APPENDIX A

Notice of Preparation and Scoping Comments

SAN FRANCISCO
PLANNING DEPARTMENT

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting

Date:	May 22, 2019
Case No.:	2017-007468ENV
Project Title:	**SFO Recommended Airport Development Plan**
Project Sponsor:	San Francisco International Airport
	Audrey Park – 650.821.7844
	audrey.park@flysfo.com
Lead Agency:	San Francisco Planning Department
Staff Contact:	Michael Li – 415.575.9107
	michael.j.li@sfgov.org

INTRODUCTION

This notice provides a summary description of the proposed project; identifies environmental issues anticipated to be analyzed in the initial study (IS) and environmental impact report (EIR); and provides the time, date, and location of the public scoping meetings (see page 22 for information on the public scoping meetings). The comments received during the public scoping process will be considered during the preparation of the IS and EIR for this project.

PROJECT SUMMARY

The project sponsor, San Francisco International Airport (SFO or Airport), is proposing to implement the SFO Recommended Airport Development Plan (RADP), which involves a long-range plan to guide the Airport's development while providing the highest level of international and domestic guest service. 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 proposed RADP includes projects that would accommodate long-term demand at the Airport, forecast to reach 71.1 million annual passengers[1] at the estimated maximum airfield capacity in its existing layout.[2] While the existing facilities, along with various Airport improvements already underway, could accommodate the forecast demand without implementing the SFO RADP, the level of service would deteriorate substantially, with inefficiencies and potential substantial passenger delays and inconvenience in the terminals, access roadways and curbsides, and rental car facilities.

The RADP serves as a roadmap for guiding future Airport development in order to modernize SFO, increase the efficiency of Airport operations, and enhance the passenger experience. The RADP is not expected to induce

[1] 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.
[2] Landrum & Brown, Inc., San Francisco International Airport Aviation Activity Forecast, April 2014, approved by the Federal Aviation Administration on June 9, 2014.

passenger demand, and no airfield expansion projects are proposed as part of the RADP, nor would the proposed project increase the capacity of the airfield, change aircraft operations or aircraft types operating at the Airport, or affect the volume of passengers that use SFO. As noted above, long-term demand at the Airport is forecast to reach 71.1 million annual passengers, which is the estimated capacity of the existing airfield, irrespective of the RADP.

In addition, a variant, hereafter referred to as the "Boarding Area F Variant," is proposed. The Boarding Area F Variant would accommodate four additional narrowbody[3] domestic gates at the end of Boarding Area F, should domestic demand exceed gate availability prior to the construction of Boarding Area H (discussed below on page 5). The Boarding Area F Variant is further described on page 17 under the heading, "Boarding Area F Variant (Figure 6)."

PROJECT LOCATION AND SITE CHARACTERISTICS

The project site is comprised of portions of SFO, primarily located 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. The U.S. Coast Guard San Francisco Air Station[4] and the United Airlines Maintenance and Operations Center (UA MOC),[5] are located on Airport land but would not be affected by the project (see Figure 1). The Airport is owned by the City and County of San Francisco (CCSF or the City), and operated by and through the San Francisco Airport Commission (the airport commission).

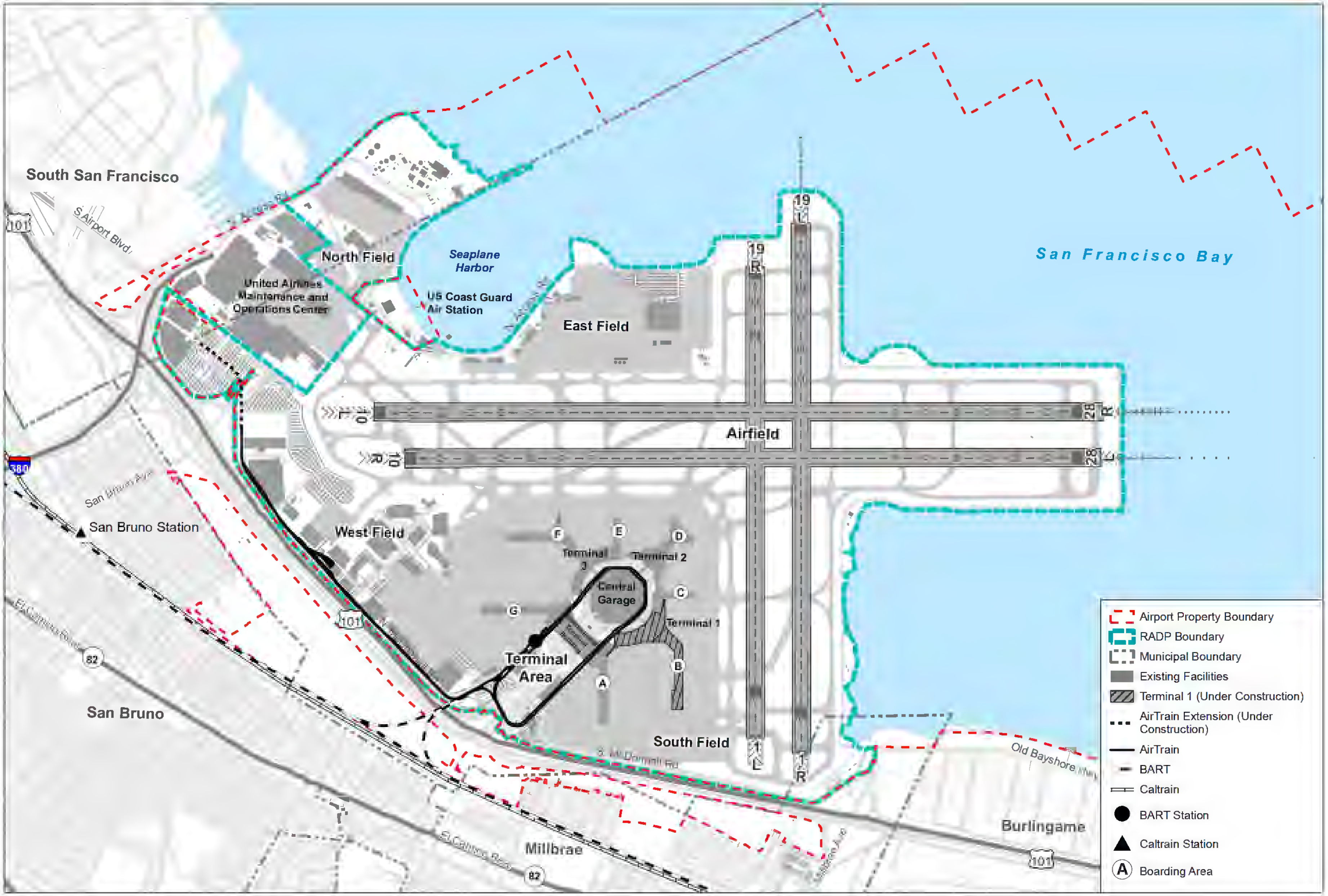
The operational area of the Airport, which includes the project site, is generally bordered by U.S. Highway 101 (U.S. 101), also referred to as the Bayshore Freeway, to the west and the San Francisco Bay to the east. Airport property also includes the area west of U.S. 101, referred to as the West-of-Bayshore property, composed of approximately 180 acres of undeveloped land with major utility rights-of-way and supporting aquatic, wetland, and upland habitats. Of the 5,100 acres that comprise 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 over San Francisco Bay.

SFO is the largest airport serving the San Francisco Bay Area. Other airports in the San Francisco Bay Area include Oakland and Norman Y. Mineta San Jose International airports. SFO contains two sets of parallel runways, oriented in north/south and east/west configurations; supporting airfield facilities and infrastructure; a passenger terminal area served by access roads, parking facilities, and ground transportation facilities; and cargo and other facilities typical of a commercial service airport.[6]

SFO was constructed in phases in the 1920s by filling portions of the San Francisco Bay, and initially 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 great majority of the SFO site is paved for aeronautical uses

---

[3] A *narrowbody* aircraft is an airliner with the seating arranged along a single aisle.
[4] The U.S. Coast Guard station is located entirely on federal land; the facilities are owned, maintained, and operated by the federal government.
[5] The facilities at the United Airlines Maintenance and Operation Center are neither owned nor operated by SFO.
[6] A *commercial service airport* is a publicly owned airport that has at least 2,500 passenger boardings each year and receives scheduled passenger service.



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

0 2,000
Feet

Case No. 2017-007468ENV: SFO RADP EIR

Figure 1
SFO Existing Conditions

such as runways, taxiways,[7] aircraft aprons,[8] and parking, or occupied by passenger terminal buildings and aircraft hangars. SFO operates 24 hours a day, seven days per week as a public use airport.[9] In calendar year 2018, the Airport served approximately 57.8 million annual passengers[10] with about 42,800 airport commission and tenant employees.[11]

SFO is accessed regionally by U.S. 101 and Interstate 380. 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 (see Figure 1). Regional rail service is provided by Bay Area Rapid Transit (BART). The BART station is located in the Airport's International Terminal (SFO Airport Station) and connects transit riders to the East Bay, San Francisco, and northern San Mateo County. The SFO Airport Station is accessible from any Airport terminal via the AirTrain, a fully automated people-mover system operated by SFO that runs between the Airport terminals, terminal parking garages, Rental Car Center, 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 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 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.

As shown on Figure 1, the developed SFO property is divided into six geographic areas: North Field, East Field, West Field, South Field, Airfield, and Terminal Area. The individual RADP projects described below are organized according to their location within these areas.

RECOMMENDED AIRPORT DEVELOPMENT PLAN

The RADP was completed in September 2016 to accommodate future passenger, cargo, and operations growth forecast to occur at SFO over the next approximately 20 years. The RADP is not expected to induce passenger demand, but would rather serve as a roadmap to modernize SFO, increase the efficiency of Airport operations, enhance the passenger experience, and balance the terminal and landside facilities[12] with the capacity of the existing runway system.

---

[7] *Taxiways* are routes used by airplanes to move to or from a runway.
[8] An *aircraft apron* is a defined area on an airport intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, or maintenance.
[9] A *public use airport* is an airport available for use by the general public without a requirement for prior approval of the airport owner or operator.
[10] The 57.8 million annual passengers include total enplaned and deplaned passengers and passengers who fly into and out of SFO on the same aircraft. San Francisco International Airport, *Analysis of Scheduled Airline Traffic*, December 2018, *http://media.flysfo.com/media/sfo/media/air-traffic/as201812.pdf*, accessed January 30, 2019.
[11] 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, *http://media.flysfo.com.s3.amazonaws.com/default/downloads/reports/2017_SFO_Economic_Impact_Study_Update.pdf*, accessed January 17, 2019. 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.
[12] *Landside facilities* are facilities necessary for the handling of aircraft, general aviation passengers, and cargo while on the ground. These facilities provide essential interface between the air and ground transportation modes (i.e., aircraft to automobile).

Figures 2, 3, 4, and 5 show RADP projects within the Terminal Area, West Field, North Field, and East Field, respectively. There are no RADP projects proposed within the Airfield or the South Field; therefore, the Airfield and South Field are not discussed further. A description of each RADP project is presented below, and each project is numbered and keyed to Figures 2, 3, 4, and 5. The current amount of existing and independently planned parking at SFO includes approximately 27,700 spaces, utilized by airport commission employees, rental car facilities, and tenants. With the proposed RADP, an additional approximately 10,000 parking spaces would be provided – primarily for the Central Hub, Consolidated Rental Car Center Facility, Consolidated Rental Car Center Quick Turn Around Facility, and the Long Term Parking Garage #3 projects.

Terminal Area (see Figure 2)

Overall, the proposed RADP projects in the Terminal Area would entail demolition of three buildings, expansion of three buildings, the complete demolition and reconstruction of one building, and roadway reconstruction and curbside expansion. The amount of demolition would total approximately 4.8 million square feet, and the amount of net new construction, including paving, would total approximately 4.1 million square feet.

(1) Boarding Area H

This project would construct the new Boarding Area H, which would include a new boarding area with multiple domestic/international-capable swing gates[13] able to accommodate 8 widebody[14] or 13 narrowbody aircraft; one international gate would be permanently lost at Boarding Area G to accommodate the building connection to Boarding Area H. Currently, the airport is deficient in gates and is accommodating scheduled flights through remote hard stands[15] and bussing passengers to and from the gates. Boarding Area H would provide the Airport with greater operational flexibility by providing the swing gates, meet immediate and forecast growth in operations, and enhance passenger level of service by adding gates and holdrooms.[16] Passengers would access Boarding Area H through a connecting corridor from the landside facilities in the International Terminal Building (ITB). The connecting corridor would contain additional domestic baggage claim devices to support bag claim and domestic operations in Boarding Area G and Boarding Area H, as well as a designated international passenger arrivals corridor that connects the gates to U.S. Customs and Border Protection facilities.

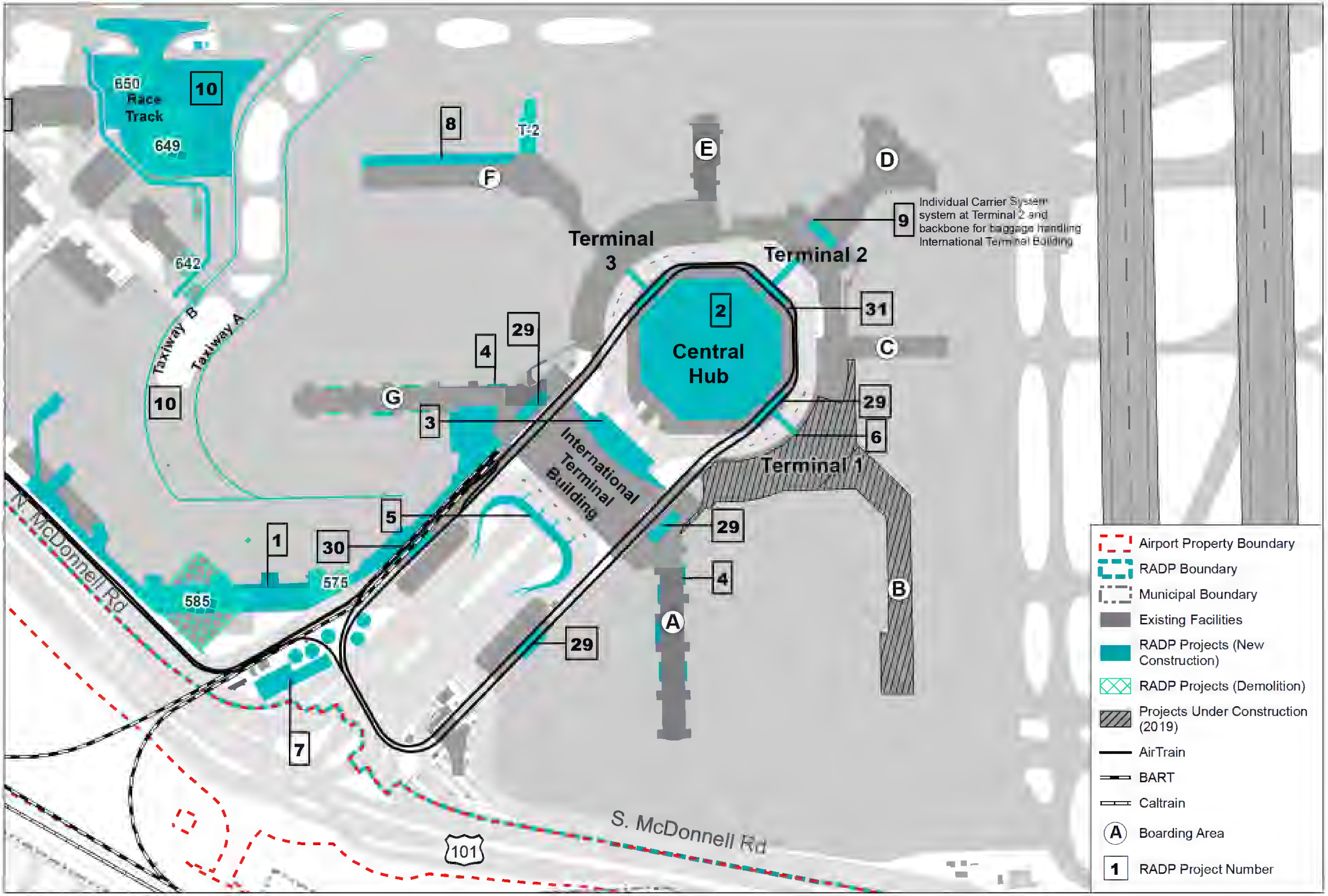
The new proposed approximately 1,375,400-square-foot Boarding Area H would consist of three levels and a mezzanine, with concessions and holdrooms on the departures level, and airline lounges and a passenger corridor on the arrivals level capable of handling both international and domestic arrivals. This project would also require relocation of a sanitary sewer pump station, and the extension of utility lines to serve the new boarding area.

[13] *"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 domestic or 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.

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

[15] A *hard stand* is a paved area for parking aircraft.

[16] A *holdroom* is an area located adjacent to the aircraft gates.



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

*Note: The RADP Project No. 21 icon is located in the general area of the sanitary sewer force main line.

Case No. 2017-007468ENV: SFO RADP EIR

Figure 2
RADP Projects - Terminal Area

This project would require demolition of Building 575 (approximately 65,800 square feet and 56 feet tall) along with an adjacent ground support equipment[17] staging facility, as well as Building 585 (approximately 168,000 square feet and 39 feet tall). Airline functions at Building 575 would be relocated to existing facilities at the UA MOC in the North Field area; and airport commission employees would be relocated to a planned airport administration facility in the West Field area. Ground support equipment staging supporting international flights are currently located adjacent to Building 575; this function would be relocated to the apron level of the lost international gate at Boarding Area G. The lost functions of Building 585 would be accommodated at existing and ongoing/planned projects: air cargo container and ground support equipment staging would be relocated to a planned consolidated cargo facility in the West Field area (a deferred project from the 1989 SFO Master Plan). Ground support equipment maintenance would be relocated to West Field Cargo Facility 9 (see RADP Project No. 15).

(2) Central Hub

The Central Hub project would demolish the existing five-level, 81-foot-tall, seismically deficient Central Parking Garage (6,460 parking) and construct a new, eight-level (up to 175 feet tall) Central Hub, capable of accommodating up to 10,000 public parking spaces. The net increase in square footage for this project would be approximately 2,650,000 square feet. The Central Hub project would also include one 900-foot-long level of curbside to augment passenger pick-up/drop-off at domestic terminals and the ITB, as well as interior waiting lounges and ground transportation staging areas; one level would be reserved for airport commission and tenant employee parking with the remainder available for 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.

The additional curbside provided in the Central Hub, intended to alleviate the congestion at the existing 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. Staging areas for private or commercial vehicles would also be provided on the curbside level. 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 potentially to the ITB.

(3) International Terminal Building Main Hall Expansion

This project would consist of an approximately 140,000-square-foot western expansion of levels two (arrivals) and three (departures) of the ITB (70,000 square feet per level) in order to: centralize passenger security checkpoints, provide additional administrative offices, provide a secure connector for passengers between Boarding Area A and Boarding Area G, and expand concession areas. 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. Currently, there is no 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 the level 2 (arrivals). The ITB Main Hall Expansion would be elevated over the existing domestic terminal roadways.

[17] *Ground support equipment* is the support equipment found at an airport, usually on the apron, used to service the aircraft between flights in order to support the operations of aircraft whilst on the ground. The role of this equipment generally involves ground power operations, aircraft mobility, and cargo/passenger loading operations.

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

This project would expand 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 in order to integrate the upper level holdroom areas with concessions, expand holdroom seating areas, and integrate the proposed new baggage handling system (described below under RADP Project No. 9). The expansions would include a series of small bump outs along each side of the existing boarding areas.

(5) International Terminal Building Curbside Expansion

This project would entail construction of 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 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.

(6) Domestic Terminal Roadways Reconstruction

This project would demolish the existing upper departures roadway, which is seismically deficient, and reconstruct a new roadway that would 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 demolition and 790,000 square feet of new construction.

(7) Central Utility Plant

This project would demolish the existing 112,900-square-foot Central Utility Plant (CUP) located on the southwestern side of the Central Parking Garage, which includes a cooling tower, hot water storage tank, and chilled water storage tank. The existing CUP is structurally integrated with the seismically deficient Central Parking Garage. As such, the new approximately 75,000-square-foot CUP would be a standalone structure with chilled water and heating hot water tanks, consisting of five two-million-gallon tanks, located south of the proposed Boarding Area H. This location would require removal of a surface parking lot currently used for shared ride van staging and pilot parking, and this parking would relocate to the new Central Hub.

The new CUP would house the chillers and boilers. It is anticipated that the hydronic chilled water and hot water supply and return piping would be routed inside the new Boarding Area H connector building and then through the ITB to connect back into the terminal area distribution network.

(8) Boarding Area F Expansion

To provide additional facilities, services, public restrooms, passenger amenities, and concessions, this project would expand the existing 485,000-square-foot Boarding Area F by approximately 63,000 square feet, and demolish and reconstruct the small projecting wing referred to as the “Thumb,” where regional flights are accommodated. The reconstructed Thumb would be approximately 20,200 square feet larger than the existing 66,800-square-foot Thumb, for a total of 87,000 square feet.

(9) Baggage Handling System

This project would replace and upgrade 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, as well as the flexibility for airlines to operate at any gate at the airport. Construction of the backbone would only entail interior modifications to the ITB and Terminal 2, and would extend down through the proposed new Boarding Area H.

West Field (see Figure 3)

Overall, the proposed RADP projects in the West Field would entail demolition of one building, the partial demolition of one building, the complete demolition and reconstruction of five buildings, and repaving for the Race Track and new taxiways. The amount of demolition would total approximately 718,000 square feet, and the amount of net new construction, including repaving, would total approximately 837,900 square feet.

(10) Taxiways A and B Shift and Race Track

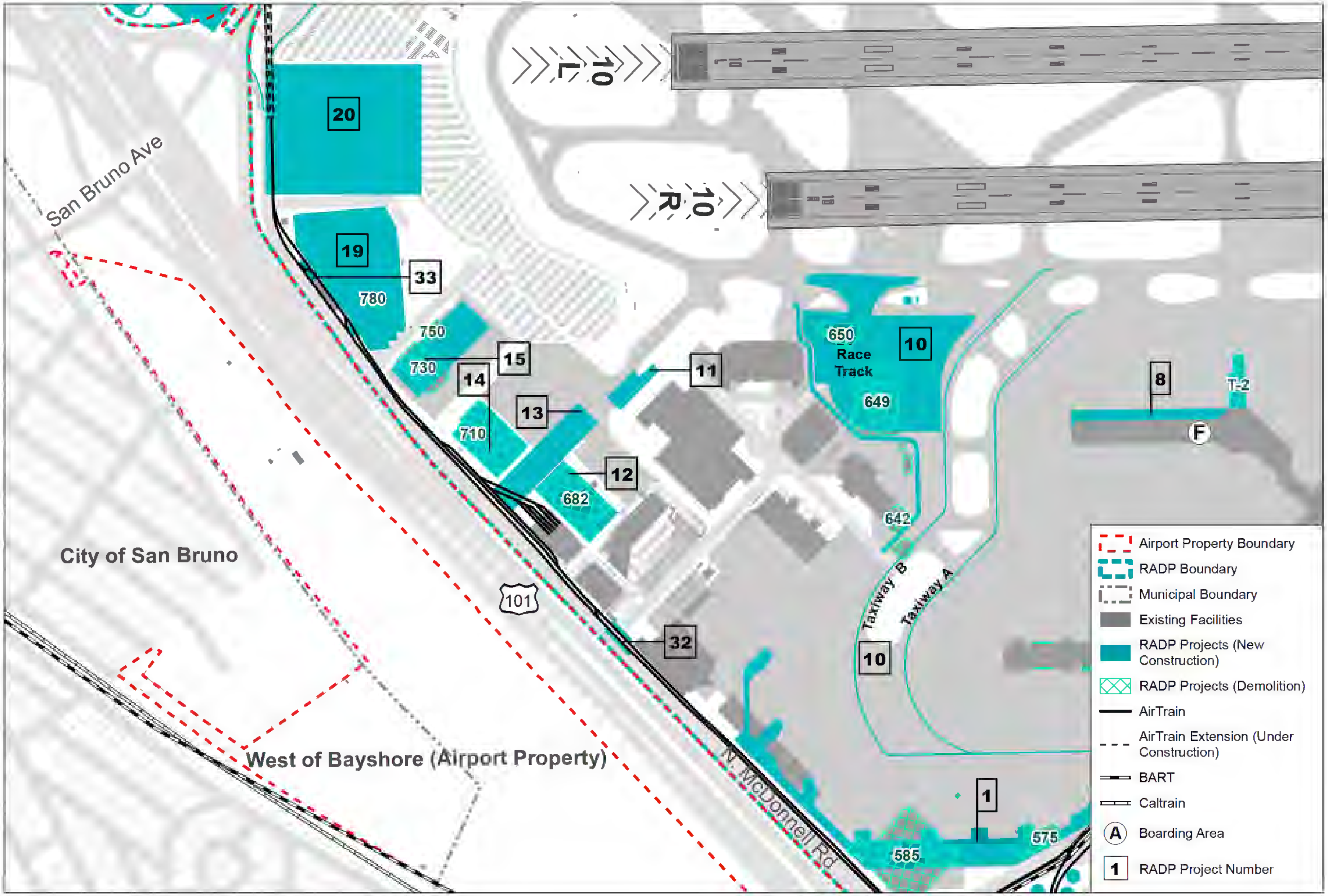
This project would shift Taxiway A by 15 feet and Taxiway B by 22 feet to the northwest, around the end of Boarding Area F, to meet Federal Aviation Administration (FAA) airport design standards,[18] accommodate the larger aircraft currently operating at ITB Boarding Area G and Terminal 3 Boarding Area F, and the proposed new Boarding Area H. In addition, a new 243,000-square-foot apron, referred to as the Race Track, would be constructed to serve the dual purpose of providing a holding area for aircraft waiting for a gate and accommodating remote aircraft parking.

This project would include demolition of:

- one bay of the 46-foot-tall Building 642 (approximately 29,000 square feet of demolition), a ground support equipment facility building;
- Building 649, a 53-foot-tall, approximately 135,000-square-foot building used for in-flight catering services (to be relocated to the North Field area; see RADP Project No. 24); and
- Building 650, a 23-foot-tall, approximately 18,800-square-foot emergency rescue fire fighting facility (to be relocated to a new facility constructed in the West Field area to retain its essential function close to the terminal area and airfield; described below under RADP Project No. 11).

These buildings would be demolished to accommodate the shifting of Taxiways A and B and construction of the new Race Track. The project would also require relocation of a vehicle service road, relocation of a drain and vent structures associated with a jet fuel test vault, and demolition and reconstruction of three security checkpoints, constituting approximately 23,000 square feet of taxiway construction.

[18] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13, Airport Design, *https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentNumber/150_5300-13*, accessed March 20, 2019.



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

*Note: The RADP Project No. 21 icon is located in the general area of the sanitary sewer force main line.

Case No. 2017-007468ENV: SFO RADP EIR

Figure 3
RADP Projects - West Field

(11) Emergency Rescue Fire Fighting Facility (Fire House) #1

This project would construct a replacement fire house (Building 650), identified for demolition to accommodate the shift of Taxiways A and B and construction of a new Race Track. The replacement facility would be a 40-foot-tall, 32,500-square-foot facility to continue to house the San Francisco Fire Department and retain firefighting capabilities in the West Field and Terminal areas. The new facility would be designed to retain secured and direct access to both the airside and landside equipment and fire truck parking, employee parking, and limited visitor parking on the landside.

(12) Airport Facilities Maintenance Center Reconstruction

This project would demolish Building 682—a 62-foot-tall, 76,000-square-foot airport facilities maintenance and administration center—and construct a new 99,000-square-foot facility in the same location. The new facility would continue to house the following functions: paint steamfitter, plumbing, automobile heavy maintenance, pavement and grounds, landscaping, vehicle and equipment storage (excluding custodial equipment), and sign shops. The facility was constructed in 1974 and has been identified for facility upgrades and roofing repairs in the near future.

(13) AirTrain Maintenance Facility

This project would demolish Building 692, an 18-foot-tall, 19,300-square-foot Airport facilities maintenance building and City vehicle parking area. A new 65-foot-tall, four-story, approximately 530,900-square-foot building would be constructed in the same location to accommodate airport commission employee parking on the first and second levels, administrative functions and parts storage on level three, and AirTrain maintenance and vehicle storage on level four. During off-peak periods, extra AirTrain vehicles would be stored in elevated track segments located north of the existing AirTrain Maintenance Facility, and at level four of the AirTrain Maintenance Facility. Additional airport commission employee parking would be accommodated underneath the elevated storage tracks.

(14) West Field Cargo Facility #6 Reconstruction

This project would demolish Building 710—a 68-foot-tall, approximately 124,000-square-foot facility with administration offices and an aircraft hangar—and construct a new 89-foot-tall, approximately 161,000-square-foot building at the same location to be used for Airport maintenance and support functions. Aircraft hangar functions would be replaced in the East Field area (see RADP Project No. 26). The freight cargo capabilities would be relocated to an existing facility (Building 900) in the North Field area.

(15) West Field Cargo Facility #9

This project would demolish the 25-foot-tall, approximately 42,700-square-foot Building 730, a former cargo facility with truck bays currently used for ground support equipment operations, as well as the 33-foot-tall, approximately 7,200-square-foot Building 750, currently used to store and maintain ground support equipment. A new consolidated 50-foot-tall, approximately 36,500-square-foot facility housing the lost functions of Buildings 730 and 750 in the same service area would be constructed in the same location. The ground level of the facility would provide ground support equipment storage, maintenance, and operations functions; the upper level would provide cargo space with truck bays and access.

North Field (see Figure 4)

Overall, the proposed RADP projects in the North Field would entail the partial demolition of one building, the conversion of one building to a different use, the complete demolition and reconstruction of two buildings, repaving, and the construction of five new buildings. The amount of demolition would total approximately 239,600 square feet, and the amount of net new construction, including repaving, would total approximately 3.7 million square feet.

(16) Consolidated Rental Car Center (CONRAC) Facility

This project would involve construction of a new 1,940,000-square-foot Consolidated Rental Car Center (CONRAC) and customer service lobby/offices at the top level linked to a new AirTrain station that is currently under construction. The CONRAC and Quick Turn Around Facility (described below) are intended to meet forecast rental car demand. The height of the CONRAC would be stepped due to the adjacent runway protection zones,[19] to adhere to prevailing critical airspace surfaces, and maintain safe aircraft operations, with height limits set at about 67 feet at the southeast corner and about 83 feet at the northwest corner of the facility. The CONRAC would be constructed on a portion of the surface long-term public parking lot (with a net loss of about 1,200 public stalls).

The facilities would provide an 80,000-square-foot customer service lobby and operator office space, 4,640 rental car spaces, a connection/platform to the new AirTrain station, and interconnecting ramps for rental cars. In addition, this project would entail roadway improvements along South Airport Boulevard.

(17) Consolidated Rental Car Center Quick Turn Around Facility

This project would construct a new three-story, 1,031,000-square-foot building immediately south of the proposed CONRAC to accommodate 2,880 short-term stacking/staging spaces, 187 car fueling spaces, and 24 car wash spaces. The height of the CONRAC Quick Turn Around 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.

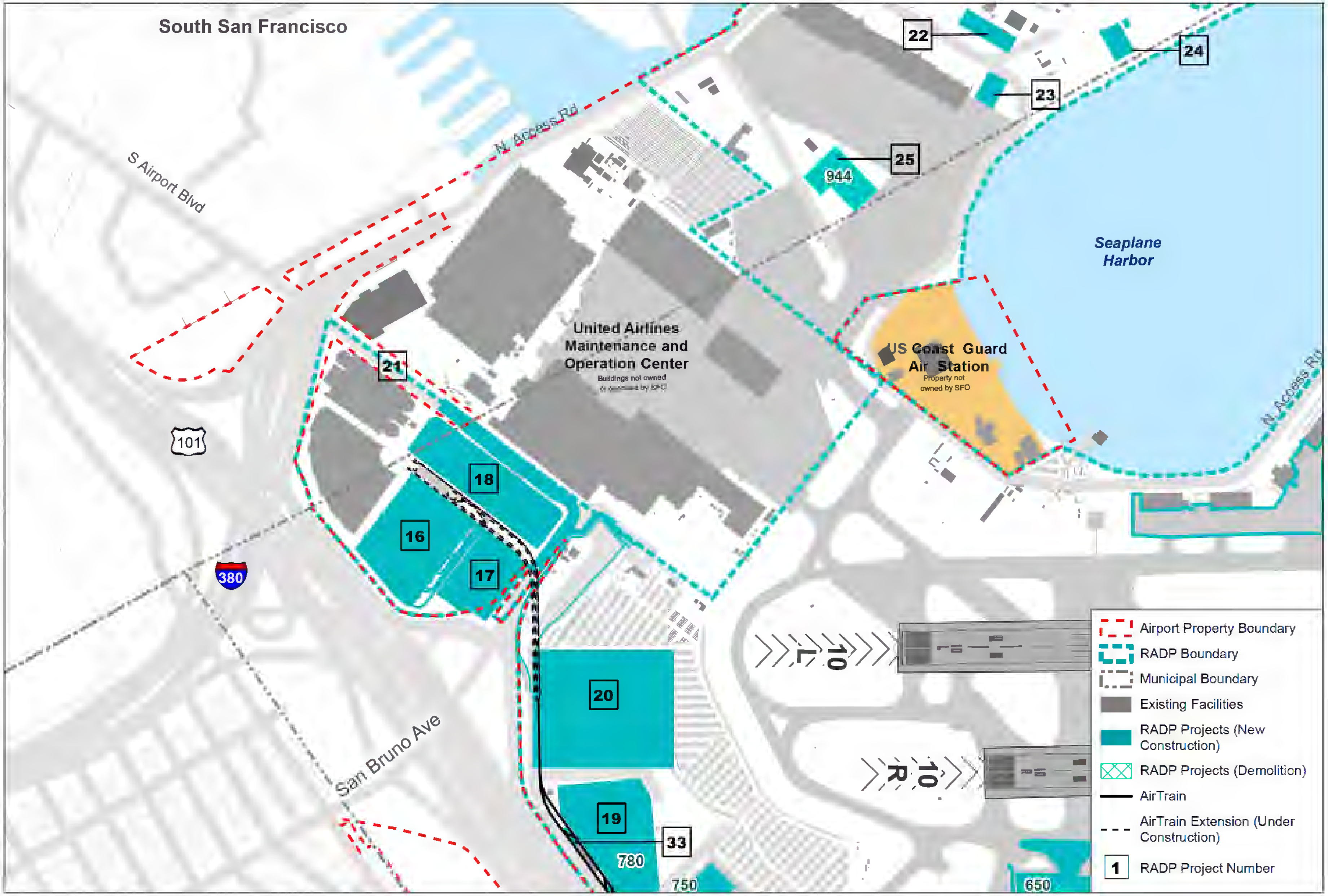
(18) Long Term Parking Garage #3

This project would construct an approximately 348,000-square-foot public parking garage with 3,200 stalls (net increase of 2,140 stalls) on the existing 1,060-stall United Airlines employee surface parking lot. The height of this garage would be stepped 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.

(19) Long Term Parking Garage #4

The existing 66-foot-tall, 1,488,000-square-foot rental car center (RAC) garage with about 2,485 ready/return stalls would be converted to a public parking garage with about 3,700 spaces—as such, the proposed 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

[19] 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.



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

*Note: The RADP Project No. 21 icon is located in the general area of the sanitary sewer force main line.

Case No. 2017-007468ENV: SFO RADP EIR

Figure 4
RADP Projects - North Field

N
0 1,000
Feet

ready/return stalls located immediately east of the existing RAC garage would be absorbed into the existing employee parking lot, with a net gain of about 610 parking stalls. About 950 feet of existing fencing would be replaced with a 680-foot-long Airport Operation Area (AOA) perimeter security fence to demarcate the boundary of the public garage and the employee parking lot.

(20) Rental Car Center Short Term Storage Lot

An awning, rental car vehicle fueling facilities, and wash bays would be removed, constituting approximately 130,000 square feet of demolition and repaving, in order to convert this area for short-term, on-Airport rental car stacking and storage. Existing functions on this site would move to the new Quick Turn Around Facility (RADP Project No. 17).

(21) Sanitary Sewer Force Main Line Realignment

The City of Burlingame (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. The treated effluent is transferred to this plant for final discharge into the San Francisco Bay. Construction of the CONRAC and QTA would require Burlingame to relocate its force main line.

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 alternatives 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 Bay Trail around the western perimeter of the long term parking lot or beneath South Airport Boulevard.

(22) North Field Airport Maintenance Facility #1

This project would entail construction of a 37,000-square-foot airport maintenance facility on an existing paved area currently used as grounds for construction staging. The 37,000-square-foot, 40-foot-tall building would be accompanied by approximately 265,000 square feet of circulation, vehicle parking, and storage space.

(23) 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 area. The existing 107 parking spaces (currently utilized by Building 900 cargo tenant employees) would be absorbed by the existing perimeter parking stalls 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.

(24) North Field Airport Maintenance Facility #2

The existing 35-foot-tall, 26,600-square-foot City College of San Francisco Airport Campus facility would be demolished and a new 55-foot-tall, 70,000-square-foot airport maintenance facility would be constructed in the same location. The existing City College surface parking lot and adjacent Airport landscaping areas would also be repaved and/or restriped for City maintenance vehicle and airport commission employee parking. In addition, about 135,000 square feet would be repaved around the new facility.

(25) Flight Kitchen Relocation

This project would demolish Building 944—a 44-foot-tall, approximately 78,000-square-foot cargo building—and reconstruct a new 50-foot-tall, 114,000-square-foot building in the same location to house the in-flight kitchen catering services formerly located in Building 649 in the West Field. The building would include airside and landside truck docks, catering truck staging/storage areas, and employee parking. The existing freight cargo operations at existing Building 944 (and freight cargo function at Building 710; see RADP Project No. 13) would be relocated to an existing freight cargo facility at Building 900. The existing six widebody aircraft parking positions adjacent to Building 900 are adequate to accommodate forecast cargo aircraft demand.

East Field (Figure 5)

Overall, the proposed RADP projects in the East Field would entail the complete demolition and reconstruction of one building, the construction of one new building, and repaving. The amount of demolition would total approximately 280,000 square feet, and the amount of net new construction, including paving, would total approximately 474,000 square feet.

(26) Aircraft Maintenance Hangar

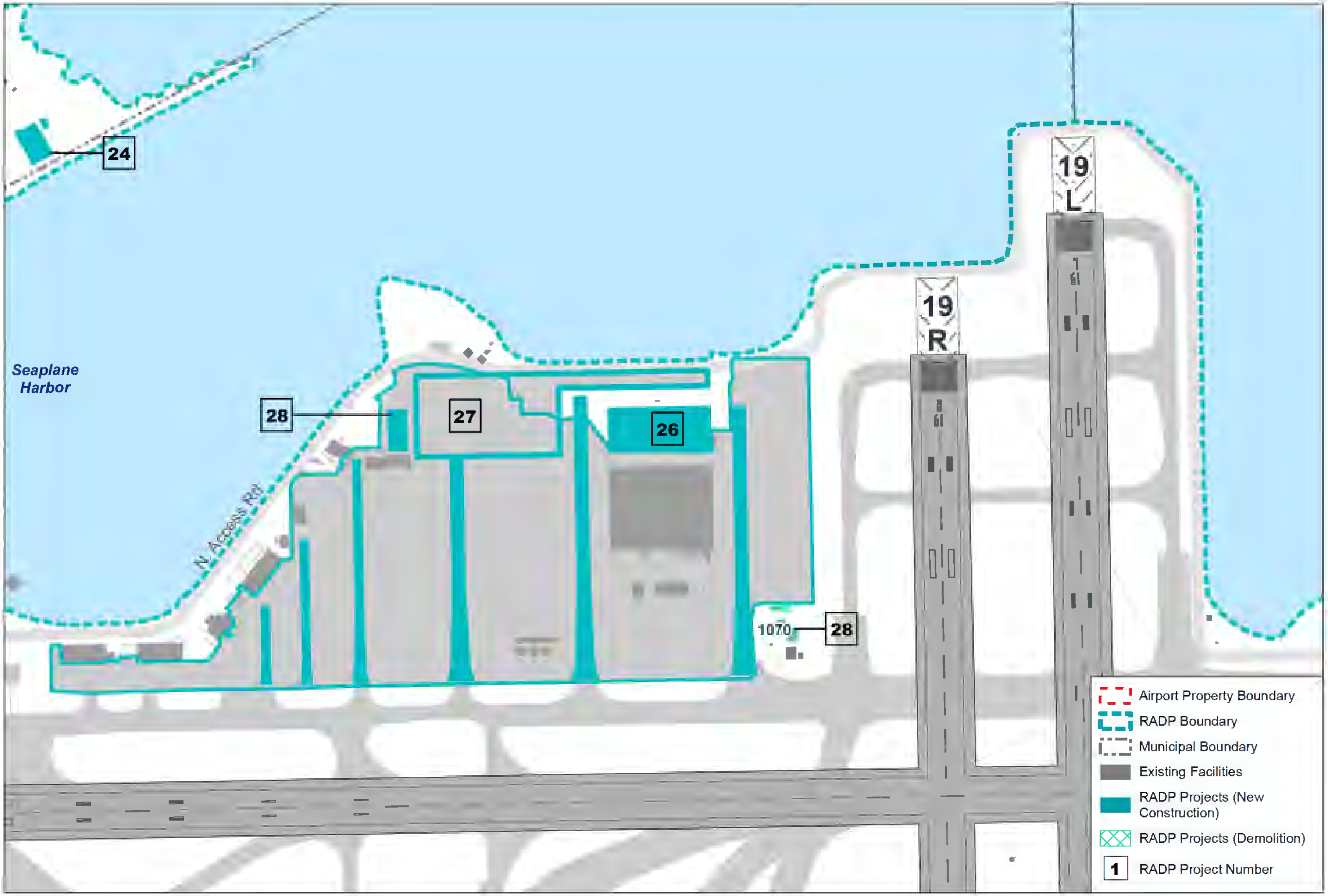
This project would construct a new 95-foot-tall, 181,000-square-foot standalone hangar on the existing Superbay Hangar employee surface parking lot. This hangar would accommodate two additional widebody aircraft for maintenance activities and support functions, including maintenance/workshop, and parts storage space. The new maintenance hangar would meet forecast demand for aircraft maintenance facilities, replace the lost aircraft hangar function at Building 710 in the West Field area, and meet forecast demand to consolidate hangar functions in the East Field area.

(27) Superbay Hangar Employee Parking Lot

The existing 380,000-square-foot airline maintenance employee surface parking lot would be relocated adjacent to the proposed Aircraft Maintenance Hangar. This project would entail repaving approximately 270,000 square feet of the existing East Field aircraft apron to increase aircraft parking positions from approximately 41 to 56 positions, depending on the aircraft type and size.

(28) East Field Ground Support Equipment Facility #2

This project would demolish an existing 26-foot-tall, approximately 10,000-square-foot ground support equipment facility, 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.



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

*Note: The RADP Project No. 21 icon is located in the general area of the sanitary sewer force main line.

Case No. 2017-007468ENV: SFO RADP EIR

Figure 5
RADP Projects - East Field

0 1,000
Feet

AirTrain (Figure 2 and Figure 3)

AirTrain is the Airport's automated people mover system, which provides post-security transportation connections for passengers and employees between the terminals and other Airport facilities. The nine-station AirTrain system (with ongoing plans to add two more stations) operates 24 hours per day on two lines (Red and Blue). AirTrain stations within the domestic terminal complex are accessed via pedestrian bridges over the roadway viaducts. The Red Line operates in a clockwise direction and connects all Airport terminals, garages, and the Airport's BART rail station. Within the terminal complex, the Blue Line operates in a counterclockwise direction, connecting to all Red Line stations, then proceeds to the support facilities north of the terminal complex.

(29) AirTrain Station Renovations

The current AirTrain system has been designed for three-car trains; however, four-car trains would be required to meet existing and forecast long-term demand. This project would modify the platforms at each AirTrain station to accommodate four-car trains in both directions. These improvements would add a fourth car berthing position by replacing glass barriers with platform doors, which would only require the physical expansion of the existing platforms, and not the actual stations.

(30) Garage G/BART AirTrain Station Expansion

This station expansion would involve a physical expansion of the existing platform to accommodate a fourth car berthing position (a net increase 27,000 square feet).

(31) Terminal 2 AirTrain Station Expansion

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

(32) West Field Road AirTrain Station Expansion

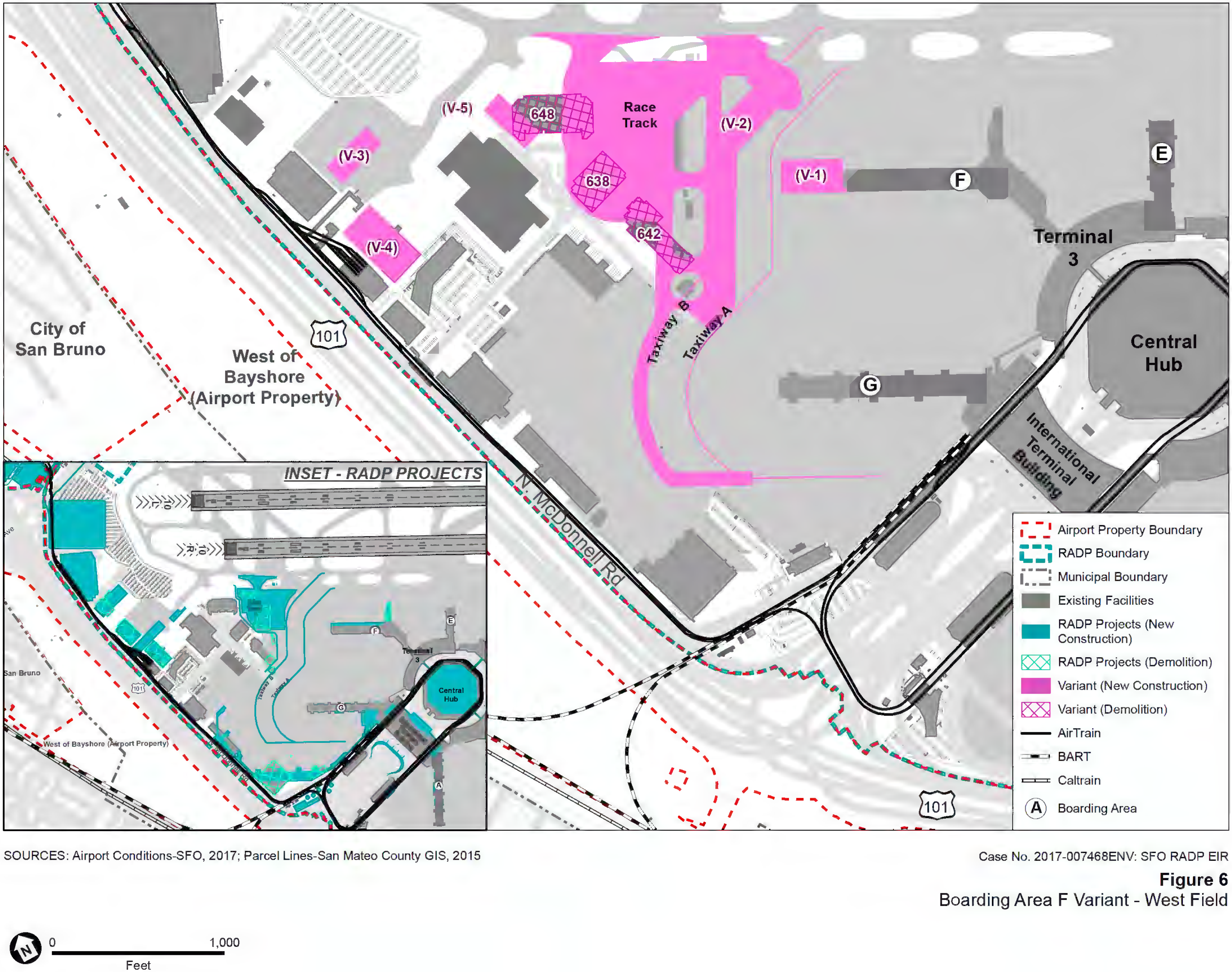
This station expansion would involve a physical expansion of the existing platform to accommodate a fourth car berthing position (a net increase 3,400 square feet).

(33) Rental Car Center AirTrain Station Expansion

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

Boarding Area F Variant (Figure 6)

The EIR will also analyze the impacts of a project variant, which would modify only limited features or aspects of the proposed project. The variant consists of the five components discussed below.



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

Case No. 2017-007468ENV: SFO RADP EIR

Figure 6
Boarding Area F Variant - West Field

(V1) Boarding Area F Extension

The Boarding Area F Variant would extend Boarding Area F by approximately 50,000 square feet to accommodate four additional narrowbody domestic gates at the end of Boarding Area F. This variant provides overflow benefits to Boarding Area G at the ITB. Currently, when Boarding Areas E and F at Terminal 3 are full, domestic narrowbody aircraft may park at Boarding Area G, which reduces availability of international gates and the efficiency of Boarding Area G. The variant would provide additional gates to accommodate additional domestic narrowbody demand instead of using Boarding Area G.

(V2) Taxiways A and B Shift and Race Track

The variant would shift Taxiway A by 265 feet and Taxiway B by 272 feet to the northwest, around the end of Boarding Area F, to meet FAA airport design standards, accommodate the larger aircraft currently operating at Boarding Areas G and F, and accommodate the proposed new Boarding Area H and Boarding Area F Variant. In addition, a new 243,000-square-foot apron, referred to as the Race Track, would be constructed to serve the dual purpose of providing a holding area for aircraft waiting for a gate and accommodating remote aircraft parking. The project components are the same as described under RADP Project No. 10 above, but revised to accommodate the extension of Boarding Area F.

Construction of the Boarding Area F Variant would require demolition of the following additional facilities located in the West Field, to accommodate the shifting of Taxiways A and B and construction of the new Race Track:

- Building 682: Demolition of a 62-foot-tall, approximately 78,000-square-foot Airport facilities maintenance and administration building.
- Building 638: Demolition of a 107-foot-tall, approximately 524,000-square-foot tenant parking garage;
- Building 642: Demolition of a 46-foot-tall, approximately 83,900-square-foot ground support equipment facility;
- Building 648: Demolition of a 72-foot-tall, approximately 125,000-square-foot cargo and ground support equipment building; and

(V3) Airport Maintenance Facility Replacement

The function of Building 682, an existing Airport facilities maintenance and administration building, would be replaced with a new facility constructed immediately northeast of the building on an existing remote aircraft parking apron; the surrounding apron area would serve as a new surface airport commission employee parking lot. Under the variant, aircraft that currently park on the apron east of Building 710 would be relocated from the West Field and either park remotely at the existing remote parking aprons at the ITB, new Race Track, or in the East Field area.

(V4) West Field Tenant Garage Replacement

The function of Building 638, an existing tenant parking garage, would be replaced with a new 80-foot-tall, approximately 500,000-square-foot tenant employee parking garage. Building 638 is the only tenant parking garage at SFO. The existing location allows for tenant employees to have access to the terminal area via AirTrain during all shift hours. The replacement garage would be located on the site of existing Building 682.

(V5) Cargo and Ground Support Equipment Facility Replacement

The function of Buildings 642 and 648, an existing ground support equipment facility and a combined cargo and ground support equipment building, respectively, would be replaced with a new facility constructed immediately west of Building 648. This new location would preserve the need to retain ground support equipment storage and maintenance functions and belly cargo operations close to the terminal complex.

Project Construction Schedule

The RADP is a demand-driven development plan under which individual projects would be implemented when activity thresholds are reached in the future and the need for those projects is identified. Construction of the RADP projects is expected to occur over approximately 15 years, from 2020 to 2035.

APPROVALS REQUIRED FOR THE RADP

The proposed project and variant are subject to review and approvals by several local, regional, state, and federal agencies. Certification of the Final EIR by the San Francisco Planning Commission, which would be appealable to the San Francisco Board of Supervisors, is required before any discretionary approval or permits would be issued for the proposed project and variant. The proposed project may require major project approvals and/or plan amendments from the following:

Federal Aviation Administration (FAA)

- Approval of updates to the Airport Layout Plan set[20] and environmental review under the National Environmental Policy Act (NEPA). As a federally obligated public use airport, SFO shall coordinate with the FAA for environmental review per FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, as it pertains to NEPA.
- Approval of Form 7460-1, Notice of Proposed Construction or Alteration, to construct on the Airport, as applicable for each RADP project.

San Francisco Regional Water Quality Control Board (RWQCB)

- The Airport has a National Pollution Discharge Elimination System (NPDES) permit, under Section 402 of the Clean Water Act, from the RWQCB and an associated Storm Water Pollution Prevention Plan (SWPPP) for the entire Airport. Prior to the construction of proposed projects that would disturb more than 1 acre of soil, the Airport would also need to obtain coverage under the State Water Resources Control Board's Construction General Permit (Order No. 2009-0009-DWQ) and prepare a site-specific SWPPP.

San Francisco Bay Conservation and Development Commission

- Review and approval of permit to designate southern portion of existing Bay Trail, adjacent to proposed CONRAC, as fire lane and/or to relocate the sanitary sewer force main beneath the Bay Trail.

[20] An Airport Layout Plan (ALP) is a comprehensive set of drawings that depicts the existing physical site, planned future development, critical airspace surfaces, land ownership and right of way. The ALP set is used by both the Airport and the FAA to guide facility development, anticipate federal budgetary needs, and assist with airspace planning. A current, FAA-approved ALP set must be maintained by all federally obligated, public use airports. The ALP submittal requirements are detailed in FAA Advisory Circular 150/5070-6, Airport Master Plans, Order 5100.38, Airport Improvement Program Handbook, and various FAA Standard Operating Procedures.

San Francisco Planning Commission

- Certification of the EIR under the California Environmental Quality Act (CEQA).

San Francisco Board of Supervisors

- Determination of fiscal responsibility and feasibility under Chapter 29 of the San Francisco Administrative Code. For any individual RADP project meeting the applicable dollar thresholds of Administrative Code Section 29.1(a), prior to initiating any detailed design work (design development), the Airport shall prepare a fiscal feasibility study and obtain a determination by the Board of Supervisors that the individual RADP project is fiscally feasible and responsible.

San Francisco Airport Commission

- Adoption of the EIR findings (if applicable), statement of overriding considerations (if applicable), and a mitigation monitoring and reporting program.
- Approval to issue design and construction bids and contracts.

San Francisco International Airport Building Inspection and Code Enforcement (BICE)

- Review and approval of demolition, grading, and building permits. All plans, specifications, calculations, and methods of construction shall meet the code requirements found in the California Uniform Building Code and SFO standards in accordance with the Airport Building Regulations (Appendix F of the SFO Rules and Regulations).

SUMMARY OF POTENTIAL ENVIRONMENTAL ISSUES

The proposed RADP and variant could result in potentially significant environmental effects. As such, the San Francisco Planning Department will prepare an initial study and an environmental impact report (EIR) to evaluate the physical environmental effects of the proposed RADP and variant. As required by CEQA, the EIR will further examine those issues identified in the initial study to have potentially significant effects, identify mitigation measures, and analyze whether the proposed mitigation measures would reduce the environmental effects to less-than-significant levels. The initial study will be published as an appendix to the draft EIR and will be considered part of the EIR.

The EIR will be prepared in compliance with CEQA (California Public Resources Code, sections 21000 et seq.), the CEQA Guidelines, and Chapter 31 of the San Francisco Administrative Code, and will address project- and variant-specific construction and operational impacts. The EIR is an informational document for use by governmental agencies and the public to aid in the planning and decision-making process. The EIR will disclose any physical environmental effects of the proposed RADP and variant and identify possible ways of reducing or avoiding their potentially significant impacts.

The EIR will evaluate the environmental impacts of the proposed RADP and variant resulting from construction and operation activities, and will propose mitigation measures for impacts determined to be significant. The EIR will also identify potential cumulative impacts that consider impacts of the RADP in combination with impacts of other past, present and reasonably foreseeable future projects. The EIR will address all environmental topics in the San Francisco Planning Department's CEQA environmental checklist, including the following environmental topics:

- Land Use and Planning
- Aesthetics
- Population and Housing
- Cultural Resources
- Tribal Cultural Resources
- Transportation and Circulation
- Noise
- Air Quality
- Greenhouse Gas 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
- Wildfire

In addition, the EIR will include an analysis of the comparative environmental impacts of feasible alternatives to the proposed RADP and variant that would reduce or avoid one or more of the significant impacts of the project while still meeting most of the project objectives. Alternatives to be considered include a No Project Alternative, as described in CEQA Guidelines section 15126.6, which considers reasonably foreseeable conditions at the project site if the proposed project is not implemented. Other alternatives will be evaluated as necessary, depending on the results of the impact analyses of the various environmental topics listed above. The EIR will also include a discussion of topics required by CEQA, including the project's growth-inducing impacts, significant unavoidable impacts, significant irreversible impacts, any known controversy associated with the project and its environmental effects, and issues to be resolved by decision-makers. The EIR will fully analyze the proposed RADP and variant at a sufficient level of detail such that they would be available for selection by the decision-makers and the project sponsors as part of the project approval actions.

FINDING

This project could have a significant effect on the environment and a focused EIR will be prepared. This finding is based upon the criteria of the Guidelines of the State Secretary for Resources, Sections 15064 (Determining Significant Effect) and 15065 (Mandatory Findings of Significance). The purpose of the EIR is to provide information about potential significant physical environmental effects of the RADP, to identify possible ways to minimize the significant effects, and to describe and analyze possible alternatives to the RADP. Preparation of an NOP or EIR does not indicate a decision by the City to approve or disapprove the project. However, prior to making any such decision, the decision makers must review and consider the information contained in the EIR.

PUBLIC SCOPING MEETING

Pursuant to the State of California Public Resources Code Section 21083.9 and CEQA Guidelines Section 15206, the Planning Department will hold two public scoping meetings to receive oral comments concerning the scope of the EIR. The meetings will be held on **Thursday, May 30, 2019, at 7:00 p.m.** in Room 431 at the San Francisco Planning Department, 1650 Mission Street, San Francisco, and **Tuesday, June 4, 2019, at 7:00 p.m.** in the Great Room at the Millbrae Community Center, 623 Magnolia Avenue, Millbrae. Written comments will also be accepted at the meetings and until 5 p.m. on Friday, June 21, 2019. Written comments should be sent or emailed to Michael Li, San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, CA 94103, or michael.j.li@sfgov.org and should reference the project title and case number on the front of this notice.

State Agencies: If you work for an agency that is a Responsible or a Trustee Agency, we need to know the views of your agency regarding the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the RADP. Your agency may need to use the EIR when considering a permit or other approval for this project. Please include the name of a contact person in your agency. If you have questions concerning environmental review of the RADP, please contact **Michael Li** at **415.575.9107.**

Members of the public are not required to provide personal identifying information when they communicate with the Commission or the Department. 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 Department's website or in other public documents.

5/22/19
Date

Lisa Gibson
Lisa Gibson
Environmental Review Officer

[THIS PAGE INTENTIONALLY LEFT BLANK]

SAN FRANCISCO PLANNING DEPARTMENT
SAN FRANCISCO INTERNATIONAL AIRPORT'S RECOMMENDED
AIRPORT DEVELOPMENT PLAN (RADP)

San Francisco Planning Department, Room 431
1650 Mission Street
San Francisco, CA 94103

MAY 30, 2019

Reported by:
Connie J. Parchman, CSR 6137
Job No.: 1-31355

JAN BROWN & ASSOCIATES
WORLDWIDE DEPOSITION & VIDEOGRAPHY SERVICES
701 Battery St., 3rd Floor, San Francisco, CA 94111
(415) 981-3498 or (800) 522-7096

MAY 30, 2019, THURSDAY 7:30 P.M.

P R O C E E D I N G S

---OOO---

MR. LI: Good evening. My name is Michael Li. I'm from the San Francisco Planning Department and this is the EIR Public Scoping Meeting for the San Francisco International Airport Recommended Airport Development Plan.

This meeting was scheduled to begin at 7:00 P.M. It's now 7:29 P.M. and no members of the public have shown up, so we are adjourning this meeting. Thank you.

(Proceedings concluded.)

---o0o---

REPORTER'S CERTIFICATE

I, Connie J. Parchman, CSR #6137, do hereby certify that I am an official court reporter; that I was the certified shorthand reporter in the above-mentioned case; that I took down in shorthand the proceedings and thereafter transcribed said notes into longhand; and that the forgoing pages upon which my name appears at the bottom, constitute a full, true and correct transcript of the said notes in said proceedings.

Connie Parchman

Connie J. Parchman, CSR #6137

Dated: June 11, 2019

DUBLIN, CA

SAN FRANCISCO PLANNING DEPARTMENT
SAN FRANCISCO INTERNATIONAL AIRPORT'S RECOMMENDED AIRPORT DEVELOPMENT PLAN (RADP)

Millbrae Community Center, Great Room
623 Magnolia Avenue
Millbrae, CA 94030

June 4, 2019

Reported by:
Connie J. Parchman, CSR 6137
Job No.: 1-31355

JAN BROWN & ASSOCIATES
WORLDWIDE DEPOSITION & VIDEOGRAPHY SERVICES
701 Battery St., 3rd Floor, San Francisco, CA 94111

JUNE 4, 2019, TUESDAY 7:22 P.M.

P R O C E E D I N G S

---oOo---

MR. LI: Good evening and welcome to tonight's Environmental Impact Report, or EIR, Public Scoping Meeting for San Francisco International Airport's Recommended Airport Development Plan, also known as the SFO RADP.

My name is Michael Li. I'm from the Environmental Planning Division of the San Francisco Planning Department. I'm responsible for coordinating the Planning Department's preparation of the EIR for the SFO RADP.

Joining me this evening are my colleague, Tania Sheyner, as well as Audrey Park from the Airport's Planning Division, Nick Niiro from the San Francisco City Attorney's Office, and Eryn Brennan from the EIR consultant team.

Before I continue, I would like to mention a few housekeeping items. Restrooms are across the hall and there's water in the kitchen to your right.

If you have a mobile phone, please turn off the ringer. If you need to talk on your phone, please step outside in the hallway.

If you would like to speak during the public comment portion of the meeting, please complete a speaker card, which can be found on the side table, or raise your hand and Eryn or Tania will give you one. We'll collect the speaker cards prior to the start of the public comment portion of the meeting and we'll call your name when it's your turn to speak.

We also have comment forms on the side table. You can use the comment form to submit written comments whether or not you plan on speaking. Please give your written comments to Eryn or Tania before you leave.

Now I would like to take a minute to discuss the purpose of tonight's meeting.

The EIR process as required by the California Environmental Quality Act, or CEQA, is a public process and this is the first step. The main purpose of the scoping meeting is to solicit your comments or suggestions concerning the scope and content of the EIR.

This is your opportunity to assist the Planning Department by sharing any information you may have that will be useful in preparing the EIR. The comments could help to identify significant environmental issues, determine the depth of analysis appropriate to each issue, or identify reasonable project alternatives.

This is not a meeting about the merits of the project or about project approval and it is not a question-and-answer session. This is an opportunity for us to collect information for use by the team that will prepare the EIR.

I'm available to respond to questions about the CEQA process via e-mail, by phone or in person at the Planning Department's office.

Now Audrey Park will provide a brief overview of the project. Then I'll discuss the CEQA process in more detail.

MS. PARK: Hello everyone.

Again my name is Audrey Park with SFO Planning.

I would be the main point person or if you have questions on the project or what the description is.

But I would ask if you have any CEQA questions or comments they be directed to Michael.

There's also a little confusion, San Francisco Planning, SFO Planning, and what are the roles? I just want to clarify that for our cities.

I will go into a very high level description of the Recommended Airport Development Plan, but again, for staff here, I think we have City of Millbrae staff here, if you would like a more detailed briefing, airport staff would be happy to meet with you at your convenience to go into a little bit more detail.

So this is an introduction.

The last Master Plan, 1989 Master Plan, was completed -- sorry, the CEQA Environmental Plan for the 1989 Master Plan was completed in 1992. It focused again on landside improvements to adequately accommodate what they forecast was the ultimate kind of facility development to accommodate 51 million annual passengers.

So that includes, you know, originating and destination passengers as well as those passengers that are connecting.

So in the 1989 Master Plan, we had the International Terminal development, Terminal 1 redevelopment, which we see now;

Renovation of Terminal 2 from an international terminal to a domestic terminal;

Airport hotel, as well as some other buildings and facilities that you're seeing. For example, the automated people mover system, the AirTrain extension out to the long-term parking garage area.

These were all supposed to have been built out in 2006. Obviously we had a lot of big milestones in between. When they started the Master Plan development, we had some recessions, there was -- that affected the desire for people to travel to the Bay Area and out of the Bay Area.

So, since the Master Plan, we have not had any changes to the airfield or the runway system. They've been as they were since I think the build out of the runways, which was in the '70s.

In calendar year 2018, SFO served about 55 million airline passengers. Obviously more than what was forecast back in the 1989 Master Plan.

So what is the Airport Development Plan? It is a full update to the 1989 Master Plan. And it is, again, kind of a renovation of the same thing you saw in the '89 Master Plan. So it's a demand-triggered long-term landside development plan that includes proposed support facilities and boarding area development enhancements and redevelopment of the central garage.

And ultimately, the Airport Development Plan is the Airport's vision to be the airport of choice to fly in and out of San Francisco Bay Area as long as there is a desire to fly into and out of San Francisco Bay Area.

What the ADP won't do is change the runway configuration or any of the flight paths. We will not be expanding the airport property footprint. And we will not be increasing runway capacity.

There's no airfield changes that would increase any of or change the flight paths as they have been designed by the F.A.A. That is outside of the purview of what a local government can do and ultimately the flight paths and runway configurations are going to stay.

The purpose of the ADP is to accommodate the forecast demands and the existing footprint and layout of the airfield.

So the ADP goals are ultimately, because we are still landlocked with the Bay and 101 to the south, is to maximize the land and footprint that we have currently.

So it is optimizing passenger common use and shared use facilities. We're proposing to do that with in-terminal facilities such as integrated baggage handling systems. And again, it's all about enhancing the passenger level of service so that we are the choice airport out of the three Bay Area airports if people decide to fly.

So this is just an overview of the ADP project. Again, they're all landside. Nothing on the airfield. Runway configurations, the length, the separations, all remain the same.

All of the facility developments that you are seeing as part of the Recommended -- oops -- Airport Development Plan are identified in teal. So this is just a visual.

This is a slide showing existing conditions at the Airport.

This is a more detailed view of the Recommended

Airport Development Plan project.

In the terminal area we're proposing some expansions to the boarding area facilities, the new gates. We have some bump outs in the international, expansions of the international building main hall to enhance passenger facility processing as well as some additional concessions.

Expanded roadways to accommodate vehicular travel as well as a new boarding area, H, that you're seeing just south of G. And it will hug the roadway, North McDonnell Road.

And that's ultimately going to be domestic and international capable, meaning if the demand grows for domestic flights, then we can accommodate that. If the demand is more for international flights for Bay Area residents and those people that want to come to the Bay Area, we can accommodate that as well by shared facilities.

In the area we call the west field area, this is kind of where we have the core real estate, if you will. We have very limited land close into the terminal area. And so for the facilities that are dilapidated or nearing their useful life, we are proposing to either relocate them away from the terminal core area and preserve those land uses for more essential uses, such as, you know, valet parking facilities that need to be close into the terminal areas, et cetera.

So that's what you're seeing here, relocation or redevelopment of the same types of use, which is airport and airline support facilities.

We are also looking at expanding our automated people moving system, so there are expanded storage capabilities to have more trains run on the airport.

And then redevelopment of our rental car facility. And on-airport ready return rental car storage.

So that number -- now we're in the north field area and this is in South San Francisco and San Bruno areas. I don't know if you are familiar with the areas just west of the United Airlines Maintenance Center, but we are proposing to relocate our rental car center there, as well as if the there is demand in the future, a third long-term parking garage.

And then up in the northeastern area, you will see some -- you see a building labeled Number 25. That's to accommodate some of the facilities that were demolished in the west field area that are not essential to the terminal core. And so, a lot of the airport maintenance, airline support facilities, will all get pushed out away from the terminal areas.

The last area, east field area, this is where we accommodate a lot of the corporate jets, regional jets, private jets, et cetera. It is just a big apron. What we want to do is re-stripe the pavement. So that's what you're seeing, the vertical lines as well as the various demands for more aircraft maintenance activities. Number 26 notes a new aircraft maintenance center.

And some of the smaller facilities I didn't mention have, again, to do with airport support. I would refer you to the NOV for details.

Number 28, for example, that would be ground support equipment, maintenance and storage area, baggage carts, et cetera, where they get maintenance.

That's a really high level view of the Recommended Airport Development Plan.

MR. LI: I would like to briefly explain the process we will be following for preparing the EIR.

The purpose of CEQA is to provide information to the decision-makers about the environmental consequences of the project or government action.

The first step in the process was the issuance of a Notice of Preparation or NOP and a Notice of the Public Scoping Meetings to solicit participation from government agencies and the public in determining the scope and content of the EIR.

The NOP was published on Wednesday, May 22nd and it included a brief description of the proposed project and indicated how to provide comments on the scope and content of the EIR. The NOP also indicated that written comments may be submitted until 5:00 P.M. on Friday, June 21st.

I would like to restate that the purpose of this meeting is to solicit comments on the scope and content of the EIR and not on the merits of the project.

As the agency preparing the EIR, the Planning Department is neutral on whether the SFO RADP should be approved. Neither the Planning Commission nor the Planning Department will be involved in making that decision. The Planning Department's role and the purpose of CEQA is to disclose the environmental impacts of the project and provide that information to the public and decision-makers.

Over the next several months, the Planning Department will prepare the Draft EIR which will be published and distributed for public review for a period of no less than 45 days. Comments on the Draft EIR will be accepted in writing and orally at a Planning Commission hearing which will be held about a month after publication of the Draft EIR.

Following the close of the Draft EIR comment period, the Planning Department will prepare a Responses to Comments document. This document will contain written responses to all substantive comments received during the Draft EIR comment period. It will also identify any changes to the Draft EIR that are necessary to fully respond to comments received.

The Responses to Comments document will be distributed to those who commented on the Draft EIR, various government agencies and other interested parties.

About two weeks after the publication of the Responses to Comments document, the Planning Commission will hold a hearing during which it will consider certifying the Final EIR, which will consist of the Draft EIR together with the Responses to Comments document.

Certification of the Final EIR would not mean the project is approved or disapproved. It would only satisfy the CEQA requirements for the project. Approval or disapproval of the project is a separate consideration from CEQA and falls under the purview of the San Francisco Airport Commission.

The EIR will analyze all topics pursuant to CEQA and identify feasible mitigation measures to avoid or substantially reduce the project's significant environmental impacts.

The EIR will also consider whether there are alternatives that would avoid or substantially lessen any of the significant environmental impacts of the project while still generally attaining the project sponsor's objective.

Now we're ready to open the meeting up for public comment.

Speakers will be limited to three minutes. If you exceed your time limit, you may consider submitting written comments to supplement your verbal comments. And please submit your written comments by 5:00 P.M. on Friday, June 21st.

We have a court reporter here who will prepare a transcript of tonight's proceedings. When you speak, please state your name and address and remember to speak slowly and clearly so the court reporter can provide an accurate transcript.

If you are representing a government agency or organization, please indicate the name of the group and your official capacity.

Please direct your comments to the scope and content of the EIR. Please note that we will not be providing direct responses to your comments, but your comments will be used to help inform the scope of analysis we will use in preparing the EIR.

So we're ready to hear from our first speaker.

MR. MEHRA: Good evening. My name is Sailesh Mehra, Chief City Planner from the City of South San Francisco.

I'm happy to be here.

We recognize what an important role the airport plays and fully support the consolidation that's mentioned in the RADP. And while I don't have comments prepared tonight, the City will be submitting some comments prior to the June 21st deadline.

Thank you.

MR. MISNER: And I have speaker card here.

My name is Brad Misner with the City of Millbrae. I'm the Community Development Director.

I understand you won't be fielding questions this evening, but I did have a question I would like to put on record, which is I just note in the Notice of Prep for the EIR Scoping Meeting on page 22 it talks about the environmental checklist that is the San Francisco Planning Department CEQA checklist. So I'm just curious if that is in line with Appendix G of CEQA guidelines or if it is different or different environmental factor areas that the city has that are different from CEQA?

MS. SHEYNER: We can answer that. It is largely the same. We just have additional categories for wind and shadow. Other than that, we are very consistent with CEQA.

MR. MISNER: Very good. Like my counterpart from the City of South San Francisco, the city recognizes that we have until June 21st to submit formal written comments and we'll likely be doing the same.

Thank you.

MR. LI: Would anyone else like to speak?

Okay. This ends the public comment portion of the meeting. Before we adjourn, I would like to mention a few things.

Comments received tonight and comments that we receive in writing prior to the June 21st deadline will be carefully reviewed and reflected in the Draft EIR as applicable. You will have several opportunities for additional input, including commenting on the Draft EIR and speaking at Planning Commission hearings on both the Draft EIR and the certification of the Final EIR.

If you have other questions or comments about the environmental review process for the project, please contact me. My business card is on the table and it's also in the NOP.

So thank you. I think we can adjourn.

(Proceedings concluded.)

---o0o---

REPORTER'S CERTIFICATE

I, Connie J. Parchman, CSR #6137, do hereby certify that I am an official court reporter; that I was the certified shorthand reporter in the above-mentioned case; that I took down in shorthand the proceedings and thereafter transcribed said notes into longhand; and that the forgoing pages upon which my name appears at the bottom, constitute a full, true and correct transcript of the said notes in said proceedings.

Connie Parchman

Connie J. Parchman, CSR #6137

Dated: June 11, 2019

DUBLIN, CA

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

June 21, 2019

Michael Li
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

RE: SFO Recommended Airport Development Plan (RADP) Project – Notice of Preparation

Dear Mr. Li:

Bay Area Air Quality Management District (Air District) staff reviewed the Notice of Preparation (NOP) for a draft Environmental Impact Report (DEIR) for the proposed SFO Recommended Airport Development Plan—or RADP (Project). This Project is a long-range plan for approximately 20 years to guide the Airport's development and accommodate the forecast passenger and operations growth. The Project consists of a total of 34 individual RADP projects within the Terminal Area, West Field, North Field, and East Field of the SFO property. The project construction schedule is described as a "demand-driven plan" and "is expected to occur over approximately 15 years from 2020 to 2035."

The total demolition and construction would approximately be as follows:

Area	Demolition	New Construction
Terminal	~4.8 million square (sq.) feet	~4.1 million sq. feet
West Field	~718,000 sq. feet	~837,900 sq. feet
North Field	~239,600 sq. feet	~3.7 million sq. feet
East Field	~280,000 sq. feet	~474,000 sq. feet

The RADP proposes approximately 10,000 additional parking spaces.

Air District staff recommends the DEIR include the following information and analysis regarding potential regional and local air quality impacts and greenhouse gas (GHG) emissions in the San Francisco Bay Area Air Basin:

- **The Air District recommends that a significance determination be based on an evaluation of the Project's consistency with the most recent draft of the SB 32 Scoping Plan by the California Air Resources Board and with the State's 2030 and 2050 climate goals.** The Air District's CEQA Guidelines are based on the State's 2020 greenhouse gas targets which are now superseded by the 2030 targets for greenhouse gases established in SB 32.

- **The DEIR should evaluate the Project's consistency with the City & County of San Francisco Climate Change Goals and Action Plan.** Staff supports SFO's mission of including sustainability through the SFO Strategic Plan (2017 – 2021). One of the goals is to achieve zero energy and waste by 2021, reduce greenhouse gas emissions by 50 percent (from 1990 baseline), and achieve carbon neutrality.

- **The DEIR should evaluate the Project's consistency with the Air District's 2017 Clean Air Plan (2017 CAP).** The 2017 CAP can be found on the Air District's website: http://www.baaqmd.gov/plans-and-climate/air-quality-plans/current-plans.

- **The DEIR should quantify the Project's potential construction and operational impacts to local and regional air quality.** The analysis should evaluate whether the project will have a cumulatively considerable net increase for construction and operational emissions for all the phases of the project. The DEIR should also include a discussion of the potential health effects of exposure to criteria pollutants.

- **The DEIR should 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 ($PM_{2.5}$) as a result of the Project's construction and operation.** Air District staff recommends that the DEIR include a cumulative site-specific health risk assessment that includes all stationary and mobile sources from this project and the existing sources.

- **The DEIR should evaluate all feasible mitigation measures, both onsite and offsite, for all potentially significant air quality and GHG impacts identified in the DEIR.** The DEIR should prioritize onsite mitigation measures, followed by offsite mitigation measures. For example, the project should encourage the use of zero-emission airport shuttles, zero-emission airport ground support equipment, fossil fuel alternatives in the development and operation of the Project, such as solar photovoltaic (PV) panels, electric heat pump water heaters, and solar PV back-up generators with battery storage capacity, and transportation demand measures.

- **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.** The SFO is subject to the Air District's Major Facility Review/Title V requirements. The DEIR should list the Air District as a responsible agency with permitting approval required for stationary sources of air pollution. The DEIR should disclose all potential stationary sources of air pollution and disclose daily and annual emissions from these sources. The following type of permits may be required:
    - Asbestos J-Number Permit: Issued for demolitions and renovations of buildings and structures that may contain asbestos. To apply online, use the following link: http://www.baaqmd.gov/permits/asbestos.
    - Authority to Construct: Issued before construction and after Air District engineers review project to ensure it will comply with air quality laws. To apply online, use the following link: http://www.baaqmd.gov/permits/ apply-for-a-permit
    - Authority to Operate: Issued after project is built and compliance is demonstrated. Must be renewed annually. To apply online use the following link: http://www.baaqmd.gov/permits/apply-for-a-permit

- **The DEIR should include a description of the cleanup and remediation at the Project Site, including the nature of the contamination, and any remaining site cleanup/remediation.** The emissions associated with the remediation should be included in the cumulative health risk assessment and emission estimates associated with this project.

- **The DEIR should 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.** Without all the supporting air quality documentation, Air District staff may be unable to review the air quality and GHG analyses.

If you have any questions about the Air District's review of this NOP, please contact Ada Márquez, Principal Environmental Planner, at (415) 749-8673 or amarquez@baaqmd.gov.

Sincerely,

Greg Nudd
Deputy Air Pollution Control Officer

cc: BAAQMD Director Gordon Mar
BAAQMD Director Tyrone Jue
Tania Sheyner, Principal Environmental Planner
Lisa Gibson, Environmental Review Officer

DEPARTMENT OF TRANSPORTATION
DISTRICT 4
P.O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5528
www.dot.ca.gov

Making Conservation
a California Way of Life!

June 20, 2019

SCH: 2019050013
04-SM-2019-00252
GTS ID 15734
Post Mile: SM-101-18.73

Michael Li, Planner
San Francisco, City and County
1650 Mission Street, Suite 400
San Francisco, CA 94103

SFO Recommended Airport Development Plan – Notice of Preparation (NOP)

Dear Michael Li:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above-referenced project. In tandem with the Metropolitan Transportation Commission's (MTC) Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS), Caltrans mission signals a modernization of our approach to evaluating and mitigating impacts to the State Transportation Network (STN). Caltrans' *Strategic Management Plan 2015-2020* aims to reduce Vehicle Miles Travelled (VMT) by tripling bicycle and doubling both pedestrian and transit travel by 2020. Our comments are based on the NOP.

Project Understanding
The San Francisco International Airport (SFO or 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 purpose of the RADP is to plan for forecast passenger and operations growth at SFO through: maximizing gate capacity, geometry, and flexibility; optimizing lobby and security flows and incorporating new technology for passenger screening; maximizing shared-use facilities and baggage handling system flexibility; and maximizing transfer connectivity for passengers and baggage. The RADP is not expected to induce passenger demand, and no airfield expansion or changes are proposed as part of the RADP.

The proposed project is located adjacent to US 101.

Sea Level Rise
The effects of sea level rise may have impacts on transportation facilities located in the project area. Executive Order (EO) S-13-08 directs State agencies planning construction projects in areas vulnerable to sea level rise to begin planning for potential impacts by considering a range of sea level rise scenarios for years 2050 and 2100. Higher water levels may increase erosion rates, change environmental characteristics that affect material durability, lead to increased groundwater levels and change sediment movement along shores and at estuaries and river mouths, as well as affect soil pore pressure at dikes and levees on which transportation facilities

are constructed. All these factors must be addressed through geotechnical and hydrological studies conducted in coordination with Caltrans.

Hydraulics
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.

Encroachment Permit
Please be advised that any work or traffic control that encroaches onto the State ROW requires an encroachment permit that is issued by Caltrans. To obtain an encroachment permit, a completed encroachment permit application, environmental documentation, and six (6) sets of plans clearly indicating the State ROW, and six (6) copies of signed and stamped traffic control plans must be submitted to: Office of Encroachment Permits, California DOT, District 4, P.O. Box 23660, Oakland, CA 94623-0660. To download the permit application and obtain more information, visit http://www.dot.ca.gov/hq/traffops/developserv/permits/.

Lead Agency
As the Lead Agency, the City and County of San Francisco is responsible for all project mitigation, including any needed improvements to the 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.

Should you have any questions regarding this letter, please contact Andrew Chan at (510) 622-5433 or andrew.chan@dot.ca.gov.

Sincerely,

WAHIDA RASHID
Acting District Branch Chief
Local Development - Intergovernmental Review

c. State Clearinghouse

City of Millbrae

621 Magnolia Avenue, Millbrae, CA 94030

WAYNE J. LEE
Mayor

REUBEN D. HOLOBER
Vice Mayor

ANN SCHNEIDER
Councilmember

ANNE OLIVA
Councilmember

GINA PAPAN
Councilmember

July 10, 2019

ATTN: Michael Li
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Subject: Notice of Preparation of Environmental Impact Report and Notice of Public Scoping Meeting, June 4, 2019 - SFO Recommended Airport Development Plan

Dear Mr. Li:

This letter is on behalf of the City of Millbrae to provide the City of San Francisco formal comments regarding the Notice of Preparation of an EIR for San Francisco International Airport's (SFO) Recommended Airport Development Plan (RADP). We appreciate the public scoping meeting held in Millbrae on Tuesday, June 4, 2019, providing information and outreach within the City of Millbrae.

According to the project summary, long-term demand forecasts estimate over 70 million annual passengers, which could be accommodated by the airport's existing ground facilities. The summary indicates that without the proposed RADP, the level of service would deteriorate substantially resulting in inefficiencies and potential substantial passenger delays, inconvenience in the terminals, access roadways and curbsides, and rental car facilities. Furthermore, the project summary indicates that the goal of the RADP would allow modernization, increase efficiency of Airport operations, and enhance the passenger experience. The summary also indicates the RADP **would not** induce passenger demand, airfield expansion or capacity increase, change aircraft operations or types, or affect the volume of passengers to use SFO.

From the City's perspective, 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.

Accordingly, the City of Millbrae requests detailed review of the following specific issues:

1. Analysis to determine 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.

2. Analysis to determine 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 aircrafts. Also, specific attention should be focused on any and all impacts to Lomita Park School, Marina Vista and Bayside Manor neighborhoods.

3. Analysis of increased ground based noise impacts associated with an increase in airport operations, including but not limited to, baggage handling, maintenance, catering trucks and personnel vehicles and whether electric operation vehicles would substantially decrease both noise and GHG potential impacts.

4. Analysis of all construction related impacts, including identification of any and all proposed off-site staging areas, storage areas, vehicle hauling routes, supply vehicles, and construction worker parking areas.

5. 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.

6. Furthermore, it appears all types of aircrafts are not being accounted for studied for potential impacts. Specifically, analysis should be prepared 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.

7. A full analysis of 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.

8. Analysis of Transportation Network Company (TNC) vehicles along with shuttle, limousine, and other automobile travel patterns, staging areas, and drop-off/pick-up routes.

9. Traffic impact analysis along Millbrae Avenue Corridor including both US101 on-off ramps due to spill over traffic from the Airport.

10. Identification of the locations of modern noise monitoring equipment that can provide real-time data.

11. The City also urges a Zero Waste approach to the demolition and recycling/reuse of materials on-site.

The list above is provided to help guide the preparation of specific analysis in the Environmental Impact Report. These issues are in addition to the commonly studied issues consistent with both the Appendix G of the State CEQA guidelines as well as the City of San Francisco's environmental checklist. The City of Millbrae also intends to thoroughly review and respond to the draft EIR when it is available for review and requests that the City is notified as soon as the Draft EIR is available.

Please feel free to contact me directly if you have any questions concerning these comments.

Sincerely,

Bradley J. Misner

Bradley J. Misner, AICP
Community Development Director

Cc: Thomas C. Williams, City Manager
Khee Lim, Public Works Director

Scenic Pacifica
Incorporated Nov. 22, 1957

CITY OF PACIFICA

170 Santa Maria Avenue • Pacifica, California 94044-2506
www.cityofpacifica.org

MAYOR
Sue Vaterlaus

MAYOR PRO TEM
Deirdre Martin

COUNCIL
Sue Beckmeyer
Mary Bier
Mike O'Neill

June 21, 2019

ATTN: Michael Li
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Subject: Notice of Preparation of Environmental Impact Report and Notice of Public Scoping Meeting, May 22, 2019 – SFO Recommended Airport Development Plan

Dear Mr. Li:

I write on behalf of the City of Pacifica in response to the above-referenced Notice of Preparation of EIR, in connection with SFO's Airport Development Plan. In particular, I write regarding the planned scope of the EIR to address *all* environmental impacts potentially arising from the Plan, as they affect the Airport's many surrounding communities.

The Plan, as described in the Notice and as outlined in the various presentations made by SFO officials to local city councils in the preceding months contemplates a dramatic increase in the capacity of the airport's ground facilities. According to the Plan, the expansion is needed to accommodate an expected increase in passenger volume in the coming years to over 70 million. 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.

Moreover, the Notice 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. Nor is there any mention 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.

The proposed EIR should also 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 Notice 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 proposed EIR should also include an analysis of the direct and indirect effects of greenhouse gas (GHG) emissions from the Airport expansion. 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.

In light of the foregoing, the City of Pacifica requests that the EIR for the SFO Airport Development Plan address the following specific issues:

1. Any and all potential noise and vibration impacts to the surrounding communities arising from the planned SFO expansion and development, and accompanying increases in air traffic arrivals and/or departures.
2. Inclusion in the analysis of issue 1 of all aircraft, including passenger flights, cargo aircraft, private jets, and helicopters.
3. Inclusion in the analysis of issues 1 and 2 of potential cumulative noise and vibration impacts from aircraft departing from or arriving at all Bay Area airports, including Oakland and San Jose.
4. Improved state-of-the art noise monitoring that includes more stations as well as stations located directly under or close to flight paths that are currently used by departing or arriving flights at the airports described above.
5. Inclusion in the analysis of issue 3 of potential direct and indirect effects of GHG emissions, including how they may contribute to increased sea level rise along Pacifica's coastline.

Please be aware that the list above is not intended to be final or exclusive. It is intended to serve merely as the starting point in the process of involving the City of Pacifica in the ongoing discussions with SFO over the Airport's future expansion and development plans, and in managing the noise impacts that in the past several years have increased and negatively impacted the residents of the City and surrounding communities.

We ask that the Planning Department provide the City of Pacifica with written notice as soon as the draft EIR is available for review.

Please feel free to contact me at any time regarding the points stated above or any other questions you may have as to the City's position on this important issue.

Very Truly Yours,

Kevin Woodhouse
City Manager

OFFICE OF THE CITY MANAGER

CITY OF PALO ALTO
250 Hamilton Avenue, 7th Floor
Palo Alto, CA 94301
650.329.2392

July 10, 2019

City of San Francisco
Planning Department
Attn: Michael J. Li
1650 Mission Street, Suite 400, San Francisco, CA 94103
michael.j.li@sfgov.org

Re: EIR Scope for the SFO Recommended Airport Development Plan (Case No. 2017-007468ENV)

Dear Mr. Li:

On behalf of the City of Palo Alto, I am writing regarding the scope of the Environmental Impact Report (EIR) for the San Francisco International Airport (SFO) Recommended Airport Development Plan. The City of Palo Alto appreciates the value of SFO to the San Francisco Bay Area's economy and the airport's central role in providing mobility to support our region's quality of life.

As the EIR is prepared for the next stage of SFO's Recommended Airport Development Plan, the City of Palo asks that the scope of the EIR include consideration of any and all environmental impacts such as noise and emissions to nearby jurisdictions, including communities located in Santa Clara and Santa Cruz counties, that may arise from the planned SFO expansion and development, and any changes in air traffic arrivals and departures. Specifically, we request that the study consider noise impacts on Palo Alto and other cities within at least a 50-mile radius from SFO and display noise contours starting at 45 dB CNEL and in increments of 5 dB.

In addition, as the EIR scope will include studying air quality and greenhouse gas emissions, we request that the study consider emissions and air quality impacts on Palo Alto and other cities within at least 50 miles of the airport. We also request the measurement of emissions on the ground, specifically the level of ultra-fine particles, in locations where aircraft fly below 5,000 ft.

We also hope you will consider the cumulative impact of noise and 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).

Finally, we ask that the study of the SFO Recommended Airport Development Plan's environmental impacts be informed by improved and expanded noise monitoring of all arriving and departing aircraft. At the June 5th SFO Roundtable meeting, we were encouraged to hear SFO Director Ivar Satero state that the airport is planning to deploy more noise monitors. We propose that monitors be deployed in communities within at least a 50-mile radius from 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. Noise monitors must be in place for impacted communities to determine the actual impacts of the airport development plan, including the cumulative impact of air traffic operations from the multiple airports listed above.

Respectfully,

Ed Shikada
City Manager

Cc: Palo Alto City Council
Mr. Ivar C. Satero, SFO Airport Director
Mr. Bert Ganoung, SFO Aircraft Noise Abatement Manager

CITY OF SAN BRUNO

Jovan D. Grogan
City Manager

OFFICE OF THE CITY MANAGER

July 10, 2019

Mr. Michael Li
San Francisco Planning Department
1650 Mission St., Suite 400
San Francisco, CA 94103-2479
via first class mail and email to: Michael.j.li@sfgov.org

RE: Comments regarding Notice of Preparation of Environmental Impact Report for SFO Recommended Airport Development Plan (Case no. 2017-007468ENV)

Dear Mr. Li,

The City of San Bruno ("City") provides the following comments regarding the proposed Environmental Impact Report for the San Francisco International Airport (SFO) Recommended Airport Development Plan (RADP) and variant based on publication of the Notice of Preparation dated May 22, 2019 ("NOP"). We appreciate the opportunity to work with SFO and the San Francisco Planning Department on identifying and mitigating potential environmental impacts including but not limited to transportation and circulation, noise, and air quality impacts on the City's residents, businesses, and public infrastructure and facilities.

The City is particularly concerned about the potential significant impacts the RADP projects' will have on transportation and circulation in the City and major freeways that run through and adjacent to the City. "[W]ith 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," as stated in the NOP; the proposed construction of the RADP projects will inevitably impact San Bruno. The City of San Bruno is located just to the west of SFO, and daily airport operations have a direct effect on the City's current and future development pattern and land use policies. While the proposed expansion will serve the Airport's forecasted 71.1 million annual passengers, 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.

As noted in the NOP, "The current amount of existing and independently planned parking at SFO includes approximately 27,700 spaces, utilized by airport commission employees, rental car facilities, and tenants. With the proposed RADP, an additional approximately 10,000 parking spaces would be provided – primarily for the Central Hub, Consolidated Rental Car Center Facility, Consolidated Rental Car Center Quick Turn Around Facility, and the Long Term Parking Garage #3 projects." The City is concerned about the 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.

As identified in the San Bruno General Plan Chapter 7, the City should aim to "*protect the health and comfort of residents by reducing the impact of noise from … San Francisco International Airport*,… (General Plan Policy HS F & G)" The General Plan policies also encourages 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 Compatibility Commission (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.

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*.

Please feel free to contact me with any questions at (650) 616-7056 or via email at jgrogan@sanbruno.ca.gov.

Sincerely,

Jovan D. Grogan
City Manager

CC: City of San Bruno City Council
Darcy Smith, City of San Bruno Community Development Director

CITY COUNCIL 2019

KARYL MATSUMOTO, MAYOR
RICHARD A. GARBARINO, MAYOR PRO TEMPORE
MARK ADDIEGO, COUNCILMEMBER
MARK NAGALES, COUNCILMEMBER
BUENAFLOR NICHOLAS, COUNCILMEMBER

MIKE FUTRELL, CITY MANAGER

July 8, 2019

Via E-mail and First-Class Mail

Michael Li
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103
Phone: (415) 575-9107
Email: michael.j.li@sfgov.org

Re: Comments regarding Notice of Preparation of Environmental Impact Report for SFO Recommended Airport Development Plan (Case No: 2017-007468ENV)

Dear Mr. Li,

The City of South San Francisco ("City") provides the following comments regarding the proposed Environmental Impact Report for the San Francisco International Airport (SFO) Recommended Airport Development Plan (RADP) and variant. We appreciate the opportunity to work with SFO on identifying and mitigating potential transportation and circulation, noise, and air quality impacts on the City's residents, businesses, and public infrastructure and facilities.

As "the Birthplace of Biotechnology" and home to the world's largest life-science research hub, South San Francisco is particularly concerned about the negative impacts the RADP projects' will have on transportation and circulation in the Highway 101 corridor. "[W]ith portions of the Airport within the city boundaries of South San Francisco to the north," as stated in the Notice of Preparation dated May 22, 2019; the proposed construction of the RADP projects will inevitably impact South San Francisco. While the proposed expansion will serve the Airport's forecasted 71.1 million annual passengers, 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.

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, we request that the Planning Department consult with the City of South San Francisco's Planning Department on the analysis of potential traffic, noise and air quality impacts on the City and its residents while it is preparing the Draft EIR prior to public release. Please also place the City on the notice list for the EIR and RADP.

Thank you again for the opportunity to participate in the planning process. Should you have any questions or want to discuss these issues further, please feel free to contact me or Senior Planner Billy Gross by phone at 650-829-6626 or email at billy.gross@ssf.net.

Sincerely,

Mike Futrell
City Manager
City of South San Francisco

cc: South San Francisco City Council
Congresswoman Jackie Speier
San Mateo County Board of Supervisors
San Francisco Mayor London Breed
San Francisco Board of Supervisors
Assembly Speaker pro Tempore Kevin Mullin
Assemblymember Phil Ting
Senator Scott Wiener
Senator Jerry Hill

HALL OF JUSTICE AND RECORDS
400 COUNTY CENTER
REDWOOD CITY, CA 94063

TEL: (650) 363-4571
FAX: (650) 368-3012
E-MAIL: dpine@smcgov.org

DAVE PINE

Supervisor, First District, County of San Mateo

July 10, 2019

Michael Li
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

Re: Notice of Preparation of an Environmental Impact Report Regarding SFO Recommended Airport Development Plan (RADP); Case No. 2017-007468ENV

Dear Mr. Li:

This letter sets forth my comments regarding the Notice of Preparation for the Environmental Impact Report (EIR) for the SFO Recommended Airport Development Plan (RADP).

As the San Mateo County Supervisor for District 1, I represent not only the unincorporated area on which San Francisco International Airport (SFIA) sits, but also the surrounding communities of Millbrae, Burlingame, San Bruno, Hillsborough and South San Francisco, as well as the unincorporated areas of Burlingame Hills and San Mateo Highlands. I also have been the County's representative to the SFO Community Roundtable for more than eight years, and I am quite attuned to the impact of SFIA's operations on our local residents. Finally, I am a leading voice in the County for addressing the impact of Sea Level Rise (SLR) in the County and have helped initiate several major studies of SLR vulnerabilities along the Bayshore.

I recognize the need to modernize and increase the efficiency of SFIA operations, especially in light of expected passenger and operations growth. However, I am concerned about the environmental impacts of the RADP on surrounding communities and look forward to the preparation of a comprehensive and detailed review of all potential environmental impacts resulting from the RADP. The Notice of Preparation (NOP) for the RADP EIR highlights some significant impacts to be addressed. However, as explained below, I would recommend that the sea level rise and ground-based noise be added to the EIR:

Sea Level Rise – 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. San Mateo County has been working with SFO on addressing Sea Level Rise since 2014. The first initiative, which was funded by the Coastal Conservancy, was a San Bruno/Colma Creek study finalized in August 2015 by Moffatt & Nichol. (See San Bruno_Colma Creek study for more information.) More recently, SFO was a key participant in the development of the San Mateo County Sea Level Rise Vulnerability Assessment, which was finalized in March 2018. (See: SMC Vulnerability-assessment.)

San Mateo County staff, primarily led by my office, has had ongoing meetings with the SFO engineering staff, since 2014, regarding the airport Shoreline Protection Program. In those meetings, we have expressly shared the work/planning being done by SFO and San Mateo County. Although these meetings have focused on the perimeter of the airport, (tentative plans would expand the RADP boundary at the end of runways 19 R and 19 L), Sea Level Rise will directly and indirectly impact the work being planned under the RADP. In particular, the footprint of the RADP will likely be impacted by the Shoreline Protection Program, and the RADP and Shoreline Protection Program projects are mutually dependent.

In light of this, I recommend that the RADP EIR include a cross-reference to the Shoreline Protection Program, specifically so that the environmental impacts of both projects can be considered holistically. Moreover and along related lines, 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.

Ground-Based Noise -- The breadth and depth of projects in the RADP will surely increase SFIA-related noise impacts in our communities. The NOP notes that "Noise" will be among the topics addressed by the EIR, and I am confident that it will address both temporary noise impacts caused by construction work, as well as any long term noise impacts from additional air traffic. However, I would also expect the EIR to identify and analyze Low Frequency Noise (also referred to as Ground-Based Noise) resulting from the RADP.

As a long-time member of the SFO Community Roundtable, and a founding member of its Ground Based Noise (GBN) Subcommittee, I am among a group of elected officials currently working to identify solutions for the recent uptick of community concerns related to GBN. The Subcommittee, working with the Roundtable's technical consultant and the SFO Noise Abatement Office (NAO), has recently launched a study specifically to assess whether physical changes at SFIA (due to previous capital improvement projects, including movement of the taxiways) has had a material impact on GBN. One component of the study will be to review historical data, in order to compare GBN during different time periods. The Subcommittee is also working with the NAO as it implements a new noise monitoring system, both within and outside of the legally defined and established noise contours, to make sure that its measurements helps meet community needs.

Among the myriad projects under the RADP, the NOP lists two potential options that would result in the movement of taxiways. Specifically, Project #10 would shift Taxiway A by 15 feet and Taxiway B by 22 feet to the northwest, while Variant #2 would shift Taxiway A by 265 feet and Taxiway B by 272 feet to the northwest. 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 include a specific analysis of 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.

Notifications required for the RADP -- The NOP (pp 20-21) lists the agencies *required* for approval of any RADP projects. Given the impacts that the RADP will have on the residents of San Mateo County, I request that presentations, regular updates and formal notifications be made to the following San Mateo County entities and individuals, and that each of these entities/individuals be placed on the notice list for the RADP project:

- The San Mateo County Board of Supervisors (Deputy Clerk of the Board Sukhmani Purewal)
- San Mateo County Manager/Clerk of the Board Mike Callagy
- San Mateo County Director of Planning and Building Steve Monowitz
- San Mateo County Counsel John Beiers
- The SFO Community Roundtable (Chair Elizabeth Lewis)

This request encompass notifications of any scoping meetings or draft documents related to the EIR as well as regular public outreach.

I appreciate the opportunity to participate in the early part of this planning process, and look forward to continued collaboration with the City and County of San Francisco. If you have any questions, please contact Linda Wolin of my staff at lwolin@smcgov.org or at (650)363-4571.

Sincerely,

Dave Pine
San Mateo County Supervisor, District 1

cc: Mike Callagy, San Mateo County Manager/Clerk of the Board
Members, San Mateo County Board of Supervisors
Steve Monowitz, Director, San Mateo County Planning and Building
Elizabeth Lewis, Chair, SFO Community Roundtable
Mayors, Millbrae, San Bruno, South San Francisco, Burlingame, Hillsborough
City Managers, Millbrae, San Bruno, South San Francisco, Burlingame, Hillsborough

Li, Michael (CPC)

From: Darlene Yaplee <darlene.yaplee@gmail.com>
Sent: Tuesday, July 09, 2019 4:46 PM
To: Li, Michael (CPC)
Cc: Marie-Jo Fremont; Darlene E. Yaplee
Subject: Public Comment - EIR Scope for the SFO Airport Development Plan due July 10th 2019

This message is from outside the City email system. Do not open links or attachments from untrusted sources.

Emailed

San Francisco Planning Department

1650 Mission Street

Suite 400

San Francisco, CA 94103

Attn: Michael Li

Re: Notice of Preparation of Environmental Impact Report and Notice of Public Scoping Meeting, May 22, 2019 – SFO Recommended Airport Development Plan. Public Comment Period extended to 5:00pm on July 10, 2019.

Dear Mr. Li:

We request that the EIR for the SFO Airport Development plan address the following topics:

- Any and all environmental impacts such as noise and emissions to the Airport's surrounding communities, including communities located in 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. Specifically, we request that the study consider noise and emissions impacts on Palo Alto and other cities within at least a 50-mile radius from SFO and display noise contours starting at 45 dB CNEL and in increments of 5 dB. It is critical that you include cities that are impacted by aircraft noise versus previously limited contours for previous studies.

- Changes in air traffic operations for all SFO arriving and departing flights that include commercial or private passenger and cargo aircraft as well as helicopters. Passenger aircraft are not the only creators of noise. For example, there are many night time cargo planes that wake up residents.

- 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 Palo Alto and other cities within a least a 50-mile radius from SFO. It is important to look at total cumulative impact of noise on residents based on multiple airports versus each individually to capture the actual impact experienced on the ground.

- Better noise monitoring coverage of all arriving and departing aircraft.

