parking supply of 37,507 spaces (i.e., public parking spaces plus employee parking spaces) would accommodate the combined passenger and employee demand of 32,633 spaces. Therefore, implementation of the Reduced Development Alternative would not result in a substantial vehicular parking deficit that would result in secondary effects. Similar to the RADP, impacts from implementation of the Reduced Development Alternative related to a substantial parking deficit would be less than significant.

With respect to cumulative conditions, because the Reduced Development Alternative would include the majority of the subsequent RADP projects (i.e., 17 of the 20 subsequent RADP projects), cumulative construction and operational conditions would be similar to those identified for the RADP. Thus, for the same reasons as described for the RADP, the Reduced Development Alternative would not combine with cumulative projects to result in significant cumulative transportation and circulation impacts. Therefore, similar to the RADP, the Reduced Development Alternative would have less-than-significant cumulative impacts related to potentially hazardous conditions, accessibility, emergency access, public transit delay, VMT, loading, parking, and construction-related transportation impacts.

Alternative C: Boarding Area H Only Alternative

The Boarding Area H Only Alternative would only construct the Boarding Area H project (RADP Project #1). The Boarding Area H Only Alternative would result in approximately 190 new SFO employees, compared to approximately 2,700 new employees with implementation of the RADP.

The Boarding Area H Only Alternative would include construction activities similar to those of subsequent RADP projects and would be required to comply with the Airport Standard Construction Measures. However, the Boarding Area H Only Alternative would entail substantially less construction than the RADP and would result in a substantial reduction in the duration of construction (i.e., about six years, rather than over a period of 20 years under the RADP) and the total number of construction vehicles would be less than for the RADP. Therefore, potential construction-related transportation impacts would be substantially reduced under the Boarding Area H Only Alternative compared to the RADP. Similar to the RADP, the construction-related transportation impacts of the Boarding Area H Only Alternative would be less than significant, albeit less severe and less intense than those under the RADP.

Similar to the subsequent RADP projects, the design of the Boarding Area H project would conform to applicable design standards. Thus, operational impacts of the Boarding Area H Only Alternative related to potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations and accessibility of people walking or bicycling to and from the project site and emergency access would be similar to those identified for the RADP and would be less than significant.

The Boarding Area H Only Alternative would reduce peak-hour vehicle trips compared to the RADP because this alternative would result in approximately 2,500 fewer new employees. It would also reduce the number of vehicles and associated congestion on streets on which SamTrans buses travel. Similar to the RADP, the Boarding Area H Only Alternative would not change transit operations at the Millbrae Transit Center or affect BART or Caltrain service. However, unlike the RADP, the Boarding Area H Only Alternative would not include the subsequent RADP projects that would increase the amount of curbside space and that would alleviate roadway congestion on the main terminal roadways. Although the decrease in the number of employee vehicle trips would reduce increases in transit travel times on SamTrans transit routes under the Boarding Area H Only Alternative compared to the RADP, this decrease would likely be offset by increases in SamTrans travel times on the main terminal roadways compared to the RADP. Thus, transit delay impacts for the Boarding Area H Only Alternative would be similar to impacts under the RADP. Therefore, impacts of the Boarding Area H Only Alternative related to transit delay would be similar to those identified for the RADP and would be less than significant.

The Boarding Area H Only Alternative would not change passenger travel demand, where passengers or employees travel to or from, nor passenger and employee ways of travel into and out of the Airport. Therefore, average VMT per passenger and average VMT per employee is estimated to remain the same as under 2045 future baseline without RADP conditions. In addition, the Boarding Area H Only Alternative would not include any projects that would induce automobile travel and would not substantially increase regional VMT related to freight or logistics activity. Therefore, impacts of the Boarding Area H Only Alternative related to VMT would be similar to those identified for the RADP and would be less than significant.

Under the Boarding Area H Only Alternative, freight loading demand associated with Airport concessions and other deliveries required for operations and maintenance of the new boarding area would be accommodated within new designated access-restricted loading docks that would be included as part of Boarding Area H project and would not result in a commercial vehicle loading deficit. However, the Boarding Area H Only Alternative would not include the subsequent RADP projects that would increase the amount of curbside space for passenger loading/unloading activities. Thus, passenger loading/unloading operations would remain similar to 2045 future baseline without RADP conditions, potentially resulting in a passenger loading deficit. As part of standard operating procedures under the No Project Alternative, SFO would update its curbside management program as appropriate to respond to changes in passenger loading/unloading facilities by private vehicles and ground transportation at terminal curbsides and within the Central Parking Garage to accommodate passenger loading/unloading demand (e.g., by providing additional facilities within the Central Parking Garage for transportation network companies (TNC)/for-hire vehicle passenger pick-up, or by requiring passenger drop-off by TNC/for-hire vehicles in the Arrival level of the terminal). Therefore, impacts of the Boarding Area H Only Alternative related to passenger loading operations would not result in a substantial passenger loading deficit that could result in secondary impacts (e.g., create a new potentially hazardous condition for people walking, bicycling, or driving). Therefore, similar to the RADP, impacts of the Boarding Area H Only Alternative would be less than significant, albeit more severe and more intense than under the RADP.

The Boarding Area H Only Alternative would not include the subsequent RADP projects that would change the passenger or employee parking supply. Therefore, the parking deficit at SFO facilities identified for 2045 future baseline without RADP conditions would increase by only the additional employees for the Boarding Area H project (about 190 employees). The parking deficit at SFO facilities under the Boarding Area H Only Alternative would be about 3,100 spaces (i.e., a public parking deficit of about 1,900 spaces and an employee parking deficit of about 1,200 spaces), which would be considered substantial (see Appendix E.5). However, this parking deficit would not result in secondary effects such as potentially hazardous conditions for people walking, bicycling, or driving; would not interfere with accessibility for people walking or bicycling or inadequate access for emergency vehicles; and would not substantially delay transit, because passenger and employee parking would be accommodated within SFO parking facilities or within off-Airport parking facilities that cater to SFO passengers and because transit and rideshare options are available. It is possible that some SFO passengers or employees may seek on-street parking in nearby jurisdictions. However, convenient on-street spaces potentially available for long-term parking are limited and dispersed and therefore, some SFO passengers and/or employees parking on-street in nearby jurisdictions would not result in substantial conflicts between parking and people walking or bicycling, or substantially delay public transit. Therefore, impacts of the Boarding Area H Only Alternative related to parking deficits would increase compared to the RADP but, similar to the RADP, would be less than significant.

With respect to cumulative conditions, the Boarding Area H Only Alternative would include only one of the 20 subsequent RADP projects and would therefore have substantially less construction and operational effects on the transportation network than the RADP. For the same reasons as described for the RADP, the Boarding Area H Only Alternative would not combine with cumulative projects to result in significant cumulative transportation and circulation impacts. Therefore, similar to the RADP, the Boarding Area H Only Alternative would have less-than-significant cumulative impacts related to potentially hazardous conditions, accessibility, emergency access, public transit delay, VMT, loading, parking, and construction-related transportation impacts.

5.F.2 Noise and Vibration

Recommended Airport Development Plan

Impacts related to noise and vibration that could result from implementation of the RADP are evaluated in Chapter 3, Section 3.B, and are summarized below. See Section 3.B for a more detailed discussion of the impacts.

Construction-related and operational noise and vibration impacts of subsequent projects that could occur with implementation of the RADP are analyzed under Impacts NO-1 through NO-4 and were determined to be less than significant or less than significant with mitigation. Each impact is briefly summarized below.

- As described under Impact NO-1, construction of subsequent projects implemented under the RADP would result in an exceedance of applicable nighttime noise standards at sensitive receptors near the Aviador Lot. Daytime and nighttime construction noise impacts associated with all RADP projects and the other construction staging areas would be less than significant. Construction activities would temporarily add traffic and increase noise levels along access roads to construction staging areas and RADP project sites, but this increase would be less than significant. Implementation of Mitigation Measure M-NO-1 would reduce nighttime noise impacts in the vicinity of the Aviador Lot to a less-than-significant level.