- More noise monitoring stations must be located directly under or nearby the current flight paths (vectored and non-vectored) of departures and arrivals flights for the Bay Area airports listed above. In addition, monitoring stations must be located in communities beyond the SFO Roundtable members. Several communities that are part of the Santa Clara Santa Cruz Roundtable are currently severely affected by SFO's operations, almost on a 24-hour basis. At the June 5th SFO Roundtable meeting, Mr. Ivar Satero, SFO Director, mentioned that the airport is planning to deploy more noise monitors. We propose that monitors be deployed in communities within at least a 50-mile radius from SFO.
- Noise monitors must be in place for impacted communities to determine the actual impacts of the Airport expansion plans, including the cumulative impact of air traffic operations for the multiple airports listed above.

\- Measurement of emissions on the ground, specifically the level of ultra-fine particles, in locations where aircraft fly below 5,000 ft.

Regards,

Darlene Yaplee and Marie-Jo Fremont, Palo Alto

Li, Michael (CPC)

From: Elizabeth Lopez <lopezelsf@gmail.com>
Sent: Tuesday, July 09, 2019 4:48 PM
To: Li, Michael (CPC)
Cc: Safai, Ahsha (BOS); Chinchilla, Monica (BOS); Latt, David
Subject: SFO Recommended Airport Development Plan - Public Comment

This message is from outside the City email system. Do not open links or attachments from untrusted sources.

michael.j.li@sfgov.org

San Francisco Planning Department
1650 Mission Street
Suite 400
San Francisco, CA 94103
Attn: Michael Li

Re: Notice of Preparation of Environmental Impact Report and Notice of Public Scoping Meeting, May 22, 2019 – SFO Recommended Airport Development Plan. Public Comment Period extended to 5:00pm on July 10, 2019.

Dear Mr. Li:

Residents of the City of San Francisco requests that the EIR for the SFO Airport Development plan address the following topics:

1. Any and all environmental impacts including but not limited to high frequency noise, low frequency noise, vibration, ground based noise from aircraft departing and arriving into SFO and noise bouncing off new structures constructed at SFO. Address impacts of SFO Airport's surrounding communities, including but not limited to all districts in the City of San Francisco, Brisbane, Pacifica, El Granada, Palo Alto, Oakland, 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. 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.

2. Changes in runway and air traffic operations for all SFO arriving and departing flights that include commercial or private passenger and cargo aircraft as well as helicopters.

3. 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 least a 50-mile radius from SFO.

4. 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.

5. Request more noise monitoring stations be located directly under the current flight paths (vectored and non-vectored) of departures and arrivals. As flight paths and aircraft noise have shifted in San Francisco, there is a need to shift or add noise monitors to reflect the current departure routes. Currently noise monitors in San Francisco are set up either near main roads with high levels of noise or too great a distance from

flight paths. 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.

6. 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 ft, including areas outside of the 65 dB CNEL.

Sincerely,

Elizabeth Lopez

San Francisco Resident

SCREAAM.org

Jennifer Tasseff

814 Peach Ave, Sunnyvale, CA · (408)737-8258
Email: jtsunnyvale1@yahoo.com

July 10, 2019

City of San Francisco
Planning Department
Attn: Michael J. Li
1650 Mission Street, Suite 400, San Francisco, CA 94103
Michael.j.li@sfgov.org

RE: EIR Scope for the SFO Recommended Airport Development Plan (Case No. 2017-007468ENV)

Dear Mr. Li:

I am writing to you regarding the scope of the Environmental Impact Report (EIR) for the San Francisco International Airport (SFO) Recommended Airport Development Plan.

I ask that the scope of the EIR include impact assessments and considerations related to the increased environmental emissions and airline noise associated with the proposed SFO expansions.

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 continued expansions of SFO will simply worsen an already serious traffic problem in the area.

In addition to an increase in overall automobile congestion, increases in airplane noise should be considered – Especially since many communities have already been significantly impacted by recent FAA NextGen implementations.

Our city of Sunnyvale is a densely populated area in the heart of Silicon Valley. 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 (impacting more than 7 separate cities).

The added carbon emissions, worsening of air quality, and increase in airline noise all need to be considered and studied prior to any expansions of SFO airport.

Respectfully,

Jennifer Tasseff

michael.j.li@sfgov.org

San Francisco Planning Department
1650 Mission Street
Suite 400
San Francisco, CA 94103

Attn: Michael Li

Re: Notice of Preparation of Environmental Impact Report and Notice of Public Scoping Meeting, May 22, 2019 – SFO Recommended Airport Development Plan. Public Comment Period extended to 5:00pm on July 10, 2019.

Dear Mr. Li:

The justification for the expansion is the increase in traffic. (First paragraph at the top of page 2 of SFO RADP NOP_2019-05-22_Final_S508). 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.

8 of the top 10 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?

The following topics need to addressed in the EIR for the SFO Airport Development plan:

- Any and all environmental impacts such as noise, emissions and health impacts to the Airport's surrounding communities that may arise from the planned SFO expansion and development, and accompanying increases in air traffic arrivals and departures.
    - Specifically, we request that the study 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.
- While SFO is the largest, it is but one of the many Bay Area airports. The EIN needs to include 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 of all arriving and departing aircraft from all the airports.
    - The current SFO monitors need to reflect the actual current flight paths i.e. vectored and not just the FAA published procedures or FAA noise model
        - The current monitor locations reflect historic flight paths and the political weight of the wealthy communities
            - The eastern side of San Francisco including Hunters Point and north are severely impacted by both Runway 01 takeoffs and south bound Oakland departures. There is no noise monitor for these low-income communities and no recent SFO Noise Office studies. This is bordering on shameful when compared to the two monitors described below.
            - Pacific Heights has a monitor. The majority of the noise events reported in the Airport Director's Report are due to News helicopters and tourist flights. The March 2019 report recorded 10/day. The

Eastern side of San Francisco must have 40+/day but until it is measured, it is not an identified problem.
  - Hillsborough had 2 events/day in the March 2019 Airport Director's report.
- Measurement of emissions on the ground, specifically the level of ultra-fine particles, in locations where aircraft fly below 5,000 ft.
- 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.

Yours sincerely

Peter Grace
95 Kings Road
Brisbane, CA 94005

Li, Michael (CPC)

From: Elizabeth Cullinan <ECullinan@HILLSBOROUGH.NET>
Sent: Thursday, July 11, 2019 1:44 PM
To: Li, Michael (CPC)
Cc: John Mullins; Ann Ritzma
Subject: SFO Expansion Environmental Documents - Issues to include San Bruno might take the brunt, depends.

This message is from outside the City email system. Do not open links or attachments from untrusted sources.

Greetings Michael – thank you for your time yesterday on the phone.

In addition for the need for the EIR to address noise and vibration (along with other CEQA required checklist items), following is a comment from our Assistant City Manager:

> *There has been major, and multiple construction projects, including the expansion of the runway surfaces at the airport. The construction projects over the years have changed past vegetated and lowered pervious surfaces into raised hardened impervious services with added impervious buildings, particularly over the last 12 years (Google Earth shows the history of the expansion of the airport and runways over the years).*

It seems that the cumulative construction projects with the added hardened impervious services have not been considered fully?

Does this project Environmental Document consider the cumulative impacts of multiple projects over the long term?

Please keep us in the loop for future notifications and documents.

Thank you.

APPENDIX B

Initial Study

APPENDIX B

INITIAL STUDY
RECOMMENDED AIRPORT DEVELOPMENT PLAN
PLANNING DEPARTMENT CASE NO. 2017-007468ENV

Contents

Attachment

Figures

Tables

SECTION A PROJECT DESCRIPTION

The project description for the San Francisco International Airport (SFO or Airport) Recommended Airport Development Plan (RADP or proposed Plan) is provided in Chapter 2, Project Description, of the draft environmental impact report (Draft EIR), to which this initial study is attached.

SECTION B PROJECT SETTING

The project setting and existing airport land use characteristics of the RADP project site are provided in Chapter 2, Project Description, of the Draft EIR, to which this initial study is attached.

SECTION C COMPATIBILITY WITH EXISTING ZONING AND PLANS

	Applicable	Not Applicable
Discuss any variances, special authorizations, or changes proposed to the planning code or zoning map, if applicable.	☐	☒
Discuss any conflicts with any adopted plans and goals of the City or region, if applicable.	☒	☐
Discuss any approvals and/or permits from city departments other than the planning department or the Department of Building Inspection, or from regional, state, or federal agencies.	☒	☐

SFO is geographically located primarily in unincorporated San Mateo County, California. 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 RADP would be implemented entirely on Airport property and would not change or affect the use of the land on which the Airport is situated. Implementation of the RADP would not require the issuance of a variance or conditional use authorization, nor would it require changes to San Francisco's Planning Code or Zoning Map. Therefore, these issues are not applicable and are not discussed further.

This section describes plans and policies that are generally applicable to the RADP and discusses the potential for any conflicts between the RADP and those plans and policies. Draft EIR Section 2.I, Approvals Required,

p. 2-40, identifies anticipated approvals required for implementation of the RADP. Policy conflicts do not in and of themselves indicate a significant environmental effect pursuant to the California Environmental Quality Act (CEQA), in that the intent of CEQA is to determine the physical impacts of a plan or project on the environment.

C.1 Adopted Plans and Policies

San Francisco International Airport 1989 Master Plan

The San Francisco International Airport 1989 Draft Final Master Plan was adopted by the San Francisco Airport Commission (airport commission) as the Final Master Plan (Master Plan) in 1992.[1] 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.[2] The major Master Plan improvements implemented to date include:

- The new International Terminal Building (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).

Implementation of the RADP would not conflict with any policies in the Master Plan.

[1] 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.
[2] The San Francisco International Airport 1989 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.

Airport Land Use Commission and Airport Land Use Compatibility Plan

With limited exceptions, California law requires that every county with an airport in its jurisdiction have an airport land use commission (ALUC). Each ALUC must develop a plan for promoting and ensuring safety, noise, and airspace compatibility between each airport in the county and surrounding land uses. While SFO is physically located on land owned by the City and County of San Francisco, the airport is geographically located in unincorporated San Mateo County and is therefore the designated ALUC according to state statute.[3] In San Mateo County, the City/County Association of Governments of San Mateo County (C/CAG) Board acts as the ALUC. The purpose of the ALUC is "to protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses."[4] Under California law, the ALUC has three primary responsibilities: to coordinate airport land use compatibility planning efforts at the state, regional, and local levels; to prepare and adopt an airport land use compatibility plan for each public-use airport in its jurisdiction; and to review plans, regulations, and other specified actions of local agencies and airport operators.

Based on state law and guidance provided in the California Airport Land Use Planning Handbook,[5] the *Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport* (SFO ALUCP),[6] adopted in November 2012, has four primary policies that were adopted by the ALUC and were required to be codified in each city's zoning code within San Mateo County:

- *Aircraft Noise Impact Reduction* – To reduce the potential number of future Airport area residents who could be exposed to noise impacts from Airport and aircraft operations. The noise compatibility policies are to (1) protect the public health, safety, and welfare by minimizing exposure of residents and occupants of future noise-sensitive development to excessive noise; and (2) protect the public interest in providing for orderly development of SFO by ensuring that new development in the Airport environs complies with all requirements necessary to ensure compatibility with aircraft noise in the area. The intent is to avoid the introduction of new incompatible land uses into the Airport's "noise impact area."
- *Safety of Persons on the Ground and in Aircraft in Flight* – To minimize the potential number of future residents and land use occupants exposed to hazards related to aircraft operations and accidents. The safety compatibility policies are to (1) protect the public health, safety, and welfare by minimizing the public's exposure to the risk associated with potential aircraft accidents in the Airport vicinity; and (2) protect the public interest in providing for the orderly development of SFO by preventing creation of new safety problems in the Airport environs.
- *Height Restrictions/Airspace Protection* – To protect the navigable airspace around the Airport for the safe and efficient operation of aircraft in flight. The airspace protection policies are to (1) protect the public health, safety, and welfare by minimizing public's exposure to potential safety hazards that could be

[3] 3 California Public Utilities Code section 21670, https://codes.findlaw.com/ca/public-utilities-code/puc-sect-21670/#:~:text=Every%20county%2C%20in%20which%20there,the%20appropriate%20airport%20operators%20and, accessed February 5, 2025.
[4] California Public Utilities Code section 21670, https://codes.findlaw.com/ca/public-utilities-code/puc-sect-21670/#:~:text=Every%20county%2C%20in%20which%20there,the%20appropriate%20airport%20operators%20and, accessed April 10, 2024.
[5] California Department of Transportation, Division of Aeronautics, 2011, California Airport Land Use Planning Handbook, https://dot.ca.gov/-/media/dot-media/programs/aeronautics/documents/californiaairportlanduseplanninghandbook-a11y.pdf, accessed August 23, 2024.
[6] The City/County Association of Governments of San Mateo County (C/CAG), 2012, 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 26, 2024.

created through the construction of tall structures; and (2) protect the public interest in providing for the orderly development of SFO by ensuring that new development in the Airport environs avoids compromising the airspace in the airport vicinity. This avoids the degradation in the safety, utility, efficiency, and air service capability of the airport that could be caused by the attendant need to raise visibility minimums, increase minimum rates of climb, or cancel, restrict, or redesign flight procedures.

- *Land Use Policies*– Land Use Policy 1 established real estate disclosure notices for all properties within San Mateo County, where aircraft could overfly to and from SFO at least once per week at altitudes 10,000 feet or less above mean sea level. Land Use Policy 2 established an area where the ALUC shall exercise its statutory duties to review proposed land use policy actions and land development proposals. This policy area is based on a combination of the outer boundaries of the noise compatibility and safety zones, the Code of Federal Regulations (CFR), title 14, part 77 conical surface, and the Terminal Instrument Procedures (TERPS)[7] approach and One-Engine Inoperative[8] departure surfaces surrounding the airport.

Implementation of the RADP would not conflict with any policies in the SFO ALUCP.

San Francisco General Plan

The San Francisco General Plan provides general policies and objectives to guide land use decisions. The general plan contains 10 elements: commerce and industry, recreation and open space, housing, community facilities, urban design, environmental protection, transportation, air quality, safety and resiliency, and arts. These elements of the general plan set forth goals, policies, and objectives for physical development of the city. The general plan also contains many area plans, which provide more specific policy direction for certain neighborhoods, primarily on the east side of the city. The City's general plan is underpinned by the Environmental Justice Framework, which articulates the City's broad visions and priorities related to environmental justice and provides guidance to City agencies on how they can address it in their work.

With regard to the Airport, the general plan includes transportation policies 5.1 through 5.3. These policies recommend supporting and accommodating the expansion of SFO, while balancing this expansion with protection of the quality of life in the communities that surround the Airport; encouraging the development of direct transit connections from downtown San Francisco to the Airport that will maximize convenience and minimize confusion for Airport patrons; and encouraging the development of a high-speed water transit system from SFO to the Ferry Building and to Metropolitan Oakland International Airport[9] to improve the efficiency and flexibility of the Airport's role in accommodating large numbers of domestic and international passengers. The RADP would not conflict with any of the goals and policies set forth in the general plan.

San Francisco Transit First Policy

The San Francisco Transit First Policy is a set of principles that emphasize the commitment by the City and County of San Francisco (City) to give the use of public rights-of-way by pedestrians, bicyclists, and public

[7] Imaginary airspace surfaces established according to the criteria published in FAA Order 8260.3B, U.S. Standard for Terminal Instrument Procedures (TERPS). The surfaces are designed to ensure the safe separation of aircraft operating under instrument procedures from manmade and natural obstructions. The term, TERPS, is also used more generally in reference to the applicable FAA order.
[8] Procedures required of commercial operators of multi-engine aircraft, mandated by federal regulation, that allow aircraft to safely climb after takeoff with the complete loss of power to one engine.
[9] 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 2024, 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.)*

transit priority over use by the private automobile. These principles are embodied in the policies and objectives of the Charter and 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. Implementation of the RADP would not conflict with the San Francisco Transit First Policy.

SFO Lower Emissions via Sustainable Solutions Transportation Policy

In 1996, the airport commission adopted a Transit First Policy to encourage the use of high-occupancy vehicles to minimize traffic congestion at the Airport and to coordinate with Bay Area Rapid Transit (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, known as the "SFO LESS Policy," to reflect changes to transit, mobility, passenger demand, sustainability, and other initiatives since 1996. This policy promotes transit use to, from, and within the Airport and includes consideration of ground transportation and curbside operations policies, electrification of Airport-owned and operated vehicles, and accessibility of transit. Implementation of the RADP would not conflict with the SFO Less Policy.

The Accountable Planning Initiative (Proposition M)

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added section 101.1 to the planning code to establish eight priority policies.[10] These policies, and the applicable sections of this initial study and Draft EIR that address the environmental issues associated with these policies, are:

1. Preservation and enhancement of existing neighborhood-serving retail uses and enhancement of future opportunities for resident employment in and ownership of such businesses. (Not applicable to the RADP)
2. Conservation and protection of existing housing and neighborhood character to preserve the cultural and economic diversity of neighborhoods. (Not applicable to the RADP)
3. Preservation and enhancement of affordable housing. (Not applicable to the RADP)
4. Discouragement of commuter automobiles from impeding Muni service or overburden streets or neighborhood parking. (Section 3.A, Transportation and Circulation, of the Draft EIR)
5. Protection of industrial and service land uses from commercial office development and enhancement of opportunities for resident employment and business ownership. (Not applicable to the RADP)
6. Maximization of preparedness from injury or loss of life in an earthquake. (Topic E.16, Geology and Soils, of this initial study)
7. Preservation of landmarks and historic buildings. (Topic E.4, Cultural Resources, of this initial study)
8. Protection of parks and open space and their access to sunlight and vistas. (Not applicable to the RADP)

[10] City and County of San Francisco, San Francisco Planning Code, section 101.1, https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_planning/0-0-0-17768#JD_101.1, accessed April 15, 2024.

Other Local Plans and Policies

Other local plans and policies of neighboring jurisdictions that are in the vicinity of or overlap with the RADP project site are discussed in this section. Although the Airport as a department of the City and County of San Francisco is not subject to the plans and policies of these adjacent jurisdictions,[11] they are included here for informational purposes.

- **South San Francisco General Plan.** South San Francisco is located on the west shore of San Francisco Bay, in northern San Mateo County. The northern portion of the Airport is within the geographic limits of the City of South San Francisco. The current South San Francisco General Plan was adopted in 2022. Chapter 16, Noise, of the general plan identifies the Airport (along with vehicular traffic, rail, and industrial uses) as sources of noise in the city. The Noise Element includes policies to protect public health and welfare by eliminating or minimizing the effects of existing noise problems and preventing increased noise levels in the future. The RADP would not conflict with any of the goals or policies of the South San Francisco General Plan.
- **San Bruno General Plan.** San Bruno is in northern San Mateo County just west of the Airport. The city stretches 3.5 miles from the relatively flat eastern areas along U.S. 101 to the hilly western neighborhoods, which are located on the east-facing slope of the Coast Ranges, gaining almost 1,200 feet in elevation. Correspondingly, the eastern portion of the city is more urbanized and has a greater mix of land uses, while the western portion is occupied primarily by low-density, residential development and open space. The current San Bruno General Plan was adopted in 2009 and includes numerous policies related to SFO, including policies concerning aircraft noise, Airport-related traffic, aircraft hazards, and land use compatibility. The RADP would not conflict with any of the goals or policies of the San Bruno General Plan.
- **Millbrae General Plan.** Millbrae is in San Mateo County just west of the Airport. The boundaries of Millbrae extend from roughly U.S. 101 to the east to Interstate 280 (I-280) to the west, and Murchison Drive to the south to Bayview Avenue to the north. The current Millbrae General Plan was adopted in 2022 and includes numerous policies related to SFO, including policies concerning aircraft noise and aircraft hazards. The RADP would not conflict with any of the goals or policies of the Millbrae General Plan.
- **County of San Mateo General Plan and Zoning.** Although the Airport is physically located in San Mateo County, it is owned and operated by the City and County of San Francisco. The County of San Mateo General Plan, last amended in 1986, includes general land use designations and policies pertaining to the Airport. The Airport is designated in the general plan as the San Francisco International Airport Special Urban Area. The general plan's land use objective for this special urban area is defined in Urban Land Use Policy 8.4.b, stating that SFO is to maintain current uses and allow redevelopment and expansion if compatible with adjacent land uses and other general plan policies. The general plan also includes Transportation Policies 12.41 through 12.44, which support the Metropolitan Transportation Commission's Regional Airport Plan policies concerning growth at the Airport and promote the use of transit and improvement of ground transportation options. The RADP would not conflict with any of the goals or policies of the County of San Mateo General Plan.

[11] San Francisco International Airport, 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. California Government Code Section 53090–53091, https://law.justia.com/codes/california/2022/code-gov/title-5/division-2/part-1/chapter-1/article-5/section-53090/, accessed March 20, 2024.

Under the County of San Mateo Zoning Ordinance, the Airport is identified as Light Industrial (M-1). The RADP would not conflict with this identification.

Regional Plans

In addition to local general plans and related documents, regional environmental, transportation, and land use plans and policies consider the growth and development of the nine-county San Francisco Bay Area (bay area). Some of these plans and policy documents are advisory, and some include specific goals and provisions that must be adhered to when evaluating a project under CEQA. These regional plans are summarized below.

- **Bay Area Air Quality Management District Plans.** The most recently adopted air quality plan in the San Francisco Bay Area Air Basin is the 2017 Clean Air Plan,[12] which the Bay Area Air Quality Management District (air district) adopted in April 2017. The 2017 Clean Air Plan requires projects to implement "all feasible measures" to reduce ozone; provide a control strategy to reduce ozone, particulate matter, toxic air contaminants, and greenhouse gas emissions in a single, integrated plan; review progress in improving air quality in recent years; and eliminate health risk disparities from exposure to air pollution among bay area communities. The 2017 Clean Air Plan and physical environmental impacts of the RADP related to attainment of air quality standards are addressed in Draft EIR Section 3.C, Air Quality. In addition, Section 3.C of the Draft EIR presents the evaluation of potential air quality impacts of the RADP with respect to the air district's 2022 CEQA Air Quality Guidelines.[13] The RADP would not conflict with any of the goals and objectives set forth in the 2017 Clean Air Plan.
- **California State Regional Water Quality Control Board Plans.** Water quality control plans (basin plans) provide the basis for protecting water quality in California. Basin plans are mandated by both the federal Clean Water Act and the state Porter-Cologne Water Quality Control Act (the Water Code). Water Code sections 13240 through 13249 specify the required contents and procedures for adopting a regional basin plan. Each plan must contain water quality objectives that, in the judgment of the regional water quality control board (regional board), will ensure the reasonable protection of beneficial uses and the prevention of nuisances. The plan must also contain an implementation program for achieving those objectives, including a description of the nature of actions necessary to achieve the objectives, time schedules for the actions to be taken, and a description of surveillance to be undertaken to determine compliance with objectives. The goal of the San Francisco Bay Basin Plan (Basin Plan) is to provide a definitive program of actions designed to preserve and enhance water quality and to protect beneficial uses of water in San Francisco Bay, which include industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, water non-contact recreation, and navigation.[14] The Basin Plan is used as a regulatory tool by the San Francisco Bay regional board's technical staff. Regional board orders cite the Basin Plan's water quality standards and prohibitions applicable to a particular discharge. The Basin Plan is also used by other agencies in their permitting and resource management activities. It also serves as an educational and reference document for dischargers and members of the public. The RADP was reviewed in the context of the San Francisco Bay regional board's Basin Plan, and

[12] 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.
[13] Bay Area Air Quality Management District, 2022, California Environmental Quality Act Air Quality Guidelines, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed February 9, 2024.
[14] San Francisco Bay Regional Water Quality Control Board, 2017, *Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin*, https://www.waterboards.ca.gov/sanfranciscobay/basin_planning.html, accessed August 26, 2024.

no potential conflicts were identified. (See Topic E.17, Hydrology and Water Quality, of this initial study for a more detailed discussion of the RADP's impacts on water quality.)

- **Plan Bay Area 2050.** Plan Bay Area 2050 is a long-range Regional Transportation Plan and Sustainable Communities Strategy for the nine-county bay area, prepared by the Association of Bay Area Governments and the Metropolitan Transportation Commission.[15] The plan discusses how the bay area will grow over the next three decades and identifies transportation and land use strategies to enable a more sustainable, equitable, inclusive, and economically vibrant future. The RADP was reviewed in the context of Plan Bay Area 2050, and no potential conflicts were identified.

SECTION D SUMMARY OF ENVIRONMENTAL EFFECTS

Implementation of the RADP could potentially result in adverse physical effects on the environmental resources checked below. Where those impacts are significant or potentially significant, CEQA requires identification of mitigation measures to reduce the severity of the impacts to a less-than-significant level to the extent feasible. The initial study and the Draft EIR present a more detailed checklist and discussion of each environmental resource.

☐ Land Use and Planning	☐ Greenhouse Gas Emissions	☐ Hydrology and Water Quality
☐ Aesthetics	☐ Wind	☐ Hazards and Hazardous Materials
☐ Population and Housing	☐ Shadow	☐ Mineral Resources
☒ Cultural Resources	☐ Recreation	☐ Energy
☒ Tribal Cultural Resources	☐ Utilities and Service Systems	☐ Agriculture and Forestry Resources
☒ Transportation and Circulation	☐ Public Services	☐ Wildfire
☒ Noise	☒ Biological Resources	☒ Mandatory Findings of Significance
☒ Air Quality	☐ Geology and Soils	

This initial study evaluates the potential for implementation of the RADP to result in significant environmental impacts and identifies which environmental resource topics are appropriately analyzed in the initial study and those that warrant a more detailed analysis in the Draft EIR.

[15] Association of Bay Area Governments and Metropolitan Transportation Commission (ABAG-MTC), 2021, *Plan Bay Area 2050: A Vision for the Future*, released October 1, https://planbayarea.org/finalplan2050, accessed August 26, 2024.

D.1 Effects Found to Be Potentially Significant

Based on this initial study, the following are the resource topics for which the potential exists for effects to be significant, or for which the analysis requires additional detail, and that are analyzed in the EIR:

- Transportation and Circulation
- Noise and Vibration
- Air Quality

D.2 Effects Found Not to Be Significant

The initial study determined that potential individual and cumulative environmental effects related to the following resource topics either would be less than significant or would be reduced to a less-than-significant level through mitigation measures identified in this initial study:

- Land Use and Planning
- Aesthetics
- Population and Housing
- Cultural Resources
- Tribal Cultural Resources
- Greenhouse Gas 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
- Wildfire

Impacts associated with these topics are discussed with mitigation measures, where appropriate, in Section E, Evaluation of Environmental Effects, of this initial study and require no further environmental analysis in the Draft EIR. All mitigation measures identified in this initial study are listed in Section F, Mitigation Measures, and have been agreed to be implemented by the project sponsor as part of implementation of the RADP, if approved. For each checklist item, the evaluation considers both RADP-specific and cumulative impacts related to implementation of the RADP.

D.3 Approach to Cumulative Impact Analysis

The cumulative impact analyses for topics addressed in Section E, Evaluation of Environmental Effects, use a combination of the list-based approach and the projections-based approach.[16] Reasonably foreseeable past, present, and future projects that could potentially contribute to cumulative impacts on various resource topics are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11.

[16] See Draft EIR Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, "Approach to Cumulative Impact Analysis," p. 3-7, for a discussion of the list-based and projections-based approaches to the cumulative analysis.

SECTION E EVALUATION OF ENVIRONMENTAL EFFECTS

E.1 Land Use and Planning

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
1. LAND USE AND PLANNING. Would the project:					
a) Physically divide an established community?	☐	☐	☒	☐	☐
b) 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?	☐	☐	☒	☐	☐

Environmental Setting

SFO is 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. The Airport is owned by the City and County of San Francisco and operated by and through the San Francisco 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. 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.

The irregularly shaped RADP project site comprises 916 acres and is generally flat. As shown on Draft EIR Figure 2-1, p. 2-4, 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 Maintenance Operations Center (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. Implementation of the RADP would occur entirely on Airport property east of U.S. 101 and would not change or affect the use of the land on which the Airport is situated.

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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. The RADP identifies various projects that would facilitate the development of terminal and *non-movement areas*[17] of the airfield (to meet Federal Aviation Administration [FAA] taxiway design standards), as well as landside facilities needed to accommodate the Airport's long-term passenger activity levels. 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. 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.[18]

Therefore, this section analyzes potential impacts related to land use and land use planning from subsequent projects that could occur with implementation of the RADP. Specifically, a land use impact would occur if implementation of the RADP would physically divide a community or conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. A conflict with a plan or policy that is applicable to the RADP would not result in a significant impact on the environment in and of itself. However, where implementation of the RADP would result in a conflict with a plan or policy that could result in physical effects on the environment, those associated physical environmental effects are analyzed in the appropriate sections of this initial study or the Draft EIR.

Impacts and Mitigation Measures

Impact LU-1: The RADP would not physically divide an established community. ***(Less than Significant)***

The division of an established community typically involves the construction of a physical barrier to neighborhood access, such as a new freeway, or the removal of a means of access, such as a bridge or a roadway. The nearest communities of South San Francisco, San Bruno, and Millbrae are physically separated from SFO by U.S. 101 and surrounding roads.

The RADP does not include projects or elements that could divide an established community because no individual neighborhoods lie within the RADP project site. Therefore, residents of areas near SFO would not have access impeded to other areas near the Airport with implementation of the RADP. Consequently, implementation of the RADP would have a ***less-than-significant*** impact related to physical division of an established community.

Mitigation: None required.

---

[17] 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 airport traffic control tower and includes runways, taxiways, and other areas of an airport that are used for taxiing, takeoff, and landing of aircraft.

[18] 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.

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. *(Less than Significant)*

Section C, Compatibility with Existing Zoning and Plans, p. 1, provides a detailed discussion of potential conflicts with land use plans and policies that are applicable to the RADP. Land use impacts would be significant if the RADP would conflict with any plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Environmental plans and policies are those that directly address environmental issues and/or contain targets or standards that must be met to preserve or improve the characteristics of the physical environment. A conflict with a plan or policy that is applicable to the RADP would not result in a significant impact on the environment in and of itself unless the conflict or inconsistency would result in a direct physical environmental impact.

The physical environmental impacts of implementing the RADP are discussed in the appropriate sections of this initial study and Draft EIR Chapter 3, Environmental Setting, Impacts, and Mitigation Measures. As discussed in Section C, Compatibility with Existing Zoning and Plans, implementation of the RADP would not conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect; therefore, this impact would be ***less than significant***.

Mitigation: None required.

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. *(Less than Significant)*

The geographic context for the analysis of potential cumulative impacts related to land use and planning consists of the development and infrastructure projects generally located on and within 0.25 mile of the RADP project site. Those projects are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11.

The RADP would not physically divide an established community and therefore would have no potential to combine with cumulative projects to result in a significant cumulative impact related to the division of an established community. In addition, the cumulative projects either would maintain existing land uses in the project vicinity or, if a land use change is proposed, would be required to comply with applicable land use plans, policies, and regulations. Thus, implementation of the RADP in combination with cumulative projects would not result in a significant cumulative impact, and the cumulative impact related to land use and planning would be ***less than significant***.

Mitigation: None required.

E.2 Aesthetics

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
2. AESTHETICS. Except as provided in Public Resources Code section 21099, would the project:					
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐	☐
b) Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐	☐
d) Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?	☐	☐	☒	☐	☐

This section describes the existing visual character of the RADP project site and vicinity and evaluates potential effects on scenic vistas, scenic resources, and public views. Because the RADP project site is in an urbanized area, implementation of the RADP would result in a significant adverse environmental effect on visual character and quality if it would conflict with applicable zoning and other regulations governing scenic quality. This section also evaluates the potential for implementation of the RADP to create a new source of substantial light or glare that could adversely affect daytime or nighttime views in the area.

The impact discussion evaluates potential impacts on aesthetic and visual resources in the context of existing conditions (2019) based on analyses of photographs, site reconnaissance, and visual simulations.

Concepts and Terminology

Visual character is a general description of the visual attributes of a particular setting. The purpose of defining an area's visual character is to provide the context within which the visual quality of a particular site or locale is most likely to be perceived by the viewing public. For urban areas, visual character is typically described on the neighborhood level, or in terms of areas with common land use, development intensity, and/or urban design features. For natural and open space settings, visual character is most commonly described in terms of areas with common landscape attributes (e.g., landform, vegetation, water features).

Visual quality is defined as the overall visual impression or attractiveness of a site or locale as determined by its aesthetic qualities (such as color, variety, vividness, coherence, uniqueness, harmony, and pattern).

Scenic vistas are locations from which the public can experience unique and exemplary views, typically from elevated vantage points that offer panoramic views of great breadth and depth.

A *viewshed* is an area of land, water, or other urban or environmental element that is visible to the human eye from a fixed vantage point.

Environmental Setting

The Airport's operational area is generally bordered by U.S. 101 to the west and by San Francisco Bay to the east. The Airport is mostly paved to facilitate aeronautical uses such as runways, taxiways, aircraft aprons, and parking, or occupied by passenger terminal buildings and airport support facilities (e.g., aircraft hangars, ground support equipment facilities).

The RADP project site is generally level, and views of San Francisco Bay, San Bruno Mountain, and the East Bay hills provide visual relief from the built environment of the Airport and surrounding areas. The areas to the north, west, and south of the Airport are primarily built out, and a significant amount of artificial light from urban uses already exists. Roadway lighting, signage, and vehicle headlights on U.S. 101 are also a substantial source of existing ambient light. Existing sources of ambient light at the Airport include lighting for terminal facilities, support facilities, parking facilities, in-pavement airfield lighting and signage, and navigational aid lighting. Airfield lighting systems and lighting system intensities are specified by the FAA for all U.S. airports.

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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.

The analysis of potential aesthetic impacts involves a qualitative comparison of the existing built and natural environments to the future built and natural environments and an evaluation of the visual changes that would result from implementing the RADP. Key views were examined and existing views were compared to those expected to occur with implementation of the RADP. Visual simulations were prepared to show physical elements of the RADP from key viewpoints in as realistic a manner and context as possible. Relevant urban design policies and guidelines were examined to determine whether implementation of the RADP would conflict with applicable zoning and other regulations governing scenic quality or create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

Impacts and Mitigation Measures

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. ***(Less than Significant)***

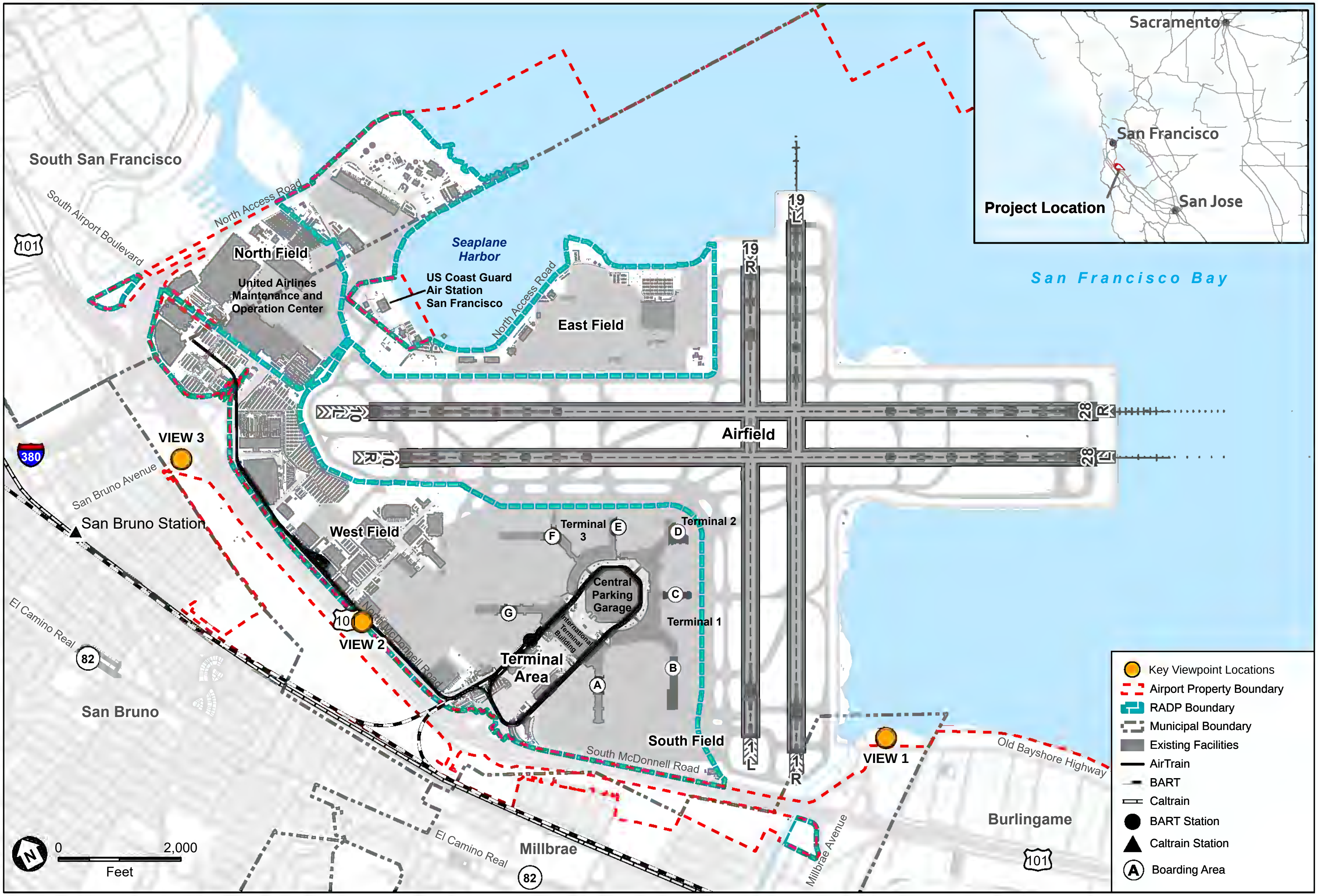
Scenic Vistas, Scenic Resources, and Visual Character

As noted previously, a scenic vista is generally considered to be a location from which the public can experience high-quality views, typically from elevated and uninterrupted vantage points that offer panoramic views of great breadth and depth. Scenic vistas may be officially recognized or designated (e.g., within local planning documents or the California Department of Transportation scenic highway program) or may be informal (e.g., mountain peaks or coastal bluffs). The RADP project site is generally level, and views of San Francisco Bay, San Bruno Mountain, and the East Bay hills provide visual relief from the built environment of the Airport and surrounding areas.

No state-designated scenic highways are located near SFO. The closest officially designated state scenic highway is I-280, approximately 2 miles west of the Airport. Because of distance, topography, and intervening structures and vegetation, the RADP project site is not clearly visible from I-280. In addition, RADP projects would be developed on previously developed portions of SFO property that do not contain any scenic resources such as vegetation and rock outcroppings, or currently identified historic buildings. Therefore, no impact would occur related to substantial damage to scenic resources. The following discussion considers whether implementation of the RADP would have a substantial adverse impact on scenic vistas.

As described in Draft EIR Chapter 2, Project Description, 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. As noted previously, visual simulations were prepared to show key physical elements of subsequent projects under the RADP from representative publicly accessible viewpoints in as realistic a manner and context as possible. **Figure 1** shows the locations for which visual simulations were prepared. **Figure 2** through **Figure 4** show existing views from key viewpoints and views expected to occur with implementation of the RADP. The images show simple massing structures based on height and bulk proposed for projects identified in the RADP.

Figure 2 shows existing and proposed views from Bayfront Park in the City of Millbrae. As discussed in Draft EIR Chapter 2, Project Description, the Central Hub project (RADP Project #6) would demolish the existing five-level, 81-foot-tall, seismically deficient Central Parking Garage in the Terminal Area and construct a new, nine-level, up to 175-foot-tall Central Hub. The Aircraft Maintenance Hangar project (RADP Project #18) would construct a new 95-foot-tall, 181,000-square-foot stand-alone hangar on the existing Superbay Hangar employee surface parking lot in the East Field. As shown on Figure 2, the Central Hub would be visible from this location and would partially obstruct existing views of San Bruno Mountain north of SFO. The Aircraft Maintenance Hangar also would be visible from this location (Figure 2), but it would not substantially alter or obstruct existing views.



SOURCE: Esri, 2022; San Mateo County, 2023; SFO, 2023; ESA, 2023

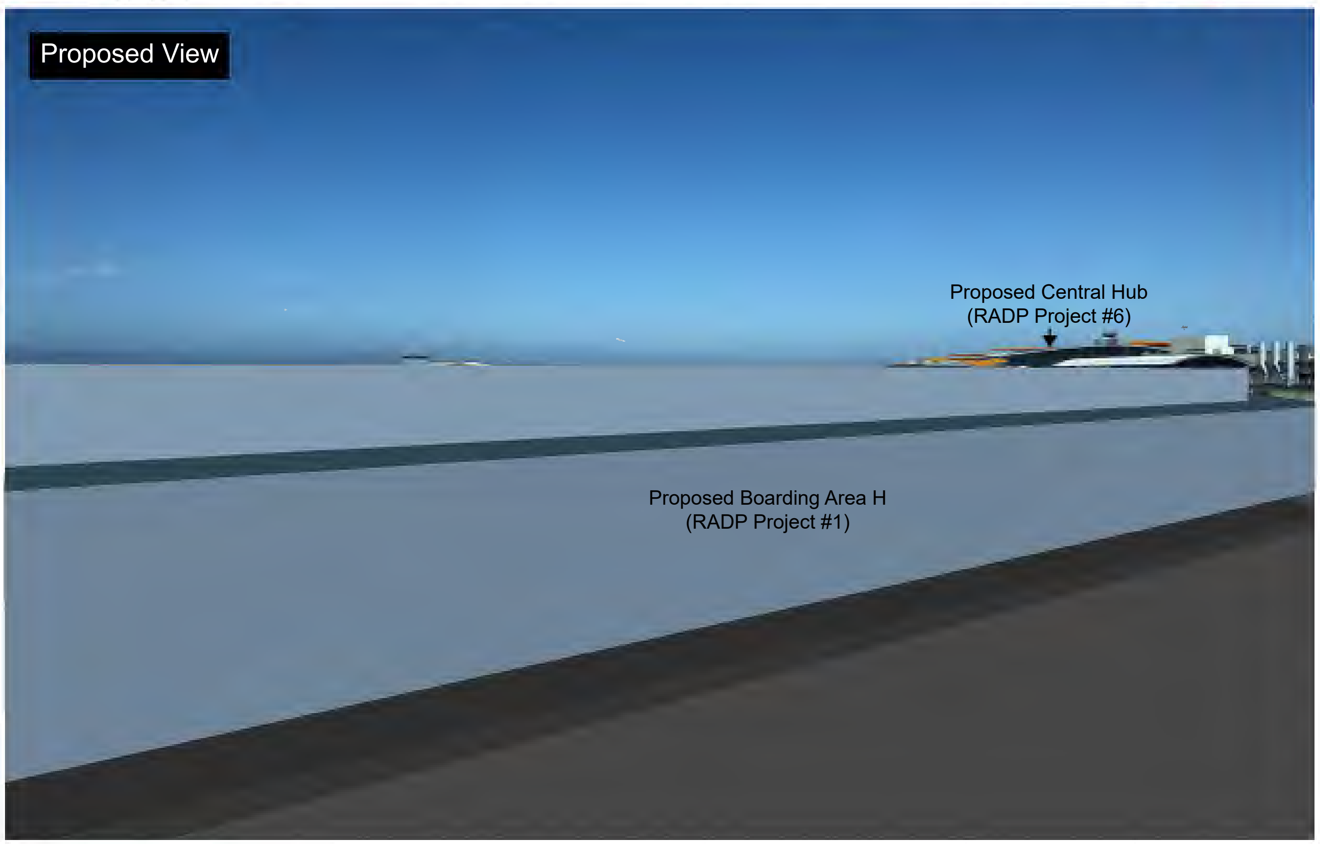
SFO Recommended Airport Development Plan EIR

FIGURE 1

VISUAL SIMULATION LOCATION MAP

SOURCE: Prevision Design, 2020

FIGURE 2
VIEW 1: EXISTING AND PROPOSED VIEWS OF SFO AND SAN BRUNO MOUNTAIN FROM BAYFRONT PARK. VIEW FACING NORTH



SOURCE: Prevision Design, 2020

FIGURE 3
VIEW 2: EXISTING AND PROPOSED VIEWS OF BOARDING AREA G, THE BAY, AND THE EAST BAY HILLS FROM AIRTRAIN. VIEW FACING EAST

SOURCE: Prevision Design, 2020

FIGURE 4

VIEW 3: EAST VIEW OF THE PROPOSED CONSOLIDATED RENTAL CAR CENTER

Figure 3 shows existing and proposed views of Boarding Area G, the bay, and the East Bay hills from the AirTrain.[19] As discussed in Draft EIR Chapter 2, Project Description, a new Boarding Area H (RADP Project #1) would be constructed with implementation of the RADP. Boarding Area H would extend west from the base of the ITB along North Link Road, then would shift north and follow North McDonnell Road. The new approximately 1,618,900-square-foot, 100-foot-tall Boarding Area H would comprise five levels: a utilidor (a subgrade utility corridor), an apron level, an arrivals level, a departures level, and an airline club level. The proposed Boarding Area H and the upper portions of the proposed Central Hub (RADP Project #6) would be visible from this location (Figure 3) and would partially alter and obstruct existing views of the bay and the East Bay hills.

Figure 4 shows existing and proposed east-facing views of Long-Term Parking Garage #1 (Building 795), Long-Term Parking Garage #2 (Building 794), and the Rental Car Center AirTrain Station (Building 797). As discussed in Draft EIR Chapter 2, Project Description, the RADP would include construction of a new 1,940,000-square-foot Consolidated Rental Car Center (CONRAC; RADP Project #9) and customer service lobby/offices at the top level linked to the AirTrain station in the North Field. The height of the new CONRAC would be stepped in recognition of the adjacent runway protection zones,[20] to adhere to prevailing critical airspace surfaces and maintain safe aircraft operations; height limits would be set at about 67 feet above grade at the southeast corner and about 83 feet above grade at the northwest corner of the facility. The CONRAC would be constructed on a portion of the surface long-term public parking lot. As shown on Figure 4, the proposed CONRAC would be highly visible from this location and would obstruct existing views of the aforementioned Airport facilities; however, it would not alter or obstruct views of any scenic vistas.

For these reasons, implementation of the RADP would alter existing scenic views from specific locations, but not to such an extent that would be substantially adverse. Abundant views of San Francisco Bay, San Bruno Mountain, the East Bay hills, and other scenic resources that are currently available from the project site and the surrounding area would remain with implementation of the RADP. For these reasons, impacts related to altering existing scenic views with implementation of the RADP would be ***less than significant***.

Mitigation: None required.

Conflict with Applicable Zoning and Other Regulations Governing Scenic Quality

Because the RADP project site is in an urbanized area, implementation of the RADP would have a significant adverse environmental effect on visual character and quality if it would conflict with applicable zoning and other regulations governing scenic quality. As discussed in Section C, Compatibility with Existing Zoning and Plans, of this initial study, although the Airport is geographically located in San Mateo County, it is owned and operated by SFO and is not subject to the land use requirements of other jurisdictions. However, a discussion of implementing the RADP within the context of the County of San Mateo General Plan is provided herein for informational purposes.

The County of San Mateo General Plan, last amended in 1986, includes general land use designations and policies pertaining to SFO. The general plan designates the Airport as the San Francisco International Airport Special Urban Area. Urban Land Use Policy 8.4.b defines the general plan's land use objective for this special urban area, stating that SFO is to maintain current uses and allow redevelopment and expansion if

[19] The AirTrain is the Airport's automated people mover system that is elevated 35 to 40 feet above ground at its highest point.
[20] 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 aboveground objects for safety of aircraft operations.

compatible with adjacent land uses and other general plan policies. Visual Quality Policy 4.36 sets forth the objective to maintain and, where possible, improve upon the appearance and visual character of development in urban areas and ensure that new development in urban areas is designed and constructed to contribute to the orderly and harmonious development of the locality. Under the County of San Mateo Zoning Ordinance, SFO is zoned Light Industrial (M-1). The Zoning Ordinance permits a wide variety of industrial uses in the M-1 zoning district, including air transportation and related activities. As such, implementation of the RADP would not substantially conflict with County of San Mateo General Plan policies, zoning, or other applicable regulations concerning scenic quality and impacts would be ***less than significant***.

Mitigation: None required.

Conclusion

For the reasons noted previously, implementation of the RADP would not have a substantial adverse effect on a scenic vista or substantially damage scenic resources, 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. New or modified structures resulting from implementation of the RADP would modestly and incrementally change the look of the Airport and views of the Airport from surrounding areas, including views of the Airport from residential areas in the hills to the west. However, given the existing context, implementation of the RADP would not result in a substantial adverse visual impact. Rather, implementation of the RADP would continue and intensify the existing visual appearance of the Airport, which is characterized by large structures and irregular building patterns within an urbanized environment. Therefore, the impact of implementation of the RADP related to aesthetics would be ***less than significant***.

Mitigation: None required.

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. *(Less than Significant)*

As discussed previously, the areas to the north, west, and south of the Airport are primarily built out, and a significant amount of artificial light from urban uses already exists. Roadway lighting, signage, and vehicle headlights on U.S. 101 are also a substantial source of existing ambient light. Existing sources of ambient light at the Airport include lighting for terminal facilities, support facilities, parking facilities, in-pavement airfield lighting and signage, and navigational aid lighting. Airfield lighting systems and lighting system intensities are specified by the FAA for all U.S. airports.

Implementation of the RADP would result in an incremental increase in new sources of nighttime light and daytime glare associated with the new or improved facilities. New sources of nighttime light or glare could include interior and exterior lighting on new or improved buildings or infrastructure that could be noticeable to drivers on nearby roadways or diminish views of the night sky. New sources of daytime glare could include glass or other reflective finishes on new or improved buildings or infrastructure.

However, RADP projects would be designed and operated in accordance with the Airport Building Regulations,[21] the Airport Architecture & Engineering Standards,[22] and applicable Federal Aviation Regulations related to aircraft and airport safety. The Airport Building Regulations govern the Airport's implementation and enforcement of the California Building Standards Code (California Code of Regulations [CCR] Title 24). The Airport Architecture & Engineering Standards are SFO's requirements for design and construction work in addition to the requirements provided within the building codes. Part 2, Site Requirements, of the Airport Architecture & Engineering Standards identifies requirements for capital projects at SFO, including requirements to reduce backlighting, uplighting, and glare during construction and operations. Federal Aviation Regulations establish the requirements to provide notice to the FAA of proposed construction activities or the alteration of existing structures to ensure the safe and efficient use of navigable airspace, air navigation facilities, or equipment. Required adherence to applicable standards and regulations would ensure that RADP projects would not introduce a new source of substantial light or glare that would adversely affect day or nighttime views in the area. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact C-AE-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact related to aesthetics. *(Less than Significant)*

The geographic context for the analysis of potential cumulative impacts related to aesthetics consists of the development and infrastructure projects located on and within 0.25 mile of the RADP project site. Those projects are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11.

Cumulative Airport projects include utility and shoreline infrastructure improvements, as well as new on-Airport buildings and other aboveground structures (e.g., Consolidated Administration Campus Phase 2, West Field Cargo Redevelopment, North Field Maintenance Facilities). However, similar to projects that could occur with implementation of the RADP, these cumulative projects are not anticipated to substantially obstruct scenic views of San Francisco Bay, San Bruno Mountain, or the East Bay hills from publicly accessible areas, as they would be limited in height due to airspace restrictions.[23] Because these cumulative Airport projects would be developed and designed to support Airport operations, they would be compatible with the existing visual character and quality of the area and would not create new sources of substantial light or glare.

Other non-Airport cumulative projects include mixed-use commercial and residential projects, as well as commercial, storage, research and development, and shoreline protection projects. These cumulative projects are located north, west, and south of the RADP project site and are not visually connected to the site. Therefore, these cumulative projects would not combine with RADP projects to result in a significant cumulative impact on scenic vistas or substantially degrade the existing visual character or quality of the

[21] San Francisco International Airport, Airport Building Regulations, January 1, 2019, https://www.flysfo.com/sites/default/files/media/sfo/about-sfo/2018-10_RR_Appx_F.pdf, accessed April 10, 2024.
[22] San Francisco International Airport, SFO Sustainable Planning, Design & Construction Standards, September 2021, https://www.sfoconnect.com/sites/default/files/2021-12/SFO%20Sustainable%20PDC%20Standards%2012-13-21.pdf, accessed April 10, 2024.
[23] Ricondo & Associates, Inc., 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 April 10, 2024.

area, nor would they combine to create new sources of substantial light or glare that would affect views in the area. Cumulative impacts related to aesthetics would be ***less than significant***.

Mitigation: None required.

E.3 Population and Housing

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
3. POPULATION AND HOUSING. Would the project:					
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐	☐
b) Displace substantial numbers of existing people or housing units, necessitating the construction of replacement housing?	☐	☐	☐	☐	☒

Implementation of the RADP would not displace any residents or housing units because no residential uses or housing units currently exist on the project site. Therefore, Topic E.3(b) related to housing and population displacement does ***not apply*** and is not discussed further in the Draft EIR, including this initial study.

Environmental Setting

SFO is 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 contains two sets of parallel runways, supporting airfield facilities and infrastructure, a passenger terminal area, ground transportation facilities, and cargo and other facilities. There are no existing or planned housing or residential facilities within the Airport property.

In calendar year 2018 and as noted in the Notice of Preparation (NOP) of an EIR and Notice of Public Scoping Meeting published in May 2019, the Airport served approximately 57.8 million annual passengers,[24] with approximately 42,800 airport commission and tenant employees.[25] (Airport commission employees are

---

[24] The 57.8 million annual passengers include total enplaned and deplaned passengers and passengers who fly into and out of SFO on the same aircraft. 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 April 10, 2024.
[25] Number of employees, including airlines, tenants, and airport commission employees, based on a 2015 Airport-wide survey and SFO data from Fiscal Year 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 April 10, 2024.

employees of the City and County of San Francisco.) In 2019, the Airport served approximately 57.5 million annual passengers.[26]

As shown in **Table 1**, employment in San Mateo County is projected to increase by approximately 51,300 persons by 2045, for a total of 455,200, and employment in San Francisco is projected to increase by 190,100 persons by 2045, for a total of 925,400. Within the nine-county San Francisco Bay Area, employment is projected to increase by approximately 1.2 million persons by 2045, for a total of 5.2 million persons.

Table 1 Population and Employment for San Mateo County, San Francisco, and the Bay Area, 2018–2045

	San Mateo County		San Francisco		Bay Area	
Year	Employment [a]	Population [b]	Employment [a]	Population [b]	Employment [c]	Population
2018	403,900	774,822	735,300	893,733	4,060,920	7,753,023[d]
2020	386,100	775,132	696,600	899,891	4,080,000	7,940,000
2025	436,700	787,161	828,700	913,369	4,150,000	8,230,000
2030	443,500	800,006	864,800	936,862	4,640,000	8,560,000
2035	447,100	808,253	885,900	956,232	4,830,000	9,010,000
2040	451,600	813,098	905,800	972,787	5,050,000	9,490,000
2045	455,200	815,187	925,400	988,709	5,230,000	9,930,000

SOURCES: California Department of Finance, Report P-2A: Total Population Projections, California Counties, 2010–2060, accessed April 10, 2024, https://dof.ca.gov/Forecasting/Demographics/projections/; Association of Bay Area Governments and Metropolitan Transportation Commission, *Plan Bay Area 2050: Forecasting and Modeling Report* (October 2021), accessed April 10, 2024, https://www.planbayarea.org/sites/default/files/documents/Plan_Bay_Area_2050_Forecasting_Modeling_Report_October_2021.pdf; U.S. Census Bureau, 2017 American Community Survey 1-Year Estimates, accessed April 10, 2024, https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2017/1-year.html.

NOTES:

a. County-level employment data were obtained from the California Department of Transportation's California County-Level Economic Forecast 2018–2050.
b. County-level population data were obtained from the California Department of Finance.
c. Employment data for the nine-county bay area were obtained from the Association of Bay Area Governments' Plan Bay Area 2050.
d. The 2018 population for the nine-county bay area was obtained from the U.S. Census Bureau, Population Division.

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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.

Population growth is considered in the context of local and regional population, housing, and employment projections. Generally, a project that induces population growth is not viewed as having a significant impact

[26] 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 April 10, 2024.

on the environment unless the physical changes that would be needed to accommodate project-related population growth would have adverse impacts on the environment. CEQA Guidelines section 15064(e) states that an economic or social change by itself shall not be considered a significant effect on the environment.

An *indirect environmental impact* is a change to the physical environment that is not immediately related to the project.[27] Specifically, project-related growth-inducing effects include ways in which a project could foster economic or population growth or the construction of additional housing, either directly or indirectly. Projects that would remove obstacles to population growth (e.g., a major expansion of a wastewater treatment plant) might, for example, allow development to occur in an area that was not previously considered feasible for development because of *infrastructure* limitations.[28] Because implementation of the RADP would not include new housing, this analysis focuses on whether the increase in jobs attributable to the RADP would result in substantial unplanned direct or indirect population growth.

Impacts and Mitigation Measures

Impact PH-1: The RADP would not induce substantial unplanned direct or indirect population growth. *(Less than Significant)*

As described in Draft EIR 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. The RADP would result in approximately 8.1 million square feet of net new construction, including new or improved terminals/boarding areas, parking, enhanced automated people mover system, landside and ground access, and support facilities that would be constructed over a period of approximately 20 years. This development would incrementally increase the number of employees at the project site.

Construction

At the time the NOP was published in May 2019, approximately 2,040 construction workers were employed at SFO for construction of ongoing and approved projects at the Airport.[29] This number of construction workers would remain relatively static and would not increase substantially with implementation of the RADP, given that only a certain number of projects at the Airport can be under construction at any given time to avoid disrupting Airport operations. Construction employees for RADP projects would likely continue to commute from their residences in the bay area rather than permanently relocating to the area from more distant locations. This is typical for employees in the various construction trades. Thus, construction of RADP

[27] CEQA Guidelines section 15064(d)(2).
[28] CEQA Guidelines section 15126.2(d).
[29] 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 Draft EIR Table 3-2, p. 3-8, and mapped on Draft EIR 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 Draft EIR 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.

projects would not generate a substantial unplanned direct or indirect employment population increase in the region, and this impact would be ***less than significant***.

Mitigation: None required.

Operation

At the time of publication of the NOP, the Airport had approximately 40,790 SFO employees (including airport commission, airlines, and tenants). As presented in Draft EIR Table 3-1, Summary of Employment Growth Projections, p. 3-6, employment growth attributable to implementation of the RADP would increase the number of employees by approximately 2,700 at full buildout.[30] As presented in Table 3-1, a certain amount of employee growth (estimated to be approximately 9,400 SFO employees) would occur regardless of implementation of the RADP based on development of cumulative and ongoing projects at the Airport. Employees associated with operation of RADP projects would likely commute from within the bay area, similar to existing patterns for SFO employees. As discussed previously, employment in San Mateo County is projected to increase by approximately 51,300 persons by 2045, for a total of 455,200, and employment in San Francisco is projected to increase by 190,100 persons by 2045, for a total of 925,400. Within the nine-county San Francisco Bay Area, employment is projected to increase by approximately 1.2 million persons by 2045, for a total of 5.2 million persons. The employment population introduced with implementation of the RADP (approximately 2,700 SFO 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, the impact of implementation of the RADP related to substantial unplanned direct or indirect employment population growth would be ***less than significant***.

Mitigation: None required.

Impact C-PH-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact related to population and housing. *(Less than Significant)*

The geographic context for potential cumulative employment population impacts encompasses the nine-county bay area. As shown in Table 1, employment in the nine-county bay area is projected to increase by approximately 1.2 million persons by 2045, for a total of 5.2 million persons. Implementation of the RADP would generate approximately 2,700 jobs, which represents 0.23 percent of anticipated employment growth in the bay area through 2045. Given the substantially low percentage increase in anticipated employment growth with implementation of the RADP, projects implemented pursuant to the RADP would not combine with cumulative projects to result in a substantial unplanned direct or indirect impact on employment population growth. Therefore, the cumulative impact related to employment population growth would be ***less than significant***.

Mitigation: None required.

---

[30] See Appendix D, Employee Growth Assumptions, for more detail regarding the employment growth projections attributable to implementation of the RADP.

E.4 Cultural Resources

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
4. CULTURAL RESOURCES. Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5, including those resources listed in article 10 or article 11 of the San Francisco Planning Code?	☐	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐	☐

Regulatory Framework

This section summarizes the plans and policies of federal, state, and local agencies that have regulatory oversight regarding cultural resources—inclusive of architectural resources, archeological resources, and human remains—within the RADP project site.

Federal Regulations

The planning department uses the federal guidelines related to the treatment of cultural resources to determine whether cultural resources, as defined under CEQA, are present and guide the treatment of such resources. The following subsections summarize the relevant federal regulations and guidelines.

California implements the National Historic Preservation Act through its statewide comprehensive cultural resource preservation programs. The California Office of Historic Preservation, an office of the California Department of Parks and Recreation, implements policies of the National Historic Preservation Act on a statewide level. The California Office of Historic Preservation also maintains the California Historical Resources Inventory. The State Historic Preservation Officer is an appointed official who implements historic preservation programs within the state's jurisdiction.

National Historic Preservation Act and National Register of Historic Places

The National Historic Preservation Act establishes the National Register of Historic Places (National Register), which provides a framework for resource evaluation and informs the process of determining impacts on historic and archeological resources under CEQA.

The National Register is the nation's official comprehensive inventory of historic properties. Administered by the National Park Service, the National Register includes buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archeological, or cultural significance at the national, state, or local level. Typically, a resource that is more than 50 years of age is eligible for listing in the National Register if it meets any one of the four eligibility criteria and retains sufficient historic integrity. A resource less than 50 years old may be eligible if it can be demonstrated that it is of "exceptional importance" or a contributor to a historic district. National Register criteria are defined in *National Register Bulletin Number 15: How to Apply the National Register Criteria for Evaluation*.[31]

A structure, site, building, district, or object would be eligible for listing in the National Register if it can be demonstrated that it meets at least one of the following four evaluative criteria:

- **Criterion A (Event):** Properties associated with events that have made a significant contribution to the broad patterns of our history.
- **Criterion B (Person):** Properties associated with the lives of persons significant in our past.
- **Criterion C (Design/Construction):** Properties that embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values; or represent a significant distinguishable entity whose components lack individual distinction.
- **Criterion D (Information Potential):** Properties that have yielded, or may be likely to yield, information important in prehistory or history.

A resource can be significant to American history, architecture, archeology, engineering, and/or culture at the national, state, or local level. In addition to meeting at least one of the four criteria, a property or district must retain integrity, meaning that it must have the ability to convey its significance through the retention of seven aspects, or qualities, that, in various combinations, define integrity. These seven qualities are: location, design, setting, materials, workmanship, feeling, and association.

Properties that are listed in the National Register, as well as properties that are formally determined to be eligible for listing in the National Register, are automatically listed in the California Register of Historical Resources (California Register; see the following discussion) and thus are considered historic resources under CEQA.

The Secretary of the Interior's Standards for the Treatment of Historic Properties

The *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (Secretary's Standards) were published and codified as 36 Code of Federal Regulations Part 68 in 1995 and updated in 2017.[32] The Secretary's Standards for rehabilitation have been adopted by local government bodies across the country, including the City and County of San Francisco, for reviewing proposed work on historic properties under local preservation ordinances. The Secretary's Standards provide a useful analytical tool for understanding and describing the potential impacts of changes to historic resources and are used to inform CEQA review. Developed by the

[31] U.S. Department of the Interior, National Park Service, National Register Bulletin Number 15: How to Apply the National Register Criteria for Evaluation, https://www.nps.gov/subjects/nationalregister/upload/NRB-15_web508.pdf, accessed April 18, 2024.
[32] U.S. Department of the Interior, National Park Service (Kay D. Weeks and Anne E. Grimmer), The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstruction Historic Buildings, revised 2017, http://www.nps.gov/tps/standards/treatment-guidelines-2017.pdf, accessed April 18, 2024.

National Park Service for reviewing certified rehabilitation tax credit projects, the rehabilitation standards provide guidance for reviewing work on historic properties.

Conformance with all rehabilitation standards does not determine whether a project would cause a substantial adverse change in the significance of a historic resource under CEQA. Rather, projects that comply with the standards benefit from a regulatory presumption that they would have a less-than-significant adverse impact on a historic resource. Projects that do not comply with the rehabilitation standards may or may not cause a substantial adverse change in the significance of a historic resource and would require further analysis to determine whether the historic resource would be "materially impaired" by the project under CEQA Guidelines section 15064.5(b).

State Regulations

California Register of Historical Resources

The California Register, administered by the California Office of Historic Preservation, is the authoritative guide to historic and archeological resources that are significant within the context of California's history. Criteria for eligibility for inclusion in the California Register are based on and correspond to the National Register criteria. These resources are considered historic resources by the San Francisco Planning Department (planning department) for the purposes of CEQA. The evaluative criteria used for determining eligibility for listing in the California Register closely parallel those developed by the National Park Service for the National Register but include relevance to California history. To be eligible for listing in the California Register as a historic resource, a resource must meet at least one of the following criteria:

- **Criterion 1 (Event):** Resources that are associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- **Criterion 2 (Person):** Resources that are associated with the lives of persons important in our past.
- **Criterion 3 (Design/Construction):** Resources that embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values.
- **Criterion 4 (Information Potential):** Resources or sites that have yielded, or may be likely to yield, information important in prehistory or history.

As with the National Register, a significant historic resource must possess integrity in addition to meeting the significance criteria to be considered eligible for listing in the California Register. Consideration of integrity for evaluation of California Register eligibility follows the definitions and criteria defined in *National Register Bulletin Number 15*.

California Environmental Quality Act

CEQA is the principal statute governing environmental review of projects in California. To be considered a historic resource, a property must generally be at least 50 years old; when acting as the CEQA lead agency, the planning department uses a criterion of 45 years. A *historical resource* is defined in CEQA Guidelines section 15064.5 as a cultural resource (i.e., a built-environment resource, archeological resource, or human remains) that meets at least one of the following criteria:

- A resource listed in, or determined by the State Historical Resources Commission to be eligible for listing in, the California Register.
- A resource included in a local register of historical resources, as defined in Public Resources Code section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of Public Resources Code section 5024.1(g), shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
- Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the California Register.
- The fact that a resource is not listed in, or determined to be eligible for listing in the California Register, not included in a local register of historical resources (pursuant to Public Resources Code section 5020.1(k)), or identified in a historical resources survey (meeting the criteria in Public Resources Code section 5024.1(g)) does not preclude a lead agency from determining that the resource may be a historical resource as defined in Public Resources Code section 5020.1(j) or 5024.1.

Therefore, under the CEQA Guidelines, even if a resource is not included in any local, state, or federal register nor identified in a qualifying historic resources survey, a lead agency may still determine that the resource is a historic resource for the purposes of CEQA if there is substantial evidence supporting such a determination. The lead agency must consider the resource historically significant if it finds that the resource meets the criteria for listing in the California Register.

CEQA requires a lead agency to determine whether a project would have a significant effect on important historic resources or unique archeological resources. If a resource is neither a historic resource nor a unique archeological resource, the CEQA Guidelines note that the effects of the project on that resource shall not be considered a significant effect on the environment. Projects that comply with the Secretary's Standards benefit from a regulatory presumption under CEQA that they would have a less-than-significant impact on a historic resource. Projects that do not comply with the Secretary's Standards may or may not cause a substantial adverse change in the significance of a historic resource and must be subject to further analysis to assess whether they would result in material impairment of a historic resource's significance.

Treatment of Human Remains

The treatment of human remains must comply with the provisions of state laws and codes discussed below, which identify protocols to be followed upon discovery of human remains. Archeological resources may also contain human remains and human remains may be determined to be historic resources as defined in CEQA section 21084.1 and CEQA Guidelines section 15064.5(a) discussed above. CEQA Guidelines section 15064.5 and California Public Resources Code section 5097.98, summarized below, also provide the process and procedures for addressing the existence of, or probable likelihood, of Native American human remains, as well as the unexpected discovery of any human remains during implementation of a project. This includes consultations with appropriate Native American tribal representatives. Based on Native American consultation, Native American human remains are also presumed to be tribal cultural resources, discussed under Topic E.5, Tribal Cultural Resources.

CALIFORNIA HEALTH AND SAFETY CODE SECTION 7050.5

California Health and Safety Code section 7050.5 states that in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined if the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify the Native American Heritage Commission within 24 hours of this identification. The role of the coroner in San Francisco is performed by the Office of the Chief Medical Examiner.

CALIFORNIA PUBLIC RESOURCES CODE SECTION 5097.98

California Public Resources Code section 5097.98 states that the Native American Heritage Commission, upon notification of the discovery of Native American human remains pursuant to Health and Safety Code part 7050.5, shall immediately notify those persons (i.e., the most likely descendant) it believes to be descended from the deceased. With permission of the landowner or a designated representative, the most likely descendant may inspect the remains and any associated cultural materials and make recommendations for treatment or disposition of the remains and associated grave goods. The most likely descendant shall provide recommendations or preferences for treatment of the remains and associated cultural materials within 48 hours of being granted access to the site.

Local Regulations, Plans, and Policies

San Francisco General Plan

The Urban Design and Housing elements of the San Francisco General Plan (general plan) address issues related to historic preservation by providing policies that emphasize preserving notable landmarks and historic features, remodeling older buildings, and respecting the character of older buildings adjacent to new development. The following general plan policies related to cultural resources are relevant to the RADP.

URBAN DESIGN ELEMENT

The Urban Design Element of the San Francisco General Plan includes the following relevant policies related to historic preservation:

- **Policy 2.4:** Preserve notable landmarks and areas of historic, architectural or aesthetic value, and promote the preservation of other buildings and features that provide continuity with past development.
- **Policy 2.5:** Use care in remodeling of older buildings, in order to enhance rather than weaken the original character of such buildings.
- **Policy 2.6:** Respect the character of older development nearby in the design of new buildings.

HOUSING ELEMENT

The Housing Element of the San Francisco General Plan includes the following relevant policies related to historic preservation:

- **Policy 4.5.5:** Designate historically and culturally significant buildings, landscapes, and districts for preservation using the Citywide Cultural Resource Survey, Planning Code Articles 10 and 11, and state and national historic resource registries to ensure appropriate treatment of historic properties that are important to the community, with a focus on those that are important to American Indian, Black, Japanese, Filipino, and other communities directly harmed by discriminatory government actions, and to unlock historic preservation incentives for more potential housing development sites.
- **Policy 4.5.6:** Promote the use of the Retained Elements Special Topic Design Guidelines to development applicants to address sites where conserving parts of buildings sustains cultural identity and proposed housing serves the community.
- **Policy 4.5.7:** Develop objective design standards for the treatment of historic buildings and districts to provide consistent and efficient regulatory review that facilitates housing development approvals and protects the City's cultural and architectural heritages.
- **Policy 5.2.4:** Recognize spaces of cultural importance identified by American Indian, Black, Japanese, Filipino, and other communities directly harmed by discriminatory government actions in community planning and regulatory review for development projects, consult them in decisions affecting those spaces, and direct resources towards their preservation and management.

San Francisco Planning Code

The City's commitment to historic preservation is codified in San Francisco Planning Code section 101.1(b), which establishes eight general plan priority policies.[33] Priority Policy 7 of section 101.1(b) of the planning code addresses the City's desire to preserve landmarks and historic buildings and states "that landmarks and historic buildings be preserved."

San Francisco Historic Preservation Commission and Planning Code, Article 10

The San Francisco Historic Preservation Commission (historic preservation commission) is a seven-member body that makes recommendations directly to the San Francisco Board of Supervisors regarding the designation of landmark buildings, historic districts, and significant buildings. The historic preservation commission approves certificates of appropriateness for individual landmarks and landmark districts designated under article 10 of the planning code and permits to alter for individual properties and conservation districts listed under article 11.[34] The historic preservation commission reviews and comments on CEQA documents for projects that affect historic resources as well as projects subject to review under section 106 of the National Historic Preservation Act.

The San Francisco Charter gives the historic preservation commission the ability to identify, designate, and protect historic landmarks, including buildings, sites, objects, and districts, from inappropriate alterations. Article 10 of the planning code contains regulations governing how the historic preservation commission

[33] San Francisco Planning Department, San Francisco Planning Code section 101.1(b), https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_planning/0-0-0-17768, accessed May 8, 2024.
[34] Article 11 applies only within the C-3 (Downtown) Use Districts, which does not include the RADP project site. Therefore, article 11 is not discussed further.

exercises its authority. Since the adoption of article 10 in 1967, the City has designated 292 landmark sites and 14 historic districts under article 10.[35] Any property that has been locally designated as an article 10 landmark or a contributor to an article 10 district is considered a historic resource for purposes of CEQA.

South San Francisco General Plan

The South San Francisco General Plan's Open Space and Conservation Element outlines policies related to historic and cultural resources. The Airport is not subject to the South San Francisco General Plan. However, the following South San Francisco General Plan policies related to cultural resources are identified briefly here for informational purposes (regarding the three RADP projects that would be partially or wholly located within boundary of South San Francisco).

OPEN SPACE AND CONSERVATION ELEMENT

The Open Space and Conservation Element of the South San Francisco General Plan includes the following policies related to historic preservation:

- **Policy 7.5-G-1:** Conserve historic, cultural, and archaeological resources for the aesthetic, educational, economic, and scientific contribution they make to South San Francisco's identify and quality of life.
- **Policy 7.5-G-2:** Encourage municipal and community awareness, appreciation, and support for South San Francisco's historic, cultural, and archaeological resources.

The Open Space and Conservation Element includes implementation policies to address the specific application of the policies noted previously. Implementation policies relevant to the RADP include:

- **Policy 7.5-I-3:** Explore mechanisms to incorporate South San Francisco's industrial heritage in historic and cultural preservation.
- **Policy 7.5-I-4:** Ensure the protection of known archaeological resources in South San Francisco by requiring a records review for any development proposed in areas of known resources.
- **Policy 7.3-I-5:** In accordance with state law, require the preparation of a resource mitigation plan and monitoring program by a qualified archaeologist in the event that archaeological resources are uncovered.

South San Francisco Municipal Code

Chapter 2.56 of the South San Francisco Municipal Code establishes the duties and definitions for the South San Francisco Planning Commission. The Airport is not subject to the building and zoning ordinances of South San Francisco. However, a brief discussion of the South San Francisco Municipal Code is provided here for informational purposes. The South San Francisco Planning Commission is charged with implementing specific protocols for the identification and treatment of historic resources within the city limits. These protocols include designation of historic resources as well as review of projects to alter or demolish known or potential historic resources. Section 15.32.010 of the municipal code codifies the adoption of the 2019 California Historical Building Code by resolution as the building code for historic buildings in South San Francisco.

---

[35] City and County of San Francisco, Article 10: Preservation of Historical Architectural and Aesthetic Landmarks, 2021, https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_planning/0-0-0-27871, accessed May 8, 2024.

Environmental and Geologic Setting

Geologically, Graymer et al. identify the Airport as consisting of artificial fill over Young Bay Mud.[36] Numerous geotechnical studies completed in and within the vicinity of SFO include more than 1,000 geotechnical borings and cone-penetration tests, providing a wealth of existing information regarding subsurface stratigraphy. Broadly, SFO is underlain by up to 40 feet of artificial fill, with an average fill thickness of 11 feet. The Young Bay Mud, presumed to represent the sediment deposited on the bay floor as the bay filled with water prehistorically, underlies the fill in a stratum up to 80 feet thick, with an average thickness of 25 feet. The Young Bay Mud generally rests on the Upper Layered Sediments, a late Pleistocene sequence of alluvial, estuarine, and marine deposits encountered in a layer 10 to 144 feet thick.[37] Where present, Upper Layered Sediments typically overlie and interfinger with Old Bay Clay, a stratum that represents earlier periods of inundation, which rests on Lower Layered Sediments lying unconformably on Franciscan bedrock.[38]

SFO has undergone substantial changes from its natural environment. The RADP project site was inundated between 4,000 to 8,000 years ago. Prior to that time, SFO would have been on a terrestrial landform adjacent to the bay shore at that time and within proximity to a number of creeks that drained into the bay. Large scale filling in of the bay to construct an airport began in the 1920s. Today, the entire Airport is developed, and the greatest portion is covered by asphalt and Airport-related structures, entirely on lands reclaimed from San Francisco Bay, including both marshland and open water. Additional information regarding the geologic context of SFO is provided in the “Native American Archeological Resources and Sensitivity Assessment” section.

Native American Archeological Context

Categorizing the Native American period into cultural stages allows researchers to describe a broad range of archeological resources with similar cultural patterns and components during a given time frame, thereby creating a regional chronology. Milliken et al. provide a framework for interpreting the bay area and have divided human history of the region into four periods: the *Paleoindian Period* (13,500–10,000 years Before Present [BP]), the *Early Period* (10,000–2500 BP), the *Middle Period* (2500–900 BP), and the *Late Period* (900–400 BP). Economic patterns, stylistic aspects, and regional phases further subdivide cultural patterns into shorter phases.[39] This scheme uses economic and technological types, sociopolitics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

Many of the original surveys of archeological sites in the region were conducted between 1906 and 1908 by N.C. Nelson and yielded the initial documentation of nearly 425 “earth mounds and shell heaps” along the littoral zone of the Bay.[40] From these beginnings, the most notable sites in the area were excavated, such as the Emeryville shell mound (CA-ALA-309), the Ellis Landing Site (CA-CCO-2-95) in Richmond, and the

---

[36] Graymer, R.W., B.C. Moring, G.J. Saucedo, C.M. Wentworth, E.E. Brabb, and K.L. Knudsen, Geologic Map of the San Francisco Bay Region. Scientific Investigations Map 2918, U.S. Geological Survey, Washington D.C., 2006.
[37] Atwater, B.F., C.W. Hedel, and E.J. Helley. Late Quaternary Depositional History, Holocene Sea Level Changes, and Vertical Crustal Movements, South San Francisco Bay, California. U.S. Geological Survey Professional Paper 1014, San Francisco, 1977.
[38] ADEC, San Francisco International Airport, Airfield Development Program, Preliminary Report No. 3C (Task C), Preliminary (Phase 1) Geotechnical Analyses, Volume 1, Main Text and Figures, 2000.
[39] Milliken, Randall, Richard T. Fitzgerald, Mark G. Hylkema, Randy Groza, Tom Origer, David Bieling, Alan Leventhal, Randy Wiberg, Andrew Gottsfield, Donna Gillette, Viviana Bellifemine, Eric Strother, Robert Cartier, and David A. Fredrickson, “Punctuated Culture Change in the San Francisco Bay Area,” in *Prehistoric California: Colonization, Culture, and Complexity*, ed. T.L. Jones and K.A. Klar, Lanham, Maryland: AltaMira Press, 2007, pp. 99–124.
[40] Nelson, Nels C., Shell mounds of the San Francisco Bay Area. *University of California Publications in American Archaeology and Ethnology* 7 (4):310-356. Berkeley, 1909.

Fernandez Site (CA-CCO2-59) in Rodeo Valley.[41] These large, dense midden sites (referred to as shell mounds) are vast accumulations of domestic debris. While there are many interpretations of the function of the shell mounds (as contrasted with lesser accumulations of shell midden, which may not have formed a discernable mound), much of the evidence suggests that the larger highly visible mounds served as sociopolitical landmarks on the cultural landscape and perhaps as ceremonial features as well.

The oldest dates of confirmed habitation sites for the San Francisco Peninsula appear to be about 8,000years BP. San Francisco sites of notable antiquity include a cryptocrystalline silicate flake fragment recovered deeply buried (48 to 52 feet bgs) under Holocene bay deposits beneath San Francisco's Southeast Water Pollution Control Plant.[42] Based on sedimentary context, that flake appears to be nearly 7,000 years old, and is presumed to be an isolated artifact inundated as the San Francisco Bay formed. Subsequent discoveries include a submerged midden component of CA-SFR-171 at the Southeast Water Pollution Control Plant dating to approximately 3,860–3,700 BP,[43] and a submerged midden on Mission Bay (CA-SFR-220), which dates to approximately 7,900 BP.[44] The oldest published dates for San Mateo County remain those from the University Village site on lower San Francisquito Creek, at just over 5,500 years BP, and from CA-SMA-40, near the outlet of Colma Creek to the bay, at just over 5,100 years BP.[45] Hints of possible older occupations along the San Mateo coast have been published, but are unsupported by technical dating techniques.[46] The peninsula, likely including the San Mateo Creek drainage, was occupied by Native Americans by at least 8,000 years BP.[47]

In 1909, Nelson, after several years searching largely the lowlands and littoral zones of the bay area counties, published a map and notes on shell mounds of the region, noting that many sites had already been destroyed or covered over by filling and development; these included several mounds on lower San Mateo Creek and the peninsula.[48] Later Jerome Hamilton[49] recorded 40 shell mounds near San Mateo, particularly in the vicinity of San Mateo Creek. Subsequent research indicates that although many of the shell mounds in San Mateo and around the bay are no longer visible on the surface, the basal deposits of mounds often lie several feet below current sea level and tend to contain a significant number of human burials. For example, a human skeleton dated to the Middle Holocene was uncovered 12.1 feet beneath the surface of San

[41] Moratto, M. J., *California Archaeology*. Academic Press, Orlando, FL, 1984.
[42] Kaijankoski, Philip, Brian F. Byrd, and Jack Meyer, *A Geoarcheological Study of the Islais Creek Estuary: A Framework for Future Project-Specific Archeological Investigations at the Southeast Water Pollution Control Plant, San Francisco, California*, prepared for the San Francisco Public Utilities Commission, 2016.
[43] Kaijankoski, Philip and Brian F. Byrd, *Prehistoric Archeological Testing Report of CA-SFR-171 for the Biosolids Digester Facilities Project, Southeast Water Pollution Control Plant, San Francisco, California*, prepared by Far Western Anthropological Research Group, Inc. for the San Francisco Public Utilities Commission, 2017.
[44] Rehor, Jay, Department of Parks and Recreation Site Record for CA-SFR-220. On file at the Northwest Information Center, Sonoma State University, CA, 2020.
[45] Clark, Matthew R., *Evaluative Archaeological Investigations at the San Bruno Mountain Mound Site, CA-SMA-40, South San Francisco, California* [1989 version revised 1998]. Report on file, Northwest Information Center, California Historical Resources Information System, Sonoma State University, 1998.
[46] Hylkema, Mark G., *Seal Cove Prehistory: Archaeological Investigations at CA-SMA-134, Fitzgerald Marine Reserve, San Mateo County, California.* Report prepared for San Mateo County Department of Parks and Recreation. On file, Northwest Information Center, California Historical Resources Information System, Sonoma State University, 1998.
[47] Milliken, Randall, Richard T. Fitzgerald, Mark G. Hylkema, Randy Groza, Tom Origer, David G. Bieling, Alan Leventhal, Randy S. Wiberg, Andrew Gottfield, Donna Gillette, Vaviana Bellifemine, Eric Strother, Robert Cartier, and David A. Fredrickson, Punctuated Culture Change in the San Francisco Bay Area. In *Prehistoric California: Colonization, Culture, and Complexity.* T.L. Jones and K.A. Klar, editors, pp. 99–124, AltaMira Press, 2007.
[48] Nelson, Nels C., Shell mounds of the San Francisco Bay Area. *University of California Publications in American Archaeology and Ethnology* 7 (4):310-356. Berkeley, 1909.
[49] Hamilton, Jerome, Indian Shell Mounds of San Mateo Creek and Vicinity (Manual to Accompany Mr. Hamilton's Map). Paper and map privately published at College of San Mateo. Originals and copies in the Archives of the San Mateo County Historical Association, Redwood City, CA. On file, Northwest Information Center, California - Historical Resources Information System, Sonoma State University; File Nos. E-182 SMA and S-3174, 1936.

Francisco Bay during dredging operations off Coyote Point.[50] The burial could be associated with the basal level of a shell mound or could be an isolate.

No previously identified Native American sites occur within SFO. Many of the known archeological resources identified in the area (CA-SMA-23, CA-SMA-30, CA-SMA-234, CA-SMA-88) are west of U.S. 101 in areas along the landward margin of the bay marshes as mapped in the 19th century. In addition, site CA-SMA-380 is a buried Native American shell midden identified during geoarchaeological testing approximately 0.3-mile north of SFO. The midden consists of mussel, oyster, clam, and barnacle shells with observed associated artifacts including two obsidian fragments, one possible chert fragment, and fire-affected rock. The site was identified in three different core samples and is buried beneath artificial fill at approximately 17 to 29 feet below ground surface.[51]

Ethnohistoric Background

A compilation of ethnographical, historical, and archeological data indicates that before the arrival of Europeans the San Francisco Peninsula was inhabited by a cultural group referred to today as the Ohlone.[52] While traditional anthropological literature portrayed the Ohlone peoples as having a static culture, today it is better understood that many variations of culture and ideology existed within and between villages.

Levy[53] describes the language group spoken by the Ohlone as “Costanoan.” This term is originally derived from a Spanish word designating the coastal peoples of Central California. Today Costanoan is used as a linguistic term that refers to a larger language family that included distinct sociopolitical groups that spoke at least eight languages of the Penutian language group. The Ohlone once occupied a large territory from San Francisco Bay in the north to the Big Sur and Salinas Rivers in the south. The northern portion of what is now San Mateo County, including the shoreline near the RADP project site, was within Urebure Ohlone territory.[54]

Economically, the Ohlone engaged in hunting and gathering. Their territory encompassed both coastal and open valley environments that contained a wide variety of resources, including grass seeds, acorns, bulbs and tubers, bear, deer, elk, antelope, a variety of bird species, and rabbit and other small mammals. The Ohlone acknowledged private ownership of goods and songs, and village ownership of rights to land and/or natural resources; they appear to have aggressively protected their village territories.[55]

Although Ohlone life ways were disrupted after European contact, the Ohlone still have a strong presence in the San Francisco Bay Area and are highly involved in the environmental review of projects in the bay area.

---

[50] Leventhal, Alan M., *Final Report on the Human Skeletal Remains Recovered from Prehistoric Site: CA-SMA-273, Coyote Point Marina, San Mateo.* San José State University, San José. Prepared for Department of General Services, County of San Mateo, Redwood City, 1987.

[51] Matthew R. Clark, *City of South San Francisco Wet Weather Program Project: Extended Phase 1 Historic Properties Research: Subsurface Reconnaissance for Phase 4, Task 1: Pump Station 4 Improvements and Force Main*. Report on file at the Department of Public Works, City of South San Francisco and on file, Northwest Information Center, California Historical Resources Information System, Sonoma State University, 2006.

[52] Byrd, Brian F., Philip Kaijankoski, Jack Meyer, Adrian Whitaker, Rebecca Allen, Meta Bunse, and Bryan Larson, Archaeological Research Design and Treatment Plan for the Transit Center District Plan Area, San Francisco, California. Prepared by Far Western Anthropological Research Group, Past Forward, Inc., and JRP Historical, Prepared for the City and County of San Francisco Planning Department, San Francisco, CA, 2010.

[53] Levy, Richard S., “Costanoan,” In *California*, edited by Robert F. Heizer, pp. 485-495, Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institution, Washington, DC, 1978.

[54] Milliken, Randall T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area 1769- 1810*. Ballena Press Anthropological Papers, No. 43. Thomas C. Blackburn, editor, Ballena Press, Menlo Park, California, 1995.

[55] Levy, Richard S., “Costanoan,” In *California*, edited by Robert F. Heizer, pp. 485-495, Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institution, Washington, DC, 1978.

Historic Context

Spanish and Mexican Period (1776–1848)

The first European expedition into the San Francisco Bay area occurred in 1772 when Pedro Fages and his party explored the eastern shore of the bay north to San Pablo Bay, then traveled east along the south shore of the Carquinez Strait, and returned to the San José area through the Diablo and Livermore valleys south of Concord. The Fages expedition encountered numerous Native American villages, and diarist Juan Crespí reported that the villagers welcomed the Spaniards, giving them food and gifts. Three years later, the ship *San Carlos* sailed through the Golden Gate, tasked with charting the bay. The ship's commander, Lieutenant Juan Manuel de Ayala, and his crew encountered many Ohlone, as well as neighboring Coast Miwok villagers from the Marin County shore. In August 1775, Huchuin-Aguasto speakers greeted the ship's longboat. They recounted the earlier visit by Fages and provided food and gifts to the new arrivals.[56]

The Spanish established Mission San Francisco de Asís (also known as Mission Dolores) and Presidio de San Francisco in 1776. Mission Dolores was located west of Mission Bay on land occupied seasonally by the Yelamu people, a small village community composed of approximately 160 people, while the Presidio was situated along the northern edge of the San Francisco Peninsula.[57] In the 1790s, the Spanish established an outpost ("Hospice") in San Mateo County to produce grain and livestock for the Mission and Presidio.[58]

In 1822, Spain ceded its North American colonial outposts to the newly independent Republic of Mexico and Upper California became a province of the Republic of Mexico. The RADP project site is within the boundaries of one of the earliest Mexican land grants in the area, Rancho Buri Buri. In 1835, then–Mexican Governor José Castro issued the 14,639-acre grant to José Antonio Sánchez, who used the land for agriculture and grazing.[59]

During the 1840s, relations between the United States and Mexico became strained, with Mexico fearing American encroachment into its territories. The political situation became unstable and war between the two nations broke out in 1846. American attempts to seize control of California ensued, and within two months, California was taken by the United States. Skirmishes between the two sides continued until the United States officially annexed California on February 2, 1848.[60]

Late 19th Century (1849–1899)

The discovery of gold in the Sierra Nevada in 1848 produced a major population increase in Northern California as immigrants poured into the territory seeking gold or associated opportunities. Before the Gold Rush, San Francisco was a small community with a population of approximately 800 people. With the discovery of gold and the sudden influx of thousands of newcomers, a city of canvas and wood sprang up around Yerba Buena Cove and on the surrounding sand dunes and hills. To accommodate the growing

[56] Milliken, Randall, *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769-1810*, Ballena Press, Menlo Park, 1995.
[57] Ibid., 61.
[58] Chávez, David, and Jan M. Hupman, *Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR, San Mateo County, California*, prepared for Environmental Science Associates Inc., 1991, p. 9.
[59] Hoover, Mildred B., Hero E. Rensch, and Ethal G. Rensch, *Historic Spots in California*, 4th ed., revised by Douglas E. Kyle, Stanford, California: Stanford University Press, 1990, p. 378.
[60] Kyle, Douglas E., *Historic Spots in California*, Stanford, California: Stanford University Press, 2002, pp. xiii–xiv.

population, city settlements soon spread out in all directions, including south and west beyond the outskirts of the burgeoning city that was centered on Yerba Buena Cove.

Although the United States recognized the Sánchez family's claim to the Rancho Buri Buri grant, the descendants of José Antonio Sánchez were forced to sell much of the land to pay legal fees and taxes. The rancho portion from east of El Camino Real to the San Francisco Bay shoreline was purchased in the early 1850s by Darius Ogden Mills, a prosperous banker and real estate developer.[61] Land reclamation efforts began in the 1880s with construction of a levee along the bay margins and subsequent drying of the newly enclosed salt marsh for grazing and agriculture.[62] Still, the RADP project site remained within salt marsh and San Francisco Bay throughout the 19th and early 20th centuries and was home to extensive oyster beds.[63]

Early 20th Century (1900–1927)

The 1906 U.S. Coast and Geodetic Survey map shows that portions of the bay under what is now the Airport were being using for oyster farming in the early part of the 20th century, but that little other development had occurred in the project vicinity.[64] The 1915 U.S. Geologic Survey topographic map does not depict any changes to the project site from the earlier 1896 topographic map, although there appears to be few updates on the map features.[65]

Efforts to construct the Airport stemmed from the desire to have a permanent airfield within close proximity but outside the San Francisco city boundary. The 1911 San Francisco Air Show, air shows at the 1915 Panama Pacific International Exposition, and aeronautical improvements made during World War I promoted an interest in flying.[66]

Development of San Francisco International Airport

In March 1927, the San Francisco Board of Supervisors voted to lease 150 acres from the Mills Estate to develop an airport. The Mills Estate included hundreds of acres of submerged land that airport engineers would later reclaim. On May 7, 1927, Mayor James Rolph dedicated the Mills Field Municipal Airport of San Francisco. The Airport opened in June 1927, and for the next 10 years it conducted business from a terminal building that "was little more than a two-room wooden shack."[67] None of the original Mills Field buildings remain at SFO.

By 1930, the City purchased an additional 1,100 acres from the Mills Estate, and the next year the airfield became known as the San Francisco Municipal Airport. Between 1934 and 1935, the Works Progress Administration employed 2,000 people in work-relief programs to lengthen and widen the runways.

[61] Stanger, Frank, *South From San Francisco: The Life Story of San Mateo County*, San Mateo, California: The San Mateo County Historical Association, 1963.
[62] Airfield Development Engineering Consultant, *Preliminary Report No. 2 (Task B1), Preliminary Site Characterization, Airfield Development Program, San Francisco International Airport*, prepared for San Francisco International Airport, 1999, p. 6-2.
[63] Jan Hupman and Daved Chavez, *Cultural Resources Evaluation for the San Francisco Airport Master Plan EIR, San Mateo,* prepared for Environmental Science Associates, 1991.
[64] United States Coast and Geodetic Survey, *San Francisco Bay, Southern Part,* (Washington, D.C., 1906).
[65] Unted States Geological Survey, *San Mateo, California,* topographic 15-minute (1: 62,500 scale) quadrangle map, (Washington, DC, 1915).
[66] Hupman and Chavez, pp. 15-19.
[67] Svanevik, Michael, "Other Times – The Never-ending Story of the SF Airport," *The Times* (San Mateo Newspaper), December 15, 1989, p. C3, quoted in David Chávez & Associates, *Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR, San Mateo County, California*, February 1991, pp. 15–19.

Hundreds of tons of dirt and rocks were carved from the nearby San Mateo hills, and approximately 319 acres of marsh and tidelands were filled.

During World War II, the U.S. Navy assumed control of the Airport and filled another 100 acres. Airport facilities in general were modified to meet military requirements. Apron areas were enlarged and strengthened to accommodate multi-engine military aircraft. It was during this period that the U.S. Coast Guard Air Station San Francisco was constructed and commissioned, and the air station was in operation when the United States entered the war in December 1941.

By the end of World War II, the Airport had 700 acres in use, with another 2,000 acres under development. The first international passenger flights operated out of the Airport beginning in 1944 when Pan American World Airways relocated its flying boats (also known as Clippers) and Pacific-Alaska division from Treasure Island to the San Francisco Municipal Airport. By the end of the 1940s, the Old Bayshore Highway, which ran through the Airport lands, was abandoned and a new Bayshore Freeway (now U.S. 101) was constructed farther to the west.

On August 27, 1954, a new terminal, then called the Central Terminal and now known as Terminal 2, was opened. The terminal employed an innovative two-level design: The upper level was for departures and the lower level was for arrivals, each with dedicated terminal roadways. The following year, the Airport was renamed San Francisco International Airport. By 1963, the South Terminal (now Terminal 1) was completed. A central garage parking structure, which accommodated 2,700 vehicles, opened in 1965.

By 1979, the North Terminal (now Terminal 3) with Boarding Area F was completed. The same year, the central garage was modified to provide an additional 4,150 parking stalls. Boarding Area E was completed in the North Terminal in 1981.

In 1983, the Central Terminal (Terminal 2) was extensively renovated, which included the addition of a new Boarding Area D with an inspections area to accommodate increasing international passenger traffic. In 1988, the South Terminal (Terminal 1) was renovated and a new Boarding Area C was opened.

Beginning in 1996, an automated people mover system known as AirTrain was constructed to transport people between the three terminal buildings and the central parking garage.[68] A new International Terminal Building was completed in 2000 with additional public parking facilities, and a BART extension began operating in 2003, providing public transit options for employees and passengers.

The Central Terminal (Terminal 2), which closed to the public in 2000 after the completion of the new International Terminal Building, was renovated and reopened for use in 2011 as a domestic terminal. A complete renovation of Boarding Area E on the east side of Terminal 3 began in 2012, and the modernized facility opened to the public in 2015. The construction of a new Airport traffic control tower located between Terminals 1 and 2 took place between 2012 and 2016, and large-scale redevelopment of Terminal 1 began in 2016 and concluded in 2024, with renovation of Boarding Area C ongoing.

[68] Environmental Science Associates, Recommended Airport Development Plan, San Francisco International Airport, Historic Resources Evaluation, Part 1, 2018, p. 29.

Previous Cultural Evaluations

Historic resources

As SFO is located outside the physical boundaries of San Francisco, it is not included in any of the City's primary historic listings or surveys, such as the Junior League of San Francisco Architectural Survey (*Here Today*, 1968), the Department of City Planning Architectural Quality Survey (1976), the San Francisco Heritage (formerly San Francisco Architectural Heritage) surveys (1970s–present), or any neighborhood surveys. However, historic evaluations of portions of SFO or of the entire Airport have been conducted, including a historic resource evaluation and addendum assessing buildings that would be demolished or altered with implementation of the RADP. These reports are summarized in **Table 2**.

Table 2 Previous Architectural Surveys Conducted at SFO

Survey	Author	Year(s)	Historic Resource(s) Identified
Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR	David Chavez & Associates	1991	None
San Francisco International Airport Master Plan Final Environmental Impact Report	San Francisco Planning Department	1992	None
Cultural Resources Survey: U.S. Coast Guard Air Station, San Francisco, California	Carey & Co.	1998	U.S. Coast Guard Air Station San Francisco Historic District (eligible for listing in the National Register with six contributors)
Final Historical Resources Report: Information Regarding the Eligibility of Properties at San Francisco International Airport for Inclusion on the National Register of Historic Places or the California Register of Historical Resources and Addendum	ESA/Carey & Co.	2000/2001	U.S. Coast Guard Air Station San Francisco Historic District (eligible for listing in the National Register with six contributors)
Historic Architecture Survey Report for the Runway Safety Area Program at SFO	URS	2011	None
Recommended Airport Development Plan Historic Resource Evaluation Part I and Addendum	ESA	2018/2019	None
Re-Evaluation of U.S. Coast Guard Air Station San Francisco for Eligibility for Listing in the California Register of Historical Resources	ESA	2021	U.S. Coast Guard Air Station San Francisco Historic District (eligible for listing in the California Register with three contributors)

As shown in **Table 3**, there are 15 buildings located within the RADP project site that would either be altered or demolished with implementation of the RADP and would meet the 45-year age criterion in 2045 (see Draft EIR Figure 2-6 through Figure 2-9, pp. 2-20 through 2-23). Eight buildings that either meet or would meet the 45-year age criterion in 2035 were evaluated in a historic resource evaluation and subsequent addendum in

2018 and 2019, respectively.[69] The Preservation Team Review Form dated June 7, 2019, determined that the eight buildings evaluated in the reports are not eligible for listing in the California Register and therefore are not historic resources for purposes of CEQA (see Attachment A to this initial study).[70] Subsequent to this determination buildout of the RADP was modified to extend the implementation period from 2035 to 2045. With the estimated buildout of the RADP extended to 2045, seven additional buildings that would meet the 45-age criterion in 2045 would be altered or demolished with implementation of the RADP.

Table 3 Buildings That May Be Altered or Demolished That Would Reach 45 Years of Age by 2045

Building	Name	Construction Date	Age-Criterion Reached	Historic Status	RADP Project
100	International Terminal Building (ITB)	2000	2045	Not currently age eligible	RADP Project #3 (ITB Main Hall Expansion)
	ITB Boarding Area A				RADP Project #4 (ITB Boarding Area A and G Improvements)
	ITB Boarding Area G				
195	Central Parking Garage	1963–1981	2008	Not Historic	RADP Project #6 (Central Hub)
400F	Terminal 3 Boarding Area F	1976	2021	Not Historic	RADP Project #5 (Terminal 3 Façade Expansion)
575	SFO Business Center	1969	2014	Not Historic	RADP Project #1 (Boarding Area H)
575B	Ground Support Equipment Structure	1998	2043	Not currently age eligible	
585	United Airlines Cargo Building	1966	2001	Not Historic	
638	West Field Employee Parking Garage	1999	2044	Not currently age eligible	RADP Project #2 (Boarding Area F Modernization)
642	United Airlines Ground Service Equipment Building	1997	2042	Not currently age eligible	
649	Flight Kitchen	1998	2043	Not currently age eligible	
682	Facilities Maintenance Center	1968–1974	2013–2019	Not Historic	
692	Sheet Metal Shop	1974	2019	Not Historic	RADP Project #16 (AirTrain Maintenance Yard)
780	Rental Car Center (RCC)	1998	2043	Not currently age eligible	RADP Project #12 (Long-Term Parking Garage #4)

[69] Ibid. Environmental Science Associates, Recommended Airport Development Plan, San Francisco International Airport, Historic Resources Evaluation, Part 1 Addendum, 2019. Note that the historic resource evaluation and addendum evaluated Buildings 710, 730, 750, and 928; however, the RADP projects that would have altered or demolished these buildings were removed from the RADP and demolition of these buildings were approved as part of the West Field Cargo Redevelopment Addendum, Case No. 2020-008656ENV, issued on May 17, 2021 (cumulative Project #3).
[70] San Francisco Planning Department, Preservation Team Review Form, June 7, 2019.

Building	Name	Construction Date	Age-Criterion Reached	Historic Status	RADP Project
782	RCC Quick Turnaround Facility	1998	2043	Not currently age eligible	RADP Project #13 (RCC Short-Term Storage Lot)
944	Cargo Building	1980	2025	Not Historic	RADP Project #2 (Boarding Area F Modernization)
1070	Ground Support Equipment Building	1950	1995	Not Historic	RADP Project #19 (East Field Ground Support Equipment Facility #2)

SOURCES: Environmental Science Associates, *Recommended Airport Development Plan, San Francisco International Airport, Historic Resources Evaluation, Part 1*, 2018; Environmental Science Associates, *Recommended Airport Development Plan, San Francisco International Airport, Historic Resources Evaluation, Part 1 Addendum*, 2019. San Francisco Planning Department, Preservation Team Review Form, June 7, 2019.