- As described under Impact NO-2, construction of subsequent projects implemented under the RADP would generate vibration impacts from construction equipment that could result in building damage based on the proximity of existing structures to RADP projects. While subsequent projects would be evaluated at such time they are proposed to determine whether they could result in building damage from the use of vibration-generating equipment, implementation of Mitigation Measure M-NO-2 would ensure that any building damage impacts from construction vibration would be less than significant. Human annoyance impacts primarily related to sleep disturbance would be less than significant due to the distance separating potential locations of vibration generating construction equipment and nighttime sensitive land uses such as residences and hotels in the vicinity.
- As described under Impact NO-3, operational noise from stationary sources such as heating, ventilation, and air conditioning (HVAC) systems and emergency generators would not result in daytime or nighttime impacts to the nearest sensitive receptors. Implementation of the RADP would increase vehicular activity in the vicinity of the Airport, primarily from additional employees and vendors, but the associated increase in roadside noise levels along all affected segments would be less than significant.
- As described under Impact NO-4, construction and operation of subsequent RADP projects would not result in any changes to aircraft activity at the Airport and would therefore not expose people residing or working in an airport land use plan to excessive noise levels resulting in a less than significant impact.

The evaluation of cumulative noise and vibration impacts in Section 3.B (Impacts C-NO-1 through C-NO-3) determined that construction-related and operational noise and vibration impacts of subsequent projects that could occur with implementation of the RADP would not combine with cumulative projects to result in significant cumulative construction-related or significant cumulative operational impacts related to noise and vibration.

Alternative A: No Project Alternative

The No Project Alternative assumes that none of the RADP projects would be constructed. Consequently, the No Project Alternative would not result in any new SFO employees, compared to the 2,700 new employees associated with implementation of the RADP. As discussed above, the No Project Alternative assumes implementation of ongoing and cumulative projects, as well as the estimated SFO employee background growth of 9,400 between 2019 and 2045 anticipated to occur regardless of implementation of the RADP (see Table 3-1, p. 3-6).

Regarding Impact NO-1, because the No Project Alternative would not include construction of subsequent RADP projects, construction activities at the Airport would be much less than with implementation of the RADP. The use of the Aviador Lot as a construction staging area for other Airport projects would continue; however, the lot would not be used for construction of the RADP projects, and therefore nighttime noise impacts on the residences on Roblar Avenue would not result in a potentially significant impact. Hence, Mitigation Measure M-NO-1 would not be needed for the No Project Alternative. Therefore, daytime and nighttime impacts of the No Project Alternative related to construction noise would be less than impacts under the RADP projects and would be less than significant. The No Project Alternative also would not add RADP-related construction traffic to Airport roadways and hence increases in noise levels over existing conditions would be much less than with implementation of the RADP.

Regarding Impact NO-2, because the No Project Alternative would not include construction of the subsequent RADP projects, construction activities at the Airport would be much less than under the RADP.

With no construction of subsequent RADP projects, there would be no RADP-related vibration impacts resulting in building damage to Airport structures, and Mitigation Measure M-NO-2 would not be needed. Although construction of ongoing projects would continue under the No Project Alternative, which could generate vibration impacts to structures, there would be no human annoyance impacts on any sensitive receptors given that there are no nighttime sensitive uses (people sleeping) on SFO property. Therefore, impacts of the No Project Alternative related to excessive groundborne vibration or groundborne noise levels would be less than impacts under the RADP and would be less than significant.

Regarding Impact NO-3, because the No Project Alternative would not include construction of the subsequent RADP projects, new development and associated operational stationary noise sources at the Airport would be much less than under the RADP. Under the No Project Alternative, ongoing projects at the Airport could increase operational sources of noise; however, this increase would happen regardless of the implementation of the RADP. Therefore, operational emissions under the No Project Alternative would be similar to conditions identified for 2045 future baseline without RADP conditions. The No Project Alternative would not include additional operational sources introduced by RADP projects. As such, impacts of the No Project Alternative related to noise from operational stationary sources would be less than impacts under the RADP and would be less than significant. With regard to noise impacts associated with operational traffic, the No Project Alternative would reduce employee vehicle trips compared to the RADP because it would not introduce the 2,700 additional employees associated with the subsequent RADP projects. Therefore, noise impacts associated with operational traffic under the No Project Alternative would be less than impacts under the RADP and would be less than significant.

Regarding Impact NO-4, because the No Project Alternative would not include construction of the subsequent RADP projects and would not introduce the 2,700 additional employees associated with those projects, impacts of the No Project Alternative related to exposure of people residing or working in an airport land use plan area to excessive noise levels would be less than impacts under the RADP and would be less than significant.

As discussed above, no significant cumulative impacts related to noise and vibration were identified for implementation of the RADP. Under the No Project Alternative, ongoing and cumulative projects at the Airport could increase construction noise and vibration and operational sources of noise; however, this increase would occur regardless of the implementation of the RADP. Because the No Project Alternative does not include implementation of subsequent RADP projects, this alternative would not combine with the ongoing and cumulative projects to result in a significant cumulative impact. Therefore, similar to the RADP, the No Project Alternative would have less-than-significant cumulative impacts related to construction and operational noise and vibration, albeit less severe and less intense than those under the RADP because of the reduced extent of new development.

Alternative B: Reduced Development Alternative

The Reduced Development Alternative would remove the Boarding Area H, ITB Main Hall Expansion, and Aircraft Maintenance Hangar projects (RADP Projects #1, #3, and #18, respectively) from the RADP. The Reduced Development Alternative would result in approximately 1,550 new SFO employees, compared to the approximately 2,700 new employees with implementation of the RADP.

Regarding Impact NO-1, because the Reduced Development Alternative would not include construction of the Boarding Area H, ITB Main Hall Expansion, and Aircraft Maintenance Hangar projects, construction activities at the Airport would be of shorter duration and less intensive than under the RADP. Although daytime construction noise impacts of the remaining RADP projects would continue to be less than significant, the use of the Aviador Lot as a construction staging area for these projects would result in significant nighttime noise impacts on the residences on Roblar Avenue. Therefore, similar to the RADP, the Reduced Development Alternative would require implementation of Mitigation Measure M-NO-1, Nighttime Construction Noise Control, to reduce this impact to a less-than-significant level. Therefore, construction noise impacts of the Reduced Development Alternative would be similar to impacts under the RADP and would be less than significant with mitigation. Because fewer RADP projects would be constructed under this alternative, resulting in fewer construction truck trips, the associated noise impacts would also be less than under the RADP and less than significant.

Regarding Impact NO-2, because construction activities at the Airport would be less under the Reduced Development Alternative than under the RADP, impacts of this alternative related to excessive groundborne vibration or groundborne noise levels would be less. However, the subsequent RADP projects under this alternative could be constructed close to existing Airport structures, resulting in significant building damage impacts from construction vibration to those structures. Therefore, implementation of Mitigation Measure M-NO-2, Protection of Adjacent Buildings/Structures and Vibration Monitoring during Construction, would be required. Human annoyance impacts from construction vibration would be less than significant, similar to the impacts under the RADP. Therefore, construction vibration impacts of the Reduced Development Alternative would be less than impacts under the RADP because fewer Airport structures would be affected; however, the impact on structures adjacent to the RADP projects that would be constructed under this alternative would be similar to the impact under the RADP and would be less than significant with mitigation.

Regarding Impact NO-3, because the Reduced Development Alternative would not include construction of the Boarding Area H, ITB Main Hall Expansion, and Aircraft Maintenance Hangar projects, new development and associated operational stationary sources at the Airport would be less under this alternative than under the RADP. Therefore, impacts of the Reduced Development Alternative related to noise from operational stationary sources would be less than impacts under the RADP and would be less than significant. With regard to noise impacts associated with operational traffic, as discussed above, the Reduced Development Alternative would reduce employee vehicle trips compared to the RADP because this alternative would result in approximately 1,150 fewer employees. Therefore, noise impacts associated with operational traffic for the Reduced Development Alternative would be less than impacts under the RADP and would be less than significant.

Regarding Impact NO-4, like the RADP, the Reduced Development Alternative would not result in any changes to aircraft operations, runway use, or the types or number of aircraft operating at SFO. Therefore, there would be no change to the extent of incompatible land uses within the community noise equivalent level 65-decibel contour in the Airport vicinity covered under the airport land use plan with implementation of the Reduced Development Alternative; and implementation of the Reduced Development Alternative would not expose people residing or working in an airport land use plan area to excessive aircraft noise levels. In addition, under California law, airport land use commissions have no jurisdiction over airport operations, and the Airport itself is not considered part of the airport land use planning area. Therefore, as with the RADP, implementation of the Reduced Development Alternative would not expose people residing or working in an airport land use plan area to excessive noise levels, and this impact would be less than significant.

As discussed above, no significant cumulative impacts related to noise and vibration were identified for implementation of the RADP. Under the Reduced Development Alternative, ongoing and cumulative projects at the Airport could increase construction noise and vibration and operational sources of noise; however, this increase would occur regardless of the implementation of the RADP. Therefore, similar to the RADP, the Reduced Development Alternative would have less-than-significant cumulative impacts related to construction and operational noise and vibration, albeit less severe and less intense than those of the RADP, given the reduced extent of new development.

Alternative C: Boarding Area H Only Alternative

The Boarding Area H Only Alternative would remove all RADP projects except Boarding Area H (RADP Project #1) from the RADP. The Boarding Area H Only Alternative would result in approximately 190 new SFO employees, compared to approximately 2,700 new employees with implementation of the RADP.

Regarding Impact NO-1, because the Boarding Area H Only Alternative would remove all RADP projects except the Boarding Area H project, construction activities at the Airport would be much less under this alternative than under the RADP. The daytime sensitive receptors nearest to Boarding Area H are located farther away than the closest representative project analyzed under the RADP. Therefore, daytime noise impacts from construction would be less than impacts under the RADP and would be less than significant. Given the proximity of the Aviador Lot to the Boarding Area H project site, it would be used as a construction staging area and significant nighttime noise impacts on the residences on Roblar Avenue would occur, similar to the RADP projects. Implementation of Mitigation Measure M-NO-1, Nighttime Construction Noise Control, would reduce this impact to a less-than-significant level, similar to the RADP. Therefore, although impacts of the Boarding Area H Only Alternative related to daytime construction noise would be less than impacts under the RADP and would be less than significant, nighttime impacts would be similar to impacts under the RADP and would be less than significant with mitigation. Because only Boarding Area H would be constructed under this alternative, fewer construction truck trips would occur compared to the RADP projects. Therefore, the associated noise impacts from construction truck trips would also be less than impacts under the RADP and would be less than significant.

Regarding Impact NO-2, under the Boarding Area H Only Alternative, construction vibration impacts would be limited to existing Airport structures near Boarding Area H. However, construction activities could take place close to these structures, resulting in significant building damage impacts, similar to the RADP. Therefore, implementation of Mitigation Measure M-NO-2, Protection of Adjacent Buildings/Structures and Vibration Monitoring during Construction, would be required. Human annoyance impacts from construction vibration would be less than significant, similar to the RADP. Therefore, impacts of the Boarding Area H Only Alternative related to construction vibration would be less than impacts under the RADP because fewer Airport structures would be affected; however, the impact on structures adjacent to Boarding Area H would be similar to the impact under the RADP and would be less than significant with mitigation.

Regarding Impact NO-3, because the Boarding Area H Only Alternative would remove all RADP projects except the Boarding Area H project, new development and associated operational stationary sources (i.e., HVAC equipment and emergency generators) would be much less under this alternative than under the RADP. Therefore, impacts of the Boarding Area H Only Alternative related to noise from operational stationary sources would be less than those under the RADP and would be less than significant. With regard to noise impacts associated with operational vehicle traffic, as discussed above, the Boarding Area H Only Alternative would reduce employee vehicle trips compared to the RADP because this alternative would result in approximately 2,500 fewer new employees. Therefore, noise impacts associated with operational traffic for the Boarding Area H Only Alternative would be less than impacts under the RADP and would be less than significant.

Regarding Impact NO-4, as is the case with the RADP, the Boarding Area H Only Alternative would not result in any changes to aircraft operations, runway use, or the types or number of aircraft operating at SFO. Therefore, there would be no change to the extent of incompatible land uses within the community noise equivalent level 65-decibel contour in the Airport vicinity covered under the airport land use plan with implementation of the Boarding Area H Only Alternative; and implementation of the Boarding Area H Only Alternative would not expose people residing or working in an airport land use plan area to excessive aircraft noise levels. In addition, under California law, airport land use commissions have no jurisdiction over airport operations, and the Airport itself is not considered part of the airport land use planning area. Therefore, as is the case with the RADP, implementation of the Boarding Area H Only Alternative would not expose people residing or working in an airport land use plan area to excessive noise levels, and this impact would be less than significant.

As discussed above, no significant cumulative impacts related to noise and vibration were identified for implementation of the RADP. Under the Boarding Area H Only Alternative, ongoing and cumulative projects at the Airport could increase construction noise and vibration and operational sources of noise; however, this increase would occur regardless of the implementation of the RADP. Therefore, similar to the RADP, the Boarding Area H Only Alternative would have less-than-significant cumulative impacts related to construction and operational noise and vibration, albeit less severe and less intense than those under the RADP given the reduced extent of new development.

5.F.3 Air Quality

Recommended Airport Development Plan

Impacts related to air quality that could result from implementation of the RADP are evaluated in Chapter 3, Section 3.C, and are summarized below. See Section 3.C for a more detailed discussion of the impacts.

Construction-related and operational air quality impacts of subsequent projects that could occur with implementation of the RADP are analyzed under Impacts AQ-1 through AQ-6. The analysis determined that implementation of the RADP would result in less-than-significant impacts or impacts that can be reduced to less than significant with mitigation for all but one impact related to air quality. Each impact is briefly summarized below.

- As described under Impact AQ-1, implementation of the RADP would support the primary goals of the current regional air quality plan (the 2017 Clean Air Plan). The measures in the 2017 Clean Air Plan that seek to control emissions from construction, transportation, energy, and building operations are most relevant to construction of subsequent RADP projects. The 2017 Clean Air Plan’s transportation measures describe a comprehensive strategy to reduce emissions from medium- and heavy-duty trucks by providing incentives for the use of new trucks with advanced emissions controls, including hybrid and zero-emissions trucks. Implementation of the RADP would not conflict with these transportation control measures. Implementation of the RADP (at full buildout) would result in a net increase in operational emissions of criteria air pollutants that would exceed significance thresholds for ROG even after mitigation. However, these emissions do not in and of themselves indicate a conflict with the 2017 Clean Air Plan given the RADP’s emphasis on reducing VMT, reducing energy demand, encouraging smart land use and building design, and achieving other objectives. The implementation of the RADP would not interfere with, disrupt, or hinder implementation of the Clean Air Plan.