NOTE: The highlighted rows indicate the buildings and structures that have not been evaluated and would meet the 45-year age criterion at such time that a subsequent project is proposed under RADP.

Archeological Resources

NATIVE AMERICAN ARCHEOLOGICAL RESOURCES AND SENSITIVITY ASSESSMENT

Native American archeological sites tend to be located in specific environmental settings. These include relatively level areas near present or former watercourses or other freshwater sources, such as perennial streams or seeps, or near large water bodies such as lakes, bays, estuaries, and oceans. The high diversity and concentration of plant and animal populations in those environmental settings makes such areas highly productive sources for food and other natural resources. On the northern San Francisco Peninsula, known Native American archeological sites are located mainly within about 0.5 mile (2,500 feet) of the historic bay or ocean margins. In San Mateo County, Native American archeological sites are clustered near the bay shore and coast, but there are also numerous sites at greater distances from the shoreline, on the bay and coastal plains along perennial creeks (such as San Mateo and San Francisquito creeks), in oak groves in the hills, and along the ridgelines.

Far Western Anthropological Research Group, Inc. (Far Western) has developed a Native American archeological sensitivity model for the City and County of San Francisco and SFO lands to predict the locations of undiscovered Native American archeological sites.[71] ESA updated and refined the model for the Airport as part of the SFO Shoreline Protection Program.[72] The model addresses sensitivity for near-surface, buried, and submerged Native American archeological resources. *Near-surface archeological resources* are associated with the pre-development land surface (in the bay area, the ground surface that existed before about 1850), and thus may be found near the modern ground surface or buried under artificial fill or historic or modern development. *Buried archeological resources* are those that are present on land surfaces that were buried by naturally deposited sediments, such as alluvium or windblown dune sand, before the historical period. *Submerged archeological sites* are resources that lie beneath sediments deposited by San Francisco Bay as it filled, starting about 10,000 years ago. The San Francisco Bay Area has undergone

[71] Meyer, Jack, and Paul Brandy, *Geoarchaeological Assessment and Site Sensitivity Model for the City and County of San Francisco, California*, prepared by Far Western Anthropological Research Group, Inc., for the Environmental Planning Division of the San Francisco Planning Department, 2019.
[72] ESA, San Francisco International Airport, Shoreline Protection Program, Cultural Resources Survey Report. Prepared for Federal Aviation Administration and San Francisco International Airport. February 2024.

significant landscape changes since humans began to inhabit the region more than 13,000 years ago. Sea levels began rising about 15,000 years ago, at which time the coastline was located west of the Farallon Islands. The earliest occupations in the valley and along the shore of the growing bay were inundated by the rising bay and then buried in the bay sediments. This process continued for several thousand years until the water reached the present level of the bay approximately 4,000 years ago.

NEAR-SURFACE AND BURIED ARCHEOLOGICAL RESOURCES

The Airport was almost entirely within San Francisco Bay and its tidal salt marshes for some 2,000 years before the 20th century. Historically, the only dry land was the former location of Belair Island. Historic maps indicate that this small island, which formerly reached as high as 60 feet above sea level, was leveled during the 1930s. Because Belair Island was adjacent to a stream and provided access to bayshore resources, it would have been a desirable location for Native American settlement; however, any archeological resources that might have been present on Belair Island would have been destroyed by the 1930s grading. Therefore, there is a low sensitivity for near-surface or buried Native American archeological resources to be present even in that location.

An archeological records search identified three previously recorded Native American archeological sites within the 0.5-mile records search area surrounding the project site; all are located west of the Airport in terrestrial settings near the historical bay shore. Thus, although the nearby historically terrestrial areas west of the Airport are sensitive for near-surface and buried Native American archeological resources, there is little or no potential for implementation of the RADP to affect such resources.

DEEPLY BURIED/SUBMERGED ARCHEOLOGICAL RESOURCES

Prior to the 20th century SFO was within San Francisco Bay and had been inundated between 4,000 to 8,000 years ago. Under certain environmental conditions, some submerged geological landforms are sensitive for containing buried Native American archeological sites. Archeologically sensitive landforms include land surfaces that lay exposed at the surface after the postulated date of arrival of humans in this area during the terminal Pleistocene (possibly as much as 10,000 to 12,000 years ago), and were subsequently inundated by rising seas during the Early (11,550 to 7,650 years BP) and Middle Holocene (7,650 to 3,750 BP) and buried by bay sediments, such as Young Bay Mud, as the sea level rose. Within the RADP project site, Young Bay Mud is typically underlain by the Upper Layered Sediments. While these Upper Layered Sediments were deposited too early in time to contain buried archeological remains, they may represent the land surface in this area during the terminal Pleistocene, and hence may have been potentially habitable in the late Pleistocene and into the Holocene, up until the time they were inundated by rising sea levels.

An accurate submerged Native American archeological sensitivity model requires knowledge of the pre-Bay land surface below the historic fill and bay/marsh deposits that accumulated as the San Francisco Bay inundated the area. ESA completed a preliminary assessment of submerged archeological sensitivity using existing geotechnical data provided by SFO.[73] SFO's engineering consultant compiled geotechnical core logs from dozens of previously completed geotechnical studies, which were used to map the interface of the historic fill, Young Bay Mud, Upper Layered Sediments, Old Bay Clay, and Franciscan bedrock.

[73] Russell, Matthew A. and Paul D. Zimmer, Archeological Testing Plan for the SFO Shoreline Protection Program, San Francisco, California. Prepared for the San Francisco Planning Department on behalf of San Francisco International Airport, 2020.

A reconstruction of the Young Bay Mud/surface of the Upper Layered Sediments based on data from 688 geotechnical boreholes and cone-penetration tests completed within and in the vicinity of SFO reveals a system of incised channels within the Upper Layered Sediments that represent former drainages on the pre-bay land surface.[74] These paleochannels, being at lower elevations, would have been the first areas to have been inundated in the Early-to-Middle Holocene as sea levels rose. Based on a sea-level rise curve developed by Far Western Anthropological Research Group, the RADP project site was inundated between 4,000 to 8,000 years ago. Prior to that time, the project site would have been on a terrestrial landform adjacent to the bay shore and within proximity to a number of creeks that drained into the bay. Based on the presence of numerous shell midden deposits around the bay, this shoreline setting is assumed to be sensitive for the presence of older Native American archeological sites, occupied and used during the time that the bay was filling during the Early (11,550 to 7,650 BP) and Middle Holocene (7,650 to 3,750 BP) and during the subsequent 2000 years during which the extent of bayshore marshes continued to expand. This sea-level rise and marsh expansion inundated the RADP project site and buried the former terrestrial surface under bay and marsh deposits known locally as Young Bay Mud. As a result, the interface between Young Bay Mud and the underlying Upper Layered Sediments is potentially sensitive for containing archeological resources submerged and buried under the Young Bay Mud and further buried by 20th century landfill. Geoarcheological testing conducted within the Airport in 2020 identified intact to partially intact buried soils (paleosols) on the surface of the Upper Layered Sediments in certain cores along the SFO shoreline, although it did not identify any cultural materials within those deposits.[75] Other cores revealed no evidence of paleosols, indicating that the former terrestrial surface had either eroded away in those locations as the bay filled, or had never formed a stable landform before inundation.

Additional geoarcheological testing conducted at 24 locations for SFO projects in the Airport's West Field area extended from the ground surface to 32 feet below ground surface (bgs), into the top of the Upper Layered Sediments, and did not encounter any buried cultural materials or archeologically sensitive soils.[76] The coring results indicate that the former terrestrial surface underlying the Young Bay Mud stratum had been eroded by natural geological processes during sea-level rise in the Holocene, and that there is a very low potential to encounter buried archeological resources in this area of the Airport.

Geoarcheological testing in the Airport's North Field area documented a stratigraphic sequence recording the transition from a terrestrial landform to estuarine and bay conditions during the Middle Holocene and indicates that the former terrestrial surface on the Upper Layered Sediments was differentially eroded by rising sea levels as the bay filled. A partially-preserved buried terrestrial landform (indicated by an intact A horizon) is present within the area, but the majority of the core locations show evidence of erosion with increasing severity from west to east, with completely eroded areas typically containing transitional sands between the older Upper Layered Sediments and the Young Bay Mud. These transitional sands are

[74] ADEC, San Francisco International Airport, Airfield Development Program, Preliminary Report No. 3C (Task C), Preliminary (Phase 1) Geotechnical Analyses, Volume 1, Main Text and Figures, 2000.
[75] Zimmer, Paul D., and Heidi Koenig, Archeological Sensitivity Assessment for the SFO Shoreline Protection Program, City and County of San Francisco, prepared for the San Francisco Planning Department on behalf of San Francisco International Airport, 2021.
[76] Zimmer, Paul D., *Archeological Testing Results Report for the San Francisco International Airport Plot 10F Demolition and Paving and Cargo Building 662, Consolidated Administrative Campus, and West Field Cargo Redevelopment Projects (San Francisco Planning Department Case Nos. 2022-003521ENV, 2019-006583ETM, and 2020-*008656ENV*)*, prepared for the San Francisco Planning Department on behalf of San Francisco International Airport, April 2023.

comprised of reworked Upper Layered Sediments and are characteristic of erosional surfaces associated with transgressive shorelines.[77,78]

The combined results of the geoarcheological testing at the Airport[79,80] report similar erosional surfaces and reworked sediments, which suggests that intact pre-bay terrestrial surfaces may only be present as isolated relict landforms. The presence of an extensive drainage network on the pre-bay terrestrial surface indicates that, geologically, the land now occupied by SFO prior to embayment was primarily an area of erosion and not deposition. Additional erosion occurred during bay inundation, as evidenced by the erosional surfaces and differential preservation of the A horizon on pre-bay landforms. Localized basins and landforms with the potential to preserve archeological remains is present within the RADP project site, but the landscape as a whole is not conducive to preservation of cultural materials, had they been deposited in the past on the Upper Layered Sediments.

HISTORICAL ARCHEOLOGICAL RESOURCES AND SENSITIVITY ASSESSMENT

As discussed previously, the Airport lay almost entirely within San Francisco Bay and adjacent tidal salt marsh until the 1920s, when land reclamation for the original Airport began. As a result, the only sensitivity for historical archeological resources within the RADP project site would be for possible buried maritime-related features that would have been present within the tidal marsh or on the bay floor. These features could include wooden pilings constructed around the oyster beds for oyster farming, piers or walkways used to access the bay, or ships beached in the shallow offshore waters, and subsequently covered by fill during land reclamation.

The only portion of the RADP project site that was not formerly within the bay or marsh was Belair Island. Historic maps and aerial photographs indicate that the small island was entirely cut down during the 1930s and used to fill the surrounding area. The highest point on the island, which formerly reached 60 feet above sea level, currently lies less than 12 feet above sea level. The former hill footprint was further affected by the construction of a canal and jetties. As a result of the extensive disturbance associated with Belair Island, little or no potential exists for historical (or any other) archeological resources to be present at that location.

The RADP has the potential to affect submerged historical archeological resources, including shipwrecks or abandoned hulks, or features related to historic oyster farming, if they were present before artificial filling. As discussed previously in the Deeply Buried/Submerged Resources Archeological Analysis section, p. 43, although the geoarcheological cores extracted for archeological assessment were also examined for any evidence of materials from the historical period, the potential to identify historical features through coring is slight because cores are unlikely to recover identifiable samples, and the testing plan did not focus on such features.

The earliest U.S. Coast Survey maps (1862 and 1869) show the Airport within the waters of San Francisco Bay and tidal salt marsh, just south of Point San Bruno. The 1862 map indicates that the site of the future Airport

---

77 Boyd, Ron, "Transgressive Wave-Dominated Coasts," In *Facies Models 4*, edited by Noel P. James and Robert W. Dalrymple, pp. 265–294, Geologic Association of Canada, Kingston, Ontario, Canada, 2010.

78 Zeccin, Massimo, Octavian Catuneanu, and Mauro Caffau, Wave-ravinement surfaces: Classification and key characteristics, *Earth-Science Reviews*, Volume 188, pp. 210-239, 2019.

79 Zimmer, Paul D. and Heidi Koenig, Archeological Sensitivity Assessment for the SFO Shoreline Protection Program, City and County of San Francisco. Prepared for the San Francisco Planning Department on behalf of San Francisco International Airport, 2021.

80 Zimmer, Paul D., Archeological Testing Results Report for the San Francisco International Airport Plot 10F Demolition and Paving and Cargo Building 662, Consolidated Administrative Campus, and West Field Cargo Redevelopment Projects. Prepared for the San Francisco Planning Department on behalf of San Francisco International Airport, 2023.

included shallow (1 to 2 feet-deep) “shell banks,” surrounded by bay waters that ranged from 1 to 4 feet deep. Because of the shallow water that encompassed much of the Airport, any vessels such as ships or boats would have had to be small, with a very shallow draft, to enter the vicinity. No piers, wharves, or other maritime features are depicted in the project vicinity on any historic maps. On this basis, overall, there is a low sensitivity for ships, boats, or other maritime features to be present within the Airport site.

Remnant features related to oyster cultivation could include closely connected wooden pilings that were constructed around the oyster beds to protect them from predators. Small structures were constructed on the pilings to house guards who watched the oyster beds. Evidence of oyster farming could be present in the Young Bay Mud and the base of the fill underlying the Airport. If present, oyster farm–related features likely would have been damaged or destroyed by construction activities. Such features would be of interest in documenting the physical characteristics of oyster farms; however, posts, piles, and connecting members generally offer limited potential to provide new information about historic oyster farming not already documented in the historic record, and it is assumed that the potential for significant features to be present is low.

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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.

Architectural Resources

Potential impacts on historic resources are assessed by identifying any activities (during either construction or operation) that could affect resources identified as historic resources for the purposes of CEQA. Once a resource has been identified, it must be determined whether the project would “cause a substantial adverse change in the significance” of the resource. Therefore, in accordance with CEQA Guidelines section 15064.5(b)(2), the following analysis considers the potential for implementation of the RADP to materially impair the significance of a historic resource by causing direct or indirect changes to the physical characteristics of the resource that convey its historic significance. Mitigation for impacts on historic resources may involve avoidance of the resource; revision of a project to minimize the impact; or, where avoidance or minimization is not feasible, documentation of the resource. However, as noted previously, documentation alone may not reduce impacts on a historic resource to a less-than-significant level.

Archeological Resources

Archeological resources can include historic resources; that is, resources that are considered significant because they meet one or more of the eligibility criteria of the California Register, as well as unique archeological resources, as defined in CEQA section 21083.2(g). The significance of Native American and historic archeological sites is most commonly derived from the information potential contained within the site (under National Register Criterion D/California Register Criterion 4). However, archeological resources can also be considered an important example of a type (criterion C/3) or associated with an important person (criterion B/2) or event (criterion A/1).

Impacts on unique archeological resources or archeological resources that qualify as historic resources are assessed pursuant to CEQA section 21083.2, which states that the lead agency shall determine whether the project may have a significant effect on archeological resources. The lead agency must determine whether the project would cause a substantial adverse change in the significance of the resource. A *substantial adverse change* is one that could result in the alteration of a resource or, in some cases, of its physical setting; physical destruction or disturbance of all or part of an archeological deposit; or removal of materials that results in a loss of information.

Human Remains

Human remains, including those buried outside of formal cemeteries, are protected under several state laws, including Public Resources Code sections 5097.98 and 5097.99 and Health and Safety Code section 7050.5. These laws are discussed under Regulatory Framework, p. 27. Potentially significant impacts on human remains may include disturbance, destruction, or removal of interred human remains.

Impacts and Mitigation Measures

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. ***(Less than Significant with Mitigation)***

Implementation of the RADP would alter or demolish eight buildings that have been determined not eligible for listing in the California Register and seven buildings that have not yet been evaluated for eligibility for listing in the California Register (see Table 3). The eight buildings that have been determined not eligible for listing in the California Register are not historic resources for purposes of CEQA; therefore, implementation of subsequent RADP projects that would alter or demolish these buildings would not result in a significant impact on a historic resource. Seven buildings would reach the 45-year age criterion during the expanded RADP implementation period of 2045 (see Table 3).[81] Therefore, at such time that a subsequent RADP project is proposed, any building that meets the 45-year age criterion would be required to be evaluated for eligibility for listing in the California Register as either an individual resource or as part of a historic district in coordination with the planning department. Should it be determined that a building proposed to be altered or demolished is a historic resource for purposes of CEQA, the subsequent RADP project could result in a significant impact on a historic resource. As such, implementation of one or more of the following mitigation measures, **Mitigation Measures M-CR-1a, Identification and Minimization Measure**; **M-CR-1b, Documentation**; **M-CR-1c, Salvage Plan**; and **M-CR-1d, Interpretation**, would be required to reduce the impact to a less-than-significant level. If it is not possible to modify the subsequent project to reduce the impact to a less-than-significant level, additional environmental review will be required.

> **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

[81] The Office of Historic Preservation established the 45-year age criterion to allow time for program implementation: "The 45-year criteria recognizes that there is commonly a 5-year lag between resource identification and the date that planning decisions are made. It explicitly encourages the collection of data about resources that may become eligible for the [National Register] or California Register […] within that planning period." Office of Historic Preservation, "Instructions for Recording Historical Resources," March 1995, p. 2, https://scic.sdsu.edu/_resources/docs/manual95.pdf, accessed October 28, 2024.

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 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 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.

- *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 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.

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 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, 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.

Other Construction-Related Impacts

Construction activities at subsequent RADP project sites would generate vibration that could potentially cause structural damage to adjacent and nearby buildings. As described in Section 3.B, Noise and Vibration, pile driving and compaction excavation activities could impact buildings and structures located within close proximity to an RADP project site. As such, Mitigation Measure M-NO-2, Protection of Adjacent Buildings/Structures and Vibration Monitoring during Construction, is identified to ensure construction activities would not result in significant impacts on adjacent buildings.

The process of determining the historic status of a building that meets the 45-year age criterion at such time a subsequent project is proposed, and reducing potential impacts on the historic resource if one is identified on or adjacent to a RADP project site, would be implemented under Mitigation Measures M-CR-1a, M-CR-1b, M-CR-1c, M-CR-1d, and M-NO-2. Mitigation Measure M-NO-2 would ensure that construction activities and vibration from construction activities would not result in significant impacts on adjacent buildings. Therefore, with implementation of these mitigation measures, impacts on historic resources would be ***less than significant with mitigation***. However, if it is not possible to modify a subsequent project to reduce impacts to a less-than-significant level, additional environmental review will be required.

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. *(Less than Significant with Mitigation)*

This section discusses archeological resources as both historic resources according to CEQA Guidelines section 15064.5 and unique archeological resources as defined in CEQA section 21083.2(g). A significant impact would occur if implementation of the RADP would cause a substantial adverse change to an archeological resource through physical demolition, destruction, relocation, or alteration of the resource.

Previous research suggests that the potential exists for archeological resources to be present at the Airport. The archeological assessment also indicates that the potential for submerged Native American resources to be present within the RADP project site. A significant impact would occur if Native American resources are damaged or destroyed during ground-disturbing activities. SFO would implement **Mitigation Measures M-CR-2a, Accidental Discovery**; **M-CR-2b, Archeological Testing**; and **M-CR-2c, Treatment of Submerged and Deeply Buried Resources**, to reduce and mitigate the potential for significant archeological impacts to less than significant.

Under Mitigation Measure M-CR-2b, SFO would provide for the development of a supplemental geoarcheological testing program to more closely examine those locations determined to have archeological sensitivity based on the results of the previous geoarcheological testing and in consultation with the planning department. As outlined in Mitigation Measure M-CR-2b, if a significant resource were identified during testing, an archeological data recovery program would be scoped in consultation with the planning department's Environmental Review Officer and carried out to recover the important information represented by the resource. Archeological interpretation also would be carried out for resources with significant interpretive value of interest to the public. For resources of Native American origin, consultation with tribal representatives regarding treatment and interpretation of the resource with respect to the tribal cultural values it represents also would be implemented, as discussed below under Topic E.5, Tribal Cultural Resources. In addition, if suspected archeological resources were uncovered during implementation of any RADP project, ground-disturbing work at the discovery location would be halted, pending documentation of the find and evaluation of whether the resource encountered constitutes a historical resource under CEQA.

Under Mitigation Measure M-CR-2c, for submerged or deeply buried archeological resources where physical documentation and data recovery would be limited by constraints, SFO would consult to explore alternative documentation and treatment options to be implemented in concert with any feasible archeological data recovery. This could include options such as modification of excavation methods; data recovery through open excavation, mechanical, or geoarcheological cores; scientific analysis from comparable archeological sites; and/or historical and paleoenvironmental reconstruction.

In addition, Mitigation Measure M-CR-2a would be implemented to address the potential for archeological discoveries in the absence of an archeologist. This measure provides that work must halt if a suspected archeological resource is discovered during project implementation and specifies procedures to be followed to protect the resource, ensure that it is assessed by an archeologist, and provide appropriate treatment of significant archeological resources.

Implementation of Mitigation Measures M-CR-2a, M-CR-2b, and M-CR-2c would minimize the potential for significant impacts on archeological resources. Therefore, with implementation of these mitigation measures, impacts on archeological resources would be ***less than significant with mitigation***.

> **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.
>
> *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 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.

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.
- *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 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 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.

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 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 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.

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 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 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:

- *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, 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 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 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 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 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.

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 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.
- *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.

- *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 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.

Impact CR-3: The RADP could disturb human remains, including those interred outside of formal cemeteries. ***(Less than Significant with Mitigation)***

CEQA Guidelines section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. No known human remains, including those interred outside of dedicated cemeteries, are located in the immediate vicinity of the RADP project site. Though unlikely, ground disturbance during implementation of the RADP could uncover or affect previously undiscovered human remains, either in the context of an archeological site or in isolation.

Should construction activities within the project site disturb human remains, any inadvertent damage to the remains would be considered a significant impact. The RADP projects would be subject to the provisions of California Health and Safety Code section 7050.5 with respect to the discovery of human remains. Public Resources Code section 5097.98 regulates the treatment and disposition of Native American human remains encountered during construction. Furthermore, Mitigation Measure M-CR-2a outlines work stoppage and agency notification protocols to follow in the event human remains or funerary objects are encountered during construction and requires development of a treatment plan. For Native American burials, a plan for treatment and disposition is to be developed in consultation with the tribal most likely descendant appointed by the Native American Heritage Commission. Compliance with state regulatory requirements and implementation of Mitigation Measure M-CR-2a would ensure that any human remains uncovered during construction would be promptly identified and appropriately protected and treated, and therefore would minimize the potential for significant impacts on human remains or other funerary objects. Therefore, with implementation of Mitigation Measure M-CR-2a, impacts from subsequent projects on previously unknown human remains that could occur with implementation of the RADP would be ***less than significant with mitigation***.

Impact C-CR-1: The RADP in combination with cumulative projects could result in cumulative impacts on historic resources. ***(Less than Significant with Mitigation)***

The geographic context for the analysis of potential cumulative impacts related to historic resources consists of the development and infrastructure projects located on the RADP project site. Those projects are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-7, and mapped on Draft EIR Figure 3-1, p. 3-10. Cumulative projects located outside of the RADP project site could not combine with RADP projects to result in a significant historic resources impact given the visual separation and distance of those projects from the RADP project site. As such, this analysis focuses only on cumulative projects located within the RADP project site.

There are seven buildings that have not been previously evaluated and do not currently meet the 45-year age criterion; however, one or more could become age eligible at such time a subsequent project is proposed. At such time when a subsequent project is proposed, these buildings would be evaluated for eligibility for listing in the California Register if they meet the 45-year age criterion. Should a historic resource be identified, Mitigation Measures M-CR-1a, M-CR-1b, M-CR-1c, and M-CR-1d would be required to ensure impacts would be less than significant. With implementation of these mitigation measures, subsequent RADP projects would not combine with cumulative projects on the RADP project site to result in a significant cumulative impact. As such, cumulative impacts on historic resources would be ***less than significant with mitigation***.

Other Construction-Related Cumulative Impacts

Construction activities at subsequent RADP project sites would generate vibration that could potentially cause structural damage to adjacent and nearby buildings. As described in Section 3.B, Noise and Vibration, pile driving and compaction excavation activities could impact buildings and structures located within close proximity to an RADP project site. As such, Mitigation Measure M-NO-2 is identified to ensure construction activities would not result in significant impacts on adjacent buildings. For this reason, subsequent RADP projects would not combine with cumulative projects on the RADP project site to result in a significant cumulative impact related to construction vibration and the impact would be less than significant with mitigation.

For these reasons noted above, with implementation of Mitigation Measures M-CR-1a, M-CR-1b, M-CR-1c, M-CR-1d, and M-NO-2, cumulative projects would not combine with RADP projects to result in a significant cumulative impact. Therefore, cumulative impacts related to historic resources would be ***less than significant with mitigation***.

Impact C-CR-2: The RADP in combination with cumulative projects could result in significant cumulative impacts on archeological resources and human remains. ***(Less than Significant with Mitigation)***

The geographic context for the analysis of potential cumulative impacts related to archeological resources and human remains consists of the development and infrastructure projects located on the RADP project site. Those projects are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-7, and mapped on Draft EIR Figure 3-1, p. 3-10. Cumulative projects located outside of the RADP project site could not combine with the RADP projects to result in a significant archeological impact given the physical separation and distance of those projects from the RADP project site and that archeological impacts are site specific; as such, this analysis focuses only on cumulative projects located within the RADP project site.

Federal and state laws protect cultural resources in most cases, by requiring either project redesign to ensure the preservation of the resource, or archeological recovery of a sample of the significant data represented by the archeological resource.

As discussed under Impact CR-2 and Impact CR-3, the potential for encountering archeological resources or human remains on the RADP project site is variable. However, should a find occur, impacts would be significant if not mitigated. Other cumulative projects on SFO property (see Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-7) would result in ground disturbance and thus could affect the same archeological resources as subsequent RADP projects, should any such resource be identified. Therefore, subsequent RADP projects could combine with cumulative projects to result in a significant cumulative impact. However, the RADP projects would include implementation of Mitigation Measures M-CR-2a, M-CR-2b, and M-CR-2c, which would reduce the potential for impacts on as-yet undiscovered resources to a less-than-significant level. Therefore, with implementation of Mitigation Measures M-CR-2a, M-CR-2b, and M-CR-2c, the RADP's contribution to a potentially significant cumulative impact would not be cumulatively considerable and the impact would be ***less than significant with mitigation***.

E.5 Tribal Cultural Resources

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Not Applicable
5. TRIBAL CULTURAL RESOURCES. Would the project:					
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☒	☐	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐	☐

Regulatory Framework

Assembly Bill (AB) 52, Native Americans: California Environmental Quality Act, enacted in 2015, defines tribal cultural resources. AB 52 requires that CEQA lead agencies provide California Native American tribal representatives the opportunity to provide input on the presence of tribal cultural resources within a project area, and on the potential for projects to result in impacts on tribal cultural resources. This is accomplished through a requirement to provide notice of such projects early in the planning process to Native American tribal representatives who have indicated that they wish to be notified; to consult with Native American tribal representatives requesting consultation, and if potential impacts on tribal cultural resources are identified through consultation, to further consult on appropriate mitigation of those impacts; and to incorporate feasible mitigation in projects for which impacts were identified.

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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.

In 2015, the planning department notified Native American tribal representatives and individuals then listed by the Native American Heritage Commission about the requirements described above, invited consultation on tribal cultural resources on lands for which San Francisco is the lead CEQA agency, and consulted with Native American tribal representatives groups and individuals who responded to that outreach. Based on the results of that consultation, it was agreed that all archeological resources of Native American origin would be presumed to be tribal cultural resources. It also was agreed that the preferred mitigation of impacts on Native American archeological resources is preservation in place of the resource. If preservation is not feasible, mitigation would include archeological data recovery and public interpretation, in consultation with and participation by tribal representatives, of the tribal values represented by the resource. The planning department includes these measures in all projects for which analysis identifies the potential for impacts on Native American archeological resources, regardless of whether Native American tribal representatives request project-specific consultation, and they are implemented upon the discovery of a Native American archeological resource.

More recently, in tribal consultation on two large programmatic projects in San Francisco, Native American tribal representatives have indicated that they place particular traditional cultural value on the San Francisco Bay shoreline and creek network. They view the shoreline and creek network both as the focus of many traditional tribal subsistence activities and other activities and as representative of the tribal relationship with the land and the water as both beneficiaries and resource stewards. Native American tribal representatives indicated that access to the shoreline and creeks and maintenance and enhancement of native vegetation are culturally valued. The cultural values represented by Native American archeological deposits may differ from or include more than their archeological information potential.

Pursuant to CEQA section 21080.3.1(d), within 14 days of a determination that an application for a project is complete or a decision is made by a public agency to undertake a project, the CEQA lead agency is required to contact Native American tribal representatives that are culturally or traditionally affiliated with the geographic area in which the project is located. Notified Native American tribal representatives have 30 days to request consultation with the lead agency to discuss potential impacts on tribal cultural resources. On July 26, 2024, the planning department contacted local Native American tribal representatives for the San Francisco area, providing a description of the RADP and requesting comments on the identification, presence, and significance of tribal cultural resources in the project vicinity. During the 30-day comment period, five local Native American tribal representatives contacted the planning department to request consultation for the current project. Two consultation meetings occurred on August 13th and August 22nd. Three tribal representatives preferred to provide written recommendations instead of undertaking consultation meetings. The recommendations from the consultation with local Native American representation undertaken for this project are discussed below. Additionally, as agreed to in prior planning department consultation, the department presumes all Native American archeological resources on projects for which the City and County of San Francisco is the CEQA lead agency to be tribal cultural resources. The results of this prior consultation are also applicable to the current project, as discussed below.

Impacts and Mitigation Measures

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. ***(Less than Significant with Mitigation)***

CEQA section 21074 requires the lead agency to consider the effects of a project on tribal cultural resources. As defined in section 21074, *tribal cultural resources* are sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribal representative that are listed, or determined to be eligible for listing, on the national, state, or local register of historical resources.

Based on tribal consultation undertaken for the RADP and previously for San Francisco lands undertaken by the planning department since 2015, all Native American archeological resources are presumed to be potential tribal cultural resources. All local Native American representatives who consulted on the RADP confirmed that all Native American archeological resources should be considered tribal cultural resources and confirmed the potential for a subsequent project proposed under the RADP to impact Native American archeological resources. As discussed under Topic E.4, Cultural Resources, geoarcheological testing and assessment indicates that buried and submerged prehistoric soils are present within the RADP project site footprint that represent surfaces that were exposed before the formation of San Francisco Bay, primarily between 8,000 and 2,000 years ago, and therefore have the potential to contain and preserve Native American archeological resources that are tribal cultural resources. Local Native American representatives confirmed that such resources could represent the earliest Native American occupation of this area; therefore, if present, they would be highly significant. As analyzed under Topic E.4, Cultural Resources, if such resources are present within the RADP project site, project construction could damage these deposits, resulting in a loss of significant information, and could affect the tribal cultural values represented by the resource. A tribal cultural resource is adversely affected when a project causes a substantial adverse change in the resource's significance. For archeological sites that are tribal cultural resources, destruction of or physical damage to a resource through pile or other deep foundation construction would constitute a substantial adverse change, which would be a significant impact on tribal cultural resources.

To address this potential impact to tribal cultural resources, local Native American representatives who consulted on the RADP requested the following to reduce impacts on Native American archeological resources that are also considered to be tribal cultural resources:

- Implementation of an archeological testing program and appropriate data recovery and treatment of project sites identified to be sensitive for Native American archeological resources.
- Native American monitoring of the archeological testing program of project sites identified to be sensitive for Native American archeological resources.
- Coordination with local Native American representatives on the scope of subsequent data recovery and treatment programs if significant Native American archeological resources are identified.
- Cultural sensitivity training program for construction personnel to be undertaken by a local Native American representative prior to ground disturbing activities at project sites determined to be sensitive for Native American archeological resources.
- Implementation of a public interpretation program to be developed if a tribal cultural resource is identified in consultation with local Native American representatives.

- Annual cultural sensitivity training for SFO staff responsible for implementation of RADP projects.
- Land acknowledgement and land honoring ceremony by local Native American representative to be undertaken at their discretion.

As discussed previously, in tribal consultation on recent San Francisco projects, tribal representatives have also identified that locations where the land meets the water have symbolic cultural value; thus, the bay shoreline may be sensitive for non-archeological tribal cultural resources. However, based on tribal consultation undertaken previously and confirmed during consultation for RADP, inherent in this value is the ability to access the bay shore. The Airport shoreline is not accessible to the public and, as the edge of an active airport, cannot be made safely accessible. This condition would not change with implementation of the RADP. Therefore, subsequent projects that could occur with implementation of the RADP would not result in significant impacts on non-archeological tribal cultural resources associated with the modern shoreline.

As discussed under Impact CR-2, the potential exists for the discovery of and impacts on Native American archeological resources, which, as discussed previously, would be presumed to be tribal cultural resources. Therefore, implementation of the RADP has the potential to result in substantial adverse changes to tribal cultural resources to the same extent that it would affect unidentified Native American archeological resources. As discussed under Impact CR-2, Mitigation Measures M-CR-2a and M-CR-2b set forth procedures for identification, protection, and treatment of archeological resources, including Native American archeological resources. To fulfill the requests by local Native American representatives made during consultation for the RADP, Mitigation Measure M-CR-2a includes the following requirements:

- Coordination with local Native American representatives on the scope of subsequent data recovery and treatment programs if significant Native American archeological resources are identified.
- Cultural sensitivity training program for construction personnel and land acknowledgement and land honoring ceremony at their discretion to be undertaken by a local Native American representative after discovery of Native American archeological resources.

To fulfill the requests by local Native American representatives made during consultation for the RADP, Mitigation Measure M-CR-2b and (as relevant) Mitigation Measure M-CR-2c includes the following requirements:

- Implementation of an archeological testing program and appropriate data recovery and treatment of project sites identified to be sensitive for Native American archeological resources,
- Native American monitoring of the archeological testing program for project sites identified as sensitive for Native American archeological resources,
- Coordination with local Native American representatives on the scope of subsequent data recovery and treatment programs if significant Native American archeological resources are identified, and
- Cultural sensitivity training program for construction personnel to be undertaken by a local Native American representative prior to ground disturbing activities at project sites determined to be sensitive for Native American archeological resources. Land acknowledgement and land honoring ceremony by local Native American representative to be undertaken at their discretion in coordination with cultural sensitivity training program.

To fulfill the requests by local Native American representatives made during consultation for the RADP to reduce impacts to potential tribal cultural resources that may be impacted during implementation of the RADP, the following tribal cultural resources mitigation measure were identified: **Mitigation Measure M-TCR-1a, Tribal Cultural Resources Public Interpretation Program, and Mitigation Measure M-TCR-1b, Tribal Cultural Resources Sensitivity Training**.

Mitigation Measures M-CR-2a through M-CR-2c, M-TCR-1a, and M-TCR-1b would mitigate the tribal cultural resource impacts of implementation of the RADP to a less-than-significant level. These measures would be implemented to ensure, through consultation with associated Native American tribal representatives, culturally appropriate treatment and acknowledgement of Native American archeological resources that are tribal cultural resources and, if applicable, culturally appropriate public interpretation that captures and conveys the cultural values represented by the tribal cultural resource. With implementation of these mitigation measures, impacts on tribal cultural resources would be ***less than significant with mitigation***.

> **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.
>
> *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 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. *(Less than Significant with Mitigation)*

The geographic context for the analysis of potential cumulative impacts related to tribal cultural resources consists of the development and infrastructure projects located on the RADP project site. Those projects are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-7, and mapped on Draft EIR Figure 3-1, p. 3-10. Cumulative projects located outside of the RADP project site could not combine with the RADP projects to result in a significant tribal cultural resources impact given the physical separation and distance of those projects from the RADP project site and that tribal cultural resource impacts are site specific; as such, this analysis focuses only on cumulative projects located within the RADP project site.

State laws protect tribal cultural resources in most cases, either through project redesign to ensure that the resource is preserved in place, or through mitigation efforts designed through consultation with the culturally affiliated Native American tribal representatives.

As discussed under Impact TCR-1, there are no known tribal cultural resources on the RADP project site, although the potential exists for the presence of undiscovered Native American archeological resources that may also be determined to be tribal cultural resources. There are cumulative projects that could affect the same tribal cultural resources if any are identified. Therefore, subsequent projects that could occur with implementation of the RADP could combine with cumulative projects within the RADP project site to result in a significant cumulative impact. However, subsequent RADP projects would include implementation of Mitigation Measures M-CR-2a, M-CR-2b, M-TCR-1a, and M-TCR-1b, which would ensure that significant impacts on undiscovered tribal cultural resources would be reduced to a less-than-significant level. Therefore, implementation of the RADP in combination with cumulative projects would not result in a cumulatively considerable contribution to a significant cumulative impact and the cumulative impact would be ***less than significant with mitigation***.

E.6 Transportation and Circulation

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
6. TRANSPORTATION AND CIRCULATION. Would the project:					
a) Involve construction that would require a substantially extended duration or intensive 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?	☒	☐	☐	☐	☐
b) Create potentially hazardous conditions for people walking, bicycling, or driving or public transit operations?	☒	☐	☐	☐	☐
c) Interfere with accessibility of people walking or bicycling to and from the project site, and adjoining areas, or result in inadequate emergency access?	☒	☐	☐	☐	☐
d) Substantially delay public transit?	☒	☐	☐	☐	☐
e) Cause substantial additional vehicle miles traveled 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?	☒	☐	☐	☐	☐
f) Result in a loading deficit, the secondary effects of which would create potentially hazardous conditions for people walking, bicycling, or driving; or substantially delay public transit?	☒	☐	☐	☐	☐
g) Result in a substantial vehicular parking deficit, the secondary effects of which 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?	☒	☐	☐	☐	☐

Implementation of the RADP has the potential to result in significant impacts related to transportation and circulation. All transportation topics are addressed in Draft EIR Section 3.A, Transportation and Circulation.

E.7 Noise and Vibration

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
7. NOISE. Would the project result in:					
a) 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?	☒	☐	☐	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐	☐
c) 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?	☒	☐	☐	☐	☐

Implementation of the RADP has the potential to result in significant impacts related to noise and vibration. All noise and vibration topics are addressed in Draft EIR Section 3.B, Noise and Vibration.

E.8 Air Quality

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
8. AIR QUALITY. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional ambient air quality standard?	☒	☐	☐	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☒	☐	☐	☐	☐

Implementation of the RADP has the potential to result in significant impacts related to air quality. All air quality topics are addressed in Draft EIR Section 3.C, Air Quality.

E.9 Greenhouse Gas Emissions

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
9. GREENHOUSE GAS EMISSIONS. Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐	☐
b) Conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐	☐

Environmental Setting

Gases that trap heat in the atmosphere are referred to as *greenhouse gases* (GHGs) because they capture heat radiated from the sun as it is reflected back into the atmosphere. The accumulation of GHGs contributes to global climate change. The primary GHGs, or climate pollutants, are carbon dioxide (CO_2), black carbon, methane, nitrous oxide, ozone, and water vapor.

Individual projects contribute to the cumulative effects of climate change by emitting GHGs during demolition, construction, and operation. Although the presence of some of the primary GHGs in the atmosphere is naturally occurring, CO_2, methane, and nitrous oxide are also emitted from human activities, accelerating the rate at which these compounds occur within Earth's atmosphere. CO_2 emissions are largely byproducts of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices and landfills. Black carbon has emerged as a major contributor to global climate change, possibly second only to CO_2. Black carbon is produced naturally and by human activities as a result of the incomplete combustion of fossil fuels, biofuels, and biomass materials.[82] Nitrous oxide is a byproduct of fossil fuel combustion and various industrial processes. Other GHGs, including hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, are generated in certain industrial processes. GHGs are typically reported in "carbon-dioxide-equivalent" (CO_2e) measurements.[83]

It is generally recognized that human-caused increases in GHGs have warmed the atmosphere, ocean, and land and that human-induced climate change is affecting every inhabited region in the world, increasing the frequency and severity of extreme events, such as heat waves, precipitation, droughts, and tropical cyclones. Furthermore, the scale of changes observed across the climate system is unprecedented in the thousands of years for which data are available.[84] Secondary effects of climate change in California include impacts on agriculture, the state's electricity system, and native ecosystems and biodiversity (especially those of freshwater and anadromous fish); increasing vulnerability of infrastructure (including levees, such as in the Sacramento–San Joaquin Delta); an increase in the frequency and intensity of extreme wildfires, flooding events, and drought conditions; and changes in disease vectors.[85,86]

Existing Greenhouse Gas Emission Estimates

The California Air Resources Board (air board) estimated that in 2020, California produced about 369 million gross metric tons of carbon dioxide equivalents (MMT CO_2e).[87] The air board found that transportation is the source of 38 percent of the state's GHG emissions, followed by industrial uses at 23 percent, and electricity generation (both in-state and outside generation) at 16 percent. Commercial and residential fuel use (primarily for heating) accounted for 14 percent of GHG emissions.[88]

In San Francisco, motorized transportation and buildings (i.e., natural gas and electricity use within the buildings) were the two largest sources of GHG emissions, each accounting for 44 percent (approximately

[82] Center for Climate and Energy Solutions, *What Is Black Carbon?* April 2010, https://www.c2es.org/document/what-is-black-carbon/, accessed May 15, 2024.
[83] Because of the differential heat absorption potential of various greenhouse gases, greenhouse gas emissions are frequently measured in "carbon dioxide equivalents," which present a weighted average, based on each gas's heat absorption (or "global warming") potential.
[84] Intergovernmental Panel on Climate Change, *Climate Change 2021: The Physical Science Basis, Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report_smaller.pdf, accessed May 15, 2024.
[85] Intergovernmental Panel on Climate Change, *Climate Change 2021: The Physical Science Basis, Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report_smaller.pdf, accessed May 15, 2024.
[86] California Climate Change Center, *Our Changing Climate 2012: Vulnerability and Adaptation to the Increasing Risks from Climate Change in California*, 2012, https://ucanr.edu/sites/Jackson_Lab/files/155618.pdf, accessed May 15, 2024.
[87] California Air Resources Board, *Current California GHG Emission Inventory Data, 2000–2022 GHG Inventory (2024 Edition)*, https://ww2.arb.ca.gov/ghg-inventory-data, accessed May 15, 2024.
[88] Ibid.

1.8 MMT CO_2e) of the approximately 4.1 MMT CO_2e emitted in the city in 2020.[89] Other sources include landfilled organics (approximately 6 percent), municipal emissions (approximately 4 percent, including both municipal buildings and fleets), and agriculture (approximately 2 percent).[90]

Electricity in San Francisco is provided primarily by the San Francisco Public Utilities Commission (SFPUC) and Pacific Gas and Electric Company (PG&E). Electricity consumption in San Francisco totaled approximately 5.0 million megawatt-hours (MWh) in 2020 and 5.1 million MWh in 2022.[91] The City produces approximately 80 percent of this power through Hetch Hetchy Power and CleanPowerSF, with the remaining energy coming from PG&E. CleanPowerSF was launched by SFPUC in 2016 to provide renewable energy to residents and businesses. The organization was formed to achieve the city's ambitious targets regarding the delivery of completely emissions-free electricity by 2030.[92] PG&E's 2022 power mix was as follows: 5 percent natural gas and other, 49 percent nuclear, 38 percent eligible renewables (described below), and 8 percent large hydroelectric.[93]

SFPUC, which operates three hydroelectric power plants as part of San Francisco's Hetch Hetchy water supply system, as well as solar, biomass, and biowaste infrastructure, provides electrical power to the San Francisco Municipal Railway, City buildings, and a limited number of commercial accounts in San Francisco.[94] Hetch Hetchy Power provides all electric power (100 percent GHG-free energy) to SFO.[95]

Regulatory Setting

State

Executive Orders S-3-05, B-30-15, and B-55-18. Executive Order S-3-05[96] sets forth a series of target dates by which time statewide emissions of GHGs will need to be progressively reduced, as follows: to 1990 levels (approximately 427 MMT CO_2e) by 2020 and 80 percent below 1990 levels (approximately 85 MMT CO_2e) by 2050. As discussed previously, in 2020 California produced about 369 gross MMT CO_2e.[97]

Executive Order B-30-15 sets an interim statewide GHG emissions reduction target of 40 percent below 1990 levels by 2030. The purpose of this interim target is to ensure that California meets its target of reducing GHG

---

[89] San Francisco Department of the Environment, *San Francisco's Carbon Footprint*, n.d., https://sfenvironment.org/carbonfootprint, accessed May 15, 2024.
[90] San Francisco Department of the Environment, *San Francisco's Carbon Footprint*, n.d., https://sfenvironment.org/carbonfootprint, accessed May 15, 2024.
[91] California Energy Commission, *Electricity Consumption by County*, 2020, https://ecdms.energy.ca.gov/elecbycounty.aspx, accessed December 4, 2023.
[92] Stark, Kevin, "*Power Switch: S.F. Builds Case for Pushing Out PG&E*," *San Francisco Public Press*, June 18, 2019, https://www.sfpublicpress.org/power-switch-s-f-builds-case-for-pushing-out-pge/, accessed May 15, 2024.
[93] Pacific Gas and Electric Company, *Clean Energy Solutions*, 2023, https://www.pge.com/en/about/corporate-responsibility-and-sustainability/taking-responsibility/clean-energy-solutions.html, May 15, 2024.
[94] San Francisco Public Utilities Commission, *Hetch Hetchy Power System*, https://sfpuc.org/about-us/our-systems/hetch-hetchy-power-system, accessed May 15, 2024.
[95] City of San Francisco Office of the Mayor, *News Release: "Mayor London Breed Announces New Climate Commitments and Environmental Successes,"* April 22, 2021, https://sfmayor.org/article/mayor-london-breed-announces-new-climate-commitments-and-environmental-successes, accessed May 15, 2024.
[96] Office of the Governor, *Executive Order S-3-05,* June 1, 2005, http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+(June+2005).pdf, accessed May 15, 2024. Executive Order S-3-05 sets forth a series of target dates by which statewide emissions of greenhouse gases will need to be progressively reduced, as follows: by 2010, reduce emissions to 2000 levels (approximately 457 million metric tons of carbon dioxide equivalents); by 2020, reduce emissions to 1990 levels (approximately 427 million metric tons of carbon dioxide equivalents); and by 2050, reduce emissions to 80 percent below 1990 levels (approximately 85 million metric tons of carbon dioxide equivalents).
[97] California Air Resources Board, Current *California GHG Inventory Data*, 2023, https://ww2.arb.ca.gov/ghg-inventory-data, accessed May 15, 2024.

emissions to 80 percent below 1990 levels by 2050.[98] Executive Order B-30-15 also requires all state agencies with jurisdiction over sources of GHG emissions to implement measures within their statutory authority for achieving reductions in GHG emissions and meeting the 2030 and 2050 GHG emission reduction targets.

Executive Order B-55-18 establishes a statewide goal of achieving carbon neutrality as soon as possible, but no later than 2045, and achieving and maintaining net negative emissions thereafter. The air board was tasked with developing a framework for implementing and accounting for progress toward the goal. Executive Order B-55-18 also requires that all policies and programs undertaken to achieve carbon neutrality be implemented in a manner that supports climate adaptation and biodiversity.[99]

Assembly Bill 32 and the Climate Change Scoping Plan. In 2006, the California Legislature enacted AB 32 (California Health and Safety Code division 25.5, section 38500 et seq.), also known as the California Global Warming Solutions Act. AB 32 requires the air board to design and implement emission limits, regulations, and other measures so that statewide GHG emissions would be reduced to 1990 levels by 2020.

Pursuant to AB 32, the air board adopted the 2008 Climate Change Scoping Plan, outlining measures to meet the 2020 GHG reduction limits. To meet the goals of AB 32, California needed to reduce its GHG emissions to 30 percent below projected 2020 business-as-usual emissions levels (approximately 15 percent below 2008 levels).[100] In 2018, the air board announced that inventory year 2016 emissions had dropped below 1990 levels, which is an achievement of the AB 32 goal as emissions have continued this current trajectory.[101]

The climate change scoping plan must be updated every five years to evaluate AB 32 policies and ensure that California is on track with respect to achieving long-term climate stabilization goals. The First Scoping Plan Update was approved in 2014. Under the 2014 scoping plan, the emission reductions necessary to achieve the 2020 emissions target of 431 MMT CO_2e would be 78.4 MMT CO_2e, or a reduction of GHG emissions by approximately 15.4 percent.

Senate Bill 32 and Assembly Bill 197. On August 24, 2016, the California Legislature enacted Senate Bill (SB) 32 (California Health and Safety Code division 25.5, section 38566), thereby amending the California Global Warming Solutions Act of 2006. SB 32 directed the air board to adopt, to the extent technologically feasible and cost effective, the rules and regulations necessary to achieve a reduction in statewide GHG emissions (i.e., to 40 percent below 1990 levels by 2030). The passage of SB 32 codified the 2030 interim GHG emissions reduction target established by Executive Order B-30-15.

SB 32 was paired with AB 197 (California Government Code division 2 of title 2, article 7.6 of chapter 1.5; California Health and Safety Code sections 39510, 39607, 38506, 38531, and 38562.5). AB 197 provides additional guidance on how to achieve the reduction targets established in Executive Order B-30-15 and SB 32. SB 32 and AB 197 became effective January 1, 2017.

[98] Office of the Governor, *Executive Order B-30-15,* April 29, 2015, https://www.ca.gov/archive/gov39/2015/04/29/news18938/index.html, accessed May 15, 2024.
[99] Office of the Governor, *Executive Order B-55-18 to Achieve Carbon Neutrality,* September 10, 2018, https://archive.gov.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf, accessed May 15, 2024.
[100] California Air Resources Board, *AB 32 Global Warming Solutions Act of 2006,* https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006, accessed May 15, 2024.
[101] California Air Resources Board, News Release: "*Climate Pollutants Fall below 1990 Levels for the First Time*," July 11, 2018, https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time, May 15, 2024.

The 2017 climate change scoping plan identified specific measures to reduce GHG emissions to 1990 levels by 2020 and required the air board and other state agencies to develop and enforce regulations and other initiatives for reducing GHGs.[102] The plan also highlights California's progress toward meeting the 2030 GHG emissions reduction goals of the California Global Warming Solutions Act of 2016 and evaluates how to align the state's longer-term GHG reduction strategies with other state policy priorities for water, waste, natural resources, clean energy, transportation, and land use.[103] Specifically, the 2017 climate change scoping plan update articulates a key role for local governments, recommending that they establish GHG reduction goals for both their municipal operations and the community consistent with those of the state.

The 2017 climate change scoping plan estimates that 385 MMT CO_2e would be reduced from known commitments, leaving a gap of 236 MMT CO_2e that is needed to meet the 2030 target codified by the California Global Warming Solutions Act of 2016. The air board concluded that the gap in emissions would need to be bridged by the cap-and-trade program's achievement of 236 MMT CO_2e.

Assembly Bill 1279 and the 2022 Scoping Plan. The California Legislature enacted AB 1279, the California Climate Crisis Act, on September 16, 2022. AB 1279 establishes the policy of the State of California to achieve net zero GHG emissions as soon as possible but no later than 2045, and to achieve and maintain net negative GHG emissions thereafter. Additionally, AB 1279 mandates that by 2045, statewide anthropogenic GHG emissions are to be reduced at least 85 percent below 1990 levels. SB 1279 also requires the air board to ensure that the scoping plan identifies and recommends measures to achieve carbon neutrality, and to identify and implement policies and strategies for CO_2 removal solutions and carbon capture, utilization, and storage technologies. It also requires the air board to submit an annual report on progress in achieving the scoping plan's goals.

The *2022 Scoping Plan for Achieving Carbon Neutrality* (2022 Scoping Plan), adopted by the air board in December 2022, expands on prior scoping plans. The 2022 Scoping Plan responds to more recent legislation, outlining a technologically feasible, cost-effective, and equity-focused path to achieve the state's climate target of reducing anthropogenic emissions 85 percent below 1990 levels and achieving carbon neutrality[104] by 2045 or sooner.

The 2022 Scoping Plan also shows that by 2030, the state must achieve a 48 percent reduction of GHG emissions below the 1990 level to achieve the 2045 targets. The plan builds on and integrates efforts already underway to reduce the state's GHG, criteria air pollutant, and toxic air contaminant emissions by identifying the clean technologies and fuels that should be phased in as the state transitions away from combustion of fossil fuels. It requires the air board and other state agencies to develop and enforce regulations and other initiatives for reducing GHGs.[105] The plan identifies opportunities for leveraging and new funds that will drive GHG emissions reductions through strategic planning and targeted low-carbon investments. The 2022

[102] California Air Resources Board, *California's 2017 Climate Change Scoping Plan*, November 2017, https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf, accessed May 15, 2024.
[103] Ibid.
[104] *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 initial study, these terms mean the same thing and are used interchangeably.
[105] California Air Resources Board, *2022 Scoping Plan for Achieving Carbon Neutrality*, November 2022, https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents, https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp.pdf, accessed May 15, 2024.

Scoping Plan defines the air board's climate change priorities for the next five years and sets the groundwork for reaching the long-term goals set forth in AB 1279. The 2022 Scoping Plan also highlights California's progress toward meeting the 2030 GHG emissions reduction goals of SB 32 and evaluates how to align the state's longer-term GHG reduction strategies with other state policy priorities for water, waste, natural resources, clean energy, transportation, and land use.[106]

Specifically, the 2022 Scoping Plan articulates a key role for local governments, recommending that they establish GHG reduction goals for both their municipal operations and the community consistent with those of the state. The 2022 Scoping Plan anticipates that actions by local governments will reduce GHG emissions because local governments have primary authority to plan, zone, approve, and permit development that will accommodate population growth and the changing needs of their jurisdictions. The plan also relies on the requirements of SB 375 (discussed below) to align local land use and transportation planning and achieve GHG reductions. The plan describes specific actions required to reduce GHG emissions across various sectors and provides the air quality and economic evaluations of these actions along with the next steps and partnerships needed for successful implementation.

The 2022 Scoping Plan acknowledges that continuing with existing policies in place shows modest GHG emissions reductions beyond 2030 that level off toward mid-century.[107] This is referred to as the *Reference Scenario.* The plan contemplates how further actions with GHG emissions reductions are needed, along with accounting for the impacts of Natural and Working Lands, to achieve the goal of reducing anthropogenic GHG emissions by at least 85 percent by 2045. The plan addresses three scenarios of varying degrees of emissions-reducing activity and reliance on CO_2 removal from Natural and Working Lands and carbon capture technologies and presents what is considered the best choice to achieve California's climate and clean-air goals. This choice is referred to as the *Scoping Plan Scenario.* The Scoping Plan Scenario aims to achieve carbon neutrality by 2045, increase GHG emissions reductions beyond existing policies represented in the Reference Scenario, prioritize sustainable land management to sequester carbon over the long term, and rely on engineered methods of carbon removal and sequestration.

Senate Bills 375 and 743. The climate change scoping plan relies on the requirements of SB 375 (chapter 728, statutes of 2008), also known as the Sustainable Communities and Climate Protection Act of 2008, to reduce carbon emissions from land use decisions. SB 375 requires regional transportation plans developed by each of the state's 18 metropolitan planning organizations to incorporate a sustainable communities strategy in each regional transportation plan, which will then achieve the GHG emissions reduction targets set by the air board. Plan Bay Area 2050, the Metropolitan Transportation Commission's regional transportation plan, serves as a roadmap for the San Francisco Bay Area's future through 2050. For the bay area, the per capita GHG emissions reduction targets applicable to Plan Bay Area 2050 are 19 percent by 2035 (i.e., emissions from vehicles and light-duty trucks compared with 2005 levels).[108]

The California Governor's Office of Planning and Research implemented changes to the CEQA Guidelines in accordance with SB 743, including the addition of section 15064.3, which requires CEQA transportation analyses to move away from a focus on vehicle delay and level of service. In support of these changes, the Governor's Office of Planning and Research published its *Technical Advisory on Evaluating Transportation*

[106] Ibid.
[107] Ibid.
[108] These targets became applicable October 1, 2018. California Air Resources Board, *SB 375 Regional Plan Climate Targets,* https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets, accessed May 15, 2024.

Impacts in CEQA, which states that the determination of a project's transportation impact should be based on whether project-related vehicle miles traveled (VMT) per capita (or VMT per employee) would be 15 percent lower than that of existing development in the region.[109] The technical advisory explains that this criterion is consistent with section 21099 of the Public Resources Code, which states that the criteria for determining significance must "promote a reduction in greenhouse gas emissions." In addition, the 15 percent reduction is consistent with the VMT reduction that the air board has determined to be necessary to meet the state's 2030 and 2050 GHG goals.[110] This metric is intended to replace the use of vehicle delay and level of service for measuring transportation-related impacts.

Senate Bills 1078, 107, X1-2,350, 100, and 1020 and Executive Orders S-14-08 and S-21-09. California established aggressive renewables portfolio standards under SB 1078 (chapter 516, statutes of 2002) and SB 107 (chapter 464, statutes of 2006), which required retail sellers of electricity to provide at least 20 percent of their electricity from renewable sources by 2010. Executive Order S-14-08 (November 2008) expanded the state's renewables portfolio standards, which called for 20–33 percent of electricity to come from renewable sources by 2020. In 2009, Governor Arnold Schwarzenegger continued California's commitment to renewables portfolio standards by signing Executive Order S-21-09, which directed the air board to enact regulations to help California meet the renewables portfolio standards (i.e., 33 percent of electricity from renewable energy by 2020).[111]

In April 2011, Governor Edmund G. Brown Jr. signed SB X1-2 (chapter 1, statutes of 2011), codifying the GHG emissions reduction goal for energy suppliers (i.e., 33 percent of electricity from renewable energy by 2020). This "renewables portfolio standard" preempted the air board's standard calling for 33 percent of electricity to come from renewable sources; it applies to all electricity suppliers (not only retail sellers) in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. SB X1-2 required all electricity-supplying entities to adopt the goals of the new renewables portfolio standard (i.e., 20 percent of retail sales from renewable sources by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020).[112] Eligible renewable sources include geothermal, ocean wave, solar photovoltaic, and wind sources but exclude large hydroelectric facilities (30 megawatts or more). Therefore, because SFPUC receives more than 67 percent of its electricity from large hydroelectric facilities, the remaining electricity provided by SFPUC must be 100 percent renewable.[113]

SB 350 (chapter 547, statutes of 2015), signed by Governor Brown in October 2015, dramatically increased the stringency of the renewables portfolio standard. SB 350 established a renewables portfolio standard that calls for 50 percent of electricity to come from renewable sources by 2030, along with interim targets of 40 percent by 2024 and 45 percent by 2027.

SB 100 further accelerated the renewable energy targets set by previous legislation. The goal of the renewables portfolio standard was revised to achieve a 50 percent renewable resource target by the end of 2026 and 60 percent by the end of 2030. The legislation states that it is the policy of the state for eligible

[109] Governor's Office of Planning and Research, *Technical Advisory on Evaluating Transportation Impacts in CEQA*, December 2018, http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf, accessed May 15, 2024.
[110] Ibid.
[111] California Public Utilities Commission, Renewables Portfolio Standard (RPS) Program, n.d., https://www.cpuc.ca.gov/rps/#:~:text=California%27s%20RPS%20program%20was%20established,a%2050%25%20RPS%20by%202030, accessed May 15, 2024.
[112] Ibid.
[113] California Energy Commission, Review of San Francisco Public Utilities Commission's Integrated Resource Plan Filing, June 2019, https://www.energy.ca.gov/zh-TW/filebrowser/download/1936, accessed June 4, 2024.

renewable energy resources and zero-carbon resources to supply 100 percent of all retail sales of electricity to California end uses, as well as 100 percent of the electricity procured for state agencies, by the end of 2045.[114] SB 1020, signed on September 16, 2022, requires that renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to end-use customers by December 31, 2035, increasing to 95 percent by December 31, 2040, and 100 percent by December 31, 2045; and supply 100 percent of electricity procured to serve all state agencies by December 31, 2035.

Green Building Code and Title 24 Updates. The California Green Building Standards Code (CALGreen Code; proposed Part 11, Title 24) was adopted as part of the California Building Standards Code (CCR title 24). Part 11 established voluntary standards that became mandatory under the 2010 edition of the code. These involved sustainable site development, energy efficiency (in excess of California Energy Code requirements), water conservation, material conservation, and internal air contaminants. The current energy efficiency standards were adopted in 2019 and took effect on January 1, 2020.

Executive Order S-01-07. With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California in 2007. Under this order, the carbon intensity of California's transportation fuels was to be reduced by at least 10 percent by 2020.

Assembly Bill 1493. With the passage in 2002 of AB 1493, also known as *Pavley I*, California launched an innovative and proactive approach to dealing with GHG emissions and climate change at the state level. AB 1493 requires the air board to develop and implement regulations to reduce GHG emissions by automobiles and light-duty trucks. These stricter emissions standards were designed to apply to automobiles and light-duty trucks beginning with the model year 2009. Additional strengthening of the Pavley standards (referred to previously as *Pavley II* and now referred to as the *Advanced Clean Cars* measure) was adopted for vehicle model years 2017–2025 in 2012. Together, the two standards are expected to increase average fuel economy to roughly 54.5 miles per gallon in 2025. The estimated standards for model year 2020 are 43.7 miles per gallon for passenger cars and 31.3 miles per gallon for light trucks.

Advanced Clean Cars II. In 2022, the California Air Resources Board approved the Advanced Clean Cars II Program for model years 2026–2035, requiring that all new passenger cars, trucks, and sport utility vehicles sold in California be zero emissions by 2035.[115] The regulation amends the Zero-Emission Vehicle (ZEV) Regulation to require an increasing number of ZEVs, and relies on advanced vehicle technologies, including battery-electric, hydrogen fuel cell electric, and plug-in hybrid electric vehicles, to meet air quality and climate change emissions standards, in support of Executive Order N-79-20.[116] This program also amended the Low-Emission Vehicle Regulations to include increasingly stringent standards for gasoline cars and heavier passenger trucks to continue to reduce smog-forming emissions.

Advanced Clean Trucks Program. On June 25, 2020, the air board adopted the Advanced Clean Trucks rule, which requires truck manufacturers to transition from diesel vehicles to electric ZEVs beginning in 2024, with the goal of reaching 100 percent ZEVs by 2045.[117] The goal of the legislation is to help California meet its

---

[114] De León, Senator Kevin, *Senate Bill No. 100: California Renewables Portfolio Standards Program: Emissions of Greenhouse Gases,* September 10, 2018, https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB100, accessed May 15, 2024.
[115] California Air Resources Board, *Advanced Clean Cars II Regulations: All New Passenger Vehicles Sold in California to be Zero Emissions by 2035*, https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii, accessed May 15, 2024.
[116] California Air Resources Board, Zero-Emission Vehicle Program, https://ww2.arb.ca.gov/our-work/programs/zero-emission-vehicle-program, accessed May 15, 2024.
[117] California Air Resources Board, News Release: "*California Takes Bold Step to Reduce Truck Pollution,*" June 25, 2020, https://ww2.arb.ca.gov/news/california-takes-bold-step-reduce-truck-pollution, accessed May 15, 2024.

climate targets of a 40 percent reduction in GHG emissions and a 50 percent reduction in petroleum use by 2030, and an 80 percent reduction in GHG emissions by 2050. Truck manufacturers will be required to sell ZEVs as an increasing percentage of their annual sales from 2024 through 2035. Companies with large distribution fleets (50 or more trucks) will be required to report information about their existing fleet operations in an effort to identify future strategies for increasing zero-emissions fleets statewide.[118]

Advanced Clean Fleets Program. On September 20, 2023, the Office of Administrative Law approved the air board's Advanced Clean Fleets rule, which became state law on October 1, 2023. This regulation is part of the air board's broader strategy to accelerate the transition to zero-emissions medium- and heavy-duty vehicles. It complements the Advanced Clean Trucks rule, focusing on reducing emissions and promoting the adoption of ZEVs. The Advanced Clean Fleets rule covers various fleet types – drayage operations, government-owned fleets, and high-priority fleets – and mandates ZEV adoption in phases. Key provisions include manufacturer sales mandates, requirements for drayage fleets to transition to ZEVs, and specific ZEV targets for high-priority and government fleets. The Advanced Clean Fleets rule states that manufacturers may sell only zero-emissions medium- and heavy-duty vehicles in California starting in 2036; that high-priority fleets must purchase only ZEVs beginning in 2024 and, starting January 1, 2025, must remove internal combustion engine vehicles at the end of their useful life; and that high-priority fleets must achieve 100 percent ZEVs by 2042.[119] The regulation is expected to significantly reduce emissions, benefit public health, and contribute to achieving climate goals.

Innovative Clean Transit. Adopted in December 2018, the Innovative Clean Transit regulation requires public transit agencies to gradually transition to 100 percent zero-emissions bus fleets by 2040. According to the air board, this regulation will provide the following benefits to the state:[120]

- Reduce GHG emissions for all Californians, especially transit-dependent and disadvantaged communities. The majority of these benefits will be in the state's most populated and impacted areas where transit buses are most prevalent.
- Increase penetration of the first wave of zero-emissions heavy-duty technologies into applications that are well suited to their use to further achieve emissions reduction benefits.
- Save energy and reduce dependency on petroleum and other fossil fuels.
- Expand the ZEVs industry to bring high-quality green jobs to local communities and trained workforce to California.
- Provide other societal benefits by encouraging improved mobility and connectivity with zero-emissions transportation modes and reduced growth in light-duty vehicle miles traveled.

Short-Lived Climate Pollutant Reduction Strategy. SB 605 directed the air board, in coordination with other state agencies and local air districts, to develop a comprehensive short-lived climate pollutant (SLCP)

---

[118] California Air Resources Board, *Advanced Clean Trucks Fact Sheet*, August 20, 2021, https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-trucks-fact-sheet, accessed May 15, 2024.
[119] California Air Resources Board, *Advanced Clean Fleets Regulation Overview*, July 20, 2023, https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-fleets-regulation-overview, accessed May 15, 2024.
[120] California Air Resources Board, *Innovative Clean Transit*, https://ww2.arb.ca.gov/our-work/programs/innovative-clean-transit/about, accessed May 15, 2024.

reduction strategy, while SB 1383 directed the air board to approve and implement the SLCP Reduction Strategy to achieve the following reductions in SLCPs:

- 40 percent reduction in methane below 2013 levels by 2030
- 40 percent reduction in hydrofluorocarbon gases below 2013 levels by 2030
- 50 percent reduction in anthropogenic black carbon below 2013 levels by 2030
- The bill also establishes the following targets for reducing organic waste in landfills and methane emissions from dairy and livestock operations as follows:
  - 50 percent reduction in organic waste disposal from the 2014 level by 2020
  - 75 percent reduction in organic waste disposal from the 2014 level by 2025
  - 40 percent reduction in methane emissions from livestock manure management operations and dairy manure management operations below the dairy sector's and livestock sector's 2013 levels by 2030

The air board and the California Department of Resources Recycling and Recovery have developed regulations to achieve the organic waste reduction goals under SB 1383. On January 1, 2022, new and amended regulations in CCR titles 14 and 27 took effect. Among other things, the new regulations set forth minimum standards for organic waste collection, hauling, and composting.

The air board adopted the SLCP Reduction Strategy in March 2017 as a framework for achieving the methane, hydrofluorocarbon, and anthropogenic black carbon reduction targets set by SB 1383. The SLCP Reduction Strategy includes 10 measures to reduce SLCPs, which fit within a wide range of ongoing planning efforts throughout the state, including the air board's and California Department of Resources Recycling and Recovery's proposed rulemaking on organic waste diversion.

SB 1206 (2022) prohibits the sale or distribution of bulk hydrofluorocarbons or bulk blends containing hydrofluorocarbons: those with a global warming potential (GWP) exceeding 2,200 in 2025, 1,400 GWP in 2030, and 750 GWP in 2033, unless the hydrofluorocarbons are reclaimed or used in medical metered dose inhalers. This bill also requires the air board to initiate a rulemaking requiring low- and ultra-low-GWP alternatives to hydrofluorocarbons in all sectors where it is practicable for entities in the sector to comply with the requirement.

Regional

The Bay Area Air Quality Management District is responsible for attaining and maintaining federal and state air quality standards in the San Francisco Bay Area Air Basin, as established by the federal Clean Air Act and the California Clean Air Act. The federal and California Clean Air acts require that plans be developed for areas that do not meet air quality standards. The most recent air quality plan, the Bay Area 2017 Clean Air Plan, includes a goal calling for the reduction of GHG emissions to 1990 levels by 2020, 40 percent below 1990 levels by 2035, and 80 percent below 1990 levels by 2050.[121] In addition, the air district established a climate protection program to reduce pollutants that contribute to global climate change and affect air

[121] Bay Area Air Quality Management District, *Spare the Air, Cool the Climate: A Blueprint for Clean Air and Climate Protection in the Bay Area, 2017 Clean Air Plan*, April 2017, https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf, accessed May 15, 2024.

quality in the air basin. The program includes GHG emissions reduction measures that promote energy efficiency, reduce VMT, and help with the development of alternative energy sources.[122]

The air district's CEQA Air Quality Guidelines help lead agencies comply with CEQA requirements with respect to potentially adverse impacts on air quality. The air district advises lead agencies to consider adopting a GHG emissions reduction strategy that meets climate stabilization goals and then review projects for compliance with the GHG emissions reduction strategy as a CEQA threshold of significance.[123,124] This is consistent with the approach to analyzing GHG emissions described in CEQA Guidelines section 15183.5.

Title V Air Quality Operating Permits. The Major Facility Review Program (Title V) requires large industrial facilities to obtain a single comprehensive operating permit that shows all federal, state, and local air quality requirements, including obligations to monitor emissions and make regular reports. These Title V air quality operating permits must be renewed every five years with the full public notice and U.S. EPA review process. The air district implements the requirements of Title V through Regulation 2, Rule 6. While this program primarily targets the regulation of criteria air pollutants and hazardous air pollutants, it can also mandate conditions for GHG emissions when a facility is already subject to Title V requirements for other air pollutants and exceeds specific GHG thresholds.

Local

San Francisco Greenhouse Gas Reduction Ordinance. In May 2008, the City adopted ordinance 81-08, amending the San Francisco Environment Code to establish GHG emissions targets and require departmental action plans. Ordinance 81-08 authorized the San Francisco Department of the Environment to coordinate efforts to meet the targets and established the following GHG emissions reduction limits and target dates:

- Determine 1990 citywide GHG emissions by 2008 (i.e., the baseline level, with reference to which target reductions have been set).
- Reduce GHG emissions to 25 percent below 1990 levels by 2017.
- Reduce GHG emissions to 40 percent below 1990 levels by 2025.
- Reduce GHG emissions to 80 percent below 1990 levels by 2050.[125]

In July 2021, the City adopted an updated GHG ordinance to demonstrate its commitment to the Paris Agreement by establishing GHG reduction targets for 2030, 2040, and 2050 and setting other critical sustainability goals. The updated ordinance sets goals for both sector-based emissions and consumption-based emissions. The GHG targets established under ordinance 81-08 applied solely to *sector-based emissions*, which are those emissions that are generated within the geographic boundaries of the city. The updated ordinance reflects a more comprehensive effort to reduce GHG emissions by setting consumption-

---

[122] Bay Area Air Quality Management District, *Climate Protection Planning Program*, 2021, https://www.baaqmd.gov/en/plans-and-climate/climate-planning/climate-protection-program, accessed October 17, 2024.
[123] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, 2022, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed May 15, 2024.
[124] The air district updated greenhouse gas emissions thresholds in 2022. The updated thresholds do not contain recommendations for construction greenhouse gas analyses but do recommend that land use projects meet certain performance measures or be evaluated for consistency with a greenhouse gas emissions reduction strategy. Therefore, because the analysis is based on consistency with such a GHG strategy, the analysis would be consistent with updated greenhouse gas emissions thresholds, as they are stated today.
[125] City and County of San Francisco, *Greenhouse Gas Emissions Targets and Departmental Action Plans*, May 13, 2008, https://sfenvironment.org/policy/chapter-9-greenhouse-gas-emissions-targets-and-departmental-action-plans, accessed May 15, 2024.

based targets as well. *Consumption-based emissions* are those that are associated with producing, transporting, using, and disposing of products and services consumed by people within the city, even those emissions that are generated outside of the city boundaries. The City's updated GHG reduction targets are as follows:

- By 2030, reduce sector-based GHG emissions to 61 percent below 1990 levels.
- By 2030, reduce annual consumption-based GHG emissions to 30 metric tons of CO_2e per household or less, equivalent to a 40 percent reduction compared to 1990 levels.
- By 2040, reach net zero sector-based emissions and sequester any residual emissions using nature-based solutions.[126]
- By 2050, reduce annual consumption-based GHG emissions to 10 metric tons of CO_2e per household or less, equivalent to an 80 percent reduction compared to 1990 levels.

These sector-based GHG reduction targets are more ambitious than those set forth in SB 32 (e.g., a 61 percent reduction in sector-based GHG emissions by 2030 rather than a 40 percent reduction by 2030) and in AB 1279 (e.g., achieving net zero GHG emissions by 2040 rather than by 2045). The consumption-based targets are consistent with the 2030 goal of Executive Order B-30-15 and the 2050 goal of Executive Order S-3-05 (80 percent below 1990 levels by 2050).

The updated GHG ordinance also serves to codify the city's "0-80-100-Roots" climate action framework, which comprises climate and sustainability goals in these key areas: waste, transportation, energy, and carbon sequestration. The framework also emphasizes the importance of housing in implementing meaningful climate solutions, which require an increased supply of high-quality housing that is both affordable and near transit service. The goals in the 0-80-100-Roots framework are defined as follows:

- Zero Waste (**0**-80-100-Roots)
  - By 2030, reduce the generation of solid waste to 15 percent below 2015 levels and reduce the amount of solid waste that is incinerated or sent to a landfill to at least 50 percent below 2015 levels.
- Transportation (0-**80**-100-Roots)
  - By 2030, increase the percentage of low-carbon trips to at least 80 percent of measured trips and increase the number of electric vehicles to at least 25 percent of all registered private vehicles.
  - By 2045, increase the number of electric vehicles to 100 percent of all registered private vehicles.
- Energy (0-80-**100**-Roots)
  - By 2025, supply 100 percent renewable electricity.
  - By 2045, supply 100 percent renewable energy.

[126] *Nature-based solutions* are those that remove remaining emissions from the atmosphere by storing them in natural systems that support soil fertility or employing other carbon farming practices. According to FAA advisory circular 150/5200-33, Hazardous Wildlife Attractants on or near Airports, nature-based solutions in the airport environs are not compatible with safe airport operations due to risk of wildlife and bird strike of aircraft, endangering passengers in the aircraft and people on the ground.

- Carbon Sequestration (0-80-100-**Roots**)
  - Sequester carbon through ecosystem restoration, including an increased urban tree canopy (i.e., tree roots), green infrastructure, and compost applications.
- Housing and Buildings
  - Build at least 5,000 new housing units per year, with at least 30 percent of these units provided as affordable units.
  - By 2021, require zero onsite fossil fuel emissions from all new buildings.
  - By 2035, require zero onsite fossil fuel emissions from all large existing commercial buildings.

To support the 2021 Housing and Buildings goal of zero onsite fossil fuel emissions from all new buildings, the Board of Supervisors enacted an all-electric new-construction ordinance in November 2020. Taking effect on June 1, 2021, the ordinance, which applies to all new buildings, prohibits the construction of natural gas or propane infrastructure.[127]

Strategies to Address Greenhouse Gas Emissions in San Francisco. San Francisco has developed many plans and programs for reducing the city's contribution to global climate change and meeting the goals of ordinance 81-08. The 2023 GHG Reduction Strategy Update[128] documents City actions related to pursuing cleaner energy, reducing energy consumption, supporting alternative transportation, and implementing solid waste policies. For instance, the City has implemented requirements and incentives that have measurably reduced GHG emissions. Among these are requirements for increased energy efficiency in new and existing buildings; requirements to install solar panels or vegetation on roofs (i.e., living roofs); implementation of a green building strategy; implementation of a transportation sustainability program; implementation of a better roofs program; adoption of a zero-waste strategy; adoption of a construction and demolition debris recovery ordinance; creation of a solar energy generation subsidy; incorporation of alternative-fuel vehicles in the City's transportation fleet (including buses); and adoption of a mandatory recycling and composting ordinance. The strategy also includes specific regulations for new development, which would reduce GHG emissions generated by anticipated future development. These GHG emissions reduction actions resulted in a 41 percent reduction in GHG emissions in 2019 compared with 1990 levels.[129,130] This level of GHG emissions substantially surpasses the 2020 and 2030 goals in the air district's 2017 Clean Air Plan, Executive Orders S-3-05 and B-30-15, the California Global Warming Solutions Act, the California Global Warming Solutions Act of 2016, and the City's 2017 GHG emissions reduction goal. The 2023 GHG Reduction Strategy Update incorporates the 2021 CAP's GHG emissions targets and strategies.

The July 2021 GHG ordinance required the San Francisco Department of the Environment to prepare and submit to the mayor a climate action plan (CAP) by December 31, 2021. The CAP is to be updated every five years and will carry forward the efforts of the City's previous CAPs and align with the Paris Agreement (e.g.,

---

[127] San Francisco Department of Building Inspection, *All-Electric New Construction Ordinance*, https://sf.gov/all-electric-new-construction-ordinance, accessed May 15, 2024.

[128] San Francisco Planning Department, *2023 Greenhouse Gase Reduction Strategy Update*, October 2023, https://sfplanning.org/project/greenhouse-gas-reduction-strategies#info, accessed May 15, 2024.

[129] The City's greenhouse gas inventory is quantified in accordance with the Greenhouse Gas Protocol for Cities developed by the World Resources Institute, C40, and ICLEI. World Resources Institute, C40 Cities, ICLEI, Global Protocol for Community-Scale Greenhouse Gas Inventories, https://ghgprotocol.org/sites/default/files/standards/GPC_Full_MASTER_RW_v7.pdf, accessed May 15, 2024. Additionally, the annual greenhouse gas inventory is submitted to global reporting entities (Carbon Disclosure Project, C40) and OpenDataSF.

[130] San Francisco Department of the Environment, *San Francisco's Carbon Footprint*, 2020, https://sfenvironment.org/carbonfootprint, accessed May 15, 2024.

limit global warming to 1.5 degrees Celsius) as well as the reduction targets adopted within the GHG ordinance. The CAP will also incorporate an equity framework to address historic inequities; prioritize the social, economic, and environmental benefits from implementing the CAP; and ensure that those benefits are distributed equitably. Other goals of the CAP include identifying synergies with the City's Hazards and Climate Resilience Plan and incorporating frameworks for health and vulnerable populations. Areas of focus in the CAP include energy supply, transportation, land use, building operations, housing, responsible production and consumption, and carbon sequestration. Reduction targets, goals, and/or principles will be outlined for each of these elements. To support the updated 2021 GHG ordinance, the City prepared the 2021 CAP in 2022.[131] The 2021 CAP is a roadmap for meeting the City's emissions reduction goals, which are:

- An interim target of cutting sector-based emissions 61 percent below 1990 levels by 2030.
- Net zero sector-based emissions by 2040, a 90 percent reduction from 1990 levels.

These goals align with the updated GHG ordinance goals and are more aggressive than the state's 2030 and 2045 GHG emission reduction targets, as discussed previously.

SFO Climate Action Planning and Initiatives. SFO first developed a CAP in 2008 as a blueprint for meeting the objectives of San Francisco's GHG Reduction Ordinance (Ordinance 81-08).[132] Consistent with the City's objectives, SFO initially established actions that would help the City reduce its GHG emissions 25 percent below 1990 emissions by 2017, 40 percent below 1990 emissions by 2025, and 80 percent below 1990 emissions by 2050. In 2016, SFO developed a five-year strategic plan, which established the following five sustainability goals for 2017–2021: (1) achieve net zero energy at the Airport, (2) achieve zero waste, (3) achieve carbon neutrality and reduce GHG emissions by 50 percent (from the 1990 baseline), (4) implement a healthy buildings strategy for new and existing infrastructure, and (5) maximize water conservation to achieve 15 percent reduction per passenger per year (from the 2013 baseline).[133] The Airport's progress to meet these goals, respectively, was provided in its annual Climate Action Plan.[134]

In November 2023, SFO adopted the 2023–2028 five-year strategic plan, which includes the following six updated sustainability goals: (1) Adopt a resilience capital plan and program, (2) inspire the public and industry partners to take bold climate actions, (3) achieve net zero carbon for airport-controlled emissions by 2030, (4) reach net zero energy by 2030, (5) become a zero-waste campus, and (6) be a net-zero water campus.[135]

SFO has implemented strategies that support the state, City, and its own climate change regulations, policies, and targets.[136] In fiscal year 2022, SFO reduced GHG emissions from Airport-controlled operations (scope 1 and 2 emissions) by 41 percent below 1990 emissions levels, compared to the Airport's goal to

---

131 City of San Francisco, *San Francisco's Climate Action Plan 2021*, https://sfenvironment.org/climateplan, accessed May 15, 2024.
132 San Francisco Board of Supervisors, Ordinance No. 81-08, Climate Change Goals and Action Plan, https://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances08/o0081-08.pdf, April 29, 2008, accessed May 15, 2024.
133 San Francisco Airport Commission, *San Francisco International Airport Five-Year Strategic Plan 2017–2021*, n.d., https://www.flysfo.com/sites/default/files/assets/pdfs/reports/Strategic-Plan-2017-2021.pdf, accessed May 15, 2024.
134 San Francisco Airport Commission, *Climate Action Plans, n.d.,* https://sustainability.flysfo.com/reports/, accessed November 13, 2024.
135 San Francisco Airport Commission, *Inspiring the Extraordinary: San Francisco International Airport Five-Year Strategic Plan 2023–2028*, November 2023, https://www.flysfo.com/sites/default/files/2023-11/SFO_StratPlan_Doc_Approved_231107_4Web.pdf, accessed May 15, 2024.
136 San Francisco Airport Commission, *Climate Action Plan: Fiscal Year 2021*, n.d., https://www.flysfo.com/sites/default/files/2022-09/SFO_Climate_Action_Plan_FY21_final.pdf, accessed May 15, 2024.

reduce GHG emissions by 50 percent below 1990 emissions level by 2021.[137,138] The Airport achieved these Scope 1 reductions by, among other things, switching to 100 percent carbon-free electricity, using renewable diesel and compressed natural gas, incorporating ZEVs into SFO's vehicle fleet, and preventing refrigerant leaks. Moreover, SFO is developing and implementing plans to achieve a reduction of up to 95 percent in GHG emissions below 1990 levels.[139] Future strategies to achieve these targets could include:

- Implement all-electric new buildings and electrify all existing buildings to eliminate the use of fossil fuels for building energy by 2030.
- Operate a cost-effective central utility plant that runs on carbon-free electricity and uses low-GWP refrigerants.
- Swap fossil fuel–based fleets with all-electric cars, shuttle buses, and an expanded AirTrain; transition 100 percent of Airport-owned light-duty vehicles to electric or clean, alternative energy sources by 2030.
- As part of SFO's ZEV Readiness Roadmap, deploy nearly 2,000 chargers across SFO's campus before 2023, electrifying 10 percent of the Airport's parking stalls.
- Generate onsite renewable electricity via solar photovoltaic panels. Use SFPUC Green Tariff options to transition to 100 percent renewable energy.
- Support airlines in bringing sustainable aviation fuel to SFO. SFO is leading the world's largest initiative to develop and deploy sustainable aviation fuel at an airport, and currently receives the highest volume of sustainable aviation fuel of any airport worldwide.
- Provide robust, load-managed electric vehicle charging infrastructure to facilitate the electrification of passenger, employee, and transportation network company vehicle travel.
- Envision, plan, and activate a transit-first intermodal airport to serve all users.
- Design highly energy-efficient, all-electric, and zero-waste terminal, office, and cargo spaces.
- Eliminate the use of plastic foodware and move to fully compostable materials, eliminate single-use plastic bottles, improve signage and training, and work to identify and reduce embodied emissions in the Airport's material use and construction operations.

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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.

CEQA Guidelines section 15064.4 calls for a "good-faith effort" to "describe, calculate, or estimate" GHG emissions. CEQA Guidelines section 15064.4 also allows lead agencies to rely on a qualitative analysis to describe a project's GHG emissions. In accordance with section 15064.4, the analysis of the significance of

[137] 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 September 13, 2024.
[138] Scope 1 emissions are emissions from sources that are owned or controlled by SFO. Scope 2 emissions are indirect emissions from the production of purchased electricity.
[139] San Francisco Airport Commission, *Climate Action Plan: Fiscal Year 2021*, n.d., https://www.flysfo.com/sites/default/files/2022-09/SFO_Climate_Action_Plan_FY21_final.pdf, accessed May 15, 2024.

GHG emissions impacts should consider the extent to which the project would increase or reduce GHG emissions, exceed a locally applicable threshold of significance, or comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions." The CEQA Guidelines also state that a project may be found to have a less-than-significant impact if it complies with an adopted plan that includes specific measures to reduce GHG emissions (section 15064[h][3]).

Additionally, on April 20, 2022, the air district adopted updated GHG thresholds.[140] Consistent with CEQA Guidelines sections 15064.4 and 15183.5, the updated thresholds for land use projects, such as the RADP, maintain the air district's previous GHG threshold that allowed the analysis for a project consistent with a GHG reduction strategy that meets the criteria under CEQA Guidelines section 15183.5(b) to conclude that the project's GHG impact would be less than significant. The updated thresholds also include an alternative performance-based threshold. Specifically, if a project meets all of the following criteria, the project would result in a less-than-significant GHG impact:

- Project would not include natural gas.
- Project would not result in wasteful, inefficient, or unnecessary energy use.
- Project would result in VMT per capita that is 15 percent below the regional average for residential and office projects and result in no net increase in existing VMT for retail projects.
- Project would meet the CALGreen Code's Tier 2 off-street electric vehicle requirement.

Thus, the determination of the impacts from implementation of the RADP is based on compliance with local, regional, and state plans, policies, and regulations adopted for the purpose of reducing the cumulative impacts of climate change. GHG emissions are analyzed in the context of their contribution to the cumulative effects of climate change because individual projects could never generate enough GHG emissions to result in a noticeable change in the global average temperature.

Because the City's GHG emissions reduction targets are more aggressive than the state's 2030 and 2045 targets, the City's GHG ordinance is consistent with the goals of statewide executive orders and bills (i.e., California Global Warming Solutions Act, California Global Warming Solutions Act of 2016, AB 1279, and Executive Orders S-3-05, B-30-15, and B-55-18). Because the 2023 GHG Reduction Strategy Update incorporates the 2021 CAP, which is consistent with the statewide GHG goals for 2030 and 2045, projects that are consistent with the 2023 GHG Reduction Strategy Update would be consistent with the state's GHG goals and would not conflict with an applicable plan or generate GHG emissions that would make a considerable contribution to global climate change.

Although the California Global Warming Solutions Act's milestone year of 2020 passed just four years ago, San Francisco has already met the 2030 GHG emissions reduction goal of the California Global Warming Solutions Act of 2016 (40 percent below 1990 levels). San Francisco's 2021 GHG ordinance includes a pathway to carbon neutrality by 2040 and the 2050 goals of the California Global Warming Solutions Act of 2016. Furthermore, the 2022 Scoping Plan is the state's overarching plan for addressing climate change and its recommendations are intended to curb projected business-as-usual increases in GHG emissions and reduce them to 48 percent below 1990 levels by 2030 and 85 percent below 1990 levels by 2045. The 2022 Scoping

140 Bay Area Air Quality Management District, CEQA Thresholds and Guidelines Update, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed June 6, 2024.

Plan also puts the state on a preliminary pathway to achieve carbon neutrality by 2045. Meeting the emissions targets of SB 32 for 2030 and AB 1279 for 2045 would result in an overall annual net decrease in GHG emissions compared with current levels and account for the projected increases in emissions resulting from anticipated growth.

In summary, the CEQA Guidelines allow a lead agency to determine that projects consistent with an adopted local GHG reduction strategy that meets the criteria under CEQA Guidelines section 15183.5(b) would result in a less-than-significant GHG impact. Specifically, under CEQA Guidelines section 15183.5(b)(2) if a jurisdiction has adopted a climate action plan that satisfies all of the section 15183.5 requirements, the jurisdiction can find that a project that is consistent with the plan will not make a cumulatively considerable contribution to global climate change under CEQA. San Francisco has a GHG reduction strategy that is consistent with state and regional GHG emissions reduction goals and is effective because it has met state and regional GHG goals in advance of target dates. Therefore, projects that are consistent with San Francisco's 2023 GHG Reduction Strategy would not result in GHG emissions that would have a significant effect on the environment, and would not conflict with state, regional, or local GHG reduction plans and regulations.

Impacts and Mitigation Measures

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. *(Less than Significant)*

Individual projects contribute to the cumulative effects of climate change by directly or indirectly emitting GHGs during the construction and operational phases. As noted above, adoption of the RADP would not immediately result in new development or direct physical changes in the environment. However, subsequent projects that could occur with implementation of the RADP would result in GHG emissions.

Construction

Construction of projects that could occur with implementation of the RADP would occur over an approximately 20-year buildout period from 2025 to 2045, resulting in temporary GHG emissions during construction activities. The projects proposed under the RADP would ensure that the Airport's level of service 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. Sources of direct construction emissions would include trips by construction vehicles and the use of off-road equipment. Indirect construction emissions sources would include electricity providers (for equipment and vehicles); energy required to pump, treat, and convey water used during construction; and waste removal, disposal, and landfill operations.

Construction workers would receive discounted Caltrain and BART transit passes to commute to and from the subsequent project sites and would be offered a shuttle from worker parking lots to construction staging areas. These programs would reduce GHG emissions from single-occupancy vehicles used by construction workers because they would promote the use of alternative transportation modes with zero or lower GHG emissions on a per capita basis.

Construction equipment would be required to meet several requirements, such as idling restrictions and the conditions of an onsite maintenance program to reduce emissions from frequently used equipment. The construction fleet – both on-road vehicles and off-road equipment – may also use biodiesel or renewable diesel if it can be demonstrated by SFO that using such fuels would reduce emissions of criteria air pollutants and GHGs compared to conventional diesel. Furthermore, the construction contractors would be required to use electric equipment where feasible in compliance with the Airport's Standard Construction Measure Division 01 57 00.[141] Electric equipment could include, but is not limited to, concrete/industrial saws, sweepers/scrubbers, welding machines, air compressors, cranes, forklifts, pumps, cement and mortar mixers, generators, and portable equipment.

The RADP's waste-related emissions would be reduced through compliance with the City's Recycling and Composting Ordinance,[142] Construction and Demolition Debris Recovery Ordinance,[143] and Construction and Demolition Debris Recycling Requirements.[144] In addition, the Airport's Standard Construction Measure Division 01 35 43.07 requires the contractor to develop and implement a construction and demolition debris management plan to comply with the debris and waste management requirements of the City and SFO, and the CALGreen Code's construction and demolition diversion requirements.[145] This standard construction measure also requires source reduction and onsite reuse and recycling of materials. Together, these regulations reduce the amount of materials sent to a landfill, thereby reducing GHG emissions from landfill operations. These regulations also promote the reuse of materials, conserving their *embodied energy*[146] and reducing the energy required to produce new materials.

With compliance with existing regulations and programs, the impact of subsequent projects that could occur with implementation of the RADP related to GHG emissions from construction would be ***less than significant***.

Mitigation: None required.

Operation

During operations, direct GHG emissions sources would include new vehicle trips, stationary sources (backup diesel generators), and landscaping equipment. Indirect emissions sources would include electricity providers; energy required to pump, treat, and convey water; and waste removal, disposal, and landfill operations.

The RADP would not induce passenger demand. It also would not increase the capacity of the airfield, change the configuration of the existing runways, alter aircraft operations or types of aircraft operating at the Airport (including cargo, private jets, and helicopters), or change the annual volume of passengers that

---

[141] Airport Standard Construction Measures, Continued Division 01 – General Requirements: Temporary Controls. San Francisco International Airport, *San Francisco International Airport Standard Construction Measures Implementation Subject: In Construction Contracts and Maintenance Projects*, March 3, 2020.

[142] San Francisco Mandatory Recycling and Composting Ordinance No. 100-09, June 2009, https://www.sfenvironment.org/files/policy/sfe_zw_sf_mandatory_recycling_composting_ord_100-09.pdf. As amended July 2019, https://www.sfenvironment.org/files/fliers/files/sfe_zw_refuse_separation_ordinance_regulations_signed.pdf, accessed September 12, 2024.

[143] San Francisco Construction and Demolition Debris Recovery Ordinance No. 144-21, January 2022, https://www.sfenvironment.org/files/cd_enforcement_regulations_signed_tj.pdf, accessed September 12, 2024.

[144] San Francisco Environment Department, Construction & Demolition Debris Recovery Law, n.d., https://www.sfenvironment.org/construction-demolition-requirements, accessed September 12, 2024.

[145] Airport Standard Construction Measures, Division 01 – General Requirements: Recovery, Reuse, and Recycling Requirements. San Francisco International Airport, *San Francisco International Airport Standard Construction Measures Implementation Subject: In Construction Contracts and Maintenance Projects*, March 3, 2020.

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

choose to fly into and out of SFO (see Appendix C, Airport Facilities to Accommodate Aviation Demand). Therefore, implementation of the RADP would not generate GHG emissions from aircraft-related sources, such as aircraft landing and takeoff, refueling, and operation of auxiliary power units and ground support equipment.[147]

Subsequent projects that could occur under the RADP would contribute to annual long-term increases in GHG emissions because of mobile-source emissions from the daily vehicle trips from an estimated approximately 2,700 new employees and an additional approximately 255 net new vendor deliveries per day (for a total of 510 truck trips per day). Increased operations would also result in an increase in energy use, water use, wastewater treatment, and solid waste disposal. The maintenance, testing, and operation of backup emergency diesel generators for RADP projects would also generate GHGs, and construction activities would result in temporary emissions increases.

As discussed previously, SFO has implemented strategies supporting the City's climate change initiatives, reduced GHG emissions from Airport-controlled operations by 41 percent below 1990 emissions levels, and identified future strategies to achieve further reduction targets.[148,149] Therefore, this analysis discusses whether the RADP's construction-related and operational GHG emissions would be consistent with the City and County of San Francisco's 2023 GHG Reduction Strategy, the City of San Francisco 2021 Climate Action Plan, the SFO Fiscal Year 2021 Climate Action Plan, and the 2022 Scoping Plan.

SFO shares the City's 2021 Climate Action Plan goal of net zero GHG emissions for Airport-controlled operations by 2030. Consequently, SFO analyzes GHG emissions–generating activities via the Airport's most recent Fiscal Year 2021 Climate Action Plan and recognizes transportation as a major source of carbon emissions. The Airport's heavy-duty vehicles operate on renewable diesel and landfill-derived compressed natural gas, leaving only light-duty vehicles powered by fossil fuels (gasoline). 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 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.[150] SFO will continue to pursue low-carbon transportation alternatives and low-emissions onsite energy generation with implementation of RADP projects pursuant to their GHG reduction goals, thereby minimizing the Airport's contributions to GHG emissions.

---

147 Aircraft taxiing to gates at the proposed Boarding Area H (RADP Project #1) would result in an approximately 900-foot westward shift from where aircraft currently taxi to gates at Boarding Area G. However, aircraft already taxi to and park in the same location where aircraft would park with Boarding Area H. Therefore, there would be no considerable change in aircraft taxi time with implementation of RADP.

148 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 September 13, 2024.

149 San Francisco Airport Commission, *Climate Action Plan: Fiscal Year 2021*, n.d., https://www.flysfo.com/sites/default/files/2022-09/SFO_Climate_Action_Plan_FY21_final.pdf, accessed May 15, 2024.

150 San Francisco International Airport Sustainability Department, *Distributed Energy Resources*, 2023, https://sustainability.flysfo.com/distributed-energy-resources/, accessed September 12, 2024.

SFO's 2023–2028 five-year strategic plan includes Goal 4, Take Bold Climate Action, which includes six sustainability objectives:[151]

- **Objective 4.1** calls for adopting a resilience capital plan and program to respond to and rebound from geologic, climatic, and human-caused hazards, shocks, and stressors.
- **Objective 4.2** directs the Airport to inspire the public and industry partners to take bold climate actions.
- **Objective 4.3** directs the Airport to achieve net zero carbon for Airport-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 Airport-owned light-duty vehicles to electric 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.
- **Objective 4.4** 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, the Airport plans to install renewable energy and monitoring equipment to increase SFO'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.
- **Objective 4.5** directs the Airport to become a zero-waste campus for Airport-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.
- **Objective 4.6** directs the Airport 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, the Airport 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.

Subsequent projects implemented pursuant to the RADP would be subject to regulations adopted to reduce GHG emissions as identified in the 2023 GHG Reduction Strategy. Subsequent projects would also be consistent with SFO's Climate Action Plan and initiatives, such as all-electric new buildings, SFO fleet vehicle turnover to ZEVs, and EV charging deployment. As discussed below, compliance with the applicable regulations would reduce the RADP's GHG emissions related to construction activities, transportation, energy consumption (including all-electric buildings), renewable energy, waste reduction, and use of refrigerants.

The RADP would include all-electric buildings with no natural gas combustion. All new buildings would be constructed to meet Leadership in Energy and Environmental Design (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 System; and

---

[151] San Francisco Airport Commission, *Inspiring the Extraordinary: San Francisco International Airport Five-Year Strategic Plan 2023–2028*, November 2023, https://www.flysfo.com/sites/default/files/2023-11/SFO_StratPlan_Doc_Approved_231107_4Web.pdf, accessed May 15, 2024.

providing a real-time monitoring and diagnostic action plan to reduce energy consumption coordinating with campus-wide systems.

Compliance with planning code section 155 (bicycle parking and facilities), planning code section 166 (carsharing 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 GHG emissions from single-occupancy vehicles by promoting the use of alternative transportation modes with zero or lower GHG 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, transit initiatives, and transportation management.

Subsequent projects that could occur pursuant to the RADP would comply with green-building requirements for energy efficiency, such as the CALGreen Code requirements. All RADP projects would meet or exceed LEED Gold requirements. These subsequent projects would comply with the City's All-Electric New Construction Ordinance. Compliance with these requirements would promote energy and water efficiency, thereby reducing the subsequent RADP projects' energy-related GHG emissions. The subsequent projects also would include onsite rooftop solar photovoltaic systems. These photovoltaic systems would comply with CALGreen Code requirements related to onsite renewable energy generation.

The RADP projects' waste-related emissions would be reduced through compliance with Chapter 7, Municipal Green Building Requirements, of the San Francisco Environment Code by implementing the Airport's Standard Construction Measure Division 01 35 43.07, Recovery, Reuse, and Recycling Requirements. This standard construction measure requires contractors to develop and implement a construction and demolition debris management plan, separate source materials, and divert at least 75 percent of their construction and demolition waste material, which would reduce the amount of materials sent to a landfill, thus reducing GHG emissions from landfill operations. The San Francisco Department of the Environment tracks compliance with this measure through contractor submittals for all SFO construction projects.[152]

SFO is required to comply with the City's GHG reduction regulations, which have proven effective, as the City's GHG emissions decreased by 48 percent between 1990 and 2020.[153] The City's GHG levels were reduced by 41 percent in 2019 compared to 1990 emissions levels, which far exceeded the statewide GHG reduction target (1990 levels) and achieved the City's local 2025 target (40 percent below 1990 levels) six years in advance of the target year. This progress puts the City on the trajectory to meet the 2030 emissions reduction target (61 percent below 1990 levels) and the 2045 target (90 percent below 1990 levels), as envisioned in the 2021 CAP.

The City will continue updating its regulations and ordinances for new development to achieve its 2030 and 2045 targets. The City will update its GHG Reduction Strategy to incorporate these new regulations. These new regulations and ordinances will apply to subsequent projects that could occur pursuant to the RADP, as individual development applications are submitted to the City for approval. Other existing regulations, such as those implemented through AB 32 and SB 32, will continue to reduce the RADP projects' contribution to climate change.

---

[152] San Francisco International Airport, *Zero Waste Plan*, https://www.flysfo.com/sites/default/files/media/sfo/community-environment/13259_Zero_Waste_Roadmap.pdf, accessed June 6, 2024.
[153] San Francisco Department of the Environment, *San Francisco's Carbon Footprint*, https://www.sfenvironment.org/carbonfootprint, accessed June 3, 2024.

Furthermore, SFO has implemented strategies that support the City's climate change initiatives, and GHG emissions from Airport-controlled operations have been reduced by 35 percent below 1990 emissions levels. Additionally, subsequent RADP projects would be required to comply with the applicable regulations and plans noted previously. As such, subsequent projects that could occur pursuant to the RADP would be consistent with San Francisco's 2023 GHG Reduction Strategy and would be required to comply with regulations that have been proven effective at meeting the City's GHG reduction targets.

Because subsequent projects under the RADP would be consistent with the City's 2023 GHG Reduction Strategy and 2021 CAP, the RADP would also be consistent with the GHG emissions reduction goals of Executive Orders S-3-05, B-30-15, and B-55-18, the California Global Warming Solutions Act of 2016, AB 1279, the 2022 Scoping Plan, and the clean air plan, and would not conflict with these plans.

Subsequent projects that could occur pursuant to the RADP would meet the air district's performance-based GHG threshold because they would not include natural gas infrastructure and would be consistent with 2022 CALGreen Code Tier 2 electric vehicle infrastructure standards. Additionally, as discussed in Section 3.A, Transportation and Circulation, subsequent projects that could occur pursuant to the RADP would not change passenger or employee VMT per capita and would not cause substantial additional VMT. Lastly, as discussed under Topic E.20, Energy, the RADP would not result in a wasteful, inefficient, or unnecessary use of energy.

With compliance with existing regulations and programs, the operational impacts of subsequent projects that could occur with implementation of the RADP related to GHG emissions would be ***less than significant***.

Mitigation: None required.

E.10 Wind

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
10.WIND. Would the project:					
a) Create wind hazards in publicly accessible areas of substantial pedestrian use?	☐	☐	☒	☐	☐

Environmental Setting

Meteorological data collected at the Airport show that west-southwesterly through northwesterly winds are the most frequent and strongest winds during all seasons.[154,155] This is reflected in the orientation of the Airport's primary runways where they align with the direction of the prevailing winds based on the total

[154] Wind directions are reported as directions from which the winds blow.
[155] Iowa State University, Iowa Environmental Mesonet, *Windrose Plan for [SFO] San Francisco Intl, 1970–2023*, https://www.mesonet.agron.iastate.edu/sites/windrose.phtml?station=SFO&network=CA_ASOS, accessed April 15, 2024.

number of weather observations from the National Oceanic and Atmospheric Administration.[156] Average wind speeds at the Airport are highest in the summer and lowest in the winter. However, the strongest peak wind speeds (gusts) occur in the winter and are generally associated with storm conditions; typically, these winds blow from the southeast and proximate directions, although their frequency is limited to storm conditions. During most of the year, average wind speeds are highest in the mid-afternoon and lowest in the early morning.[157] The highest mean hourly wind speeds at the Airport occur in the mid-afternoon in July, when nearly 50 percent of all winds are measured at 15 miles per hour (mph) or more. The lowest mean hourly wind speeds occur in November, December, and January, when wind speeds throughout the day average less than 8 mph.[158]

Wind Effects on People

The comfort of pedestrians varies based on the conditions of sun exposure, temperature, clothing, and wind speed:[159]

- Winds up to about 4 mph have no noticeable effect on pedestrian comfort.
- With speeds from 4 to 8 mph, wind is felt on the face.
- Winds from 8 to 13 mph will cause clothing to flap and extend a light flag mounted on a pole.
- Winds from 13 to 19 mph will raise loose paper, dust, and dry soil.
- The force of winds from 19 to 26 mph will be felt on the body.
- With 26 to 34 mph winds, umbrellas are difficult to use, walking steadily is difficult, and wind noise is unpleasant.
- Winds stronger than 34 mph and gusts can blow people over.

Wind Effects from Buildings

Tall buildings and exposed structures can strongly affect the wind environment for pedestrians. A building that stands alone or is much taller than the surrounding buildings can intercept and redirect winds that might otherwise flow overhead, then bring those winds down the vertical face of the building to ground level, where they create ground-level wind and turbulence. During normally prevailing westerly winds, this effect is most often noticeable near the northwest and southwest corners of tall buildings, where prevailing winds from the northwest and west strike west-facing building façades and are redirected and accelerated around the buildings' northwest and southwest corners. These redirected winds can be relatively strong and turbulent and, in some instances, may be incompatible with the intended uses of nearby ground-level pedestrian spaces. Moreover, structural designs that present tall flat surfaces square to strong winds can create ground-level winds that can be hazardous to pedestrians. Conversely, a building with a height similar

[156] Federal Aviation Administration, Advisory Circular 150/5300-13 Change 1, *Airport Design,* August 16, 2024, https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC-150-5300-13B-Airport-Design-Chg1.pdf, accessed November 6, 2024.
[157] Arens, E., D. Ballanti, C. Bennett, S. Guldman, and B. White, "Developing the San Francisco Wind Ordinance and its Guidelines for Compliance," *Building and Environment*, Vol. 24, No. 4 (1989), pp. 297–303.
[158] Iowa State University, Iowa Environmental Mesonet, *Windrose Plan for [SFO] San Francisco Intl, 1970–2023*, https://www.mesonet.agron.iastate.edu/sites/windrose.phtml?station=SFO&network=CA_ASOS, accessed April 15, 2024.
[159] Lawson, T. V., and A. D. Penwarden, "The Effects of Wind on People in the Vicinity of Buildings," *Proceedings of the Fourth International Conference on Wind Effects on Buildings and Structures*: London, 1975; Cambridge University Press, 1976, pp. 605–622.

to the heights of surrounding buildings typically would cause little or no additional ground-level wind acceleration and turbulence.

Thus, wind impacts are generally caused when a large building mass extends substantially above its surroundings, and when a building is oriented so that a large wall catches a prevailing wind, particularly if such a wall includes little or no articulation. In general, new buildings less than approximately 85 feet tall are unlikely to result in substantial adverse effects on ground-level winds that would make pedestrians uncomfortable or cause hazardous wind conditions. Such winds may occur under existing conditions, but shorter buildings typically do not cause substantial changes in ground-level winds.

Regulatory Framework

San Francisco Planning Code section 148 codifies wind requirements and establishes wind speed criteria for the Downtown (C-3) use districts.[160] Section 148 defines *equivalent wind speed* as "an hourly mean wind speed adjusted to incorporate the effect of gustiness or turbulence on pedestrians." Under section 148, a hazardous wind condition exists when the wind speed at a particular location exceeds 26 mph for a single hour of the year. Section 148 also establishes pedestrian *comfort wind speed* criteria: in areas of substantial pedestrian use, 11 mph for no more than 10 percent of the time year-round between 7 a.m. and 6 p.m.; and in public seating areas, 7 mph for no more than 10 percent of the time year-round between 7 a.m. and 6 p.m.

The RADP project site is not in a use district where wind standards apply. Therefore, the City does not require that subsequent projects that could occur pursuant to the RADP be subject to the planning code's regulatory framework for wind speeds. For this reason, the wind analysis in this section relies on qualitative criteria to determine whether the RADP projects would result in hazardous pedestrian-level winds.

Impacts and Mitigation Measures

Impact WI-1: The RADP would not create wind hazards in publicly accessible areas of substantial pedestrian use. *(Less than Significant)*

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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.

The RADP includes four projects that would involve new construction of buildings more than 85 feet tall: Boarding Area H (RADP Project #1), the Central Hub (RADP Project #6), and the Aircraft Maintenance Hangar (RADP Project #18). Of these, one—the Aircraft Maintenance Hangar—would be constructed within the East Field area and would not be near any publicly accessible areas of pedestrian use. Therefore, this project is not discussed further.

The approximately 1,618,900-square-foot, approximately 100-foot-tall Boarding Area H would comprise five levels, including a utilidor (a subgrade utility corridor). The portion of Boarding Area H along North Link Road would be constructed adjacent to existing structures such as Boarding Area G and elevated terminal

[160] Other sections of the San Francisco Planning Code apply comparable standards in the Downtown Residential (DTR) districts, the Folsom and Main Residential/Commercial Special Use District, the Van Ness Special Use District, and certain zoning districts in the South of Market neighborhood.

roadways and therefore, would not substantially alter existing wind conditions. The portion of Boarding Area H along North McDonnell Road would be adjacent to the elevated AirTrain tracks and therefore, also would not substantially alter existing wind conditions given the presence of the intervening elevated AirTrain tracks. For these reasons, Boarding Area H would not result in adverse wind impacts on the limited pedestrian traffic on the North McDonnell Road sidewalks.

The Central Hub project would demolish the existing five-level, 81-foot-tall, seismically deficient Central Parking Garage in the Terminal Area and construct a new, nine-level (up to 175-foot-tall) Central Hub, capable of accommodating up to 10,000 public parking spaces. The Central Hub would be 94 feet taller than the existing Central Parking Garage.

As discussed previously, buildings less than 85 feet tall generally do not redirect substantial wind to ground level. In addition, wind speeds in outdoor areas and along sidewalks at SFO are already generally reduced by the existing Airport buildings and by elevated Airport structures and the AirTrain. Therefore, RADP projects other than the Central Hub would not be expected to substantially alter wind speeds in a manner that would create hazardous wind conditions in areas of pedestrian use.

The Central Hub would be surrounded by Terminals 1–3 on the north, east, and south and the International Terminal Building on the west (see Draft EIR Figure 2-6, p. 2-20). As described previously, winds blow primarily from the west through the northwest. Because the International Terminal Building and Terminal 3 would be adjacent to the location of the Central Hub to the west and northwest, these buildings would provide shelter from winds blowing from the west. In addition, like the existing Central Parking Garage, the Central Hub would be round; this would prevent wind acceleration at corners, a common problem for buildings with 90-degree corners. Furthermore, the Central Hub is anticipated to be an open-air structure and porous on all sides and on all levels, as is typical of parking garages. This would serve to minimize the potential for *downwashing* or *channeling.*[161]

Publicly accessible outdoor areas near the Central Hub would be limited to existing curbsides, which are used primarily by departing and arriving passengers who are being dropped off or waiting to be picked up. Many existing curbside locations are covered by overhangs, which would block winds that may be redirected down the façades of adjacent buildings. The outdoor areas not covered by overhangs are limited in extent and are located primarily between terminals at connecting walkways where fewer pedestrians are present. Moreover, the Central Hub, like the existing Central Parking Garage, would be separated from terminal curbsides by the departures-level and arrivals-level roadways, each of which is a minimum of approximately 100 feet wide. This distance would attenuate any winds accelerated by the Central Hub before those winds reach the sidewalks outside the terminals. Therefore, the RADP would not increase wind speeds at publicly accessible locations at the Airport to a level that would be considered hazardous, and this impact would be ***less than significant***.

Mitigation: None required.

[161] *Downwashing* occurs when tall buildings intercept stronger winds and redirect them to ground level. *Channeling* is the acceleration of wind as it travels through narrow spaces between buildings.

Impact C-WI-1: The RADP in combination with cumulative projects would not result in a significant cumulative wind impact. *(Less than Significant)*

The geographic context for the analysis of potential cumulative impacts related to wind consists of the development and infrastructure projects located within 0.25 mile of the RADP project site that are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11. The cumulative projects do not include buildings more than 85 feet tall. Moreover, because of their distance to the RADP project site, these projects would not combine with subsequent projects that could occur with implementation of the RADP to redirect winds or cause increases in wind speeds at ground level. Therefore, the cumulative wind impact would be ***less than significant***.

Mitigation: None required.

E.11 Shadow

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
11. SHADOW. Would the project:					
a) Create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces?	☐	☐	☒	☐	☐

Environmental Setting

No City parks or other publicly accessible open spaces exist in the RADP project site. A portion of the San Francisco Bay Trail (Bay Trail) is located along the north side of North Access Road and continues south along the western edge of the Airport and under the U.S. 101/Interstate 380 ramps to the intersection of South Airport Boulevard and North Access Road.

Parks near SFO include Seventh Avenue Park, Lions Park, and Lomita Park in San Bruno and Marina Vista Park, Bayside Manor Park, SFO's Bayfront Park, and Green Hills Park in Millbrae.

Regulatory Framework

Section 295 of the San Francisco Planning Code generally prohibits new structures more than 40 feet tall that would cast additional shadows on open space under the San Francisco Recreation and Park Commission's jurisdiction between one hour after sunrise and one hour before sunset, at any time of the year, unless that shadow would not result in a significant adverse effect on use of the open space.

The threshold for determining the significance of impacts under CEQA is whether a project would create new shadow in a manner that would substantially and adversely affect the use and enjoyment of outdoor publicly accessible open spaces. This threshold applies whether or not those facilities or areas are protected by planning code section 295 (are under the jurisdiction of public entities other than the recreation and park commission or are privately owned public open spaces). In addition, as under section 295, the CEQA analysis of shadow impacts accounts for the usage of the open space; time(s) of day and year of project shadow; physical layout of the facilities affected; intensity, size, shape, and location of the shadow; and proportion of open space affected.

Impacts and Mitigation Measures

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. ***(Less than Significant)***

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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.

No City parks or other publicly accessible open spaces exist in the RADP's potential shadow area; therefore, no parks or open spaces would be affected by shadow caused by subsequent projects that could occur with implementation of the RADP. Shadow from subsequent RADP projects also would not reach any publicly accessible open spaces at any point during the year in parks near SFO in San Bruno and Millbrae.

As described in Draft EIR Chapter 2, Project Description, RADP projects include the Consolidated Rental Car Center Facility, the Consolidated Rental Car Center Quick Turn Around Facility, and Long-Term Parking Garage #3, which would include new structures from 71 to 83 feet tall. Because the sun rises, as a general rule, in the east, these buildings would cast new shadow on a section of the Bay Trail along the Airport's northwestern perimeter in the morning throughout the year.[162] However, this section of the Bay Trail is not along the bay shoreline; it lacks scenic views, seating, landscaping, or other features or amenities that would cause people to linger; and it is not in an area where access to sunlight is important to the use and enjoyment of the trail. Therefore, this trail section functions primarily as a transit corridor for pedestrians, bicyclists, runners, and other trail users. Moreover, the length of the affected section of the trail (0.5 mile) is not substantial relative to the overall 350-mile length of the existing Bay Trail along the San Francisco waterfront (a total of 500 miles is planned). Lastly, the shadow effect on the trail would be of limited duration, occurring only in the morning, and would be gone at or before noon throughout the year. Therefore, with implementation of the RADP, Bay Trail users could continue to use the trail as a pedestrian and bicycling path. Thus, shadow cast by subsequent RADP projects would not substantially or adversely affect the use and enjoyment of the existing Bay Trail.

Subsequent projects that could occur pursuant to the RADP would cast new shadow on the Bay Trail, but the extent and duration of the increased shadow coverage would be limited and would not adversely affect the use of these areas. Therefore, shadow impacts related to implementation of the RADP would be ***less than significant***.

Mitigation: None required.

---

[162] Sunrise occurs between east-northeast in June and east-southeast in December.

Impact C-SH-1: The RADP in combination with cumulative projects would not result in a significant cumulative shadow impact. ***(Less than Significant)***

The geographic context for the analysis of potential cumulative impacts related to shadow consists of the development and infrastructure projects located within 0.25 mile of the RADP project site that are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Figure 3-1, p. 3-11. None of the cumulative projects listed in Table 3-2 would include structures tall enough to cast shadow on the segment of the Bay Trail adjacent to SFO property. Only one of the cumulative projects listed in Table 3-2, the A-1 Self Storage facility (cumulative project #19) on the SamTrans peninsula in South San Francisco, would have the potential to newly shadow a portion of the Bay Trail not adjacent to SFO. Assuming a 65-foot-tall building (consistent with the site's height limit), this facility would add new shadow to portions of the Bay Trail that make a circuit of the peninsula throughout the year. However, the shadow would move across the peninsula throughout the day and would occur for a limited duration at any given location. Given that no RADP projects would add shadow to this portion of the Bay Trail, shadow from cumulative projects would not combine with shadow from RADP projects to result in a significant cumulative shadow impact, and this impact would be ***less than significant***.

Mitigation: None required.

E.12 Recreation

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
12. RECREATION. Would the project:					
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?	☐	☐	☒	☐	☐
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☒	☐	☐

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. ***(Less than Significant)***

The RADP project site is located entirely within the Airport's boundaries and does not contain any neighborhood or regional parks. A portion of the Bay Trail is located along the northern boundary of the

RADP project site north of North Access Road and continues south along the western edge of the Airport and under the U.S. 101/Interstate 380 ramps to the intersection of South Airport Boulevard and North Access Road. Parks near SFO include Seventh Avenue Park, Lions Park, and Lomita Park in San Bruno and Marina Vista Park, Bayside Manor Park, SFO's Bayfront Park, and Green Hills Park in Millbrae.

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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. The RADP does not include residential land uses that would increase the use of existing recreational facilities in the area. As discussed in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, implementation of the RADP would increase the number of employees at the project site by approximately 2,700 persons at full buildout. This increase in the number of employees could generate additional demand for neighborhood parks and recreational facilities.

In general, new employees may use parks and recreational facilities during the midday lunch period, during other midday breaks, and after work, particularly in the case of employees who also reside in nearby cities. New employees could use local parks and recreational facilities in passive ways, such as for eating, sitting, or reading for short periods of time. However, passive recreational uses tend to involve a lower level of activity than active uses and are less likely to involve the intensive management, maintenance, and high costs that are common for active recreational uses. Therefore, the mostly passive use of existing recreational facilities that could result from new employees with implementation of the RADP would not cause a substantial deterioration of existing neighborhood and regional parks or recreational facilities or necessitate the construction or expansion of existing recreational facilities. This impact would be ***less than significant***.

Mitigation: None required.

Impact C-RE-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on recreational facilities. ***(Less than Significant)***

The geographic context for the analysis of potential cumulative impacts related to recreational facilities consists of the development and infrastructure projects located within 0.25 mile of the RADP project site that are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11.

As discussed under Impact RE-1, the RADP does not include residential uses that would increase the use of existing neighborhood and regional parks or recreational facilities in the area. The incremental increase in the number of employees that would result from implementation of the RADP could generate additional passive demand for neighborhood parks and recreational facilities. However, the RADP would not create a substantial increase in the use of existing neighborhood or regional recreational facilities such that physical deterioration or degradation of existing facilities would occur, nor would it result in the need to expand or construct recreational facilities.

Furthermore, the surrounding cities of South San Francisco, San Bruno, and Millbrae reassess their inventory of parks, open space, and recreational facilities to ensure that the needs of all residents are met. These cities identify new or expanded parks or facilities to meet desired service ratios based on regional growth projections, and the development of new or expanded facilities would be subject to environmental review pursuant to CEQA.

For these reasons, recreational impacts from cumulative projects would not combine with recreational impacts from RADP projects to result in a significant cumulative impact related to recreation, and this impact would be ***less than significant***.

Mitigation: None required.

E.13 Utilities and Service Systems

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
13. UTILITIES AND SERVICE SYSTEMS. Would the project:					
a) Require or result in the relocation or construction of new or expanded, water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☒	☐	☐
c) Result in a determination by the wastewater treatment provider which 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?	☐	☐	☒	☐	☐
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐	☐

Environmental Setting

The Airport is served by existing public and investor-owned utility service systems, including facilities for the collection and treatment of stormwater and wastewater; provision of potable and fire water supply; solid waste collection and recycling; and power distribution.

Stormwater Facilities and Industrial Wastewater

The Airport's drainage basin area includes approximately 2,100 acres of Airport property east of U.S. 101, divided into eight separate *subbasins*.[163] 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 site is collected through a series of inlets and collection pipes. Four detention basins, each with its own detention facility, divert the "first flush" of a rainfall event to the industrial wastewater treatment plant at the Mel Leong Treatment Plant (MLTP). The MLTP is a wastewater and stormwater treatment plant operated by SFO that serves all Airport systems and facilities and is in the northeast portion of the Airport (see Draft EIR Figure 2-4, p. 2-9). After the first flush, stormwater is conveyed to the bay via stormwater outfalls. Conveyance for the system operates mostly by gravity; however, 19 existing pump stations are used as part of the stormwater system. The Airport is at a low elevation and is flat, averaging about 2.5 feet above the mean high-tide elevation of San Francisco Bay.[164] For this reason, stormwater must be discharged to the outfall locations via a stormwater pump station.

Sanitary Sewer

The MLTP includes two sub-plants: an industrial wastewater treatment plant and a sanitary waste treatment plant. The sanitary waste treatment plant treats wastewater from potable uses such as terminal restrooms, hangars, restaurants, and retail shops.[165]

As a result of the Airport's low, flat elevation, the system requires the use of lift and pump stations to convey wastewater and stormwater to the treatment facility. The MLTP treats and discharges both the sanitary and industrial wastewater in accordance with federal and state permits.[166] The facility can treat up to 4.4 million gallons per day at peak flows. The solids are separated and the dried sludge is removed and hauled to a landfill. A portion of the treated effluent is used as *reclaimed water*[167] at the Airport. The remaining effluent is pumped to the plant's North Bayside System Unit, where the effluent is combined with effluent from surrounding municipalities for dechlorination and deepwater discharge into San Francisco Bay, or conveyed for final processing at the South San Francisco – San Bruno Water Quality Control Plant (see Draft EIR Figure 2-1, p. 2-4).[168]

---

[163] A *sub-basin* is a structural geologic feature where a larger basin is divided into a series of smaller basins with intervening intrabasinal highs.
[164] *Mean high tide* means the average height of all daily high tides recorded over a specified period at a given location. Note the Geology and Soils and Hydrology and Water Quality sections reference an elevation range from 2.5 to 12.5 feet above the North American Vertical Datum of 1988, which is the relevant datum for those topics.
[165] San Francisco International Airport, *Draft Final Airport Development Plan*, 2016, https://www.flysfo.com/about-sfo/sfo-tomorrow/draft-final-airport-development-plan#:~:text=The%20ADP%20includes%20a%20series,overarching%20strategic%20goals%20and%20objectives, accessed June 4, 2024.
[166] San Francisco Bay Regional Water Quality Control Board, National Pollutant Discharge Elimination System Permit (No. CA0038318) and Waste Discharge Requirements (Order No. R2-2018-0045).
[167] *Reclaimed water* is wastewater that has been treated and converted to water that can be reused for other purposes.
[168] San Francisco Bay Regional Water Quality Control Board, National Pollutant Discharge Elimination System Permit (No. CA0038318) and Waste Discharge Requirements (Order No. R2-2018-0045).

Potable/Fire Water Supply

As a department of the City and County of San Francisco, SFO purchases municipal water from SFPUC's Hetch Hetchy Reservoir in Yosemite National Park and protected local watersheds in the bay area. Both domestic water and fire water supply are supplied by Airport infrastructure. The Airport's water supply system connects to the regional water supply in two locations near U.S. 101 via three supply mains.

Solid Waste Collection and Recycling

SFO continues to recycle nearly all of its construction and demolition waste, with a consistent recycling rate of over 90 percent. To maintain a high level of waste diversion from capital and tenant construction projects, SFO works closely with contractors to ensure all projects are meeting recovery and tracking requirements, which are then reported to the San Francisco Department of the Environment. Operational solid waste generated at the Airport is sorted into color-coded bins by type in accordance with SFO waste sorting requirements. Following sorting, SFO's solid waste contractor consolidates, removes, and transports all refuse generated at SFO. In accordance with its contract with SFO, the contractor must maximize diversion of compostables and recyclables from a landfill, from the point of collecting refuse at the materials recovery areas, which serves a critical role in SFO meeting its strategic zero waste goal.

Power Distribution

The Airport is served by two 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.[169] In addition, approximately 47 stationary diesel-powered emergency generators are located throughout the Airport.

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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. As presented in Draft EIR Table 3-1, Summary of Employment Growth Projections, p. 3-6, employment growth attributable to implementation of the RADP would increase the number of employees by approximately 2,700 at full buildout.

Effects on utilities and service systems could result as subsequent projects that could occur with implementation of the RADP introduce new employees on the project site and new buildings and infrastructure that require utility service. Accordingly, the analysis in this section evaluates the potential effects of the RADP on utilities and service systems.

[169] San Francisco International Airport, *Climate Action Plan, Fiscal Year 2021*, https://sustainability.flysfo.com/reports-2/, accessed October 3, 2024.

Impacts and Mitigation Measures

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. ***(Less than Significant)***

Wastewater Treatment Facilities

As discussed under Impact UT-3, the MLTP has sufficient capacity to treat water during construction and operation of subsequent projects that could occur pursuant to the RADP. Furthermore, if it is determined that any subsequent projects under the RADP would require the construction and operation of new or expanded wastewater treatment facilities, construction or expansion of such facilities would be subject to project-level environmental review in accordance with CEQA at the time it is proposed. This project-level review would identify any significant environmental impacts that could result from the construction and operation of such facilities and would identify project-specific mitigation measures to lessen or avoid any significant impacts as feasible. Therefore, impacts related to the relocation or construction of new or expanded wastewater treatment facilities would be ***less than significant***.

Mitigation: None required.

Stormwater Drainage Facilities

As discussed under Impact HY-4, implementation of the RADP would not alter land uses at the Airport or include operational activities that could result in additional sources of polluted runoff. The RADP project site is generally covered by impervious surfaces that drain into the existing SFO stormwater collection system, with the exception of runoff from runways and some portions of taxiways that flow through pervious grassy infield areas to facilitate infiltration, reduce peak discharges, and capture of sediment and other pollutants before being discharged directly into the bay. As discussed under Impact HY-4, construction of RADP projects would not be expected to increase the amount of stormwater runoff to the existing stormwater collection system. Areas where construction is proposed are already developed with impervious surfaces, and the volume and rate of stormwater runoff would be substantially similar to baseline conditions. Furthermore, if it is determined that any subsequent projects under the RADP would require the construction and operation of new or expanded stormwater drainage facilities, construction or expansion of such facilities would be subject to project-level environmental review in accordance with CEQA at the time it is proposed. This project-level review would identify any significant environmental impacts that could result from the construction and operation of such facilities and would identify project-specific mitigation measures to lessen or avoid any significant impacts as feasible. Therefore, impacts related to the relocation or construction of new or expanded stormwater drainage facilities would be ***less than significant***.

Mitigation: None required.

Electric Power, Natural Gas, and Telecommunications Facilities

Subsequent projects that could occur with implementation of the RADP would result in an incremental increase in electricity, natural gas, and telecommunications demand. The RADP project site is currently served by existing electric power, natural gas, and telecommunications services and infrastructure, and implementation of the RADP would not extend any of these services or infrastructure into undeveloped areas that are currently unserved by these services. Should upgrades to these utility service systems and/or infrastructure be required for subsequent projects under the RADP, they would be subject to project-level environmental review in accordance with CEQA at the time it is proposed. This project-level review would identify any significant environmental impacts that could result from the construction and operation of such facilities and would identify project-specific mitigation measures to lessen or avoid any significant impacts as feasible. Therefore, impacts related to the relocation or construction of new or expanded electric power, natural gas, and telecommunications facilities would be ***less than significant***.

Mitigation: None required.

Impact UT-2: Sufficient water supplies are available to serve the RADP and reasonably foreseeable future development in normal, dry, and multiple dry years. *(Less than Significant)*

The RADP does not require a water supply assessment under the California Water Code. Under California Water Code sections 10910–10915, urban water suppliers like SFPUC must prepare water supply assessments for certain "water demand projects," as defined in CEQA Guidelines section 15155.[170] 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 RADP itself does not qualify as a "water-demand project" as defined by CEQA Guidelines section 15155(a)(1), and a water supply assessment is not required and has not been prepared for the RADP.[171] However, subsequent projects that could occur with implementation of the RADP would be evaluated once they are proposed to determine whether the projects would require water supply assessments. Therefore, impacts related to water supply would be ***less than significant***.

Mitigation: None required.

---

[170] Pursuant to CEQA Guidelines section 15155(a)(1), "a water-demand project" means:

(A) A residential development of more than 500 dwelling units.
(B) A shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
(C) A commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor area.
(D) A hotel or motel, or both, having more than 500 rooms,
(e) An industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
(F) A mixed-use project that includes one or more of the projects specified in subdivisions (a)(1)(A), (a)(1)(B), (a)(1)(C), (a)(1)(D), (a)(1)(E), and (a)(1)(G) of this section.
(G) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling-unit project.

[171] While a water supply assessment is not required and has not been prepared for the RADP, HNTB prepared a memo in August 2024 to summarize and update the water utilities demand data and results of the hydraulic modeling. The water utilities addressed in the memo include domestic water, fire water, and recycled water. The memo identifies sufficient water supplies to meet the current and future demands at SFO through 2045. HNTB, *SFO Water Supply Summary*, August 14, 2024.

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. *(Less than Significant)*

Construction

During construction of RADP projects, workers would use portable toilets and hand-washing facilities for their sanitary needs and no related discharges to the sanitary sewer system would occur. The only discharges to the Airport's industrial or sanitary sewer system would be groundwater pumped from excavations during construction. The Airport has confirmed that the MLTP can accommodate dewatering effluent in the Airport's wastewater collection systems from construction of RADP projects.[172] Therefore, the impact of construction of subsequent RADP projects related to an exceedance of the MLTP's wastewater treatment capacity would be ***less than significant***.

Mitigation: None required.

Operations

The Airport provides wastewater treatment at the MLTP, followed by further treatment at the North Bayside System Unit in South San Francisco before discharge into San Francisco Bay. The MLTP is designed to treat anticipated Airport wastewater volumes to 2050, and the Airport has confirmed that the MLTP has sufficient capacity to serve subsequent projects that could occur pursuant to the RADP.[173] Therefore, the impact of operation of RADP projects related to the MLTP's wastewater treatment capacity would be ***less than significant***.

Mitigation: None required.

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. *(Less than Significant)*

There are no federal or state laws or regulations related to solid waste that are applicable to the RADP. As specified in the SFO Rules and Regulations, effective January 1, 2024, SFO has a goal to become a zero-waste campus for Airport-controlled municipal solid waste and construction waste. Zero waste, as defined by the Zero Waste Alliance,[174] means diversion of at least 90 percent of waste from landfills and incinerators using methods like recycling and composting. SFO aims to reduce landfill-bound municipal solid waste generated per passenger by 70 percent from 2022 levels by 2028.[175]

---

[172] San Francisco Bay Regional Water Quality Control Board, National Pollutant Discharge Elimination System Permit (No. CA0038318) and Waste Discharge Requirements (Order No. R2-2018-0045).
[173] Ibid.
[174] The Zero Waste International Alliance was formed in 2003 to promote positive alternatives to landfill and incineration and to raise community awareness of the social and economic benefits to be gained when wasted materials are regarded as resources that can create both employment and business opportunities, https://zwia.org/, accessed July 8, 2024.
[175] San Francisco International Airport, 2024, Rules and Regulations, https://www.flysfo.com/sites/default/files/2023-12/Rules%20%26%20Regs-Final%2011.7.2023.pdf, accessed June 28, 2024.

Construction

SFO continues to recycle almost all of its construction and demolition waste, with a consistent recycling rate of more than 90 percent.[176] To maintain a high level of waste diversion from capital and tenant construction projects, SFO works closely with contractors and the San Francisco Environment Department to ensure all projects are meeting recovery and tracking requirements. SFO uses Sustainable Planning, Design, and Construction Standards in accordance with the Airport Building Regulations[177] and the Airport Architecture and Engineering Standards[178] to guide new construction, major renovations, and tenant projects on-site at the Airport. These standards require recycling of materials to the maximum extent practicable. Contractors working on-site are required to manage the materials generated on-site in accordance with the Airport Building Regulations. They must also follow construction and demolition debris recovery and tracking requirements set by the San Francisco Environment Department and SFO.

Under City of San Francisco Ordinance 144-21,[179] construction and demolition debris materials removed from a project site must be recycled or reused. No construction and demolition debris can be transported to or disposed of in a landfill or incinerator or put in a designated trash bin. Effective January 1, 2022, as noted in City of San Francisco Ordinance 144-21, full demolition projects at SFO are required to submit to the San Francisco Environment Department for review and approval a Construction and Demolition Debris Management Plan prior to initiating construction and hauling any debris off-site. Contractors must also submit corresponding debris off-haul weight tickets and/or receipts to the San Francisco Environment Department for review and approval using Municipal Green Halo Systems software.[180] An SFO Zero Waste Coordinator is assigned to guide contractors through the entirety of the reporting process and monitor project reporting. For these reasons the impact would be ***less than significant***.

Mitigation: None required.

Operation

Operational solid waste generated at the Airport is sorted into color-coded bins by type (e.g., compostables,[181] recyclables,[182] and non-recyclables[183]) in accordance with SFO waste sorting requirements. Following sorting, SFO's current solid waste contractor, South San Francisco Scavenger Company, consolidates, removes, and transports all refuse generated at SFO. In accordance with its contract with SFO, the contractor must maximize diversion of compostables and recyclables from a landfill from the point of

---

[176] San Francisco International Airport, SFO Sustainability, 2023, Construction and Demolition Debris Standards, https://sustainability.flysfo.com/sustainable-construction-an.d-demolition-debris-standards/, accessed June 28, 2024.
[177] San Francisco International Airport, Airport Building Regulations, January 1, 2019, accessed April 10, 2024, https://www.flysfo.com/sites/default/files/media/sfo/about-sfo/2018-10_RR_Appx_F.pdf.
[178] San Francisco International Airport, *SFO Sustainable Planning, Design & Construction Standards*, September 2021, accessed April 10, 2024, https://www.sfoconnect.com/sites/default/files/2021-12/SFO%20Sustainable%20PDC%20Standards%2012-13-21.pdf.
[179] San Francisco Ordinance No. 144-21 and Public Works Code Section 725 add new construction and demolition (C&D) debris recovery requirements for C&D transporters, processing facilities, and projects. Under the ordinance, C&D debris material removed from a project in San Francisco must be recycled or reused. No C&D debris can be transported to or disposed of in a landfill or incinerator or put in a designated trash bin.
[180] Green Halo provides web-based construction and demolition disposal record keeping and analysis. This system enhances accurate recording of construction and demolition debris disposal and diversion.
[181] Compostables are placed in SFO's green composting bins and include food scraps, ranging from coffee grounds and lettuce trimmings to baked goods, and cuts of meat. Soiled paper, including paper napkins and pizza boxes, are also compostables.
[182] Recyclables are placed in SFO's blue recyclables bins and include empty, clean, and dry aluminum cans, glass bottles (not broken glass), and hard rigid plastic containers. Paper and clean, unsoiled cardboard can also be recycled.
[183] Non-recyclables are placed in SFO's black bins and include soft plastic bags, shiny plastic such as candy wrappers, and chip or snack bags. Personal protective equipment such as face masks and gloves are also be disposed of in black landfill-bound bins.

collecting refuse at the materials recovery areas, which serves a critical role in SFO meeting its strategic zero waste goal.

Continued implementation of SFO's zero-waste program for Airport-controlled municipal solid waste and construction waste would ensure that implementation of the RADP would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. Implementation of RADP would comply with applicable federal, state, and local management and reduction statutes and regulations related to solid waste. For these reasons the impact would be ***less than significant***.

Mitigation: None required.

Impact C-UT-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to utilities and service systems. ***(Less than Significant)***

The geographic context for the analysis of potential cumulative impacts related to utilities and service systems consists of the development and infrastructure projects located within 0.25 mile of the RADP project site. Those projects are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11.

Cumulative projects could incrementally increase the demand for utilities and service systems by adding employees on the RADP project site. Implementation of the RADP in combination with these cumulative projects would increase water consumption and the generation of wastewater and solid waste. SFPUC has accounted for such growth in its water demand and wastewater service projections, and SFO has implemented various programs to divert solid waste from landfills. For these reasons, implementation of the RADP would not combine with cumulative projects to create a significant cumulative impact on utilities and service systems. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

E.14 Public Services

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
14.PUBLIC SERVICES. Would the project:					
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for 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, parks, or other public facilities?	☐	☐	☒	☐	☐

Impacts related to park or recreational facilities with implementation of the RADP are discussed in Topic E.12, Recreation. Impacts on other public services are discussed below.

Environmental Setting

San Francisco Police Department Airport Bureau

The San Francisco Police Department, Airport Bureau (police department) has approximately 180 employees who provide law enforcement and emergency services at the Airport.[184] The police department also enforces the Transportation Security Administration's security plan and supports the individual airlines' security plans. A police training facility (Building 1059) is located in the East Field and used for the police department and other law enforcement agencies supporting the Airport (see Draft EIR Figure 2-5, p. 2-10).

San Francisco Fire Department Airport Division

The San Francisco Fire Department, Airport Division (fire department) has approximately 95 employees and provides fire protection, fire prevention, code enforcement, emergency medical services, water rescue operations, and hazardous materials abatement at the Airport.[185] The fire department facilities include the following: Emergency Rescue Fire Fighting Facility #1 (Building 650) located in the West Field (see Draft EIR Figure 2-3. p. 2-8); Marine Emergency Response Facility #4 (Building 1030) and Emergency Rescue Fire Fighting Facility #2 (Building 1064), located in the East Field (see Draft EIR Figure 2-5, p. 2-10); and Emergency Rescue Fire Fighting Facility #3 (Building 12) in the South Field. The Airport's SFO Medical Clinic, located in

---

[184] San Francisco Police Department, Airport: Keeping You Safe on the Fly, https://www.sanfranciscopolice.org/your-sfpd/explore-department/airport, accessed April 19, 2024.
[185] San Francisco Fire Department, Airport Division, https://sf-fire.org/our-organization/airport-division, accessed April 19, 2024.

the International Terminal Building, provides travel medicine, urgent care, immigration physicals, and occupational health services.[186]

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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. Growth attributable to implementation of the RADP would amount to approximately 2,700 new employees at full buildout, which could generate additional demand for fire protection, police protection, and emergency response services.

Impacts and Mitigation Measures

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. *(Less than Significant)*

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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. The RADP does not include residential uses that would increase demand for schools or other public facilities, such as libraries; therefore, impacts related to these government facilities are not discussed further.

As discussed in Topic E.3, Population and Housing, of this initial study, the RADP would incrementally increase the number of employees at the project site. Implementation of the RADP would result in approximately 2,700 new employees at the Airport (see Draft EIR Table 3-1, p. 3-6). This increase in the number of employees could generate additional demand for fire protection, police protection, and emergency medical services.

As described previously, the fire department and police department have Airport bureaus that serve SFO. The Airport routinely plans for demand for fire, police, and emergency medical services as part of Airport-wide planning efforts. The police and fire departments conduct ongoing assessments of their performance based on response times and, when appropriate, reallocate resources to meet the need for services at the Airport if and when conditions warrant. Although implementation of RADP projects would increase the Airport's employee population, it would align with growth projections of airline and Airport staff and would not result in unplanned population growth. As such, projects that could occur pursuant to the RADP would not necessitate the construction of new or expanded fire, police, or emergency medical services facilities.

Should future fire, police protection, or medical services be needed, additional facilities would be planned for and designed at that time and would be required to undergo separate environmental review pursuant to

[186] San Francisco International Airport, Medical Services: SFO Medical Clinic, https://www.flysfo.com/passengers/services-amenities/medical-services, accessed April 22, 2024.

CEQA. Therefore, impacts associated with implementation of the RADP regarding the provision of new or physically altered governmental facilities would be ***less than significant***.

Mitigation: None required.

Impact C-PS-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on public services. *(Less than Significant)*

The geographic context for the analysis of potential cumulative impacts related to public services consists of the development and infrastructure projects located within 0.25 mile of the RADP project site. Those projects are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11.

Cumulative projects located on Airport property could incrementally increase the demand for public services by adding employees or new residents to the RADP project site. However, as described under Impact PS-1, the San Francisco Fire Department and San Francisco Police Department have Airport bureaus that serve SFO. The Airport routinely plans for demand for fire, police, and emergency medical services as part of Airport-wide planning efforts and must provide emergency service staffing levels to meet FAA-required response times for on-airfield emergencies. Cumulative projects not located on Airport property do not have the same service providers. Therefore, subsequent projects that could occur pursuant to the RADP would not combine with these cumulative projects to affect their service levels. The RADP would not combine with the cumulative projects to create a significant cumulative impact on public services. This impact would be ***less than significant***.

Mitigation: None required.

E.15 Biological Resources

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
15. BIOLOGICAL RESOURCES. Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any 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?	☐	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐	☐
c) 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?	☐	☐	☒	☐	☐
d) Interfere substantially with the movement of any 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?	☐	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐	☐
f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☐	☒

This section describes the regulatory and environmental setting for biological resources, including wetlands, for the RADP project site primarily located in unincorporated San Mateo County; evaluates direct and indirect project-related impacts of the RADP on those resources; and provides mitigation measures to reduce significant impacts, where feasible and appropriate. Information used during the preparation of this section includes database queries from the California Natural Diversity Database (CNDDB), the California Native Plant Society Electronic Inventory, the U.S. Fish and Wildlife Service, personal communication with Airport biologists, and studies completed for other projects at SFO.[187] Current and historical Google Earth aerial imagery of the RADP project site was reviewed. The RADP project site and immediate surrounding areas (i.e., 50 feet) with similar land use and habitats are referred to in this section as the RADP "study area" (see **Figure 5**).

Habitat conditions and the findings of the database queries were reviewed to compile a list of special-status species that may occur in the RADP study area and to characterize the local project setting, described below. Habitat quality and species distribution were considered in evaluating the likelihood of special-status species presence in the study area.

There is no adopted habitat conservation plan or natural community conservation plan for the RADP study area. Therefore, no conflict with such plans would occur and Topic E.15(f) is not discussed further.

Environmental Setting

Vegetation Communities and Wildlife Habitats

Past and ongoing development and other human activities have altered natural vegetation communities in the RADP study area. However, several diverse vegetation communities and wildlife habitats remain both within and near the project site. The RADP project site has been previously developed. Thus, the RADP project site consists mostly of developed or paved surfaces with landscaping and annual grassland adjacent to airfield runways and taxiways. Intertidal vegetation communities and wildlife habitat types including intertidal habitat, rocky shoreline, tidal marsh, tidal mudflats, and open water areas occur along the RADP project site boundary with San Francisco Bay. However, no RADP projects are proposed within such habitat and they are not discussed further in this analysis.

Developed

Most of the RADP project site consists of developed areas, such as pavement, buildings, roads, parking lots, and other airport and airline support facilities. Hardscape areas generally do not provide wildlife habitat.

Landscaped/Non-Native Trees

Developed areas also include landscaped regions with both ornamental native and non-native trees and shrubs. Ornamental native and non-native trees and shrubs are present around buildings in the North Field east of North Access Road; along the access road east of North McDonnell Road; around buildings north of West Field Road and east of North McDonnell Road; around some buildings in the West Field; and between the terminal access and exit roads. As part of the landscape design, approximately 400 redwood trees (*Sequoia sempervirens*) have been planted between the arrival and departure access routes to Airport terminals, while approximately 35 olive trees (*Olea europaea*) are specifically located on the west side of the International Terminal Building's departure access route.

[187] Environmental Science Associates queried California Natural Diversity Database and California Native Plant Society records for the following U.S. Geological Survey 7.5-minute topographic quadrangles: San Mateo, Montara Mountain, Hunters Point, and San Francisco South, accessed November 28, 2023.

SOURCE: SFO, 2024; ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 5
BIOLOGICAL RESOURCES STUDY AREA

Landscaped areas in an otherwise urban environment can provide cover, foraging, and nesting habitat for a variety of bird species, as well as reptiles and small mammals, especially those that are tolerant of disturbance and human presence. Few wildlife species are expected to use these areas considering the limited biological value offered there as part of such a developed and heavily used site. Birds commonly found in such habitat include non-native species such as European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), and native birds such as rock dove (*Columba livia*) and mourning dove (*Zenaida macroura*). Reptiles such as the western fence lizard (*Sceloporus occidentalis*) and small mammals such as house mice (*Mus musculus*) may use landscaped areas for cover or foraging. In addition, bats could roost in existing or underused buildings, other human-made structures, and tree cavities and foliage on or near the RADP project site.

Annual Grassland

Annual grasslands are an herbaceous plant community dominated by non-native annual grasses and forbs. Within the RADP study area, this habitat type occurs near the eastern and southern edges of Seaplane Harbor and in the North Field between the limits of development and the riprap shoreline. Annual grassland in the region consists primarily of non-native annual grass and forb species such as Italian ryegrass (*Festuca perennis*), wild oat (*Avena fatua*, *A. barbata*), wild barley (*Hordeum murinum*, *H. marinum*), annual fescue (*F. microstachys*, *F. myuros*), and hare barley (*H. murinum*), with cut-leaf plantain (*Plantago coronopus*), birds-foot trefoil (*Lotus corniculatus*), and filaree (*Erodium* spp.) also expected on the project site. At SFO, these locations are regularly mowed and occasionally sprayed with herbicide to maintain visibility and minimize habitat functions that might attract animals to these areas, among other safety reasons, as required under CFR title 14, part 139.337 (Wildlife Hazard Management).

Birds common to small areas of annual grassland in an urban environment include non-native European starlings and house sparrows and birds native to the area, such as the American robin (*Turdus migratorius*), house finch (*Haemorhous mexicanus*), and mourning dove. Because of wildlife hazard management activities, including trapping and relocation of some mammals, relatively large wildlife species such as striped skunk (*Mephitis mephitis*), grey fox (*Urocyon cinereoargenteus*), opossum (*Didelphis marsupialis*), and coyote (*Canis latrans*) are uncommon at the airfield; however, the area likely supports rodents such as Botta's pocket gopher (*Thomomys bottae*), house mouse, and California vole (*Microtus californicus*). Raptors, including red-tailed hawks (*Buteo jamaicensis*) prey on the rodents found in this community. Over-wintering western burrowing owls (*Athene cunicularia*) have been documented on occasion within annual grasslands at SFO, although no resident or wintering burrowing owls occur at the RADP project site.[188]

Seasonal Wetland

Seasonal wetlands, which typically inundate during the rainy season only, occur within the northeast corner of the North Field. Vegetation in the seasonal wetlands varies from freshwater to saline species, depending on the salinity of the soil. Dominant species include pickleweed and brass buttons, as well as hyssop loosestrife (*Lythrum hyssopifolia*) and common spikerush (*Eleocharis macrostachya*).[189] These seasonal wetlands are a result of seasonal ponding or precipitation in shallow depressions due to slight differences in topography. The depressions are located on predominantly gravel fill between the existing shoreline and the paved roads or developed structures. Based on a review of historic aerials, the seasonal wetlands are located on bay fill and appear to be highly disturbed. These features may attract wildlife similar to the species that

[188] ESA, Mandi McElroy, FAA-Qualified Airport Wildlife Biologist, ESA, wildlife point-count survey observations, 2023–2024.
[189] ESA, *Shoreline Protection Program Aquatic Resource Delineation Report*, prepared for San Francisco International Airport, September 2024.

use annual grasslands, as well as foraging great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), and other waterbirds, depending on the availability and duration of water in the area. Canada geese (*Branta canadensis*) nest annually in the Annual Grassland/Seasonal Wetland habitat matrix north of the MLTP in the North Field.

Wetlands and Waters

Wetlands are ecologically complex habitats that support a variety of both plant and animal life. The federal government defines and regulates other waters, including wetlands, in Section 404 of the Clean Water Act. *Wetlands* are defined as "areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support (and do support, under normal circumstances) a prevalence of vegetation typically adapted for life in saturated soil conditions."

As previously discussed, the RADP project site includes seasonal wetlands that are in close proximity to San Francisco Bay, which is subject to the ebb and flow of the tide. Seasonal wetlands may be classified by the U.S. Army Corps of Engineers as jurisdictional navigable waters of the United States if they have a relatively permanent surface water connection and are adjacent to *navigable waters of the United States*.[190] The seasonal wetlands in the northeast corner of the North Field are considered potential non-jurisdictional because they appear to be isolated and do not have a relatively permanent surface water connection to navigable waters of the United States. When requested by an applicant, the U.S. Army Corps of Engineers will make a formal determination of jurisdiction for waters of the United States. To date, no such determination has been made for the seasonal wetlands in the northeast corner of the North Field.

In California, *waters of the state* are defined as "any surface water or groundwater, including saline waters, within the boundaries of the State" (California Water Code section 13050[e]) and include all waters under federal jurisdiction. Waters of the United States are regulated by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act up to the high-tide line. These waters are also regulated by the San Francisco Bay Regional Water Quality Control Board as waters of the state. In addition, the San Francisco Bay Conservation and Development Commission regulates the fill, extraction of materials, and substantial changes in use of land, water, and structures within the bay, including the historical bay shoreline,[191] and within 100 feet of the modern bay shoreline (100 feet inland of the mean high-water mark), which includes some of the landside portions of the RADP project site.

Wildlife Movement Corridors

Wildlife movement corridors link areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or areas of human disturbance or urban development. Topography and other natural factors in combination with urbanization have fragmented or separated large open-space areas. The fragmentation of natural habitat can create isolated "islands" of vegetation that may not provide sufficient area to accommodate sustainable populations and can adversely affect genetic and species diversity. Movement corridors lessen the effects of this fragmentation by allowing animals to move between remaining habitats, which in turn allows depleted populations to be replenished and promotes genetic exchange between separate populations. The Airport is not part of a known or described wildlife movement corridor

---

[190] *Navigable waters of the United States* refers to nonwetland aquatic features (other waters) that are regulated by the Clean Water Act.
[191] California Code of Regulations, Title 14, section 10710, Continuing Commission Jurisdiction.

and does not provide a connection between adjacent areas of higher quality habitat.[192] Wildlife that reside in or use intertidal habitats and the open waters of San Francisco Bay will continue using these areas, with unimpeded movement along the site boundary and open bay waters.

Special-Status Species

The potential for the RADP project site to support special-status plant or animal species was assessed using database results, previous studies of biological resources on SFO property and in the regional vicinity, and an understanding of existing site conditions and available habitat. Information about the distribution of special-status species was obtained from the CNDDB, the U.S. Fish and Wildlife Service, and the California Native Plant Society for the vicinity of the RADP project site.[193,194,195]

To support the discussion of biological resources impacts, the above data were examined to create a focused list of special-status species that could be encountered in the study area and within the project site. Each species was determined to have low, moderate, or high potential to occur in the study area based on previous location data, the species' range, and current site conditions. Species with moderate or high potential for occurrence are discussed in detail below. Several species that require specialized habitat not found on the project site, including large areas of annual grassland, oak woodland, coastal prairie, or coastal scrubland, were also eliminated from further discussion.

Special-Status Plants

Several special-status plant species are documented in the vicinity of the RADP project site; however, none were determined to have at least moderate potential to occur within the boundaries of the RADP project site. The special-status or otherwise protected plant species identified are considered to have either no or low potential to occur in the terrestrial study area, given that the RADP project site is heavily disturbed or developed (paved, landscaped, or maintained annual grassland) and suitable habitat for rare species is correspondingly absent.

Because of existing development and the maintained nature of annual grasslands and other vegetation communities on the project site, and because subsequent projects that could occur pursuant to the RADP would avoid the limited seasonal wetlands present at SFO, special-status plants are not expected within the RADP project site. In addition, tidal marsh vegetation that occurs sporadically along the Airport's boundary with the bay may host special-status plants. However, no RADP projects would occur in such habitat. Therefore, rare plants are not considered further in the analysis.

---

[192] California Department of Fish and Wildlife, Natural Areas Small - California Essential Habitat Connectivity Spatial Data, 2023, https://data-cdfw.opendata.arcgis.com/datasets/CDFW::natural-areas-small-california-essential-habitat-connectivity-cehc-ds1073-1/explore?location=37.625218%2C-122.372813%2C13.94, accessed April 24, 2024.

[193] California Department of Fish and Wildlife, CNDDB RareFind version 5 query of the San Mateo, Montara Mountain, Hunters Point, and San Francisco South U.S. Geological Survey 7.5-minute topographic quadrangles, Commercial Version, https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data, accessed April 24, 2024.

[194] U.S. Fish and Wildlife Service, My Project, IPaC Trust Resource Report and Official Species List of Federally Endangered and Threatened Species, https://ecos.fws.gov/ipac/project/WBXXTX643ZFO5ASSB3OFSOKL74/resources, accessed April 24, 2024.

[195] California Native Plant Society, Inventory of Rare and Endangered Plants for San Mateo, Montara Mountain, Hunters Point, and San Francisco South U.S. Geological Survey 7.5-minute topographic quadrangles, https://rareplants.cnps.org/Search/result?frm=T&sl=1&quad=3712254:3712264:3712263:3712253:&elev=0:50:m:o, accessed April 24, 2024.

Special-Status Animals

SPECIAL-STATUS BIRDS AND MAMMALS

A number of special-status species have the potential to occur adjacent to subsequent projects that could occur under the RADP. One special-status bird species, the California Ridgway's rail,[196,197] is known to occur in marshes adjacent to Runway 1R (far from the study area) and has limited potential to occur in other marshes around the shoreline that are closer to the study area. There are several other special-status species that are either infrequently documented (i.e., transient or incidental) or have low potential to occur based on limited or poor habitat conditions; these species include the western burrowing owl, Alameda song sparrow (*Melospiza melodia pusillula*),[198] salt marsh common yellowthroat (*Geothlypis trichas sinuosa*),[199] western snowy plover (*Charadrius alexandrinus nivosus*), and California least tern (*Sterna antillarum browni*).[200] Because the habitat is mostly developed land cover, which provides poor habitat conditions, no special-status bird species are expected to nest in the landside portions of the RADP study area. In addition, low quality habitat for salt marsh harvest mouse (*Reithrodontomys raviventris*) occurs in tidal marsh habitats adjacent to the RADP study area; however, this species has not been previously detected on or near the Airport.

OTHER BREEDING AND MIGRATORY BIRDS

Annual grassland and mature landscaped trees and shrubs in the RADP study area provide nesting and foraging habitat for a variety of resident and migratory birds. Species that could nest in the area include Canada goose, Anna's hummingbird (*Calypte anna*), Bewick's wren (*Thryomanes bewickii*), lesser goldfinch (*Spinus psaltria*), American robin, American crow (*Corvus brachyrhynchos*), and California towhee (*Melozone crissalis*).[201] Raptors such as red-tailed and red-shouldered hawks (*Buteo lineatus*) may forage in the study area; however, they are unlikely to nest in the study area, such as the mature redwood trees between the Airport's departure and arrival access routes, given the extent of existing development and the near-constant activity surrounding this portion of the RADP study area. American peregrine falcons (*Falco peregrinus anatum*) may hunt for prey along the San Francisco Bay shoreline in the RADP study area. Large buildings with open access areas may support nesting owls, such as barn owl (*Tyto alba*).

The federal Migratory Bird Treaty Act and California Fish and Game Code protect raptors, native migratory birds, and nesting birds that would occur in the RADP study area and/or nest in the surrounding vicinity.

SPECIAL-STATUS BATS

Based on data from the CNDDB, there is a moderate or greater likelihood of encountering four special-status bat species within the RADP study area: fringed myotis bat (*Myotis thysanodes*), Yuma myotis (*Myotis yumanensis*), hoary bat (*Lasiurus cinereus*), and pallid bat (*Antrozous pallidus*).

---

[196] Documented in the tidal salt marsh bordering the South Field as recently as 2021 during annual surveys by the Invasive Spartina Project.
[197] Olofson Environmental, Inc., *California Ridgway's Rail Surveys for the San Francisco Estuary Invasive Spartina Project 2021*, prepared for State Coastal Conservancy, January 31, 2022.
[198] Tidal salt marsh habitat located sporadically along the bay perimeter of SFO could provide suitable foraging and nesting habitat.
[199] Foraging or stopover habitat only.
[200] Small numbers of migrant or post-breeding least terns may occasionally fly over or forage over the bay waters adjacent to the study area. The nearest breeding colonies are less than 10 miles from the RADP study area.
[201] ESA, Mandi McElroy, FAA-Qualified Airport Wildlife Biologist, ESA, wildlife point-count survey observations, 2023-2024.

The fringed myotis bat is categorized as a high-priority species by the Western Bat Working Group. It occurs in a wide variety of habitats, with optimal areas including pinyon-juniper, valley foothill hardwood, and hardwood-conifer vegetation communities, with the nearest observations from Crystal Springs Reservoir about 2.3 miles west of SFO. They use caves, mines, buildings, or crevices for maternity colonies and roosts. The Yuma myotis bat is ranked as a low- to medium-priority species by the Western Bat Working Group that also roosts in forest habitats. The Yuma myotis is known to forage over salt marshes and estuaries in San Francisco Bay.

The hoary bat is categorized as a medium-priority species according to the Western Bat Working Group. This species has been documented foraging insects near the SFO airfield runways and taxiways and along the bay shoreline. Hoary bat, the most widespread North American bat, may be found throughout California where dense trees or woodlands offer roosting habitat. Hoary bats may roost in the mature redwood trees located between SFO's terminal departure and arrival access routes within the RADP study area.

Pallid bat is considered a high-priority species by the Western Bat Working Group and is a California species of special concern. This bat species is present in most low-elevation areas of California, favoring rocky outcrops with crevices that provide access to open areas. However, they can adapt to various habitats as well. Day roosts include crevices, caves, and mines, and occasionally buildings and tree hollows, while night roosts include more open areas such as building porches. They are known to use both vacant and human-occupied buildings as roost sites. Local occurrences of the pallid bat within 5 miles of the project site have been documented in Millbrae.[202] As a result, the potential exists for these bats to utilize buildings and trees within the RADP study area as roosting sites.

Sensitive Natural Communities

A *sensitive natural community* is a biological community that is regionally rare, provides important habitat opportunities for wildlife, is structurally complex, or is of special concern to federal, state, or local agencies in other ways. One sensitive plant community identified by CDFW on its *California Sensitive Natural Community List*, Northern coastal saltmarsh, occurs sporadically along the northern and eastern boundaries of the North Field, along the northern boundary of the East Field, and along the southern boundary of the South Field at elevations below the riprap-armored shoreline and existing sheet pile retaining wall. Northern coastal salt marsh is a highly productive plant community dominated by herbaceous, suffrutescent (subshrubby), salt-tolerant hydrophytes (water plants) that typically form dense mats up to 3 feet high. The most characteristic plant of this community is pickleweed. No sensitive natural communities occur within the RADP project site.

Critical Habitat

Critical habitat is defined as the specific areas that are essential to the conservation of a federally listed species and that may require special management consideration or protection. There is no federally designated critical habitat within the RADP project site. Beyond the site boundaries, the waters of San Francisco Bay are designated by the National Marine Fisheries Service as critical habitat for green sturgeon, southern distinct population segment (*Acipenser medirostris*), and steelhead – Central California coast distinct population segment (*Oncorhynchus mykiss*).

---

[202] California Department of Fish and Wildlife, California Natural Diversity Database RareFind version 5 query of the San Mateo, Montara Mountain, Hunters Point, and San Francisco South U.S. Geological Survey 7.5-minute topographic quadrangles, Commercial Version, accessed November 13, 2024.

Regulatory Framework

Biological resources fall under the jurisdiction of various regulatory agencies. The following regulations are relevant to the limited biological resources that could be affected by implementation of the RADP.

Federal

Federal Endangered Species Act

The Federal Endangered Species Act (FESA) protects listed plant and wildlife species from harm or "take," which is broadly defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Take can also include habitat modification or degradation that directly results in death or injury of a listed wildlife species. An activity can be defined as take even if it is unintentional or accidental. Listed plant species are provided less protection than listed wildlife species. Listed plant species are legally protected from take under FESA only if they occur on federal lands or if the project requires a federal action, such as a section 404 permit from U.S. Army Corps of Engineers. The U.S. Fish and Wildlife Service has jurisdiction over wildlife species that are federally listed as threatened and endangered under FESA, while the National Marine Fisheries Service has jurisdiction over marine species and anadromous fish that are federally listed as threatened and endangered. Species that are candidates for listing under FESA are not granted these protections under FESA.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) is the domestic law that affirms and implements a commitment by the United States to four international conventions (with Canada, Mexico, Japan, and Russia) for the protection of a shared migratory bird resource. Unless and except as permitted by regulations, the MBTA encompasses whole birds, parts of birds, and bird nests and eggs. The federal Endangered Species Act defines *take* as "…harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species." "Harm" may include significant habitat modification where the take actually kills or injures an individual of a listed species by impairing its essential behavior (e.g., nesting or reproduction). This would include the protection of nests for all species that are on the List of Migratory Birds, most recently updated in the *Federal Register*.

All native migratory bird species occurring in the RADP study area are protected by the MBTA and could be affected by implementation of the RADP.[203]

Federal Regulation of Wetlands and Waters

Wetlands are ecologically complex habitats that support a variety of both plant and animal life. The federal government defines and regulates other waters, including wetlands, in Clean Water Act section 404. Wetlands are "areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Under normal circumstances, the federal definition of

[203] For the purposes of wildlife hazard management, SFO maintains an active federal depredation permit for select migratory bird species if they pose an imminent threat to human life.

wetlands requires the presence of three identification parameters: wetland hydrology, hydric soils, and hydrophytic vegetation.

The regulations and policies of various federal agencies (e.g., U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service) mandate that the filling of wetlands be avoided unless it can be demonstrated that there is no practicable alternative to filling. The discharge of dredged or fill material typically means adding into waters of the United States materials such as concrete, dirt, rock, pilings, or side-cast material for the purpose of replacing an aquatic area with dry land or raising the elevation of an aquatic area. The U.S. Army Corps of Engineers has primary federal responsibility for administering regulations that concern waters and wetlands in the study area under the statutory authority of the Rivers and Harbors Appropriation Act (sections 9 and 10) and the Clean Water Act (section 404).

Pursuant to Rivers and Harbors Appropriation Act section 10 (33 USC section 403), the U.S. Army Corps of Engineers regulates the construction of structures in, over, or under, excavation of material from, or deposition of material into navigable waters. In tidal areas, the limit of navigable water under section 10 is the elevation of the mean high-water mark; in nontidal waters, it is the ordinary high-water mark. Larger streams, rivers, lakes, bays, and oceans are examples of navigable waters regulated under Rivers and Harbors Appropriation Act section 10. The act prohibits the unauthorized obstruction or alteration of any navigable water (33 USC section 403). Navigable waters under the act are those “subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.” Typical activities requiring section 10 permits are construction of piers, wharves, bulkheads, marinas, ramps, floats, intake structures, cable or pipeline crossings, and dredging and excavation.

Federal Clean Water Act section 404 prohibits the discharge of dredged or fill material into waters of the United States, including wetlands, without a permit from the U.S. Army Corps of Engineers. The agency’s jurisdiction in tidal waters under section 404 extends to the high-tide line or high-tide mark, simply indicating a point on the shore where water reaches a peak height at some point each year.

The Clean Water Act prohibits the discharge of any pollutant without a permit. Implicit in the act’s definition of pollutant is the inclusion of dredged or fill material regulated by section 404. Activities typically regulated under section 404 include the use of construction equipment such as bulldozers, and the leveling or grading of sites where jurisdictional waters occur.

State

California Endangered Species Act

Under the California Endangered Species Act (CESA), the California Department of Fish and Wildlife (CDFW) is responsible for maintaining a list of threatened and endangered species. The department also maintains a list of candidate species, which are species formally under review for addition to either the list of endangered species or the list of threatened species.

CESA prohibits the take of plant and animal species that the California Fish and Game Commission has designated as either threatened or endangered in California. “Take” in the context of this regulation means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill a listed species (CFGC section 86). The take prohibitions also apply to candidates for listing under CESA. However, section 2081 of the act allows the department to issue permits for the minor and incidental take of species by an individual or permitted activity listed under the act. Unlike FESA, species that are candidates for state listing are granted the same protections as listed species under CESA.

In accordance with the requirements of CESA, an agency reviewing a project within its jurisdiction must determine whether any state-listed endangered or threatened species could be present in the study area. The agency also must determine whether the project could have a potentially significant impact on such species. In addition, the department encourages informal consultation on any project that could affect a candidate species.

California Fish and Game Code

PROTECTION OF BIRDS AND THEIR NESTS

Under California Fish and Game Code section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code or any regulation made pursuant thereto. California Fish and Code Commission section 3503.5 prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs. Migratory non-game birds are protected under section 3800, whereas other specified birds are protected under section 3505. California Fish and Game Code section 3513 adopts the federal definition of migratory bird take, which is defined by the U.S. Department of the Interior under the provisions of the MBTA. Section 3513 does not prohibit the incidental take of birds if the underlying purpose of the activity is not to take birds. In addition, the California Department of Fish and Wildlife has issued an advisory affirming that California law prohibits incidental take of migratory birds.[204]

Regional

San Francisco Bay Plan

Enacted in 1965, the McAteer-Petris Act established the San Francisco Bay Conservation and Development Commission (BCDC) as a state agency, designated the San Francisco Bay as a state-protected resource, and charged BCDC with preparing a plan for the long-term use of the bay and regulating development in and around the bay while the plan was being prepared. The San Francisco Bay Plan (Bay Plan) and its subsequent amendments specifies goals, objectives, and policies for existing and proposed waterfront land uses and other areas under the jurisdiction of BCDC.[205] Although BCDC is a state agency, its jurisdiction is regional in scope.

A small portion of the RADP study area in the North Field was historically part of the San Francisco Bay. This area was filled after the establishment of the McAteer-Petris Act. Areas once subject to BCDC jurisdiction remain subject to that same jurisdiction even if filled or otherwise artificially altered whether pursuant to a BCDC permit or not. Based on initial overlays and review of aerial photography from 1965, a small portion of Building 944, proposed to be demolished and reconstructed as part of the Boarding Area F Modernization project (RADP Project #2; see Draft EIR Figure 2-8, p. 2-22), appears to overlap with the BCDC Bay and/or

---

[204] California Department of Fish and Wildlife, *California Department of Fish and Wildlife and California Attorney General Xavier Becerra Advisory Affirming California's Protections for Migratory Birds*, November 29, 2018, https://oag.ca.gov/system/files/attachments/press-docs/20181129mbta-advisory3.pdf, accessed April 24, 2024.
[205] San Francisco Bay Conservation and Development Commission, *San Francisco Bay Plan*, https://bcdc.ca.gov/wp-content/uploads/sites/354/2023/09/bayplan.pdf, accessed November 15, 2024.

Shoreline Band jurisdiction. However, because the area has been filled and subsequently developed most of the Bay Plan policies are not expected to apply to this area.

Local

San Francisco General Plan

The Environmental Protection Element of the San Francisco General Plan contains the following objectives and policies related to biological resources protection that are relevant to the RADP project site:

GENERAL

Objective 1: Achieve a proper balance among the conservation, utilization, and development of San Francisco's natural resources.

Policy 1.1: Conserve and protect the natural resources of San Francisco.

Policy 1.2: Improve the quality of natural resources.

Policy 1.3: Restore and replenish the supply of natural resources.

Policy 1.4: Assure that all new development meets strict environmental quality standards and recognizes human needs.

LAND

Objective 7: Assure that the land resources in San Francisco are used in ways that both respect and preserve the natural values of the land and serve the best interests of all the city's citizens.

FLORA AND FAUNA

Objective 8: Ensure the protection of plant and animal life in the city.

Policy 8.1: Cooperate with and otherwise support the California Department of Fish and Game and its animal protection programs.

Policy 8.2: Protect the habitats of known plant and animal species that require a relatively natural environment.

Policy 8.3: Protect rare and endangered species.

County of San Mateo General Plan

The Airport is not subject to the County of San Mateo General Plan. However, a brief discussion of the general plan's Vegetative, Water, Fish and Wildlife Resources policies that are relevant to biological resources is provided below for informational purposes.[206]

[206] County of San Mateo Planning and Building, *General Plan Policies,* https://planning.smcgov.org/sites/planning.smcgov.org/files/documents/files/SMC-GP%20Policies%202013.pdf, accessed April 24, 2024.

- **Policy 1.25 Protect Vegetative Resources.** Ensure that development will (1) minimize the removal of vegetative resources; and/or (2) protect vegetation which enhances microclimate, stabilizes slopes or reduces surface water runoff, erosion or sedimentation; and/or (3) protect historic and scenic trees.
- **Policy 1.27 Protect Fish and Wildlife Resources.** Ensure that development will minimize the disruption of fish and wildlife and their habitats.

Millbrae General Plan

The Airport is not subject to the Millbrae General Plan. However, a brief discussion of the policy in Section 6.1, Open Space and Habitat Conservation, of the general plan is relevant to biological resources and provided below for informational purposes.[207]

- **NRC-1.10 Habitat Protection.** The City shall protect sensitive biological resources, including habitats of State and Federally designated sensitive, rare, threatened, and endangered plant, fish, and wildlife species from urban development and incompatible land uses through analysis in the CEQA and permitting process. If new development results in impacts to any of these resources, loss of habitat should be fully compensated on-site whenever it is feasible to do so. If off-site mitigation is necessary, it should occur within the city of Millbrae whenever it is feasible to do so.

South San Francisco General Plan

The Airport is not subject to the South San Francisco General Plan. However, a brief discussion of the policies in the general plan that are relevant to biological resources is provided below for informational purposes.[208]

- **Policy ES-2.2: Maintain development standards adjacent to the San Francisco Bay to support habitat.** Maintain standards and guidelines for new construction within 150 feet of San Francisco Bay that support the health of the Bay. This policy includes: requiring no net new impervious areas; maintaining (or increasing) building setbacks to support habitat areas and adaptation; requiring new construction to construct bioswales or similar features to treat runoff before it enters the bay; requiring low intensity lighting to reduce the amount of light reaching sensitive habitat; using a planting palette consisting of native species and species that provide valuable resources for native wildlife; and requiring an assessment as part of the CEQA process to consider wildlife impacts before project approval to continue to protect special status of species.
- **Policy ES-4.9: Choose native, climate-adaptive trees.** Continue to choose species that are better suited to the local, changing climate.
- **Policy ES-6.2: Conduct wildlife and plant assessments for new development.** Require assessments for new developments in areas that could impact threatened or endangered species.

---

[207] City of Millbrae, *City of Millbrae General Plan* Policy Document, Public Review Draft, June 2022, https://ccag.ca.gov/wp-content/uploads/2022/07/7-A5-Millbrae-General-Plan-Public-Review-Draft-June-2022.pdf, accessed April 24, 2024.
[208] City of South San Francisco, *City of South San Francisco 2040 General Plan*, Final Plan, adopted October 2022, Resolution #178-2022, https://www.ssf.net/departments/economic-community-development/planning-division/general-plan, accessed April 24, 2024.

Impacts and Mitigation Measures

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. ***(Less than Significant with Mitigation)***

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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. Implementation of the RADP could result in impacts on special-status animals. Impacts attributable to subsequent projects that could occur pursuant to the RADP would depend on the proximity of those projects to suitable habitat for such species (e.g., redwood trees and other landscaping) and the potential for the projects to disrupt individuals. The following discussion analyzes impacts on special-status animals that could occur with implementation of the RADP.

Construction

Construction of subsequent projects that could occur pursuant to the RADP could have a significant impact on protected nesting birds and the active roosts of special-status bats, either directly or indirectly through habitat modifications. These potential impacts are discussed below.

Special-Status and Migratory Birds

Demolition of existing buildings, construction of new buildings, and a general increase in noise and visual disturbance during construction near individual RADP project sites during these activities may adversely affect common nesting passerine birds or raptors within and adjacent to construction areas during the nesting season (roughly January 15–August 15, depending on the species). Common migratory and resident passerine species such as Anna’s hummingbird, lesser goldfinch, California towhee, and American robin could nest in Airport landscaping. Barn owl, mourning dove, house finch, black phoebe (*Sayornis nigricans*), and other common bird species have the potential to nest on buildings or structures slated for demolition or occurring near construction areas.[209]

Suitable foraging habitat (i.e., non-nesting habitat) for special-status species, including American peregrine falcon, western burrowing owl, and other raptors, is located within the RADP study area. Ridgway’s rails are known from tidal marsh areas near the southeastern edge of the airfield, and they may occur in marginal tidal marsh habitat present near subsequent RADP project sites; however, no project activities are proposed in or near tidal marsh habitat.

Should nesting birds be present at the time of construction, the removal of landscaping plants, including trimming or removal of trees to facilitate subsequent projects that could occur pursuant to the RADP, could directly remove active nests of common migratory bird species. In addition, an increase in noise and visual disturbance associated with demolition or construction activities has the potential to disrupt nesting efforts in areas surrounding the individual subsequent project site. Under CEQA, the loss or disruption of an active nest due to project activities may be considered a significant impact. Moreover, disruption of nesting migratory or native birds under the federal MBTA or California Fish and Game Code is only allowed if

[209] ESA, Mandi McElroy, FAA-Qualified Airport Wildlife Biologist, ESA, wildlife point-count survey observations, 2023-2024.

authorized by permit. Thus, the loss of any active nest by, for example, trimming a tree or removing a shrub containing a nest must be avoided under federal and California law. Thus, the RADP projects could result in a significant impact on nesting birds.

Implementing **Mitigation Measure M-BI-1a, Nesting Bird Protection Measures**, would prevent significant impacts on nesting birds in compliance with existing federal and state regulations and would protect nesting birds. With implementation of this mitigation measure, vegetation removal would preferentially occur outside of the bird nesting season, pre-construction nesting surveys would be conducted before those vegetation and habitat removal actions performed during the nesting season, and no-work buffer zones would be established around active nests identified on or near the project site to avoid impacts on nesting birds.

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 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 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.

Special-Status and Otherwise Protected Bats. Project activities including tree trimming, tree removal, and demolition of existing buildings could disturb special-status or common bats roosting within or near subsequent RADP project sites. Special-status bats (fringed myotis, Yuma myotis, hoary and pallid bat) have the potential to roost in existing or underused buildings, other human-made structures, and tree cavities and foliage on or near the project site. Common bats such as the common Mexican free-tailed bat could roost in similar habitat on subsequent RADP project sites. Bat roosts include maternity roosts that provide a safe environment for bats to give birth and raise young, and non-breeding day roosts that provide resting places for non-breeding bats. As a nongame mammal, the take of bats is prohibited under California Fish and Game Code without authorization from CDFW. Both direct and indirect disturbances may arise during construction. Direct disturbance may include building removal (demolition), tree removal, or other activities that result in the destruction of bat roosts. Indirect disturbances are those that lead to changes in bat behavior due to construction-associated noise or vibration or increased human activity in the area.

Under CEQA, the loss of or disturbance to active maternity colonies of special-status bats may be considered a significant impact. Implementing **Mitigation Measure M-BI-1b, Avoidance and Minimization Measures for Bats**, would reduce potential impacts on special-status bats to a less-than-significant level by requiring pre-construction surveys and avoidance measures if potential roosting habitat or active roosts are located.

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.[210] 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

[210] 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.

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, 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, 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:
    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.

With implementation of Mitigation Measures M-BI-1a and M-BI-1b, the impact of subsequent projects that could occur pursuant to the RADP on special-status and migratory birds and special-status and otherwise protected bats would be ***less than significant with mitigation***.

Operation

The project site is located within the Pacific Flyway along the western shoreline of San Francisco Bay, whose waters and adjacent terrestrial open space areas on the San Francisco Peninsula provide valuable stopover habitat for migratory birds, including special-status bird species, that forage and replenish energy stores during spring and fall migrations. The amount of open space habitat near individual subsequent RADP project sites, such as landscape vegetation that could be used for foraging, roosting, or resting by birds in flight, may increase slightly relative to existing conditions.

The potential for migrating birds to collide with buildings is greater if the designs of new buildings include large amounts of reflective or artificially lighted surfaces, because artificial night lighting induces many bird collisions. The tendency of birds to move toward lights at night when migrating, and their reluctance to leave the sphere of light influences for hours or days once encountered, has been well documented.[211]

The Airport is already a developed property with high levels of existing nighttime lighting and reflective surfaces or glare, which could attract migrating birds and result in collisions with Airport structures. As discussed under Topic E.2, Aesthetics, required adherence to applicable standards and regulations would ensure that subsequent RADP projects would not introduce a new source of substantial light or glare that would further attract special-status and migratory birds.

For these reasons, implementation of the RADP would not substantially increase the quantity or frequency of avian collisions with Airport buildings. Therefore, the impact related to avian collisions would be ***less than significant***.

[211] Gauthreaux, S. A., and C. G. Belser, "Effects of Artificial Night Lighting on Migrating Birds," in C. Rich and T. Longcore, *Ecological Consequences of Night Lighting*, Covelo, CA: Island Press, 2006, pp. 67–93.

Mitigation: None required.

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. *(Less than Significant)*

The sensitive natural community northern coastal salt marsh occurs sporadically along the northern and eastern boundaries of the North Field, along the northern boundary of the East Field, and along the southern boundary of the South Field at elevations below the riprap-armored shoreline and existing sheet pile retaining wall. Projects that could occur with implementation of the RADP would not be located where northern coastal salt marsh vegetation is present, as the extent of the RADP project site lies entirely within upland, developed areas of SFO consisting of currently paved, landscaped, or otherwise built environments. No other sensitive natural community or riparian habitat that would be affected by implementation of the RADP is located within or adjacent to the RADP project site; thus, the RADP would have a ***less-than-significant*** impact on sensitive natural communities.

Mitigation: None required.

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. *(Less than Significant)*

Implementation of the RADP would not include demolition, fill, or development activities in areas with seasonal wetlands (the northeastern portion of the North Field). As part of the Shoreline Protection Program project (cumulative project #4),[212] the seasonal wetlands located in the northeastern portion of the North Field would be filled to create a construction staging area in the short term and development of Airport and airline support facilities in the long term, identified as the Lot near Tanks on Draft EIR Figure 2-10, p. 2-41. Subsequent projects that could occur pursuant to the RADP would not deposit fill in federally protected wetlands. RADP projects would occur entirely in upland, developed areas of the Airport property. Moreover, the habitat types in these areas are paved, landscaped, or otherwise built environments that lack jurisdictional aquatic features. As such, implementation of the RADP would result in a ***less-than-significant*** impact on federally protected wetlands.

Mitigation: None required.

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. *(Less than Significant)*

Potential impacts on the migratory birds and the Pacific flyway are discussed under Impact BI-1. Implementation of the RADP would not interfere with the movement of native or migratory fish because

[212] City and County of San Francisco, San Francisco Planning, *San Francisco International Airport Shoreline Protection Program Final Environmental Impact Report (Case No. 2020-004398ENV)*, certified June 1, 2023.

subsequent projects that could occur pursuant to the RADP would occur landside of San Francisco Bay. Similarly, those projects would not create barriers to terrestrial wildlife movement along the SFO shoreline in tidal marsh and mudflat habitats because no RADP projects would occur where these habitat types are present. Implementation of the RADP would not create any new barriers to wildlife movement through the RADP study area that do not already exist with the current extent of development; therefore, implementation of the RADP would have a ***less-than-significant*** impact on wildlife movement. Potential impacts on wildlife nursery sites (i.e., bat maternity roosts) are discussed under Impact BI-1.

Mitigation: None required.

Impact BI-5: The RADP would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. *(Less than Significant)*

The San Francisco Airport Commission adopted the Airport Rules and Regulations to provide for safe and efficient Airport operations, effective January 1, 2024. Rule 3.0, General, 3.3 General Conduct, Wildlife Management, in the Airport Rules and Regulations states:

> *No person shall feed, approach, disturb, frighten, hunt, trap, capture, wound, kill, or disturb the habitat of any wild bird, mammal, reptile, fish, amphibian or invertebrate anywhere within the Airport. Furthermore, no person shall create an attractant for rodents or other wildlife by leaving food or debris in any open and exposed area. It is the responsibility of the tenant to maintain its leasehold areas in a manner that does not promote wildlife hazards. This prohibition shall not apply to the following:*
>
> *(1) Action taken by public officials or their employees and agents, within the scope of their authorized duties, to protect the public health and safety.*
>
> *(2) The taking of fish as permitted by State Fish and Game Regulations.*
>
> *(3) The capturing and/or taking of wildlife for scientific research purposes when done with written permission from the Director.*

Implementation of the RADP would not harm fish or wildlife at the Airport and therefore would not conflict with local policies or ordinances protecting biological resources.

In addition, to facilitate the construction of the Boarding Area F Modernization project (RADP Project #2), the project would demolish Building 944 in the North Field. Because a portion of this building is potentially within the BCDC Bay and/or Shoreline Band jurisdiction, BCDC would review the project at such time it is proposed for consistency with the relevant Bay Plan policies and existing or amended authorizations. Because the area has been historically filled and developed, demolition and reconstruction of Building 944 is not expected to conflict with Bay Plan policies protecting biological resources.

To facilitate construction of the International Terminal Building Curbside Expansion (RADP Project #8; see Draft EIR Figure 2-6, p. 2-20), the project would remove approximately 35 landscaped olive trees from along the west side of the International Terminal arrivals access route and approximately 30 redwood trees from either side of the Airport entrance and exit routes. No local planning codes, ordinances, or policies apply to the protection of landscaping trees at the Airport. Therefore, implementation of the RADP would have a ***less-than-significant*** impact with respect to conflicts with local policies.

Mitigation: None required.

Impact C-BI-1: The RADP in combination with cumulative projects would not result in a significant cumulative impact on biological resources. *(Less than Significant with Mitigation)*

The geographic context for the analysis of potential cumulative impacts related to biological resources consists of the development and infrastructure projects located within 0.25 mile of the RADP project site. Those projects are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11.

Sensitive Natural Communities

Implementation of the RADP would have no impacts on sensitive natural communities, wetlands, or wildlife movement, and no conflicts with an adopted habitat conservation plan or natural community conservation plan, as there is no habitat conservation plan nor natural community conservation plan applicable to the RADP project site. Similarly, no conflicts were identified with local policies or ordinances that protect biological resources. Therefore, the RADP would not combine with cumulative projects to result in a significant cumulative impact under these criteria and they are not discussed further.

Special-Status and Migratory Birds

Implementation of the RADP would have a limited effect on terrestrial biological resources that inhabit the project site and vicinity, primarily because the existing built environment in the study area offers marginal habitat value to resident species.

Construction Impacts

Construction impacts identified under Impact BI-1 include potential disturbance to nesting birds and roosting bats. Similar to subsequent projects that could occur pursuant to the RADP, development of the other cumulative projects is likely to have limited effects on nesting birds and roosting bats because of the similarity of developed upland habitat conditions in these areas, and the related limited opportunity for nesting birds and roosting bats in this urbanized geographic area. However, cumulative projects would be required to comply with applicable regulatory requirements for protecting these biological resources, and with project-specific mitigation measures (where applicable) similar to those regarding implementation of the RADP.

Many of the cumulative projects would generate noise and visual disturbance beyond pre-project conditions during construction. Some projects would require removal of trees and/or vegetation that could cause nest failure or abandonment if active bird nests are present. The combined effects of implementing the RADP and developing the cumulative projects could result in a significant cumulative impact on nesting birds. However, implementing Mitigation Measure M-BI-1a, Nesting Bird Protection Measures, would reduce the subsequent RADP projects' contribution to cumulative impacts on nesting birds. Initial project disturbance (such as vegetation removal and building demolition) and other activities that might affect nesting birds would be conducted outside of nesting season, to the extent feasible; pre-construction nesting bird surveys would be performed before the start of construction or demolition activities during nesting season; and protective no-disturbance buffers would be established around active nests identified within the subsequent project site or active nests would be monitored during construction. These protective requirements would avoid and minimize the subsequent RADP projects' contribution to significant cumulative impacts on nesting birds. Therefore, implementation of the RADP would result in a less-than-considerable contribution to a significant cumulative impact, and the cumulative impact on nesting birds would be ***less than significant with mitigation***.

Operational Impacts

Operational impacts discussed under Impact BI-1 include a less-than-significant increased risk of bird collisions with buildings or features associated with implementation of the RADP. Those buildings or features would be designed and built similarly to existing SFO buildings and in compliance with Airport building regulations, and they would not result in a substantial increase in light and glare above existing conditions. The cumulative projects may contribute to an increase in avian collisions should those projects not be held to local building or design standards to limit light, glare, reflective surfaces, or building height. Several municipalities near SFO have not yet adopted bird-safe ordinances aimed at minimizing operational impacts on flying birds. Without such policies and the corresponding significance criteria in place to mitigate the risk of bird collisions, the cumulative projects could result in impacts on flying birds. Therefore, implementation of the RADP combined with cumulative projects could result in a significant cumulative impact on avian species. However, RADP projects would comply with SFO's building design and engineering standards, discussed under Impact AE-2, which would reduce operational impacts on birds. Therefore, subsequent projects that could occur pursuant to the RADP would not result in a cumulatively considerable contribution to a significant cumulative impact. The cumulative impact on avian species would be ***less than significant***.

Subsequent projects that could occur pursuant to the RADP and many of the cumulative projects identified previously would include demolition and/or construction activities that would generate noise and increase human activity above pre-project conditions during construction. These activities could have a substantial adverse effect on special-status bats and/or maternal roosts, if present, which, combined with cumulative projects, could result in a significant cumulative impact on special-status bats and/or maternal roosts.

However, Mitigation Measure M-BI-1b, Avoidance and Minimization Measures for Bats, would reduce the subsequent RADP projects' contribution to cumulative impacts on special-status and roosting bats. This mitigation measure would involve the preferential removal of structures when bats are active; establishment of no-disturbance buffers around roost sites; and removal of structures containing active bat roosts under the oversight of a qualified biologist and in a manner that would encourage the bats to safely leave the roost.

Other cumulative projects with the potential to affect roosting bats would be required to implement similar measures to comply with regulatory protection requirements. Thus, bats would be avoided during sensitive periods to minimize direct impacts, and bats would be removed safely, when necessary, during appropriate non-sensitive periods. Thus, implementation of the RADP combined with cumulative projects would not result in a significant cumulative impact on roosting bats, and the cumulative impact would be ***less than significant with mitigation***.

Conclusion

In summary, although adverse effects on nesting birds and special-status bats or maternal roosts could occur with implementation of the RADP combined with cumulative projects, the subsequent RADP projects would not make a cumulatively considerable contribution to the significant cumulative impact. Therefore, the cumulative impact on these biological resources would be ***less than significant with mitigation***.

E.16 Geology and Soils

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
16. GEOLOGY AND SOILS. Would the project:					
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐	☐
iv) Landslides?	☐	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐	☐
c) Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☐	☒

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐	☐

Environmental Setting

The topography of the Airport is essentially level, with minimal relief. The topography of the RADP project site is relatively flat and level; the ground surface elevation ranges from 2.5 to 12.5 feet above the North American Vertical Datum of 1988.

The Airport is located along the western margin of San Francisco Bay on land reclaimed from the original bay. Development of the area began in about 1880, when a levee was constructed to control the periodic flooding of the marsh that bordered the bay's western rim. Over the next 40 years, the wetland protected by the levee dried and the sediments within the area settled. Development of the Airport began with the opening of Mills Field in June 1927.[213] The earliest developments of the Airport were built onto low-lying reclaimed pastures and farm fields. Subsequent expansion of the Airport from the 1920s through the 1970s involved successive episodes of fill placement (i.e., silt, sand, gravel, rock, construction demolition debris) inboard of the levee and directly on top of submerged soft bay mud.[214] In general, the fill was placed in shallow water, using bulldozers to push the fill onto the bay bottom and compact it above the water table. Rock breakwaters were constructed to protect the exposed fill perimeter.[215]

Table 4 provides a description of the geologic materials underlying the Airport. In general, these materials (from oldest to youngest) consist of bedrock, a lower alluvial sedimentary sequence (dense granular soils and clays), Old Bay Mud, an upper sedimentary unit (dense silts, sand, and clay), Young Bay Mud, and artificial fill. Previous geotechnical studies show that the presence and thickness of sedimentary units vary spatially, particularly because of the presence of paleochannels,[216] but that subsurface materials throughout the Airport have similar characteristics, allowing for a more regional understanding of subsurface conditions.[217]

The artificial fill material placed over the native Young Bay Mud has been described in geotechnical studies as predominantly silty and sandy clay, sometimes containing small amounts of building debris.[218] It is likely that variations in the characteristics of the fill are related to the various episodes of fill placement. In most

[213] Airfield Development Engineering Consultants – A Joint Venture, *Airfield Development Program, Preliminary Report No. 11A (Task S) Geotechnical Data and Site Characterization, Runway Configuration Area*, Volume 1B, Sections 4 through 12, May 2001.
[214] City and County of San Francisco, Department of City Planning, *San Francisco International Airport Master Plan, Final Environmental Impact Report*, certified May 28, 1992.
[215] Mejia, Lelio H., Jiaer Wu, Zhaohui Yang, and Jim Chiu, "Seismic Response of the San Francisco International Airport Airfield during the 1989 Loma Prieta Earthquake," in *Proceedings, Geotechnical Earthquake Engineering and Soil Dynamics V, Sacramento, California,* May 2008.
[216] *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.
[217] Airfield Development Engineering Consultant, *San Francisco International Airport Airfield Development Program Preliminary (Phase 1) Geotechnical Analyses*, Volume 1: Main Text and Figures, February 2000.
[218] URS and AGS Inc., *Airfield Seismic Stabilization and Realignment, Phase A, San Francisco International Airport, Data Review Memorandum and Engineering Report*, prepared for the San Francisco Airport Commission, November 2005 and July 2006.

cases, the fill materials placed during reclamation were "unengineered," meaning they were typically not segregated, were randomly dumped, and were spread out with machinery. In addition, the underlying sediments were not tested for their potential to settle under loads. The consequence of the unengineered fill overlying softer, more compressible Young Bay Mud deposits was settlement, which occurred at varying rates over time as the weight of the fill consolidated the underlying bay mud.

Geologic and Seismic Hazards

Surface ground settlement has been ongoing on parts of the Airport property as a result of decades of bay reclamation activities (placing fill over tidal sediments). Seismic groundshaking from earthquakes on the nearby bay area faults is considered a seismic hazard because the artificial fill and Young Bay Mud amplify seismic waves and can cause strong to violent groundshaking. The presence of unengineered fill overlying Young Bay Mud poses the potential for liquefaction that can result in lateral spreading and loss of a soil's bearing strength. The geologic and seismic hazards considered pertinent to the Airport are summarized below.

Table 4 Description of Geologic Units Underlying San Francisco International Airport

Geologic Unit	Description of Unit	Thickness (feet)
Fill materials	Granular material consisting primarily of silty and clayey sands and silts and clays	5–25
Young Bay Mud	Very soft to medium stiff marine clay	25–80
Upper Layered Sediments	*Upper subunit:* Interlayered stiff to hard silts and clay, dense clay sand, silt, and clay *Middle subunit:* Fairly uniform clay with occasional sand layers *Lower subunit:* Information is lacking due to erosion; interfingered with Old Bay Mud at San Francisco International Airport margin	*Upper:* 8–40 *Middle:* 30–80 *Lower:* 3–20
Old Bay Mud	*Upper unit:* Stiff to hard, fat marine clay deposited as an upper subunit *Lower unit:* Hard, fat and lean clay, with occasional sand layers	50–100
Upper Alluvial Sediments Lower Alluvial Sediments	Layers of dense, granular soils and hard clays	20–80
Bedrock	Jurassic- to Cretaceous-age Franciscan Formation composed of highly consolidated and tectonically deformed sedimentary, volcanic, and metamorphic rocks including serpentinite, sandstone, siltstone, shale, and claystone	Bedrock occurring at 5–300; thickness is extensive

SOURCE: Airfield Development Engineering Consultants (ADEC) – A Joint Venture, *Airfield Development Program, Preliminary Report No. 11A (Task S) Geotechnical Data and Site Characterization, Runway Configuration Area*, Volume 1B, Sections 4–12, May 2001.

Settlement

The weight of fill materials causes Young Bay Mud to consolidate, which in turn causes differential settlement at the surface. Settlement has occurred throughout the Airport for decades. The first measurements of settlement in pavement and structures – between 1 and 4 feet – were made in 1944.[219] The magnitude of settlement was highly variable and caused distress to building slabs, runway pavements, and other Airport facilities. Studies showed that the slab and pavement problems were caused primarily by differential movements, which resulted largely from dumping fill over the existing land edge as it was placed. Subsequent consolidation of the bay mud created highly variable patterns of surface settlement.[220]

Settlement on the order of several feet has occurred since unengineered fill was placed at the Airport beginning in the 20th century, and settlement will continue, though at a decreasing rate. Primary consolidation appears to be 70–80 percent complete in areas filled between 1960 and 1969 and is expected to continue for an additional 20–50 years. Settlement has caused ground surface deformation, separation of pavement from buildings, and movement of underground pipelines. Future settlement is expected to be most severe in the eastern part of the Airport, where the bay mud is thickest.[221]

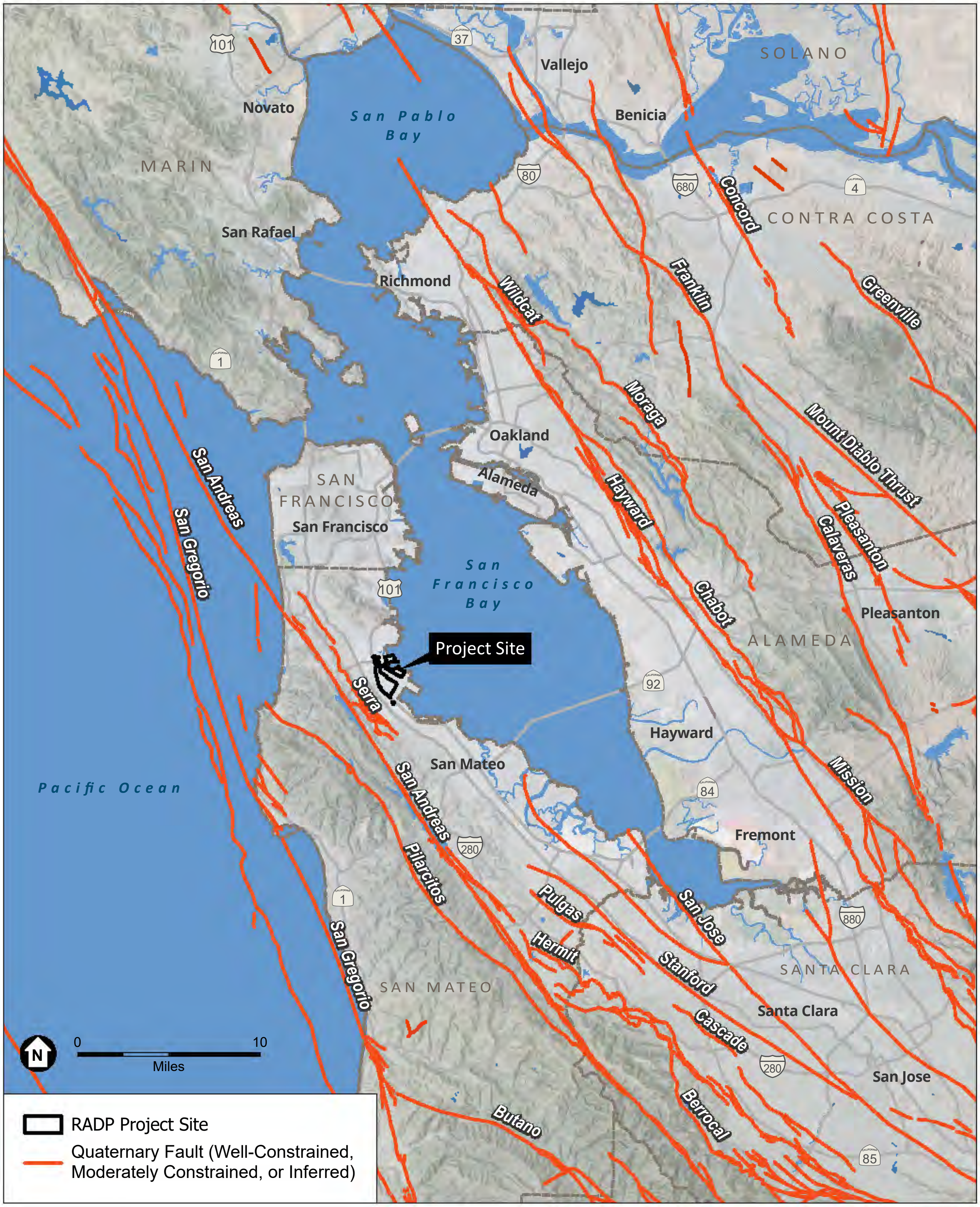
Surface Fault Rupture

Surface rupture is the surface expression of vertical or lateral displacement on an active fault. The Airport is on the western shore of San Francisco Bay in a seismically active region bounded to the west by the San Andreas Fault Zone and to the east by the Hayward Fault Zone. However, the Airport is not located on a known active fault. The closest active fault to the Airport capable of causing substantial surface fault rupture is the San Andreas Fault Zone, located about 2.5 miles to the west (see **Figure 6**).

In 1993, the U.S. Geological Survey used high-resolution seismic reflection testing to study the portions of San Francisco Bay immediately offshore of the Airport. The investigation identified several linear fault-like traces that resembled active, Holocene-age strike-slip faulting. The U.S. Geological Survey grouped these features into what it referred to as the Coyote Point fault zone and described it as a 2-kilometer-wide zone of strike-slip faults traceable offshore from Coyote Point, trending northwest offshore, adjacent to the Airport, and extending toward San Bruno Mountain. The U.S. Geological Survey eventually reversed its conclusion regarding the Coyote Point fault zone after a subsequent study refuted the previous interpretations of Holocene faulting. The study concluded that the evidence of faulting was attributable to sediments that were saturated with *biogenic gas*[222] and that there was no indication of Holocene fault movement. Only one linear feature was interpreted as having experienced Holocene displacement, but that feature is in the bay about 9,000 feet to the east and does not represent a threat of surface fault rupture at the Airport.[223]

---

[219] URS and AGS Inc., *Airfield Seismic Stabilization and Realignment, Phase A, San Francisco International Airport, Data Review Memorandum and Engineering Report*, prepared for the San Francisco Airport Commission, November 2005 and July 2006.
[220] Ibid.
[221] Ibid.
[222] *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.
[223] Airfield Development Engineering Consultants – A Joint Venture, *Geotechnical and Site Characterization, Runway Reconfiguration Area*, Volume B, Sections 4–12, May 2001.



SOURCE: CGS, 2010; SFO, 2024; ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 6
REGIONAL FAULTS

Groundshaking

The San Andreas, San Gregorio, Hayward–Rodgers Creek, Calaveras, Concord–Green Valley, and Marsh Creek–Greenville strike-slip faults are active faults in the San Andreas system, which predominantly accommodate lateral movement between the tectonic plates. Earthquakes on these bay area faults could cause substantial groundshaking at the Airport, especially considering that the Airport is built on soft bay mud underlying unengineered fill material, a combination that can amplify the effects of groundshaking. Consequently, the potential exists for high-intensity earthquake groundshaking to affect the Airport. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the strength and duration of shaking, and the nature of the underlying geologic materials.

The San Francisco Bay Area has a 72 percent chance of experiencing an earthquake of *moment magnitude*[224] 6.7 or higher over the next 30 years; among the various active faults in the region, the Hayward and Calaveras faults are the most likely to cause such an event.[225] Ground accelerations in the northeast portion of the Airport have been estimated at 0.96 g,[226] corresponding to a seismic event with a 2 percent probability of exceedance in 50 years, and 0.52 g, corresponding to a seismic event with a 10 percent probability of exceedance in 50 years.[227] On the *Modified Mercalli Intensity scale*,[228] those estimated ground accelerations would correspond to intensity values of VIII (very strong shaking) to IX (violent shaking). Seismic shaking could place people and structures at risk.

Liquefaction

Liquefaction occurs when saturated loose granular soils (sand and silt) take on the characteristics of a liquid during the intense shaking of an earthquake.[229] Although *fine-grained plastic*[230] soils (clay and bay mud) are generally considered not susceptible to liquefaction, cohesionless soils and fine-grained soils of low plasticity, such as silts, are considered potentially liquefiable.[231] Liquefaction can cause a loss of bearing and shear strength,[232] initiate lateral spreading, cause upwelling of saturated sand (sand boils), or trigger landslides on saturated slopes. The occurrence of these effects is dependent on many complex factors, including the intensity and duration of groundshaking, particle-size distribution, and soil density.

---

[224] *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.

[225] Working Group on California Earthquake Probabilities, *UCERF3: A New Earthquake Forecast for California's Complex Fault System*, U.S. Geological Survey Fact Sheet 2015–3009, March 2015.

[226] A common measure of ground motion at any particular site during an earthquake is the *peak ground acceleration*, expressed as the percentage of the acceleration caused by gravity (g), which is approximately 980 centimeters per second squared. In terms of automobile acceleration, 1 g of acceleration is equivalent to the motion of a car traveling 328 feet from rest in 4.5 seconds. Unlike measures of magnitude, which provide a single measure of earthquake energy, peak ground acceleration varies from place to place and is dependent on the distance from the epicenter and the character of the underlying geology (e.g., hard bedrock, soft sediments, or artificial fill).

[227] Geotechnical Consultants Incorporated, *Preliminary Geologic Hazards and Geotechnical Assessment, Plot 700, North Access Road, San Francisco International Airport*, September 13, 2013.

[228] The Modified Mercalli Intensity scale is composed of increasing levels of ground motion intensity, designated by Roman numerals, that range from imperceptible shaking to catastrophic destruction. It does not have a mathematical basis; instead, it is an arbitrary ranking based on observed effects.

[229] U.S. Geological Survey. Earthquake Hazard Program, *Liquefaction Susceptibility.* https://earthquake.usgs.gov/education/geologicmaps/liquefaction.php, accessed January 30, 2025.

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

[231] Mejia, Lelio H., Jiaer Wu, Zhaohui Yang, and Jim Chiu, "Seismic Response of the San Francisco International Airport Airfield during the 1989 Loma Prieta Earthquake," in *Proceedings, Geotechnical Earthquake Engineering and Soil Dynamics V, Sacramento, California,* May 2008.

[232] *Bearing* and *shear strength* refer to a soil's ability to support weight (bearing) and resist lateral deformation under stress (shear).

A direct effect of liquefaction can be *lateral spreading*, which occurs when large blocks of intact, non-liquefied soil move downslope on a liquefied soil substrate. When lateral displacement occurs, the mass moves toward an unconfined area, such as a descending slope or stream-cut bluff. Slopes ranging between 0.3 and 3 percent can displace the surface by several meters to tens of meters. Areas of observed lateral spreading on the bay margin are areas where fill has been placed over marsh and bay mud deposits, similar to the conditions at the Airport. No evidence of lateral spreading was reported at the Airport after the Loma Prieta Earthquake in 1989. However, considering the existing conditions at the Airport, lateral spreading could occur in sloped areas where Young Bay Mud or fill materials undergo liquefaction.