- As described under Impact AQ-2, the RADP would be consistent with the control measures contained in the 2017 Clean Air Plan, would support the primary objectives of the 2017 Clean Air Plan, and would not hinder implementation of the 2017 Clean Air Plan. Furthermore, the growth rate (29 percent) in vehicle trips due to implementation of the RADP would not exceed the employment growth rate (29 percent) attributable to RADP projects. Nor would the RADP cause localized carbon monoxide (CO) impacts. In addition, the RADP includes goals and policies that would reduce criteria air pollutant emissions. Therefore, implementation of the RADP would not result in a cumulatively considerable net increase of criteria air pollutants for which the region is in nonattainment.
- As described under Impact AQ-3, construction of subsequent RADP projects would not exceed daily district significance thresholds. No individual representative RADP project, on its own, would exceed air district significance thresholds for construction activities. This analysis is a generalized assessment of the range of project types that was conducted in the absence of project-specific information, which cannot be known at this time. The analysis also accounts for the potential for RADP project activities to overlap and contemplates low-, medium-, and high-overlap scenarios. The low- and medium-overlap scenarios would not result in exceedances of air district significance thresholds for construction activities. As such, small subsequent RADP projects would result in less-than-significant impacts related to criteria air pollutant emissions. Given the short-term nature of small projects, it is unlikely that more than several would occur at the same time, producing substantially higher overlapping emissions than each small project in isolation. The high-overlap scenario would result in exceedances of air district construction significance thresholds for ROG and oxides of nitrogen (NO_X) for medium and large subsequent RADP projects. With implementation of Mitigation Measures M-AQ-3a and M-AQ-3b, which require that construction equipment engines meet or exceed the latest air emissions standards and that architectural coatings contain less than 10 grams of volatile organic compounds (VOC) per liter, ROG and NO_X emissions during the high overlap scenario would not exceed the air district significance thresholds. Each subsequent medium or large project would be required to undergo a project-level assessment of criteria air pollutant emissions at the time the project is proposed, and implement mitigation measures as needed. Therefore, the construction of subsequent RADP projects would not cause a cumulatively considerable net increase of any criteria air pollutant for which the region is in nonattainment.
- As described under Impact AQ-4, operational ROG emissions during full buildout of the RADP (including operations of all subsequent RADP projects) would exceed daily and annual air district significance thresholds during full-buildout of the RADP. Area sources of consumer product use would generate the majority of ROG emissions (58 percent), followed by area sources of architectural coatings (12 percent), landscaping equipment (15 percent), and mobile emissions from employee commutes (8 percent). With implementation of Mitigation Measures M-AQ-4a, M-AQ-4b, M-AQ-4c, M-AQ-4d, and M-AQ-4e, which require best available emissions controls for generator engines, limits on operation and idling time for non-road and heavy duty truck diesel engines, use of low-VOC consumer products and paints by tenants and vendors, use of super-compliant VOC architectural coatings during building maintenance, and use of all-electric landscaping equipment, operational ROG emissions would be reduced, but would exceed the air district's significance thresholds. Mitigation Measure M-AQ-4f would require the project sponsor to further reduce operational emissions by funding or implementing a specific ROG offset project, or to pay mitigation offset fees to an independent third party approved by the planning department, in order to reduce ROG emissions within the air basin below the threshold of significance of 10 tons per year (54 lb/day). However, the exact amount of ROG emission reductions achieved through this mitigation measure is not currently known given the uncertainty regarding implementing a specific offsite emission reduction project and because no offsite emissions reduction project is known to date. Therefore, the

operation of subsequent RADP projects would cause a cumulatively considerable net increase of ROG, a precursor pollutant of ozone for which the region is in nonattainment.

- As described under Impact AQ-5, lifetime cancer risk and annual average $PM_{2.5}$ concentrations would not exceed significance thresholds at any sensitive receptor or worker receptor location for construction and full-buildout operation of any subsequent RADP project. The closest sensitive receptors to any subsequent RADP project are residents west of U.S. 101, specifically those west of the North Field area, where the Consolidated Rental Car Center (CONRAC; RADP Project #9) and CONRAC Quick Turn-Around Facility (RADP Project #10) projects are located. These residents are located more than 1,000 feet from these RADP projects. Additionally, residential areas west of U.S. 101 are close to the truck delivery routes and employee travel for both construction and operations of subsequent RADP projects. Worker receptors were considered to be located in physical buildings within the Airport property boundary. Workers on the airfield are not considered sensitive receptors because they must follow regulations set forth by the U.S. Occupational Safety and Health Administration to ensure their health and well-being. Workers on the airfield would receive training about air pollution hazards as part of their employment, which would include methods to minimize exposure and risk. During construction, the highest impact to a worker receptor would occur in the ITB. During full-buildout operation, the highest impact to a worker receptor would occur east of North McDonnell Road in a United Airlines building. Therefore, construction and operation of the RADP, including construction and operation of subsequent RADP projects, would be less than significant, and no mitigation is required.
- As described under Impact AQ-6, the RADP is expected to generate only minor sources of odor. During construction, the various diesel-powered vehicles and equipment would create localized odors while in use. During excavation activities, organic materials could be temporarily exposed to the air. These odors would be temporary and intermittent and are not likely to be noticeable for extended periods of time beyond the boundaries of the Airport. Existing Airport uses are not sources of odorous emissions, except for those associated with food preparation at restaurants within the terminals. Therefore, construction and operation of RADP projects would not result in other emissions (such as those leading to odor) adversely affecting a substantial number of people.

The evaluation of cumulative air quality impacts in Section 3.C (Impacts C-AQ-1 and C-AQ-2) determines that construction-related and operational air quality impacts of subsequent projects that could occur with implementation of the RADP would not combine with cumulative projects to result in significant cumulative construction-related or significant cumulative operational impacts related to air quality health risk and odor impacts.

Alternative A: No Project Alternative

The No Project Alternative assumes that none of the RADP projects would be constructed. Consequently, the No Project Alternative would not result in any new SFO employees, compared to the 2,700 new employees associated with implementation of the RADP. As discussed above, the No Project Alternative assumes implementation of ongoing and cumulative projects, as well as the estimated SFO employee background growth of 9,400 between 2019 and 2045 anticipated to occur regardless of implementation of the RADP (see Table 3-1, p. 3-6).

Regarding Impact AQ-1, similar to the RADP, the No Project Alternative would support the primary goals of the 2017 Clean Air Plan by adhering to SFO's sustainability and renewable energy policies (described in Topic E.9, Greenhouse Gas Emissions, of the initial study included as Appendix B of this Draft EIR). Thus, the

No Project Alternative would not interfere with, disrupt, or hinder implementation of the Clean Air Plan, and Clean Air Plan consistency impacts of the No Project Alternative would be less than significant, similar to those of the RADP.

Regarding Impact AQ-2, similar to the RADP, under the No Project Alternative, the growth in vehicle trips would not exceed employment growth because vehicle trips and employees are estimated to remain the same as under 2045 future baseline without RADP conditions (see Draft EIR Section 3.A, Transportation and Circulation). In addition, the No Project Alternative would not include any projects that would induce automobile travel and would not substantially increase regional VMT or regional trips related to freight or logistics activity. Furthermore, the No Project Alternative would result in fewer employee vehicle trips compared to the RADP because it would not include the 2,700 additional employees associated with the subsequent RADP projects. The No Project Alternative would therefore also result in fewer peak-hour vehicle trips on nearby study roadway segments compared to the RADP, would not exceed 44,000 peak hour trips on nearby study roadway segments (as discussed under Impact AQ-2), and would not exceed the state one-hour or eight-hour CO standards. Therefore, impacts of the No Project Alternative related to regional emissions of criteria air pollutants would be less than impacts under the RADP and would be less than significant.

Regarding Impact AQ-3, the No Project Alternative would not result in construction emissions related to the RADP because it would not include construction of the subsequent RADP projects. Construction of ongoing and cumulative projects at SFO would still generate construction emissions; however, these projects would be required to comply with Airport Standard Construction Measures. Because the No Project Alternative would not include construction of subsequent RADP projects, construction activities at the Airport would be much less than under the RADP. Thus, construction criteria air pollutant impacts of the No Project Alternative would be less than impacts under the RADP and would be less than significant.

Regarding Impact AQ-4, because the No Project Alternative would not include operation of the subsequent RADP projects, it would not result in operational emissions of criteria air pollutants from the subsequent RADP projects, including consumer product use, vehicle trips, emergency diesel generators, landscape maintenance activities, and architectural coatings. Operational emissions under the No Project Alternative would be similar to conditions identified for 2045 future baseline without RADP conditions. Therefore, the No Project Alternative would not exceed the thresholds of significance for ROG and NO_X and would not contribute to new or exacerbated air quality violations in the San Francisco Bay Area Air Basin (air basin) by contributing to more days of ozone exceedance, nor would this alternative result in air quality index values that would be unhealthy for sensitive groups and other populations. Thus, operational criteria air pollutant impacts of the No Project Alternative would be less than impacts under the RADP and would be less than significant.

Regarding Impact AQ-5, the No Project Alternative would not include construction and operation of the subsequent RADP projects and therefore would not produce emissions of $PM_{2.5}$ or TACs from the subsequent RADP projects that would expose sensitive receptors to substantial air pollutant concentrations. TAC emissions under the No Project Alternative would be similar to conditions identified for 2045 future baseline without RADP conditions. Thus, TAC emissions and health risk impacts under the No Project Alternative would be less than impacts under the RADP and would be less than significant.