The California Geological Survey (CGS) conducted a seismic hazard zone analysis in the San Mateo Quadrangle, which included the Airport.[233] The results of the study placed the entire Airport in a liquefaction zone, in which "the historical occurrence of liquefaction, and local geological, geotechnical, and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Division 2, Chapter 7.8, section 2693(c) would be required." Section 2693(c) defines mitigation as "those measures that are consistent with established practice and that will reduce seismic risk to acceptable levels." The RADP project area has been mapped within a liquefaction zone and thus would be required to comply with the requirements of California's Seismic Hazard Mapping Act (SHMA). As discussed under Impact GE-1 below, the RADP projects would be required by the SHMA to evaluate the individual site for liquefaction susceptibility and apply geotechnical recommendations necessary to reduce the severity of liquefaction hazards. Although the bay muds are mostly fine-grained silts and clay, the materials are soft with high water content and may contain lenses of liquefiable material, especially near the mouth of creeks. The fill materials underlying the Airport consist of a relatively broad range of soils, so the susceptibility to and potential for liquefaction of the fill can vary significantly within short distances.[234] One reported indication of liquefaction – a localized eruption of *sand boils* – was reported on undeveloped land immediately north of the Airport during the Loma Prieta Earthquake in 1989.[235,236]

Paleontological Resources

Paleontological resources are the fossilized evidence of past life found in the geologic record and can include vertebrates (animals with backbones), invertebrates (e.g., starfish, clams, ammonites, and marine coral), and fossils of microscopic plants and animals (microfossils). The Airport is covered by imported fill materials that would not contain fossils because, although such materials may have been originally derived from rocks, they have been fractured, weathered, and/or reworked such that fossils would not be preserved. The Young Bay Mud that underlies the fill is relatively young (less than 10,000 years old). However, in some locations, these bay mud deposits may contain common fossils such as mussel shells, but these fossils are ubiquitous and their occurrence would not be noteworthy.

---

[233] California Geological Survey, *Seismic Hazard Zone Report for The San Mateo 7.5-Minute Quadrangle, San Mateo County, California*, Seismic Hazard Zone Report 113, 2018.
[234] Mejia, Lelio H., Jiaer Wu, Zhaohui Yang, and Jim Chiu, "Seismic Response of the San Francisco International Airport Airfield during the 1989 Loma Prieta Earthquake," in *Proceedings, Geotechnical Earthquake Engineering and Soil Dynamics V, Sacramento, California,* May 2008.
[235] U.S. Geological Survey, *The Loma Prieta, California, Earthquake of October 17, 1989—Liquefaction*, USGS Professional Paper 1551-B, Thomas Holzer, editor, 1998.
[236] 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.

Regulatory Setting

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was enacted in 1972 to mitigate the hazard of surface faulting in structures for human occupancy. This law does not apply to the RADP because no active faults cross on or near the Airport.[237] However, it is included here for informational purposes given the Airport's proximity to the San Andreas Fault Zone and the identification of suspected but refuted Holocene faulting in the sediments under the bay east of the Airport, as discussed above.

Seismic Hazards Mapping Act

The California Legislature enacted the Seismic Hazards Mapping Act of 1990 (Public Resources Code sections 2690–2699) to address the effects of strong groundshaking, liquefaction, landslides, and other ground failures caused by seismic events. The Seismic Hazards Mapping Act requires the state geologist to delineate "seismic hazard zones." Under Public Resources Code section 2697, cities and counties must require, before the approval of a project located in a seismic hazard zone, the submittal of a preliminary geotechnical report defining and delineating any seismic hazard. Public Resources Code section 2698 states that cities and counties may establish policies and criteria that are stricter than those established by the CGS.

State publications supporting the requirements of the Seismic Hazards Mapping Act include CGS Special Publication 117A, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*,[238] and Special Publication 118, *Recommended Criteria for Delineating Seismic Hazard Zones in California*.[239] Special Publication 117A provides guidelines to assist in the evaluation and mitigation of earthquake-related hazards for projects within designated zones requiring investigations and to promote uniform and effective statewide implementation of the evaluation and mitigation elements of the Seismic Hazards Mapping Act. Special Publication 118 provides recommendations to assist CGS in carrying out the requirements of the Seismic Hazards Mapping Act to produce the Probabilistic Seismic Hazard Maps for the state.

The entire Airport property within the San Francisco South and Montara Mountain topographic quadrangles (about 95 percent) has been evaluated by CGS as an area with liquefaction hazards.[240] The remaining Airport property (the easternmost 5 percent) in the Hunters Point Topographic Quadrangle has not yet been evaluated; because the majority of the quadrangle is within San Francisco Bay, it would not likely be zoned for liquefaction hazard in the future.

California Building Code

The California Building Code (CBC; CCR title 24, part 2) was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards for structural strength, means of egress

---

[237] California Geological Survey, Earthquake Zones of Required Investigation, https://maps.conservation.ca.gov/cgs/EQZApp/app/, accessed May 22, 2024.
[238] California Geological Survey, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*, Special Publication 117A, March 1997, revised September 2008, https://www.conservation.ca.gov/cgs/Documents/Publications/Special-Publications/SP_117a.pdf, accessed May 22, 2024.
[239] California Geological Survey, *Recommended Criteria for Delineating Seismic Hazard Zones in California*, Special Publication 118, May 1992, revised April 2004, https://www.conservation.ca.gov/cgs/Documents/Publications/Special-Publications/SP_118-2004-Criteria-Seismic-Hazard-Zones-CA.pdf, accessed May 22, 2024.
[240] Ibid.

facilities, and general stability of buildings. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction. The California Building Standards Commission administers title 24, and, by law, is responsible for coordinating all building standards. Under state law, all building standards must be codified in title 24 or they are not enforceable. The provisions of the CBC apply to the construction, alteration, movement, replacement, location, and demolition of every building or structure, or any appurtenances connected or attached to such buildings or structures throughout California.

The 2022 edition of the CBC is based on the 2021 International Building Code published by the International Code Council. The code is updated triennially, and the 2022 edition of the CBC, which was published by the California Building Standards Commission, took effect starting January 1, 2023. The 2022 CBC contains California amendments based on American Society of Civil Engineers Minimum Design Standard ASCE/SEI 7-16, Minimum Design Loads for Buildings and Other Structures, which provides requirements for general structural design, and includes means for determining earthquake loads and other loads (such as wind loads) for inclusion into building codes.

Seismic design provisions of the building code generally prescribe minimum lateral forces applied statically to the structure, combined with the gravity forces of the dead and live loads of the structure, which the structure then must be designed to withstand. The prescribed lateral forces are generally smaller than the actual peak forces that would be associated with a major earthquake. Consequently, structures that comply with the applicable CBC requirements should be able to (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage but with some nonstructural damage; and (3) resist major earthquakes without collapse, but with some structural as well as nonstructural damage.

Conformance to the current building code recommendations does not constitute any kind of guarantee that substantial structural damage would not occur in the event of a maximum-magnitude earthquake. However, it is reasonable to expect that a structure designed in accordance with the seismic requirements of the CBC should not collapse in a major earthquake.[241] The structural elements of projects that could occur with implementation of the RADP would be required to comply with CBC requirements.

Federal Aviation Administration Advisory Circular No. 150/5370-10H, Standard Specifications for Construction of Airports

The standard specifications in FAA Advisory Circular No. 150/5370-10H relate to the materials and methods used for construction at airports. Items covered in the advisory circular include general provisions, earthwork, flexible-base courses, rigid-base courses, flexible-surface courses, rigid pavement, fencing, drainage, turf, and lighting installation. The advisory circular also describes temporary soil erosion and siltation control measures to be used during construction. Section 70 requires airport contractors to observe and comply with all applicable laws, ordinances, regulations, orders, and decrees. During construction, temporary erosion and siltation control measures must be maintained both within the active construction limits and in outside areas, such as borrow pits, equipment and material storage sites, waste areas, and temporary plant sites. In the event of a conflict between the advisory circular's requirements and pollution

[241] California Seismic Safety Commission. *Guide to Identify and Manage Seismic Risks of Buildings for Local Governments*. Publication SSC 17-01. March 9, 2017.

control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

Although compliance with FAA Advisory Circular No. 150/5370-10H is not mandatory, construction of subsequent projects that could occur pursuant to the RADP would comply with the advisory circular's requirements. However, airports with federal funding, such as SFO, must adhere to the Advisory Circular to comply with their grant assurances.

Airport Building Regulations and the Airport Building Inspection and Code Enforcement Section

The San Francisco Airport Commission adopts rules and regulations that express the policy of the commission and are intended to ensure the safe and efficient operations at SFO. The rules and regulations govern the general conduct of the public, tenants, employees, and commercial users of the Airport as their activities relate to the possession, management, supervision, operation, and control of the Airport through its airport commission.

On October 17, 2017, the Airport Building Regulations were adopted by the airport commission, superseding previous regulatory instruments (such as the 1999 Tenant Improvement Guide).[242] The Airport Building Regulations apply to all persons doing construction work at the Airport, including Airport contractors, tenants, and other permittees. The purpose of the Airport Building Regulations is to do all of the following:

- Establish the minimum requirements for safeguarding the public health, safety, and general welfare through structural strength; means-of-egress facilities; stability; access for persons with disabilities; sanitation; adequate lighting and ventilation; energy conservation; and safety to life and property from fire and other hazards attributed to the built environment.
- Regulate and control the demolition of all buildings and structures, and the quarrying, grading, excavation, and filling of land.
- Provide safety to firefighters and emergency responders during emergency operations.

As discussed under section 105 of the Airport Building Regulations, with limited exceptions, no building, structure, or system shall be erected, installed, enlarged, altered, repaired, removed, converted, or replaced, or demolished unless a separate permit for each has first been obtained from the building official.[243]

The Airport Building Regulations are supplemented by the Airport Architecture and Engineering Standards, which currently apply to all projects conducted by the Airport, whether performed by tenants or other permittees.

The Airport's Building Inspection and Code Enforcement Section (BICE) is the code administration and enforcement agency under the Airport Building Regulations.[244] BICE reviews construction documents, issues building permits, inspects premises for which permits have been issued, and enforces compliance with the Airport Building Regulations. BICE provides plan checks and inspections of all Airport and tenant building

[242] The 1999 Tenant Improvement Guide was the mechanism by which the Airport enforced the California Building Standards Code (California Building Code) and served as the Airport design standards for both Airport projects and tenant improvement projects.
[243] Work not requiring permits under section 105 are addressed in section 105.2 and include small or temporary construction, electrical, gas, mechanical or plumbing projects.
[244] The San Francisco Department of Building Enforcement does not have jurisdiction at SFO.

construction, enforces all code requirements, monitors construction activity, ensures contract compliance, and coordinates construction to minimize its impact on Airport operations. In particular, BICE enforces the CBC, title 24, and ensures that all Airport buildings and structures are constructed in conformance with applicable provisions in section 1613 (Earthquake Loads). Additionally, the Airport Standard Construction Measure Division 01 60 00, Material and Equipment, specifies seismic anchorage requirements for Airport buildings and structures.[245] Before approval of construction plans for subsequent RADP projects, the Airport or its tenants would be required to conduct a design-level geotechnical investigation to evaluate the soil properties needed for the development of site-specific seismic design criteria. The results of the geotechnical investigation would be used to develop recommendations necessary to reduce seismic hazards, and those recommendations would be incorporated into the final structural design. Recommendations may include ground stabilization, appropriate selection of foundation type and depths, and selection of appropriate structural systems.

Public Resources Code

Public Resources Code chapter 1.7, sections 5097 and 30244, includes additional state-level requirements for the assessment and management of paleontological resources. These statutes require reasonable mitigation of adverse impacts on paleontological resources resulting from development on state lands. They also define the excavation, destruction, or removal of paleontological “sites” or “features” from public lands without the express permission of the jurisdictional agency as a misdemeanor. As used in section 5097, *state lands* refers to lands owned by, or under the jurisdiction of, the state or any state agency. *Public lands* is defined as lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or agency thereof.

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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. As such, the following analysis considers whether compliance with regulatory requirements relevant to construction and operation of projects that could occur pursuant to the RADP would be sufficient to minimize and/or avoid significant impacts related to geologic hazards. This section summarizes the key physical conditions and regulatory requirements relevant to assessing impacts related to geologic hazards and paleontological resources. The evaluation of potential impacts of the subsequent RADP projects is based on a review of geotechnical studies previously conducted for Airport development projects and engineering studies prepared to support the development of the RADP.
Topic E.16(e), regarding the capability of soils to adequately support the use of septic tanks or alternative wastewater disposal systems, is not applicable to projects that could occur pursuant to the RADP because sanitary sewers at the Airport are connected to municipal wastewater systems and the RADP does not propose any septic or leachfield systems. Therefore, this topic is not discussed further.

CEQA does not generally require lead agencies to consider how existing hazards or conditions might affect a project’s users or residents, except where the project would significantly exacerbate an existing environmental hazard.[246] Accordingly, hazards resulting from a project that places development in an

[245] The Airport’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.
[246] *California Building Industry Association v. Bay Area Air Quality Management District*, 62 Cal.4th 369. Opinion filed December 17, 2015.

existing seismic hazard area or an area with unstable soils are not considered impacts under CEQA unless the project would significantly worsen the seismic hazard or soil conditions. Thus, the following analysis evaluates whether implementation of the RADP would exacerbate future seismic hazards or unstable soils at the Airport and result in a substantial risk of loss, injury, or death. The impact is considered significant if the project would intensify effects of seismic ground motion or cause soils to further destabilize during an earthquake, thereby increasing the severity of these hazards that would occur or be present without the project. Projects that could occur pursuant to the RADP would not exacerbate seismic hazards because temporary construction activities such as excavation and grading and construction of permanent structures designed to seismic standards do not initiate or intensify ground shaking nor do they contribute to consequent soil failure.

Impacts and Mitigation Measures

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. *(Less than Significant)*

Fault Rupture

The RADP project site is located on the western shore of San Francisco Bay in a seismically active region. However, the Airport is not located on a known active fault and is not within an Alquist-Priolo Earthquake Fault Zone.[247] The active San Andreas Fault Zone is approximately 2.5 miles to the southwest and the active Hayward Fault Zone is about 15 miles to the northeast.

Projects that could occur with implementation of the RADP would involve constructing additional buildings and infrastructure at the Airport in areas that have been developed for years. The Airport is not located on an active fault and the potential for fault rupture is remote. Therefore, the impacts associated with surface fault rupture would be ***less than significant***.

Mitigation: None required.

Groundshaking

The Airport is in a seismically active region bounded by the San Andreas Fault Zone to the southwest and the Hayward Fault Zone located across the bay to the northeast. Intense groundshaking and high ground accelerations would affect the entire Airport during a regional earthquake on one of the several active bay area faults. Groundshaking during an earthquake could damage structural foundations, distort and break pipelines, and cause structural failure. As discussed below, construction or operation of projects that could occur pursuant to the RADP would not exacerbate shaking or increase its damaging effects.

As discussed above, the RADP projects would be required to undergo appropriate design-level geotechnical evaluations before final design and construction. Project engineers and Airport building officials would be responsible for implementing regulatory requirements found in the CBC and in CGS's *Guidelines for Evaluating and Mitigating Seismic Hazards in California*.[248] SFO's BICE enforces CBC title 24 at the Airport and

[247] Working Group on California Earthquake Probabilities, *The Third California Earthquake Rupture Forecast (UCERF3), output from Google Earth file with fault probabilities,* 2015.
[248] California Geological Survey, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*, Special Publication 117A, October 7, 2008.

ensures that Airport buildings and structures are constructed in conformance with applicable fire and life-safety codes and standards. BICE provides plan checks and inspections of all Airport and tenant building construction, enforces code requirements, monitors construction activity, ensures contract compliance, and coordinates construction to minimize impacts on Airport operations. All construction activities would be required to obtain a permit from SFO in accordance with section 105 of the Airport Building Regulations, as discussed above.

The State of California requires that buildings be constructed to withstand a prescribed level of groundshaking without causing extensive damage and/or collapse. These laws, administered through the CBC and enforced by BICE, are designed to protect the public from injury and death during a large regional earthquake. Tenants are required to comply with, and the Airport is required to enforce, design and construction guidelines aimed at reducing risks to the public. Compliance with the CBC would minimize the potential for damage and/or building collapse from strong groundshaking to an acceptable level.

Because projects that could occur pursuant to the RADP would reduce the risk of groundshaking through adherence to federal, state, and local laws and would use design and construction techniques that are proven to reduce damage and building collapse, the impact of earthquake groundshaking on the RADP projects would be ***less than significant***.

Mitigation: None required.

Liquefaction

As discussed previously, as individual RADP projects are proposed, the Airport or its tenant would conduct a geotechnical investigation as required by the CBC and comply with the investigation and mitigation requirements set forth in CGS's *Guidelines for Evaluating and Mitigating Seismic Hazards in California*. The geotechnical investigation would evaluate liquefaction potential, and the associated geotechnical report would include recommendations for reducing the severity of potential liquefaction hazards. The recommendations may include remediation measures including removal and replacement with engineered fill, treatment of soils to reduce liquefaction potential, or construction of pile foundations that would extend through the liquefiable materials to be supported by the underlying bedrock.

Pursuant to the Airport Building Regulations, BICE would review designs for all new Airport buildings and structures to ensure compliance with the CBC requirements and to confirm that construction complies with applicable codes that safeguard public health, safety, and general welfare. The design and construction of RADP projects would incorporate site-specific geotechnical recommendations developed to reduce the risk of ground failure during an earthquake. Therefore, impacts associated with liquefaction and ground failure would be ***less than significant***.

Mitigation: None required.

Earthquake-Induced Landslides

Landslides are movements of a mass of rock, debris, or earth down a slope. The Airport is located on relatively flat land and is not in an area susceptible to landslides.[249] Therefore, the subsequent projects that

[249] Ibid.

could occur pursuant to the RADP would not expose people or structures to potential substantial adverse effects related to landslides. As such, ***no impact*** would occur.

Mitigation: None required.

Conclusion

As described previously, the projects that could occur with implementation of the RADP would incorporate design and construction recommendations identified in site-specific geotechnical investigations required by the CBC with oversight from BICE. Therefore, the RADP would not increase the potential for people or structures to be exposed to substantial adverse effects from seismic hazards, including fault rupture, seismic groundshaking, liquefaction, and seismically induced ground failure, lateral spreading, or landslides. In addition, subsequent RADP projects would not exacerbate existing or future seismic hazards. Therefore, direct or indirect impacts related to strong seismic shaking, seismic-related ground failure, and liquefaction would be ***less than significant***.

Mitigation: None required.

Impact GE-2: The RADP would not result in substantial soil erosion or the loss of topsoil. *(Less than Significant)*

The Airport is entirely developed and covered with hardscape. No topsoil used for agricultural purposes is present. Because the RADP project site would remain entirely developed and covered with hardscape (buildings and pavement), no impact related to the loss of topsoil would occur, and implementation of the RADP would not result in substantial soil erosion during operations.

Construction of subsequent projects that could occur pursuant to the RADP would involve temporary localized ground disturbance activities, such as grading, excavation, and construction. Project facilities would be constructed in relatively flat areas with little topographic relief. The gentle topographic relief would minimize the potential for soil erosion during construction. However, the excavations for subsurface foundations and structures could create slopes that would be susceptible to erosion. In addition, if not adequately protected, soil stockpiles could erode, generating sediment.

Any construction project that would disturb 1 or more acres of soil at the Airport must obtain coverage under the National Pollutant Discharge Elimination System (NPDES) *General Permit for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities: Order WQ 2022-0057-DWQ* (Construction General Permit). See Topic E.17, Hydrology and Water Quality, for additional details regarding this permit. The Construction General Permit was developed to ensure that stormwater is managed and erosion is controlled on construction sites. The Construction General Permit requires preparation and implementation of a storm water pollution prevention plan (SWPPP), which requires the application of best management practices (BMPs) to control stormwater run-on and runoff from construction sites. The BMPs could include but would not be limited to physical barriers to prevent erosion and sedimentation, construction of sedimentation basins, limitations on work periods during storm events, use of bio-infiltration swales, protection of stockpiled materials, and other measures that would substantially reduce or prevent erosion from occurring during construction.

Smaller projects that would disturb less than 1 acre of soil must have a site-specific erosion and sediment control plan in accordance with the Airport's Construction SWPPP Guidelines (Appendix S of SFO's Industrial SWPPP). See Topic E.17, Hydrology and Water Quality, for details regarding this permit. The guidelines include provisions applicable to all construction projects and supplement the requirements of the Construction General Permit. The Airport may also require preparation of a site-specific SWPPP for construction projects that would disturb less than 1 acre of soil.

The Airport, tenant, or contractor directly performing construction work must prepare a site-specific SWPPP or an erosion and sediment control plan, which is reviewed for adequacy by the Airport's Bay Pollution Prevention Program (BPPP). See Topic E.17, Hydrology and Water Quality, for details regarding this requirement. Either the SWPPP or the erosion and sediment control plan must include BMPs to reduce erosion and sedimentation effects. For example, the SWPPP must describe how excavated soil would be characterized, handled, stored, and disposed of and how the work site would be managed to avoid rainfall pass-through. Typical measures for construction sites include erosion control or site stabilization that retains soil and sediment onsite. Stabilization and structural control practices are to be used at all construction sites. Examples of such practices include placement of fiber rolls or gravel barriers to detain small amounts of sediment from disturbed areas, and temporary or permanent covering of stockpiles to prevent rainfall from contacting the stockpiled material.

Implementing the BMPs specified in the subsequent project's SWPPP or erosion and sediment control plan would reduce erosion and sedimentation effects of construction of subsequent projects that could occur pursuant to the RADP. Project construction activities and post-construction design would comply with the erosion control and stormwater quality requirements discussed previously, which would minimize the potential for soil erosion. Therefore, the impact of subsequent projects that could occur pursuant to the RADP, with respect to substantial increases in soil erosion during construction and operation, would be ***less than significant***.

Mitigation: None required.

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. *(Less than Significant)*

Given the nature of the artificial fill materials underlying Young Bay Mud and the history of settlement at the Airport, other than liquefaction-related ground failure during an earthquake, settlement is considered the primary soil instability issue for implementation of the RADP. This impact analysis focuses on the potential for subsequent projects to encounter soils with the tendency to settle during construction and operations and the remedies to overcome the problematic soils. In most cases, the geotechnical investigation that is required before facility design and construction would identify and incorporate necessary measures to reduce settlement.

Settlement Related to Excavation

Depending on site conditions and the structural design, some RADP projects may require deep foundation excavations. During construction, the artificial fill and Young Bay Mud adjacent to the excavation could become unstable, causing the immediate area to settle differentially as lateral support decreases with the depth of excavation. Settlement could damage adjacent Airport buildings, streets, and utilities, and newly constructed buildings.

Settlement response immediately adjacent to deep excavations is a common concern, especially in areas underlain by artificial fill and soft native clays. Typically, a contractor will remedy the lateral displacement of material adjacent to an excavation through the placement of shoring. Temporary shoring would be required during construction of some RADP projects to maintain stable sidewalls in the excavations and protect adjacent public streets/sidewalks and nearby buildings. An example of temporary shoring method is the installation of retaining walls secured with tie-back anchors. The site-specific geotechnical reports required by CBC section 1803 would identify the final shoring requirements for the RADP projects. In accordance with CBC requirements, the contractor would submit shoring drawings and calculations, subject to review and approval by BICE as part of the building permit approval process. The impact of settlement associated with excavation would be ***less than significant***.

Mitigation: None required.

Settlement Related to Construction Dewatering

Groundwater at the RADP project site is relatively shallow (encountered at depths of 4 to 14.5 feet bgs). As a result, the potential exists for substantial amounts of water to flow into excavations during construction of buildings and related infrastructure. Where unconsolidated soils such as artificial fill and Young Bay Mud are present, dewatering could result in localized settlement of adjacent structures, including runways, utility infrastructure, BART tracks, and buildings.

As discussed under Impact GE-1, the Airport or its tenant would be required to conduct a geotechnical investigation for each RADP project as required by the CBC and would incorporate recommendations from the geotechnical engineer into the project design. CBC section 1803.5.7 states that where excavation will reduce support from any foundation, a registered design professional shall prepare an assessment of the structure based on a structural inspection, review of available design documents, and if necessary, excavation of test pits. For RADP projects, a registered design professional would determine requirements for underpinning and slope protection and would prepare site-specific plans, details, and a work sequence for submission to BICE. Relevant information would be collected as needed during the geotechnical investigation. The geotechnical report would include recommendations to address the anticipated settlement, accounting for the presence of pile foundations that would support surrounding structures. The recommendations may include installation of sheet pile walls to reduce the amount of dewatering required. The geotechnical recommendations would be incorporated into the project design, which would be reviewed by BICE for code compliance.

Because the design of RADP projects would incorporate site-specific geotechnical recommendations developed to reduce potential settlement during construction, the impact of subsequent projects that could occur pursuant to the RADP related to settlement from construction dewatering would be ***less than significant***.

Mitigation: None required.

Ground Disturbance Related to Pile Driving

Construction of subsequent RADP projects could include driving displacement piles, which could cause the ground to heave upward several inches. Heave to that degree could adversely affect adjacent structures, such as existing utilities, streets, and existing and newly constructed buildings.

CBC section 1810.4 (installation of deep foundations) requires that the installation of deep foundations prevent distortion or damage that may adversely affect the structural integrity of adjacent structures or of foundation elements being installed or already in place. The installation of deep foundations must avoid compacting the surrounding soil to the extent that other foundation elements cannot be installed properly. The CBC also requires that special inspections be conducted in accordance with sections 1705.7 and 1705.8 for driven and cast-in-place deep foundation elements, respectively. Special inspections and tests must be performed continuously during installation of deep foundation elements.

A plan showing the locations and designations of deep foundation elements must be filed with BICE before the installation. As part of the building permit review process, BICE would review the geotechnical report's recommendations addressing the potential for heave. The approved geotechnical report and construction documents prepared by registered design professionals would be used to determine compliance. The Airport would determine the subsequent monitoring required to address the potential for heave. During installation of the deep foundations, special inspections and monitoring would occur, pursuant to plans reviewed by BICE for conformance with the CBC. Therefore, the impact of subsequent projects that could occur pursuant to the RADP related to heave would be ***less than significant***.

Mitigation: None required.

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. *(Less than Significant)*

Expansive soils are defined as soils possessing clay particles that react to moisture changes by shrinking when dry or swelling when wet. Previous geotechnical investigations at the Airport identified expansive soils at depths greater than 6.5 to 16 feet bgs.[250,251] The potential for expansion in shallower fill materials would depend on the amount of clayey materials used for fill, and thus, this potential likely varies by location. The fill in the western area of the West Field, adjacent to North McDonnell Road (see Draft EIR Figure 2-8, p. 2-22), is known to have some clay materials with expansion potential.[252]

Corrosion refers to potential soil-induced electrochemical or chemical action that could corrode or deteriorate concrete, reinforcing steel in concrete structures, and bare-metal structures exposed to these soils. The rate of corrosion is related to factors such as soil moisture, particle-size distribution, and the chemical composition and electrical conductivity of the soil. The corrosive potential of the fill materials is unknown. However, the location of the RADP project site next to San Francisco Bay and the relatively shallow

[250] Engeo, *Geotechnical Data Report, San Francisco International Airport (SFIA), SFO Consolidated Administration Campus, San Francisco, California*, revised June 11, 2013.
[251] Geotechnical Consultants Incorporated, *Preliminary Geologic Hazards and Geotechnical Assessment, Plot 700, North Access Road, San Francisco International Airport*, September 13, 2013.
[252] Engeo, *Geotechnical Data Report, San Francisco International Airport (SFIA), SFO Consolidated Administration Campus, San Francisco, California*, revised June 11, 2013.

depth to groundwater are anticipated to result in saline corrosive conditions in shallow fill materials. In addition, foundations in native soils could encounter high potential to corrode steel and concrete.[253]

As discussed under Impact GE-1, as part of compliance with the CBC, BICE would require that a geotechnical investigation be conducted to identify geotechnical issues for subsequent projects that could occur pursuant to the RADP, including problematic soil conditions such as expansive or corrosive soil. Should the investigation identify expansive or corrosive soils, or both, the geotechnical engineer of record would provide recommendations to address the problematic soils. Remedies for corrosive soils include removal and replacement, treatment with lime, and proper fill selection. Complying with the CBC would ensure that the RADP project designs would include technical specifications to minimize the impacts of expansive or corrosive soils. Therefore, impacts of the subsequent projects that could occur pursuant to the RADP related to expansive or corrosive soils would be ***less than significant***.

Mitigation: None required.

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. *(Less than Significant)*

Paleontological resources are the fossilized remains or impressions of plants and animals, including vertebrates (animals with backbones, such as mammals, birds, and fish), invertebrates (animals without backbones, such as starfish, clams, and coral), and microscopic plants and animals (microfossils). They are valuable, non-renewable scientific resources used to document the existence of extinct life forms and to reconstruct the environments in which they lived. Fossils can be used to determine the relative ages of the depositional layers in which they occur and of the geologic events that created those deposits. The age, abundance, and distribution of fossils depend on the geologic formation in which they occur and the topography of the area in which they are exposed. The geologic environments within which the plants or animals became fossilized usually were quite different from the environments in which the geologic formations now exist.

The City uses the Potential Fossil Yield Classification system as the basis for its paleontological potential designations. The classification system is a predictive resource-management tool founded on the fact that occurrences of paleontological resources are closely tied to the geologic units that contain them, and that the likelihood that fossils are present can be broadly predicted from the distribution of geologic units at or near the surface. Therefore, geologic mapping, as the documentation of geologic unit distribution, is a reliable method for assessing the potential of geologic units to preserve fossils.[254]

The paleontological potential designations for San Francisco are numbered on a scale from Class 1 (very low potential) to Class 3 (moderate potential). According to the paleontological designation system, geologic deposits younger than 10,000 years before present (i.e., Holocene-age surficial deposits) are Class 2 – Low Potential and not likely to contain paleontological resources. The potential for significant paleontological resource impacts is generally low and impact reduction requirements are unnecessary.

---

[253] U.S. National Resources Conservation Service, *Web Soil Survey, SFO*, September 11, 2017.
[254] Ibid.

Furthermore, a search of the University of California Museum of Paleontology database for San Mateo County did not identify known Holocene vertebrate paleontological resources along the bay shoreline area near the Airport.[255] The fill and underlying Young Bay Mud are not likely to contain scientifically significant fossils; therefore, the Young Bay Mud is considered to have a low paleontological potential (Class 2).

Subsequent projects that could occur pursuant to the RADP would be constructed on strata comprising imported fill and Young Bay Mud, neither of which typically contains vertebrate paleontological remains or unique geologic features. The Young Bay Mud is up to 30 feet deep. Geologic units beneath the artificial fill and bay mud (i.e., Franciscan Formation) have the potential to contain paleontological resources, although fossil vertebrates in the Franciscan Formation are extremely rare and known invertebrate fauna consist mainly of a few molluscan genera and a diversity of microfossils.[256]

Because the underlying geologic materials that would be directly disturbed by implementation of the RADP have low paleontological sensitivity and do not contain unique geological features, the impact of subsequent projects that could occur pursuant to the RADP on unique paleontological resources or geologic features would be ***less than significant***.

Mitigation: None required.

Impact C-GE-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to geology or paleontological resources. *(Less than Significant)*

Cumulative projects are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11. Geologic impacts tend to be site-specific and dependent on local conditions. For these reasons, the geographic context for potential cumulative impacts is the Airport.

In general, to have a cumulative impact, two or more projects must overlap spatially and occur at the same time. Construction of three cumulative projects – the Consolidated Administration Campus Phase 2, the West Field Cargo Redevelopment, and portions of the Shoreline Protection Program – could potentially overlap with construction of RADP projects. In the context of geology and soils, a cumulative impact would occur if projects that could occur pursuant to the RADP and the other cumulative projects would increase the hazards associated with seismic groundshaking, including ground failure and liquefaction, or would increase the rate or occurrence of settlement at the Airport. However, this increase in hazards would not occur because subsequent projects that could occur pursuant to the RADP and the cumulative projects must comply individually with the design, reporting, and inspection requirements of the CBC as enforced by the Airport through BICE, as discussed previously.

In addition, the subsequent projects that could occur pursuant to the RADP would improve overall seismic performance at the Airport by using modern seismic design strategies that would strengthen underlying soils and construct more failure-resistant structures. Subsequent projects that could occur pursuant to the RADP

[255] University of California Museum of Paleontology, search results of Collections Database within San Mateo County, 2019, https://ucmpdb.berkeley.edu/loc.html, accessed May 22, 2024.
[256] Ibid.

also would not exacerbate existing or future seismic hazards or unstable soils by increasing the severity of the hazards that otherwise would not occur or be present without implementation of the RADP.

Geologic materials underlying the cumulative projects (artificial fill and Young Bay Mud) are similar to those that could underlie projects that could occur pursuant to the RADP, and would have similar low paleontological sensitivity. Therefore, with regard to seismic hazards, ground failure (settlement), problematic soils, and paleontological resources, subsequent projects under the RADP would not combine with cumulative projects to result in a significant cumulative impact, and the cumulative impact would be ***less than significant***.

Mitigation: None required.

E.17 Hydrology and Water Quality

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
17. HYDROLOGY AND WATER QUALITY. Would the project:					
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐	☐
c) 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:					
i) Result in substantial erosion or siltation on- or offsite;	☐	☐	☒	☐	☐
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite;	☐	☐	☒	☐	☐
iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐	☐
iv) Impede or redirect flood flows?	☐	☐	☒	☐	☐

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐	☐

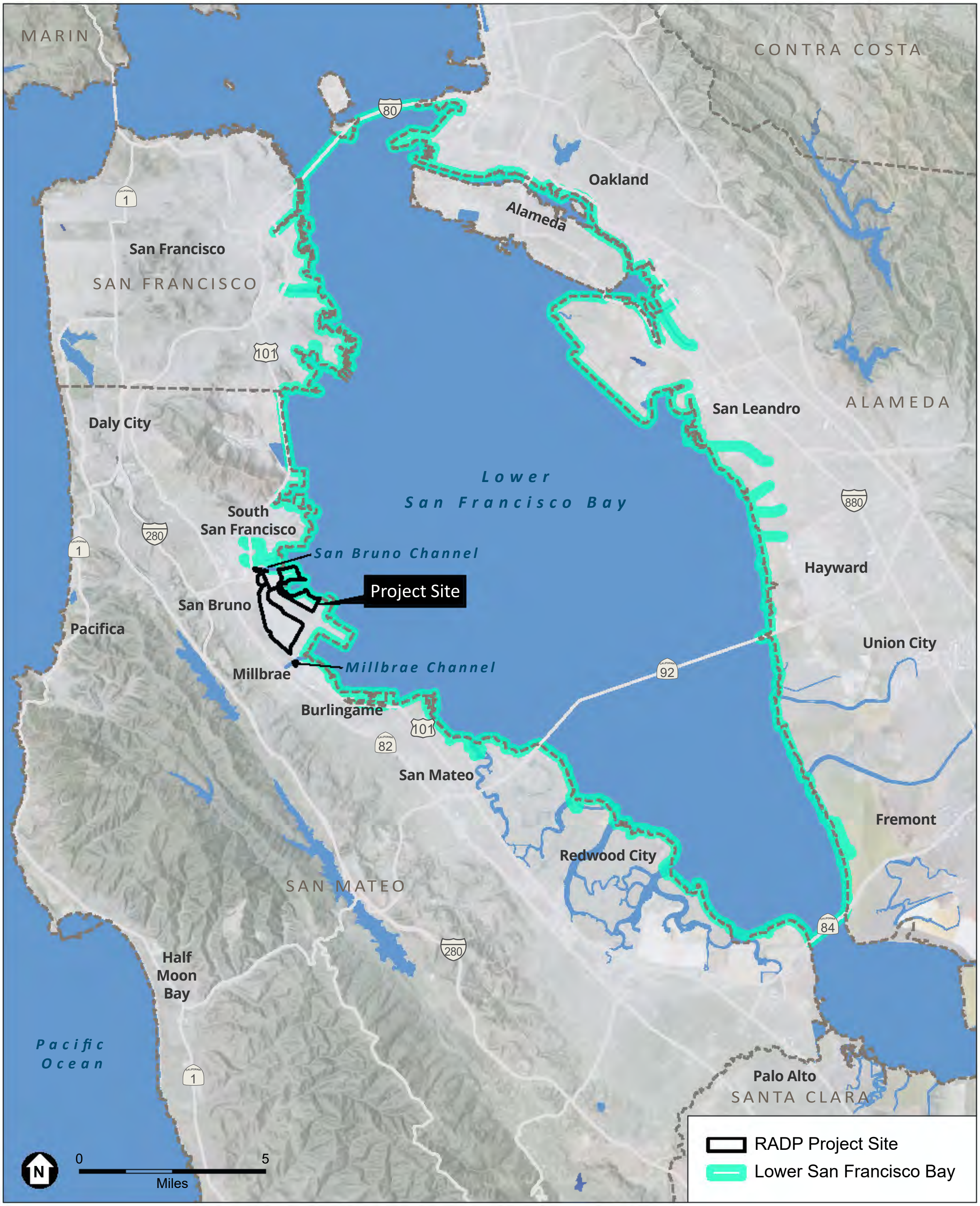
Environmental Setting

Surface Water Hydrology and Water Quality

The RADP project site is located predominantly on artificial fill that was placed in San Francisco Bay to create a relatively flat area that resides just above sea level.[257] The topography of the RADP project site is relatively flat and level; the ground surface elevation ranges from 2.5 to 12.5 feet above the North American Vertical Datum of 1988. The operational area of the Airport, which includes the RADP project site, has been largely developed with hardscape: asphalt, concrete, and aboveground steel and concrete structures. The Airport is not a part of a natural drainage area; water enters the Airport site either directly as precipitation or via the potable water supply system.[258] The mean annual precipitation at the Airport is approximately 20 inches per year, with most of the rainfall occurring between November and March.[259] Once onsite, first flush stormwater enters either the stormwater collection system or the industrial and sanitary sewer system (discussed below) before being discharged to San Francisco Bay.[260]

Key surface water features relevant to the RADP project site are the San Bruno Channel to the north, the Millbrae Channel to the south, and San Francisco Bay (described under "Water Quality," below) to the east (see **Figure 7**). The San Bruno Channel forms the northern border of the Airport's operational area. This channel consists of open sections, as well as culverted sections under roadways and industrial development, and is naturally lined with dense vegetation occurring in places toward the top of the channel banks. At the downstream end, the San Bruno Channel discharges into the bay via a flood control gate consisting of four 5-foot-diameter pipes that have been fitted with *flap gates*[261] that prevent back flow from entering the channel at high tides. The Millbrae Channel generally forms the southern edge of the operational area of the Airport as a relatively uniform concrete channel that empties into the bay through two 12-by-10-foot flap gates. No water from the Airport's operational area is discharged to or otherwise drains to these channels.[262]

[257] City and County of San Francisco, Department of City Planning, *San Francisco International Airport Master Plan Final Environmental Impact Report (Case No. 86.638E)*, certified May 28, 1992.
[258] Ibid.
[259] Western Regional Climate Center, 2024, San Francisco International Airport Period of Record Monthly Climate Summary, Period of Record: 07/01/1945 to 06/09/2016, https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7769, accessed May 14, 2024.
[260] Mel Leong Treatment Plant – Sanitary and Industrial Plants, NPDES Permit Number CA0038318, California Regional Water Quality Control Board Order Number R2-2018-0045.
[261] 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.
[262] City and County of San Francisco, Department of City Planning, *San Francisco International Airport Master Plan Final Environmental Impact Report (Case No. 86.638E)*, certified May 28, 1992.



SOURCE: SFO, 2024; ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 7
LOWER SAN FRANCISCO BAY

The RADP staging areas (see Draft EIR Figure 2-10, p. 2-41) are currently used as staging, storage, and laydown areas. The Plot 16D, Lot at North Access Road, Lot near Tanks, and Aviador Lot staging areas are generally pervious or partially pervious (i.e., graded compacted dirt and/or gravel-covered areas); most stormwater likely infiltrates onsite, and stormwater runoff that exceeds the infiltration capacity of onsite soils potentially drains to stormwater collection and conveyance systems or adjacent surface waters. The 5.28-acre Lot near Tanks staging area is partially graded with gravel cover; the remainder of the lot is composed of vegetative cover with some wetland features.[263] The Lot near Coast Guard (north and south) and Plot 41 staging areas are located within the Airport's operational area and are generally paved and impervious, with runoff draining to the Airport's stormwater collection system (discussed below).

Stormwater

Stormwater at the Airport is collected in the existing stormwater collection system, which consists of approximately 91 miles of piping and 19 pump stations. The stormwater is routed either to one of four detention basins,[264] directly to the onsite MLTP (see Draft EIR Figure 2-4, p. 2-9), or to one of nine stormwater outfalls.[265] The four detention basins drain to the MLTP industrial system; they are sized to capture for treatment the *first flush*[266] of stormwater runoff from terminals, taxiways, aprons, and aircraft and vehicle parking in compliance with NPDES permit requirements. When the detention basins have reached capacity, having captured for treatment the first approximately quarter-inch of rainfall from the Airport, additional runoff is discharged directly to San Francisco Bay through the nine stormwater outfalls.

Some stormwater runoff on Airport property, such as runoff from the bay shoreline around the Airport, is not collected by the stormwater collection system; instead, it drains directly to San Francisco Bay. Stormwater discharged directly to the bay from runways and some portions of taxiways flows through pervious grassy median areas, which allows some surface runoff to infiltrate into underlying soils as well as the capture of sediment and other pollutants transported in stormwater runoff.

Sanitary and Industrial Wastewater

Wastewater is generated either onsite at Airport facilities or on arriving aircraft. Wastewater generated at Airport facilities is pumped to the MLTP sanitary system[267] for treatment before being discharged to San Francisco Bay. The MLTP includes a separate collection system to treat industrial wastewater from maintenance shops and vehicle washing, as well as first-flush stormwater runoff from industrial areas. The sanitary and industrial wastewater is treated in compliance with NPDES regulatory requirements (discussed in more detail below) and discharged to Lower San Francisco Bay via the North Bayside System Unit[268] force

[263] Fill of the wetland areas and use of the Lot near Tanks area as a construction staging area was approved as part of the *San Francisco International Airport Shoreline Protection Program Final Environmental Impact Report*, certified June 1, 2023.
[264] The detention basins have the following capacities: North Field Detention Basin, 0.25 million gallons; South Field Detention Basin, 1.5 million gallons; West Field Detention Basin, 6.1 million gallons; and East Field Detention Basin, 0.5 million gallons.
[265] Mel Leong Treatment Plant – Sanitary and Industrial Plants, NPDES Permit Number CA0038318, California Regional Water Quality Control Board Order Number R2-2018-0045.
[266] 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.
[267] The only waste streams allowed in the sanitary system under the Airport's 2017 Sewer System Management Plan are those from Airport sinks and toilets, lavatory waste collected from airplanes, and restaurant-related wash water.
[268] The North Bayside System Unit is a joint-powers authority that includes the City and County of San Francisco, acting through its Airport Commission, along with nearby cities, and owns and operates the North Bayside System Unit facility.

main, pumping station, dechlorination facilities, and deepwater outfall. The deepwater outfall is northeast of Point San Bruno, approximately 5,300 feet offshore at a depth of 20 feet below *mean lower low water*.[269]

In addition to using treatment technologies at the MLTP, the Airport enforces internal requirements to control the quality of sanitary and industrial wastewater that flows to the MLTP. The Airport's regulatory mechanisms for controlling and reducing pollutants in sanitary and industrial wastewater and stormwater include the Airport Rules and Regulations (discussed in more detail below).

Water Quality

San Francisco Bay is the receiving water body relevant to the RADP project site. San Francisco Bay is subdivided into seven segments (moving north to south): the Sacramento–San Joaquin Delta, Suisun Bay, the Carquinez Strait, San Pablo Bay, the Central Bay, Lower San Francisco Bay, and the South Bay. The RADP project site is located on the bay margins of Lower San Francisco Bay. Various contaminants are transported into the bay by several different sources: industrial outfalls, municipal wastewater outfalls, municipal stormwater, upstream farming, upstream historic and current mining discharges, legacy pollutants,[270] and various other pollutant sources. Mercury in the bay is deposited from the atmosphere along with sediments transported from areas affected by historic gold mining in the Central Valley and Sierra Nevada foothills. Sediment, plastics, metals, and pesticides are washed into the bay from the surrounding communities during storms, and nutrients and water containing low levels of dissolved oxygen can enter the bay through discharges from wastewater collection systems.

In accordance with Clean Water Act section 303(d), states must present the U.S. Environmental Protection Agency (U.S. EPA) with a list of *impaired water bodies*, defined as those water bodies that do not meet water quality standards. The State Water Resources Control Board (state board) and San Francisco Bay regional board have listed Lower San Francisco Bay as an impaired water body for legacy concentrations of the chlorinated pesticides chlordane, dichloro-diphenyl-trichloroethane (DDT), dieldrin, dioxin compounds, furan compounds, the oil coolant polychlorinated biphenyl (PCB), mercury, trash, and invasive species.[271] The Clean Water Act requires the development of total maximum daily loads to improve the water quality of impaired water bodies. A total maximum daily load applicable to Lower San Francisco Bay has been developed and approved by U.S. EPA for mercury and PCBs.[272] The San Bruno Channel and the Millbrae Channel are not listed as impaired.[273] Lower San Francisco Bay is not considered a sediment-sensitive water body and is not listed as impaired for sediment.[274]

[269] *Mean lower low water* is the lowest of the two low tides per day averaged over a 19-year period.
[270] *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.
[271] California State Water Resources Control Board, *2020–2022 California Integrated Report (Clean Water Act Section 303(d) List/305(b) Report)*, Appendix A: Proposed Final 2020–2022 303(d) List, https://www.waterboards.ca.gov/water_issues/programs/tmdl/2020_2022state_ir_reports_revised_final/apx-a-303d-list.xlsx, accessed May 20, 2024.
[272] 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.
[273] California State Water Resources Control Board, *2020–2022 California Integrated Report (Section 303(d) List/305(b) Report)*, Appendix A: Proposed Final 2020–2022 303(d) List, https://www.waterboards.ca.gov/water_issues/programs/tmdl/2020_2022state_ir_reports_revised_final/apx-a-303d-list.xlsx, accessed May 20, 2024.
[274] Ibid.

Groundwater Hydrology and Water Quality

SFO overlies the Westside Groundwater Basin (2-035), which extends from near Golden Gate Park in the north to Hillsborough in the south, and from the San Andreas Fault in the west to the hills dividing eastern and western San Francisco in the east.[275] The basin opens to the Pacific Ocean on the northwest and San Francisco Bay on the southeast. Near the Airport, the groundwater basin contains three aquifers (from shallowest to deepest): the Shallow Aquifer, the Primary Production Aquifer, and the Deep Aquifer. Each aquifer is separated from the others by substantial clay layers that act as aquitards.[276] *Aquitards*, which have very low permeability, constrain the top and bottom of the aquifers like a sandwich, causing groundwater to be confined and under higher pressure.

The groundwater closest to the surface in the Shallow Aquifer is often referred to as *shallow groundwater* or the *water table*. Shallow groundwater is not constrained by an overlying aquitard and is therefore not confined. Unconfined aquifers are at atmospheric pressure, and water levels rise and fall in response to precipitation, surface recharge, tidal changes, local irrigation, and underflow. As a result, shallow groundwater levels vary somewhat across the Airport. The depth to groundwater measured during a 2013 site investigation in the North Field ranged from 4 feet to 7 feet bgs.[277] Groundwater in the East Field was encountered at depths of 9 feet and 14.5 feet bgs; however, a groundwater depth of 5 feet bgs was recommended by a study for design purposes because of the expected variability in rainfall, tidal changes, and irrigation.[278] Shallow groundwater in the West Field was estimated to occur between 5 feet and 6 feet.[279] Based on this information, groundwater could be present at 4 feet bgs or deeper across the Airport.

Shallow groundwater underlying the Airport is of poor quality and is not used for supply. Deeper confined aquifers are used for public water supply and are shared by various municipalities. Beneath the Airport, the Young Bay Mud acts as an aquitard, separating the shallow groundwater from deeper aquifers used for municipal water supply and generally acting as a barrier to the vertical migration of contaminants.

Flooding and Flood Risk

The Airport is subject to coastal flooding when high water levels combine with high wave conditions. Low-lying areas along San Francisco Bay's shoreline, including the Airport, can experience flooding due to extreme high tides, storm surge, and waves; however, these occurrences are relatively rare in San Francisco Bay compared to areas prone to hurricanes or other major coastal storms. Strong winds during storms can also generate waves that impact the bay shoreline and cause localized flooding, particularly when the waves ride on a storm surge–elevated water surface.[280] Depending on the intensity of each of these processes, as well as their timing relative to astronomic tides, storm surge can result in bay water levels up to about 3 feet higher than astronomical tides alone.

[275] California Department of Water Resources, *San Francisco Bay Hydrologic Region, Westside Groundwater Basin*, California's Groundwater Bulletin 118, January 2006.
[276] 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.
[277] Geotechnical Consultants Incorporated, *Preliminary Geologic Hazards and Geotechnical Assessment, Plot 700, North Access Road, San Francisco International Airport (SFO)*, September 13, 2013.
[278] Engeo and Geotechnical Consultants Incorporated, *Geotechnical Report SFIA Airfield Operations Facility, San Francisco, California*, March 30, 2012.
[279] Engeo, *Geotechnical Data Report, San Francisco International Airport (SFIA), SFO Consolidated Administration Campus, San Francisco, California*, revised June 11, 2013.
[280] AECOM and Telamon Engineering Consultants, *Shoreline Protection Program Conceptual Design Study*, prepared for the San Francisco International Airport, March 2018.

Riverine flooding refers to flooding that results from prolonged or intense precipitation in upstream watersheds that produces high flows in creeks and streams, such as the San Bruno and Millbrae channels. In downstream reaches adjacent to San Francisco Bay, high tides that occur during peak storm-related discharges can exacerbate riverine flooding.[281]

The *100-year floodplain* denotes an area that has a 1 percent chance of being inundated during any 12-month period. Floodplain zones called *Special Flood Hazard Areas* are determined by the Federal Emergency Management Agency (FEMA) and used to create Flood Insurance Rate Maps. These tools assist communities in mitigating flood hazards through land use planning. FEMA also outlines specific regulations, intended to be adopted by local jurisdictions, for any construction within 100-year floodplains, whether residential, commercial, or industrial. The FEMA Flood Insurance Rate Map for the RADP project site that depicts the 100-year flood zone identifies most of the Airport as being within the 100-year flood hazard zone, with water surface elevations for the 100-year flood ranging from 11 to 14 feet above the North American Vertical Datum of 1988. Select areas along the runways and at the inland edges of the Airport are outside of the 100-year flood zone but are within the *500-year flood zone* (see **Figure 8**).[282]

Future Flood Risk

The Airport's vulnerability to coastal flooding from extreme storm events has the potential to increase in frequency and severity (magnitude) as a result of sea-level rise.[283] During future floods, particularly those that include sea-level rise, many stretches of the bay shoreline would be overtopped and experience landward inundation from bay waters. In 2018, the State of California released its *Sea-Level Rise Guidance 2018 Update*, which provides a science-based methodology for state and local governments to analyze and assess the risks associated with sea-level rise.[284] The State of California's Sea-Level Rise Guidance presents planning, policy setting, project development, collaboration, and decision-making guidance to increase coastal resilience to sea-level rise and the science and policies are regularly updated to incorporate new research and findings.[285,286] To address existing flood risk at the Airport and implement future flood protection through 2080 (see Figure 8), including consideration of sea-level rise, the Airport has developed the Shoreline Protection Program,[287] which would install a new seawall that would comply with current FEMA requirements for flood protection and address future flood risk related to sea-level rise. The Shoreline Protection Program is anticipated to be completed by 2035.

---

[281] Ibid.
[282] The *500-year flood zone* has a 0.2 percent chance of being equaled or exceeded in any given year.
[283] City and County of San Francisco, *Sea Level Rise Action Plan,* March 2016, https://sfpublicworks.org/about/san-francisco-sea-level-rise-action-plan.
[284] California Natural Resources Agency and California Ocean Protection Council, *State of California Sea-Level Rise Guidance 2018 Update*, 2018.
[285] California Natural Resources Agency, California Environmental Protection Agency, *Making California's Coast Resilient to Sea Level Rise: Principles for Aligned State Action,* October 2020, https://www.opc.ca.gov/webmaster/_media_library/2021/01/State-SLR-Principles-Doc_Oct2020.pdf, accessed September 25, 2024.
[286] California Sea Level Rise Science Task Force, California Ocean Protection Council, California Ocean Science Trust, *California Sea Level Rise Guidance: 2024 Science and Policy Update,* January 2024, https://opc.ca.gov/wp-content/uploads/2024/01/SLR-Guidance-DRAFT-Jan-2024-508.pdf, accessed September 25, 2024.
[287] City and County of San Francisco, San Francisco Planning, *San Francisco International Airport Shoreline Protection Program Final Environmental Impact Report (Case No. 2020-004398ENV)*, certified June 1, 2023.

SOURCE: FEMA, 2024; SFO, 2024; ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 8

FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD HAZARD ZONES

Tsunami and Seiche

Tsunamis (seismic sea waves) are long-period waves that are typically caused by underwater seismic disturbances, volcanic eruptions, or submerged landslides and can travel at speeds of up to 500 miles per hour. Tsunami wave heights are typically up to 3 feet in the open water and can be barely perceptible to watercraft. Wave heights may increase to 30 feet or more when they reach land, potentially causing large amounts of damage.[288]

A *seiche* (a temporary disturbance in the water level) is caused by oscillation of the surface of an enclosed body of water such as San Francisco Bay as a result of an earthquake or large wind event. Seiches can generate long-period waves that cause run-up or overtopping of adjacent landmasses, similar to tsunami run-up.

Certain areas of the Airport along the bay shoreline are within a potential tsunami inundation zone; these areas include portions of taxiways and the eastern edge of the East Field.[289]

Regulatory Setting

Clean Water Act

In 1972, the Clean Water Act established the basic structure for regulating discharges of pollutants into the waters of the United States and gave the U.S. EPA the authority to implement pollution control programs. The Clean Water Act sets water quality standards for contaminants in surface waters. The statute incorporates a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, to finance municipal wastewater treatment facilities, and to manage polluted runoff. The U.S. EPA has delegated responsibility for implementation of portions of the Clean Water Act, including water quality control planning and programs in California, to the state board and the nine regional boards. Water quality standards applicable to the proposed project are listed in the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), as discussed below.

Clean Water Act Section 303(d) and Total Maximum Daily Loads

In accordance with section 303(d) of the Clean Water Act, states must present the U.S. EPA with a list of impaired water bodies, defined as those water bodies that do not meet water quality standards. The Clean Water Act requires the development of total maximum daily loads to improve the water quality of impaired water bodies. Implementation of this program in the RADP project area is conducted by the regional board.

Clean Water Act Section 401—Water Quality Certification

Section 401 of the Clean Water Act requires compliance with state water quality standards for actions within state waters. Compliance with the water quality standards required under Section 401 is a condition for issuance of a section 404 permit. Under section 401 of the Clean Water Act, every applicant for a federal permit or license for any activity that may result in a discharge to a water body must obtain a State Water Quality Certification that the proposed activity will comply with state water quality standards.

---

[288] City and County of San Francisco, *Emergency Response Plan, an Element of the CCSF Emergency Management Program, Tsunami Annex*, August 2016.
[289] California Geological Survey, Tsunami Hazard Area Map, https://maps.conservation.ca.gov/cgs/informationwarehouse/ts_evacuation/, accessed May 17, 2024.

Clean Water Act Section 402— National Pollutant Discharge Elimination System Permits

Section 402 of the Clean Water Act authorizes the U.S. EPA to establish a nationwide surface water discharge permit program for municipal and industrial point sources known as the NPDES program. Under section 402, the regional board has set standard conditions for each permittee in the bay area, including effluent limitation and monitoring programs. Discharges of stormwater and dewatering effluent from the proposed project would be subject to NPDES permits that are described below.

National Pollutant Discharge Elimination System Waste Discharge Regulations

Clean Water Act section 402 established the NPDES program to protect the water quality of receiving waters. The NPDES program requires all facilities that discharge pollutants into waters of the United States to obtain a permit. The permit provides two levels of control – technology-based limits and water quality–based limits – to control discharge of pollutants to protect water quality. *Technology-based limits* are based on the ability of dischargers in the same category to treat wastewater, while *water quality–based limits* are required if technology-based limits are not sufficient to protect the water body. Water quality–based effluent limitations required to meet water quality criteria in the receiving water are based on criteria specified in the National Toxics Rule, the California Toxics Rule, and the Basin Plan.[290]

NPDES permits also must incorporate total maximum daily waste load allocations when they are developed for *impaired water bodies*, defined as those water bodies that do not meet water quality standards and are listed under Clean Water Act section 303(d). In California, the state board and the regional boards implement and enforce the NPDES program.[291] The regional board implements this program for the Airport.

To ensure that Airport activities do not degrade water quality, the Airport has implemented pollutant controls in accordance with the NPDES permit, applicable both to the Airport and to all Airport tenants and operators (with the exception of the United Airlines MOC;[292] see Draft EIR Figure 2-4, p.2-9). These controls apply to sanitary wastewater, industrial wastewater, and stormwater generated during construction activities and Airport operations. The NPDES permits relevant to subsequent projects that could occur pursuant to the RADP are described below.

National Pollutant Discharge Elimination System Construction General Permit

California's state board adopted the Construction General Permit on September 8, 2022 (Order 2022-0057-DWQ). The Construction General Permit regulates stormwater management at construction sites. Dischargers whose projects disturb 1 acre or more of soil, or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 acre or more, must obtain coverage under the Construction General Permit. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground, such as stockpiling or excavation, as well as construction of buildings and linear underground projects, including installation of water pipelines and other utility lines.

---

[290] State Water Resources Control Board, *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy), February 2005, https://www.waterboards.ca.gov/water_issues/programs/state_implementation_policy/docs/sip2005.pdf, accessed September 25, 2024.
[291] San Francisco Bay Regional Water Quality Control Board, *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*, incorporating all amendments approved by the Office of Administrative Law as of May 4, 2017.
[292] United Airlines enrolls its stormwater discharges for the area occupied by the United Airlines MOC under the statewide industrial stormwater NPDES permit (NPDES General Permit No. CAS000001).

At the RADP project site, the Construction General Permit is implemented and enforced by the regional board, which administers the stormwater permitting program. To obtain coverage under this permit, project operators must electronically file permit registration documents, which include a notice of intent, a SWPPP (referred to here as a "Construction SWPPP" in the context of the Construction General Permit), and other compliance-related documents. The Construction SWPPP identifies BMPs that must be implemented to reduce the effects of construction on receiving water quality based on potential pollutants. The BMPs include both sediment and erosion control measures and other measures to control potential chemical contaminants. Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fences and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations and the washing and fueling of vehicles and equipment. The Construction SWPPP also describes the BMPs to reduce pollutants in stormwater discharges after all construction phases have been completed at the site (i.e., the "post-construction BMPs").

The Construction General Permit includes requirements for a site-specific risk-level assessment,[293] an active stormwater effluent monitoring and reporting program during construction (for Risk Level 2 and 3 sites), and numeric effluent limitations for pH and turbidity, as well as requirements for qualified professionals who prepare and implement the plan. A state-certified Qualified SWPPP Developer (QSD) must prepare the risk assessment and Construction SWPPP, and a state-certified Qualified SWPPP Practitioner (QSP) must oversee implementation of the Construction SWPPP.

NPDES Industrial General Permit

In November 1990, as part of the Clean Water Act, U.S. EPA published final regulations establishing application requirements for stormwater permits. The regulations require specific categories of industrial facilities that discharge stormwater to obtain coverage under NPDES General Permit No. CAS000001 for Discharges of Storm Water Associated with Industrial Activities (NPDES Industrial Permit). The NPDES Industrial Permit requires regulated facilities to take the following steps, among others:

- Prepare and maintain a SWPPP (discussed below).
- Implement stormwater BMPs to minimize discharge of pollutants in runoff.
- Inspect the facility regularly, during both wet and dry weather.
- Collect and analyze samples of runoff from each discharge location at least twice per year.
- Prepare and submit annual reports on stormwater management activities.

Industrial facilities that discharge stormwater either directly to surface waters or indirectly must be covered by a permit. This includes the discharge of "sheet flow" through a drainage system or other conveyance. The permit also prohibits non-stormwater discharges into the industrial stormwater system and is intended to authorize discharges composed entirely of industrial stormwater.

[293] The Construction General Permit defines three levels of risk (Risk Levels 1, 2, and 3) that may be assessed for a construction site. Risk is calculated based on the "project sediment risk," which determines the relative amount of sediment that can be discharged given the project and location details, and the "receiving water risk" (the risk sediment discharges pose to the receiving waters). Risk Level 1 corresponds to a low risk, Risk Level 2 to a moderate risk, and Risk Level 3 to a high risk.

The NPDES Industrial Permit requires dischargers to file a notice of intent requesting coverage under this permit. The permit also requires dischargers to prepare and implement both an Industrial SWPPP and a monitoring and reporting program and to submit these plans to the regional board. Stormwater discharges at SFO are currently regulated by an NPDES permit (Order R2-2025-0002, Permit Number CA0038318) issued by the regional board for wastewater discharges associated with the MLTP.

STORMWATER POLLUTION PREVENTION PLAN FOR INDUSTRIAL ACTIVITIES

SFO has developed a SWPPP for Industrial Activities (Industrial SWPPP) that conforms to the requirements of the Airport's NPDES Industrial Permit and provides for stormwater discharges from industrial activities. The Airport has adopted and implements the Industrial SWPPP to prevent construction and ongoing industrial activities from degrading surface water and groundwater quality through the transport of pollutants in stormwater. The Industrial SWPPP identifies pollutant sources associated with typical activities that may affect stormwater quality. It provides BMPs to reduce pollutants in stormwater discharges to avoid degrading the quality of receiving waters. A *stormwater BMP* is any program, technology, process, siting criterion, operating method, measure, or device that prevents or mitigates stormwater pollution and that addresses source control, pollutant control, and treatment control.

Through its bay pollution prevention program or BPPP, discussed in more detail below, SFO manages compliance with the Industrial SWPPP and conducts all inspections, monitoring, and reporting activities required to ensure consistency with the water quality standards and stormwater requirements specified in the NPDES permit. No discharge or disposal of dewatering effluent may occur without prior inspection and approval from the BPPP Compliance Section or MLTP staff. The Airport also provides stormwater pollution prevention training to all parties responsible for implementing the Industrial SWPPP.

The Industrial SWPPP includes a list of potential pollution-causing activities associated with ongoing Airport operations and the locations of these activities. Activity-specific BMPs must be implemented for these typical operations and include specific BMPs to address pollutants associated with all of the following:

- Maintenance activities
- Fueling activities
- Storage of chemicals and equipment
- Equipment, vehicle, and airplane washing activities
- Vehicle parking
- Sanitary and janitorial services
- Cargo handling
- Landscaping and pest control
- Aircraft de-icing
- Airfield runway de-rubberizing operations
- New pipe and public water system flushing
- General surface cleaning
- Vacuum scrubbing and pressure-washing activities
- Firefighting activities
- Maintenance of bioswales

Because of the numerous daily aircraft and vehicle fueling activities at the Airport, fuel spills occur periodically. As required by the Industrial SWPPP, SFO has instituted procedures to minimize discharges of these materials to surface water bodies, which consist primarily of prompt spill reporting and response so that spills are not allowed to enter the storm drain system.

The Industrial SWPPP requires the implementation of specific guidelines for construction activities on Airport property. These guidelines require the preparation of site-specific construction SWPPPs for all Airport construction to address stormwater discharges and avoid the release or transport of pollutants associated with construction activity (e.g., sediment) on Airport property. Under the Industrial SWPPP Construction Guidelines, each construction project at the Airport must manage and control site runoff. Construction projects disturbing less than 1 acre must implement an erosion and sediment control plan. Projects disturbing 1 acre of soil or more, or that are a part of a larger common plan of development, must obtain coverage under the Construction General Permit and implement a site-specific Construction SWPPP developed, amended, and revised by a state-certified QSD.

The Industrial SWPPP Construction Guidelines also include procedures for handling and disposing of groundwater, tidal infiltration, or stormwater associated with construction-related or operational dewatering activities. Those procedures include testing the water quality, then based on the results of the testing, either pumping or off-hauling to the MLTP Industrial Plant, discharging to the industrial collection system, discharging to the stormwater system, or off-hauling to an approved disposal facility.

The site-specific SWPPP for construction activities of less than 1 acre in size developed under the Construction Guidelines of the Industrial SWPPP must also describe all post-construction BMPs for the project. These BMPs must consist of permanent features designed to minimize discharges of pollutants, including sediment, for the site after construction has been completed. Because most construction sites at the Airport are usually paved, post-construction BMPs mainly include using detention basins or ponds to treat stormwater runoff and ensuring that runoff from industrial areas and floor drainage are not discharged to the stormwater conveyance system. When construction is complete, curb and gutter stormwater collection systems and catch basins typically provide stormwater drainage for developed areas, and each site will drain to the Airport's stormwater collection system.

The requirements of the Industrial SWPPP Construction Guidelines are intended to supplement, not replace, the Construction General Permit and associated Construction SWPPP requirements. Plans for large and small construction projects are submitted to the BPPP Compliance Section for review and approval before the start of construction and for monitoring and evaluation of BMP effectiveness during construction activities. If evaluation and/or inspection determines that additional or revised BMPs are necessary, the corrective actions required are described and the dates during which the corrective actions are to be implemented are provided. Once a construction project is completed, stormwater discharges from that drainage area are again subject to the Airport's Industrial SWPPP.

Bay Pollution Prevention Program

The stormwater requirements of the Airport's NPDES Industrial Permit and Industrial SWPPP apply to discharges by tenants and operators in addition to Airport discharges. Ongoing monitoring and reporting at the Airport are required to evaluate SFO's compliance with the NPDES permit. To manage compliance with the NPDES permit and the associated stormwater requirements detailed in the Industrial SWPPP, SFO created the BPPP Compliance Section.[294]

The BPPP is responsible for ensuring that the BMPs identified in the Airport's Industrial SWPPP and site-specific Construction SWPPPs (for construction activities) are properly implemented and maintained. As

[294] SFO Connect, SFO Bay Pollution Prevention Program, https://sfoconnect.com/sfo-bay-pollution-prevention-program, accessed May 23, 2024.

such, the BPPP Compliance Section routinely inspects all industrial areas at the Airport to identify potential SWPPP issues and recommend BMP improvements to tenants and operators, as necessary. The BPPP Compliance Section also modifies the SWPPPs as required after evaluation, monitoring, and/or inspection.

The BPPP manager is responsible for managing, coordinating, disseminating information, and updating the Industrial SWPPP. The BPPP manager serves as the primary point of contact with federal and state officials, the Airport's SWPPP representatives, Airport project managers, tenants, and contractors. The BPPP manager is also responsible for SFO's implementation of the Airport's Industrial SWPPP Construction Guidelines; monitoring, maintenance, and upgrades of BMPs; coordination of Airport personnel training; and verification of contractor implementation of the site-specific Construction SWPPPs.

San Francisco Bay Water Quality Control Plan (Basin Plan)

The Porter-Cologne Water Quality Control Act (division 7 of the California Water Code) provides for protection of the quality of waters of the State of California and establishes provisions for a statewide program for the control of water quality. This law requires the state board and/or the regional boards to adopt statewide and/or regional water quality control plans, the purpose of which is to establish water quality objectives for specific water bodies. The regional board has prepared the *Water Quality Control Plan for the San Francisco Bay Basin* (the Basin Plan), which identifies existing and potential beneficial uses for surface and ground waters and provides numerical and narrative water quality objectives designed to protect those uses.

The Airport is located adjacent to the Lower Basin of San Francisco Bay, referred to in this initial study as "Lower San Francisco Bay." Beneficial uses of Lower San Francisco Bay include industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, water non-contact recreation, and navigation.[295] All surface waters within the region must comply with objectives for many physical/chemical conditions or pollutants, such as floating material, oil and grease, pH,[296] and turbidity. The regional board has also identified numerical water quality objectives for mercury and PCBs in San Francisco Bay.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA) became effective January 1, 2015. The SGMA gives local agencies the authority to customize groundwater sustainability plans to their regional economic and environmental needs and manage groundwater in a sustainable manner to protect groundwater resources. The California Department of Water Resources and the state board are the lead state agencies responsible for developing regulations and reporting requirements necessary to carry out SGMA. The California Department of Water Resources sets basin prioritization, basin boundaries, and develops regulations for groundwater sustainability plans. Basin prioritization is a technical process that utilizes the best available data to classify California's 515 groundwater basins into one of the four categories: high-, medium-, low-, or very low-priority. The state board is responsible for fee schedules, data reporting, probationary designations, and interim sustainability plans. The SGMA requires governments and water agencies of medium- and high-

[295] San Francisco Bay Regional Water Quality Control Board, *Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin*, plan and amendments adopted through May 2017.
[296] *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.

priority basins to develop groundwater sustainability plans to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge and sets a 20-year timeline for implementation.

San Francisco International Airport Standard Construction Measures

The San Francisco Airport Commission operates the Airport on behalf of the City. The airport commission requires that standard construction measures be included in construction contracts and applied through the Airport Rules and Regulations. Additionally, federal, state, and local regulations, including existing resource agency permits, obligate SFO to implement construction measures specific to certain activities, areas, and natural resources.

The majority of development projects on Airport property are approved by the airport commission or by Airport staff on behalf of the airport commission and are constructed by contractors. The Airport'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 Airport also has a series of Architecture and Engineering Standards, which automatically apply to all pertinent Airport projects through the Airport Rules and Regulations. The Division Documents' standard construction measures and BMPs are designed to reduce or eliminate the potential for environmental impacts from Airport construction projects. The following airport standard construction measures are relevant to hydrology and water quality, in addition to existing federal, state, and local regulations:

- **General Requirements.** Require project-specific materials management plan (division 01 33 16); demolition rubbish and debris must be controlled and managed in accordance with a detailed environmental protection plan (division 01 35 43.01); dust from demolition must be controlled (division 01 35 43.01); garbage must be contained and disposed of in a sanitary landfill (division 01 35 43.01); containment and disposal requirements applicable during excavation and disposal of contaminated soil, sludge, and water (division 01 35 43.16); implementation of erosion control plans during grading and ground disturbance, protection of embankments from erosion, requirements to prevent disturbed materials from entering the bay or drainage systems, conduct groundwater testing and store dewatering in holding tanks prior to discharge, compliance with spill prevention control and countermeasure plan (division 01 57 00).
- **Stormwater Pollution Prevention and Erosion and Sediment Control (Division 01 57 23).** Construction activities must comply with the Airport's Industrial SWPPP Construction Guidelines, the Construction General Permit, and the MLTP NPDES permit. A site-specific Construction SWPPP containing BMPs must be implemented during construction activities. Contractors must not discharge any liquid, solution, wash water, or operational effluent into any drainage areas on or off Airport until approval is received from the Airport's BPPP Compliance Section.
- **Earthwork.** Dust generated during earthwork must be controlled, and excavated materials suitable for backfill must be shaped so as to cause the least possible interference with drainage (division 31).

Airport Rules and Regulations – Environmental Standards

The airport commission adopts rules and regulations intended to ensure the safe and efficient operations of SFO. The Airport Rules and Regulations govern the general conduct of the public, tenants, employees, and commercial users of the Airport. The following rules and regulations are relevant to water resources and the implementation of the RADP.

Airport Environmental Standards rule 8.0 includes regulations related to general wastewater, sanitary sewage, industrial wastewater discharge, stormwater, hazardous materials and hazardous waste management, spills and responsibility for cleanup, and de-icing policies and procedures. The general wastewater rules and regulations apply to all tenants, service providers, and contractors operating on Airport property when performing permitted operations that generate discharges into storm drains, sanitary sewage, and industrial wastewater collection systems, affecting the operations of the Airport's MLTP, or affecting the health of the Airport community or the quality of water in San Francisco Bay.

Rule 8.0 specifies water quality standards applicable to all water entering the sanitary or industrial collection system. The rule requires that all tenant operations be carried out in a manner so that no unauthorized discharge enters the Airport's stormwater collection system. Tenants are required to practice effective housekeeping to prevent stormwater from carrying debris, trash, sediment, spillage, or contaminants into the Airport's stormwater runoff collection system. All operations described previously must be performed in compliance with NPDES permits issued to the Airport for the MLTP and all applicable SWPPP requirements and general permits (such as the Construction General Permit) for management of stormwater runoff at the Airport.

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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. Subsequent projects that could occur pursuant to the RADP would be located on the existing developed Airport site and would be connected to the existing stormwater and wastewater collection, conveyance, and treatment systems, portions of which would be improved as part of implementation of the RADP. The analysis of direct, indirect, and cumulative impacts considers whether complying with regulatory requirements relevant to construction and operation of the subsequent RADP projects would be sufficient to minimize and/or avoid significant impacts related to hydrology and water quality. The analysis assumes that construction, operation, and maintenance activities associated with RADP projects would be conducted in a manner consistent with the Airport Rules and Regulations, including the Airport Environmental Standards, as well as relevant mandatory Airport Standard Construction Measures required for construction implementation on Airport property.

Impacts and Mitigation Measures

Impact HY-1: The RADP would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. ***(Less than Significant)***

Construction

Construction of subsequent projects that could occur with implementation of the RADP would include staging of construction equipment and material, earthwork activities (grading, excavation, and other soil-disturbing activities), demolition of existing facilities, and the placement of imported engineered soils. Stormwater runoff from soils disturbed during construction activities is a common source of pollutants (mainly sediment) to receiving waters. Earthwork can render soils and sediments more susceptible to erosion from stormwater runoff, causing soil and sediment to migrate in stormwater runoff to storm drains and downstream water bodies, such as the bay. In addition, construction of subsequent RADP projects would likely involve using various materials typically associated with construction activities such as paint, solvents, oil and grease, petroleum hydrocarbons, concrete, and associated concrete wash-out areas. If handled improperly, these materials could cause pollutants to be mobilized and transported offsite by stormwater runoff and degrade receiving water quality. However, federal, state, and local regulations require construction projects on Airport property to control potential water quality pollutants and prevent or minimize erosion and sedimentation by implementing site-specific BMPs as prescribed by the Airport Standard Construction Measures, the state's Construction General Permit, and the Airport's Industrial NPDES Permit, as discussed below.

Airport Standard Construction Measures

During construction of subsequent RADP projects, the Airport's contractors would be required to implement Airport Division Document 01 57 23 (Stormwater Pollution Prevention and Erosion and Sediment Control) for each project that could occur pursuant to the RADP, which requires development and implementation of a site-specific construction SWPPP containing stormwater BMPs. The site-specific construction SWPPP must be consistent with the Construction General Permit's requirements and the requirements of the Construction Guidelines in the Airport's Industrial SWPPP. The site-specific construction SWPPP must be approved by the Airport's BPPP before the start of any ground-disturbing activities. Pursuant to Airport Division Document 01 57 23, contractors are also prohibited from discharging any liquid, solution, wash water, or operational effluent into any drainage areas on or off Airport property until approval is received from the BPPP. The BPPP Compliance Section also monitors and evaluates BMP effectiveness during construction activities.

The standard construction measures also include requirements for management of hazardous materials, demolition rubbish and debris, dust, and trash (divisions 01 33 16 and 01 35 43.01) and containment and disposal requirements for excavation and disposal of contaminated soil, sludge, and water (division 01 35 43.16). Managing these potential pollutants consistent with the general requirements of the Airport's standard construction measures would avoid or reduce water quality degradation during on-land construction.

Construction General Permit

The Clean Water Act effectively prohibits discharges of stormwater from construction projects unless the discharge complies with an NPDES permit. Because the implementation area for the RADP would exceed 1 acre in size, with all subsequent RADP projects constituting a larger common plan of development, all construction activities pursuant to the RADP would be required to comply with NPDES regulations and obtain coverage under the Construction General Permit. The Construction General Permit would require SFO or its contractor(s) to implement construction BMPs as set forth in a site-specific construction SWPPP. Construction SWPPPs must specify erosion control and stormwater quality BMPs needed to minimize pollutants in stormwater runoff and must detail BMP placement and proper installation. The BMPs are designed to prevent pollutants from contacting stormwater and to keep all products of erosion and stormwater pollutants from migrating offsite into receiving waters.

A state-certified QSD determines the site risk level for sediment transport and a state-certified QSP develops and implements the Construction SWPPP associated with the Construction General Permit. Site risk level is determined using a combination of the project's sediment risk and the risk to receiving water quality. The sediment risk for each subsequent RADP project would depend on when it is implemented; the risk would be greater if construction were to occur during the rainy season. Receiving-water risk would be based on whether the RADP project drains to a sediment-sensitive water body.[297]

Risk Level 1 (low risk) specifies minimum BMPs that must be implemented to address good-housekeeping practices (including those for managing hazardous materials used during construction), non-stormwater management, erosion and sediment control, and run-on and runoff control. Typical BMPs include placement of fiber rolls or gravel barriers to detain sediment from disturbed areas and temporary or permanent covering of stockpiles to prevent rainfall from contacting the stockpiled material. In addition, BMPs also would be required to prevent discharge of pollutants other than sediment (e.g., paint, solvents, concrete, petroleum products) to downgradient waters. BMPs for pollutants include routine inspections for equipment leaks, proper material handling and construction material disposal.

Erosion controls for Risk Level 2 (moderate risk) must be implemented in conjunction with sediment controls in active construction areas, and linear sediment controls such as silt fences, gravel bag berms, or fiber rolls must be used along slopes. Risk Level 3 (high risk) requirements include more stringent narrative and numeric effluent standards than required for Risk Level 2 sites, as well as additional sediment control requirements (such as covering and containing stockpiles of soil with berms). Construction activities for subsequent RADP projects would not be characterized as Risk Level 3 because Lower San Francisco Bay is not considered a sediment-sensitive water body listed as impaired for sediment[298] and does not have all three beneficial uses: cold freshwater habitat, fish migration, and fish spawning.[299]

Under the direction of the state-certified QSD, the state-certified QSP routinely inspects BMPs, samples surface water when necessary, and reports site conditions to the state board and/or the applicable regional board as part of Construction General Permit compliance monitoring and reporting, using the Stormwater Multi Application Reporting and Tracking System. Compliance with the Construction General Permit is required by law and has proven effective in protecting water quality at construction sites.

Industrial Stormwater Pollution Prevention Plan

The Industrial SWPPP's Construction Guidelines requirements supplement the Construction General Permit's requirements, providing guidelines to ensure that BMPs would be implemented to minimize and/or avoid erosion and sedimentation effects, including for construction sites that are less than 1 acre in size. For example, the Construction Guidelines describe how excavated soil must be characterized, handled, stored, and disposed and how a worksite must be managed to avoid erosion or stormwater contamination. In addition, construction and excavation activities occurring at Airport sites known to contain contaminants in the soil and/or groundwater must adhere to the requirements of Water Board Order No. 99-045, including implementing the requirements of residual risk management plans (RRMPs; see Section E.18, Hazards and Hazardous Materials). RRMPs specify appropriate precautions required during construction and excavation

[297] 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.
[298] California State Water Resources Control Board, *Final 2020–2022 California Integrated Report (Clean Water Act Section 303(d) List/305(b) Report)*, https://www.waterboards.ca.gov/water_issues/programs/tmdl/2020_2022state_ir_reports_revised_final/apx-a-303d-list.xlsx, accessed May 20, 2024.
[299] San Francisco Bay Regional Water Quality Control Board, *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*, November 5, 2019.

activities (e.g., fugitive dust controls, equipment decontamination, and stormwater pollution prevention) to minimize and avoid the potential for adverse impacts on human health and water quality, consistent with receiving-water beneficial uses and water quality standards.

Construction Dewatering

Shallow groundwater can occur at SFO at depths of 4 feet bgs. Because of spills and leaks that have occurred during Airport operations, the presence of petroleum products and other contaminants in the shallow groundwater beneath parts of the Airport has been documented and sites with known soil and/or groundwater contamination are located close to or extend into RADP construction areas (see Topic E.18, Hazards and Hazardous Materials, for more details). Excavation for subsequent RADP projects could intercept shallow groundwater, requiring temporary localized dewatering to create a dry work area and facilitate construction activities.

Dewatering typically involves extracting excess shallow groundwater or accumulated surface water from excavations at construction areas and then discharging the effluent. Effluent may be discharged onto land (for infiltration into soils); may be conveyed to nearby storm drains, sanitary sewer systems, or temporary storage tanks; or may be released directly into receiving waters such as Lower San Francisco Bay. Typical construction-related dewatering effluent can contain pollutants (e.g., sediment, residual petroleum hydrocarbons, and other contaminants) that must be removed before discharge to avoid potential water quality impacts. Construction-related dewatering would result in a significant impact should contaminated dewatering effluent not be managed properly and be released untreated to surface waters or into stormwater drains that discharge directly to surface waters. Such a release would violate water quality standards and waste discharge requirements and degrade the quality of receiving waters.

The Industrial SWPPP outlines the construction water-handling procedures applicable to work at the Airport.[300] In addition, construction activities for subsequent RADP projects must meet the site-specific dewatering requirements of RRMPs that supplement the SWPPP requirements. The procedures and requirements state that the MLTP lab must sample construction water from dewatering activities and analyze the dewatering effluent for pollutants before it is discharged to determine whether all water quality constituent parameters fall below acceptable discharge limits.

If the lab testing confirms suitability for discharge, the dewatering effluent may be conveyed to a storm drain for direct discharge to the bay[301] or conveyance to the MLTP. If the testing shows that treatment is required, the Airport or its contractor(s) must follow appropriate handling and treatment procedures to reduce pollutant levels to the applicable NPDES permit limits, which are protective of defined beneficial uses for receiving water bodies and water quality standards.

Treatment could include methods using transportable, large-capacity steel storage tanks as settling tanks to remove sediments; filters to remove suspended solids; and other methods to meet chemical-specific discharge limitations. The chemical-specific treatment method used would depend on the chemicals that exceed the specified discharge limitations, but a method such as filtration or activated carbon treatment could be used to reduce chemical concentrations as necessary to meet permit requirements before

[300] Ibid.
[301] Stormwater at the Airport is collected in the existing stormwater collection system and is routed either to one of four detention basins, directly to the onsite Mel Leong Treatment Plant's Industrial Plant, or to one of nine stormwater outfalls, such as those draining runways, that discharge directly to San Francisco Bay.

discharge. Any collected sediment from onsite treatment would be disposed of offsite at an appropriate disposal facility.

Consistent with the Industrial SWPPP, if chemical analysis of construction water indicates that the dewatering effluent contains pollutant concentrations above acceptable discharge limits, the MLTP must grant approval to the contractor before conveying dewatering effluent through the industrial wastewater system and to the treatment plant. After reviewing the results of dewatering effluent testing, MLTP or BPPP staff may require the contractor to further filter or otherwise treat the construction water and resubmit new sampling results, or have the water hauled offsite to an appropriate disposal facility. Options for disposing of the dewatering discharge include:

- Conveyance to the MLTP Industrial Plant for treatment and discharge via the North Bayside System Unit, consistent with NPDES permit number CA0038318.
- Onsite treatment by the contractor before conveyance to the MLTP Industrial Plant for additional treatment before discharge.
- Onsite treatment by the contractor before conveyance to the Airport storm drain system for direct discharge to Lower San Francisco Bay.
- Discharge to mobile storage tanks for settling, then hauling offsite to an appropriate licensed treatment and disposal location.

Similar to the Industrial SWPPP, the Construction General Permit (and associated Construction SWPPP) outlines BMPs, construction water-handling procedures, and requirements that apply to dewatering discharges. Consistent with the Construction General Permit, non-stormwater discharges are authorized for construction activities that are not subject to a separate general NPDES permit adopted by a regional board when the following conditions are met:

- Dischargers shall not violate any discharge prohibitions contained in applicable basin plans or statewide water quality control plans.
- The discharge does not cause or contribute to a violation of any water quality standard.
- The discharge is not prohibited by the applicable basin plan.
- The discharger has included and implemented specific BMPs required by the Construction General Permit to prevent or reduce the contact of the non-stormwater discharge with construction materials or equipment.
- The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants.
- The discharge is monitored and meets the applicable numeric action levels.
- The discharger reports the sampling information in the annual report.

Contractors may not dispose of any water in the Airport's stormwater, industrial, or sanitary system without prior review and approval from SFO's BPPP Section. The BPPP Section is responsible for and oversees all construction-related and operational water quality monitoring and reporting programs so that onsite treatment and/or disposal will adhere to the conditions of the Airport's NPDES permit, Industrial SWPPP, RRMPs, and Construction General Permit requirements.

Construction activities associated with the subsequent RADP projects would comply with applicable water quality protection requirements to prevent dewatering discharges from causing an exceedance of a water quality standard, otherwise degrading surface water or groundwater quality, or adversely affecting beneficial uses of receiving waters. For these reasons, impacts related to violating any water quality standards or waste discharge requirements or otherwise substantially degrading surface or groundwater quality due to construction under the RADP would be ***less than significant***.

Mitigation: None required.

Operation

The areas proposed for development and improvements that could occur pursuant to the RADP are developed, largely covered by impervious surfaces, and served by existing stormwater, sanitary wastewater, and industrial wastewater collection, conveyance, and treatment systems. Subsequent projects that could occur with implementation of the RADP would not substantially increase the area of impervious surfaces relative to baseline conditions, nor would they increase stormwater runoff rates or volumes. Implementing the RADP also would not alter the character of typical stormwater runoff (i.e., pollutants present and water quality constituent concentrations) and/or wastewater discharges from Airport operations.

After construction of subsequent RADP projects, the contractors would notify the Airport's BPPP Section and certify that all state and local requirements have been met in accordance with the Airport's Industrial NPDES permit, the site-specific construction SWPPP, and the Construction General Permit. The QSP/QSD responsible for the site-specific construction SWPPP would notify the regional board that construction in that area of the Airport has been completed and would certify that state and local requirements have been met in accordance with the Construction General Permit.

Consistent with the Airport Rules and Regulations, tenants and operators of subsequent RADP projects would discharge sanitary and industrial wastewater to the appropriate collection system, which would route the wastewater to the MLTP Sanitary Plant and/or Industrial Plant. The NPDES permit for the MLTP requires the Airport to evaluate each year whether concentrations of any pollutants have increased substantially relative to past performance; to investigate the cause of any increase; and to implement remedial measures to address any increase that results in the reasonable potential to cause or contribute to an exceedance of applicable water quality objectives.[302] The permit also requires the Airport to continue improving its efforts to minimize pollutant loadings to the MLTP and evaluate the pollutant minimization program's effectiveness annually. Such annual evaluations would enable the Airport to incorporate updates that reflect changes at SFO resulting from implementation of the RADP.

In addition, the Industrial SWPPP includes the following post-construction stormwater management requirements that would apply to all RADP projects:

- Each project's site-specific SWPPP must describe permanent features (or post-construction BMPs) to minimize discharges of pollutants, including sediment, from the site after construction has been completed.

[302] Mel Leong Treatment Plant – Sanitary and Industrial Plants, NPDES Permit Number CA0038318, California Regional Water Quality Control Board Order Number R2-2018-0045.

- The SWPPP must identify the agency or parties responsible for maintaining the post-construction BMPs. Such BMPs would mainly include treatment of stormwater runoff using detention basins or ponds, to prevent runoff from industrial areas and floor drainages from being discharged into the stormwater conveyance system.
- Developed areas must include curb and gutter stormwater collection systems and use catch basins. Landscaped areas must be designed to minimize irrigation drainage and improve the quality of any stormwater runoff to the extent possible.
- Tenants and operators must report annually to the BPPP Section the types of industrial activities performed, areas of operation, and stormwater BMPs being implemented, and provide a description of non-stormwater discharges. Tenants and operators must also practice effective housekeeping to prevent potential pollutants from entering the stormwater collection system.

BPPP Section staff members inspect operations annually to assess compliance with the Industrial SWPPP and NPDES permit requirements and, after inspection, can require additional BMPs as necessary to ensure that individual projects are not exceeding water quality standards. For these reasons, impacts related to violating any water quality standards or waste discharge requirements or otherwise substantially degrading surface or groundwater quality due to operation of subsequent projects under the RADP would be ***less than significant***.

Mitigation: None required.

Conclusion

Subsequent RADP projects would comply with the Airport Standard Construction Measures, Construction General Permit, Construction Guidelines in the Industrial SWPPP, and Airport Rules and Regulations. The projects would implement associated BMPs, which would be monitored, evaluated for effectiveness, and augmented as necessary by the BPPP during construction. These compliance efforts would substantially reduce the potential for pollutants to be discharged to groundwater or surface waters, including San Bruno Channel, Millbrae Channel, and Lower San Francisco Bay receiving waters. They would also minimize or eliminate potential degradation of groundwater or surface water quality during construction.

Operational activities for the subsequent RADP projects would comply with the MLTP's NPDES permit requirements and the post-construction stormwater requirements of the Airport's Industrial NPDES Permit and Industrial SWPPP. Such compliance would limit the potential for wastewater and stormwater associated with operation of subsequent RADP projects to transport pollutants that would impair or degrade the beneficial uses of receiving water bodies. As a result, construction and operation of projects that could occur with implementation of the RADP would be consistent with applicable regulations, plans, and policies. Impacts of implementing subsequent projects pursuant to the RADP related to the violation of water quality standards, waste discharge requirements, and/or creation of additional sources of polluted runoff or other degradation of water quality would be ***less than significant***.

Mitigation: None required.

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. ***(Less than Significant)***

The RADP project site is located within the Westside Groundwater Basin. The RADP project site is developed and largely covered by impervious surfaces that have been historically used by industrial facilities and do not contribute substantial recharge to the deeper aquifers in the Westside Groundwater Basin that are used for municipal and industrial water supply. Any new paved area associated with subsequent RADP projects would replace and overlie an existing paved area. Therefore, implementation of the RADP would not alter groundwater recharge relative to existing conditions. Impacts of implementing the subsequent projects pursuant to the RADP related to interference with groundwater recharge would be ***less than significant***.

During construction, excavations at the Airport would be completed within the artificial fill materials and upper layers of Young Bay Mud that underlie the Airport's operational area. If groundwater is encountered, it would be shallow groundwater, which can occur at 4 feet bgs or deeper across the Airport, as discussed previously. Groundwater used for water supply is at greater depths than the excavation depths for subsequent RADP projects. The use of an active dewatering system such as a sump pump may be required to maintain a dry working space in these excavation areas.

As discussed under Impact HY-1, construction dewatering for any subsequent RADP project would not involve substantial extraction of groundwater from aquifers used for municipal or industrial water supply. Dewatering for construction would be temporary and highly localized and would typically involve extracting low volumes of shallow groundwater from excavation trenches associated with utilities and foundations and would not cause groundwater depletion.

The Westside Groundwater Basin is designated by the California Department of Water Resources as having a "very low-priority."[303] Consequently, the preparation of a groundwater sustainability plan is not required and none has been prepared for the Westside Groundwater Basin under the SGMA. Shallow groundwater underlying SFO is of poor quality and is not used near the RADP project site. Operation of subsequent RADP projects would not deplete local groundwater resources because no long-term groundwater extraction is proposed as part of the RADP. Potable water for operations of subsequent RADP projects would be supplied by SFPUC via a connection to the public water system. Impacts of implementing subsequent projects pursuant to the RADP related to a decrease in groundwater supplies or impedance of the basin's sustainable groundwater management would be ***less than significant***.

Mitigation: None required.

---

[303] California Department of Water Resources, SGMA Groundwater Basins Prioritization Layer, https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#boundaries, accessed August 21, 2024.

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. ***(Less than Significant)***

This analysis discusses whether implementation of the RADP would alter drainage such that substantial erosion, siltation, or flooding on land would result during construction or operation of subsequent RADP projects. As described under Impact HY-1, the RADP project site is developed and covered by impervious surfaces that drain into the existing stormwater collection system. Stormwater runoff from the Airport is collected in the existing stormwater collection system and routed either to the MLTP or to one of the nine stormwater outfalls. No streams or other surface water bodies cross the Airport, and the Airport is not a part of a natural drainage area. No surface drainage or stormwater from the Airport operational area is discharged to the San Bruno Channel to the northwest or the Millbrae Channel to the south.

Erosion and siltation impacts related to construction were addressed previously under Impact HY-1. Construction of subsequent RADP projects could temporarily alter local drainage patterns on the RADP project sites. However, construction activities would be subject to the Airport's Industrial SWPPP Construction Guidelines. BMPs would be implemented to control stormwater during construction, minimizing the potential for temporary changes in erosion, sedimentation, or flooding patterns at the Airport. After construction, subsequent RADP project sites would be paved, which would prevent erosion by covering soils. Fill of the wetlands associated with the 5.28-acre proposed staging area "Lot near Tanks" was previously assessed during environmental review of the Airport's Shoreline Protection Program.[304] As described in the Shoreline Protection Program Final Environmental Impact Report, wetlands within the Lot near Tanks staging area would be filled to raise elevations to the same grade as the adjacent Airport uses and filled areas would be covered with gravel to create a permanent construction staging area. After the completion of the permanent construction staging area, the Lot near Tanks site would be covered under the Industrial SWPPP for Airport operations.

Implementation of the RADP would not create a substantial net new impervious area. After the completion of construction, stormwater runoff from subsequent RADP project sites would not increase in volume or peak discharge rate as compared to existing conditions. Once operational, each subsequent RADP project would drain to the existing stormwater collection system and comply with the NPDES permit and Industrial SWPPP requirements to control pollutants, including sediment, in stormwater runoff. Sanitary or industrial wastewater from each subsequent RADP project would drain to the existing or improved sanitary or industrial sewer collection system and would be prevented from draining to the stormwater collection system, consistent with the Airport Rules and Regulations. For these reasons, impacts from subsequent projects that could occur with implementation of the RADP related to erosion, siltation, or flooding as a result of increased stormwater runoff onsite and offsite due to altered drainage patterns would be ***less than significant***.

Mitigation: None required.

---

[304] City and County of San Francisco, San Francisco Planning, *San Francisco International Airport Shoreline Protection Program Final Environmental Impact Report* (Case No. 2020-004398ENV), certified June 1, 2023; and adopted findings by the San Francisco Airport Commission June 20, 2023.

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. *(Less than Significant)*

As discussed under Impacts HY-1 and HY-3, implementation of the RADP would not alter land uses at the Airport or include operational activities that could result in additional sources of polluted runoff. The RADP project site is generally covered by impervious surfaces that drain into the existing stormwater collection system. (The exception is runoff from runways and some portions of taxiways, which flows through pervious grassy median areas to facilitate infiltration, reduce peak discharges, and capture sediment and other pollutants before being discharged directly to the bay.) Additionally, as described previously, a number of the staging areas are pervious, with the majority of stormwater infiltrating into underlying soils.

Construction of subsequent RADP projects would not increase the amount of stormwater runoff to the existing stormwater collection system. Areas where construction is proposed are already developed with impervious surfaces, and the volume and rate of stormwater runoff would be substantially similar to baseline conditions. Stormwater runoff, including from the staging areas, would be managed in accordance with the Construction General Permit and Industrial NPDES Permit and Industrial SWPPP Construction Guideline requirements, as discussed under Impact HY-1, to prevent sediment and other pollutants typically associated with construction from being mobilized and/or transported by stormwater runoff.

During operation of subsequent RADP projects, as described under Impact HY-1, stormwater runoff from the RADP project sites would be collected by the stormwater collection system, then treated by the MLTP Industrial Plant (first flush) or discharged directly to San Francisco Bay in compliance with NPDES requirements. Stormwater runoff would not increase as a result of implementing subsequent projects pursuant to the RADP. Stormwater control plans would be developed for each subsequent project to ensure compliance with the Industrial SWPPP, as described under Impact HY-1, to avoid or minimize pollutants being transported offsite by stormwater. Therefore, impacts from subsequent projects that could occur with implementation of the RADP related to an exceedance of the capacity of existing or planned stormwater drainage systems, or to generation of additional polluted runoff, would be ***less than significant***.

Mitigation: None required.

Impact HY-5: The RADP would not impede or redirect flood flows. *(Less than Significant)*

Under existing conditions, most of the Airport's operational area is within the 1 percent annual chance (or 100-year) flood hazard zone for coastal flooding. In addition to current coastal flood hazards, the best available science projects that sea level will rise in the coming decades and into the next century, which will exacerbate coastal flood hazards at the Airport. As discussed previously, cumulative projects at the Airport include the Shoreline Protection Program[305] (discussed further under Impact C-HY-1), which would install a new shoreline protection system by 2032 to comply with FEMA requirements for the 100-year flood event and to account for projections of sea-level rise through 2080. Therefore, as subsequent RADP projects are constructed between 2025 and 2045, the Shoreline Protection Program would be installed. However, this

[305] City and County of San Francisco, San Francisco Planning, *San Francisco International Airport Shoreline Protection Program Final Environmental Impact Report* (Case No. 2020-004398ENV), certified June 1, 2023.

analysis conservatively considers whether implementation of the RADP without the Shoreline Protection Program would impede or redirect flood flows.

Given the nature of coastal flooding, which inundates a large area, and the dispersed locations of subsequent projects that could occur pursuant to the RADP within the Airport's already developed operational area, implementation of the RADP would not substantially alter flood dynamics on- or offsite as compared to existing conditions. The size of the individual subsequent RADP projects, which would be implemented over an approximately 20-year period, relative to the total size of the Airport's operational area also would limit the effects of those projects on the floodplain. Utilities and other facilities installed below ground would not impede or redirect flood flows. Therefore, impacts from subsequent projects that could occur with implementation of the RADP related to impedance or redirection of flood flows would be ***less than significant***.

Mitigation: None required.

Impact HY-6: The RADP would not risk the release of pollutants from project inundation in flood hazard, tsunami, or seiche zones. ***(Less than Significant)***

Under existing conditions, most of the Airport's operational area is within the 1 percent annual chance (or 100-year) flood hazard zone for coastal flooding. Certain areas of the Airport along the bay shoreline are within a potential tsunami inundation zone; these areas include portions of taxiways and the eastern edge of the East Field. Seiches can generate long-period waves that cause run-up or overtopping of adjacent landmasses, similar to tsunami run-up.

As discussed under Impacts HY-3 and HY-4, subsequent RADP projects would not alter drainage patterns in a manner that would result in flooding or a change to land uses at the Airport, and pollutants onsite would be substantially similar to those present under existing conditions. As discussed under Impact HY-5, implementing the subsequent projects pursuant to the RADP would not substantially alter flood dynamics on- or offsite as compared to existing conditions. Furthermore, subsequent projects that could occur pursuant to the RADP would not affect the severity or frequency of flooding or tsunamis. Therefore, impacts from subsequent projects that could occur with implementation of the RADP related to the release of pollutants from project inundation would be ***less than significant***.

Mitigation: None required.

Impact HY-7: The RADP would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. ***(Less than Significant)***

As discussed under Impacts HY-1 and HY-2, implementation of the RADP would not cause water quality degradation relative to existing conditions. The RADP project site is located within the jurisdiction of the San Francisco Bay regional board. The regional board has adopted a water quality control plan (the Basin Plan), which includes water quality objectives designed to preserve and enhance water quality and protect the beneficial uses of terrestrial surface water bodies (e.g., creeks, rivers, streams, and lakes), groundwater, coastal drainages, estuaries, coastal lagoons, and enclosed bays within the jurisdictional area of the regional board.

Both the construction and the operation of projects that could occur pursuant to the RADP would be required to adhere to all applicable state and local water quality regulations, including policies and objectives of the Basin Plan. Construction of the subsequent RADP projects, as well as long-term use and associated maintenance activities, would comply with the requirements of the Airport's Industrial NPDES Permit, Industrial SWPPP, Construction General Permit, and Airport Rules and Regulations. These requirements are designed to ensure that all Airport discharges comply with the Basin Plan's narrative and numeric water quality objectives and requirements.

As discussed under Impact HY-2, implementation of the RADP would not require ongoing groundwater withdrawals or substantially alter groundwater recharge; it also would not conflict with or obstruct implementation of a sustainable groundwater management plan as a groundwater sustainability plan is not required and none has been prepared for the Westside Groundwater Basin under the SGMA due to the basin being designated as "very low-priority" by the California Department of Water Resources. Therefore, impacts from subsequent projects that could occur with implementation of the RADP related to conflicts with a water quality control plan or sustainable groundwater management plan would be ***less than significant***.

Mitigation: None required.

Impact C-HY-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts on hydrology or water quality. ***(Less than Significant)***

The RADP would be implemented in areas where stormwater is primarily collected and treated before being released to Lower San Francisco Bay. Therefore, the geographic scope of most hydrology and water quality impacts includes Lower San Francisco Bay and receiving waters near the Airport, including the San Bruno Channel and the Millbrae Channel. The geographic scope of cumulative impacts on groundwater includes the Westside Groundwater Basin. As described under Impacts HY-1 through HY-7 above, implementation of the RADP would have less-than-significant impacts related to violation of water quality standards, water quality degradation, alteration of existing drainage patterns, exceedance of stormwater drainage capacity, and risk of release of pollutants due to inundation by floodwaters, including those resulting from a tsunami or seiche.

As discussed under Impact HY-1, implementation of the RADP would include construction activities and ground disturbance, which could affect the quality of receiving bay waters. Cumulative projects that involve considerable ground disturbance and use of heavy equipment, and that would overlap with construction of subsequent RADP projects, include the projects listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11. Other projects farther from the SFO property also drain to Lower San Francisco Bay and could affect the quality of bay waters.

During construction, cumulative projects greater than 1-acre in size, including those within and outside of SFO, would be required to comply with the Construction General Permit. Projects located on SFO property would also be required to comply with the Airport's Industrial SWPPP Construction Guidelines, the Airport Rules and Regulations, and the Airport's standard construction measures. The SFO cumulative projects also would be required to adhere to stormwater drainage control requirements applicable on SFO property (discussed under Impact HY-3). Cumulative projects outside of SFO would be required to adhere to the development standards in the San Francisco Bay Municipal Regional Stormwater NPDES Permit, which requires new development or redevelopment around Lower San Francisco Bay to implement BMPs that avoid increasing the volume or worsening the quality of stormwater.[306]

Compliance with these drainage control requirements would ensure that both runoff water quality and runoff volumes would be managed in a way that would not adversely affect water quality, create flooding, or exceed infrastructure capacity, both on an individual basis and cumulatively, as these regulations inherently consider cumulative effects. Therefore, implementation of the RADP in combination with cumulative projects would have a ***less-than-significant*** cumulative impact related to violation of water quality standards, degradation of water quality, alteration of existing drainage patterns, and exceedance of stormwater drainage capacity.