Regarding Impact AQ-6, the No Project Alternative would generate only minor sources of odor. Odor impacts under the No Project Alternative would be similar to conditions identified for 2045 future baseline without RADP conditions. Air district Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds if it receives more than a minimum number of complaints. Thus, odor impacts under the No Project Alternative would be less than impacts under the RADP and would be less than significant.

Regarding Impact C-AQ-1, no significant cumulative impacts related to $PM_{2.5}$ or TAC emissions that would expose sensitive receptors to substantial air pollutant concentrations were identified for implementation of the RADP. Under the No Project Alternative, ongoing and cumulative projects at the Airport could result in impacts related to $PM_{2.5}$ or TAC emissions; however, these impacts would occur regardless of the implementation of the RADP. Because the No Project Alternative does not include implementation of subsequent RADP projects, this alternative would not combine with ongoing and cumulative projects to result in a significant cumulative impact. Therefore, similar to the RADP, the No Project Alternative would have less-than-significant cumulative impacts related health risks and cumulative impacts would be less than impacts under the RADP.

Regarding Impact C-AQ-2, no significant cumulative impacts related to odors were identified for implementation of the RADP. Under the No Project Alternative, ongoing and cumulative projects at the Airport could result in impacts related to odors; however, these impacts would occur regardless of the implementation of the RADP. The No Project Alternative would not generate sources of odors associated with subsequent RADP projects and therefore would not combine with ongoing and cumulative projects to result in a significant cumulative odor impact. As such, cumulative odor impacts of the No Project Alternative would be less than impacts under the RADP and would be less than significant.

Alternative B: Reduced Development Alternative

The Reduced Development Alternative would remove the Boarding Area H, ITB Main Hall Expansion, and Aircraft Maintenance Hangar projects (RADP Projects #1, #3, and #18, respectively) from the RADP. The Reduced Development Alternative would result in approximately 1,550 new SFO employees, compared to the approximately 2,700 new employees with implementation of the RADP, and reduction in VMT is proportional, as an average distance was assumed for employees.

Regarding Impact AQ-1, similar to the RADP, the Reduced Development Alternative would support the primary goals of the 2017 Clean Air Plan by supporting the applicable measures that aim to achieve these goals. Also similar to the RADP, the vast majority of the control measures in the 2017 Clean Air Plan do not apply directly to the Reduced Development Alternative and its related subsequent projects, because the measures target facilities or land uses that do not currently exist and are not part of this alternative. However, the Reduced Development Alternative would include all of the same elements as the RADP that support the 2017 Clean Air Plan's control measures, such as solar generation capacity; all-electric buildings with no natural gas combustion; implementation of all Airport Standard Construction Measures during construction; support for and compliance with the Airport's Zero-Emission Vehicle Readiness Roadmap; and compliance with the goals of SFO's 2023–2028 five-year strategic plan, such as zero waste and zero water. Therefore, the Reduced Development Alternative would not interfere with, disrupt, or hinder implementation of the Clean Air Plan and impacts would be less than significant, similar to the RADP.

Regarding Impact AQ-2, similar to the RADP, under the Reduced Development Alternative, the growth in vehicle trips would not exceed the employment growth attributable to Reduced Development Alternative projects. In addition, this alternative would not include any projects that would induce automobile travel and would not substantially increase regional VMT or regional trips related to freight or logistics activity.

Furthermore, the Reduced Development Alternative would reduce employee vehicle trips compared to the RADP because this alternative would result in approximately 1,150 fewer new employees and fewer vehicle trips. The Reduced Development Alternative therefore would also reduce peak-hour vehicle trips on nearby study roadway segments compared to the RADP and would not exceed 44,000 peak-hour vehicles or state one-hour or eight-hour CO standard. Because fewer RADP projects would be constructed under this alternative, impacts of the Reduced Development Alternative related to regional emissions of criteria air pollutants would be less than impacts under the RADP and would be less than significant.

Regarding Impact AQ-3, the Reduced Development Alternative would result in fewer construction emissions because it would not include construction of the Boarding Area H, ITB Main Hall Expansion, and Aircraft Maintenance Hangar projects (RADP Projects #1, #3, and #18, respectively). Construction of the subsequent projects under the Reduced Development Alternative would be required to comply with Airport Standard Construction Measures, like all RADP projects. Because this alternative would include less development, construction activities under the Reduced Development Alternative would be less than those for the full set of RADP projects. However, the Reduced Development Alternative would include construction of the Central Hub (RADP Project #6), the Consolidated Rental Car Center Facility (RADP Project #9), and the East Field Ground Support Equipment Facility #2 (RADP Project #19), the representative projects modeled for construction emissions of criteria air pollutants for the RADP. Similar to the RADP, small subsequent projects would not result in significant criteria air pollutant emissions, but medium and large subsequent projects could result in significant NOx and ROG emissions. Therefore, similar to the RADP, implementation of Mitigation Measures M-AQ-3a and M-AQ-3b would be required to reduce the impact. These mitigation measures would reduce the impact to less-than-significant levels. Each subsequent medium or large project would be required to undergo a project-level assessment of criteria air pollutant emissions at the time the project is proposed and implement mitigation measures as needed. Therefore, construction criteria air pollutant impacts under the Reduced Development Alternative would be less than impacts under the RADP and would be less than significant with mitigation.

Regarding Impact AQ-4, the Reduced Development Alternative would result in fewer operational emissions because it would not include construction of the Boarding Area H, ITB Main Hall Expansion, and Aircraft Maintenance Hangar projects. Therefore, operational emissions of criteria air pollutants associated with consumer product use, vehicle trips, emergency diesel generators, landscape maintenance activities, and architectural coatings would be less than those under the RADP. The reduction in ROG emissions for this alternative was calculated using the consumer product emission factor of 1.46 e^{-05} pounds of ROG per square feet of building area per day. The reduction of 2.2 million square feet of building area under this alternative would result in a reduction of 32.1 pounds per day of ROG emissions, which would reduce the operational ROG emissions to below the 54 pound per day threshold. However, the Reduced Development Alternative includes operational activity similar to the RADP and could therefore result in ROG emissions exceeding the air district’s thresholds of significance. These exceedances could contribute to new or exacerbated air quality violations in the air basin by contributing to more days of ozone exceedance or could result in air quality index values that are unhealthy for sensitive groups and other populations. Therefore, as under the RADP, implementation of Mitigation Measures M-AQ-4a, M-AQ-4b, M-AQ-4c, M-AQ-4d, M-AQ-4e, and M-AQ-4f would be required to reduce the impact. With implementation of these mitigation measures, ROG emissions under the Reduced Development Alternative would be reduced to less-than-significant levels. This is because under this alternative, the reduced extent of development would be sufficient to reduce operational ROG emissions below the air district’s thresholds of significance with mitigation, unlike those for subsequent

RADP projects. Therefore, operational criteria air pollutant impacts of the Reduced Development Alternative would be less than impacts under the RADP and would be less than significant with mitigation.

Regarding Impact AQ-5, the Reduced Development Alternative would include less construction and operational activity than the RADP and would therefore produce fewer emissions of $PM_{2.5}$ and TACs that would result in exposure of sensitive receptors to substantial air pollutant concentrations. Similar to the RADP, the Reduced Development Alternative would not produce lifetime cancer risk or annual average $PM_{2.5}$ concentrations that would exceed significance thresholds at any sensitive receptor or worker receptor location for construction and full-buildout operations. Therefore, TAC emissions and health risk impacts from the Reduced Development Alternative would be less than impacts under the RADP and would be less than significant.

Regarding Impact AQ-6, similar to the RADP, the Reduced Development Alternative would generate only minor sources of odor. Air district Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds if it receives more than a minimum number of complaints. Thus, odor impacts of the Reduced Development Alternative would be less than impacts under the RADP and would be less than significant.

Regarding Impact C-AQ-1, implementation of the Reduced Development Alternative would not emit DPM and $PM_{2.5}$ that would lead to a significant health risk impact, as discussed under Impact AQ-5. This impact, combined with the health risk impact from DPM and $PM_{2.5}$ emissions from construction and operation of ongoing and cumulative projects, would not result in a significant cumulative health risk impact. Because less development would occur under this alternative, cumulative impacts associated with health risks would be less than impacts under the RADP and would be less than significant.

Regarding Impact C-AQ-2, the Reduced Development Alternative would generate only minor sources of odors. As stated under Impact C-AQ-2, the Mel Leong Treatment Plant is a source of odorous emissions located at the northeast end of the Airport and more than 2 miles from the closest residential sensitive receptor. The South San Francisco – San Bruno Water Quality Control Plan, located approximately 700 feet north of the United Airlines Maintenance and Operations Center, is another source of odorous emissions located more than 0.5 mile from the closest residential sensitive receptor. Construction activities could be a source of odorous emissions, mainly from diesel fuel combustion, but these emissions would be temporary and intermittent. Therefore, the Reduced Development Alternative would not combine with ongoing and cumulative projects to result in a significant cumulative impact. Because less development would occur, cumulative odor impacts of the Reduced Development Alternative would also be less than impacts under the RADP and would be less than significant.

Alternative C: Boarding Area H Only Alternative

The Boarding Area H Only Alternative would remove all RADP projects except Boarding Area H (RADP Project #1) from the RADP. The Boarding Area H Only Alternative would result in approximately 190 new SFO employees, compared to approximately 2,700 new employees with implementation of the RADP. As discussed above, the Boarding Area H Only Alternative assumes implementation of ongoing and cumulative projects, as well as the estimated SFO employee background growth of 9,400 between 2019 and 2045 anticipated to occur regardless of implementation of the RADP (see Table 3-1, p. 3-6).

Regarding Impact AQ-1, similar to the RADP, the Boarding Area H Only Alternative would support the primary goals of the 2017 Clean Air Plan by supporting the applicable measures that aim to achieve these goals. Also similar to the RADP, the vast majority of the control measures included in the 2017 Clean Air Plan do not apply directly to the Boarding Area H Only Alternative because these measures target facilities or land uses that do not currently exist and are not part of this alternative. However, the Boarding Area H Only Alternative would include some of the same elements as the RADP that support the 2017 Clean Air Plan's control measures, such as solar generation capacity; all-electric buildings with no natural gas combustion; implementation of all Airport Standard Construction Measures during construction; and compliance with the goals of SFO's 2023–2028 five-year strategic plan, such as zero waste and zero water. Therefore, the Boarding Area H Only Alternative would not interfere with, disrupt, or hinder implementation of the Clean Air Plan. The Clean Air Plan consistency impacts of the Boarding Area H Only Alternative would be less than significant, similar to the RADP.

Regarding Impact AQ-2, similar to the RADP, under the Boarding Area H Only Alternative, the growth in vehicle trips would not exceed the employment growth attributable to the Boarding Area H Only Alternative Furthermore, the Boarding Area H Only Alternative would reduce employee vehicle trips compared to the RADP because this alternative would result in approximately 2,500 fewer new employees and fewer vehicle trips. Therefore, the Boarding Area H Only Alternative would also reduce peak-hour vehicle trips on nearby study roadway segments compared to the RADP and would not exceed the state one-hour or eight-hour CO standard. Impacts of the Boarding Area H Only Alternative related to regional emissions of criteria air pollutants would be less than impacts under the RADP and would be less than significant.

Regarding Impact AQ-3, the Boarding Area H Only Alternative would entail substantially less construction than the RADP and would result in a substantial reduction in the construction duration (i.e., about six years, rather than 20 years under the RADP). Like the RADP, construction of Boarding Area H would be required to comply with Airport Standard Construction Measures. However, the Boarding Area H project is classified as a "large" subsequent RADP project and therefore could produce construction ROG and NO_X emissions that could exceed the air district's thresholds of significance. Therefore, similar to the RADP, implementation of Mitigation Measures M-AQ-3a and M-AQ-3b would be required to reduce the impact. These mitigation measures would reduce the impact to less-than-significant levels. Boarding Area H would be required to undergo a project-level assessment of criteria air pollutant emissions at such time the project is proposed and implement mitigation measures as needed. Thus, construction criteria air pollutant impacts under the Boarding Area H Only Alternative would be less than impacts under the RADP and would be less than significant with mitigation.

Regarding Impact AQ-4, the Boarding Area H Only Alternative would result in fewer operational emissions than the RADP because it would only include construction of Boarding Area H. Operational emissions of criteria air pollutants associated with consumer product use, vehicle trips, emergency diesel generators, landscape maintenance activities, and architectural coatings would be substantially lower than under the RADP. The ROG emissions for this alternative were calculated using the consumer product emission factor of 1.46 e^{-05} pounds of ROG per square feet of building area per day. Boarding Area H would include 1,413,300 square feet of net new construction. This would result in consumer product ROG emissions of 21 pounds per day, which would reduce the operational ROG emissions to below the 54 pound per day threshold. However, the Boarding Area H Only Alternative could produce ROG emissions that would exceed the air district's thresholds of significance. These exceedances could contribute to new or exacerbated air quality violations in the air basin by contributing to more days of ozone exceedance or could result in air quality index values that would be unhealthy for sensitive groups and other populations. Therefore, as under the RADP, implementation of Mitigation Measures M-AQ-4a, M-AQ-4b, M-AQ-4c, M-AQ-4d, M-AQ-4e, and M-AQ-4f would be required to reduce the impact. With implementation of these mitigation measures, ROG emissions for the Boarding Area H Only Alternative would be reduced to a less-than-significant level. This is because under the Boarding Area H Only Alternative, the reduced extent of development would be sufficient to reduce operational ROG emissions below the air district's thresholds of significance with mitigation. For these reasons, operational criteria air pollutant impacts of the Boarding Area H Only Alternative would be less than impacts under the RADP and would be less than significant with mitigation.

Regarding Impact AQ-5, the Boarding Area H Only Alternative would include less construction and operational activity than the RADP and therefore would produce substantially fewer emissions of $PM_{2.5}$ or TACs that would expose sensitive receptors to substantial air pollutant concentrations. Similar to the RADP, the Boarding Area H Only Alternative would not produce lifetime cancer risk or annual average $PM_{2.5}$ concentrations that would exceed significance thresholds at any sensitive receptor or worker receptor location for construction and full-buildout operation. Therefore, TAC emissions and health risk impacts from the Boarding Area H Only Alternative would be less than impacts under the RADP and would be less than significant.

Regarding Impact AQ-6, the Boarding Area H Only Alternative would generate only minor sources of odor. Air district Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds if it receives more than a minimum number of complaints. Thus, odor impacts of the Boarding Area H Only Alternative would be less than impacts under the RADP and would be less than significant.

Regarding Impact C-AQ-1, implementation of the Boarding Area H Only Alternative would not emit DPM and $PM_{2.5}$ that would lead to a significant health risk impact, as discussed under Impact AQ-5. This impact, combined with the health risk impact from DPM and $PM_{2.5}$ emissions from construction and operation of ongoing and cumulative projects, would not result in a significant cumulative health risk impact. Because less development would occur under this alternative, cumulative impacts associated with health risks would be less than impacts under the RADP and would be less than significant.

Regarding Impact C-AQ-2, the Boarding Area H Only Alternative would generate only minor sources of odors. As stated under Impact C-AQ-2, the Mel Leong Treatment Plant is a source of odorous emissions located at the northeast end of the Airport and more than 1 mile from the closest residential sensitive receptor. The South San Francisco – San Bruno Water Quality Control Plan, located approximately 700 feet north of the United Airlines Maintenance and Operations Center, is another source of odorous emissions located more than 0.5 mile from the closest residential sensitive receptor. Construction activities associated with implementation of the RADP could be a source of odorous emissions, mainly from diesel fuel combustion, but these emissions would be temporary and intermittent. Therefore, the Boarding Area H Only Alternative would not combine with cumulative projects to result in a significant cumulative impact. Because less development would occur, cumulative odor impacts of the Boarding Area H Only Alternative would be less than impacts under the RADP and would be less than significant.

5.F.4 Issues Analyzed in the Initial Study

As discussed previously in Section 5.D, the initial study (Appendix B to this Draft EIR) determined that implementation of the RADP would have either no impact, less-than-significant impacts, or impacts that could be reduced to less than significant with mitigation for the following environmental topics: land use and planning, aesthetics, population and housing, cultural resources, tribal cultural resources, GHG emissions, wind, shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, mineral resources, energy, agriculture and forestry resources, and wildfire.[315] The discussion below compares each alternative to the RADP and their respective impacts related to the aforementioned environmental topics.