Implementation of the RADP would result in less-than-significant impacts related to groundwater recharge or depletion. The cumulative projects may also include construction dewatering should excavations intercept shallow groundwater. However, for the reasons discussed under Impact HY-2, any temporary and localized decline in shallow groundwater would not result in a substantial reduction of water storage or groundwater levels and would not impede sustainable groundwater management. Therefore, implementation of the RADP in combination with cumulative projects would have a ***less-than-significant*** cumulative impact related to groundwater supplies, recharge, and sustainable groundwater management.

The OneShoreline project (cumulative project #20; see Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11) would include shoreline and offshore features to protect Millbrae and Burlingame from sea-level rise. The Shoreline Protection Program would remove the Airport from the 100-year floodplain and protect the Airport's operational area from coastal inundation, including from sea-level rise and tsunami, as compared to existing conditions. Other cumulative projects that could affect hydrology and flooding in the geographic scope include the Underground Pipeline and Pump Station Upgrades, Sanitary Sewer Infrastructure Improvements, and Pipeline Replacement to MLTP, which would all improve the collection and conveyance of stormwater and wastewater at the Airport but would not expand impervious area. The cumulative effect of implementation of the RADP with other projects on SFO property would be to reduce the potential for flooding. Therefore, the RADP in combination with cumulative projects would have a ***less-than-significant*** cumulative impact related to the risk of release of pollutants due to inundation by floodwaters, exceeding the capacity of existing or planned stormwater drainage systems, or impeding or redirecting flood flows.

Mitigation: None required.

---

[306] California Regional Water Quality Control Board San Francisco Bay Region, Municipal Regional Stormwater NPDES Permit, Order No. R2-2015-0049, NPDES Permit No. CAS612008, November 19, 2015, as amended by Order No. R2-2019-0004.

E.18 Hazards and Hazardous Materials

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
18. HAZARDS AND HAZARDOUS MATERIALS. Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☒	☐	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	☐	☒

Environmental Setting

Concepts and Terminology

A *hazardous material* is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment (California Health and Safety Code

Section 25501[n][1]). The term refers to both hazardous substances and hazardous wastes. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases).

Hazardous wastes are hazardous substances that no longer have practical use, such as materials that have been spent, discarded, discharged, spilled, or contaminated, or are being stored until they can be disposed of properly (CCR Title 22, Section 66261.10). Soil that is excavated from a site containing hazardous materials is a hazardous waste if it exceeds specific criteria established in CCR Title 22, Sections 66261.20 through 66261.24.

Multiple agencies regulate hazardous substances, and cleanup requirements for hazardous releases are determined on a case-by-case basis according to the agency with lead jurisdiction over a contaminated site (e.g., California Department of Toxic Substances Control, State Water Resources Control Board, or San Mateo County Environmental Health Services).

Use of Hazardous Materials at the Airport

Chemicals are used by Airport staff and tenants as part of ongoing operations. Aircraft maintenance activities use lubricating oil, hydraulic oil, solvent, antifreeze, degreaser, and other cleaning products. Fueling of both aircraft and support vehicles occurs at the Airport. Fuels used and stored at the Airport include jet fuel, gasoline, and diesel. Much of the chemicals and fuels are stored onsite in 55-gallon drums and in aboveground storage tanks, both of which are required to employ secondary containment.[307]

Hazardous Materials in Soil and Groundwater

The Airport includes areas where past use of hazardous materials such as chemicals, fuels, solvents, and other petroleum-based compounds has contaminated the shallow soil and groundwater. Groundwater in the shallow aquifer underlying the Airport (described under Topic E.17, Hydrology and Water Quality) is impacted by contamination from chemical constituents used during typical Airport operations. These compounds include petroleum hydrocarbon constituents (i.e., fuel and/or oil), solvents, metals, and PCBs. Past releases have been primarily petroleum hydrocarbons from leaking underground storage tanks and jet fuel releases from surface spills and leaks from below-grade pipelines.

The State Water Resources Control Board oversees soil and groundwater investigations and remediation at the Airport. The regional board has issued Order 99-045 to the Airport, several current and former SFO tenants/operators, and the U.S. Coast Guard as an Airport-wide strategy for soil and groundwater investigation and remediation requirements. Order 99-045 requires an Airport-wide cleanup and management strategy for the on-land portions of the Airport to ensure the consistent and adequate cleanup of soil and groundwater. Because of the Airport's land size and complexity, the Airport-wide cleanup and management strategy required by Order 99-045 allows SFO to develop cleanup plans based on location-specific risks to probable ecological and human receptors, rather than applying the same cleanup standards to the entire Airport site.

[307] SFO, *Stormwater Pollution Prevention Plan for Industrial Activities*, January 9, 2019.

The San Francisco Airport Commission leases and issues use permits for defined land areas to airlines, aviation support companies, and concessionaires (e.g., ground transportation companies), which operate within their leasehold agreement areas. To date, numerous investigations have been performed under the direction of both airport commission staff and tenants, and have documented the presence, nature, and extent of subsurface contaminated soils and groundwater.

The Airport-wide strategy for investigation and cleanup of contaminated sites required under Order 99-045 incorporates the requirements of and is consistent with previously issued regional board site cleanup orders[308] specific to SFO and other regulatory standards and requirements.[309] Addressing the investigation and cleanup of the numerous contaminated sites at SFO under a single guideline (Order 99-045) administered by one oversight agency (the regional board) streamlines the investigative phase for both SFO and its tenants and facilitates adequate and timely cleanup. Order 99-045 requires dischargers that do not achieve the most stringent cleanup standards to manage residual contamination in soil and/or groundwater. Less stringent cleanup levels are risk-based and established to require the discharger to remediate a site to acceptable risk levels, while leaving some residual contaminants in the soil. The discharger is required to prepare and comply with a plan for source removal and to prepare and implement an RRMP to contain, manage, and monitor existing and/or remaining polluted soil and groundwater in a manner consistent with current and projected land and water use (e.g., beneficial uses and standards defined in the Basin Plan).

Hazardous Building Materials

Hazardous materials, such as asbestos, lead, and PCBs, may also be contained in building materials and released during demolition activities. The likelihood of the presence of hazardous materials in buildings can generally be assessed based on the age of the buildings, as the use of these materials was phased out following the U.S. EPA ban in the mid- to late-1970s. Hazardous building materials are likely to be present in construction pre-dating 1980. These materials include asbestos-containing materials, lead-based paint, PCBs, di(2 ethylhexyl) phthalate, and mercury. Based on laboratory sampling results from asbestos surveys, multiple buildings at the Airport are known to contain asbestos.[310] Implementation of the RADP could include projects that would require the demolition of buildings known to contain asbestos.[311]

Regulatory Framework

The following regulations and agency actions apply to the handling, storage, and disposal of hazardous materials:

- **Toxic Substances Control Act/Resource Conservation and Recovery Act/Hazardous and Solid Waste Act.** These federal laws established a program administered by U.S. EPA to regulate the generation, transport, treatment, storage, and disposal of hazardous waste. The Resource Conservation and Recovery Act was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the “cradle-to-grave” system of regulating hazardous wastes.
- **U.S. Department of Transportation.** This federal agency regulates and works to ensure the safe and secure movement of hazardous materials to industry and consumers by all modes of transportation. The

[308] Previously adopted Site Clean Requirements for individual sites (Order 92-140, 94-044, 92-152), Order 95-136.
[309] San Francisco Bay Regional Water Quality Control Board Basin Plan, State Board Resolution 92-49, State Board Resolution 68-16, and State Board Resolution, 88-160.
[310] San Francisco International Airport, Annual Asbestos Notification, 2023.
[311] Ibid.

transportation department develops regulations and standards for classifying, handling, and packaging shipments of hazardous materials within the United States to minimize threats to life, property, or the environment resulting from hazardous materials–related incidents.

- **Occupational Safety and Health Administration.** The U.S. Occupational Safety and Health Administration and California Division of Occupational Safety and Health set standards for safe workplaces and work practices, including reporting accidents and occupational injuries (CFR title 29, part 1910) and 8 CCR section 5192). These standards would apply to all construction workers.
- **California Hazardous Materials Release Response Plan and Inventory Law of 1985.** This law, also known as the Business Plan Act, requires businesses storing hazardous materials onsite to prepare a hazardous materials business plan and submit it to the local certified unified program agency, which in this case is San Mateo County Environmental Health Services. This requirement would apply to the businesses that use hazardous materials during construction of subsequent projects that could occur pursuant to the RADP.
- **California Hazardous Waste Control Act.** Under this law (California Health and Safety Code section 25100 et seq.), the California Department of Toxic Substances Control regulates the generation, transportation, treatment, storage, and disposal of hazardous waste in California. The hazardous waste regulations establish criteria for identifying, packaging, and labeling hazardous wastes; dictate the management of hazardous waste; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills. These criteria would apply to hazardous waste generated as a part of implementation of the RADP.

In addition to the federal and state regulations that apply to the handling, storage, and disposal of hazardous materials, SFO has established standard construction and operation measures relevant to the handling, storage, and disposal of hazardous materials.[312] The Airport's Standard Construction Measures related to hazardous materials stipulate procedures for verifying the presence of contaminated soils, sludge, and groundwater and specify measures for remediation and disposal. The measures also specify management practices for installation, removal, and disposal of underground storage tanks and fuel lines. Contractors constructing projects that may accidentally or deliberately disturb or remediate contaminated soil, sludge, or groundwater must prepare a materials management plan and post-project documentation regarding contaminant investigation, remediation, and disposal activity. A hazardous materials site characterization report must document the findings of site investigations. The Temporary Controls Division Document (division 01 57 00, see below) requires the contractor to implement an onsite maintenance and spill containment program to reduce pollution from construction equipment. Activities subject to the standard construction measures include but are not limited to excavation, equipment and materials staging, soil remediation, and transport and disposal of hazardous materials.

Stormwater discharges at the Airport are regulated under NPDES Permit No. CA0038318, WDID #2 417033001, San Francisco Bay regional board Order No. R2-2018-0045 (Airport's NPDES Industrial Permit). Projects affecting an area larger than 1 acre must prepare a project-specific SWPPP under the Airport's Industrial Permit. Projects affecting an area smaller than 1 acre must prepare an erosion and sediment control plan. SWPPPs prescribe BMPs to address and manage hazardous materials that may be mobilized by and

[312] San Francisco International Airport, *San Francisco International Airport Standard Construction Measures Implementation Subject: In Construction Contracts and Maintenance Projects*, March 3, 2020.

transported in stormwater and non-stormwater discharges at the Airport (see Topic E.17, Hydrology and Water Quality, of this initial study).

In addition, the Airport's Standard Construction Measures[313] include "Division Documents" related to hazardous materials, which include the following:

- Division 01 33 16 – Submittal Requirements for Removal of Contaminated Soil, Sludge, and Water
- Division 01 35 13.43 – Regulatory Requirements for Hazardous Waste
- Division 01 35 43.02 – Underground Petroleum Products Storage Tank Removal
- Division 01 35 43.13 – Asbestos Remediation
- Division 01 35 43.14 – Lead Remediation
- Division 01 35 43.15 – PCB Remediation
- Division 01 35 43.16 – Excavation and Disposal of Contaminated Soils, Sludge, and Water
- Division 01 57 00 – Temporary Controls
- Division 01 57 23.02 – Storm Water Pollution Prevention, Erosion Controls

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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. As such, the following analysis considers whether compliance with regulatory requirements relevant to construction and operation of projects that could occur pursuant to the RADP would be sufficient to minimize and/or avoid significant impacts related to the use, storage, and disposal of hazardous materials. This section summarizes the key physical conditions and regulatory requirements relevant to assessing impacts related to hazardous materials. The evaluation of the subsequent RADP projects' potential impacts is based on a review of SFO's health and safety protocols, the Airport Standard Construction Measures, federal and state statutes regulating hazardous materials, and state hazardous materials databases.

The RADP project site is not located within 0.25 mile of a school. Lomita Park Elementary School at 200 Santa Helena Avenue, San Bruno, is located approximately 0.3 mile southwest of the nearest RADP project (RADP Project #1; Boarding Area H). Therefore, Topic E.18(c) would have ***no impact*** and is not discussed further in this section. Additionally, the Airport is not mapped as being in or adjacent to a Very High Fire Hazard Severity Zone.[314] Therefore, Topic E.18(g) is not applicable to the RADP and is not discussed further in this section.

---

[313] San Francisco International Airport, *Airport Standard Construction Measures Implementation in Construction Contracts and Maintenance Projects*, March 3, 2020.

[314] California Department of Forestry and Fire Protection, Fire Hazard Severity Zone Viewer, https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones, accessed May 24, 2024.

Impacts and Mitigation Measures

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. ***(Less than Significant)***

Demolition and Renovation

Implementation of the RADP would involve the demolition and removal of existing buildings, structures, and associated utilities. Some of these structures pre-date the 1980s, which could also pre-date U.S. EPA's ban on the use of asbestos-containing materials and lead-based paint in the mid- to late-1970s. Additional possible hazardous building materials include PCBs in light ballasts and transformers, mercury-containing fluorescent light tubes and older switches, and Freon in refrigeration equipment. These hazardous building materials may be present in structures slated for demolition.

Federal and state regulations specify that if demolition or renovation activities would disturb or require the removal of materials consisting of, containing, or coated with asbestos-containing materials, lead-based paint, PCBs, mercury, or other hazardous materials, the materials must be inspected and/or tested for the presence of hazardous materials. If present, the materials must be managed and disposed of as hazardous waste in accordance with applicable laws and regulations. In addition, the Airport's Standard Construction Measures regulate the handling and removal of hazardous materials. As listed previously, contractors would be required to comply with numerous regulations during demolition activities to ensure that hazardous materials are removed, encapsulated, transported, and disposed of safely to protect worker safety, and to reduce the potential for a release of hazardous building materials. With compliance with these demolition regulations, implementation of subsequent RADP projects would result in a ***less-than-significant*** impact.

Mitigation: None required.

Construction and Operation

Construction and operation of subsequent projects that could occur with implementation of the RADP would require the transportation and use of fuel and oil, sealants and glues, paints and thinners, solvents and cleaners, and other materials that can be hazardous to humans or the environment. During construction and operations, construction workers, operations workers, the public, or the environment could be exposed to these hazardous materials through routine use or accidental spills.

The use of hazardous materials during subsequent project construction and operations would be subject to numerous federal, state, and local health and safety requirements for handling, storage, and disposal. These requirements would include preparing hazardous materials business plans, to be implemented both by the contractors constructing the subsequent project and by SFO for Airport operations. The hazardous materials business plans would be submitted to the local certified unified program agency – in this case, San Mateo County Environmental Health Services – for its review and approval. The hazardous materials business plans would describe the hazardous materials to be used; procedures for transportation, storage, use, and disposal; security measures and secondary containment; and emergency response procedures, describing preparations for and actions to take in an emergency. The California Fire Code also requires measures for the safe storage and handling of hazardous materials.

With compliance with existing regulations, the impact of subsequent projects that could occur with implementation of the RADP related to the transportation, storage, use, and disposal of hazardous materials would be ***less than significant***.

Mitigation: None required.

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. *(Less than Significant)*

The list of hazardous materials sites compiled pursuant to Government Code section 65962.5 (the "Cortese List") includes hazardous materials sites listed on the state board's GeoTracker website, which includes site data from the California Department of Toxic Substances Control's EnviroStor database.

The currently active sites under investigation and/or remediation at the Airport have contaminated soil and possibly contaminated groundwater. Some inactive sites have yet to be investigated and may or may not have contaminated soil and/or groundwater. In addition, there are closed sites of former leaking underground storage tanks and closed cleanup program sites. *Closed sites* are those for which regulatory agency closure has been granted after a site investigation and any subsequent remediation demonstrates a low risk to the public or the environment. The closed sites may have residual contaminants at concentrations below regulatory standards.

There are numerous currently active sites within the Airport where the use and/or release of hazardous substances has resulted in contamination of soil and/or groundwater. In addition, the potential exists for unknown contaminated sites to be encountered during construction of subsequent projects that require excavation. Subsequent RADP projects could occur at or adjacent to a contaminated site.

As discussed previously, the Airport's Standard Construction Measures provide requirements for soil and groundwater investigation and remediation. The investigation and cleanup of hazardous materials release sites require the following:

- The removal, closure, or repair of the primary discharge source(s).
- Removal of free product and soil saturated with contaminants in the immediate vicinity of the source, where practicable.
- Implementation of a risk assessment and necessary cleanup or abatement, if there is a risk to ecological and/or human receptors or the beneficial uses of the water affected by the discharge.
- Monitoring of groundwater, if necessary, to determine plume stability and the effectiveness of the remediation strategy.

Dischargers at contaminated sites would be responsible for ensuring that the sites are remediated to regulatory action levels established for the intended use (i.e., residential, commercial, or industrial). When buildings are located on sites with contaminated soil or groundwater, or future buildings are proposed for a particular site, an investigation is conducted to determine the residual contaminant levels in the soils and groundwater. These data are then compared to relevant environmental screening levels established by the regional board.[315] Depending on the environmental screening levels and the site's determined potential risk to public health, the regional board must consider and approve corrective actions before the site can be considered for development. This process ensures that any residual chemical contamination remaining on a subsequent RADP site would not be at levels that could be harmful to human health or the environment. Therefore, with these regulatory controls in place, the potential that subsequent RADP projects would be constructed on sites with hazardous levels of residual contamination in soil and groundwater would be low.

If subsurface soil or groundwater contamination is encountered during construction, adherence to the Airport's Standard Construction Measures that address discovery of unknown contaminants in the soil and groundwater would reduce risks to the public or the environment. Therefore, although the potential exists to encounter contaminants in the soil and groundwater, the risks associated with exposure to contaminants are considered low, and this impact would be ***less than significant***.

Mitigation: None required.

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. *(Less than Significant)*

Subsequent RADP projects would be constructed in existing developed areas of the Airport and would therefore be within 2 miles of an existing airport. As noted above, the RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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.

The RADP would not induce passenger demand. It also would not increase the capacity of the airfield, change the configuration of the existing runways, alter aircraft operations or types of aircraft operating at the Airport (including cargo, private jets, and helicopters), or change the annual volume of passengers that choose to fly into and out of SFO. (See Appendix C, Airport Facilities to Accommodate Aviation Demand.) Therefore, implementation of the RADP would not result in safety hazards or excessive noise for people residing or working in the vicinity of an airport (see Section 3.B, Noise and Vibration, for a more detailed discussion of noise impacts related to implementation of the RADP).

Subsequent RADP projects could result in a hazard to aircraft operations and a potential safety hazard for people working or living nearby. However, these potential hazards are minimized through the FAA's system of hazard evaluation, which includes a series of standards and criteria for assessing the potential effect of surrounding structures and terrain on air safety. Among the criteria are those that portray critical airspace as three-dimensional imaginary surfaces around airports.[316] The surfaces developed from these criteria establish obstruction standards used by the FAA in its review of proposed development. The FAA's hazard evaluation system would be applied to the subsequent projects that would occur under the RADP, thereby reducing potential hazards to aircraft operations or hazards to the public.

[315] San Francisco Bay Regional Water Quality Control Board, Environmental Screening Level Tables, Rev. 1, January 24, 2019, https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/sitecleanup.shtml, accessed May 16, 2024.
[316] Subpart C of 14 Code of Federal Regulations part 77 sets forth criteria for the definition of imaginary surfaces around civil and military airports.

Critical aeronautical surfaces are used to establish procedures for arrivals and departures. These surfaces indicate the maximum height at which structures can be constructed to avoid penetration of critical airspace, thereby maintaining a safe operating environment within the Airport. All subsequent RADP projects would be designed to avoid penetration of critical airspace to comply with CFR, title 14, part 77.

In compliance with CFR, title 14, part 77 (subpart b, section 77.9) any construction at a public use airport must submit a notice to the FAA (Form 7460-1, Notice of Proposed Construction or Alteration) and provide information to support an obstruction evaluation/airport airspace analysis review. The FAA also requires the filing of notices for proposed construction based on considerations other than height, such as potential to interfere with electronic *navigation aids*.[317] Any construction at a public-use airport, regardless of building height, must follow this process.

After conducting the initial aeronautical review, the FAA issues a Determination of No Hazard or a Notice of Presumed Hazard. For subsequent projects that could occur with implementation of the RADP to be deemed consistent with the airport land use compatibility plan, the project sponsor must comply with the findings of FAA aeronautical studies with respect to any recommended alterations to building design and height and any recommended marking and lighting of its structures. Although the FAA has no direct land use regulatory authority, the failure of an airport operator with land use regulatory authority (such as the San Francisco Airport Commission) to enforce an FAA hazard determination could be interpreted as a violation of Grant Assurances 20 and 21,[318] which obligate the airport operator to avoid penetration of critical airspace surfaces and to promote airport land use compatibility.[319]

Compliance by subsequent RADP projects with the findings of the required FAA hazard studies would minimize or avoid potential safety hazards associated with implementation of the RADP for people living or working near or at the Airport. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact HZ-4: The RADP would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. *(Less than Significant)*

Construction

Construction activities associated with implementation of the RADP may require temporary detours of established access routes between areas within the Airport. However, safety and emergency access specifications issued by the Airport director and enforced through the building permit process would minimize the subsequent RADP projects' effects on the Airport's emergency response procedures. Rule 3.4 of the Airport Rules and Regulations states that no person shall conduct any work on Airport premises without

---

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

[318] When airport owners or sponsors, planning agencies, or other organizations accept funds from Federal Aviation Administration–administered airport financial assistance programs, they must agree to certain obligations (or assurances). Assurance 20, applicable to Airport sponsors such as the Airport, is called "Hazard Removal and Mitigation." Assurance 21 is "Compatible Land Use."

[319] State Public Utilities Commission airport regulations and ALUCP requirements are enforceable by the FAA under 14 CFR Part 77, which incorporates both Part 77 and One Engine Inoperative surfaces for airspace compatibility policies; safety compatibility policies for areas within the Runway Protection Zone and Object Free Area; and noise compatibility policies.

first obtaining a building permit from BICE, and without strict compliance and adherence to the safety specifications and directions of the Airport director.[320]

In addition, Rule 4.0 states that the Airport director may at any time change, alter, expand, or limit access to Airport roadways, parking zones, and designated pick-up, drop-off, and staging areas necessary to accommodate renovation, construction, and other structural improvements and/or modifications to Airport property. The Airport director would have the ability to detour and/or close Airport roadways to maintain emergency response procedures throughout implementation of the RADP.

Implementing safety and emergency access specifications tailored to each RADP project would reduce the potential for construction activities to affect emergency procedures. For these reasons, construction impacts on emergency response or emergency evacuation from subsequent projects that could occur with implementation of the RADP would be ***less than significant***.

Mitigation: None required.

Operations

Rule 3.3(I) of the Airport Rules and Regulations states that all airline tenants must develop and maintain written procedures for use in the event of a bombing and/or bomb threat, natural disaster, hijacking, or other emergency and train their personnel in the implementation of those procedures. Airline tenants must annually provide the Airport director with their emergency procedures and these procedures must interface with procedures established by the airport commission.

Subsequent RADP projects would be subject to the Airport Rules and Regulations, including Rule 3.3(I). The emergency procedures for subsequent projects that could occur pursuant to the RADP therefore would be compatible with the Airport's emergency response procedures and would neither obstruct implementation of those procedures nor interfere with emergency evacuation planning.

In addition, SFO is required to develop and maintain an Airport Emergency Plan as required by 14 CFR Part 139.325, "designed to minimize the possibility and extent of personal injury and property damage on the airport in an emergency." The plan must describe emergency procedures for aircraft incidents and accidents; bomb incidents, including designation of parking areas for the aircraft involved; structural fires and fires at fuel farms or fuel storage areas; natural disasters; hazardous materials/dangerous goods incidents; sabotage, hijack incidents, and other unlawful interference with operations; failure of power for movement area lighting; and water rescue situations, as appropriate. The plan must identify and address medical services; crowd control; inventory of personal, equipment, and facilities; removal of disabled aircraft; emergency alarm and notification systems; and coordination with airport and control tower functions. The plan must be coordinated with law enforcement, rescue and firefighting, medical personnel and organizations, airport tenants, and all other persons with emergency response responsibilities. The plan must be reviewed once every 12 months to ensure all parties know their responsibilities and that all of the information in the plan is current. Finally, SFO must hold a full-scale airport emergency plan exercise at least once every 36 consecutive calendar months. The Airport Emergency Plan is required as part of the Airport Certification Program under FAA Order 5280-5D, Airport Certification Program.

---

[320] San Francisco Airport Commission, *Rules and Regulations, San Francisco International Airport*, effective January 1, 2024.

Subsequent RADP projects would also be required to comply with the existing codes and regulations noted previously and would implement provisions for emergency response that would account for and be compatible with the Airport's emergency procedures. Therefore, impacts related to interference with emergency response or evacuation during operation of subsequent projects that could occur pursuant to the RADP would be ***less than significant***.

Mitigation: None required.

Impact C-HZ-1: The RADP in combination with cumulative projects would not result in significant cumulative impacts related to hazards or hazardous materials. ***(Less than Significant)***

Hazards and hazardous materials impacts tend to be site-specific and depend on local conditions. For these reasons, the geographic scope for potential significant cumulative impacts consists of the Airport and the immediate vicinity. In general, for a cumulative impact to occur, two or more projects would have to spatially overlap and take place at the same time.

The RADP project site is located entirely on Airport property. All non-Airport cumulative projects are separated from the Airport by U.S. 101, with the exception of cumulative project #19, A-1 Self Storage, which is separated from the Airport by the San Bruno Channel. Given this substantial physical separation, non-Airport cumulative projects could not spatially overlap with the subsequent projects that could occur with implementation of the RADP. In addition, subsequent RADP projects and cumulative projects at SFO would all be required to comply with the same existing regulations, such as the state Construction General Permit to prevent polluted runoff from each project, and the requirements for a hazardous materials business plan to properly transport, store, use, and dispose of hazardous materials.

As discussed previously, with implementation of and compliance with applicable regulatory requirements, the subsequent projects that could occur with implementation of the RADP would not result in any significant impacts related to hazards or hazardous materials. All cumulative and subsequent RADP projects at the Airport would be subject to the same regulatory framework for the transport, use, and storage of hazardous materials and the abatement of hazardous building materials.

During construction, the subsequent projects that could occur pursuant to the RADP could result in exposure to chemicals in soils and groundwater. Concurrent construction of cumulative projects adjacent to subsequent RADP projects could also encounter similar materials at their respective project sites. However, compliance with the Airport's required Standard Construction Measures would limit the potential for staff or members of the public to become exposed to contaminated materials during construction, such that subsequent RADP projects would not combine with cumulative projects to result in a significant cumulative impact. Therefore, cumulative impacts related to exposure to hazardous materials in soil and groundwater during construction would be ***less than significant***.

During operation, the subsequent projects that could occur pursuant to the RADP could expose site occupants, workers, recreational users, and visitors to chemicals in the soil once the project is constructed. However, this project-level effect would be site-specific and would not combine with cumulative projects to result in a significant cumulative impact because the same receptors would not be exposed to chemical risks from more than one site. Therefore, no significant cumulative effects would occur and cumulative impacts related to exposure to chemicals in soil during operation would be ***less than significant***.

With implementation of the Airport Rules and Regulations, which provide a framework for emergency planning for all Airport and tenant operations, and adherence to the FAA-required Airport Emergency Plan, as described above, subsequent RADP projects would not combine with cumulative projects to result in a significant cumulative impact. Therefore, cumulative impacts related to interference with or impedance of an emergency response plan would be ***less than significant***.

Mitigation: None required.

E.19 Mineral Resources

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
19. MINERAL RESOURCES. Would the project:					
a) 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?	☐	☐	☐	☒	☐
b) 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?	☐	☐	☐	☒	☐

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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.

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. *(No Impact)*

For purposes of this analysis, *mineral resources* include sand, clay, gravel, and rock deposits that could be located within the RADP project site and that would be of value to the region and residents of the state.

The California Department of Conservation, Division of Mines and Geology (now known as the California Geological Survey) has mapped mineral resources in the San Francisco Bay Area, including resources such as sand and gravel and other economically valuable resources.[321] The entire project site is designated as MRZ-1, which includes “areas where adequate information indicates that no significant mineral deposits are

[321] California Department of Conservation, Division of Mines and Geology, *Mineral Land Classification: Aggregate Materials in the San Francisco-Monterey Bay Area*, Special Report 146, Part II, Plate 2.41: San Francisco North Quadrangle and Plate 2.42: San Francisco South Quadrangle, 1987.

present, or where it is judged that little likelihood exists for their presence."[322] Therefore, ***no impact*** related to valuable mineral resources would occur as a result of implementation of the RADP.

Mitigation: None required.

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. *(No Impact)*

The San Francisco General Plan states that as an urban place, San Francisco does not contain mineral resources to any appreciable extent; as a result, consideration of mineral resources is omitted from the general plan. The Millbrae General Plan, San Bruno General Plan, and South San Francisco General Plan make no mention of locally important mineral resource recovery sites. Therefore, ***no impact*** related to local mineral resource recovery sites would occur as a result of implementation of the RADP.

Mitigation: None required.

Impact C-MR-1: The RADP in combination with cumulative projects would not result in the loss of valuable mineral resources. *(No Impact)*

As described previously, the entire Airport is in an area designated MRZ-1, which indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence. Because subsequent projects that could occur pursuant to the RADP would result in no impact on mineral resources, RADP projects would not have the potential to combine with cumulative projects to result in a significant cumulative impact on mineral resources. As such, implementation of the RADP would have ***no impact*** on mineral resources.

Mitigation: None required.

---

[322] Ibid.

E.20 Energy

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
20.ENERGY. Would the project:					
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐	☐

Environmental Setting

PG&E provides electric service and natural gas to SFO. With a relatively mild Mediterranean climate and strict energy-efficiency and conservation requirements, California has lower energy consumption rates than other parts of the country. According to the U.S. Department of Energy, California's per capita energy consumption was the fourth lowest in the nation as of 2021.[323]

PG&E provides natural gas within an area of 70,000 square miles in Northern and Central California, including SFO. PG&E's service area extends north to south from Eureka to Bakersfield and east to west from the Sierra Nevada to the Pacific Ocean. PG&E purchases gas from a variety of sources, including other utility companies.

Regulatory Setting

Over the past 15 years, several federal, state, and citywide policies and measures have been enacted to promote energy efficiency and reduce current demands on non-renewable resources. The federal Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, this law enables consumers and businesses to attain federal tax credits for purchasing fuel-efficient appliances and products, buying hybrid vehicles, building energy-efficient buildings, and improving the energy efficiency of commercial buildings. In addition, tax credits are available for installing qualified fuel cells, stationary micro-turbine power plants, and solar power equipment.

SB 1389, enacted in 2002, requires the California Energy Commission to develop an integrated energy plan biennially (once every two years) for electricity, natural gas, and transportation fuels. The 2020 Integrated Energy Policy Report identifies actions the state and others can take to ensure a clean, affordable, and reliable energy system.[324] Volume I of the report focuses on California's transportation future and the

[323] U.S. Department of Energy and U.S. Energy Information Administration, *Rankings: Total Energy Consumed per Capita*, 2021 (million Btu), https://www.eia.gov/state/rankings/?sid=CA#series/12, accessed May 8, 2024.
[324] California Energy Commission, *2020 Integrated Energy Policy Report*, https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2020-integrated-energy-policy-report-update, accessed May 8, 2024.

transition to zero-emission vehicles. Volume II examines microgrids[325] and their potential to contribute to a clean and resilient energy system. Volume III reports on California's energy demand outlook and is updated to reflect the global COVID-19 pandemic and to help plan for a growth in zero-emissions plug-in electric vehicles.

California's Building Energy Efficiency Standards (CCR title 24, part 6) govern all aspects of building construction. Included in part 6 of the code are standards mandating energy efficiency measures in new construction. Since their establishment in 1977, the building efficiency standards (along with standards for energy efficiency in appliances) have contributed to a reduction in electricity and natural gas usage and costs in California. The standards are updated every three years to incorporate new energy efficiency technologies. The latest update to the Title 24 standards became effective on January 1, 2023, and reflect the California Building Standards Commission–approved 2022 Building Energy Efficiency Standards for Residential and Nonresidential Buildings.[326] The standards regulate energy consumed in buildings for heating, cooling, ventilation, water heating, and lighting. Subsequent projects that could occur pursuant to the RADP would adhere to these regulations and standards to substantially reduce energy and fuel use during construction and operation.

California's renewable energy and energy efficiency plans include the Renewables Portfolio Standard Program (as revised by SB X1-2), which required utilities to increase their renewable energy generation to 33 percent by 2020, and the California Energy Efficiency Strategy Plan, which was developed to provide a roadmap for energy efficiency in California through the year 2020 and beyond. At the local level, the majority of San Francisco's energy-efficiency requirements are geared toward commercial and residential development and do not apply to the RADP projects. Construction and operation of projects that could occur with implementation of the RADP would occur over an approximately 20-year buildout period from 2025 to 2045. Subsequent projects would be subject to the most current energy and water efficiency standards in effect.

Approach to Analysis

The RADP would not immediately result in new development. As described in Draft EIR Chapter 2, Project Description, 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. Effects on energy use could result because subsequent projects would add new buildings and employees.

This analysis considers the extent to which implementation of the RADP would generate demand for energy and whether implementation of the RADP would result in wasteful or inefficient consumption of energy resources. The existing state and local regulatory environments were evaluated to determine requirements for new structures that could occur pursuant to the RADP. These requirements (e.g., LEED, GreenPoint) are well established in the industry as standards for efficient building practices.

[325] 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.
[326] California Energy Commission, 2022 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, 2022, https://www.energy.ca.gov/publications/2022/2022-building-energy-efficiency-standards-residential-and-nonresidential, accessed January 30, 2025.

Impacts and Mitigation Measures

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. *(Less than Significant)*

Construction

Construction of subsequent projects that could occur with implementation of the RADP would require the use of fuel-powered equipment and vehicles, resulting in the consumption of gasoline or diesel fuel. Heavy construction equipment (e.g., cranes, dump trucks, backhoes, loaders) and generators could be diesel powered, while smaller construction vehicles such as pickup trucks would be gasoline powered. The precise amount of fuel required for construction of subsequent projects is uncertain because design details for the subsequent projects are not known at this time; however, the quantity of gasoline and diesel used by construction equipment, workers' vehicles, and haul vehicles would likely be comparable to the quantity used during large construction projects in the area. Electric power would be used mainly to provide service to the concrete/industrial saws, sweepers/scrubbers, welding machines, air compressors, cranes, forklifts, pumps, cement and mortar mixers, and portable equipment. In addition, indirect electricity usage would occur for the supply, distribution, and treatment of water used for construction. As a condition of project approval, all plans, specifications, calculations, and methods of construction would meet the requirements of the California Building Energy Efficiency Standards 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.[327]

The construction fleet—both on-road vehicles and off-road equipment—may also use biodiesel or renewable diesel, provided that the use of such fuels is demonstrated by SFO to reduce emissions of criteria air pollutants and GHGs compared to conventional diesel. Furthermore, construction contractors would be required to use electric equipment where feasible in compliance with the Airport's Standard Construction Measure division 01 57 00.[328]

This analysis conservatively assumes that all electrical power would be obtained from generators. The construction contractor would have a financial incentive to use fuel and energy efficiently because excess usage would increase costs and reduce profits. The use of fuel and energy during construction would not be wasteful or inefficient, nor would it conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, the impact of construction-related fuel and energy usage would be ***less than significant***.

Mitigation: None required.

---

[327] San Francisco Airport Commission, *Rules and Regulations*, *San Francisco International Airport,* 2023, Appendix F, Building Regulations, https://www.flysfo.com/sites/default/files/2023-12/Rules%20%26%20Regs-Final%2011.7.2023.pdf, accessed May 8, 2024.

[328] San Francisco International Airport, *San Francisco International Airport Standard Construction Measures Implementation Subject: In Construction Contracts and Maintenance Projects*, March 3, 2020.

Operation

SFO established a target in its 2016 strategic plan to achieve zero net energy by 2021.[329] This goal was updated in 2021 and re-envisioned in 2023 to achieve net zero energy by 2030.[330,331] Pursuant to that goal, SFO developed a Zero Net Energy Plan with key strategies to achieve zero net energy, such as reducing the energy use of existing buildings; constructing highly efficient new buildings; updating the central utility plant to a heat recovery chiller plant; monitoring energy use and ongoing commissioning; installing onsite renewable energy systems; and purchasing offsite renewable energy.[332] However, as of 2023, SFO has not achieved zero net energy.[333] The SFO 2023 Zero Annual Report states that Airport energy consumption for that year achieved a 15 percent reduction below 2013 levels, or 60 percent of the interim goal of reducing energy consumption to 25 percent below 2013 levels.[334]

Buildings, including terminal buildings, are the primary energy consumer at SFO, accounting for 95 percent of the 1.9 billion thousand British thermal units (kBtu) of energy used in 2018. The Zero Net Energy Plan identified system improvements across the SFO campus, which represent an estimated savings of 346 million kBtu/year.[335] New construction projects would be "Zero Net Energy–ready," minimizing energy use as much as feasible so that remaining energy use could be met with renewable energy.[336] Constructing Zero Net Energy–ready new buildings could save 191 million kBtu per year.[337]

To maintain strong energy performance and realize the associated cost savings, SFO plans to install an energy management control system. Once complete, this system would save 180 million kBtu/year. The Zero Net Energy Plan proposes several new solar photovoltaic and energy storage projects, in addition to the nearly 4,000 kilowatts of existing photovoltaic capacity, which would allow SFO to generate more renewable energy on site and offset some of its consumption. These projects would save 94 million kBtu/year.

The Zero Net Energy Plan, if fully implemented, would reduce SFO's annual energy use by 60 percent or 1.3 billion kBtu/year. This is equivalent to the annual energy use of 27,000 households. These strategies and projects are not enough on their own to achieve the goal of zero net energy, however. SFO would need to procure remaining energy needs from offsite renewable sources. SFO purchases renewable energy from SFPUC, but SFO's total demand may exceed the utility's supply of green power. SFO can also purchase renewable energy credits, which represent the energy generated from renewable sources.

[329] San Francisco International Airport Five-Year Strategic Plan 2017-2021, n.d., https://www.flysfo.com/sites/default/files/assets/pdfs/reports/Strategic-Plan-2017-2021.pdf, accessed September 12, 2024.
[330] San Francisco International Airport Interim Strategic Plan: COVID-19 Recovery to Resilience Framework, July 2021, https://sustainability.flysfo.com/wp-content/uploads/2023/03/SFO_Covid19_Recovery_Framework_New-07.20.21.pdf, accessed September 12, 2024.
[331] San Francisco International Airport Strategic Plan 2023-2028, November 2023, https://www.flysfo.com/sites/default/files/2023-11/SFO_StratPlan_Doc_Approved_231107_4Web.pdf, accessed September 12, 2024.
[332] San Francisco International Airport, Zero Net Energy at SFO 2020 Executive Summary Report, March 2023, https://sustainability.flysfo.com/wp-content/uploads/2023/03/SFO_Zero_Net_Energy_Plan-Executive_Summary.pdf, accessed September 13, 2024.
[333] San Francisco International Airport 2023 Zero Annual Report, 2023, https://sustainability.flysfo.com/wp-content/uploads/2024/04/Zero-Annual-Report-2023.pdf, accessed September 12, 2024.
[334] Ibid.
[335] San Francisco International Airport, Zero Net Energy at SFO 2020 Executive Summary Report, March 2023, https://sustainability.flysfo.com/wp-content/uploads/2023/03/SFO_Zero_Net_Energy_Plan-Executive_Summary.pdf, accessed September 13, 2024.
[336] Ibid.
[337] Ibid.

The 2023–2028 five-year strategic plan includes Goal 4, Take Bold Climate Action, which includes six sustainability objectives.[338] Several of these objectives would serve to reduce the subsequent RADP projects' energy consumption to prevent the wasteful, inefficient, or unnecessary consumption of energy resources. Objective 4.3 directs the Airport to achieve net zero carbon for Airport-controlled emissions by 2030 and establish a stakeholder emission reduction target and implementation plan by 2024. Actions to achieve this objective include transitioning 100 percent of Airport-owned light-duty vehicles to electric or clean alternative energy sources by 2030; enabling the decarbonization of landside and airside transit vehicles by providing sufficient infrastructure and incentives; and eliminating the use of fossil fuels for building energy by 2030. Objective 4.4 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, the Airport plans to install renewable energy and monitoring equipment to increase SFO's electricity generation by 10 MW above 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. Finally, Objective 4.6 directs the Airport 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, the Airport 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.

Operational energy consumption pursuant to RADP implementation would include electricity, as well as fuel used by employees and visitors as expressed through VMT. Electricity would be used for building space heating and lighting (uses that are covered by title 24), and for the operation of equipment and machines. All RADP buildings and facilities would be constructed as all-electric buildings and would consume no natural gas. New operational sources with implementation of the RADP would include emergency generators, which would require diesel fuel.

The RADP would not immediately result in new development and therefore would not result in the wasteful consumption of energy resources or conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Subsequent projects that could occur with implementation of the RADP would be designed to meet SFO's sustainability objectives identified in the San Francisco International Airport Strategic Plan, 2023–2028.[339] Subsequent projects that could occur pursuant to the RADP would result in the consumption of energy resources. However, any subsequent project would be constructed to be consistent with SFO's Sustainable Planning, Design, and Construction standards, maximizing energy efficiency as described previously under Impact C-GG-1. Furthermore, subsequent projects would be subject to the most current energy and water efficiency standards in effect at the time the projects are proposed.

Operation of projects implemented under the RADP would not result in the wasteful, inefficient, or unnecessary consumption of energy resources, nor would it conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, the impact would be ***less than significant***.

Mitigation: None required.

---

[338] San Francisco Airport Commission, *Inspiring the Extraordinary: San Francisco International Airport Five-Year Strategic Plan 2023–2028*, November 2023, https://www.flysfo.com/sites/default/files/2023-11/SFO_StratPlan_Doc_Approved_231107_4Web.pdf, accessed May 8, 2024.
[339] San Francisco International Airport, *Inspiring the Extraordinary: San Francisco International Airport Strategic Plan, 2023–2028*, https://www.flysfo.com/sites/default/files/2023-11/SFO_StratPlan_Doc_Approved_231107_4Web.pdf, accessed May 8, 2024.

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. ***(Less than Significant)***

The geographic context for the analysis of potential cumulative impacts related to energy consists of the development and infrastructure projects located within 0.25 mile of the RADP project site. Those projects are listed in Draft EIR Table 3-2, Cumulative Projects on and within 0.25 Mile of the RADP Project Site, p. 3-8, and mapped on Draft EIR Figure 3-1, p. 3-11.

The cumulative projects would develop commercial, residential, and Airport-related uses that would result in a cumulative increase in the demand for energy, fuel, and water. Projects developed in the region, including RADP projects, would be subject to the most current energy and water efficiency standards in effect at the time the projects are proposed. Conformance with these requirements would result in less-than-significant impacts related to the wasteful, inefficient, or unnecessary consumption of energy resources. Conformance with these requirements also would ensure adherence to state or local plans for renewable energy or energy efficiency on a project level.

Although overall energy demand in California is increasing commensurate with the increasing population, the state is also making concerted efforts to conserve energy. Cumulative projects would create demand for energy and fuel; however, both state and local policies seek to minimize increases in demand through conservation and energy efficiency regulations and policies so that energy is not used in a wasteful manner. Nearby cumulative projects would be subject to the same statewide energy and similar water conservation ordinances as those projects that could occur pursuant to the RADP. Therefore, implementation of the RADP in combination with cumulative projects would result in a ***less-than-significant*** cumulative impact related to the wasteful use of energy, fuel, and water resources.

Mitigation: None required.

E.21 Agriculture and Forestry Resources

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
21. AGRICULTURE AND FORESTRY RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:					
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☐	☒
e) Involve other changes in the existing environment that, due to their location or nature, could result in conversion of farmland to non-agricultural use or forest land to non-forest use?	☐	☐	☐	☐	☒

The RADP project site is an operational international airport and is not used for farming or agricultural activities. Based on the California Department of Conservation's Farmland Mapping and Monitoring Program, the entire site is classified as Urban and Built-up Land. Because the RADP project site does not contain agricultural uses and is not zoned for such uses, implementation of the projects that could occur pursuant to the RADP would not require the conversion of any land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to nonagricultural use.[340] Subsequent projects that could occur pursuant to the RADP would not conflict with any existing agricultural zoning or Williamson Act

[340] California Department of Conservation, Division of Land Resource Protection, 2018, *San Mateo County Important Farmland 2016*, map published February 2018. San Francisco International Airport is identified by this map as "Urban and Built-Up Land."

contracts. No land at SFO is designated as forest land or timberland by the Public Resources Code. Therefore, implementation of the RADP would not conflict with zoning for forest land, cause a loss of forest land, or convert forest land to a different use. For these reasons, topics a), b), c), d), and e) are ***not applicable***.

E.22 Wildfire

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
22. WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:					
a) Substantially impair an adopted emergency response plan or emergency evacuation plans?	☐	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☐	☒
d) Expose people or structure to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☐	☒

The California Department of Forestry and Fire Protection maps areas and designates zones with varying degrees of fire hazard: moderate, high, and very high. The fire hazard severity zones do not predict when or where a wildfire will occur; rather, they identify areas where wildfire hazards could be more severe and therefore are of greater concern. The RADP project site is not located on or near state responsibility lands for fire management or lands classified as very high fire hazard severity zones.[341] Because the RADP project site is not on or near lands classified as very high fire hazard severity zones, this topic is ***not applicable***.

[341] California Department of Forestry and Fire Protection, Fire Hazard Severity Zones, https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones, accessed April 17, 2024.

E.23 Mandatory Findings of Significance

Topic	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
23.MANDATORY FINDINGS OF SIGNIFICANCE. Does the project:					
a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐	☐
b) Have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐	☐
c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐	☐

As discussed in this initial study, the RADP is anticipated to have less-than-significant impacts on most of the environmental topics discussed. Where necessary, mitigation measures have been identified to reduce impacts to less-than-significant levels. Mitigation measures are included for the following topics: cultural resources, tribal cultural resources, and biological resources. However, even with implementation of mitigation measures, implementation of the RADP could have potentially significant impacts related to transportation and circulation, air quality, and noise and vibration. Therefore, these topics are discussed and analyzed in the Draft EIR.

Implementation of the RADP in combination with cumulative projects, as described in Section E of this initial study, would not result in significant cumulative impacts related to 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, or wildfire. However, implementation of the RADP in combination with cumulative projects could result in cumulative impacts related to transportation and circulation, noise and vibration, and air quality. These cumulative impacts are discussed and analyzed further in the Draft EIR.

Potential adverse effects on human beings have been considered as a part of the analysis of individual environmental topics in this initial study. As discussed previously, implementation of the RADP has the potential to result in significant impacts with respect to transportation and circulation, air quality, and noise and vibration, which could adversely affect human beings. The Draft EIR analyzes these topics and identifies mitigation measures where applicable.

SECTION F MITIGATION MEASURES

The following mitigation measures have been identified in this initial study to reduce potentially significant impacts resulting from implementation of the RADP to less-than-significant levels. The project sponsor has agreed to implement all mitigation measures identified in the initial study.

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 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 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.
- *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 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.

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 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, 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.

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.

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 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.

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.
- *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 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 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.

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 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 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.

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 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 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:

- *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, 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 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 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 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 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.

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 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.
- *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.
- *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 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.

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.

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 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.

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 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 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.[342] 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, 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.

[342] 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.

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, 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:

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.

SECTION G PUBLIC NOTICE AND COMMENT

The planning department prepared and distributed a notice of availability of a notice of preparation of an EIR on May 22, 2019. The notices were mailed to a variety of City departments and neighborhood groups, other public agencies, and interested parties. Two public scoping meetings were held, one on May 30, 2019, and a second on June 4, 2019, at which oral comments from the public were received and transcribed. The topics raised in comment letters and oral comments are addressed in this initial study and the Draft EIR to which this initial study is attached, as appropriate. Draft EIR Table 1-1, Summary of Scoping Comments, p. 1-6, lists the comments on topics raised during the public scoping period. The planning department considered the comments made by the public in preparation of the initial study and the Draft EIR for the RADP. The notice of preparation and comment letters are included as Appendix A in the Draft EIR.

SECTION H DETERMINATION

On the basis of this Initial Study:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.

Lisa Gibson
Lisa Gibson
Environmental Review Officer
for
Rich Hillis
Director of Planning

DATE April 16, 2025

SECTION I INITIAL STUDY PREPARERS

I.1 Lead Agency

Planning Department, City and County of San Francisco
Environmental Planning Division
49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103

- Environmental Review Officer: Lisa Gibson
- Deputy Environmental Review Officer: Devyani Jain
- Principal Environmental Planner: Tania Sheyner
- Senior Environmental Planner: Kei Zushi
- Principal Air Quality and Noise Planner: Jessica Range
- Principal Noise Planner: Chelsea Fordham
- Principal Transportation Planner: Jenny Delumo
- CEQA Cultural Resources Team Manager: Allison Vanderslice
- Senior Air Quality and GHG Planner: Josh Pollak
- Senior Transportation Planner: Elizabeth White
- Senior Preservation Planner: Justin Greving
- Senior Noise Planner: Kei Zushi

I.2 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
3990 20th Street
San Francisco, CA 94114

- Principal: Luba C. Wyznyckyj

PreVision Design
1806 Belles Street, Suite 6B
San Francisco, CA 94129

- Principal: Adam Phillips

Sutro Science, LLC
3030 Bridgeway, Suite 229
Sausalito, CA 94965

- Pete Hudson
- Justin Taplin

I.3 Project Sponsor

San Francisco International Airport, City and County of San Francisco
Bureau of Planning and Environmental Affairs
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

INTENTIONALLY BLANK

ATTACHMENT A

Historic Resources Documentation

RECOMMENDED AIRPORT DEVELOPMENT PLAN SAN FRANCISCO INTERNATIONAL AIRPORT, SAN FRANCISCO, CALIFORNIA

Historic Resources Evaluation Part 1

Prepared for
San Francisco International Airport

June 2018

ESA

RECOMMENDED AIRPORT DEVELOPMENT PLAN
SAN FRANCISCO INTERNATIONAL AIRPORT, SAN FRANCISCO, CALIFORNIA

Historic Resources Evaluation Part 1

Prepared for
San Francisco International Airport

June 2018

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900
www.esassoc.com

ESA

Bend	Oakland	San Francisco
Camarillo	Orlando	Santa Monica
Delray Beach	Pasadena	Sarasota
Destin	Petaluma	Seattle
Irvine	Portland	Sunrise
Los Angeles	Sacramento	Tampa
Miami	San Diego	

OUR COMMITMENT TO SUSTAINABILITY | ESA helps a variety of public and private sector clients plan and prepare for climate change and emerging regulations that limit GHG emissions. ESA is a registered assessor with the California Climate Action Registry, a Climate Leader, and founding reporter for the Climate Registry. ESA is also a corporate member of the U.S. Green Building Council and the Business Council on Climate Change (BC3). Internally, ESA has adopted a Sustainability Vision and Policy Statement and a plan to reduce waste and energy within our operations. This document was produced using recycled paper.

CONTENTS

Recommended Airport Development Plan
San Francisco International Airport

Appendix

Figures

Tables

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER I

Introduction

This Part 1 Historic Resources Evaluation (HRE) provides an evaluation of the potential historic significance per the California Register of Historical Resources (California Register) criteria of 11 buildings that are proposed to be demolished or altered at San Francisco International Airport (SFO or the Airport) as part of the Recommended Airport Development Plan (RADP). These buildings either currently meet (in 2018) or will meet the 45-year age criterion by the full build-out of the RADP in 2035. The 11 buildings are listed in **Table 1**.

Table 1 Buildings Proposed to Be Demolished or Altered at SFO as Part of the RADP

Building No.	Building Name	Current Use	Year(s) Constructed [a]
195	Central Parking Garage	Public parking	1963–1981
400F	Terminal 3 Boarding Area F	Passenger terminal	1976–1979
575	SFO Business Center	Airport support and administration	1969
585	United Airlines Cargo Building	Air cargo	1966
682	Facilities Maintenance Center	Airport maintenance	c. 1968–1974
692	Sheet Metal Shop	Airport maintenance	1974
710	Singapore Cargo Building	Air cargo, airport support and administration	1968
750	Ground Service Equipment Building	Ground service equipment maintenance	1969
928[b]	City College of San Francisco Airport Campus	Education (not operated by SFO)	1976
944	Cargo Building	Air cargo	1980
1070	Ground Service Equipment Building	Ground serviced equipment maintenance	1950

SOURCE: SFO, June 2017.

NOTES:

a. Data provided by SFO includes the "Build Year" for each building, which generally reflects the completion of construction. As such, "Year(s) Constructed" reflects construction dates confirmed by ESA.

b. Building 928A is associated with Building 928 and appears to be a rear storage shed (access to this building was not permitted). The shed appears in a 1976 aerial photograph.

SFO is located on the west shore of San Francisco Bay, approximately 13 miles south of downtown San Francisco in San Mateo County. The Airport is owned by the City and County of San Francisco (the City or CCSF), and operated and managed by and through the San Francisco Airport Commission. In March 1927, the San Francisco Board of Supervisors leased 150 acres belonging to the descendants of Darius Mills for the site of the City's future airport. SFO, then known as Mills Field, opened in June 1927. By 1930, the San Francisco Board of Supervisors had purchased 1,112 acres of property from the Mills Estate, and the following year the Airport became known as the San Francisco Municipal Airport. None of the original Mills Field buildings remain at the present-day Airport.

As the RADP would include demolition or alteration of 11 buildings that are currently 45 years old or older, or will be 45 years old by the full build-out of the RADP in 2035, an evaluation of these buildings with regard to the California Register criteria is being undertaken. This report provides a discussion of the 11 buildings' current historic status and architectural descriptions of the buildings, and evaluates their potential individual historic significance and/or their significance as contributors to potential historic districts.

Johanna Kahn, M.Ar.H., an architectural historian, is the author of this report. Amber Grady, M.A., a senior architectural historian, and Eryn Brennan, M.Ar.H., M.U.E.P, an architectural historian and urban planner, provided senior review. The author and reviewers of this report meet the Secretary of the Interior's Professional Qualification Standards for architectural history.

CHAPTER II
Summary

The 11 buildings evaluated in this HRE were constructed between 1950 and 1981 and serve a variety of functions including cargo, airline and airport administration, parking, and airport maintenance. None of these 11 buildings were found to be individually significant under any California Register criteria, nor do they appear to contribute to any known or potential historic districts on the SFO property. As such, none of the buildings evaluated in this HRE are considered historical resources for the purposes of the California Environmental Quality Act (CEQA).

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER III
Current Historic Status

A. Previous Architectural Surveys Conducted at SFO

As the SFO property is outside the physical boundaries of the City, it is not included in any of the city's primary historical listings or surveys, such as the Junior League of San Francisco Architectural Survey (*Here Today*, 1968), the Department of City Planning Architectural Quality Survey (1976), the San Francisco Heritage (formerly San Francisco Architectural Heritage) surveys (1970s-present), or any neighborhood surveys.

Some historic evaluations of portions of SFO or of the entire Airport have been conducted in the last 30 years. Studies conducted between 1991 and 2000 are referenced in the *Final Historical Resources Report: Information Regarding the Eligibility of Properties at San Francisco International Airport for Inclusion on the National Register of Historic Places or the California Register of Historic Resources* (ESA 2000) and Addendum (ESA/Carey & Co., 2001) (herein referred to as the 2000–2001 Historical Resources Report and Addendum). This report draws from the information contained in three previous studies conducted at SFO:

- *San Francisco International Airport Master Plan Final Environmental Impact Report* (San Francisco Department of City Planning 1992) and the *Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR* (David Chavez & Associates 1991). Age-eligible buildings that were identified included the Flying Tiger hangar (since demolished), the buildings associated with the U.S. Coast Guard Air Station San Francisco (extant)[1], and two metal maintenance buildings identified as Building 1000 and the Val Boiler House. None of these buildings were found to be historically significant under any criteria.
- *Cultural Resources Survey: U.S. Coast Guard Air Station, San Francisco California* (Carey & Co. 1998). The U.S. Coast Guard Air Station San Francisco was found to be eligible for listing on the National Register of Historic Places (National Register) as a district with five contributing buildings, one contributing structure, and four non-contributing buildings. However, the National Register-eligible district is not part of the SFO RADP project site.

As part of the 2000–2001 Historical Resources Report and Addendum, an inventory of the existing buildings at SFO was compiled for the purpose of determining the eligibility of properties for inclusion in the California and National registers. The report and addendum were prepared in support of the San Francisco International Airport Master Plan Final Environmental Impact Report that was certified by the San Francisco Planning Commission in 1992. The building inventory excluded moveable structures (e.g., trailers), minor equipment and infrastructure elements, and buildings and structures that were recently constructed at the time the inventory was compiled.[2]

[1] The U.S. Coast Guard San Francisco Air Station is located entirely within a federally-owned property boundary within the SFO property and is not part of the SFO RADP.
[2] URS, *Historic Architecture Survey Report for the Runway Safety Area Program at San Francisco International Airport*, June 2011, p. 35.

The 2000–2001 Historical Resources Report and Addendum included 10 of the 11 buildings evaluated in this HRE. Notably, Building 195 (the Central Parking Garage) was omitted from the inventory and was not accounted for as part of the existing building stock. Building 1070 was mistakenly listed in the inventory twice, once as "Building 34/ASII [*sic*, should be ASIG] Aviation Fueling Service" and again as "Old Firehouse No. 2." Old Firehouse No. 2 is listed in the inventory simply as "not significant," and no evaluation appears to have been conducted. A construction date was not provided for Building 34, and it was excluded from the collection of buildings that were age eligible at that time.

The remaining nine buildings evaluated in this HRE were less than 35 years old at the time of the inventory. Five were considered to be "major buildings," i.e., those measuring at least 50,000 square feet in area. The major buildings were identified as:

- **Building 400F** (listed in the inventory as "Buildings E, F/North Terminal (2 buildings)" and presumably also combined with the main terminal building [Building 400])
- **Building 585** (listed as "Building 58/United Cargo")
- **Buildings 750** and **710** (listed together in the inventory as "Buildings 45, 47/Delta Maintenance")
- **Building 944** (listed as "Building 83/JAL Cargo")[3]

None of the 11 buildings evaluated in this HRE were evaluated for historic significance as part of the 2000–2001 Historical Resources Report and Addendum, nor have they subsequently been evaluated for historic significance.

B. California Historical Resource Status Code (CHRSC)

The California Register is an authoritative guide to significant architectural, archaeological, and historic resources in the State of California. Resources can be listed in the California Register through a number of methods. California Historical Landmarks and/or National Register-eligible properties (both listed and formal determinations of eligibility) are automatically listed. Properties can also be nominated to the California Register by local governments, private organizations or citizens. This includes properties identified in historic resource surveys with Status Codes of 1 to 5 and resources designated as local landmarks or listed by a city or county ordinance. A building or structure identified in the California Office of Historic Preservation's (OHP) Historic Resources Inventory Directory with a California Historical Resource Status Code (CHRSC) rating of 1 or 2 (on or determined eligible for the National Register) is also considered to be listed on the California Register. Properties of local significance that have been designated under a local preservation ordinance (i.e., local landmarks), or that have been identified in a local historical resources survey, may also be eligible for listing in the California Register.

[3] ESA, *Final Historical Resources Report: Information Regarding the Eligibility of Properties at San Francisco International Airport for Inclusion on the National Register of Historic Places or the California Register of Historic Resources*, December 2000, pp. 6–11.

The evaluative criteria used by the California Register for determining eligibility are closely based on those developed for use by the National Park Service for the National Register. In order to be eligible for listing in the California Register a property must demonstrate significance under one or more of the following criteria:

- **Criterion 1 (Event):** Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
- **Criterion 2 (People):** Resources that are associated with the lives of persons important to local, California, or national history.
- **Criterion 3 (Architecture):** Resources that embody the distinctive characteristics of a type, period, region, or method of construction or represent the work of a master or possess high artistic values.
- **Criterion 4 (Information Potential):** Resources or sites that have yielded, or have the potential to yield information important to the prehistory or history of the local area, California, or the nation.

None of the 11 buildings evaluated in this HRE has been assigned a CHRSC rating.

C. Known Historic Resources in Project Vicinity

As described above, the U.S. Coast Guard Air Station San Francisco was found to be eligible for listing as a district on the National Register in 1998. The district occupies federally owned land that is located within the Airport property boundary. The Coast Guard property is not included in the RADP project site (see Chapter V, Property and Building Descriptions). The Coast Guard Air Station was identified as eligible under National Register Criterion A for its association with the development of SFO, and as one of the first three Coast Guard Air Stations on the Pacific Coast, as well as for its association with the development of the U.S. Coast Guard and World War II search and rescue operations.[4] The six contributing buildings and structures include: the main hangar (Building A), the administration building (Building B), a warehouse (Building F), a utility/fuel repair/storage building (Building G), living quarters (Building H), and the seaplane ramp. The four non-contributing buildings include the Stonerock Barracks (Building C), the paint/gardener shop (Building D), the pump house/storage (Building E), and the utility/sewage pump house (Building J). At the time of this writing, the historic district has not been formally listed in any local, state, or national registers.

According to a review of OHP's Historic Resources Inventory Directory for San Mateo County, there are no historic resources listed on the California and/or National registers located immediately adjacent to the SFO property.[5] There are also no locally listed historic resources in the cities of South San Francisco,[6] San Bruno,[7] Millbrae,[8] or Burlingame[9] that are adjacent to the SFO property.

---

[4] Carey & Co., *Cultural Resources Survey: U.S. Coast Guard Air Station, San Francisco California*, July 1998.

[5] California Office of Historic Preservation, *Historic Resources Inventory Directory for San Mateo County,* April 2012.

[6] City of South San Francisco, *South San Francisco Historic Preservation, http://www.ssf.net/departments/economic-community-development/planning-division/historic-preservation*, accessed March 19, 2018.

[7] Dyett & Bhatia, *Environmental Resources and Conservation Element of the San Bruno General Plan,* March 2009, p. 6.11, *https://www.sanbruno.ca.gov/civicax/filebank/blobdload.aspx?BlobID=24019*, accessed March 19, 2018.

[8] Sam Fielding, Senior Planner at the City of Millbrae, telephone discussion with Johanna Kahn, ESA, March 29, 2018.

[9] PBS&J, *Burlingame Downtown Specific Plan Initial Study/Mitigated Negative Declaration*, May 2010, pp. 218-222, https://www.burlingame.org/document_center/Planning/General%20and%20Specific%20Plans/Draft%20Initial%20Study%20Mitigated%20Negative%20Declaration.pdf, accessed March 19, 2018.

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER IV
Project Description

A. Recommended Airport Development Plan

From late 2014 to 2016, SFO staff prepared the Draft Final Airport Development Plan (Draft Final ADP) to plan for future passenger and operations growth at SFO.[10] The Draft Final ADP serves as a roadmap to guide long-term Airport development up to the estimated maximum capacity of the existing runway system and supports SFO's overarching strategic objectives. The Draft Final ADP was completed in September 2016.

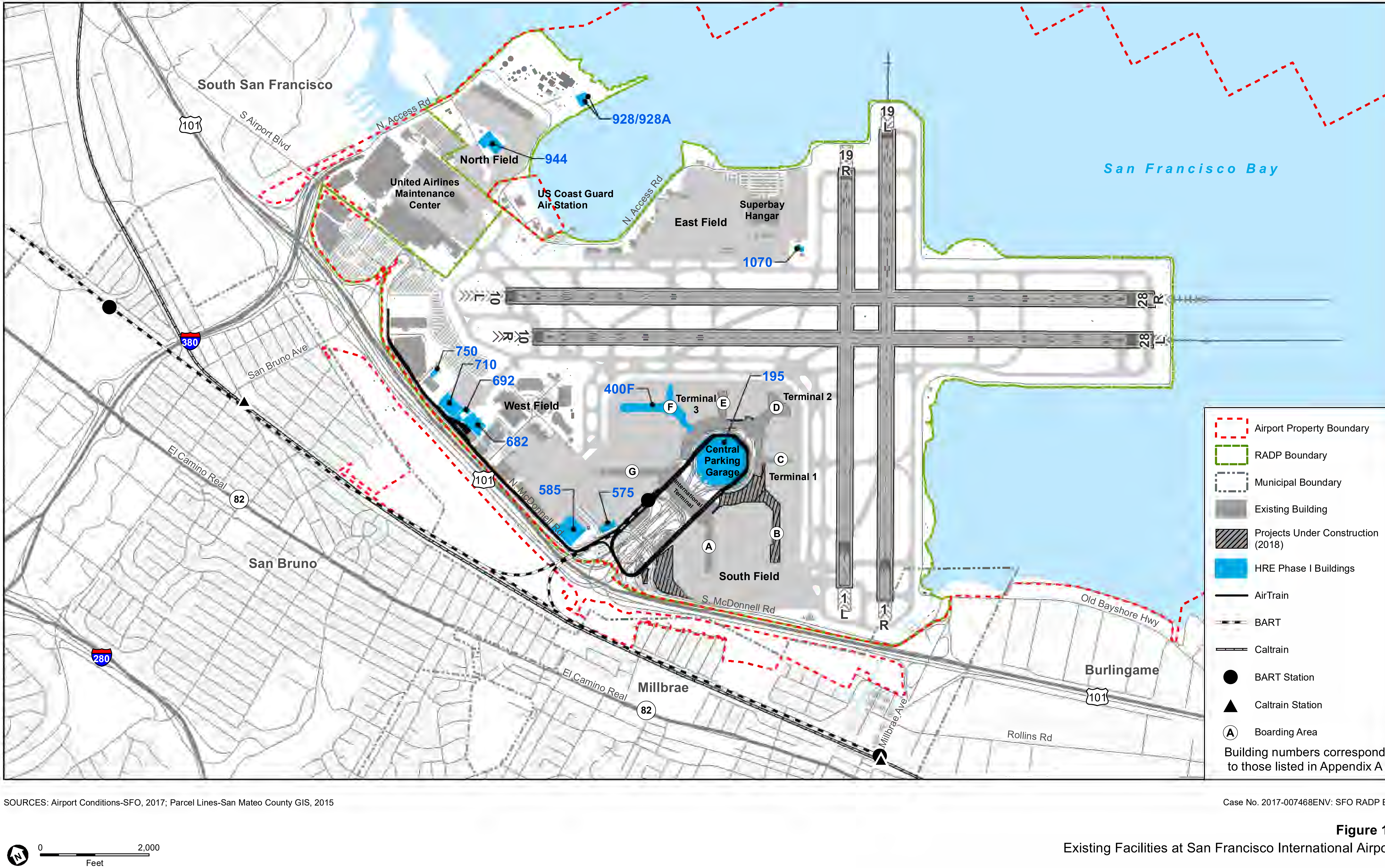
The prior 1989 Master Plan was approved by the Airport Commission in 1992 following certification of the Master Plan Final EIR. The 1989 Master Plan provided a long-term plan for the Airport's growth of up to approximately 51 million annual passengers (MAP). A number of significant capital projects were completed or are in the process of being implemented under the 1989 Master Plan, including the International Terminal Building, the Airport's automated people mover system (AirTrain), Terminal 2 renovation, Terminal 1 redevelopment, hotel development, Long Term Parking Garage No. 2, and administrative office development.

The Draft Final ADP sets forth a long-range plan to guide the Airport's development over the next two decades while providing the highest level of international and domestic guest service. Building upon ongoing projects at SFO, the Draft Final ADP defines Recommended Airport Development Plan projects (i.e., RADP projects) that would accommodate long-term demand at the Airport, which is forecast to reach 71.1 MAP at the estimated maximum airfield capacity with the existing geometry.[11]

As noted above, the proposed RADP projects would include demolition or alteration of 11 existing buildings and structures that either currently meet or will meet the 45-year age criterion by the full build-out of the RADP in 2035. These 11 buildings and structures are identified in **Table 1** and **Figure 1a through Figure 1e**.

[10] San Francisco International Airport, *Draft Final Airport Development Plan 2016: Executive Summary*, September 2016, *http://www.flysfo.com/about-sfo/sfo-tomorrow/draft-final-airport-development-plan*.
[11] Landrum & Brown, Inc., *San Francisco International Airport Aviation Activity Forecast*, April 2014, approved by the Federal Aviation Administration on June 9, 2014. The estimated 71.1 MAP includes passengers who make connecting flights at SFO and those who are originating and departing from the San Francisco Bay Area.

[THIS PAGE INTENTIONALLY LEFT BLANK]



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

Case No. 2017-007468ENV: SFO RADP EIR

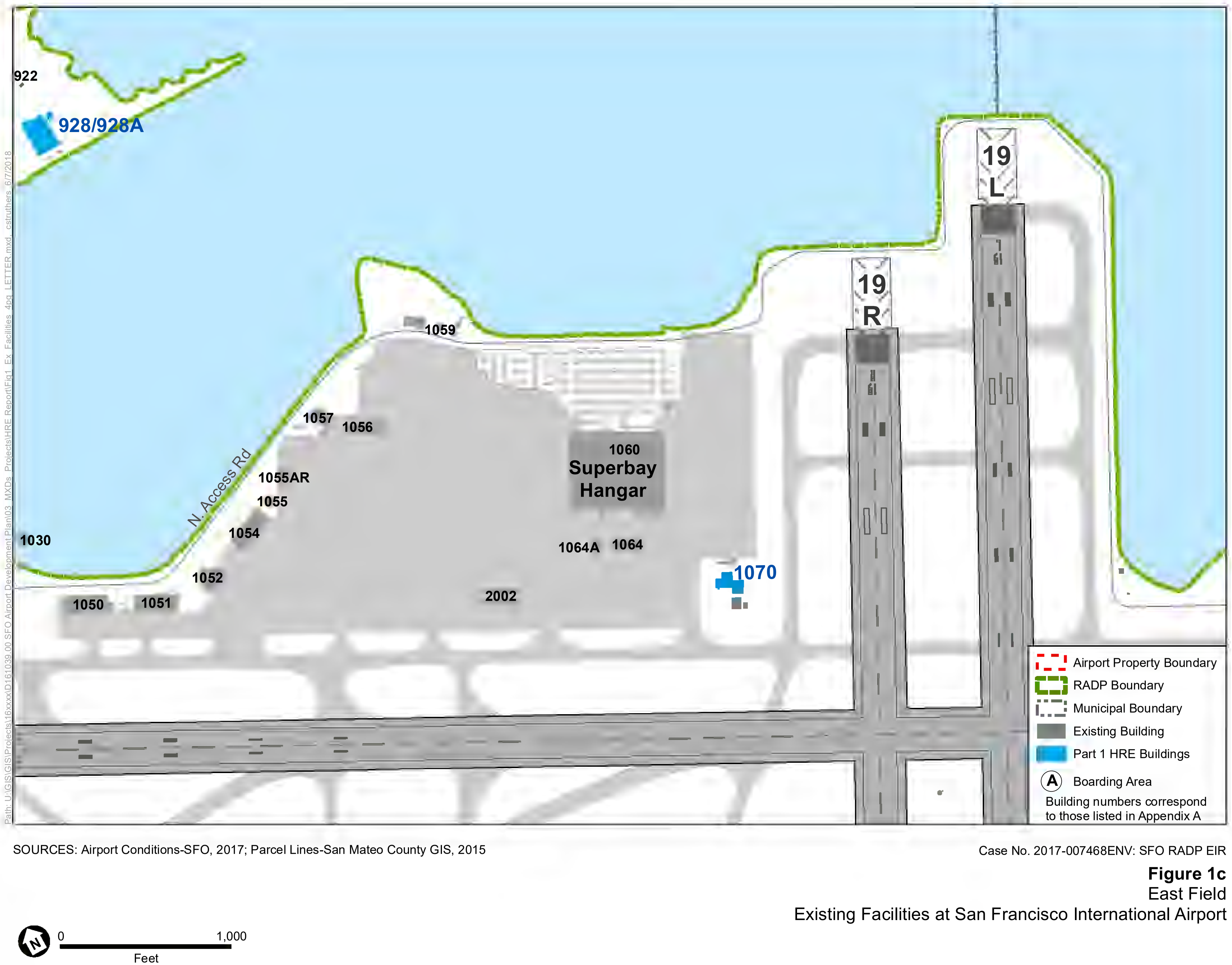
Figure 1a
Existing Facilities at San Francisco International Airport

[THIS PAGE INTENTIONALLY LEFT BLANK]

SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

Case No. 2017-007468ENV: SFO RADP EIR

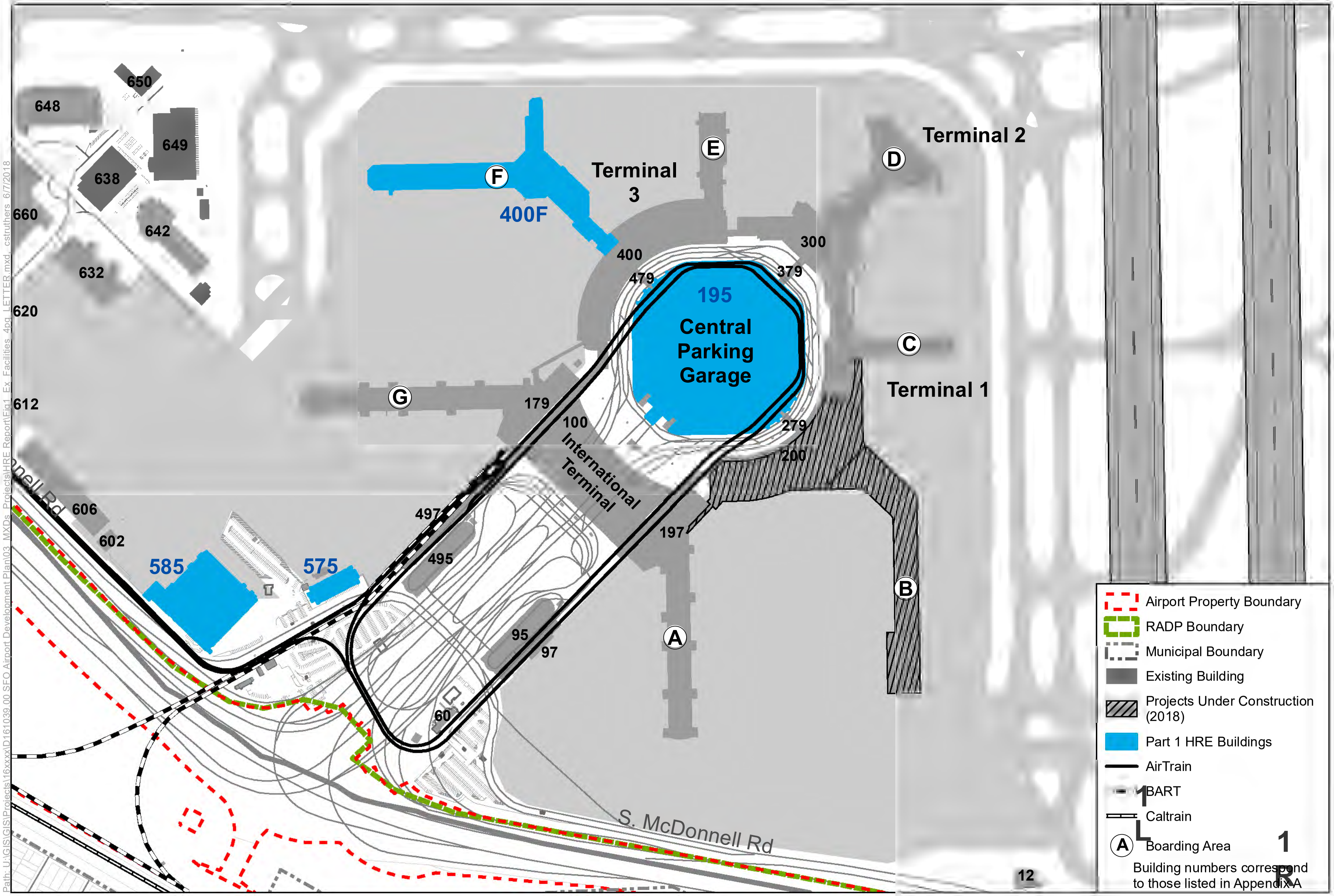
Figure 1b
North Field
Existing Facilities at San Francisco International Airport



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

Case No. 2017-007468ENV: SFO RADP EIR

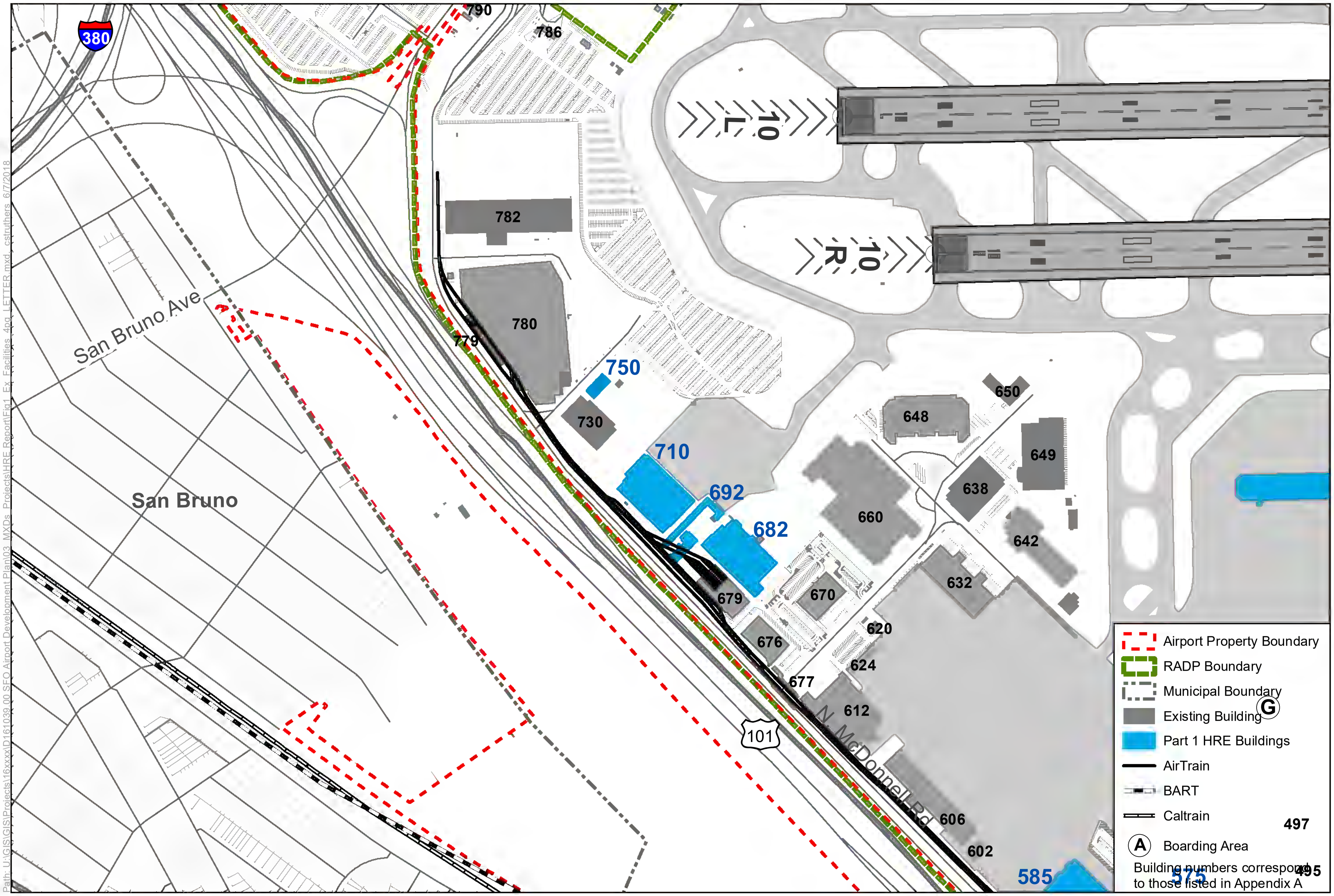
Figure 1c
East Field
Existing Facilities at San Francisco International Airport



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

Case No. 2017-007468ENV: SFO RADP EIR

Figure 1d
Terminal Area
Existing Facilities at San Francisco International Airport



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

Case No. 2017-007468ENV: SFO RADP EIR

Figure 1e
West Field
Existing Facilities at San Francisco International Airport

CHAPTER V
Property and Building Descriptions

The following provides a description of SFO's setting, architectural descriptions of the exterior of the 11 buildings identified in Table 1 and Figure 1a through Figure 1e, and descriptions of publicly accessible interior spaces (i.e., interiors that are intended to be used by the general public). Construction chronologies and known alterations to the 11 buildings are also discussed below.

A. Setting

SFO is owned by the City and County of San Francisco and operated by and through the San Francisco Airport Commission. The Airport is located approximately 13 miles south of downtown San Francisco, and encompasses approximately 5,200 acres in San Mateo County. The majority of the Airport property is in unincorporated San Mateo County but parts of the Airport are located within city boundaries of South San Francisco, San Bruno, Millbrae, and Burlingame. SFO is bordered on the south and east by San Francisco Bay, on the west by the City of San Bruno, and on the north by the City of South San Francisco. Of the 5,200 acres of Airport property, approximately 2,050 acres located east of U.S. 101 serve Airport functions. Approximately 2,900 acres are located in San Francisco Bay waters, and the remaining 180 acres (called "West of Bayshore" property) are mostly undeveloped land located west of U.S. 101.

B. RADP Project Site

The RADP project site includes the portions of SFO located east of U.S. 101 that contain the runway complex, passenger terminals, and airport and airline maintenance, air cargo, and other aviation support facilities.[12] The project site boundary (also called the RADP boundary) includes the portion of the SFO property east of U.S. 101 bounded by South McDonnell Road and Millbrae Avenue to the south; the bay to the east and north; and North Access Road, North Field Road, and South Airport Road/North McDonnell Road to the west. The RADP boundary does not include the United Airlines San Francisco Maintenance Operations Center, which is located in the Airport's North Field on land that is leased, developed, and operated by United Airlines. The RADP boundary also excludes the federal property occupied by U.S. Coast Guard Air Station San Francisco, which is located in the Airport's East Field (see **Figure 1a** and **Figure 1b**).[13]

1. Passenger Terminals

The existing terminal complex (see **Figure 1e**) consists of four terminals with seven aircraft boarding areas (B/As): International Terminal Building (B/As A and G), Terminal 1 (B/As B and C), Terminal 2 (B/A D), and

[12] San Francisco International Airport, *Airport Layout Plan*, approved by the Federal Aviation Administration on September 23, 2016.

[13] The United Airlines San Francisco Maintenance Operations Center and the U.S. Coast Guard Air Station San Francisco are both located more than 100 feet from the nearest RADP project.

Terminal 3 (B/As E and F). Ongoing domestic terminal planning projects include the Terminal 1 redevelopment project, which is currently under construction.[14] RADP projects identified in the terminal areas include renovation and expansion of the International Terminal Building main hall (Building 100) and B/As A and G; demolition, renovation, and expansion of B/A F; and International Terminal curbside expansions.

2. Ground Access and Parking

The landside transportation system at the Airport consists of a complex network of facilities used by various ground access modes, including roadways, curbsides, commercial and public transportation (Bay Area Rapid Transit [BART], which also connects riders to the Caltrain commuter rail system via the Millbrae Intermodal Station, and SamTrans), the rental car center, public parking, and SFO's automated people mover system called the AirTrain. RADP projects identified for ground access and parking includes expansion of select AirTrain stations to accommodate four-car trains, additional AirTrain maintenance and storage capacity, construction and/or renovation of existing garages for long-term public parking garages, and expansion of the central garage and seismic upgrade of the adjacent elevated terminal roadways.[15]

3. North Field

The North Field (see Figure 1b) primarily contains air freight, fueling, airport support facilities, and water treatment facilities, as well as the United Airlines San Francisco Maintenance Operations Center, which is not a part of the project site. RADP projects located in the North Field primarily include the redevelopment of existing buildings for reuse and consolidated airport and airline support and maintenance facilities. RADP projects identified in the North Field include construction of and redevelopment of existing facilities for use as airport maintenance facilities, a new ground service equipment (GSE) maintenance facility, and renovation of a cargo building for flight kitchen operations.[16]

4. East Field

The East Field (see **Figure 1c**) contains remain overnight (RON) aircraft parking, general aviation, SFO airfield operations, and airline maintenance facilities. RADP projects in the East Field include new maintenance hangar north of the Superbay Hangar, replacement GSE maintenance facilities, relocated fire suppression tanks, and reconfigured RON aircraft parking.[17]

5. West Field

Because of the West Field's proximity to the terminal complex (see **Figure 1d**), its primary functions include air cargo, close-in RON aircraft parking, employee parking garages, AirTrain storage and maintenance facility, and SFO and airline administration and maintenance facilities. An existing flight kitchen facility is also located in

[14] San Francisco International Airport, *Draft Final Airport Development Plan 2016: Executive Summary*, September 2016, p. 11.
[15] Ibid., 15.
[16] Ibid., 20.
[17] Ibid., 21.

the West Field. RADP projects in the West Field include renovating existing Airport buildings for reuse, replacing buildings that are beyond their useful lives, new B/A H, and relocation of the Central Utility Plant.[18]

6. South Field

No RADP projects are proposed in the South Field; however, construction of the approximately 350-room airport hotel is currently underway southwest of International Terminal Building (B/A A) on South McDonnell Road.[19]

C. Building Descriptions

1. Building 195/Central Parking Garage (also known as the Domestic Garage)

Exterior

Building 195 is a five-story parking garage located in the center of SFO's passenger terminal complex and surrounded by a network of multi-level roadways. The garage is octagonal in plan and is constructed of reinforced concrete slabs. There are multiple vehicular entrances and exits located on the west side of the garage (see **Figure 2**). At the center of the garage is an oculus that extends vertically through all five parking levels; a system of covered ramps that connect the parking levels is located on the perimeter of the oculus (see **Figure 3**). An airport traffic control tower (ATCT) was planned to be constructed in the oculus in the 1970s as part of the Terminal Area Master Plan, but it was never constructed in this location. Seven large elevator/stairwell/ mechanical shaft structures and numerous smaller mechanical structures protrude above the uppermost parking deck. The seven large shafts are notched on top and were designed to support an elevated "people mover system" to transport passengers between the garage and the terminal buildings, but the system was never constructed. These structures are clad in board-formed concrete with vertical ridges. At the north, east, and south sides of the roof level are covered walkways to three of the Airport's AirTrain stations. The AirTrain stations and tracks, which are elevated above the parking garage and whose supporting structural elements are integrated with the perimeter of the garage, are part of a larger AirTrain system comprised of nine stations and two lines covering a distance of 6 miles.

The parking garage does not have any façades. The perimeter of the garage is composed of a variety of vertical and horizontal concrete components. The vertical components (e.g., walls) feature a textured finish, and the horizontal components (e.g., the parking decks with curved, perforated lips) feature a smooth finish.

There is a subterranean partial level alternately described in architectural drawings as a "crawl space" and a "utility tunnels level." The garage's foundations were reportedly designed to accommodate future construction of a BART station and lines, which were never constructed in this location.[20]

[18] Ibid.
[19] This project received environmental clearance and entitlements under the 1992 SFO Master Plan EIR.
[20] Department of Transportation, Federal Aviation Administration, *Draft Environmental Impact Statement for San Francisco International Airport Development Program, Vol. I*, April 1976, p. II-34, https://books.google.com/, accessed November 6, 2017.

SOURCE: ESA, June 2017. Recommended Airport Development Plan HRE

Figure 2
Building 195, Looking East toward Terminal 2

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 3
Building 195, Looking South across the Oculus

Interior

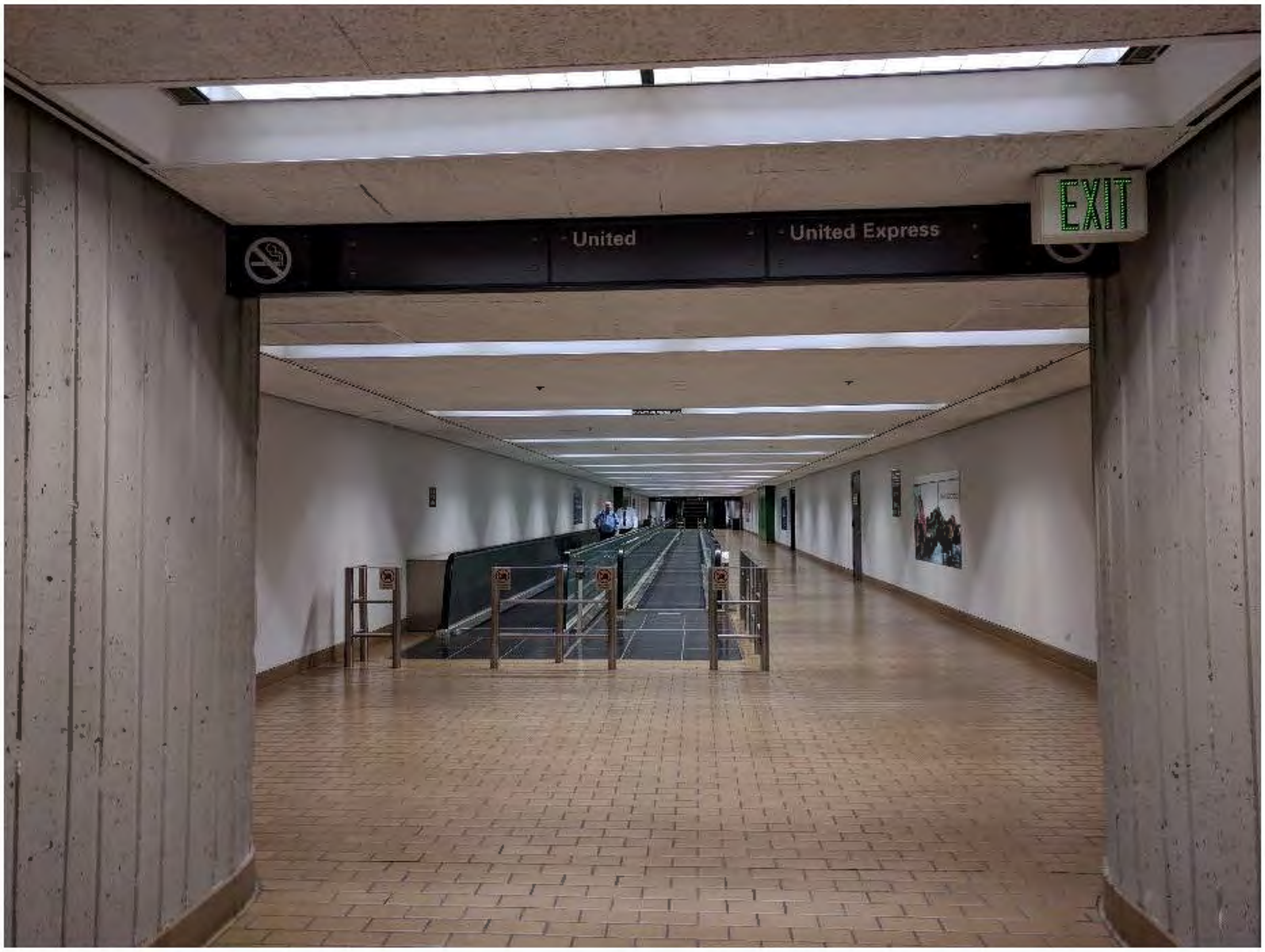
All five parking levels of Building 195 are publicly accessible. The garage's mechanical spaces and the subterranean partial level are not publicly accessible.

The first through fourth floors of the garage are similar in design. Each features a concrete floor slab with painted lines for parking stalls, crosswalks, and lane divisions. Round concrete columns, which display the number of the associated parking zones, support a massive concrete slab above. The underside of each slab consists of a series of long, rectangular recessed areas, some of which feature fluorescent lighting fixtures. Directional signage is suspended from the concrete ceiling on metal rods (see **Figure 4**).

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 4
Interior View of the Second Floor; This Is a Typical view of the First through Fourth Parking Levels

The seven elevator shafts and stairwells located on each parking level feature tiled floors and walls clad in board-formed concrete with vertical ridges. The first floor features a system of tunnels to transport pedestrians from the garage directly to the terminal buildings. The tunnels feature tiled floors, pairs of moving sidewalks, plastered walls, and low ceilings with acoustic panels and fluorescent lighting fixtures (see **Figure 5**).



SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 5
A Typical Tunnel Located on the First Floor of Building 195, Looking North toward Terminal 3

Construction Chronology and Alterations

Building 195 was constructed over the course of nearly two decades from 1963 to 1981. A $9.8 million bond issue was passed by San Francisco voters in June 1962 to fund the construction of a new four-story parking garage at SFO on land formerly occupied by an at-grade parking lot, as shown in **Figure 6**.[21]

[21] "Plans for Garage Presented to PUC," *San Francisco Chronicle,* July 4, 1962, p. 2. Originally part of the San Francisco Public Utilities Commission (PUC), the Airport Commission was established by City Charter (Article 4, Sec. 4.115) in 1970.

SOURCE: Collection of SFO Museum. Accession No. 2011.032.0591. Recommended Airport Development Plan HRE

Figure 6
Aerial View, 1960. This Photo Shows an At-Grade Parking Lot That Occupied the Future Site of Building 195

The garage was ultimately designed in two distinct sections and multiple phases. As shown in **Figure 7** and **Figure 8**, the first section of the garage, which contained 2,700 parking stalls, was designed by architect Edward B. Page and engineers Gould & Degenkolb, and the project was overseen by the Utilities Engineering Bureau of the City and County of San Francisco Public Utilities Commission (Contract No. A-331). Construction began in the spring of 1963, and an opening ceremony for the parking garage took place on October 15, 1965. Several related construction projects were concurrently realized, including a project to install moving ramps and walkways between the parking garage and the Central Terminal (Contract Nos. 393 and 406). In the days leading up to the opening ceremony, a newspaper article announced, "Not only will it be the largest garage in the world … More importantly, it will be the most convenient garage in the world … Bigness[,] compactness and convenience were equally important."[22]

[22] "Huge Airport Garage Opens," *San Mateo Times*, October 13, 1965, Section 2, p. 13.

This photo shows the completion of the first section of the garage (four levels of parking).

SOURCE: Collection of SFO Museum. Accession No. 2011.032.0348.

Recommended Airport Development Plan HRE

Figure 7
Aerial View of Building 195, c. 1966

This photo shows the completion of the first section of the garage (four levels of parking). The perforated perimeter screen has been demolished.

SOURCE: Collection of SFO Museum. Accession No. 2011.032.1338. Recommended Airport Development Plan HRE

Figure 8
Building 195, 1965

A fifth floor addition to the first section was constructed in 1969–1971 (Contract No. 581, costing $1,955,248; see **Figure 9**). This was designed by the San Francisco Airport Architects, a then-recently formed partnership of John Carl Warnecke & Associates and Dreyfuss & Blackford. The San Francisco Airport Architects next designed the second section of the parking garage, essentially a large addition constructed in five phases between 1974 and the 1981. The first two phases were for the construction of a foundation (Contract Nos. 800 and 801, costing a total of $4,757,261), the third phase was for the construction of the garage structure (Contract No. 900, costing $3,759,223; see **Figure 10**), the fourth phase was for the construction of a superstructure addition (Contract No. 1000, costing $54,079,037), and the fifth phase was for final modifications (Contract No. 1015, costing $14,247,158; see **Figure 11**). According to a commemorative plaque located on the first floor of the garage, the completed parking structure was dedicated in August 1980.

This photo shows the completion of the fifth-level addition to the first section of the garage.

SOURCE: Collection of SFO Museum. Accession No. 2011.032.2498. Recommended Airport Development Plan HRE

Figure 9
Building 195, 1971

This photo shows the completion of the third phase of construction of the second section of the garage. Note that the west half of the oculus had been constructed, and the center of the oculus contained two circular ramps for vehicular traffic that were part of the original garage.

SOURCE: Collection of SFO Museum. Accession No. 2011.096.220. Recommended Airport Development Plan HRE

Figure 10
Building 195, 1979

This photo shows the completion of final phase of construction of the garage.

SOURCE: Collection of SFO Museum. Accession No. 1993.07.27. Recommended Airport Development Plan HRE

Figure 11
Building 195, c. 1980s (exact date unknown)

In 1996, a people mover system known as AirTrain was constructed to transport people between the three domestic terminal buildings and the central parking garage. (This system was later extended to serve the International Terminal that was constructed in 2000.) The domestic AirTrain stations (i.e., the three stations that service Terminals 1, 2, and 3) were designed by Kwan Henmi Architecture/Planning, Inc., and the associate architects were Gordon H. Chong & Associates and LDA Architects & Planners (Contract No. 5706, costing $35,190,000). As described above, the stations and tracks are elevated above the parking garage, and the supporting structural elements are integrated with the perimeter of the garage.

2. Building 400F/Terminal 3 Boarding Area F

Exterior

Building 400F is the boarding area for Gates 76–90 and connects to the north side of the main Terminal 3 building (Building 400). Together with Building 400 and Boarding Area E (Building 400E), Building 400F is part of the Terminal 3 (formerly called "North Terminal") complex, which is shown in **Figure 12**. Building 400F is a multi-story building with a Y-shaped floor plan, and capped with a series of flat roofs. It is composed of four distinct sections that are described below: the connector to Terminal 3, the "hub," the "thumb," and the main boarding area (see **Figure 13**). At the time of the site visit, the exterior of Building 400F could only be photographed from inside adjacent buildings, providing limited visibility (see **Figure 14** and **Figure 15**).

This figure shows the main terminal building (the curved building in the right foreground) and associated boarding areas E (right background) and F (left background).

SOURCE: Google Maps, 2017. Recommended Airport Development Plan HRE

Figure 12
Aerial View of the Terminal 3 Complex

The connector is a two-story-over-basement section of Building 400F that connects to the north side of Building 400.[23] The connector is T-shaped in plan, and a large three-story addition with a rhomboidal floor plan is located on the east side. The façades are clad in precast concrete panels. The first floor of the connector features several large openings on the west façade. The second floor features continuous fixed, aluminum-sash ribbon windows and terminates in low parapets on the east and west façades. The eastern addition is also clad in formed concrete, features continuous fixed, aluminum-sash ribbon windows on the second and third floors, and terminates in low parapets at the roofline. The third floor is set back from the lower floors on the south and east sides, and a mechanical penthouse is located on the roof level of the addition.

[23] According to original architectural drawings (Contract No. 950), the connector is the only section of Building 400F with a basement level.

SOURCE: SFO, n.d. Recommended Airport Development Plan HRE

Figure 13
Aerial View of Building 400F, Looking North

The "hub" is a three-story section of Building 400F that is octagonal in plan and attached to the connector on its southeast side, the "thumb" on its northeast side, and the main boarding area on its northwest side. The façades of the "hub" are clad in precast concrete panels. The first floor features openings of various sizes on all of the façades. The second and third floors feature fixed, aluminum-sash ribbon windows on all of the façades. The third floor is set back from the lower floors and terminates in low parapets at the roofline. A large, multi-light octagonal skylight is located in the center of the roof.

The "thumb" is a two-story section of Building 400F that connects to the northeast side of the "hub." The "thumb" is rectangular in plan with chamfered corners on its north end, and a two-story addition with a similar floor plan is located on the west side. The façades of the "thumb" are clad in precast concrete panels. The first floor of the "thumb" and the addition feature openings of various sizes on the east and west façades. The second floor features continuous fixed, aluminum-sash ribbon windows on all façades, and Gates 76–79 are located at the second floor. The façades terminate in low parapets at the roofline.

This photo shows the southwest façades of the main boarding area (left), the "hub" (center), and the west façade of the connector (right).

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 14
Building 400F, Looking Northeast from the International Terminal Building

The main boarding area is a two-story section of Building 400F that connects to the northwest side of the "hub." The main boarding area is rectangular in plan with chamfered corners on its west end. The façades are clad in precast concrete panels. The first floor of the main boarding area features openings of various sizes on its northeast, northwest, and southwest façades. The second floor features continuous fixed, aluminum-sash ribbon windows on all façades, and Gates 80–90 are located on the second floor. The façades terminate in low parapets at the roofline. Set back from the roofline is a raised rectangular area of the roof that features clerestory windows on all sides.

This photo shows the east façades of the addition to the connector (left), the "hub" (center), and the "thumb" (right).

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 15
Building 400F, Looking Northwest from Boarding Area E

Interior

The second floor of Building 400F is publicly accessible. The first floor, which is used for baggage handling, and the partial third floor, which is used for concessions storage and mechanical equipment, are restricted areas and are not publicly accessible. The second floor is composed of four distinct spaces: the connector to Terminal 3, the "hub," the "thumb," and the main boarding area. These spaces are described below.

The connector, shown in **Figure 16**, is one long space that provides access for passengers from the terminal building to the boarding areas. The connector features a carpeted floor, a ceiling with recessed lighting and clad in acoustic panels, two moving sidewalks below dropped ceilings, and two walls of windows. Furnishings include small planters and display cases for the SFO Museum's art objects and exhibits.

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 16
Interior View of the Connector, Looking North toward the "Hub"

The "hub," shown in **Figure 17**, features an octagonal floor plan and an atrium with a skylight that is two stories in height. The floor is carpeted, and the ceiling is clad in acoustic panels. The third floor occupies the perimeter of the atrium and is obscured behind low walls and etched glass. There are three large openings in the "hub": one is a passageway to the "thumb," one is a passageway to the connector, and one is a passageway to the main boarding area. Concessions located in the hub include District Market, California Lifestyle, See's Candy, Sunglass Hut, XpresSpa, Andale Mexican Restaurant, Boudin's Bakery and Café, Firewood Café, and the San Francisco Soup Company. The entrance to a members-only United Club is located near the "hub;" this is one of three United Clubs in Terminal 3.[24]

[24] *United*, "United Club Locations and Other United Lounges," https://www.united.com/web/en-US/content/travel/airport/lounge/locations/default.aspx, accessed November 6, 2017.