Alternative A: No Project Alternative

The No Project Alternative assumes that none of the RADP projects would be constructed. Consequently, the No Project Alternative would not result in any new SFO employees, compared to the 2,700 new employees associated with implementation of the RADP. The No Project Alternative also assumes that the estimated SFO employee background growth of 9,400 between 2019 and 2045 would occur, as this employee growth is associated with the growth in passengers anticipated to occur regardless of implementation of the RADP (see Table 3-1, p. 3-6). Because this alternative assumes that employment growth and construction activities attributable to implementation of the RADP would not occur, impacts related to all of the following resource areas would be less than impacts under the RADP: land use and planning, aesthetics, population and housing, cultural resources, tribal cultural resources, GHG emissions, wind, shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, and energy. Furthermore, the No Project Alternative would avoid all physical environmental effects directly attributed to implementation of the RADP.

Alternative B: Reduced Development Alternative

The Reduced Development Alternative would remove the Boarding Area H, ITB Main Hall Expansion, and Aircraft Maintenance Hangar projects (RADP Projects #1, #3, and #18, respectively) from the RADP. The Reduced Development Alternative would result in approximately 1,550 new SFO employees, compared to 2,700 new employees with implementation of the RADP. Given the reduction in new development and employment generation that would occur under this alternative, the Reduced Development Alternative would result in reduced less-than-significant and less-than-significant-with-mitigation impacts related to all of the following resource areas, as compared to the RADP: land use and planning, aesthetics, population and housing, cultural resources, tribal cultural resources, GHG emissions, wind, shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, and energy.

Alternative C: Boarding Area H Only Alternative

The Boarding Area H Only Alternative would remove all RADP projects except the Boarding Area H project (RADP Project #1) from the RADP. The Boarding Area H Only Alternative would result in approximately 190 new SFO employees, compared to approximately 2,700 new employees with implementation of the RADP. Given the reduction in new development and employment generation that would occur under this alternative, the Boarding Area H Only Alternative would result in reduced less-than-significant and less-than-significant-with-mitigation impacts related to all of the following resource areas, as compared to the RADP: land use and planning, aesthetics, population and housing, cultural resources, tribal cultural resources, GHG

[315] The initial study determined that the RADP would have no impacts related to mineral resources, agriculture and forestry resources, and wildfire.

emissions, wind, shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, and energy.

5.G Comparison of Alternatives and Environmentally Superior Alternative

5.G.1 Comparison and Summary of Impacts of Alternatives and Their Ability to Meet Project Objectives

The impacts of each alternative and its ability to meet the project objectives compared to the RADP are summarized in **Table 5-2** and the subsequent discussion.

Table 5-2 Summary of Ability of Alternatives to Meet Project Objectives

Project Objective	Alternative A: No Project	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
1. Provide a long-range development plan that elevates the passenger experience at the Airport and accommodates forecast passenger demand and aviation activity in a safe, cost-effective, operationally efficient, environmentally conscious, and flexible manner.	No	Partially, due to reduction in development	Partially, due to reduction in development
2. Maximize practical airfield capacity and operational efficiency in the existing physical geometry of the runways; there would be no changes to the existing runways geometry and configuration under the RADP.	No	Partially, due to reduction in development	Partially, due to reduction in development
3. Maximize gate capacity, geometry, and flexibility of airline use to efficiently accommodate forecast aviation activity, without relying on remote gates/hard stands that would require bussing operations to accommodate boarding and deplaning passengers on the airfield.	No	Partially, due to reduction in development	Partially, due to reduction in development
4. Optimize passenger processing areas including terminal lobby and security check point flows to meet future needs and incorporate new technologies.	No	No	No
5. Maximize shared-use facilities in the terminal areas and airport and airline support facilities, as well as enable shared use by providing technology, bag claim flexibility, and connectivity for passengers and baggage across all terminals.	No	No	No

Project Objective	Alternative A: No Project	Alternative B: Reduced Development Alternative	Alternative C: Boarding Area H Only Alternative
6. Achieve industry standards and airport planning principles by prioritizing efficient flow of aircraft, passengers, and goods through the Airport, through optimizing flows in the following order of priority: Airport operations area/airside; Airport facilities that are passenger facing such as terminals and gate areas, and associated passenger/aircraft support facilities (e.g., ground service equipment); landside Airport facilities including ground transportation, passenger parking, and rental car facility; other Airport and airline support facilities within the Airport property; and off-Airport uses such as catering, warehousing, and remote passenger parking.	No	Partially, due to reduction in development	No
7. Provide sufficient on-Airport parking to accommodate passenger demand and transport passengers and employees to/from the terminal areas using automated people mover system AirTrain to the greatest extent possible.	No	Yes	No

Alternative A: No Project Alternative

The No Project Alternative assumes that none of the RADP projects would be constructed. Therefore, this alternative would fail to meet all of the project objectives. Moreover, SFO's long-term operations and passenger activity levels are forecast to reach approximately 506,000 annual aircraft operations, based on the estimated capacity of the existing runways, regardless of whether the RADP is implemented. Passenger aircraft operations represent the largest portion of the 506,000 annual aircraft operations, which are forecast to accommodate approximately 71.1 million annual passengers considering the forecast passenger aircraft fleet mix. This growth would still occur under the No Project Alternative; however, RADP projects developed to accommodate the long-term increased aircraft operations and passenger activity levels would not be implemented. Nevertheless, because no construction or operation of subsequent RADP projects would occur, the No Project Alternative would eliminate the significant and unavoidable impact and reduce the less-than-significant and less-than-significant-with-mitigation impacts under the RADP.

Alternative B: Reduced Development Alternative

This alternative would remove the Boarding Area H, ITB Main Hall Expansion, and Aircraft Maintenance Hangar projects (RADP Projects #1, #3, and #18, respectively) from the RADP. By removing key RADP projects designed to accommodate long-term aircraft operations and passenger activity levels at the Airport, the Reduced Development Alternative would only partially meet Objectives 1, 2, 3, and 6. Because this alternative would include the same parking facilities proposed under the RADP, this alternative would meet Objective 7. However, this alternative would not meet Objective 4 because the Boarding Area H and ITB Main Hall Expansion projects would not be constructed; therefore, passenger processing areas including terminal lobby and security checkpoint flows to meet future needs would not be implemented. This alternative also would not meet Objective 5 because the Boarding Area H and ITB Main Hall Expansion projects would not be constructed; therefore, maximizing shared-use facilities in the terminal areas and airport and airline support facilities would not be implemented. Although this alternative would implement some projects under the RADP, the full range of RADP projects developed to accommodate long-term increased aircraft operations and passenger activity levels would not be implemented under the Reduced Development Alternative. Nevertheless, the reduced extent of development that would occur under the Reduced Development Alternative would be sufficient to reduce the significant and unavoidable operational criteria air pollutant impact under the RADP to less than significant with mitigation and would reduce the less-than-significant and less-than-significant-with-mitigation impacts of implementation of the RADP.

Alternative C: Boarding Area H Only Alternative

The Boarding Area H Only Alternative would remove all RADP projects except the Boarding Area H project (RADP Project #1) from the RADP. By removing several key terminal projects, all ground access and parking projects, and support facilities projects proposed under the RADP, the Boarding Area H Only Alternative would only partially meet Objectives 1 through 3. Boarding Area H does not include passenger processing (e.g., ticketing, bag claim, security screening) and would not improve those facilities. Maximization of shared-use facilities in the terminal areas and Airport and airline support facilities would not be achieved across all terminals under the Boarding Area H Only Alternative. Efficient flow of aircraft, passengers, and goods through the Airport that would be facilitated by the RADP would not be achieved under the Boarding Area H Only Alternative. Consequently, the Boarding Area H Only Alternative would not meet Objectives 4 through 6. Because this alternative would remove all parking facilities proposed under the RADP, this alternative would not meet Objective 7. Although this alternative would implement one of the primary terminal projects in the RADP, the full range of RADP projects developed to accommodate long-term increased aircraft operations and passenger activity levels would not be implemented under the Boarding Area H Only Alternative. Nevertheless, the substantially reduced extent of development that would occur under the Boarding Area H Only Alternative would be sufficient to reduce the significant and unavoidable operational criteria air pollutant impact under the RADP to less than significant with mitigation and would reduce the less-than-significant and less-than-significant-with-mitigation impacts under the RADP.

5.G.2 Environmentally Superior Alternative

The CEQA Guidelines require the identification of an environmentally superior alternative among the alternatives (CEQA Guidelines section 15126.6[e]). Based on the analysis and comparison of the impacts of the alternatives presented above, Alternative A (No Project Alternative) is the environmentally superior alternative. As described previously, Alternative A would eliminate the significant-and-unavoidable-with-mitigation impact and reduce the less-than-significant and less-than-significant-with-mitigation impacts associated with implementation of the RADP because no construction or operation of the subsequent RADP projects would occur.

The CEQA Guidelines state that if the “no project” alternative would be the environmentally superior alternative, then the EIR shall also identify an environmentally superior alternative among the other project alternatives (CEQA Guidelines section 15126.6[e][2]). Based on the preceding evaluation, Alternative C (Boarding Area H Only Alternative) is the environmentally superior alternative. Under Alternative C, the significant-and-unavoidable-with-mitigation impact under the RADP related to operational emissions of the criteria air pollutant ROG would be reduced to less than significant with mitigation as a result of the reduced extent of development (Impact AQ-4). While the significant-and-unavoidable-with-mitigation impact under the RADP related to operational emissions of the criteria air pollutant ROG would also be reduced (32.1 pounds per day) to less than significant with mitigation under Alternative B (Reduced Development Alternative), the reduction would be greater (21 pounds per day) under Alternative C due to the substantially reduced extent of development compared to Alternative B. In addition, by retaining implementation of the primary terminal project under the RADP, Alternative C would more effectively (though still only partially) meet most of the RADP project objectives in comparison to Alternatives A and B. However, under Alternative C, the full range of new and expanded terminal facilities and aircraft maintenance facilities proposed under the RADP to accommodate long-term operations and passenger activity would not be implemented. Nevertheless, Alternative C is the environmentally superior alternative.

5.H Alternatives Considered but Eliminated from Further Analysis

The concepts considered but eliminated from further analysis are described below.

5.H.1 Annual Limit on SFO Aircraft Operations and Passengers

This alternative would impose an annual limit of approximately 62.2 million passengers and 498,900 aircraft operations for SFO, which is the “Base Constrained” annual demand level identified in Table 2-1, p. 2-17. This alternative is intended to reduce the scale of the subsequent RADP projects by imposing an annual cap on passengers and operations, which would reduce the need for landside facilities to serve those passengers. This alternative would reduce the identified significant adverse effect under the RADP related to air quality (i.e., operational ROG emissions). However, SFO does not have the authority to impose an annual limit on SFO aircraft operations and passengers given that it is a public-use, commercial service, large-hub airport connected to the national grid. Therefore, this alternative was eliminated from further analysis.

5.H.2 Redirection of SFO Passengers to Other Airports

This alternative would redirect a certain number of annual SFO passengers to other airports throughout the state. This alternative is intended to reduce the scale of the RADP projects by redirecting passengers to other airports, which would reduce the need for landside facilities to serve those passengers. This alternative would reduce the identified significant adverse effect under the RADP on air quality (i.e., operational ROG emissions). However, SFO does not have the authority to redirect SFO passengers to other airports, as passengers are free to choose what airports they use based on their desired destinations. Therefore, this alternative was eliminated from further analysis.

5.H.3 Extension of the RADP Construction Schedule

This alternative would extend the overall RADP construction schedule to reduce the intensity of construction activity during any given calendar year, thus reducing the average daily criteria air pollutant emissions resulting from construction of the RADP projects. However, average daily construction emissions for the RADP would already be reduced to below the applicable thresholds of significance with mitigation, so this alternative would not avoid or substantially lessen the already less-than-significant-with-mitigation environmental effects related to construction of the subsequent RADP projects. Furthermore, although this alternative would delay the date when the RADP is fully operational, which would result in fewer operational ROG and NO_X emissions from mobile sources (as vehicle emission rates decline over time with vehicle turnover and implementation of regulations), the significant air quality impact from RADP operations is attributable to ROG emissions from consumer product use, which do not decline over time. Consequently, this alternative would not avoid or substantially lessen any significant adverse environmental effects related to operation of the subsequent RADP projects. Therefore, this alternative was eliminated from further analysis.

5.H.4 Prohibition of Nighttime Aircraft Operations

This alternative would prohibit aircraft operations at SFO between 10 p.m. and 7 a.m. This alternative concept was considered in response to scoping comments suggesting that implementation of the RADP could increase and/or alter aircraft operations at SFO and therefore could result in new or increased impacts related to aircraft noise and vibration. The preliminary consideration for this alternative concept was that it would eliminate aircraft noise and vibration effects during the more sensitive nighttime periods. However, as discussed in more detail in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, the RADP would not induce passenger demand, would not increase airfield capacity, would not change the configuration of the existing runways, would not change the number of aircraft operations or aircraft types operating at the Airport (including cargo, private jets, and helicopters), and would not change the volume of annual passengers that choose to fly into and out of SFO; therefore, implementation of the RADP would not result in new or increased impacts related to aircraft noise. Consequently, there is no environmental basis for this alternative, as it would not avoid or substantially lessen any significant adverse environmental effect resulting from implementation of the RADP. Moreover, even if this alternative concept would help to reduce or eliminate an identified significant impact under the RADP, SFO does not have the authority to prohibit nighttime aircraft operations given that it is a public-use, commercial service, large-hub airport connected to the national grid. Therefore, this alternative was eliminated from further analysis.

CHAPTER 6
REPORT PREPARERS

6.A San Francisco Planning Department

Environmental Planning Division
49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103

- Environmental Review Officer: Lisa Gibson
- Principal Environmental Planner: Tania Sheyner
- Senior Environmental Planner: Kei Zushi
- Principal Air Quality Planner: Tania Sheyner
- Principal Noise Planner: Chelsea Fordham
- CEQA Cultural Resources Team Manager: Allison Vanderslice
- Principal Transportation Planner: Jenny Delumo
- Senior Air Quality Planner: Josh Pollak
- Senior Transportation Planner: Elizabeth White
- Senior Preservation Planner: Justin Greving
- Senior Noise Planner: Kei Zushi

6.B San Francisco International Airport

San Francisco International Airport
P.O. Box 8097
San Francisco, CA 94128

- Project Manager: Audrey Park
- Deputy Project Manager: Michael Li (retired)
- Air Quality/Senior Environmental Planner: David Kim, PhD

Ricondo & Associates (Technical Review)
20 N. Clark Street, Suite 1500
Chicago, IL 60602

- Technical Reviewers: Stephen Culberson, John C. Williams, Avant Ramsey
- Air Quality Technical Reviewer: Allison Ducar
- Transportation Technical Reviewer: Jim Ducar and Alex Chambers

6.C Office of the City Attorney

City Hall, Room 234
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102

- Deputy City Attorney: Andrea Ruiz-Esquide

6.D Environmental Consultants

Environmental Science Associates
575 Market Street, Suite 3700
San Francisco, CA 94105

- Project Director: Michael Arnold
- Project Manager: Eryn Brennan
- Deputy Project Managers: Steve Smith/Patrick Hickman
- Air Quality and Greenhouse Gas Lead: Brian Schuster
- Noise and Vibration Lead: Jyothi Iyer
- Architectural Resources Lead: Becky Urbano
- Archeological and Tribal Cultural Resources Lead: Heidi Koenig
- Biological Resources Lead: Erika Walther
- Publications: Joel Miller
- Graphics: James Songco

Fehr & Peers
100 Pringle Avenue, Suite 600
Walnut Creek, CA 94596

- Principal: Matt Goyne
- Principal: Sarah Chan

LCW Consulting
33 Route 17
Jewett, New York 12444

- Principal: Luba C. Wyznyckyj