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 17
Interior View of the "Hub," Looking West toward the Main Boarding area

The "thumb" is one long space occupied by Gates 76–79, as shown in **Figure 18**. The "thumb" features a carpeted floor and a ceiling with recessed lighting and clad in acoustic panels. Windows are located all along the east and north walls and part of the west wall. Furnishings include trash and recycling bins, banks of chairs, and desks at each of the gates. Concessions in the "thumb" include Ghirardelli, InMotion Entertainment, San Francisco Magazine News, and Emporio Rulli Gran Caffe.

SOURCE: ESA, September 2017.

Recommended Airport Development Plan HRE

Figure 18
Interior View of the "Thumb," Looking South toward the "Hub"

The main boarding area is one long space occupied by Gates 80–90, as shown in **Figure 19**. The boarding area is divided into three distinct sections. Two long, double-height volumes with clerestory windows on the north and south sides are separated by a shorter section with a dropped ceiling. The entire boarding area features carpeted floors and ceilings with recessed lighting and is clad in acoustic panels. The two long volumes feature pairs of moving sidewalks and walls of windows on the north and south sides. Art installations are suspended from the ceiling and mounted to a wall. The central section does not have any windows; all wall space is occupied by concessions and passenger amenities (e.g., restrooms). Furnishings include trash and recycling bins, banks of chairs, and desks at each of the gates. Concessions in the main boarding area include the Bay Area Club House, Boucle, CNBC Smartshop, Greetings from San Francisco, InMotion Entertainment, SF Uncork'd, Buena Vista Café, Fraîche, Klein's Deli and Coffee Bar, and Peet's Coffee & Tea.

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 19
Interior View of the Main Boarding area, Looking Northwest

Construction Chronology and Alterations

Construction of Building 400F began in 1976 as an addition to the main Terminal 3 building (Building 400), and it opened to the public in 1979. According to architectural drawings prepared by the San Francisco Airport Architects, the building was originally known as Boarding Areas H and I and was composed of four distinct parts (see **Figure 20**). The octagonal center was called the "hub"; the north projection (the area that is currently referred to as the "thumb") was called "Concourse H"; the main boarding area was called "Concourse I"; and a connector joined the building to the North Terminal building (Contract No. 950).[25] The names of all of the Airport's boarding areas have been renamed over time, and Building 400F has been known as Boarding Area F since at least 1985.[26]

[25] The drawing set for Contract No. 950 is incomplete and provides partial floor plans and no sections or elevations.
[26] *Yesterday's Airlines*, "San Francisco International Airport: Gateway to the Golden Gate Part 3: 1978–2015," http://www.yesterdaysairlines.com/san-francisco---1978-2015.html, accessed August 21, 2017.

Building 400F was originally known as Boarding Areas H and I.

SOURCE: Collection of SFO Museum. Accession No. 2011.032.1937. Recommended Airport Development Plan HRE

Figure 20
Architectural rendering of Building 400F, 1974

In 1981, a small area of floor located on the interior of the "hub" was modified (Contract No. 1387). In 1982, localized alterations were made to the roof of the "hub" (Contract No. 1472R). Two additions—one on the east side of the connector and one on the west side of the "thumb"—were constructed sometime between 1996 and 2002, according to historic aerial photographs. As part of proposed interior renovations to the Terminal 3 complex in 1996, several renovation action items were identified for Building 400F. For the connector, proposed work included cleaning and repairing the curbside pavement; painting the existing soffit, painting window wall frame and door framing; new case work for SkyCap stations; painting and replacing metal panel walls at SkyCap stations; and installing uplighting at the canopy. For the thumb and main boarding area, proposed renovations included new carpet; painting the walls, columns, soffits, and ceilings; new acoustic tile ceiling; new check-in counters at the gates; new upholstery for seating; and new signage and lighting. Additional renovations in the main boarding area included screen walls for concessions and services, and new toilet rooms.[27] Research did not confirm whether and to what extent any or all of these renovations were implemented. All carpet in Building 400F was replaced in 2003 (Contract No. 3842R). SFO published its *Design Review Committee Guidelines for Terminal 3* in 2016, providing "information for SFO partners, airlines, service providers, utilities, tenants, departments and staff who are considering making any physical modifications withing [*sic*] public areas of the airport campus."[28]

[27] Skidmore, Owings & Merrill LLP, et al., *Conceptual Master Plan Proposal for the North Terminal Renovation*, June 1996, p. 25, in the collection of the SFO Museum, Accession No. 2010.138.019.
[28] San Francisco International Airport, "Design Review Committee Guidelines for Terminal 3," 2016, p. 32, https://sfoconnect.com/sites/default/files/T3_Hub_Concessions_Guidelines_08-2016.pdf, accessed November 9, 2017.

3. Building 575/SFO Business Center

Exterior

Building 575 is located in the West Field and has frontage on North McDonnell Road on its south side. The four-story building is irregular in plan and is clad in metal panels arranged in a grid pattern. The façades terminate in metal coping on a parapet at the roofline.

The primary (south) and north façades are nearly identical in design and are comprised of three components: a central mass composed of 13 structural bays flanked by massive rectangular pilasters and set between two recessed and unadorned expanses of wall (see **Figure 21**). The façades feature several aluminum-sash windows on the first and second floors, and the third and fourth floors feature continuous rows of aluminum-sash windows in every bay.

The east and west façades are also nearly identical in design and are composed of alternating projecting and recessed bays (see **Figure 22**). The west façade has no fenestration, and the east façade features a single window on the second through fourth floors.

SOURCE: ESA, June 2017. Recommended Airport Development Plan HRE

Figure 21
View of the Primary (South) Façade of Building 575, Looking Southeast

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 22
View of the North and East Façades of Building 575, Looking West

Construction Chronology and Alterations

No original architectural drawings were found for Building 575. According to data provided by SFO, it was constructed in 1969 as the administration and in-flight training building for United Airlines and still retains the in-flight training use. Since 2010, the building has also been occupied by six sections of the Airport Commission.[29] No known alterations have been made to the exterior of Building 575, which resembles its original design as shown in historical photographs (see **Figure 23**). Interior alterations were made in 2009 (Contract No. 8873A).

[29] San Francisco International Airport, "SFO Business Center Open for Business," press release, July 28, 2010, www.flysfo.com/media/press-releases/sfo-business-center-open-business, accessed September 18, 2017.

South and east façades of Building 575 are visible in the left background.

SOURCE: Collection of SFO Museum. Accession No. 2011.032.2452. Recommended Airport Development Plan HRE

Figure 23
Looking North on McDonnell Road Underpass (Now Demolished), 1970

4. Building 585/United Airlines (UAL) Cargo Building

Exterior

Building 585 is located in the West Field and has frontage on North McDonnell Road on its west and south sides. The building is L-shaped in plan and is clad in corrugated metal siding. It is composed of a two-story volume on the west (likely partially occupied by offices) that is capped by low-pitched gabled and shed roofs and a one-story volume on the east (occupied by warehouse space) that is also capped by low-pitched gabled and shed roofs. The building sits on a poured concrete foundation.

The primary (south) façade is composed of two components: the western two-story volume and the eastern one-story volume (see **Figure 24**). The western component features metal-sash windows and glazed doors on the first floor and one continuous row of ribbon windows on the second floor. A partially-covered metal staircase is attached to the west end of the façade. The eastern component features a loading dock with 23 roll-up vehicular doors and several ramps.

SOURCE: SFO, n.d. Recommended Airport Development Plan HRE

Figure 24
Primary (south) Façade of Building 585, Looking North

As shown in **Figure 25**, the east façade is composed of two components: the southern component is the large warehouse space capped with a shallow gable roof, and the northern component is an addition capped with a shed roof. The southern component features four large openings for the movement of cargo into and out of the building.

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 25
East Façade of Building 585, Looking West from International Terminal Building

The north façade is composed of two components: the eastern one-story volume and the western two-story volume. The eastern component features two large openings with metal awnings and a double row of ribbon windows above. The western component features six roll-up doors.

The west façade is composed of two components: the northern component is a two-story addition constructed to match the design of the southern two-story component (see **Figure 26**). Both components feature a continuous row of ribbon windows on the second floor, and a partially-covered metal staircase is located between the two components.

SOURCE: ESA, June 2017. Recommended Airport Development Plan HRE

Figure 26
South End of the West Façade of Building 585, Looking Southeast

Construction Chronology and Alterations

No architectural drawings were found for Building 585. According to data provided by SFO, it was constructed in 1966 as a cargo and freight building by United Airlines, and it continues to be occupied by United Airlines (see **Figure 27**). A bank of four fixed, aluminum-sash windows were added to the west façade at an unknown date. According to aerial photographs, a large addition was constructed on the building's north side sometime between 1993 and 2001, increasing the size of the building by half. No other known alterations have been made to the exterior of the building.

This photo shows the original two-story component of the building (extant).

SOURCE: Collection of SFO Museum. Accession No. 2011.032.2093. Recommended Airport Development Plan HRE

Figure 27
Building 585, 1969

5. Building 682/Facilities Maintenance Center

Exterior

Building 682 is located in the West Field and is accessible from North McDonnell Road. It is a one- and two-story building clad in corrugated metal siding. The first story has an irregular-shaped plan, and the second story is rectangular in plan and aligns with the east wall of the first story. The first story is capped by a series of flat metal roofs, and the second story is capped by a low-pitched gable roof. The façades terminate in metal coping on low parapet walls at the rooflines. Signage on the second story of the west façade reads "Airport Commission City & County of San Francisco Maintenance."

The primary (west) façade features the building's main entrance, which is composed of a wide, recessed area with a sloped, corrugated metal ceiling that contains a roll-up vehicular door and aluminum-sash windows and doors behind a concrete planter. There are four secondary entrances on this façade, all composed of flush metal doors below metal awnings. The southernmost awning also covers a roll-up vehicular door (see **Figure 28**).

The south façade features eight vehicular doors on the first floor. The east façade faces the airfield and features a pair of large sliding doors to accommodate the movement of large machinery (see **Figure 29**). The north façade features four vehicular doors on the first floor.

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 28
West and South Façades of Building 682, Looking Northeast

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

Figure 29
Rear (East) Façade of Building 682, Looking Northwest

Construction Chronology and Alterations

No original architectural drawings were found for Building 682. According to historic aerial photographs, Building 682 was constructed sometime between 1966 and 1968. The earliest known alterations to the building occurred in 1974. The architect was Stone, Marraccini, & Patterson Architects/Planners and the engineer was Sverdrup & Parcel and Associates. Alterations included demolition of most of the interior walls and construction of new interior walls, creation of a new entrance and the removal of two shed structures on the west façade, a one-story addition on the east end of the north façade, and fixing one of the large sliding doors in the closed position on the east façade (Contract No. 569). A portion of the roof on the one-story component of the building was replaced in 1976 (Contract No. 1045). Another one-story addition was constructed on the west end of the north façade c. 1980 (Contract No. 1247).

Building 682 has been occupied by SFO since its construction and by DHL from 2005 to 2013.

6. Building 692/Sheet Metal Shop

Exterior

Building 692 is located in the West Field below the elevated spur track that is part of the AirTrain Blue Line. It is accessible from North McDonnell Road. Building 692 consists of one building and one partially enclosed shed structure that were once part of the same structure, and a maintenance yard and parking lot now separate the two. The one-story building and shed structure are irregular in plan, clad in corrugated metal siding, and capped by a series of metal shed roofs. The façades terminate in metal coping on a parapet at the roofline (see **Figure 30**). The south building features several additions capped by shed roofs on the west and north façades. Typical fenestration on the south building consists of sliding aluminum-sash windows with metal grates and single and pairs of flush metal doors. The north partially enclosed shed structure is open on the south and west sides that face the maintenance yard (see **Figure 31**).

The north shed structure is visible in the left background.

SOURCE: ESA, September 2017. Recommended Airport Development Plan HRE

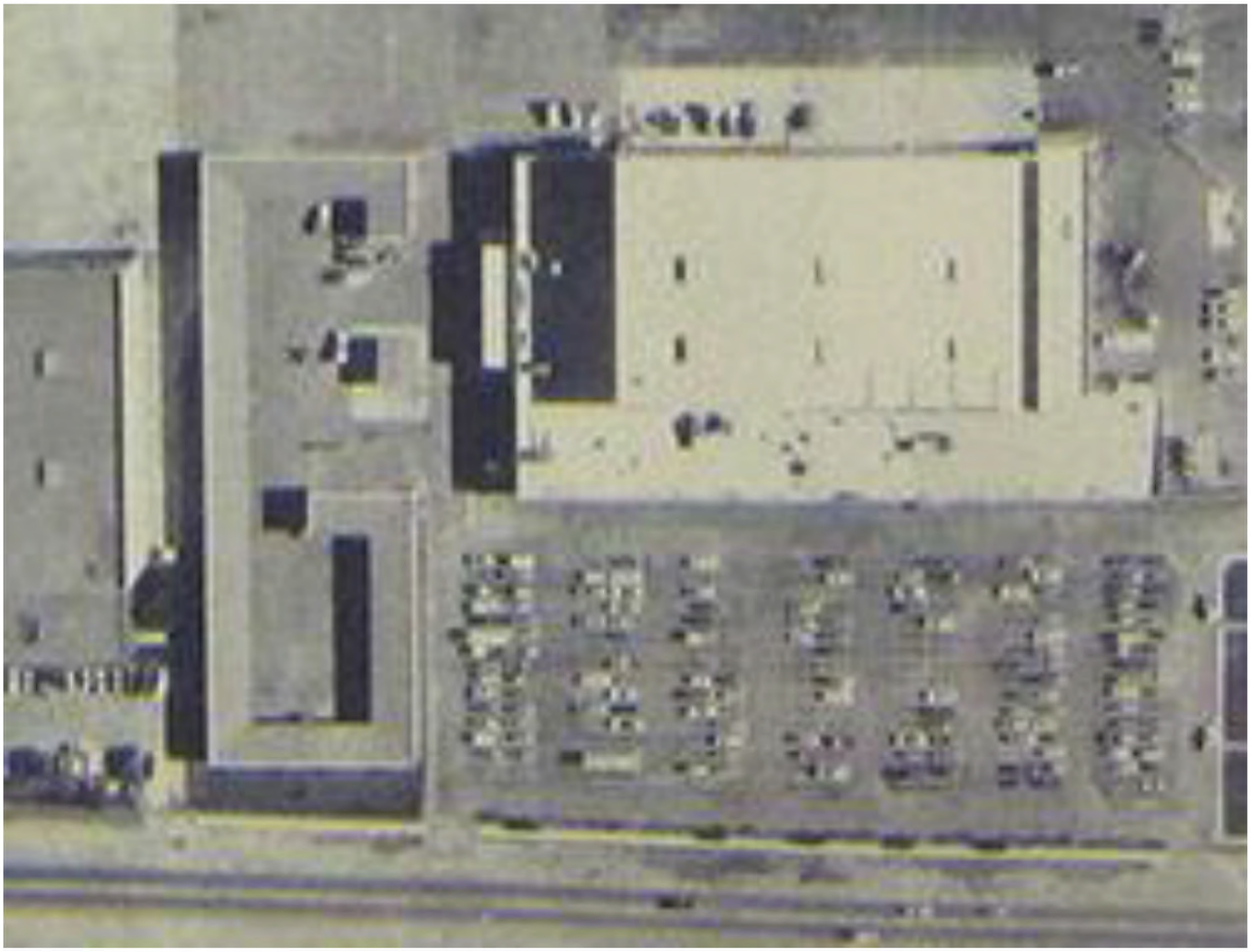
Figure 30
West and South Façades of Building 692 (South Building), Looking Northeast

SOURCE: ESA, September 2017 Recommended Airport Development Plan HRE

Figure 31
West and South Façades of Building 692 (North Shed Structure) and Maintenance Yard, Looking East

Construction Chronology and Alterations

Building 692 was constructed in 1974 as a "vehicle compound" associated with the adjacent maintenance facility (now Building 682). The architect was Stone, Marraccini, & Patterson Architects/Planners and the engineer was Sverdrup & Parcel and Associates. The vehicle compound was a series of sheds arranged around a central courtyard in a G-shaped configuration (see **Figure 32**). Besides providing covered parking for vehicles, the sheds also contained a car wash, paint storage, spaces for steam cleaning and sand blasting, spaces labeled "gard. st." and "comp. rm." on the architectural drawings, a covered island with two gas pumps, and an electrical generator storage area (Contract No. 569). According to historic aerial photographs, the gas island and the southwest wall of the shed structure were demolished sometime after 1993, and the enclosed sheet metal shop building was constructed on the southeast side of the courtyard sometime between 1980 and 1987 as an addition to the earlier shed structure. The sheet metal shop essentially doubled in size following an expansion project executed c. 1993 by the SFO Airport Commission (Contract No. 3103).



Building 692 is shown on the left in its original G-shaped configuration that includes the courtyard, surrounding shed buildings, and gas island. Building 682 is shown on the right.

SOURCE: Collection of SFO Museum. Accession No. 2011.096.222 Recommended Airport Development Plan HRE

Figure 32
1978 Aerial Photograph of the West Field

7. Building 710/Singapore Cargo Building

Exterior

Building 710 is located in the West Field and has frontage on North McDonnell Road. It is rectangular in plan and is composed of two distinct components. The larger eastern component is a steel-frame aircraft hangar that is rectangular in plan, clad in corrugated metal siding, and capped by a flat roof. The smaller western component is three stories in height and contains office space. It is constructed of a reinforced concrete exterior frame, likely with a steel-frame structure within (see **Figure 33**).

The primary (west) façade is a three-story reinforced concrete frame composed of 14 structural bays. A projecting concrete canopy structure is located near the center of the façade at the first floor. The first floor is recessed from the concrete frame, and its exterior walls are clad in stucco. It features several pairs of glazed aluminum doors. The second and third floors are identical. The actual wall plane is recessed from the concrete frame, and each of the upper floors features a continuous band of fixed, aluminum-sash ribbon windows. Four windows are visible within each bay of the concrete frame.

The south façade is composed of two components. The west component is a three-story reinforced concrete frame composed of one structural bay; its design is similar to the design of the primary façade. A wood pergola is located at the first floor. The east component is a large blank wall of the hangar that is clad in corrugated metal siding and features no window or door openings.

The rear (east) façade faces the airfield and features a series of large sliding doors that accommodate the movement of aircraft and/or other large equipment. The doors are partially glazed and feature multi-light, metal-sash windows.

The north façade is composed of two components and resembles the south façade. The east component is a large blank wall of the hangar that is clad in corrugated metal siding; seven vehicular doors are located on the first floor below a metal awning. The west component is a three-story reinforced concrete frame composed of one structural bay; its design is very similar to the design of the primary façade.

SOURCE: ESA, June 2017. Recommended Airport Development Plan HRE

Figure 33
Building 710, Looking South

Construction Chronology and Alterations

No original architectural drawings were found for Building 710, which was constructed in 1968 as the hangar and offices for Western Airlines (see **Figure 34**). Vehicular openings were created on the north façade at an unknown date. No other known alterations have been made to the exterior of Building 710. By 1989, the building was used as a maintenance facility for Delta Air Lines, and a complete interior renovation of the second and third floor offices was completed in 1995 (Contract No. 5865). Singapore Airlines subleased Building 710 from Delta Air Lines beginning in 1996 for its cargo handling operation at SFO. At that time, Singapore Airlines invested $6.2 million to convert the former Delta Air Lines aircraft hangar to an operational cargo warehouse.[30] Today, it is occupied by offices of the SFO Airport Commission, Andalé, United Airlines, and Quatrotec. The interior of the former hangar space was renovated in 2016 to provide temporary office space for the design-build consultant team of Terminal 1 and storage/operations area for the SFO electric shop.

SOURCE: Collection of SFO Museum. Accession No. 2011.032.1991. Recommended Airport Development Plan HRE

Figure 34
Building 710, Looking Southeast, 1969

8. Building 750/Ground Service Equipment (GSE) Building

Exterior

Building 750 is located in the West Field and has frontage on West Area Drive. The two-story building is rectangular in plan, clad in corrugated metal siding, and capped by a low-pitched gable roof. The façades terminate in metal coping on low parapet walls at the roofline.

As seen in **Figure 35**, the primary (north) façade is composed of five structural bays. The center bay features a recessed entry on the first story that is covered with a corrugated metal awning. The recessed entry features a pair of flush metal doors with a transom above. The two bays flanking the entry each feature a pair of flush metal doors with a transom above on the first story. The center and west-of-center bays each feature a bank of five aluminum-sash windows on the second story. The easternmost bay features a large recessed opening with three paneled metal doors. The westernmost bay has no window or door openings.

The east façade features two flush metal doors on the first story.

[30] SFO Airport Commission Board of Supervisors, "Resolution No. 071580 approving and authorizing the execution of Lease Agreement L-07-0255 with Singapore Airlines Cargo Pte., Ltd. For cargo warehouse and office space in Building 710 on Plot 12 of San Francisco International Airport," adopted January 15, 2008, http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/resolutions08/r0018-08.pdf, accessed September 1, 2017.

The south façade is composed of five structural bays. The four eastern bays each feature a roll-up vehicular door. The westernmost bay features a smaller roll-up vehicular door and a bank of three aluminum-sash windows on the first floor and a bank of five windows on the second floor.

The west façade features one aluminum-sash windows on the first and second floors.

SOURCE: ESA, June 2017. Recommended Airport Development Plan HRE

Figure 35
Building 750, Looking Southeast

Construction Chronology and Alterations

No architectural drawings were found for Building 750. Historical photographs reveal that it was constructed sometime between 1966 and 1969, and the building resembles its original design as shown in **Figure 36**. The original use and occupant are unknown. No known alterations have been made to the exterior of Building 750. The building was used as a support facility for Delta Air Lines in 1989, and it remained in use by Delta as a cargo warehouse until at least 2013.

Building 750 is visible on the left, and Building 710 is on the right.

SOURCE: Collection of SFO Museum. Accession No. 2011.032.1995. Recommended Airport Development Plan HRE

Figure 36
Looking South on North McDonnell Road, 1969

9. Buildings 928 and 928A/City College of San Francisco Airport Campus

Exterior

Building 928

Building 928 is located in the North Field. A paved parking lot surrounds the building on its north and west sides, and a storage yard on its south side separates the building from the bay. As seen in **Figure 37**, the one-story, prefabricated building is roughly rectangular in plan and is clad in corrugated metal siding. It is capped by a low-pitched gable roof clad in corrugated steel siding. The center part of the roof on the east side of the building is raised in order to accommodate large sliding doors on the east façade. Typical fenestration on the north, west, and south façades consists of sliding aluminum-sash windows and single flush metal doors. An addition was constructed on the north façade to enclose the building's primary entrance and features three glazed walls and glazed doors.

SOURCE: ESA, June 2017. Recommended Airport Development Plan HRE

Figure 37
Building 928, Looking East

Building 928A

Building 928A is an ancillary building located on the east side of Building 928.[31] It is a one-story, prefabricated building that is roughly rectangular in plan and is clad in corrugated metal siding. It is capped by a low-pitched shed roof clad in corrugated steel siding. The west façade features a sliding metal door, and the south façade features a flush metal pedestrian door and a roll-up metal vehicular door. Additions were constructed on the south and east façades.

[31] The building was not accessible during the field surveys, as such photographs are not available.

Construction Chronology and Alterations

Building 928

No architectural drawings or historical photographs were found for Building 928. According to data provided by SFO, it was constructed in 1976 as the Airport Campus of the City College of San Francisco. An addition was constructed on the north façade to enclose the building's primary entrance at an unknown date. No other known alterations have been made to the building's exterior. Today, Building 928 is occupied by the college's Fire Science and Aircraft Maintenance Technology Programs.

Building 928A

No architectural drawings or historical photographs were found for Building 928A. According to historic aerial photographs, it was constructed c. 1976. Additions were constructed on the south and east façades (dates unknown). No other known alterations have been made to the building's exterior. Today, Building 928A is an ancillary building associated with the City College of San Francisco Airport Campus.

10. Building 944/Cargo

Exterior

Building 944 is located in the North Field and has frontage on North Field Road. As seen in **Figure 38**, it is L-shaped in plan and is composed of two distinct components. The larger component is rectangular in plan, one story in height, clad in corrugated metal siding, and capped by a metal shed roof with a deep canopy on the west façade. The smaller component abuts the larger component on its west side. It is also rectangular in plan and one story in height, but it is shorter than the large component. It features a raised concrete foundation, is clad in metal panels, and is capped by a flat roof.

The primary (west) façade features 24 fixed, oblong windows on the north end of the smaller component, in a design that resembles the exterior of a passenger aircraft. The south end of the smaller component features a raised concrete foundation that supports a single round, steel column. A curved wall constructed of glass block is recessed behind the column, and it continues on the south façade. A glazed aluminum-frame door with a fixed transom is located in the glass block wall. The larger component is set back behind a paved parking area. It features a loading dock with 11 vehicular doors below a deep canopy, and 12 vents are located below the roofline.

The south façade features three vehicular doors. The east façade features 11 vehicular doors of various dimensions, and 12 vents are located below the roofline. The east end of the north façade is a blank wall clad in corrugated metal siding, and the west end features the same fixed, oblong windows found on the primary façade. A metal staircase and metal-framed vestibule encloses a flush metal door near the west end of the façade.

The building contains a 59,438-square-foot cargo warehouse, 13,500 square feet of office space, and a covered loading dock measuring 5,183 square feet.[32]

SOURCE: ESA, June 2017. Recommended Airport Development Plan HRE

Figure 38
Building 944, Looking Northeast

Construction Chronology and Alterations

No architectural drawings or historical photographs were found for Building 944. According to data provided by SFO, it was constructed in 1980 as a cargo facility for Japan Airlines, which occupied the building until 2011.[33] No known alterations have been made to the building's exterior. The building is currently occupied by the following service providers: Certified Aviation Services, MAC Cargo Handling, Skywest, Swissport USA, and the Transportation Security Administration. These service providers handle cargo for a number of airlines including Air France, Air New Zealand, American Airlines, DHL, Emirates, KLM, Qantas, and SAS.

11. Building 1070/Ground Service Equipment (GSE) Building

Exterior

Building 1070 is located in the East Field on the north side of the juncture of runways 10L-28R and 1L-19R, on the secured airfield side of the Airport. The one- and two-story building is poured concrete construction and is L-shaped in plan. It is capped by a series of flat roofs.

As seen in **Figure 39**, the primary (southwest) façade is one story in height. The primary entrance is located near the east end of the façade and is composed of a metal door accessed by concrete steps and situated below an awning. The entrance is flanked by five groups of multi-light, steel-sash windows that are either in pairs or in threes. A continuous concrete sill is located below the windows.

The northwest façade, seen in **Figure 40**, includes three components. The north component is set back behind a maintenance yard and is two stories in height. It features three multi-light, steel-sash windows and a paneled wood door on the first floor and four sliding windows on the second floor. The center component is two stories in height.

[32] SFO Airport Commission Board of Supervisors, "Resolution No. 100983 approving and authorizing the execution of Modification No. 1 to Lease No. L01-0297 with Japan Airlines Company Limited to reduce the demised premises and the annual rent at Building 944 on Plot 50B-1 at San Francisco International Airport," adopted October 5, 2010, https://sfgov.legistar.com/View.ashx?M=F&ID=1051775&GUID=F0D83FC8-DD5F-41DC-95E6-482152CD95C9, accessed September 1, 2017.
[33] Survey report for Plot 50B, leased by Japan Airlines, Document No. 1649-005 in the SFO digital archive, includes documents dated 1979–1980.

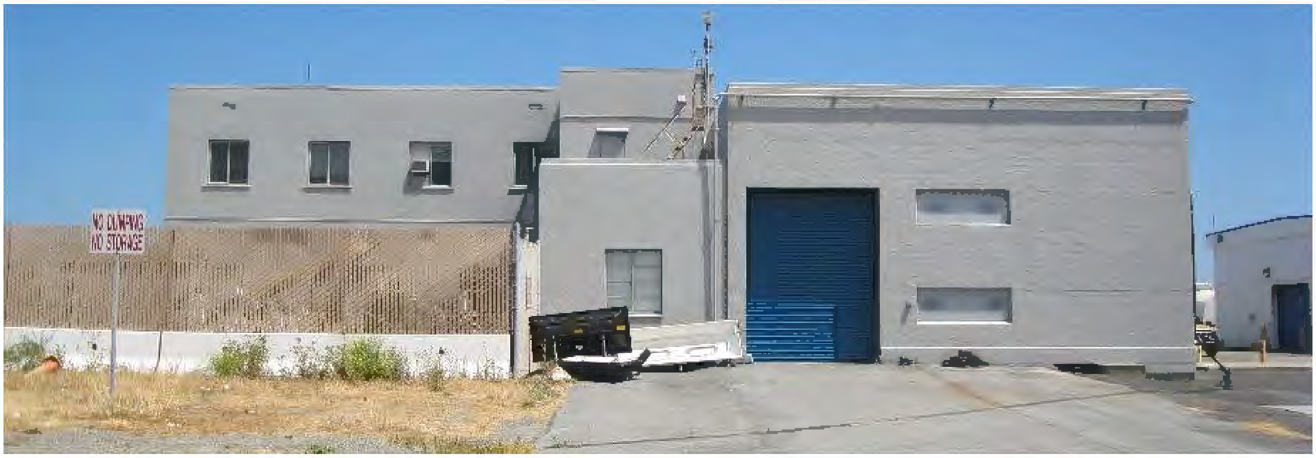
The first floor features a multi-light, steel-sash window. The second floor is set back in the same plane as the north component and features a flush metal door that provides roof access. The south component is one story in height and features a roll-up metal door and two recessed, rectangular panels that may be former window openings.

The northeast façade is composed of four components, and the western half of the façade is set back (see **Figure 41**). The east component is one story in height and features two multi-light, steel-sash windows (see **Figure 42**). The first-from-east component is two stories in height and features two multi-light, steel-sash windows on the first floor and two sliding windows on the second floor. The first-from-west component is two stories in height and features one multi-light, steel-sash window on the first floor and one sliding window on the second floor. The west component is one story in height and features two multi-light, steel-sash windows and a glazed wood door. A roof-mounted metal staircase provides access to a higher roof level beyond.

As seen in **Figure 42** and **Figure 43**, the southeast façade is one story in height and features two roll-up metal doors. A prefabricated metal garage addition with a gabled roof is located on the south end of the façade.

SOURCE: ESA, June 2017. Recommended Airport Development Plan HRE

Figure 39
Primary (Southwest) Façade of Building 1070, Looking Northeast



SOURCE: ESA, June 2017. Recommended Airport Development Plan HRE

Figure 40
Northwest Façade of Building 1070, Looking Southeast

Note the large second-floor addition.

SOURCE: ESA, June 2017.

Recommended Airport Development Plan HRE

Figure 41
Northwest and Northeast Façades of Building 1070, Looking Southeast

Note second-floor addition in background.

SOURCE: ESA, June 2017.

Recommended Airport Development Plan HRE

Figure 42
Northeast and Southeast Façades of Building 1070, Looking Southwest

SOURCE: ESA, June 2017. Recommended Airport Development Plan HRE

Figure 43
Southeast Façade of Building 1070 Showing Large Shed Addition, Looking Northwest

Construction Chronology and Alterations

No architectural drawings were found for Building 1070, which was constructed on manmade land in the East Field after it was filled in the late 1940s. According to data provided by SFO, it was constructed in 1950, and a historic aerial photograph from this year supports this claim (**Figure 44**). Building 1070 originally functioned as Fire Station No. 2, and research revealed that the building retained this use until at least 1989. In the mid-1990s, the building became a fueling station operated by Aircraft Service International Group, Inc. (ASIG), and today it is occupied by Menzies. **Figure 45** shows that the building was originally one story in height, and the second story was constructed sometime between 1965 and 1973. A prefabricated metal garage addition was constructed on the building's southeast façade at an unknown date, and a shed addition was constructed on the southwest side of the garage addition. No other known alterations have been made to the building's exterior, although it is likely that additional alterations have been made over time. For example, it is possible that at some point one window on the primary (southwest) façade was removed and replaced with the extant doorway.

Building 1070 was slated for demolition as part of the Airport's 1989 Master Plan. At that time, a new crash/fire/rescue (CFR) facility was planned to replace Building 1070 and "to eliminate the microwave interference that the building occasionally presents when the airfield is operating under IFR conditions."[34] It was ultimately not demolished, and its use was likely changed to a GSE building around 1990.

[34] San Francisco Airport Commission, *San Francisco International Airport Final Draft Master Plan,* November 1989, p. 6.11, in the collection of the SFO Museum, Accession No. 2 002.133.005.002.

This photo shows the newly filled East Field in 1950. Building 1070 is visible at the center.

SOURCE: Collection of SFO Museum. Accession No. 2011.032.0193. Recommended Airport Development Plan HRE

Figure 44
Building 1070, 1950

This photo shows the northeast and southeast façades of the former fire station before the second story was constructed.

SOURCE: Collection of SFO Museum. Accession No. 2011.032.0962. Recommended Airport Development Plan HRE

Figure 45
Building 1070, 1963

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER VI
Methodology

The methodology used for completion of this report included a records search and literature review of pertinent records of the 11 subject buildings, as well as field surveys. Each of these methodologies is described below.

A. Records Search and Literature Review

ESA conducted a records search and literature review of the subject property in August and September 2017. The records search consisted of an examination of the following sources:

- **SFO Records.** Various Airport divisions have maintained architectural and engineering drawings since the Airport's creation in 1927. The Airport currently maintains a database of architectural and engineering drawings, and project files are organized by contract number. The database is not for use by the general public, but the Airport provided ESA staff with access to the database. Between August and November 2017, ESA staff reviewed approximately 200 drawing sets and contracts to determine precise construction dates for the 11 subject buildings. ESA staff was able to locate architectural drawings for alterations to six of the 11 subject buildings, and original architectural drawings were located for three of these buildings. As a result, approximate construction dates or date ranges have been provided for several buildings.[35] The San Francisco Department of Building Inspection (DBI) does not hold records for SFO, which has a separate permitting process from the San Francisco Planning Department.[36]
- **Published Resources.** Published records in the SFO Museum Collection include hard copies of various planning and design documents that are not available through the database listed above, as well as annual reports of the San Francisco Public Utilities Commission and the San Francisco Airport Commission. Other published sources include:
    - John H. Hill's *SFO: A Pictorial History of the Airport* (2000)
    - R.E.G. Davies' *Airlines of the Jet Age: A History* (2016)
    - *Final Historical Resources Report: Information Regarding the Eligibility of Properties at San Francisco International Airport for Inclusion on the National Register of Historic Places or the California Register of Historic Resources* (ESA, 2000) and Addendum (ESA/Carey & Co. 2001)
    - *Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR* (David Chaves and Associates 1990)
    - *Historic Architecture Survey Report for the Runway Safety Area Program at SFO* (URS 2011)
    - *Cultural Resources Report for the South Field Demolition Project at SFO* (ESA 2014)
- **Photographs.** Historical photographs of SFO were provided by the SFO Museum, including photographs of individual buildings and aerial photographs from every decade dating back to the

[35] Certain documents in SFO's data may not be publicly accessible records due to security constraints.
[36] San Francisco Department of Building Inspection, Records Management Division, telephone call with Johanna Kahn, ESA. May 22, 2018.

1920s. Many have been digitized and are available on the museum's website (www.flysfo.com/museum), and others were provided by museum staff at the request of ESA staff.

- **Internet Research.** Internet research included the following online sources:
  - Internet Archive (www.archive.org) for various issues of *Architect & Engineer* as well as assorted SFO publications, including marketing, planning, and environmental documents.
  - Newspapers.com and NewsBank.com for newspaper articles about SFO published in the *San Francisco Chronicle*, *San Francisco Examiner*, *San Mateo Times*, and *Sacramento Bee*.
  - The Pacific Coast Architecture Database (www.pcad.lib.washington.edu) for information about architects and engineers associated with SFO.

B. Field Survey

ESA architectural historian Johanna Kahn completed pedestrian surveys of the subject property on June 30 and September 12, 2017. The property was recorded through digital photography and field notes (see Chapter V, Property and Building Descriptions, above).

CHAPTER VII
Historic Context

A. SFO History

The following history of SFO from 1927 to approximately 1966 is excerpted from the 1991 *Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR*:

> As the Peninsula's fishing industry was dying, San Francisco's aviation industry was being born. The antics of barnstorming pilots resulting from the 1911 San Francisco Air Show, the aerobatics over Lincoln Beach during the 1915 Panama Pacific International Exposition, the aeronautical improvements made during World War I and the 1924 dawn-to-dusk flight between New York City and San Francisco all served to promote an interest in flying. With Crissy Field and Ingleside district sand dunes [functioning] as sites for [early aircraft] takeoffs and landings, the people of San Francisco realized that public safety demanded that a permanent airfield be developed outside the boundaries of the city. Late in 1926 the citizens of San Francisco voted 81,552 to 16,592 to approve a charter amendment that would permit the city to purchase such land. Six sites were investigated and in March 1927 the San Francisco supervisors opted to lease 150 acres belonging to the descendants of Darius Mills for the site of the city's future airport.
>
> The land lays 14 miles south of San Francisco and could be reached by automobile in less than twenty-five minutes. The Mills estate property was above the Bay tides, offered hundreds of acres of submerged land which airport engineers could later reclaim and, most important, the site was available immediately. The city agreed to rent the 150 acres for $15,000 a year, and on May 7, 1927, Mayor James Rolph dedicated the Mills Field Municipal Airport of San Francisco.
>
> The airport opened in June of 1927, and for the next 10 years, it conducted business from a terminal building that "was little more than a two-room wooden shack." By the end of that first year the Bayshore Highway had been constructed, which provided easy automobile access to the airport. In addition, four hangers [sic] were erected, three graded dirt runways were constructed, 2,895 aircraft landed carrying 4,562 passengers. Nevertheless, many carriers located or moved to the newly established Oakland Airport, the pilots disenchanted with the fog at the San Francisco facility.
>
> City officials hoped that the popularity of the airfield would improve when Charles Lindbergh arrived at Mills Field in September 1927, a few months after his historic transatlantic flight in "The Spirit of St. Louis."
>
> > But a second Lindbergh visit a couple of years later, with a 32-passenger Boeing plane, was … catastrophic. It was said the news flashed around the world, when Lindbergh's plane, in an effort to let another aircraft pass on the single runway, got stuck in the Peninsula mud, and had to be pulled out by a tractor. A civilian flyer who knew the field in its first years called the fledgling airport 'a mud hole, just a mud hole.'[37]
>
> The Lindbergh incident produced a storm of criticism on a local and national level. San Francisco voters refused to approve bond issues for airport improvements in both 1928 and 1930; the federal government threatened to cancel their airmail carrier contracts unless the runways were expanded.
>
> On August 30, 1930 the San Francisco supervisors completed negotiations that allowed them to purchase 1,112 acres of Mills Estate property for $1,050,000 and the following year the name of the airfield was changed … to the San Francisco Municipal Airport. The administration of the airport also changed hands on January 8, 1931 with the establishment of the Public Utilities Commission (PUC), designed to regulate citizen-owned utilities. Within two years the voters of San Francisco approved a $260,000 airport improvement bond …

[37] Abby Jane Frederickson, "From a Mud Hole by the Bay to San Francisco's Airport, Part 1," *The Boutique & Villager* (Hillsborough Weekly Newspaper), April 16, 1974, p. B1, quoted in David Chavez & Associates, *Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR, San Mateo County, California,* February 1991, pp. 15–19.

By 1934 as many [as] 2,000 people a day were [employed] "at the task of improving the physical facilities of the airport." To widen and lengthen the runways, hundreds of tons of dirt and rocks were carved from the nearby San Mateo Hills, and for months, dozens of trucks could be seen barreling down the Bayshore, carrying the fill.

Filling in the marsh- and tidelands of the airport property had begun as early as 1927 when 38 acres were reclaimed. By 1935 another 38 acres had been filled and two years later an ambitious project to build a 9,000-foot seawall, fill 315 acres of the Bay and expand the runways was initiated. As a result of reclamation activities the terminal was closed to air traffic for fifty-six days during the 1938–1939 fiscal year.

The construction, largely carried out through the Works Progress Administration (WPA), allowed the San Francisco Municipal Airport to begin the transition from national to international status. The airport now possessed three runways over 3,000 feet in length as well as a new California Mission-style "terminal building … with a weather bureau, control tower, restaurant and buffet, which was touted as the most up-to-date structure of its type in the country." On the eve of the 1940s the city and the PUC looked forward to the construction of a Coast Guard Station and the completion of Seaplane Harbor at the airport.

> Then came Pearl Harbor and the military assumed control of the airport but permitted restricted commercial airline flights, primarily to accommodate military and high government officials. The Navy … began development of a base at the airport's seaplane harbor. This work involved the fill of about 100 acres and the construction of a passenger terminal, hanger [*sic*] and other facilities. It became operational in 1944. Airport facilities in general were modified to meet military requirements. Runways, taxiways and apron areas were enlarged and strengthened to accommodate multi-engine military aircraft.[38]

The Coast Guard Air Station [extant; Buildings 1019A–1019D] was also constructed in the early 1940s, at the foot of Seaplane Harbor. From the station, guardsmen conducted rescues from the coast of Oregon to southern California to the "point of no return" over the ocean. Throughout the war years, Coast Guard planes made thousands of flights, covered over 4 million square miles and plucked 103 downed-plane survivors from the frigid waters of the Pacific. During the same period, airport officials saw the relocation of United Air Lines' Western Division operations, maintenance, and overhaul facilities from Oakland [extant and located in the North Field; Buildings 800A–800H] and the transfer of Pan American World Airways' Pacific-Alaska Division from Treasure Island to the city's airport.

[As early as 1943, the Airport's first master plan was publicly discussed "for an airport expansion program [estimated to cost $40 million] which will place the field in readiness to handle the great air transports of the future…Expansion of the field westerly, which will mean relocation of the Bayshore highway; reclamation of tide lands to the south and east of the field; extension of runways, construction of hangers [*sic*], freight sheds and railroad terminal facilities will be required." [39] A $20 million bond issue was approved in November 1945 to expand the airport. The first major activities were the reclamation of 400 acres of marshland, followed by the construction of a second runway and planning for a new administration building.[40]]

By the end of the war "the airport had 700 acres in use, another 2,000 under development, and several 16,000-foot runways." In 1946, over a million passengers proceeded through the terminal gates, making San Francisco one of the world's busiest airports. With 6,000 people on the airport payroll and the increased passenger traffic, access roads became inadequate. As a result, by the end of the decade the Old Bayshore Highway, which ran through the airport lands, was abandoned and a new Bayshore Freeway [now U.S. Highway 101] constructed further to the west.

During the 1950s and 1960s, the marshlands between the [old] Bayshore Highway and the Bayshore Freeway were developed [due in part to the advent of the jet], complete with hangars, buildings, airport shops and taxiways. In 1954, after [the airport's final] massive landfill activities and the running of steel piles down to bedrock, a new, ultra-modern, six-story administration building or Central Terminal was erected at the airport, accompanied by a 60,000-car parking lot. By 1963 the Southern Terminal with its 8,000-vehicle parking lot, was also realized. In the spring of 1966, the San Mateo County Historical Association and the public gathered at the

[38] Alessandro Baccari & Associates, *San Francisco International Airport: A Socioeconomic View,* 1975, pp. 13-14, quoted in David Chavez & Associates, *Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR, San Mateo County, California,* February 1991, pp. 15–19.
[39] "San Francisco's Airport of the Future," *San Francisco Chronicle,* March 26, 1943, p. 26.
[40] "$4,000,000 Runway Next Development at Airport," *San Francisco Chronicle,* July 8, 1948, p. 9.

> airport to bid farewell to the classic [Spanish Revival]-style terminal, built in 1937, as well as Mills Field's first big hanger [*sic*], built in 1927. In order to extend and construct additional runways, both structures were razed [during the] summer [of 1966. This was the final runway extension].[41]

The Airport had rapidly expanded during the 1940s and 1950s. By 1960, assets included the Central Terminal (today known as Terminal 2) with capacity to load 33 aircraft, multiple passenger boarding areas with moveable ramp jetways, an on-airport hotel, a bank, dining and retail, various professional services, police and fire departments, and two pairs of parallel runways.[42] The Airport's first master plan for a central terminal area was approved by the Public Utilities Commission in 1959. Developed by Welton Becket and Associates, a Los Angeles-based architecture and engineering firm, the master plan was "designed to last until the airliner gives way to the rocket ship" and to take place throughout and possibly beyond the 1960s. The first phase of this master plan began immediately: the two-story South Terminal (today known as Terminal 1, which was extensively renovated in 2016) was designed by Becket's firm and completed by 1964. The master plan identified future phases (e.g., the construction of a north terminal, a 6,000-car garage to be constructed in multiple stages, a two-level roadway around the terminal area), but these were never constructed as designed by Welton Becket and Associates.[43]

By 1966, SFO selected a consultant to develop an updated master plan for the long-term growth of the Airport. The chosen consultant, known as the San Francisco Airport Architects, was a joint venture of the prominent architecture firms of John Carl Warnecke & Associates and Dreyfuss & Blackford. In 1968, the firm was awarded a major contract to provide architectural and engineering services for a number of key projects as part of the Terminal Area Master Plan. These projects were part of the Expansion Phase constructed between 1969 and 1981 and included designs for a new North Terminal (today known as Terminal 3, extant and enlarged in 2015) and associated Boarding Areas E (demolished and reconstructed in 2014) and F (extant with multiple additions constructed between 1996 and 2002) that were leased by United Airlines and could accommodate the newer wide-bodied "jumbo" jets; an expanded central parking garage (extant); an elevated terminal roadway surrounding the parking garage (extant); the old Boarding Area A (demolished c. 2005–2009) that was part of the South Terminal designed by Welton Becket and Associates (today known as Terminal 1); and miscellaneous roadwork including the entrance road and underpasses (extensively redesigned leading up to the completion of the new International Terminal in 2000).

The Terminal Area Master Plan included a second Modernization and Replacement Phase that was implemented between 1981 and 1987. Work included renovating the old Central Terminal (today known as Terminal 2) for use as the Airport's new international terminal, with a new Federal Aviation Administration (FAA) ATCT and expanded passenger boarding area (Boarding Area D, designed by Anshen & Allen and subsequently redesigned in the early 2000s by Gensler). The old South Terminal (today known as Terminal 1) received a $512 million renovation (designed by Gensler and demolished in 2016), and aircraft apron facilities were also modified.[44]

---

[41] David Chavez & Associates, *Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR, San Mateo County, California*, February 1991, pp. 15–19.

[42] John H. Hill et al., *SFO: A Pictorial History of the Airport*, San Francisco: San Francisco Airport Commission, 2000, p. 73.

[43] "Big Jet-Age Airport Play Okayed Here," *San Francisco Chronicle*, February 4, 1959, pp. 1, 4.

[44] City and County of San Francisco Airport Commission, *San Francisco International Airport Terminal Area Master* Plan, 1985, p. 1, in the collection of the SFO Museum, Accession No. 2002.133.010.

By the mid-1980s, passenger traffic at SFO was projected to exceed 56 MAP. A new master plan was prepared in 1989 and approved by the Airport Commission in 1992. Beginning in 1996, an airport rail transit system known as AirTrain was constructed to transport people between the three terminal buildings and the central parking garage. A new, state-of-the-art International Terminal was planned to occupy the area on the west side of the existing terminal complex. The new International Terminal was designed to have capacity and functionality for "super jumbo jet aircraft," such as Air France's high-capacity A380 Airbus. The $2.5 billion project designed by Skidmore, Owings & Merrill also provided new parking facilities and a long-planned BART extension, all of which were completed in 2000. AirTrain was expanded to serve all four terminals and the BART station, and both transit systems began operating in 2003.

The old international Central Terminal (Terminal 2), which closed to the public in 2000 following the completion of the new International Terminal, was renovated and expanded by Gensler and reopened for use in 2011 as a domestic terminal. A complete renovation of Boarding Area E on the east side of Terminal 3 began in 2012, and the modernized facility opened to the public in 2015. Subsequently, a separate project to renovate the west side of Terminal 3 was developed with construction anticipated to occur from 2021 through 2023. The construction of a new ATCT located between Terminals 1 and 2 took place between 2012 and 2016. At this writing, the old ATCT that was part of the old Central Terminal building is in the process of being decommissioned by the FAA and demolished by the Airport. Large-scale renovations of Terminal 1 began in 2016 and are projected to conclude in 2024. The Airport celebrated its 90th anniversary in May 2017.

B. Tenant/Occupant Histories

The past and current tenants or occupants of the 11 subject buildings are presented in **Table 2**. Data were provided by SFO and supplemented with additional research by ESA.

C. SFO in the Jet Age

What is commonly referred to as the Jet Age is a period in the history of aviation—as well as social history—characterized by the development of aircraft powered by turbine engines. In his book *Airlines of the Jet Age: A History*, author R.E.G. Davies explains that there have been three distinct Jet Ages. The First Jet Age lasted from 1952 to 1969 and correlates to the advent of early, multi-engine jet aircraft such as the Boeing 707. The Second Jet Age lasted from 1970 to 1999 and correlates to the arrival of wider-bodied jet aircraft such as the Boeing 747 and the first Airbus service as well as the Concorde. The Third Jet Age began in 2000 and continues to the present and was ushered in by the double-decker Airbus A380 with significantly greater passenger capacity than earlier models of aircraft.[45]

Numerous newspaper articles in the mid-1950s heralded the coming of the Jet Age at SFO with great enthusiasm, as well as some apprehension, about the changes it would require. The following account is from a 1956 *San Francisco News* article:

> Two years ago the jet age was not upon us; in fact, it appeared a decade away.

[45] R.E.G. Davies, *Airlines of the Jet Age: A History*, Washington, D.C.: Smithsonian Institution Scholarly Press, 2016, Preface (n.p.).

Table 2 Past and Current Tenants or Occupants of the 11 Subject Buildings

Building No.	Building Name	Current Use	Tenant(s) and Period(s) of Occupation [a]
195	Central Parking Garage	Public parking	SFO (1968–present)
400F	Terminal 3 Boarding Area F	Passenger terminal	United Airlines (1979–present) Various commercial tenants
575	SFO Business Center	Airport support and administration and airline in-flight training	United Airlines (1969–present) SFO (2010–present)
585	United Airlines Cargo Building	Air cargo	United Airlines (1968–present)
682	Facilities Maintenance Center	Airport maintenance	SFO (1972–present) DHL (2005–2013)
692	Sheet Metal Shop	Airport maintenance	SFO (1974–present)
710	Singapore Cargo Building	Air cargo, airport support and administration, tenant administration	Western Airlines (1968–1987) Delta Air Lines (1987–unknown) Singapore Accounting & Cargo (1996–2017) SFO Airport Commission (c. 2008–present) Andalé (2014–present) Quatrotec (2007–2009) United Airlines Western Region Corporate Offices (2018)
750	Ground Service Equipment Building	Ground service equipment maintenance	Delta Air Lines (before 1989–2013 or later)
928	City College of San Francisco Airport Campus	Education (not operated by SFO)	City College of San Francisco (1976–present)
944	Cargo Building	Air cargo	Certified Aviation Services (2015–present) Japan Airlines (1980–2011) MAC Cargo Handling (2011–present) ServisAir (2012–2016) Skywest (2015–present) Swissport USA (2016–present) TSA (2009–present) Airlines handled by service providers above: Air France Cargo Air New Zealand Cargo AA Cargo DHL Cargo Emirates/Sky Cargo KLM Cargo Qantas Cargo SAS Cargo
1070	Ground Service Equipment Building	Ground serviced equipment maintenance	SF Fire Department (c. 1950–1989 or later) Menzies (formerly ASIG/Menzies) (1996–present)

SOURCE: SFO, October 2017.
NOTE:
a. Data for tenants and periods of occupation supplemented by ESA.

> Then, early in 1955, the Air Force released the Boeing Airline Co. to build commercial jetliners. Douglas Aircraft Corp. jumped into the competition with the DC-8 jetliner. Six months later, Convair made it a triumvirate with the 880 "Golden Arrow."
>
> Today, the three firms hold well over a billion dollars in orders for jet equipment. San Francisco will see the giant 575 mph planes in less than three years.
>
> Additionally, when the [Old Central] terminal opened, traffic projections based on the estimates of the best aviation brains in the land indicated the in and out passenger total at the airport would reach the five-million figure in 1965.
>
> Revised estimates show the five million mark may be reached in 1959, and one million more will be added each year through the 1960s. […]
>
> Preparation must be made not only for the greater passenger traffic and for jet planes, but also for handling correspondingly high increases in air mail, air express and freight volume. […]
>
> Proposed expansion and improvement of the airport under the [Proposition B] bond issue is in four classifications:
>
> - Improvements to landing area—estimated cost $6,274,000. This includes: reconstruct portion of runway pavement to accommodate jets; extend instrument landing runways and main north-south runways for jet operations by increasing them from 8,770 feet to 9,500 feet; construct high-speed taxiways; purchase 760 acres for runway extensions;
> - Improvements to aircraft maintenance base areas—estimated cost $4,769,000. This includes: Development of circulation roads, including fill, drainage, surfacing and utilities; extend taxiways to west field area; preliminary development of maintenance base areas by filling land, paving, providing sewage plant and utilities;
> - Improvements to the Terminal "City"—estimated cost $12,957,000. This includes: Construction of air cargo facilities; purchase 5.5 acres of land for terminal area; additions to terminal building to improve baggage handling, provide additional public areas, more ticket counter, office and baggage space and facilities, install escalators between ground floor and lobby floor, and install canopy across driveway;
> - Complete Concourse B; building Concourses E, F, and G; construct secondary terminal building to serve Concourses E, F, and G; provide acoustical ceiling, new flooring, moving sidewalks and minor alterations for Concourses C, D, and B;
> - Develop heliport facilities; construct additions to Air Mail building; construct aircraft loading apron for Concourses F and G; build fire house and buy new fire fighting [*sic*] equipment; pave parking area three for accommodation of 1500 cars, and construct road and prepare additional parking space for commercial area;
> - Improvements to executive aircraft area and miscellaneous improvements—estimated cost one million dollars.[46]

The larger, heavier jet aircraft, which carried more passengers than earlier aircraft types, necessitated a number of physical improvements not only at SFO but at other major airports around the United States. The primary physical features needed were longer runways due to the longer take-off requirements; wider taxiways to maneuver the larger planes (both of which need to be constructed with thicker concrete bases for the heavier planes); moveable passenger boarding bridges to connect the planes to the gates; terminals that allowed for faster loading and unloading for the larger number of passengers (as well as quicker turnarounds between flights); larger terminals to handle the increased passenger loads; modern airport avionics and enhanced lighting; as well as larger hangars to maintain the longer and wider aircraft, many of which no longer fit within existing hangars designed for older and smaller aircraft.

[46] "San Francisco Meets Challenge," *San Francisco News*, October 15, 1956, p. 14.

The need for enhanced ground improvements to accommodate the jet at the airport was echoed by Trans World Airlines (TWA) in its March 1957 newsletter, *Skyliner*, which stated that,

> The upheaval that's bound to come with the advent of the jets needn't run wild. The U.S. has two or three years to prepare for the jets' entry into regular commercial flying. The airlines are hoping that the airports, the control systems, the terminals, and the whole method of getting passengers and their baggage into and out of airliners can be prepared so they will at least begin to cope with the jets' demands. Since the airlines are putting billions of dollars into the new planes, they're determined to do all they can to see that their investment isn't wasted through lack of preparation on the ground. […]
>
> Whether the airlines can meet the terms of the loans they have negotiated for their jet transports depends on all that follows—on whether airports can be enlarged fast enough to handle the heavier loads and more frequent trips of the new planes, on whether air traffic control can be improved fast enough for them to get full service out of the jets, and on whether there'll be sufficient passengers to fill the big new planes.[47]

SFO made all of these changes to accommodate commercial jet aircraft beginning in the mid-1950s, including the construction of the Central and South terminals (completed in 1954 and 1963, respectively, and both later extensively demolished and renovated); new jetways connected to pinwheel-shaped gates or "rotundas" at the terminal areas (first at the South Terminal and subsequently at the Central Terminal); lengthened, strengthened, and widened runways and taxiways; enhanced ground equipment; as well as new or enlarged maintenance hangars and service centers for TWA, United Airlines, and American Airlines. This extensive campaign of physical improvements at SFO was necessary to support the increased passenger load brought about by jet travel.

SFO's new International Terminal opened in 2000, and its construction resulted in the demolition of earlier Jet Age buildings that were part of the United Airlines Service Center, which contained a hangar designed by Skidmore, Owings & Merrill, a cafeteria and parking lot for United Airlines employees, a flight kitchen, a washing facility for aircraft, and a boiler plant.[48] The International Terminal was designed to have capacity and functionality for "super jumbo jet aircraft." The first scheduled Airbus A380 flight to SFO, which was operated by Lufthansa, arrived in 2011 from the Frankfurt Airport in Germany, and a daily service has continued since that time.[49] This aircraft accommodates up to 509 passengers.

D. Large Hub Airports in California

As established by the Code of Laws of the United States of America, SFO is classified as a large hub airport, meaning that it is a primary commercial service airport that accounts for at least one percent of total enplanements (i.e. passenger boardings) in the United States.[50] Of the 25 commercial service airports in California, three are large hub airports, six are medium hub airports, three are small hub airports, 10 are nonhub primary airports, and three are non-primary airports. The three large hub airports in California are SFO, Los Angeles International Airport (LAX), and San Diego International Airport (SAN). In terms of numbers of

[47] TWA, "Jets Bring About Need for Improved Ground Facilities and New Plan of Financing," *Skyliner (Trans World Airlines Weekly Employee Publication)*, Vol. 20, No. 10 (March 7, 1957), p. 3.

[48] "United Expands at Mills Field," *San Mateo Times*, February 6, 1957, p. 17.

[49] Lufthansa, "Lufthansa to Introduce First-Ever A380 Service to San Francisco" (press release), January 26, 2011, *https://www.lufthansa.com/mediapool/pdf/69/media_931369.pdf*, accessed March 6, 2018.

[50] 49 United States Code § 40102 [Title 49, Transportation; Subtitle VII: Aviation Programs; Part A, Air Commerce and Safety; Subpart I, General], *http://uscode.house.gov/view.xhtml?path=/prelim@title49/subtitle7&edition=prelim*, accessed September 17, 2017.

enplanements nationwide during the 2016 calendar year, LAX ranked second with 39,635,692 enplanements, SFO ranked seventh with 25,706,994 enplanements, and SAN ranked 27th with 10,340,164 enplanements.[51]

All three large hub airports came into existence in the early 1920s. While all were constructed adjacent to bodies of water, the land that was developed for SFO was manmade bay fill. The runway layouts of the three airports vary widely due to differing local terrain and prevailing winds. The primary runway must be oriented towards the direction of the prevailing wind.[52] SAN has a single runway that is located north of the two passenger terminal buildings and measures 9,401 feet in length and 200 feet in width. LAX has four parallel runways that are oriented east-west. One pair of runways is located on both the north and south sides of the central complex of nine terminal buildings. The runways range in length from 8,926 to 12,091 feet and in width from 150 to 200 feet. SFO has four runways arranged in two pairs of parallel runways that intersect at a 90-degree angle. The runways range in length from 7,650 to 11,870 feet, and all measure 200 feet in width. The parallel runways are separated by only 750 feet and do not meet FAA design standards of 4,300 lateral feet of separation runway centerline-to-centerline for independent dual arrivals.[53]

For comparisons of passenger terminal configurations and parking amenities at the three large hub airports, see Section VIII below, specifically the Criterion 3 (Architecture) discussions for Buildings 195 and 400F.

E. Design and Construction of Some of the Building Types Represented by the Subject Buildings

1. Brief History of Airport Passenger Terminals

The following is an excerpt from the FAA's 2016 Advisory Circular titled "Airport Terminal Planning and Design":

> Airport terminal facilities have evolved considerably, along with the air travel industry. [The following discussion] describes these changes (providing context for older terminals) and suggests how current trends are influencing modern facilities.
>
> Airport terminals have evolved in step with the demands of the commercial aviation industry, which is over 100 years old. Despite their relative "newness," airport terminals have assumed a significant place in the lives of United States citizens, many of whom travel regularly by air. Expectations of the scale and grandeur of airport terminals grew as local governments came to increasingly regard airports as iconic symbols of their status and economic power, fulfilling a position much as did grand railway stations of the 19th Century.
>
> The earliest terminals in the United States date from the late 1920s, when commercial aviation was in its infancy. The relatively high price and limited availability of air travel meant that it primarily served the wealthy elite. Most commercial flights provided a level of service well into the 1950s that would now be considered "First Class." This was the same era when airports were major civic and even national symbols. Designs were often tailored to meet the needs of a particular airline, and aesthetic considerations predominated over functionality and flexibility—a trend that would reverse in the 1960s.

---

[51] U.S. Department of Transportation, Federal Aviation Administration, "Preliminary Enplanements at All Commercial Service Airports (by Rank)," *https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/?year=all*, accessed September 17, 2017.

[52] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13A, Airport Design, *https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.information/documentNumber/150_5300-13A*, September 28, 2012.

[53] San Francisco International Airport, "Weather and Operations at SFO: A Primer for the Media," January 2010, *http://media.flysfo.com/media/sfo/media/weather-operations-primer_0.pdf*, accessed September 17, 2017.

Between 1960 and 1970, the number of air passengers in the United States increased 173%, the largest percentage increase ever for a single decade in United States aviation history. At the same time most airline fleets converted to jets. Jet aircraft evolved from the B707/DC-8/CV880-990 in the early 1960s (typical capacity of 125 to 150 passengers) to the B747-100 in 1969 (typical capacity of 350 to 450 passengers depending on the cabin configuration).

Larger capacity jet aircraft increased demands on terminal buildings. Greater efficiency and flexibility were needed to accommodate more passengers and baggage. Terminal buildings had to move beyond niche designs to vast "processors" capable of handling thousands of passengers and their baggage during peak periods. Airport terminal planners of the 1960s had few guidelines to follow, so experimentation was the rule. From the perspective of the early 21st Century we are able to look back and see which terminal designs worked and which did not; which proved flexible enough to grow with demand, and which were inflexible to change.

The Airline Deregulation Act of 1978, which removed restrictions on entry, pricing, and routes, had the greatest impact on the commercial aviation industry and ultimately on the planning and design of terminal facilities. Between 1978 and 1985, the number of non-commuter airlines increased from 43 to 87; the number of revenue passenger miles almost doubled; and the share of total traffic of the incumbent major airlines declined from 94% to 77%. Commuter and regional airlines (operating aircraft with fewer than 60 seats) increased their revenue passenger miles by a factor of seven between 1979 and 1989.

Deregulation also saw the emergence of two trends that directly affected terminal planning: the development of airline hubs and the introduction of low-cost carriers. While hubbing did exist prior to deregulation, building routes through hubs was a slow bureaucratic process. After deregulation, hub routing could be established quickly and the impact on terminals was dramatic. Hubs had to accommodate much higher peak volumes of passengers than originally planned, and most of these passengers needed to connect to other flights. The development of "banks" of flights (busy times of the day when many flights arrive and depart in a short window), significantly impacted aircraft maneuvering in the terminal area as well as airfield capacity. Passenger security screening, already required prior to deregulation, had to be redesigned in order to avoid connecting passengers having to go through screening again at a hub.

Deregulation also saw the advent of low-cost carriers, which is an airline business model based on short-haul, high-frequency service that bypasses hubs, and the use of a single aircraft type. Although some low-cost carriers establish "focus cities," which allow passengers to make connections, the scheduling of flights is not based on concentrated banks of flights. This resulted in more continuous use of the terminal facilities throughout the day. In addition, these carriers' insistence on low costs caused some airport operators to reconsider how they designed and operated terminals. Many low-cost carrier operating concepts, such as not serving in-flight meals, came to be adopted by legacy carriers. As a result, airports have increased food concessions throughout the terminal.

During the early 1990s, higher fuel costs combined with a global recession and increased industry capacity caused the financial failure of a number of new and long-established airlines. Airlines also continued to consolidate after 2000 as competitive price pressure intensified. These actions, combined with the introduction of smaller capacity regional jet aircraft and the new large capacity A380 caused dramatic changes to the airline industry, airport terminals, and terminal planning.

The industry landscape is expected to continue to shift as airlines change their operating procedures and markets. This likelihood places a premium on flexibility in terminal design. Terminal planning and design guidelines will always have a limited life and need to be re-evaluated periodically to reflect developing trends. On a cautionary note, history shows that not all trends survive; terminal planners and designers need to look at the latest "next big thing" carefully before basing a terminal concept on it.[54]

[54] U.S. Department of Transportation, Federal Aviation Administration, "Advisory Circular: Airport Terminal Planning and Design (Draft)," 22 July 2016, 5-1 to 5-2, *https://www.faa.gov/documentLibrary/media/Advisory_Circular/draft-150-5360-13a.pdf*, accessed November 13, 2017.

2. Brief Overview of Air Cargo Facilities

The following is an excerpt from the Transportation Research Board's 2015 Airport Cooperative Research Program Report titled "Guidebook for Air Cargo Facility Planning and Development":

> The cargo industry changed significantly over the 25 years of 1988 to 2013. As the world economy has become more global, markets and manufacturing have developed, shifted, and in many instances, relocated to markets with low labor rates. New logistics and supply-chain concepts based on low fuel costs and labor costs developed along with trends in just-in-time production and final manufacturing assembly at destination. As new product shelf life decreased, such as for consumer electronics, during this time period, and as the value of goods shipped has increased, the demand for expeditious transport and control, as well as transparency, has correspondingly increased. Domestic air cargo in the United States also experienced shifts, particularly as fuel costs increased in recent years and integrated express carriers developed deferred delivery business models, reducing the demand for overnight delivery by aircraft and relying increasingly on truck networks.
>
> The air cargo terminal is a critical part in the air cargo supply chain. An inadequately sized air cargo building that is unable to accommodate peak volumes may result in shipment delays, while a cargo warehouse that is not designed with flexibility in mind to meet demand may become obsolete during its service life. Airports routinely accommodating air cargo operations typically have space dedicated to support this activity […]. The space is commonly made up of aircraft parking apron, air cargo buildings, and truck parking and maneuvering areas. Cargo throughput between the land and air mode is either through the warehouse buildings or a through-the-fence security gate. These air cargo installations on airports function as a platform that allows for the interface between land and air modes, with the goal of providing the expeditious processing of cargo. This platform has a role to play in ensuring that cargo products arrive at their destination on time and intact, that customers have easy access to the cargo facilities for collection and delivery, and that the truck access is relatively uncongested and does not interfere with passenger-related traffic. Cargo storage is an attribute of these facilities, but the duration is to be limited by design. For the cargo carrier, it is most optimal for air cargo to arrive at the precise time for loading onto aircraft with no on-airport storage or processing time needed. Since there are typically numerous arrivals on cargo trucks to an air cargo terminal, space for processing, build up, and storage is required. These space requirements vary with carrier type and the size of the airport's air cargo market.[55]

3. Brief History of Prefabricated Metal Buildings

Although patented as early as 1903, steel siding was rarely used in residential or commercial construction due to its susceptibility to water infiltration and rust. In 1939, Frank Hoess patented an advanced interlocking system that prevented water penetration and applied his steel siding on a small residential development in Chicago.[56] However, with the onset of World War II, manufacturing steel and aluminum for any purpose other than that which supported the war effort came to a halt. As the primary building material for war materials, the production of aluminum and steel escalated during the war. The development and popularity of the Quonset Hut, a corrugated steel, prefabricated structure with a semicircular cross section, further promoted the benefits of prefabricated metal structures. Initially developed by the US military to meet the needs of a lightweight, prefabricated building that could be used for any purpose, shipped anywhere, and quickly assembled with unskilled labor, the original T-Rib Quonset hut was modeled on the Nissen Hut developed by the British during

[55] Mike Maynard et al., *Airport Cooperative Research Program Report 143: Guidebook for Air Cargo Facility Planning and Development*, Washington, D.C.: National Academy of Sciences, 2015, p. 5, *https://www.nap.edu/catalog/21906/guidebook-for-air-cargo-facility-planning-and-development*, accessed November 13, 2017.
[56] Richa Wilson and Kathleen Snodgrass, "Early 20th-Century Building Materials: Siding and Roofing," *Facilities Tech Tips, United States Department of Agriculture Forest Service* (February 2008), pp. 6–7.

World War I.[57] A redesign of the structure by Otto Brandenberger to make it lighter weight and easier to assemble was approved by the government in 1941, after which it was mass-produced to support the war effort.[58]

Other industrialists and manufacturers quickly jumped at the opportunity to design and develop their own version of the Quonset Hut, including Emanuel Norquist with the Butler Manufacturing Company, the largest manufacturer of sheet metal (particularly used for grain silos) in the United States at the time.[59] Norquist had collaborated with Buckminster Fuller to develop the Dymaxion Deployment Unit, a low-cost, prefabricated metal house. However, even with government approval to build 1,000 units daily, not enough steel could be diverted from the war effort and only a few hundred units were produced for the army.[60] Nonetheless, after the war, an abundance of aluminum and steel led to a plunge in price and an opportunity for architects, manufacturers, and engineers to find new applications for the material.[61] The Butler Manufacturing Company, although having abandoned further development of their own version of the Quonset Hut, called the Butler Hut, shortly after the war, they launched production of their rigid frame design building developed before the onset of the war and remain one of the largest producers of prefabricated metal buildings today.[62]

Because of its flexibility and resistance to corrosion, aluminum rather than steel became the preferred siding material for residential structures, until vinyl siding was introduced in the 1950s.[63] However, further advances in the exterior treatment of steel to resist corrosion, combined with its greater strength and fire resistance and lower cost, led to the preference of steel cladding over aluminum for large prefabricated buildings, such as Buildings 585, 682, 692, 928 and 928A at SFO.

F. Architecture and Engineering Firms

Research identified the architects and/or engineers responsible for the designs of four of the 11 subject buildings. Brief histories of these firms are presented below.

1. Architects

San Francisco Airport Architects (Buildings 195 and 400F)

The San Francisco Airport Architects was a joint venture of John Carl Warnecke & Associates and Dreyfuss & Blackford that was active from 1966 until c. 1981. The title block on some of the firm's architectural drawings list an office at 61 New Montgomery Street in San Francisco, which was also the office for John Carl Warnecke & Associates. In 1966, the San Francisco Airport Architects was selected to develop a master plan for the long-term growth of the Airport, and in 1968, it was awarded a major contract to provide architectural and engineering services for a number of key projects that included a new North Terminal building (today known as Terminal 3), expansion of the South Terminal (today known as Terminal 1), associated boarding areas,

---

[57] Julie Decker and Chris Chiel, *Quonset Hut: Metal Living for a Modern Age* (New York: Princeton Architectural Press, 2005), p. 4.
[58] Ibid., 19.
[59] Ibid., 52-3.
[60] Ibid.
[61] Bruce S. Kaskel, "The Metal and Glass Curtain Wall," *Cultural Resources Management* 18, no. 8 (1995), pp. 23–24.
[62] Butler Manufacturing Company, "About Us," *http://www.butlermfg.com/about_us*, accessed October 17, 2015.
[63] Wilson and Snodgrass, p. 7.

infrastructure, and support facilities.[64] Staff involved in project direction and design included John Carl Warnecke, Albert M. Dreyfuss, Carl Russell, Leonard D. Blackford, and James T. Ream. Landscape design was attributed to Michael Painter, and the project manager was Paul Johansson.[65]

John Carl Warnecke & Associates

John Carl Warnecke & Associates was founded by John Carl "Jack" Warnecke (1919–2010), a second-generation San Francisco Bay Area architect. After receiving his master's degree in architecture from Harvard University, he began a solo architectural practice in 1945. Between 1952 and 1970, he worked simultaneously in two firms: Warnecke and Warnecke (a partnership with his father, Carl I. Warnecke) and in his own practice. He established a firm in 1956, and in 1958 it became known as John Carl Warnecke & Associates. Both Warnecke and his firm became renowned for numerous high-profile projects over the next two decades, and by 1977, it was the largest architectural firm in the United States, with headquarters in San Francisco and New York City as well as four satellite offices.[66]

Besides the various projects at SFO, other notable projects include the renovation of Lafayette Square in Washington, DC (1969); the Hawaii State Capitol in Honolulu (1969); the master plan and several buildings for the United States Naval Academy in Annapolis, MD (1965); the Hilton Hotel (1971) and the a Federal Office Building (1959) in downtown San Francisco; the Maples Pavilion, bookstore, post office, and the Cummings Art Building at Stanford University (1961–1969); and the south terminal at Logan International Airport in Boston, MA (1977).[67,68] The firm ceased operations c. 1985.[69]

Dreyfuss & Blackford

Dreyfuss & Blackford was established in 1950 in Sacramento, CA, as a partnership of Leonard D. Blackford (1923–2014) and Albert Milford Dreyfuss, Jr. It remains in operation and in 2013 won the American Institute of Architects (AIA) California Council's Firm Award, the highest honor the council can bestow on an architectural practice.[70]

Prior to partnering with John Carl Warnecke and Associates, Dreyfuss & Blackford was part of a joint venture with Quinton Engineers to develop an early master plan for SFO in 1965.[71] The firm's design for expanded terminal facilities at SFO was its largest project to date in 1970, both physically and financially.[72] Dreyfuss & Blackford (and by extension the San Francisco Airport Architects) received several design awards for various

---

[64] San Francisco Airport Commission, *San Francisco International Airport Expansion Program,* 1973, https://cors.archive.org/details/sanfranciscointe1973sanf, accessed August 21, 2017.

[65] The San Francisco Airport Architects, *San Francisco International Airport: Definitive Plan,* 1968, p. 42, in the collection of the SFO Museum, Accession No. 2016.148.018.

[66] John King, "John Warnecke—S.F. Architect with Close Ties to Kennedy Clan," *San Francisco Chronicle,* May 7, 2010, p. C8.

[67] Ibid.

[68] San Francisco Planning Department, *San Francisco Modern Architecture and Landscape Design 1935–1970 Historic Context Statement*, January 2011, pp. 250–251.

[69] Pacific Coast Architecture Database, "Warnecke, John Carl, and Associates, Architects (Partnership)," *http://pcad.lib.washington.edu/firm/1151/*, accessed September 18, 2017.

[70] "Capital Design Firm Takes Top State Honor—Dreyfuss & Blackford Has Major Landmarks in Area," *Sacramento Bee*, October 7, 2012, p. D1.

[71] Dreyfuss & Blackford, "San Francisco International Airport Award Info," Miscellaneous archival records provided to ESA on October 2, 2017.

[72] "Capital Design Firm Takes Top State Honor—Dreyfuss & Blackford Has Major Landmarks in Area," *Sacramento Bee*, October 7, 2012, p. D1.

SFO projects, including a 1979 merit award for Building 195 (extant) from the Northern California/Western Nevada Chapter of the American Concrete Institute, a 1980 AIA Central Valley Merit Award for the North Terminal and Building 400F (both extant), a 1974 AIA Central Valley Merit Award for the International Rotunda/Rotunda A (demolished), and a 1972 National Pre-Stressed Concrete Institute Design Excellence Award for the elevated roadway surrounding the central parking garage (extant).[73]

Besides the various projects at SFO, other notable projects by Dreyfuss & Blackford include the 1964, 1973, and 2007 master plans for the Sacramento International Airport, as well as the terminal buildings and other buildings (1967–2011); the Sacramento Municipal Utility District Headquarters (1961; it is listed on the National Register as "a virtually pristine example of the International/Miesian style of post-WWII Modernism in Sacramento"); the IBM Building in Sacramento that was the first pre-cast high-rise building in Northern California (1963), the CalPERS headquarters in Sacramento (1986); and the Nut Tree in Vacaville, CA (1957–1970, demolished).[74,75] Since the 1960s, Dreyfuss & Blackford's projects have focused on health care and public works facilities and "purpose-built headquarters."[76]

Edward B. Page, Architect (First Section of Building 195)

The first section of Building 195 (central parking garage) was designed by architect Edward B. Page and was constructed between 1963 and 1965. Besides Building 195, other notable projects by Page include the Fireman's Fund Home Office Building in San Francisco (1957, now the University of California San Francisco Laurel Heights Campus, also a partnership with structural engineering firm Gould & Degenkolb), the Mason B. Wells House in Belvedere, California (1957, extant) which won several awards including a merit award from the American Institute of Architects, several residential developments in San Francisco's Glen Park neighborhood in partnership with W.D. Peugh (1942 and 1949–1951), the Stanford University Faculty Club (1965), and an interior remodel of the old Central Terminal building at SFO (1962, demolished).[77,78,79]

Stone, Marraccini, & Patterson Architects/Planners (Building 692 and Alterations to Building 682)

The partnership of Stone, Marraccini, & Patterson was formed in 1955 as a derivative of the earlier firms of Stone & Mulloy and Stone, Mulloy, & Marraccini. Its partners included George Agron (1913–1985), Daniel Akol, Sanford Berger, Robert Bettencourt, Dean Folker, Silvio Marraccini (1918–1970), Norman Patterson (1917–1990), and Douglas Stone (1897–1969). The firm specialized in the design of hospitals and medical centers.[80] Besides Building 692 and alterations to Building 682, other notable projects include the First Western Building in Oakland, CA (1957), Federal Office Building No.2 in San Francisco (1959), El Camino Hospital in Mountain View, CA, the Alexian Brothers Hospital in San Jose, CA, the Pacific Presbyterian Medical Center in San

---

[73] Dreyfuss & Blackford, "Recognition," *http://www.dreyfussblackford.com/about/recognition/*, accessed September 25, 2017.

[74] Dreyfuss & Blackford, "Projects," *http://www.dreyfussblackford.com/projects/*, accessed September 18, 2017.

[75] Roland-Nawi Associates, Draft National Register of Historic Places Registration Form for the SMUD Headquarters Building, 2009.

[76] "Capital Design Firm Takes Top State Honor—Dreyfuss & Blackford Has Major Landmarks in Area," *Sacramento Bee*, October 7, 2012, p. D1.

[77] Richard Johnston, "Making the Most of a Belvedere …," *San Francisco Chronicle*, May 5, 1957, p. 4.

[78] "Glen Park, De Haro Plaza Home Projects Open Bids," *San Francisco Chronicle*, March 29, 1942, p. 9.

[79] "Chinatown Project First of Six Local Housing Developments," *San Francisco Chronicle*, July 3, 1949, p. 2.

[80] "Silvio P. Marraccini Dies at 52," *San Francisco Chronicle*, July 11, 1970, p. 27.

Francisco, the Peninsula Hospital in San Mateo, CA (1954), and the Walter Reed Army Medical Center in Washington, DC. The firm secured a joint consulting contract with Sverdrup & Parcel to oversee construction of SFO expansion projects between 1974 and 1981. At the beginning of the contract period, the *San Francisco Chronicle* reported that "the myriad of projects now underway at the airport make it impossible for the [airport's] engineering staff to control all phases of building effectively."[81] The role of this joint venture was to provide engineering and construction management services and reportedly included work on the Airport's central parking garage and North Terminal buildings, in addition to other unidentified projects.[82] Stone, Marraccini, & Patterson merged with Smith, Hinchman, & Grylls, a Detroit-based architecture firm.[83]

2. Engineers

Gould & Degenkolb, Structural Engineers (First Section of Building 195)

The short-lived partnership of John Gould (d. 1961) and Henry J. Degenkolb (1913–1989) was based in San Francisco and operated from 1956 until 1961. Gould employed Degenkolb as chief engineer in his firm beginning in 1946, and they became partners a decade later. Following Gould's death, Degenkolb continued as president of Gould & Degenkolb and eventually renamed the practice H. J. Degenkolb Associates. In his obituary, Degenkolb was hailed as "a leading structural engineer … [whose] contributions to the community and to public safety will long be remembered as precedent setting for the entire engineering profession." Besides Building 195, other notable projects include the International Building in San Francisco (1963, designed by architects Anshen & Allen and Mario Ciampi), the Fireman's Fund Home Office Building in San Francisco (1957, now the University of California San Francisco Laurel Heights Campus, designed by architect Edward B. Page), UCSF's Long Hospital, and the Stanford Court Hotel. Building 195 is one of dozens of parking structures attributed to Degenkolb.[84]

Sverdrup & Parcel, Civil Engineers (Building 692 and Alterations to Building 682)

The partnership of Leif "Jack" Sverdrup (d. 1975) and John Ira Parcel (d. 1965) began in 1928 in Minnesota. By the 1940s the firm had become renowned for its design of bridges across the United States, and it also designed railroads and highways. During World War II, the company began working with the Army Corps of Engineers, designing oil pipelines, airfields, and wind tunnels. The firm secured a joint consulting contract with Stone, Marraccini, & Patterson Architects to oversee construction of SFO expansion projects between 1974 and 1981. As noted above, the role of this joint venture was to provide engineering and construction management services and reportedly included work on the Airport's central parking garage and North Terminal buildings, in addition to other unidentified projects.[85] Sverdrup & Parcel's diverse services led to its incorporation in 1977, after which time it operated five different companies: Sverdrup & Parcel and Associates (architecture, engineering, and

[81] "Consultants for Airport Construction," *San Francisco Chronicle*, December 4, 1974, p. 3.
[82] "Airport Noise Study Gets OK," *San Mateo Times*, December 4, 1974, p. 55.
[83] Pacific Coast Architecture Database, "Stone, Marraccini, and Patterson, Architects (Partnership)," http://pcad.lib.washington.edu/firm/473/, accessed September 18, 2017.
[84] William J. Hall, "Henry J. Degenkolb," *Memorial Tributes: National Academy of Engineering, Volume 4*, The National Academies of Sciences, Engineering, and Medicine, 1991, pp. 44–49, http://www.nap.edu/read/1760/chapter/10#48, accessed September 18, 2017.
[85] "Airport Noise Study Gets OK," *San Mateo Times*, December 4, 1974, p. 55.

planning services), Arnold Research Organization Inc. (high-tech engineering services and facilities operations), SPIRE Corporation (real estate and development), SPCM Inc. (construction management), and Sverdrup & Parcel Consultants Inc. (New York-based projects).[86] The corporation was purchased by Jacobs Engineering in 1998.[87]

[86] Thomas Derdak and Tina Grant, "Sverdrup Corporation," *International Directory of Company Histories, Volume 14.* St, James Press, 1996, pp. 473–477.
[87] "Jacobs Engineering Agrees to Buy Sverdrup," *Los Angeles Times*, December 10, 1998.

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER VIII
Evaluation of Historic Status

The following section provides an evaluation of historic significance based on the site surveys and research and follows the California Register Criteria 1 through 4. The 11 subject buildings were evaluated individually, and they were also evaluated as to whether or not they could be contributors to a potential historic district.

A. Building 195/Central Parking Garage (also known as the Domestic Garage)

Years constructed: 1963–1981

Architects: Edward B. Page, San Francisco Airport Architects

1. Criterion 1 (Events)

The enlargement of Building 195 to become the central parking garage that exists today was one component of SFO's Terminal Area Master Plan constructed between 1969 and 1987. The Terminal Area Master Plan, which specifically addressed the facilities involved in the movement of airport passengers between the main roadway and the airplane, was constructed in two phases. The first Expansion Phase began in 1969 and was completed in 1981, and the second Modernization and Replacement Phase took place between 1981 and 1987.

All buildings and structures that were included in the Expansion Phase were designed by the San Francisco Airport Architects. This phase included the construction of:

- The enlargement of an existing parking garage (today known as the central parking garage/Building 195; extant and largely intact);
- A new North Terminal (today known as Terminal 3/Building 400, extant and enlarged in 2015) and associated Boarding Areas E/Building 400E (demolished and reconstructed in 2014) and F/Building 400F (extant with multiple additions constructed between 1996 and 2002);
- An elevated roadway surrounding the central parking garage (extant and largely intact; this was a federally funded project);
- The old Boarding Area A (demolished c. 2005–2009) that was part of the old South Terminal (today known as Terminal 1); and
- Miscellaneous roadwork including the entrance road and underpasses (extensively redesigned leading up to the completion of the new International Terminal in 2000).

The Modernization and Replacement Phase included renovations to the old Central Terminal (designed by Anshen & Allen and subsequently redesigned by Gensler) and the old South Terminal (designed by Gensler and demolished in 2016) as well as modifications to aircraft apron facilities.[88] In 2000, the new International Terminal was constructed on the west side of the older terminal complex and was designed by Skidmore, Owings & Merrill; this building was not part of the two-phase Terminal Area Master Plan.

As described above, several major components of the Terminal Area Master Plan that were constructed during the 1970s and 1980s have been demolished, reconstructed, or modified, and the terminal complex itself has been significantly expanded as a result of more recent construction (e.g., the new International Terminal). The development of the terminal area over time is illustrative of the Airport's continual expansion to meet the ever-increasing passenger load and traffic. This state of flux was specifically addressed by the San Francisco Airport Architects in its 1968 *Definitive Plan* for the terminal complex:

> It is necessary in this plan to look beyond the present construction phase to the direction of possible future development. As the average size of passenger aircraft continues to increase over the years, additional space for supporting facilities will continue to be required … The needs of the future, however, must be weighed against the needs of the present. Requirements for (1) custom solutions to present functions and (2) achieving the maximum number of aircraft parking positions on the limited ramp space both work against future flexibility and yet must be satisfied. This definitive plan seeks a proper balance between these opposing, yet important, needs.[89]

Although Building 195 is associated with the realization of the Terminal Area Master Plan, which had a significant impact on the physical development of SFO, research does not indicate that the execution of the master plan was an event that contributed significantly to the broad patterns of local or regional history or the cultural heritage of California or the United States. For this reason, Building 195 does not appear to be individually eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Building 195 is associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individual person or persons are directly associated with the central parking garage. For this reason, Building 195 does not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Among large hub airports in California—that is SFO, LAX, and SAN—the configuration and design of parking facilities in the terminal area at SFO is unique, but it is not exceptional. Building 195 replaced an earlier surface parking lot and was constructed in multiple phases. Although it is the earliest parking structure built at SFO, it is not the only garage in the terminal area. Two additional garages were constructed west of the new International Terminal building in 2000. SAN has four large surface parking lots located south and east of the passenger terminal buildings and one parking lot north of the runway. There are no parking garages at SAN.[90] LAX has eight parking structures located opposite the passenger terminal buildings. According to aerial photographs, the structures replaced surface parking lots (as was also the case at SFO) and were built between c. 1965 and c. 2003. There is also a large surface parking lot and numerous smaller lots located northeast of the

[88] City and County of San Francisco Airport Commission, *San Francisco International Airport Terminal Area Master* Plan, 1985, p. 1, in the collection of the SFO Museum, Accession No. 2002.133.010.
[89] The San Francisco Airport Architects, *San Francisco International Airport: Definitive* Plan, 1968, p. 40, in the collection of the SFO Museum, Accession No. 2016.148.018.
[90] San Diego International Airport, "Parking," www.san.org/Parking-Transportation/Parking, accessed October 27, 2017.

terminal complex. As a property type commonly found at modern airports, Building 195 is not a significant example of a parking garage.

Building 195, which was built in several phases over the course of nearly two decades, was not constructed as originally envisioned and designed by the San Francisco Airport Architects. By 1974, plans for an expanded central parking garage had developed into a cutting-edge "ground transportation center" approved by the Airport Commission. The *San Mateo Times* announced that "The transportation center wins its name because it also provides for a possible future BART station, makes provision for underground baggage conveyors from the parking area to the aircraft loading [areas], and makes provision for upper-level 'people movers.'"[91] None of these features were ultimately implemented in Building 195, and the garage never reached its full potential as the imagined "ground transportation center" of SFO.

As discussed in the construction chronology of Building 195 above, a BART station was never realized in this location, even though the building's foundation was constructed to accommodate a future station. As early as 1969, the San Francisco Airport Architects proposed a number of alignments for a future BART line, including one leading directly to the center of the garage.[92] According to a September 1990 article published in the *San Francisco Examiner*, Bill Dwyer, who was the director of SFO during the 1970s, reportedly "stopped airport expansion planning in midstream to move utilities and eliminate pilings to provide a clear path for a BART right-of-way under the North Terminal and central parking garage … The BART tunnel—officially called the BART 'trace' because it's a clear, unobstructed path under the airport—has appeared on every airport master plan since 1971. It last appeared in the 1985 master plan … showing the BART right-of-way into the center of the airport." The "trace" was omitted from drawings in the Airport's 1989 master plan, and in 1990, the Airport's then-manager Lou Turpin announced to other Airport directors that it had suddenly and mysteriously become "obstructed." An aboveground BART station was ultimately constructed in 2003 west of the terminal complex, 23 years after Turpin expressed that "BART passengers would have an easier and less disorienting time getting onto his above-ground system to go to the airport than emerging in 'the dark hole of Calcutta' underneath the parking garage and fighting their way onto elevators and people movers."[93]

Likewise, research does not indicate that the planned underground baggage conveyance system was ever constructed. The 1968 *Definitive Plan* for the terminal complex prepared by the San Francisco Airport Architects explains that "Passengers desiring to claim baggage in the garage would … descend to the tunnel level to reach the garage baggage claim islands."[94] Leonard Blackford, Jr., one of the principals of Dreyfuss & Blackford (a partner firm of the San Francisco Airport Architects) said in 1970 that, "At some time, hopefully, you'll be able to insert a punchcard into a device anywhere in the airport and your baggage will be delivered to you promptly. We don't know yet whether the airlines will go for this when it's available, but we have to design to allow for it."[95] The sophisticated baggage handling system, also known as the Automatic Interline Baggage System, was

[91] "Airport Garage OKd," *San Mateo Times,* December 18, 1974, p. 23.
[92] San Francisco Airport Architects and Wilbur Smith & Associates, *Rapid Transit to the San Francisco International Airport*, October 1, 1969, p. 18.
[93] Warren Hinckle, "Will BART Ever Go to SFO?" *San Francisco Examiner,* September 16, 1990, pp. B1 and B8.
[94] The San Francisco Airport Architects, *San Francisco International Airport: Definitive Plan*, 1968, p. 18, in the collection of the SFO Museum, Accession No. 2016.148.018.
[95] Douglas Hope, "Architect Blackford Drew Blueprint for His Life's Work in Kindergarten," *Sacramento Bee,* December 20, 1970, p. B3.

never implemented due to the excessively high cost.[96] Architectural drawings for the final phase of construction of the "ground transportation center" show only a network of crawl spaces and utility trenches under the lowest parking level (Contract No. 1015).

A "people mover system" was designed to span the seven rooftop elevator shafts, or cores, but tracks and stations were never constructed. The cores were constructed with stair and elevator access to a future sixth level and with notches on top to support a "future P.M.S. [people mover system] roadbed" and "future pedestrian bridge[s]."[97] Two above-ground pedestrian bridges were in fact constructed that connected the garage to the North Terminal building (these were demolished when the AirTrain system was built in the late 1990s), and *San Francisco Chronicle* architecture critic Allan Temko pointed out that "the other stations on the mini-transportation system [i.e., the people mover system] will not be operable until five more bridges—two for the central terminal and three on the south—are built in the early 1980s."[98] The remaining five bridges were never constructed. Following the completion of the central parking garage in 1980, Turpen acknowledged that, "Even our engineers don't understand the [signage] of the garage. There's a very simple problem there. The garage was designed as a random parking facility, so you could go on or off a people-mover, which would take you to your terminal. But if you've been on top of the garage, you know that the people-mover is conspicuous by its absence."[99]

As a result of the incomplete realization of the design of the "ground transportation center," the intended methods of conveying passengers and their luggage within the garage and between it and the terminal buildings was left incomplete, and Building 195 has historically functioned simply as a parking garage. Despite the fact that Dreyfuss & Blackford (and by extension the San Francisco Airport Architects) won a merit award for the design of Building 195 in 1979 from the American Concrete Institute, the garage was never fully realized as the "ground transportation center" it was intended to become. As a utilitarian parking garage that does not directly serve the essential aviation function (i.e., the operation and use of aircraft) of SFO, Building 195 does not embody the distinctive characteristics of a type, period, or method of construction.

The first section of the garage to be constructed—the first four floors occupying approximately the eastern third of the garage—was partially demolished and absorbed by the later phases of garage construction. As such, the first section of the central parking garage is not distinguishable as a structure designed by architect Edward B. Page and engineering firm Gould & Degenkolb. When considered among the entire bodies of work of the architectural firms John Carl Warnecke and Associates and Dreyfuss & Blackford, both of which are considered master architects, Building 195 is a minor project (see Section E. Architecture and Engineering Firms).

For these reasons, Building 195 does not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

---

[96] Dreyfuss & Blackford, "San Francisco International Airport Award Info," Miscellaneous archival records provided to ESA on October 2, 2017.
[97] Notations found on sheets A5.2 and A5.5 of the drawing set for Contract No. 1015 (1977).
[98] Allan Temko, "S.F. Airport—It Should Have Been Scrapped," *San Francisco Chronicle,* April 10, 1978, p. 6.
[99] Walter Blum, "Coping: Clearing the Air at the Airport," *California Living: The Magazine of the San Francisco Examiner & Chronicle*, July 20, 1980, pp. 14–18.

B. Building 400F/Terminal 3 Boarding Area F

Years constructed: 1976–1979

Architect: San Francisco Airport Architects

Because Building 400F was designed as an addition to the main Terminal 3 building, a discussion of its potential historic significance must include the entire Terminal 3 complex. Therefore, the following analysis discusses Building 400F as part of the Terminal 3 complex, which also includes Building 400 (the main terminal building) and Building 400E (Boarding Area E).

1. Criterion 1 (Events)

The Terminal 3 complex is associated with the realization of SFO's Terminal Area Master Plan. (See the Criterion 1 discussion for Building 195 above.) Although the master plan had a significant impact on the physical development of SFO, research does not indicate that the execution of the master plan was an event that contributed significantly to the broad patterns of local or regional history or the cultural heritage of California or the United States. For this reason, Building 400F does not appear to be individually eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Building 400F is associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individual person or persons are directly associated with the building, which was constructed as part of the Terminal 3 complex and has historically been occupied by United Airlines. For this reason, Building 400F does not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Among large hub airports in California, the configuration of the Terminal 3 complex is not unique. Of the five basic types of passenger terminal configurations—i.e., pier, satellite, linear, transporter, and midfield—SFO's Terminal 3 complex represents a hybrid pier/linear configuration, meaning that aircraft park on the airfield side of the terminal building itself and also around freestanding piers that are attached to the terminal building. This configuration also applies to SAN, which, according to historic aerial photos, was constructed c. 1966 and predates SFO's Terminal 3 complex by more than a decade. In the case of LAX, the passenger terminals employ separate pier and linear layouts. As a property type commonly found at modern airports, SFO's Terminal 3 complex is not a significant example of a passenger terminal.

The San Francisco Airport Architects' design of SFO's Terminal 3 complex was both lauded and panned. It received an AIA Central Valley Merit Award in 1980, and the jury particularly valued the "atmosphere of quiet elegance for the air traveler seldom seen in a large urban airport terminal."[100] More vehement, however, was the series of reviews published in the *San Francisco Chronicle* in the 1970s by longtime architecture critic, Allan

[100] Quoted in a press release from Dreyfuss & Blackford, December 1, 1980. Included with miscellaneous archival records provided to ESA by Dreyfuss & Blackford on October 2, 2017.

Temko, who was intimately familiar with the prolonged Airport development over the course of several decades. In Temko's professional opinion, "San Francisco is one of the most chilling examples of inhumane airport planning and is going to become more forbidding still when the colossal north terminal is opened [in 1979]."[101] He elaborated on the deficiencies of the North Terminal design:

> The huge north terminal [including Boarding Area F] provides an idea of what the whole vast airport, still badly torn up after two decades of continuous building and rebuilding, will be when the present $403 million expansion program is completed in the 1980s. By then the ugly, ill-kempt, and inefficient central and southern terminals should be removed and enlarged, but it is doubtful that this malplanned airport, plagued by labyrinthine confusion and enormous pedestrian entrances, will ever really be finished …
>
> The main issue to resolve right now is whether architects John Carl Warnecke & Associates and Dreyfuss & Blackford, jointly responsible for the airport since 1968, have done well enough with the north terminal to warrant its being used as a model for more than $100 million of work that remains to be done on the two older terminals …
>
> [H]ow often, in all the history of architecture, do designers have the chance to create a curving façade 1,200 feet long? This was the space available on the northern side of the huge central garage. Even if it were hemmed in by a ring of approach roads, the front of the new terminal could have been a magnificent ceremonial portal to both the airport and [San Francisco].
>
> Yet somehow the architects failed to make the most of the opportunity. Instead of lucid strength and monumental presence, the immense building gives the impression of ineffable blandness and lack of conviction …
>
> It's difficult to criticize such construction as if it were serious architecture, yet it is obvious that the designers failed to profit from one of the most masterful lessons in the bible of architecture: the powerful, successive rhythmic structure of Bernini's colonnades at St. Peter's of Rome, which has almost the same dimensions …
>
> [T]he architects elected to disguise and weaken, if not altogether conceal basic structure. This is particularly apparent at the top of the façade, which bulges outward in concrete panels that are meant to be "sculptural," but look simply empty. Their weak form adheres to the building like chewing gum …
>
> And everything will be in inoffensive conventional taste, bereft of any spontaneity, any joy, any sense of genuine culture and regional feeling … The architecture, like the freeways and jet runways, will go on and on without any suggestion of civilized control.
>
> Perhaps sensing this, the Airport Commission has appointed new architects, Anshen & Allen and Arthur Gensler & Associates, to finish the southern and central terminals respectively.[102]

Discontent with the outsized dimensions of Boarding Area F, in particular, extended to one of the Airport's policy-making bodies. The building's plans were developed in consultation with United Airlines and approved by the San Francisco Airport Commission on March 18, 1975. Commission president William E. McDonnell explained that the approval "leaves room for those who are making the decisions when we are long gone." However, this caused some tension with the San Francisco Airlines Policy Committee chairman, Alfred J. Kaiser, who complained that the building was "'extremely large' and, in fact, has a 'surplus of space' … Kaiser said 10,000 square feet could be 'easily' removed from the hub building plans and the width of the connecting passageway and the longer concourse reduced … Kaiser said the airlines would 'go along' with the plans submitted 'providing we get the assurance that we'll try to do better next time.'"[103]

The Terminal 3 complex does not embody the distinctive characteristics of a type, period, or method of construction or possess high artistic values. The San Francisco Airport Architects' design for the Terminal 3

[101] Allan Temko, "S.F. Airport—It Should Have Been Scrapped," *San Francisco Chronicle,* April 10, 1978, p. 6.
[102] Allan Temko, "S.F. Airport—The Bland, Empty Look," *San Francisco Chronicle,* April 17, 1978, p. 6.
[103] Keith Power, "An OK for New Boarding Area at S.F. Airport," *San Francisco Chronicle,* March 19, 1975, p. 19.

complex does not exemplify the weightless, sculptural, and futuristic qualities typically associated with well-known Jet Age architecture at major American airports. Examples include the 1961 Theme Building at LAX (determined eligible for listing in the National Register and listed in the California Register and as a City of Los Angeles Historic-Cultural Monument; see **Figure 46**) and Eero Saarinen's 1962 TWA Flight Center at the John F. Kennedy International Airport in New York (listed in the National Register; see **Figure 47**).[104] Nor does the Terminal 3 complex clearly embody characteristics of Postmodern architecture, namely overt historical references and bold geometries. John Carl Warnecke & Associates, one of the partners of the San Francisco Airport Architects, was renowned as an early proponent of the architectural theory known as "contextualism," which refers to the harmonization of buildings with their historical and cultural setting.[105] However, as observed by Temko, the Terminal 3 complex does not appear to reflect this concept.

SOURCE: City of Los Angeles Department of City Planning (www.cityplanning.lacity.org). Recommended Airport Development Plan HRE

Figure 46
Theme Building at LAX, 1993

[104] PCR Services Corporation, *LAX Master Plan Draft EIS/EIR, Appendix 1: Section 106 Report*, January 2001.
[105] William Grimes, "John Carl Warnecke, Architect to Kennedy, Dies at 91," *New York Times*, April 23, 2010, p. A25.

SOURCE: New York Architecture, www.nyc-architecture.com. Recommended Airport Development Plan HRE

Figure 47
TWA Flight Center at John F. Kennedy International Airport, n.d.

When considered among the body of work completed by the San Francisco Airport Architects for SFO's terminal area, the Terminal 3 complex represents the centerpiece. Because that firm's projects are limited to the few buildings and structures completed under the Terminal Area Master Plan and because several have been demolished or modified, it is necessary to consider Building 400F among the bodies of work of architectural firms John Carl Warnecke & Associates and Dreyfuss & Blackford, both of which are considered master architects. (See Section E. Architecture and Engineering Firms and the Criterion 1 discussion for Building 195 above.)

By the time the Terminal 3 complex was completed, John Carl Warnecke & Associates had become the largest architectural practice in the United States and was regularly engaged in major architectural commissions both nationally and internationally. The firm had already completed two other airport projects: Terminal 1 at the Oakland International Airport in 1962 and the South Terminal at Logan International Airport in Boston in 1974 (both extant). Dreyfuss & Blackford had also established a prominent, albeit smaller, architectural practice whose projects were concentrated in the Sacramento area. Of note is the firm's master plan of the Sacramento International Airport since 1964, as well as the design of the terminals and other buildings, several of which have been demolished and replaced by new buildings also designed by Dreyfuss & Blackford. Research does not support a conclusion that the Terminal 3 complex expresses a distinct aspect, idea, theme, or phase in the development of either firm's work.

For the reasons discussed above, Building 400F does not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

C. Building 575/SFO Business Center

Year constructed: 1969

Architect: Unknown

1. Criterion 1 (Events)

Research does not indicate that Building 575 is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. The building was originally constructed as an administration building for United Airlines, and it has recently been occupied by offices of the SFO Airport Commission. It is likely that Building 575 was functionally related to the nearby United Airlines cargo building (Building 585), both of which were constructed during the late 1960s. However, neither building appears to have featured prominently in the development of the Airport (e.g., were not part of the Terminal Area Master Plan), and neither has an important association with the essential aviation function (i.e., the operation and use of aircraft) of SFO. For this reason, Building 575 does not appear to be eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Building 575 is associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individuals are directly associated with the building, which was used initially as an administration building for United Airlines, and then later by the SFO Airport Commission. For this reason, Building 575 does not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Building 575 does not appear to embody the distinctive characteristics of a type, period, region, or method of construction. Research indicates that the building has continually functioned as an administration building for United Airlines since its construction in 1969. Research did not identify the architect or engineer of Building 575, and it does not appear to represent the work of a master or possess high artistic values. For these reasons, Building 575 does not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

D. Building 585/United Airlines (UAL) Cargo Building

Year constructed: 1966

Architect: Unknown

1. Criterion 1 (Events)

Research does not indicate that Building 585 is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. The building has continually functioned as a cargo facility for United Airlines since its construction in 1966. It is likely that Building 585 was functionally related to the nearby former United Airlines administration building (Building 575), both of which were constructed during the late 1960s. However, neither building appears to have featured prominently in the development of the Airport (e.g., were not part of the Terminal Area Master Plan), and neither has an important association with the essential aviation function (i.e., the operation and use of aircraft) of SFO. For this reason, Building 585 does not appear to be eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Building 585 is associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individuals are directly associated with the building, which has functioned as a cargo building for United Airlines since its construction. For this reason, Building 585 does not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Among large hub airports in California, the cargo buildings located at SFO are not distinctive for their architectural design, nor are they unique or exceptional. SFO has nine cargo facilities totaling 1,153,996 square feet.[106] LAX has more than 2,100,000 square feet developed for cargo, including a United Airlines cargo building that was designed by Miller Cook Architects. It was constructed in 2002 and measures 180,000 square feet in area.[107] Five airlines operate cargo facilities at SAN, including Delta Air Lines, California Air Cartage, Northwest Airlines, United Airlines, and Southwest Airlines.[108] As a property type commonly found at modern airports, Building 585 is not a significant example of a cargo building.

[106] San Francisco International Airport, "Fact Sheet for Calendar Year 2016," https://media.flysfo.com/2016_Fact_Sheet.pdf, accessed September 25, 2017.
[107] Airport LA, "LAX Cargo," https://www.airport-la.com/info/cargo.html, accessed September 25, 2017.
[108] San Diego International Airport, "Frequently Asked Questions," http://www.san.org/Travel-Info/FAQs?QuestionID=43&AFMID=1307, accessed November 10, 2017.

Building 585 does not appear to embody the distinctive characteristics of a type, period, region, or method of construction. The building has continually functioned as a cargo facility for United Airlines since its construction in 1966. The building increased significantly in size and changed in appearance when a large addition was constructed on the building's north side sometime between 1993 and 2001. Research did not identify the architect or engineer of Building 585, and it does not appear to represent the work of a master or possess high artistic values. For these reasons, Building 585 does not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

E. Building 682/Facilities Maintenance Center

Years constructed: c. 1968–1974

Architect: Stone, Marraccini & Patterson

1. Criterion 1 (Events)

Research does not indicate that Building 682 is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. The building was originally constructed as the Airport's facilities maintenance center and has historically been operated as a facility for general maintenance (e.g., sheet metal shop, electric shop) and administration functions, and does not have an important association with the essential aviation function (i.e., the operation and use of aircraft) of SFO. For this reason, Building 682 does not appear to be eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Building 682 is associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individuals are directly associated with the building, which has functioned as a facilities maintenance center for the Airport since its construction c. 1968. For this reason, Building 682 does not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Building 682 does not appear to embody the distinctive characteristics of a type, period, region, or method of construction. The building is a utilitarian steel structure that does not exhibit or embody distinctive characteristics of a particular architectural style or period, and it is not directly related to the aviation operations of SFO. Research did not identify the original architect or engineer of Building 682. When the building was significantly modified in 1974, the architect—Stone, Marraccini, and Patterson Architects/Planners—and the engineer—Sverdrup & Parcel and Associates—were at the beginning of a joint construction management contract with SFO, the scope of which was not determined through preliminary research. Both firms were well-known in their respective fields for achievements in health care facility design (Stone, Marraccini, and Patterson) and bridge design (Sverdrup & Parcel and Associates), among other specialties. Building 682 does not appear to be representative of either firm's work, nor does it possess high artistic values. For these reasons, Building 682 does not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

F. Building 692/Sheet Metal Shop

Year constructed: 1974

Architect: Stone, Marraccini & Patterson

1. Criterion 1 (Events)

Research does not indicate that Building 692 is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. The building was constructed as an extension of the Airport's facilities maintenance center. Its original use as a City vehicle compound and its other various facilities maintenance-related uses over time clearly indicate that Building 692 does not have an important association with the essential aviation function (i.e., the operation and use of aircraft) of SFO. For this reason, Building 692 does not appear to be eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Building 692 is associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individuals are directly associated with the building, which was originally constructed as an auxiliary vehicle compound and storage area to the adjacent maintenance facility (now Building 682) and has functioned in part as a sheet metal shop for SFO since at least 1993. For this reason, Building 692 does not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Building 692 does not appear to embody the distinctive characteristics of a type, period, region, or method of construction. It was originally designed as a series of partially enclosed shed structures configured around a courtyard as part of a complex of buildings dedicated to airport facilities maintenance, and it has been modified over time to accommodate a variety of maintenance uses (including a sheet metal shop) that are not directly related to the aviation operations of SFO. When Building 692 was constructed in 1974, the architect—Stone, Marraccini, and Patterson Architects/Planners—and the engineer—Sverdrup & Parcel and Associates—were at the beginning of a joint construction management contract with SFO, the scope of which was not determined through preliminary research. Both firms were well-known in their respective fields for achievements in health care facility design (Stone, Marraccini, and Patterson) and bridge design (Sverdrup & Parcel and Associates), among other specialties. Building 692 does not appear to be representative of either firm's work, nor does it possess high artistic values. For these reasons, Building 692 does not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

G. Building 710/Singapore Cargo Building

Year constructed: 1968

Architect: Unknown

1. Criterion 1 (Events)

Research does not indicate that Building 710 is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. Research revealed that the building has historically functioned as a hangar, offices and cargo space for three different airlines, and as offices for the San Francisco Airport Commission and several smaller commercial tenants. As such, the building does not have an important association with the essential aviation function (i.e., the operation and use of aircraft) of SFO. Building 710 does not appear to have featured prominently in the development of the Airport's West Field. For these reasons, Building 710 does not appear to be eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Building 710 is associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individuals are directly associated with the building, which originally functioned as a hangar and offices for Western Airlines and later as a maintenance facility for Delta Air Lines and is currently used by SFO Airport Commission staff and tenants for administration functions. For this reason, Building 710 does not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Among large hub airports in California, the presence of a Singapore Airlines cargo building is not unique or exceptional. A Singapore Airlines cargo building was constructed at LAX in 1999 and measures 65,000 square feet.[109,110] As reported by Caltrans in 2012, the roles of both LAX and SFO "as gateways for Asian export and import cargo has been permanently diminished due to bypassing of [California] by longer-range aircraft which now directly connect interior U.S. cities with overseas origins and destinations." Despite this development, "With Southern California region air cargo expected to triple over the next 25 years, LAX will continue to be the

[109] Airport LA, "LAX Cargo," https://www.airport-la.com/info/cargo.html, accessed September 25, 2017.
[110] Los Angeles World Airports, "LAX Air Cargo," http://www.lawa.org/welcome_lax.aspx?id=776, accessed September 25, 2017.

center of airfreight activity for the Pacific Rim and Europe."[111] Singapore Airlines does not maintain cargo facilities at SAN. As a property type commonly found at modern airports, Building 710 is not a significant example of a cargo building.

Building 710 does not appear to embody the distinctive characteristics of a type, period, region, or method of construction. The building was originally constructed as a hangar and offices, but it has not functioned as a hangar for over 30 years. Since the mid-1990s, the building has functioned as a cargo facility and offices. Research did not identify the architect or engineer of Building 710, and it does not appear to represent the work of a master or possess high artistic values. For these reasons, Building 710 does not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

H. Building 750/Ground Service Equipment (GSE) Building

Year constructed: 1969

Architect: Unknown

1. Criterion 1 (Events)

Research does not indicate that Building 750 is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. Research revealed that the building has historically been used for cargo and other airport support functions and does not have an important association with the essential aviation function (i.e., the operation and use of aircraft) of SFO. For this reason, Building 682 does not appear to be eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Building 750 is associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individuals are directly associated with the building, about which little is known. For this reason, Building 750 does not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Building 750 does not appear to embody the distinctive characteristics of a type, period, region, or method of construction. Although the original use and occupant of Building 750 are unknown, it was used as a cargo warehouse for Delta Air Lines by the late 1980s and until at least 2013. It is small in scale compared to other

---

[111] Caltrans Office of System and Freight Planning, "Freight Planning Fact Sheet: Los Angeles International Airport," July 2012, http://www.dot.ca.gov/hq/tpp/offices/ogm/air_cargo/Los_Angeles_Airport_Fact_Sheet_072512.pdf, accessed September 25, 2017.

airline support and cargo buildings at SFO, and it does not appear to be a characteristic example of such buildings. Research did not identify the architect or engineer of Building 750, and it does not appear to represent the work of a master or possess high artistic values. For these reasons, Building 750 does not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

I. Buildings 928 and 928A/City College of San Francisco Airport Campus

Years constructed: 1976 (Building 928), c. 1976 (Building 928A)

Architect: Unknown

1. Criterion 1 (Events)

Research does not indicate that Buildings 928 or 928A are associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. The buildings have continuously functioned as a satellite campus of the City College of San Francisco since its construction in 1976. Research does not indicate that either of the college's two programs housed in Building 928—the Fire Science and Aircraft Maintenance Technology programs—are notable for past achievements or records. City College of San Francisco is one of more than 20 schools and organizations that offer aircraft maintenance education programs in California, and it is not exceptional in its offerings.[112] Furthermore, the operations of the college are separate from SFO, and Buildings 928 and 928A therefore do not have an important association with the essential aviation function (i.e., the operation and use of aircraft) of SFO. Buildings 928 and 928A do not appear to have featured prominently in the development of the Airport's North Field, nor is it associated with other buildings in the North Field, namely the U.S. Coast Guard Air Station San Francisco (previously determined eligible for listing as a historic district on the National Register), the United Airlines Maintenance Operations Center constructed in c. 1948–1980, the Mel Leong Treatment Plant (for wastewater treatment, parts of which were constructed as early as 1972), and several cargo buildings. For these reasons, Buildings 928 and 928A do not appear to be eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Buildings 928 and 928A are associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individuals are directly associated with the buildings, which have functioned as the Airport Campus of the City College of San Francisco since its construction in 1976. Furthermore, research did not reveal that the two educational programs housed at the Airport Campus—Fire Science and Aircraft Maintenance Technology—are notable for any achievements or

[112] Aviation Schools Online, "California Aircraft Maintenance Schools," http://www.aviationschoolsonline.com/aircraft-maintenance-schools/California/, accessed September 24, 2017.

records. For these reasons, Buildings 928 and 928A do not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Buildings 928 and 928A do not appear to embody the distinctive characteristics of a type, period, region, or method of construction. Since their construction, Buildings 928 and 928A have continually functioned as the Airport Campus of the City College of San Francisco and have historically housed the college's Aircraft Maintenance Technology Program. The buildings are prefabricated, utilitarian steel structures that do not exhibit or embody distinctive characteristics of a particular architectural style or period, and they are not directly related to the operation of SFO. Research did not identify the architect or engineer of Buildings 928 and 928A, and they do not appear to represent the work of a master or possess high artistic values. For these reasons, Buildings 928 and 928A do not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

J. Building 944/Cargo

Year constructed: 1980

Architect: Unknown

1. Criterion 1 (Events)

Research does not indicate that Building 944 is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. Research revealed that the building has historically been used for cargo and does not have an important association with the essential aviation function (i.e., the operation and use of aircraft) of SFO. Building 944 does not appear to have featured prominently in the development of the Airport's North Field, nor is it associated with other buildings in the North Field, namely the U.S. Coast Guard San Francisco Air Station (previously determined eligible for listing as a historic district on the National Register), the United Airlines Maintenance Operations Center constructed in c. 1948–1980, the Mel Leong Treatment Plant (for wastewater treatment, parts of which were constructed as early as 1972), and CCSF's Airport Campus constructed in 1976. For this reason, Building 944 does not appear to be eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Building 944 is associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individuals are directly associated with the building, which was originally constructed as a cargo facility for Japan Airlines and is now a cargo facility for nine airlines and cargo companies. For this reason, Building 944 does not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Among large hub airports in California, the cargo buildings located at SFO are not distinctive for their architectural design, nor are they unique or exceptional. SFO has nine cargo facilities totaling 1,153,996 square feet.[113] LAX has more than 2,100,000 square feet developed for cargo.[114] Five airlines operate cargo facilities at SAN, including Delta Air Lines, California Air Cartage, Northwest Airlines, United Airlines, and Southwest Airlines.[115] As a property type commonly found at modern airports, Building 944 is not a significant example of a cargo building.

Building 944 does not appear to embody the distinctive characteristics of a type, period, region, or method of construction. It has functioned as a cargo warehouse and offices for a number of different companies since its construction in 1980. Research did not identify the architect or engineer of Building 944, and it does not appear to represent the work of a master or possess high artistic values. For these reasons, Building 944 does not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

K. Building 1070/Ground Service Equipment (GSE) Building

Year constructed: 1950

Architect: Unknown

1. Criterion 1 (Events)

Research does not indicate that Building 1070 is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. Research revealed that the building functioned as one of the Airport's fire stations from its construction in c. 1950 until at least 1989. As such, it clearly does not have an important association with the essential aviation function (i.e., the operation and use of aircraft) of SFO. Furthermore, it does not appear to feature prominently in the development of the Airport (e.g., was not part of the Terminal Area Master Plan). For these reasons, Building 1070 does not appear to be eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Building 1070 is associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individuals are directly associated with the

[113] San Francisco International Airport, "Fact Sheet for Calendar Year 2016," https://media.flysfo.com/2016_Fact_Sheet.pdf, accessed September 25, 2017.

[114] Airport LA, "LAX Cargo," https://www.airport-la.com/info/cargo.html, accessed September 25, 2017.

[115] San Diego International Airport, "Frequently Asked Questions," http://www.san.org/Travel-Info/FAQs?QuestionID=43&AFMID=1307, accessed November 10, 2017.

building, which functioned as Fire Station No. 2 for at least 40 years before becoming the offices of a GSE building. For this reason, Building 1070 does not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Building 1070 does not appear to embody the distinctive characteristics of a type, period, region, or method of construction. The building functioned as the Airport's Fire Station No. 2 from its construction in 1950 until c. 1990. Although the building has been enlarged and adapted to new uses as a GSE and office building, the large vehicular doors on the building's southeast façade are original to the fire station and are a universal feature of fire station buildings, though they are de-emphasized by the fact that they are not located on the primary (southwest) façade. No other exterior features clearly illustrate the fire station function, and although much of the first-floor fenestration appears to be original, Building 1070 does not embody the distinctive characteristics of fire station architecture. Furthermore, it is located in a remote area in the East Field and was intended to be a utilitarian building rather than one designed with stylistic distinction, and it is not directly related to the operation of SFO. Research did not identify the architect or engineer of Building 1070, and it does not appear to represent the work of a master or possess high artistic values. For these reasons, Building 1070 does not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

L. Historic District Considerations

An inventory of all extant buildings located within the RADP boundary is presented in Appendix A. Data were provided by SFO and supplemented by additional focused research by ESA. All buildings are listed in ascending order by building number, and the 11 subject buildings are shown in bold. Under "Type of Project," buildings that are proposed to be affected by RADP projects are listed as "RADP," ongoing projects that are not part of RADP projects are listed as "Ongoing," and buildings that will not be affected by the RADP or ongoing projects are listed as "N/A."[116] Dates listed under "Build Year" generally reflect the completion of construction. As such, the inventory also includes a column titled "Year(s) Constructed," which reflects confirmed construction dates, if known.

SFO's historic narrative is one of continual change, from its inception in 1927 to the present day, in order to accommodate the exponential rise in airline passenger travel during the 20th and 21st centuries. The greatest amount of change has occurred within the past 50 years, with the expansion of the Central Terminal (Terminal 2) and the addition of the North (Terminal 3), South (Terminal 1), and new International terminal, new and expanded parking facilities, as well as substantial additions, modifications, and demolition of aircraft

[116] At the direction of Environmental Planning staff, several support facilities and infrastructure elements were excluded from the building inventory. These include Buildings 56 (South MPOE/MPOE #2), 60 (Data Center), 588 (BART Substation), 787 (Electrical Substation BB), 906 (SFO Fuel Control Building), 1072 (Field Lighting Building #1), 1080 (Field Lighting Building #2), 2001 (Fuel Farm), and 2002 (water tanks). These buildings and structures will either be affected only by ongoing projects or will not be affected by RADP or ongoing projects.

maintenance and airline support facilities at SFO. Changes to the landscape include the lengthening of runways and the revisions of the taxiways. In a 1978 article in the *San Francisco Chronicle*, Pulitzer Prize-winning architecture critic, Allan Temko, made an accurate prediction when he wrote, "For a quarter of a century, large sections of the airport … have been torn up every single day—as a dirty, bewildering construction site. What we shall have in the future, probably well into the [21st] century, is a facility basically planned in the 1950s, when its present outline was set, and then enlarged and given cosmetic touches in the 1970s and 1980s."[117]

1. U.S. Coast Guard Air Station San Francisco Historic District

There is one known historic district located within the Airport on property owned by the federal government. In 1998, Carey & Company prepared a cultural resources survey that identified the U.S. Coast Guard Air Station San Francisco as a historic district that is eligible for listing in the National Register for its associations with the development of SFO and the U.S. Coast Guard and with World War II search and rescue operations. It is also significant as one of the first Coast Guard air stations constructed on the Pacific Coast (see Chapter III, Current Historic Status). At the time of this writing, the historic district has not been formally listed in any local, state, or national registers.

The air station was constructed on 20.53 acres of the former San Francisco Municipal Airport that was donated by the City to the federal government for the purpose of establishing a Coast Guard air station. The historic district is located entirely within the boundary of the federally owned U.S. Coast Guard property within the larger SFO property, as shown in Figure 1b. The air station's taxiway is connected to the Airport's system of runways; according to historical photographs, this same configuration existed during World War II when the air station was newly constructed (see **Figure 48**). The air station appears to have been constructed as a clearly identifiable collection of buildings independent from and unrelated to the Airport and within a clearly defined boundary that corresponds to the current property boundary. Based on the previous evaluation of the U.S. Coast Guard Air Station San Francisco, no buildings located within the RADP boundary, including the 11 subject buildings, are associated with the district and no further analysis is required.[118]

[117] Allan Temko, "S.F. Airport—It Should Have Been Scrapped," San Francisco Chronicle, April 10, 1978, p. 6.
[118] The U.S. Coast Guard Air Station San Francisco and the United Airlines San Francisco Maintenance Operations Center are both located more than 100 feet from the nearest RADP projects. No adverse impacts would occur as a result of RADP projects.

SOURCE: California State Military Museum (www.militarymuseum.org). Recommended Airport Development Plan HRE

Figure 48
U.S. Coast Guard Air Station San Francisco during World War II, c. 1945.

2. United Airlines San Francisco Maintenance Operations Center

As noted above, the RADP boundary does not include the United Airlines San Francisco Maintenance Operations Center, which is located in the Airport's North Field on land that is leased and operated by United Airlines (see Chapter V, RADP Project Boundary). Since the establishment of the Maintenance Operations Center in c. 1941-1942, it has operated and developed independently of the Airport. For these reasons, the Maintenance Operations Center is not analyzed as part of this HRE.

3. Potential Historic District that Includes the 11 Age-Eligible Buildings in the RADP Boundary

Based on the architectural descriptions provided above and documentation of the physical development of SFO, the 11 age-eligible buildings do not together form a discontiguous district. None of the 11 subject buildings appear to be significantly related in terms of architectural design, function, or historical development. As such, none of the 11 subject buildings contribute to a potential historic district.

4. Potential Historic District(s) within the RADP Boundary that Include One or More Age-Eligible Buildings within the RADP Boundary

Based on an analysis of data presented in Appendix A and the spatial relationships between extant buildings on the Airport property, no apparent patterns emerge to suggest that there is a potential historic district or districts that include one or more of the 11 subject buildings, as further discussed below.

Buildings Designed by the Same Architect

- At least three extant buildings were designed by Gensler: Buildings 200 (2011), 300D (2011), and 400E (2014). However, this group of buildings does not include any of the 11 subject buildings. Furthermore, none of these buildings are age eligible.
- At least three extant buildings were designed by Kwan Henmi Architecture/Planning: Buildings 279, 379, and 479 (AirTrain stations for Terminals 1, 2, and 3, all constructed in 2003). However, this group of buildings does not include any of the 11 subject buildings. Furthermore, none of these buildings are age eligible.

Buildings Related by Construction Date

(Any of the 11 age-eligible subject buildings are shown in bold type below for context.)

- Buildings generally constructed during the 1960s include Buildings **575**, **585**, 602, 606, 612, 624, 660, 676, **682**, **710**, and **750**. All of these buildings are located in the West Field, which is the portion of the Airport that was last to be filled and developed. Despite being temporally and geographically related, these buildings do not appear to represent a unified entity in that they are not historically, functionally, or aesthetically related.
- Buildings generally constructed during the 1970s include Buildings **195**, 400, **400F**, 670, **692**, 730, 908, 918, and **928/928A**. These buildings are variously located in the terminal area and the North and West fields. The buildings located in the terminal area were constructed as part of the Terminal Area Master Plan during the 1970s and 1980s, and, as discussed above, a building's association with the master plan does not confer significance under California Register Criterion 1. Considerable alterations have been made to the buildings and structures constructed as part of the Terminal Area Master Plan, and the terminal area has also been enlarged in the 21st century. As a result of these continual changes, the buildings and structures located in the terminal area do not appear to represent a unified entity, and many are not age eligible, nor are the buildings located in the North and West fields historically, functionally, or aesthetically related.
- Buildings generally constructed during the 1980s include Buildings 200B, 200C, 790, and **944**. These buildings are variously located in the terminal area and the North and West fields. Despite being temporally related, these buildings do not appear to represent a unified entity in that they are not historically, functionally, or aesthetically related.

Buildings Historically Operated by the Same Airline

- At least five extant buildings have historically been operated by United Airlines: Terminal 3 (1979), B/As E (reconstructed 2014) and F (1976–1979), and Buildings 575 (1969) and 585 (1966). These buildings are grouped in two distinct areas – one in the terminal area and one in the West Field – and were functionally linked to the United Airlines Service Center, which was demolished before 2000 and replaced with the new International Terminal and B/A G. The service center, which opened in 1958–1959, occupied 47 acres and contained an expansive hangar designed by Skidmore, Owings & Merrill, a cafeteria and parking lot for United Airlines employees, a flight kitchen, a washing facility for aircraft, and a boiler plant. The extant United Airlines-related buildings were constructed in close proximity to the service center, but since its demolition, the remaining buildings no longer appear to be functionally or aesthetically related.

Buildings Related by Architectural Style

- Among the 11 subject buildings, there is no apparent stylistic consistency beyond certain functional and utilitarian considerations. The prevalence of buildings of a utilitarian nature at the Airport does not denote architectural or engineering significance.

5. Potential Historic District(s) that Include One or More Age-Eligible Buildings Within the RADP Boundary and Historic Resources Adjacent to the Project Site

The only known historic resource adjacent to the project site is the U.S. Coast Guard Air Station San Francisco; a historic district that has been determined eligible for listing on the National Register. As described above, based on the evaluation of the U.S. Coast Guard Air Station San Francisco by Carey & Company in 1998, no buildings located within the RADP boundary, including the 11 subject buildings, are associated with the historic district. Furthermore, none of the 11 subject buildings appear to be significantly related to the historic district in terms of architectural design, function, or historical development. As such, none of the 11 subject buildings combine with historic resources adjacent to the project site to form a potential historic district.

6. Potential Historic District(s) Within the RADP Boundary that Do Not Include Age-Eligible Buildings Within the RADP Boundary

The identification of potential historic districts that do not include any of the 11 subject buildings is outside the scope of this evaluation.

CHAPTER IX

Integrity

In addition to being eligible for listing under at least one of the four California Register significance criteria (1 through 4), a property must also retain sufficient integrity to convey its historical significance in order to be considered a historical resource. The California Register defines integrity as the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. A property is examined for seven aspects that together comprise integrity. These aspects, which are based on the National Register criteria for evaluation, are location, design, setting, materials, workmanship, feeling, and association.

As discussed above, because none of the 11 subject buildings appear to be individually significant under any California Register criteria or contributors to known or potential historic districts, a discussion of integrity is not necessary.

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER X
Conclusion

Based on a site survey, archival research, and analysis, ESA finds the 11 subject buildings at SFO ineligible for individual listing in the California Register. Nor do these buildings appear to contribute to any known or potential historic districts. As such, the subject buildings would not be considered historical resources for the purposes of CEQA.

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER XI
Sources

A. Publications

1. Newspaper and Newsletter Articles

"$4,000,000 Runway Next Development at Airport," *San Francisco Chronicle*, July 8, 1948, p. 9.

"Airport Garage OKd," *San Mateo Times*, December 18, 1974, p. 23.

"Airport Noise Study Gets OK," *San Mateo Times*, December 4, 1974, p. 55.

"Big Jet-Age Airport Play Okayed Here," *San Francisco Chronicle*, February 4, 1959, pp. 1, 4.

Blum, Walter, "Coping: Clearing the Air at the Airport," *California Living: The Magazine of the San Francisco Examiner & Chronicle*, July 20, 1980, pp. 14–18.

"Capital Design Firm Takes Top State Honor—Dreyfuss & Blackford Has Major Landmarks in Area," *Sacramento Bee*, October 7, 2012, p. D1.

"Chinatown Project First of Six Local Housing Developments," *San Francisco Chronicle*, July 3, 1949, p. 2.

"Consultants for Airport Construction," *San Francisco Chronicle*, December 4, 1974, p. 3.

Frederickson, Abby Jane, "From a Mud Hole by the Bay to San Francisco's Airport, Part 1," *The Boutique & Villager* (Hillsborough Weekly Newspaper), April 16, 1974, p. B1. Quoted in David Chavez & Associates, *Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR, San Mateo County, California*, February 1991.

"Glen Park, De Haro Plaza Home Projects Open Bids," *San Francisco Chronicle*, March 29, 1942, p. 9.

Grimes, William, "John Carl Warnecke, Architect to Kennedy, Dies at 91," *New York Times*, April 23, 2010, p. A25.

Hinckle, Warren, "Will BART Ever Go to SFO?" *San Francisco Examiner*, September 16, 1990, pp. B1 and B8.

Hope, Douglas, "Architect Blackford Drew Blueprint for His Life's Work in Kindergarten," *Sacramento Bee*, December 20, 1970, p. B3.

"Huge Airport Garage Opens," *San Mateo Times*, October 13, 1964, section 2, p. 13.

"Jacobs Engineering Agrees to Buy Sverdrup," *Los Angeles Times*, December 10, 1998, n.p.

Johnston, Richard, "Making the Most of a Belvedere …" *San Francisco Chronicle*, May 5, 1957, p. 4.

Kaskel, Bruce S, "The Metal and Glass Curtain Wall," *Cultural Resources Management*, Vol. 18, No. 8, pp. 23–27, Published by the National Park Service, 1995.

King, John, "John Warnecke—S.F. Architect with Cloe Ties to Kennedy Clan" (obituary), *San Francisco Chronicle*, May 7, 2010, p. C8.

"Plans for Garage Presented to PUC," *San Francisco Chronicle*, July 4, 1962, p. 2.

Power, Keith, "An OK for New Boarding Area at S.F. Airport," *San Francisco Chronicle*, March 19, 1975, p. 19.

"San Francisco's Airport of the Future," *San Francisco Chronicle*, March 26, 1943, p. 26.

"San Francisco Meets Challenge," *San Francisco News*, October 15, 1956, p. 14.

"Silvio P. Marraccini Dies at 52," *San Francisco Chronicle*, July 11, 1970, p. 27.

Temko, Allen, "S.F. Airport—It Should Have Been Scrapped," *San Francisco Chronicle*, April 10, 1978, p. 6.

----, "S.F. Airport—The Bland, Empty Look," *San Francisco Chronicle*, April 17, 1978, p. 6.

TWA, "Jets Bring About Need for Improved Ground Facilities and New Plan of Financing," *Skyliner (Trans World Airlines Weekly Employee Publication)*, Vol. 20, No. 10, March 7, 1957, p. 3.

"United Expands at Mills Field," *San Mateo Times*, February 6, 1957, p. 17.

Wilson, Richa and Kathleen Snodgrass, "Early 20th-Century Building Materials: Siding and Roofing," *Facilities Tech Tips, United States Department of Agriculture Forest Service*, February 2008, pp. 6–7.

2. Books

Davies, R.E.G., *Airlines of the Jet Age: A History*, Washington, D.C.: Smithsonian Institution Scholarly Press, 2016.

Decker, Julie and Chris Chiel, *Quonset Hut: Metal Living for a Modern Age*, New York: Princeton Architectural Press, 2005.

Derdack, Thomas and Tina Grant, "Sverdrup Corporation," *International Directory of Company Histories, Volume 14*, St. James Press, 1996, pp. 473–477.

Hill, John H., et al., *SFO: A Pictorial History of the Airport*, San Francisco: San Francisco Airport Commission, 2000.

3. Reports

Alessandro Baccari & Associates, *San Francisco International Airport: A Socioeconomic View*, 1975. Quoted in David Chavez & Associates, *Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR, San Mateo County, California*, February 1991.

Carey & Co., *Cultural Resources Survey: U.S. Coast Guard Air Station, San Francisco California*, July 1998.

City and County of San Francisco Airport Commission, *San Francisco International Airport Terminal Area Master Plan*, 1985, in the collection of the SFO Museum, Accession No. 2002.133.010.

David Chavez & Associates, *Cultural Resources Evaluation for the San Francisco International Airport Master Plan EIR, San Mateo County, California*, February 1991.

ESA, *Final Historical Resources Report Final Historical Resources Report: Information Regarding the Eligibility of Properties at San Francisco International Airport for Inclusion on the National Register of Historic Places or the California Register of Historic Resources*, December 2000, Addendum (by ESA/Carey & Co.), 2001.

PCR Services Corporation, *LAX Master Plan Draft EIS/EIR*, Appendix 1: Section 106 Report, January 2001.

Roland-Nawi Associates, *Draft National Register of Historic Places Registration Form for the SMUD Headquarters Building*, 2009.

The San Francisco Airport Architects, *San Francisco International Airport: Definitive Plan*, 1968, in the collection of the SFO Museum, Accession No. 2016.148.018.

San Francisco Airport Commission, *San Francisco International Airport Final Draft Master Plan*, November 1989, in the collection of the SFO Museum, Accession No. 2 002.133.005.002.

San Francisco International Airport, *Airport Layout Plan*, approved by the Federal Aviation Administration on September 23, 2016.

———, *Draft Final Airport Development Plan 2016: Executive Summary*, September 2016.

San Francisco Planning Department, *San Francisco Modern Architecture and Landscape Design 1935–1970 Historic Context Statement*, January 2011.

Skidmore, Owings & Merrill LLP et al., *Conceptual Master Plan Proposal for the North Terminal Renovation*, June 1996, In the collection of the SFO Museum, Accession No. 2010.138.019.

URS, *Historic Architecture Survey Report for the Runway Safety Area Program at San Francisco International Airport*, June 2011.

B. Unpublished

California Office of Historic Preservation, *Historic Resources Inventory Directory for San Mateo County*, April 2012.

San Francisco Public Library History Room, "SF Airports, San Francisco International—History" (clipping file).

SFO Museum, Miscellaneous reports, documents, and photographs, Accessed September 11, 2017.

Urbani, Raquel, Art Director, Dreyfuss & Blackford, "Re: SFO Master Plan Project Award Info," Email correspondence with Johanna Kahn, ESA, October 2 and 9, 2017. Attachments include archival records about projects completed by the San Francisco Airport Architects.

C. Internet

Airport LA, "LAX Cargo," 2017, https://www.airport-la.com/info/cargo.html, accessed September 25, 2017.

Aviation Schools Online, "California Aircraft Maintenance Schools," http://www.aviationschoolsonline.com/aircraft-maintenance-schools/California/, accessed September 24, 2017.

Butler Manufacturing Company, "About Us," http://www.butlermfg.com/about_us, accessed October 17, 2015.

California State Military Museum, http://www.militarymuseum.org, accessed March 19, 2018.

Caltrans Office of System and Freight Planning, "Freight Planning Fact Sheet: Los Angeles International Airport," July 2012, http://www.dot.ca.gov/hq/tpp/offices/ogm/air_cargo/Los_Angeles_Airport_Fact_Sheet_072512.pdf, accessed September 25, 2017.

Department of Transportation, Federal Aviation Administration, *Draft Environmental Impact Statement for San Francisco International Airport Development Program, Vol. I*, April 1976, http://books.google.com, accessed November 6, 2017.

Dreyfuss & Blackford, "Projects," 2017, http://www.dreyfussblackford.com/about/projects/, accessed September 25, 2017.

———, "Recognition," 2017, http://www.dreyfussblackford.com/about/recognition/, accessed September 18, 2017.

Dyett & Bhatia, *Environmental Resources and Conservation Element of the San Bruno General Plan*, March 2009, p. 6.11, https://www.sanbruno.ca.gov/civicax/filebank/blobdload.aspx?BlobID=24019, accessed March 19, 2018.

Hall, William J. "Henry J. Degenkolb," *Memorial Tributes: National Academy of Engineering, Volume 4*, The National Academies of Sciences, Engineering, and Medicine, 1991, pp. 44–49, http://www.nap.edu/read/1760/chapter/10#48, accessed September 18, 2017.

Historic Aerials, http://www.historicaerials.com, accessed August 17, 2017.

Los Angeles World Airports, "LAX Air Cargo," 2017, http://www.lawa.org/welcome_lax.aspx?id=776, accessed September 25, 2017.

Lufthansa, "Lufthansa to Introduce First-Ever A380 Service to San Francisco" (press release), January 26, 2011, https://www.lufthansa.com/mediapool/pdf/69/media_931369.pdf, accessed March 6, 2018.

Maynard, Mike, et al., *Airport Cooperative Research Program Report 143: Guidebook for Air Cargo Facility Planning and Development*, Washington, D.C.: National Academy of Sciences, 2015, https://www.nap.edu/catalog/21906/guidebook-for-air-cargo-facility-planning-and-development, accessed November 13, 2017.

Pacific Coast Architecture Database, "Stone, Marraccini, and Patterson, Architects (Partnership)," http://pcad.lib.washington.edu/firm/473/, accessed September 18, 2017.

———, "Warnecke, John Carl, and Associates, Architects (Partnership)," http://pcad.lib.washington.edu/firm/1151/, accessed September 18, 2017.

PBS&J, *Burlingame Downtown Specific Plan Initial Study/Mitigated Negative Declaration*, May 2010, pp. 218-222, https://www.burlingame.org/document_center/Planning/General%20and%20Specific%20Plans/Draft%20Initial%20Study%20Mitigated%20Negative%20Declaration.pdf, accessed March 19, 2018.

San Diego International Airport, "Frequently Asked Questions," 2017, http://www.san.org/Travel-Info/FAQs?QuestionID=43&AFMID=1307, accessed November 10, 2017.

———, "Parking," 2017, www.san.org/Parking-Transportation/Parking, accessed October 27, 2017.

San Francisco Airport Architects and Wilbur Smith & Associates, Rapid Transit to the San Francisco International Airport, October 1, 1969, https://archive.org/details/rapid-transit-to-sfo, accessed September 13, 2017.

San Francisco Airport Commission, San Francisco International Airport Expansion Program, 1973, https://cors.archive.org/details/sanfranciscointe1973sanf, accessed August 21, 2017.

San Francisco Board of Supervisors, "Resolution No. 071580 approving and authorizing the execution of Lease Agreement L-07-0255 with Singapore Airlines Cargo Pte., Ltd. For cargo warehouse and office space in Building 710 on Plot 12 of San Francisco International Airport," adopted January 15, 2008, http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/resolutions08/r0018-08.pdf, accessed September 1, 2017.

———, "Resolution No. 100983 approving and authorizing the execution of Modification No. 1 to Lease No. L01-0297 with Japan Airlines Company Limited to reduce the demised premises and the annual rent at Building 944 on Plot 50B-1 at San Francisco International Airport," adopted October 5, 2010, https://sfgov.legistar.com/View.ashx?M=F&ID=1051775&GUID=F0D83FC8-DD5F-41DC-95E6-482152CD95C9, accessed September 1, 2017.

San Francisco International Airport, "Design Review Committee Guidelines for Terminal 3," 2016, https://sfoconnect.com/sites/default/files/T3_Hub_Concessions_Guidelines_08-2016.pdf, accessed November 9, 2017.

———, "Fact Sheet for Calendar Year 2016," 2017, https://media.flysfo.com/2016_Fact_Sheet.pdf, accessed September 25, 2017.

———, “Fact Sheet for Calendar Year 2017,” 2018, https://media.flysfo.com/2017_Fact_Sheet%5B1%5D.pdf, accessed March 19, 2018.

———, “SFO Business Center Open for Business” (press release), July 28, 2010, www.flysfo.com/media/press-releases/sfo-business-center-open-business, accessed September 18, 2017.

———, “Weather and Operations at SFO: A Primer for the Media,” January 2010, http://media.flysfo.com/media/sfo/media/weather-operations-primer_0.pdf, accessed August 17, 2017.

San Francisco International Airport, Various SFO design and construction drawings, accessed August through November 2017.

United, “United Club Locations and Other United Lounges,” https://www.united.com/web/en-US/content/travel/airport/lounge/locations/default.aspx, accessed November 6, 2017.

United States Code, http://uscode.house.gov/, accessed August 25, 2017.

U.S. Department of Transportation, Federal Aviation Administration, “Advisory Circular: Airport Terminal Planning and Design (Draft),” https://www.faa.gov/documentLibrary/media/Advisory_Circular/draft-150-5360-13a.pdf, accessed July 22, 2016.

———, “Advisory Circular 150/5300-13A, Airport Design,” September 28, 2012. https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.information/documentNumber/150_5300-13A, accessed January 18, 2018.

———, “Preliminary Enplanements at All Commercial Service Airports (by Rank),” 2017, https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/?year=all, accessed August 21, 2017.

Yesterday’s Airlines, “San Francisco International Airport: Gateway to the Golden Gate Part 3: 1978–2015,” 2017, http://www.yesterdaysairlines.com/san-francisco---1978-2015.html, accessed August 21, 2017.

[THIS PAGE INTENTIONALLY LEFT BLANK]

APPENDIX A

Inventory of Buildings Located within RADP Boundary

San Francisco International Airport
Recommended Airport Development Plan (RADP) EIR
Appendix A: Inventory of Buildings Located Within RADP Boundary

BUILDING NO.	ONGOING OR RADP?	EXISTING FACILITY NAME	TYPE/ FUNCTION	BUILD YEAR [1]	YEAR(S) CONSTRUCTED (IF KNOWN) [2]	ARCHITECT (IF KNOWN) [2]	BUILDING LOCATION IN FIGURES 1A-1E
12	N/A	Emergency Rescue Fire Fighting Facility (ERF #3)	Airport Support	2017			Figure 1d
95	N/A	Parking Garage A	Parking	2000			Figure 1d
97	RADP	Garage A AirTrain Station	Passenger Transport	2003			Figure 1d
100	N/A	International Terminal Building	Passenger Terminal	2000	2000	SOM, Del Campo & Maru Architects, and Michael Willis Associates	Figures 1a, 1d
100A	N/A	International Terminal Boarding Area A	Passenger Terminal	2000	2000	Gerson/ Overstreet Architects	Figures 1a, 1d
100G	N/A	International Terminal Boarding Area G	Passenger Terminal	2000	2000	HOK, Robin Chiang & Co., Robert Wong Associates	Figures 1a, 1d
179	RADP	International Terminal G AirTrain Station	Passenger Transport	2001			Figure 1d
195	**RADP**	**Central Parking Garage**	**Parking**	**1974**	**1963-1981**	**San Francisco Airport Architects, Edward B. Page**	**Figures 1a, 1d**
197	RADP	International Terminal A AirTrain Station	Passenger Transport	2001			Figure 1d
200	Ongoing	Terminal 1	Passenger Terminal	Not available [4]	2016-2024		Figures 1a, 1d
200B	Ongoing	Terminal 1 Boarding Area B	Passenger Terminal	1984[4]			Figures 1a, 1d
200C	Ongoing	Terminal 1 Boarding Area C	Passenger Terminal	1984			Figures 1a, 1d
279	RADP	Terminal 1 AirTrain Station	Passenger Transport	2003		Kwan Henmi Architecture/ Planning	Figure 1d
300	N/A	Terminal 2	Passenger Terminal	2011		Gensler	Figures 1a, 1d
300D	N/A	Terminal 2 Boarding Area D	Passenger Terminal	2011		Gensler	Figures 1a, 1d
379	RADP	Terminal 2 AirTrain Station	Passenger Terminal	2003		Kwan Henmi Architecture/ Planning	Figure 1d

BUILDING NO.	ONGOING OR RADP?	EXISTING FACILITY NAME	TYPE/ FUNCTION	BUILD YEAR [1]	YEAR(S) CONSTRUCTED (IF KNOWN) [2]	ARCHITECT (IF KNOWN) [2]	BUILDING LOCATION IN FIGURES 1A-1E
400	N/A	Terminal 3	Passenger Terminal	1979		San Francisco Airport Architects	Figures 1a, 1d
400E	N/A	Terminal 3 Boarding Area E	Passenger Terminal	2014		Gensler	Figures 1a, 1d
400F	**RADP**	**Terminal 3 Boarding Area F**	**Passenger Terminal**	**1976**	**1976-1979**	**San Francisco Airport Architects**	**Figures 1a, 1d**
479	RADP	Terminal 3 AirTrain Station	Passenger Transport	2003		Kwan Henmi Architecture/ Planning	Figure 1d
495	N/A	Parking Garage G	Parking	2000			Figure 1d
497	RADP	Garage G BART and AirTrain Station	Passenger Transport	2003			Figure 1d
575	**RADP**	**SFO Business Center**	**Airport Support & Airport**	**1969**	**1969**	**Unknown**	**Figures 1a, 1d**
585	**RADP**	**United Airlines Cargo Building**	**Air Cargo**	**1966**	**1966**	**Unknown**	**Figures 1a, 1d, 1e**
602	Ongoing	Swissport Cargo Building	Air Cargo	1969			Figures 1d, 1e
606	Ongoing	American Airlines Cargo Building	Air Cargo & Airport Maintenance	1967			Figures 1d, 1e
612	Ongoing	Northwest Airlines Cargo Building	Air Cargo & Airport Office	1969			Figures 1d, 1e
620	N/A	North MPOE (MPOE #1)	Support facility	1998			Figure 1e
624	Ongoing	West Cargo Building No. 7	Air Cargo	Not available	1969		Figure 1e
632	N/A	West Cargo Joint Use Freight Building No. 7	Air Cargo	2014			Figures 1d, 1e
638	RADP B/A F Variant	West Field Employee Parking Garage No. 1	Parking	1999			Figures 1d, 1e
642	RADP	UA Ground Service Equipment Building (To Be Partially Demolished)	GSE maintenance	1997			Figures 1d, 1e
642	RADP B/A F Variant	UA Ground Service Equipment Building (To Be Demolished)	GSE maintenance	1997			Figures 1d, 1e

BUILDING NO.	ONGOING OR RADP?	EXISTING FACILITY NAME	TYPE/ FUNCTION	BUILD YEAR [1]	YEAR(S) CONSTRUCTED (IF KNOWN) [2]	ARCHITECT (IF KNOWN) [2]	BUILDING LOCATION IN FIGURES 1A-1E
648	RADP B/A F Variant	West Field Cargo Building No. 1	Air Cargo	2001			Figures 1d, 1e
649	RADP	Flight Kitchen	Airline Support	1998			Figures 1d, 1e
650	RADP B/A F Variant	Emergency Rescue Fire Fighting Facility (ERF #1)	Police and Fire	1998			Figures 1d, 1e
660	N/A	Airport Post Office (United States Postal Service)	Air Cargo	1967			Figures 1d, 1e
670	Ongoing	Airport Museum	Museum Support & Education	1978			Figure 1e
676	Ongoing	Jason Yuen Architectural Building	Airport	1967			Figure 1e
677	RADP	West Field Road AirTrain Station	Passenger Transport	2003			Figure 1e
679	N/A	AirTrain Maintenance and Storage Facility	Airport Maintenance	1999			Figure 1e
682	**RADP**	**Facilities Maintenance Center**	**Airport Maintenance**	**1974**	**1968-1974**	**Stone, Marraccini & Patterson**	**Figures 1a, 1e**
692	**RADP**	**Sheet Metal Shop**	**Airport Maintenance**	**1966**	**1974**	**Stone, Marraccini & Patterson**	**Figures 1a, 1e**
710	**RADP**	**Cargo Building/ Office**	**Airport Maintenance**	**1967**	**1968**	**Unknown**	**Figures 1a, 1e**
730	Ongoing	Cargo Building	Air Cargo	1971			Figure 1e
750	**RADP**	**GSE Building**	**Airport Maintenance**	**1971**	**1969**	**Unknown**	**Figures 1a, 1e**
779	RADP	Rental Car Center (RCC) AirTrain Station	Passenger Transport	1998			Figure 1e
780	RADP	Rental Car Center (RCC)	Support facility	1998			Figure 1e
782	RADP	Rental Car Quick Turnaround Facility	Parking	1998			Figure 1e
786	N/A	Lot D Parking Office	Support facility	1995			Figure 1b
790	Ongoing	Shuttle Bus Vehicle Maintenance Building	Parking	1983			Figures 1b, 1e
795	N/A	Long-Term Parking Garage #1	Parking	1994			Figure 1b

BUILDING NO.	ONGOING OR RADP?	EXISTING FACILITY NAME	TYPE/ FUNCTION	BUILD YEAR [1]	YEAR(S) CONSTRUCTED (IF KNOWN) [2]	ARCHITECT (IF KNOWN) [2]	BUILDING LOCATION IN FIGURES 1A-1E
900	N/A	North Field Cargo Building	Air Cargo	2000			Figure 1b
904	N/A	SFO Fuel Maintenance and Operations Building	Support facility	2000			Figure 1b
908	Ongoing	Mel Leong Treatment Plant/ Industrial Waste Process	Support facility	1974			Figure 1b
918	Ongoing	Mel Leong Treatment Plant/ Administrative Building	Support facility	1974			Figure 1b
922	Ongoing	Mel Leong Treatment Plant/ SBR Sanitary Process	Support facility	2005			Figure 1b
928 & 928A	**RADP**	**City College of San Francisco Airport Campus and Ancillary Building**	**Education**	**1976 (928)**	**1976 (928) c. 1976 [3] (928A)**	**Unknown**	**Figures 1a, 1b**
944	**RADP**	**Cargo Building**	**Airline Support**	**1980**	**1980**	**Unknown**	**Figures 1a, 1b**
1030	N/A	Marine Emergency Response Facility (ERF #4)	Police and Fire	2014			Figure 1c
1050	N/A	FBO Hangar D	General Aviation	1997			Figure 1c
1051	N/A	FBO Hangar C	General Aviation	2014			Figure 1c
1052	N/A	FBO Hangar B	General Aviation	1997			Figure 1c
1054	N/A	FBO Terminal A	General Aviation	1997			Figure 1c
1055	N/A	FBO Fuel and Maintenance Shop	General Aviation	1997			Figure 1c
1055AR	N/A	SFO ITT	Infrastructure	Not available	c. 2002 [3]		Figure 1c
1056	N/A	Airfield Operations Vehicle Garage	Parking	2015			Figure 1c
1057	N/A	Airfield Operation Building	Airport	2015			Figure 1c
1059	Ongoing	San Francisco Police Department Training Facility and Shooting Range	Police and Fire	2018			Figure 1c

BUILDING NO.	ONGOING OR RADP?	EXISTING FACILITY NAME	TYPE/ FUNCTION	BUILD YEAR [1]	YEAR(S) CONSTRUCTED (IF KNOWN) [2]	ARCHITECT (IF KNOWN) [2]	BUILDING LOCATION IN FIGURES 1A-1E
1060	N/A	Superbay Hangar	Airline Support	1969			Figures 1a, 1c
1064	Ongoing	Emergency Rescue Fire Fighting Facility (ERF #2)	Police and Fire	1995			Figure 1c
1064A	N/A	Emergency Rescue Fire Fighting Facility (ERF #2) Ancillary	Police and Fire	1994			Figure 1c
1070	**RADP**	**GSE Building**	**GSE maintenance**	**1950**	**1950**	**Unknown**	**Figures 1a, 1c**

Source: SFO, November 2017.

NOTES:
1 Dates listed under Build Year generally reflect the completion of construction.
2 Data confirmed by ESA
3 Historic aerial photos in the collection of the SFO Museum
4 Demolished or partially demolished as part of ongoing project

Final

RECOMMENDED AIRPORT DEVELOPMENT PLAN SAN FRANCISCO INTERNATIONAL AIRPORT, SAN FRANCISCO, CALIFORNIA

Historic Resources Evaluation Part 1 Addendum

Prepared for
San Francisco International Airport

June 2019

Final

RECOMMENDED AIRPORT DEVELOPMENT PLAN SAN FRANCISCO INTERNATIONAL AIRPORT, SAN FRANCISCO, CALIFORNIA

Historic Resources Evaluation Part 1 Addendum

Prepared for
San Francisco International Airport

June 2019

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900
www.esassoc.com

ESA

Bend
Camarillo
Delray Beach
Destin
Irvine
Los Angeles
Miami
Oakland
Orlando
Pasadena
Petaluma
Portland
Sacramento
San Diego
San Francisco
Santa Monica
Sarasota
Seattle
Sunrise
Tampa

CONTENTS

Recommended Airport Development Plan San Francisco International Airport Historic Resources Evaluation Part 1 Addendum

Appendix

Figures

Tables

CHAPTER I

Introduction

In June 2018, ESA completed The Recommended Airport Development Plan (RADP), San Francisco International Airport, Historic Resources Evaluation Part 1 (HRE or 2018 HRE). That document evaluated 11 structures identified for alteration or demolition at San Francisco International Airport (SFO or the Airport) as part of the proposed RADP. These 11 buildings were identified because they currently meet, or will meet the 45-year age criterion by the full build-out of the RADP in 2035. In a letter dated June 25, 2018, the San Francisco Planning Department determined that none of the 11 buildings qualify as historic resources, nor do they contribute to an eligible historic district, for the purposes of the California Environmental Quality Act (CEQA).[1] In January 2019, the RADP was modified to include demolition of Building 730, a structure not evaluated in the 2018 HRE. Because this building was constructed c. 1971, it meets the 45-year age criterion under CEQA. This addendum draws from the historical contexts, summaries, and relevant background information presented in the HRE for the assessment of Building 730 as a historic resource for the purposes of CEQA.

This report provides an architectural description of the building, discusses the building's current historic status, and evaluates its potential historic significance both as an individual resource and as a contributor to potential historic districts. The evaluation of Building 730 is based on information presented in the 2018 HRE and excerpted in this assessment as needed.

Becky Urbano, M.S., a senior architectural historian, is the author of this report. Johanna Kahn, M.Ar.H., an architectural historian, is the author of the 2018 HRE, used as the foundation of this assessment. Eryn Brennan, M.Ar.H., M.U.E.P, an architectural historian and urban planner, provided senior review. The author and reviewer of this report, as well as the author of the 2018 HRE, meet the Secretary of the Interior's Professional Qualification Standards for architectural history.

[1] San Francisco Planning Department, *Preservation Team Review Form*, June 25, 2018.

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER II
Summary

Building 730 was constructed in 1971 and serves a variety of functions including cargo distribution, temporary cargo storage, and tenant offices. The building was not found to be individually significant under any California Register criteria, nor does it appear to contribute to any known or potential historic districts on the SFO property. As such, Building 730 is not considered a historical resource for the purposes of CEQA.

[THIS PAGE INTENTIONALLY LEFT BLANK]

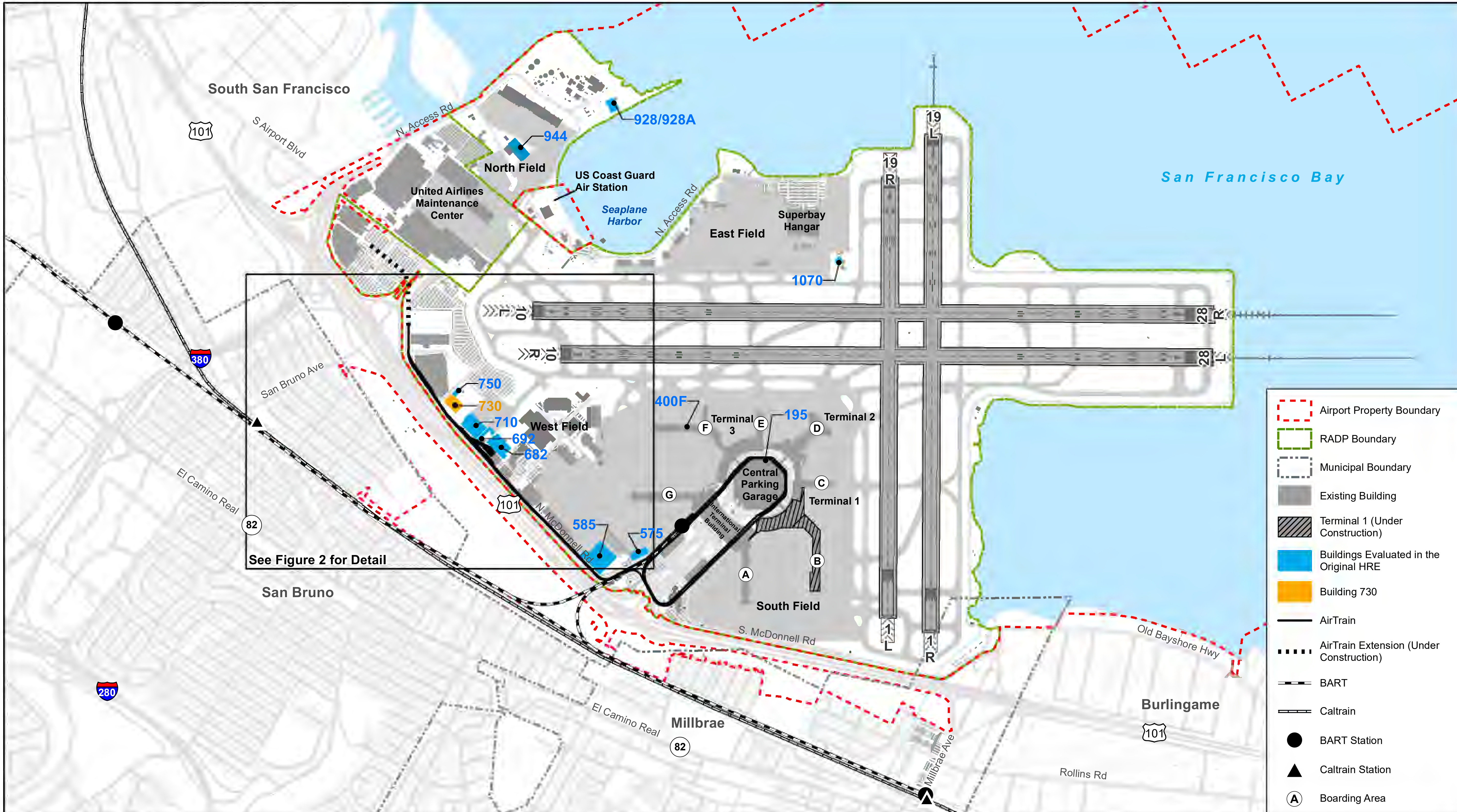
CHAPTER III

Project Description

The RADP identifies projects that would accommodate long-term demand at the Airport, which is forecast to reach 71.1 million annual passengers (MAP) at the estimated maximum airfield capacity with the existing geometry. Initially, proposed RADP projects included demolition or alteration of 11 existing buildings and structures that currently meet or will meet the 45-year age criterion by full build-out in 2035. These buildings were evaluated in the 2018 HRE and none were found to be historic for the purposes of CEQA. Modification of the RADP in January 2019 added demolition of Building 730 to the list of proposed projects. The 12 age-eligible buildings proposed for demolition or alteration are identified in **Figure 1**. Building 730 is included in the West Field as shown in **Figure 2**.[2]

[2] The figure numbers in this addendum are consistent with figures shown in the 2018 HRE. These figures have been updated to include Building 730.

[THIS PAGE INTENTIONALLY LEFT BLANK]

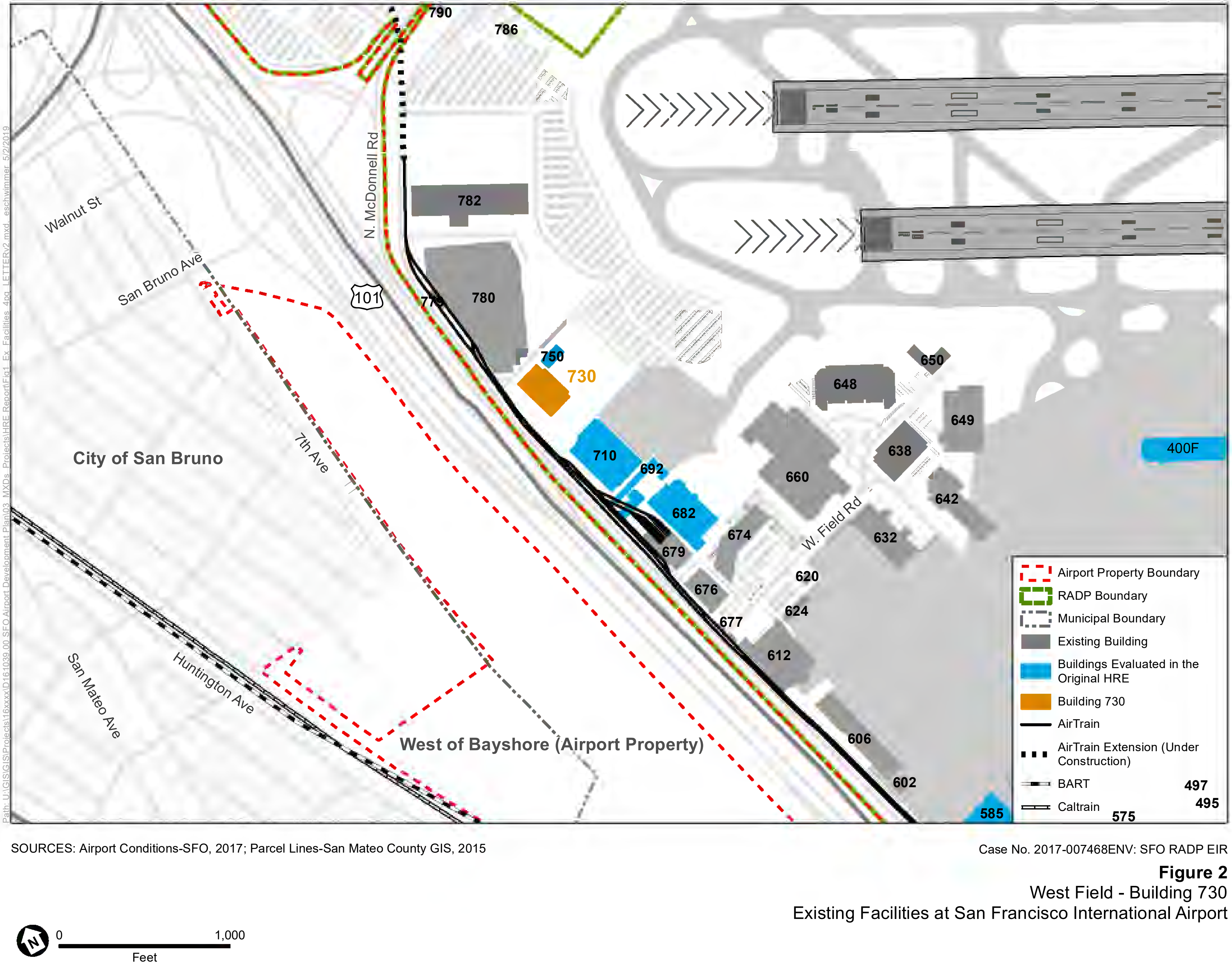


SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

Case No. 2017-007468ENV: SFO RADP EIR

Figure 1
Existing Facilities at San Francisco International Airport

[THIS PAGE INTENTIONALLY LEFT BLANK]



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

Case No. 2017-007468ENV: SFO RADP EIR

Figure 2
West Field - Building 730
Existing Facilities at San Francisco International Airport

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER IV
Property and Building Description

A. Project Site

SFO is owned by the City and County of San Francisco (City or CCSF) and operated by and through the San Francisco Airport Commission. The Airport is located approximately 13 miles south of downtown San Francisco, and encompasses approximately 5,200 acres in San Mateo County. The majority of the Airport property is in unincorporated San Mateo County but parts of the Airport and property are located within the city boundaries of South San Francisco, San Bruno, Millbrae, and Burlingame. SFO is bordered on the south and east by San Francisco Bay, on the west by the City of San Bruno, and on the north by the City of South San Francisco.

The RADP project site includes the portions of SFO located east of U.S. 101 that contain the runway complex, passenger terminals, and airport and airline maintenance, air cargo, and other aviation support facilities. The project site boundary (also called the RADP boundary) includes the portion of the SFO property east of U.S. 101 bounded by South McDonnell Road and Millbrae Avenue to the south; the bay to the east and north; and North Access Road, North Field Road, and South Airport Road/North McDonnell Road to the west—excluding the U.S. Coast Guard Air Station and the United Airlines Maintenance Operations Center. Building 730 is located on West Area Road in the West Field section of the property.

Because of the West Field's proximity to the terminal complex, its primary functions include air cargo, overnight aircraft parking, employee parking garages, an AirTrain storage and maintenance facility, and SFO and airline administration and maintenance facilities. An existing flight kitchen facility is also located in the West Field.

B. Building 730

1. Exterior

Building 730 is located in the West Field and has frontage on both West Area Drive and North McDonnell Road. The one-story, concrete and steel-frame building is rectangular in plan and capped by a flat roof. The exterior walls are inset slightly, creating a flat frieze at the roof. The bottom edge of the frieze slopes down and in to meet the recessed wall plane. Seven contemporary illuminated sign boxes of varying size are mounted within the frieze. All are currently blank or painted over.

As seen in **Figure 3**, the primary (west) façade is composed of 10 structural bays. The northernmost bay contains a protruding glass-enclosed entry to the current tenant's commercial office. Each of the remaining nine bays are recessed along a loading dock that runs the length of the west façade. Within each bay are two rollup cargo doors.

An additional loading dock and cargo doors are found on the east façade. Unlike the north façade, these doors are flush with the exterior wall and are covered by a flat canopy that extends over the loading dock.

Detail of Cargo Doors on West Façade


Oblique View of South and West Façades

SOURCE: ESA, 2019.

Case No. 2017-007468ENV: SFO RADP EIR

Figure 3
Exterior of Building 730 Showing the West (Primary) and South Facades

The north and south facades contain no openings. Each structural bay is slightly recessed and partially clad in corrugated metal.

2. Construction Chronology and Alterations

Very limited construction and occupation information was found for Building 730. No architectural drawings were located. Information provided by SFO notes that the building was constructed by Delta Air Lines in 1971 as a belly cargo facility.[3] Ownership was transferred to SFO at an unknown time. It is currently occupied by Menzies Aviation, an international cargo and ground services support company.

Construction drawings from 2015 show that the building was occupied by a number of tenants at that time.[4] The two northernmost structural bays were enclosed and used as office space with the remaining interior utilizing an open floor plan for cargo storage. All cargo doors were in use at that time. In 2019, many of these cargo doors appear fixed in place with a single tenant occupying the entire structure.

[3] Belly cargo is freight that is shipped underneath the main deck of an airplane.
[4] Tenant information is based on photographs included in the 2015 architectural plans (Contract No. 10051.43).

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER V
Methodology

A. Research

In addition to efforts completed for the 2018 HRE, ESA conducted a records and literature review for Building 730. The records search consisted of an examination of the following sources:

- **SFO Records.** Various Airport divisions have maintained architectural and engineering drawings since the Airport's creation in 1927. The Airport currently maintains a database of architectural and engineering drawings, and project files are organized by contract number. The database is not for use by the general public, but the Airport provided ESA staff with access to the database. In January 2019, ESA searched this database for information pertaining to construction and occupancy of Building 730. No architectural drawings were located. The San Francisco Department of Building Inspection (DBI) does not hold records for SFO, which has a separate permitting process from the San Francisco Planning Department.
- **Photographs.** Digitized historical photographs of SFO are available on the SFO Museum's website (www.flysfo.com/museum).

B. Field Survey

ESA architectural historian, Eryn Brennan, completed pedestrian surveys of the subject property on January 11, 2019. The property was recorded through digital photography and field notes.

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER VI
Historic Context

A. SFO West Field History

A detailed history of SFO is provided in the 2018 HRE. For the purposes of this addendum, a brief summary of the development of the West Field area is excerpted from the original report:[5]

> By 1966, SFO selected a consultant to develop an updated master plan for the long-term growth of the Airport. The chosen consultant, known as the San Francisco Airport Architects, was a joint venture of the prominent architecture firms of John Carl Warnecke & Associates and Dreyfuss & Blackford. In 1968, the firm was awarded a major contract to provide architectural and engineering services for a number of key projects as part of the Terminal Area Master Plan. These projects were part of the Expansion Phase constructed between 1969 and 1981 and included designs for a new North Terminal (today known as Terminal 3, extant and enlarged in 2015) and associated Boarding Areas E (demolished and reconstructed in 2014) and F (extant with multiple additions constructed between 1996 and 2002) that were leased by United Airlines and could accommodate the newer wide-bodied "jumbo" jets; an expanded central parking garage (extant); an elevated terminal roadway surrounding the parking garage (extant); the old Boarding Area A (demolished c. 2005–2009) that was part of the South Terminal designed by Welton Becket and Associates (today known as Terminal 1); and miscellaneous roadwork including the entrance road and underpasses (extensively redesigned leading up to the completion of the new International Terminal in 2000).
>
> The Terminal Area Master Plan included a second Modernization and Replacement Phase that was implemented between 1981 and 1987. Work included renovating the old Central Terminal (today known as Terminal 2) for use as the Airport's new international terminal, with a new Federal Aviation Administration (FAA) ATCT [airport traffic control tower] and expanded passenger boarding area (Boarding Area D, designed by Anshen & Allen and subsequently redesigned in the early 2000s by Gensler). The old South Terminal (today known as Terminal 1) received a $512 million renovation (designed by Gensler and demolished in 2016), and aircraft apron facilities were also modified.
>
> By the mid-1980s, passenger traffic at SFO was projected to exceed 56 MAP. A new master plan was prepared in 1989 and approved by the Airport Commission in 1992. Beginning in 1996, an airport rail transit system known as AirTrain was constructed to transport people between the three terminal buildings and the central parking garage. A new, state-of-the-art International Terminal was planned to occupy the area on the west side of the existing terminal complex. The new International Terminal was designed to have capacity and functionality for "super jumbo jet aircraft," such as Air France's high-capacity A380 Airbus. The $2.5 billion project designed by Skidmore, Owings & Merrill also provided new parking facilities and a long-planned BART extension, all of which were completed in 2000. AirTrain was expanded to serve all four terminals and the BART station, and both transit systems began operating in 2003.
>
> The old international Central Terminal (Terminal 2), which closed to the public in 2000 following the completion of the new International Terminal, was renovated and expanded by Gensler and reopened for use in 2011 as a domestic terminal. A complete renovation of Boarding Area E on the east side of Terminal 3 began in 2012, and the modernized facility opened to the public in 2015. Subsequently, a separate project to renovate the west side of Terminal 3 was developed with construction anticipated to occur from 2021 through 2023. The construction of a new ATCT located between Terminals 1 and 2 took place between 2012 and 2016. At this writing, the old ATCT that was part of the old Central Terminal building is in the process of being decommissioned by the FAA and demolished by the Airport. Large-scale renovations of Terminal 1 began in 2016 and are projected to conclude in 2024. The Airport celebrated its 90th anniversary in May 2017.

[5] ESA, *Recommended Airport Development Plan, SFO, Historic Resource Evaluation Part 1*, June 2018, p. 63.

B. Tenant/Occupant History

The past and current tenants or occupants of Building 730 is presented in Table 1. Data was provided by SFO.

Table 1 Past and Current Tenants or Occupants of the Building 730

Period(s) of occupation	Tenant(s)	Use
Present (2019)	Menzies Aviation	Office/Ground Service Equipment Maintenance and Storage
2015	Swiss World Cargo Swissport Cargo Services China Eastern Airlines Alaska Air Cargo Philippine Airlines	Cargo
1971	Delta Air Lines	Cargo

SOURCE: SFO, 2019
NOTE:
a. Data for tenants and periods of occupation provided by SFO.

C. Applicable Historic Contexts

Of the contexts presented in the 2018 HRE, only one, Air Cargo Facilities, appears potentially applicable to Building 730. As stated in the HRE, a brief overview of air cargo facilities is excerpted from Transportation Research Board's 2015 Airport Cooperative Research Program Report titled "Guidebook for Air Cargo Facility Planning and Development":

> The cargo industry changed significantly over the 25 years of 1988 to 2013. As the world economy has become more global, markets and manufacturing have developed, shifted, and in many instances, relocated to markets with low labor rates. New logistics and supply-chain concepts based on low fuel costs and labor costs developed along with trends in just-in-time production and final manufacturing assembly at destination. As new product shelf life decreased, such as for consumer electronics, during this time period, and as the value of goods shipped has increased, the demand for expeditious transport and control, as well as transparency, has correspondingly increased. Domestic air cargo in the United States also experienced shifts, particularly as fuel costs increased in recent years and integrated express carriers developed deferred delivery business models, reducing the demand for overnight delivery by aircraft and relying increasingly on truck networks.
>
> The air cargo terminal is a critical part in the air cargo supply chain. An inadequately sized air cargo building that is unable to accommodate peak volumes may result in shipment delays, while a cargo warehouse that is not designed with flexibility in mind to meet demand may become obsolete during its service life. Airports routinely accommodating air cargo operations typically have space dedicated to support this activity […]. The space is commonly made up of aircraft parking apron, air cargo buildings, and truck parking and maneuvering areas. Cargo throughput between the land and air mode is either through the warehouse buildings or a through-the-fence security gate. These air cargo installations on airports function as a platform that allows for the interface between land and air modes, with the goal of providing the expeditious processing of cargo. This platform has a role to play in ensuring that cargo products arrive at their destination on time and intact, that customers have easy access to the cargo facilities for collection and delivery, and that the truck access is relatively uncongested and does not interfere with passenger-related traffic. Cargo storage is an attribute of these facilities, but the duration is to be limited by design. For the cargo carrier, it is most optimal for air cargo to arrive at the precise time for loading onto aircraft with no on-airport storage or processing time needed. Since there are typically numerous arrivals on cargo trucks to an air cargo terminal, space for processing, build up, and storage is required. These space requirements vary with carrier type and the size of the airport's air cargo market.[6]

[6] Mike Maynard et al., Airport Cooperative Research Program Report 143: Guidebook for Air Cargo Facility Planning and Development, Washington, D.C.: National Academy of Sciences, 2015, p. 5, *https://www.nap.edu/catalog/21906/guidebook-for-air-cargo-facility-planning-and-development*, accessed November 13, 2017.

CHAPTER VII
Evaluation of Historic Status

A. California Register of Historical Resources

The California Register is an authoritative guide to significant architectural, archaeological, and historic resources in the State of California. Resources can be listed in the California Register through a number of methods. California Historical Landmarks and/or National Register–eligible properties (both listed and formal determinations of eligibility) are automatically listed. Properties can also be nominated to the California Register by local governments, private organizations or citizens. This includes properties identified in historic resource surveys with Status Codes of 1 to 5 and resources designated as local landmarks or listed by a city or county ordinance. A building or structure identified in the California Office of Historic Preservation’s (OHP) Historic Resources Inventory Directory with a California Historical Resource Status Code (CHRSC) rating of 1 or 2 (on or determined eligible for the National Register) is also considered to be listed on the California Register. Properties of local significance that have been designated under a local preservation ordinance (i.e., local landmarks), or that have been identified in a local historical resources survey, may also be eligible for listing in the California Register.

The evaluative criteria used by the California Register for determining eligibility are closely based on those developed for use by the National Park Service for the National Register. To be eligible for listing in the California Register a property must demonstrate significance under one or more of the following criteria:

- **Criterion 1 (Event):** Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
- **Criterion 2 (People):** Resources that are associated with the lives of persons important to local, California, or national history.
- **Criterion 3 (Architecture):** Resources that embody the distinctive characteristics of a type, period, region, or method of construction or represent the work of a master or possess high artistic values.
- **Criterion 4 (Information Potential):** Resources or sites that have yielded, or have the potential to yield information important to the prehistory or history of the local area, California, or the nation.

The following section provides an evaluation of historic significance based on the site survey and research and follows the California Register Criteria 1 through 4. Building 730 is evaluated individually as well as whether or not it could be a contributor to a potential historic district.

B. Individual Resource Evaluation

1. Criterion 1 (Events)

Research does not indicate that Building 730 is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. Research revealed that the building has historically been used for cargo and other airport support functions and does not have an important association with the essential aviation function (i.e., the operation and use of aircraft) of SFO. For this reason, Building 730 does not appear to be eligible for listing under California Register Criterion 1.

2. Criterion 2 (People)

Research does not indicate that Building 730 is associated with the lives of persons significant in our past. (Architects and/or engineers are discussed under Criterion 3.) No individuals are directly associated with the building, about which little is known. For this reason, Building 730 does not appear to be eligible for listing under California Register Criterion 2.

3. Criterion 3 (Architecture)

Building 730 does not appear to embody the distinctive characteristics of a type, period, region, or method of construction. Although the original use and occupant of Building 730 are unknown, its possible earliest use may have been a belly cargo warehouse for Delta Air Lines. It is small in scale compared to other airline support and cargo buildings at SFO, and it does not appear to be a notable example of such buildings. Research did not identify the architect or engineer of Building 730, and it does not appear to represent the work of a master or possess high artistic values. For these reasons, Building 730 does not appear to be eligible for listing under California Register Criterion 3.

4. Criterion 4 (Information Potential)

Criterion 4 generally refers to a property's information and research potential in terms of archaeological values. As such, evaluation of this building for eligibility under this criterion is beyond the scope of this evaluation.

C. Historic District Considerations

An evaluation of potential historic districts that include one or more of the original 11 age-eligible buildings located within the RADP boundary was conducted in the 2018 HRE. None were found to qualify as historic resources for the purposes of CEQA. Below is a re-evaluation of these potential districts with Building 730 included.

1. Potential Historic District that Includes the 12 Age-Eligible Buildings in the RADP Boundary

Based on the architectural descriptions of the 11 age-eligible buildings and documentation of the physical development of SFO provided in the 2018 HRE, along with this HRE Addendum, the combined 12 age-eligible buildings do not together form a discontiguous district. None of the 12 subject buildings appears to be significantly related in terms of architectural design, function, or historical development. As such, none of the 12 subject buildings contributes to a potential historic district.

2. Potential Historic District(s) within the RADP Boundary that Include One or More Age-Eligible Buildings within the RADP Boundary

Based on an analysis of data presented in the 2018 HRE and the spatial relationships between extant buildings on the Airport property, no apparent patterns emerge to suggest that there is a potential historic district or districts that include one or more of the 12 subject buildings, as further discussed below.

Buildings Related by Construction Date

(Any of the 12 age-eligible buildings that would be demolished or altered as a result of the proposed RADP projects are shown in bold type below for context. See Appendix A for details regarding buildings addressed in the analysis below.)

Buildings generally constructed during the 1970s include Buildings **195**, 400, **400F**, 670, **692**, **730**, 908, 918, and **928/928A**. These buildings are variously located in the terminal area and the North Field and West Field (see Figure 1 and Appendix A). The buildings located in the terminal area were constructed as part of the Terminal Area Master Plan during the 1970s and 1980s; however, as noted in the 2018 HRE, a building's association with the master plan does not confer significance under California Register Criterion 1. Considerable alterations have been made to the buildings and structures constructed as part of the Terminal Area Master Plan, and the terminal area has also been enlarged in the 21st century. As a result of these continual changes, the buildings and structures located in the terminal area do not appear to represent a unified entity, and many are not age eligible, nor are the buildings located in the North Field and West Field historically, functionally, or aesthetically related.

Buildings Historically Operated by the Same Airline

Three buildings were originally constructed and occupied by Delta Air Lines: Building **710** (1968), Building **750** (1966–1969), and Building **730** (1971). These buildings are all found in the West Field, forming a small grouping between West Area Road and North McDonnell Road. Each served Delta, or one of its predecessors as a cargo facility in the early 1970s. Each was constructed at a separate time, with no cohesive architectural style or form. They do not appear to be related through design although they were initially related through general use (cargo storage) and proximity. Because such uses are a common feature of airport design and are found throughout the entire RADP site, these buildings do not constitute a potential historic district.

Buildings Related by Architectural Style

Among the 12 subject buildings, there is no apparent stylistic consistency beyond certain functional and utilitarian considerations. The prevalence of buildings of a utilitarian nature at the Airport does not denote architectural or engineering significance.

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER VIII
Integrity

In addition to being eligible for listing under at least one of the four California Register significance criteria (1 through 4), a property must also retain sufficient integrity to convey its historical significance in order to be considered a historical resource. The California Register defines integrity as the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. A property is examined for seven aspects that together comprise integrity. These aspects, which are based on the National Register criteria for evaluation, are location, design, setting, materials, workmanship, feeling, and association.

As discussed above, Building 730 does not appear to be individually significant under any California Register criteria or a contributor to known or potential historic districts; as such, a discussion of integrity is not necessary.

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER IX
Conclusion

Based on a site survey, archival research, and analysis, ESA finds Building 730 ineligible for individual listing in the California Register. In addition, this building does not appear to contribute to any known or potential historic districts. As such, the subject building would not be considered an historical resource for the purposes of CEQA.

[THIS PAGE INTENTIONALLY LEFT BLANK]

San Francisco International Airport
Recommended Airport Development Plan (RADP) EIR
Appendix A: Inventory of Buildings Located Within RADP Boundary Included in the HRE Addendum

BUILDING NO. [1]	Ongoing or RADP?	EXISTING FACILITY NAME	TYPE/ FUNCTION	OPERATIONAL YEAR	YEAR(S)[2] CONSTRUCTED	ARCHITECT[2] (IF KNOWN)
195	**RADP**	**Central Parking Garage**	**Parking**	**1974**	**1963-1981**	**San Francisco Airport Architects, Edward B. Page**
400	N/A	Terminal 3	Passenger Terminal	1979		San Francisco Airport Architects
400F	**RADP**	**Terminal 3 Boarding Area F**	**Passenger Terminal**	**1976**	**1976-1979**	**San Francisco Airport Architects**
670	Ongoing	Airport Museum	Museum Support & Education	1978		
692	**RADP**	**Sheet Metal Shop**	**Airport Maintenance**	**1966**	**1974**	**Stone, Marraccini & Patterson**
710	**RADP**	**Cargo Building/ Office**	**Airport Maintenance**	**1967**	**1968**	**Unknown**
730	**RADP**	**Cargo Building**	**Air Cargo**	**1971**		

San Francisco International Airport
Recommended Airport Development Plan (RADP) EIR
Appendix A: Inventory of Buildings Located Within RADP Boundary

BUILDING NO.	Ongoing or RADP?	EXISTING FACILITY NAME	TYPE/ FUNCTION	OPERATIONAL YEAR	YEAR(S)[2] CONSTRUCTED	ARCHITECT[2] (IF KNOWN)
750	**RADP**	**GSE Building**	**Airport Maintenance**	**1971**	**1969**	**Unknown**
908	Ongoing	Mel Leong Treatment Plant/Industrial Waste Process	Support facility	1974		
918	Ongoing	Mel Leong Treatment Plant/ Administrative Building	Support facility	1974		
928 & 928A	**RADP**	**City College of San Francisco Airport Campus and Ancillary Building**	**Education**	**1976 (928) Not Available (928A)**	**1976 (928) ca. 1976[1] (928A)**	**Unknown**

Source: SFO, November 2017.

NOTES:

[1] Age-eligible buildings that would be demolished or altered as a result of the proposed RADP projects are shown in bold

[2] Data confirmed by ESA

SAN FRANCISCO
PLANNING DEPARTMENT

PRESERVATION TEAM REVIEW FORM

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

Preservation Team Meeting Date:		Date of Form Completion	6/7/2019

PROJECT INFORMATION:

Planner:	Address:	
Jørgen G. Cleemann	Various Properties at San Francisco International Airport	
Block/Lot:	**Cross Streets:**	
N/A	U.S. 101, San Bruno Ave., Millbrae Ave.	
CEQA Category:	**Art. 10/11:**	**BPA/Case No.:**
B	N/A	2017-007468ENV

PURPOSE OF REVIEW:			PROJECT DESCRIPTION:	
◉ CEQA	○ Article 10/11	○ Preliminary/PIC	◉ Alteration	○ Demo/New Construction

DATE OF PLANS UNDER REVIEW:	N/A

PROJECT ISSUES:

- [x] Is the subject Property an eligible historic resource?
- [ ] If so, are the proposed changes a significant impact?

Additional Notes:

Submitted: Historic Resources Evaluation, Part 1, prepared by Environmental Science Associates (dated June 2018); Historic Resources Evaluation, Part 1, Addendum, prepared by Environmental Science Associates (dated June 2019)

PRESERVATION TEAM REVIEW:

Category: ○ A ○ B ◉ C

Individual			Historic District/Context		
Property is individually eligible for inclusion in a California Register under one or more of the following Criteria:			Property is in an eligible California Register Historic District/Context under one or more of the following Criteria:		
Criterion 1 - Event:	○ Yes	◉ No	Criterion 1 - Event:	○ Yes	◉ No
Criterion 2 -Persons:	○ Yes	◉ No	Criterion 2 -Persons:	○ Yes	◉ No
Criterion 3 - Architecture:	○ Yes	◉ No	Criterion 3 - Architecture:	○ Yes	◉ No
Criterion 4 - Info. Potential:	○ Yes	◉ No	Criterion 4 - Info. Potential:	○ Yes	◉ No
Period of Significance:			Period of Significance:		
			○ Contributor	○ Non-Contributor	

Complies with the Secretary's Standards/Art 10/Art 11:	Yes	No	■ N/A
CEQA Material Impairment to the individual historic resource:	Yes	■ No	
CEQA Material Impairment to the historic district:	Yes	■ No	
Requires Design Revisions:	Yes	■ No	
Defer to Residential Design Team:	Yes	■ No	

PRESERVATION TEAM COMMENTS:

According to the Historic Resources Evaluation, Part 1, and the Historic Resources Evaluation, Part 1, Addendum (collectively, "the HRE") prepared by Environmental Science Associates, as well as information accessed by the Planning Department, the subject properties are 12 buildings or structures at San Francisco International Airport (SFO), an approximately 5,200-acre property located 13 miles south of downtown San Francisco in San Mateo County. The 12 properties under evaluation are those properties located within the Recommended Airport Development Plan (RADP) boundaries that either currently are age-eligible or will be age-eligible for the California Register of Historical Resources (CRHR) by the time the proposed project is completed in 2035. Properties at SFO not located within the RADP boundaries include the United Airlines San Francisco Maintenance Operations Center, which is leased and independently operated by United Airlines; and the federal property occupied by U.S. Coast Guard Air Station San Francisco, which was determined to be eligible for listing in the National Register of Historic Places in 1998.

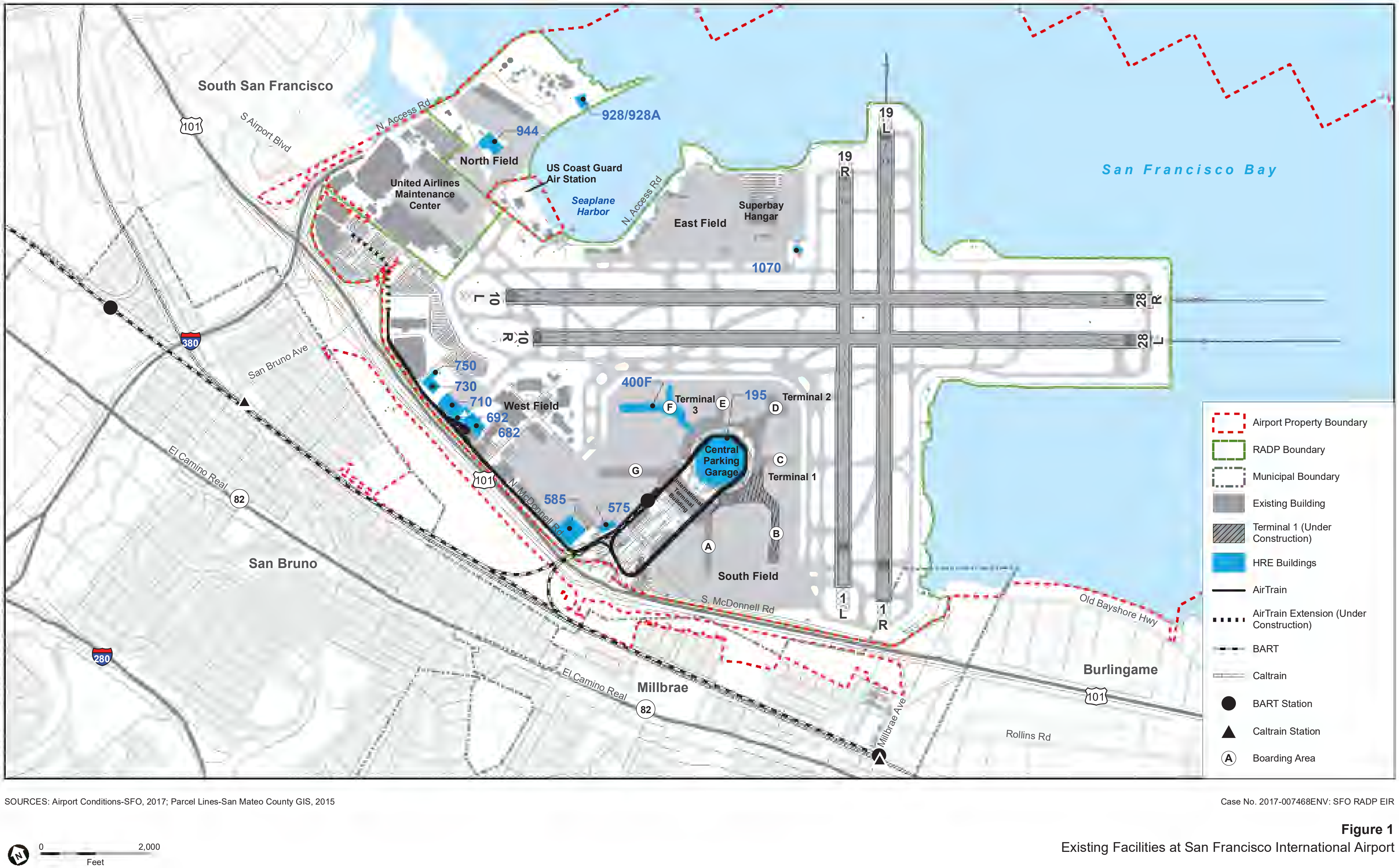
Planning staff concurs with the HRE's finding that none of the 12 properties is individually eligible for listing in the CRHR under any criteria. None of the properties is directly associated with historic events such that it would be eligible under Criterion 1. None of the properties is associated with historic persons to justify a finding of eligibility under Criterion 2. Architecturally, the 12 properties are generally undistinguished and utilitarian, are not representative works of a master architect, and do not possess high artistic values. Therefore, the 12 properties are not eligible for the CRHR under Criterion 3. Planning staff also finds that none of the properties appears to embody a rare construction type, and therefore none appears eligible under Criterion 4 as it applies to buildings and structures. The potential archeological significance of the site, as opposed to the buildings and structures built upon it, is not evaluated in the current analysis.

Planning staff also concurs with the HRE's finding that none of the 12 properties appears to contribute to an eligible historic district, including districts located partially outside of the RADP boundary.

In conclusion, none of the 12 properties under evaluation appears to be eligible for listing in the CRHR, either individually or as contributors to historic districts. The full analysis of the individual buildings and the district analysis is provided in the HRE upon which the current document is based.

Signature of a Senior Preservation Planner / Preservation Coordinator:	Date:
Allison K. Vanderslice Digitally signed by Allison K. Vanderslice Date: 2019.08.19 17:06:00 -07'00'	

Figure 1. SFO. Screenshot of Google Maps aerial view.



SOURCES: Airport Conditions-SFO, 2017; Parcel Lines-San Mateo County GIS, 2015

Case No. 2017-007468ENV: SFO RADP EIR

Figure 1
Existing Facilities at San Francisco International Airport

APPENDIX C

Airport Facilities to Accommodate Aviation Demand

RICONDO®

MEMORANDUM

Date: May 8, 2024

To: San Francisco Planning Department (Case No. 2017-007468ENV)

From: John Williams________________________________

Subject: AIRPORT FACILITIES TO ACCOMMODATE AVIATION DEMAND

Introduction

The City and County of San Francisco (City) owns and operates San Francisco International Airport (SFO or Airport) through the Airport Commission. SFO is a "commercial service airport," which is defined as a publicly owned airport that has at least 2,500 passenger boardings each calendar year and receives scheduled passenger service (49 U.S.C. § 47102(7)). SFO is also a "primary airport" (more than 10,000 passenger boardings each year) and a "large hub airport" (1 percent or more of total annual passenger boardings at all US airports) (49 U.S.C. § 47102(11), (16)). As a publicly owned airport that receives grants from the Federal Aviation Administration (FAA) through the Airport Improvement Program, SFO must comply with grant assurances. Grant Assurance 22 (Economic Nondiscrimination) requires airport operators to "make the airport available as an airport for public use on reasonable terms and without unjust discrimination to all types, kinds and classes of aeronautical activity, including commercial aeronautical activities offering services to the public at the airport."[1] This means that although the City operates and maintains the Airport, it cannot discriminate or regulate airline or aircraft operations occurring at the Airport beyond ensuring the safe and efficient operation of the Airport. Additionally, Grant Assurance No. 34 (Policies, Standards, and Specifications) requires that federally funded projects be carried out in accordance with policies, standards, and specifications approved by the FAA including but not limited to FAA advisory circulars.[2]

---

1 US Department of Transportation, Federal Aviation Administration, Airport Sponsor Assurances, May 2022.

2 US Department of Transportation, Federal Aviation Administration, https://www.faa.gov/airports/aip/grant_assurances/media/airport-sponsor-assurances-aip.pdf (accessed February 5, 2024). https://www.faa.gov/sites/faa.gov/files/airports/new_england/airport_compliance/assurances-airport-sponsors-2022-05.pdf

The City prepared the *Draft final Airport Development Plan* (ADP)[3] to set forth a long-range plan to modernize SFO, increase the efficiency of Airport operations, and enhance the passenger experience. Building upon Ongoing Projects[4] at SFO, the ADP studied forecast growth and recommended landside long-range facility projects, collectively called the Recommended Airport Development Plan (RADP). Chapter 6 of the ADP describes the RADP Projects, which are derived from conducting inventory assessment of existing/ongoing projects, preparing an aviation activity forecast, analyzing the facilities requirements to meet the aviation activity forecast, and alternatives analyses. Implementation of the ADP would align the capacity of SFO's passenger terminals, ground transportation, and support facilities with the fixed capacity of the existing runway system, allowing those facilities to accommodate aircraft operations and passengers corresponding to the runway system capacity. The ADP does not contemplate nor would result in any change to existing runway configurations or flight paths, expand Airport property, or increase runway capacity, as explained further in this memorandum. This memorandum also discusses historical and forecast aircraft operations and passengers at SFO, airport capacity concepts, the capacity constraints of SFO, and ADP goals for the overall level of service[5] (LOS) provided to Airport passengers.

The question has been raised as to whether implementation of the RADP projects would induce growth or cause growth to occur at a faster rate than would otherwise occur without their implementation. This memorandum summarizes the processes followed to identify the RADP projects needed to accommodate long-term demand at the LOS desired by the City and further demonstrates that airport facilities do not induce growth. Forecasts of aviation activity were developed for the ADP based on demographics and economic activity in the region. These forecasts were then used to identify the facilities to accommodate those demand levels at the desired LOS. Development of the forecasts did not consider and was fully agnostic to existing Airport facilities and ongoing projects and was therefore not influenced by those facilities. Recognizing that the Airport runways are the limiting factor determining overall Airport capacity, simulation analysis was used to identify the level of activity that could be accommodated without causing unacceptable levels of aircraft delay. The RADP projects were then developed to provide facilities that would accommodate the level of activity dictated by the runway capacity at the desired passenger LOS.

As to the question of the implementation of the RADP projects inducing growth, it is demonstrated that growth is a function a factor of demographic and economic conditions and is not influenced by facilities.

---

3 City and County of San Francisco, San Francisco International Airport, *Draft Final Airport Development Plan*, September 2016.

4 An ongoing project was included as part of existing inventory prior to developing facilities requirements, based on an established aviation activity forecast. An ongoing project is defined in the *Draft Final Airport Development Plan* as projects that have been authorized to proceed by the Airport Commission or have been identified by Airport management as needing to be implemented in the near future, subject to Airport Commission and other necessary approvals. They are in various stages of planning, programming, design, or construction. Appropriate environmental reviews, as required under the California Environmental Quality Act (CEQA) or the National Environmental Policy Act (NEPA), are completed, in process, or will be conducted. These projects are proceeding, or will proceed if approved, irrespective of any RADP projects and do not address long-term demands and capacity needs. The redevelopment of Terminal 1 and Boarding Area B and the Airport hotel are examples of the projects in this category. (see page 5 of the *Draft Final Airport Development Plan*, Executive Summary)

5 Level of service is used to measure overall performance of a system and can be measured both quantitatively and qualitatively. For example, when assessing roadway performance, level of service can be measured quantitatively using a variety of metrics. For the purposes of this memorandum and as applied to the ADP, level of service is used qualitatively to refer to the overall efficiency of the Airport and to describe passenger comfort and with the City's goal of providing the highest level of international and domestic guest service.

Therefore, the projects will allow the Airport to continue to operate at the desired LOS but will not affect growth in demand. It has been demonstrated at numerous airports around the country, such as Hollywood Burbank and LaGuardia Airports, that activity well above terminal design capacity can be accommodated, although at a poor LOS. Because demand is based on factors other than airport facilities, constructing the RADP projects would not induce growth in demand, deter passengers from using the Airport nor discourage airlines from serving the Airport. The same is true for other types of activity, including cargo, general aviation (GA) and air taxi, and military aircraft operations.

Forecasts of Aviation Activity

Understanding forecast demand and airport capacity concepts is crucial to plan for and appropriately evaluate the need for airport facility improvements. For commercial service airports, the forecast of aircraft *operations* and aircraft fleet mix is used to determine airfield facility requirements needed to accommodate those operations, while the forecast of passenger *enplanements*[6] and aircraft fleet mix, in combination with an average daily schedule of aircraft operations, is used to determine terminal and landside facility requirements needed to accommodate those passengers at the airport. The FAA states, "[f]orecasts of future levels of aviation activity are the basis for effective decisions in airport planning. These projections are used to determine the need for new or expanded facilities."[7] The forecasts are used not only to determine the sizes or capacities of the various facilities needed to meet anticipated demand, but also to determine the timing so that the facilities are constructed and available when needed. As demand increases, the goal is to have facilities in place to accommodate that demand at a desired LOS, determined by the airport operator or sponsor, without building facilities too soon and having them underutilized for an extended period.

Forecasts of aviation activity are driven by several factors. Research conducted on behalf of the FAA indicates that, "[a]viation activity levels result from the interaction of demand and supply factors. The demand for aviation is largely a function of demographic and economic activity. Supply factors that influence activity levels include cost, competition, and regulations."[8] The FAA recommends that "…forecasts of [aviation] demand should consider socioeconomic data, demographics, disposable income, geographic attributes, and external factors such as fuel costs and local attitudes towards aviation."[9]

The City completed an updated forecast of aviation activity, documented in the *San Francisco International Airport Forecast Update*[10] in April 2014 (2014 Forecast), using a base year of 2013 that served as the basis for development of the ADP. The forecast (referred to herein as the 2014 Forecast) includes activity levels for the years 2018, 2023, 2028, and 2033, including the numbers of annual enplaned passengers, air cargo volumes, aircraft operations, and the associated commercial passenger aircraft fleet mix. The forecast was

---

6 Enplaned passengers are those boarding an aircraft. The number of total passengers is double the number of enplaned passengers, assuming the number of deplaned passengers equals the number of enplaned passengers.

7 US Department of Transportation, Federal Aviation Administration, Advisory Circular 150/6070-6B, *Airport Master Plans*, Change 2, January 27, 2015, p. 35.

8 GRA, Incorporated, *Forecasting Aviation Activity by Airport*, prepared for Federal Aviation Administration, Office of Aviation Policy and Plans, Statistics and Forecast Branch (APO-110), April 2001.

9 US Department of Transportation, Federal Aviation Administration, Advisory Circular 150/6070-6B, *Airport Master Plans*, Change 2, January 27, 2015, p. 37.

10 Landrum & Brown, Inc., San Francisco International Airport Forecast Update, April 2014.

developed using standard industry practice considering a variety of factors such as historical and forecast socioeconomic data, historical 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 the combination of trends in the airline industry, national and international economic conditions, and the socioeconomic conditions in the San Francisco Bay area.[11] The 2014 Forecast report considered socioeconomic data and trends for the San José-San Francisco-Oakland Combined Statistical Area (Bay Area CSA) consisting of 11 counties, which contain three international commercial service airports: SFO, Metropolitan Oakland International (OAK), and San José Mineta International (SJC). Socioeconomic data assessed included population, per capita personal income, employment, tourism, gross regional product, and airline yield.[12] 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,[13] forecasts of cargo carried in freighter aircraft, and historical factors, industry trends, and FAA Aerospace Forecasts for GA and air taxi, and military aircraft operations.

Initially, an unconstrained forecast was developed, assuming no facility or other constraints existed that would limit or otherwise affect activity at the Airport. A market share analysis for domestic O&D passengers was conducted to determine SFO’s historical and forecast market share of domestic passengers. SFO’s market share has fluctuated between 40 percent of the Bay Area airports (SFO, OAK, and SJC) at its low point in 2003, to a high of 64 percent in 1990-1991. In 2012 and 2013, SFO’s market share had increased to 60 percent.[14] The 2014 Forecast projected that SFO’s market share of domestic O&D passengers would increase to 62.8 percent by 2033.[15]

The COVID-19 public health emergency depressed global air travel demand in early 2020 as the virus spread rapidly throughout the world. Airlines responded by placing aircraft in storage and drastically reducing capacity across their networks, initially through flight cancellations and later through schedule reductions. At the lowest point in May 2020, scheduled departing seat capacity represented 24 percent of May 2019 departing seat capacity for all US airports, and 15 percent of May 2019 departing seat capacity for SFO.

Demand began to recover in June 2020, before another COVID-19 variant began to spread in early 2021. Since mid-2021, increased vaccinations and reduced cases have helped the industry recover. As passenger demand began to increase, airlines brought back capacity with some US airport enplaned passenger

---

11 Landrum & Brown, Inc., *San Francisco International Airport Forecast Update*, April 2014, p. 1.

12 The average amount of revenue received per paying passenger flown one mile either into or out of the Airport.

13 Forecasts of passenger aircraft operations consider enplaned passengers as well as anticipated changes in the types of aircraft serving the airport, and the average number of seats per aircraft, and the assumed load factor (the average percentage of seats filled per aircraft departure).

14 Landrum & Brown, Inc., *San Francisco International Airport Forecast Update*, April 2014, Exhibit 4-2, p. 42.

15 Landrum & Brown, Inc., *San Francisco International Airport Forecast Update*, April 2014, p. 42.

volumes exceeding pre-pandemic (2019) levels in 2022. Based on recent activity, enplaned passenger volumes are anticipated to reach pre-pandemic (2019) levels in 2024, while annual passenger aircraft operations are anticipated to reach pre-pandemic (2019) levels in 2025.

Airport Capacity

The calculation of the capacity of specific airport facilities varies depending on the type of facility being considered and the level of delay or congestion determined to be acceptable. The limiting factor defining the overall capacity of SFO is the airfield. FAA Advisory Circular 150/5060-5 defines capacity as the maximum throughput rate of the airfield; in other words, the maximum number of aircraft operations that can take place at an airport in one hour.[16] Thus, the capacity of SFO is defined by the maximum number of aircraft operations that can occur on the airfield (runways and taxiways) in one hour. Factors such as weather, wind direction and speed, aircraft fleet mix, and FAA air traffic procedures can and do influence how many aircraft operations can occur in any given hour. Under visual flight rules (VFR)[17] conditions, generally consisting of good visibility and minimal other conditions affecting flight navigation, typical SFO operations include two paired arrival streams to Runways 28R and 28L and two paired departure streams from Runways 1L and 1R, with paired departures taking off on Runways 1L and 1R between paired arrivals landing on Runways 28R and 28L. Under instrument flight rules (IFR)[18] conditions, generally consisting of poor visibility and weather conditions that affect flight navigation, SFO arrivals are limited to only one arrival runway at a time, which reduces capacity and causes delays.[19] Departures may also be affected during these periods but to a lesser extent; the reduced arrival capacity is the primary contributor to aircraft delays.

As stated in the Goals and Objectives of the ADP:[20]

> The ADP assumes that the existing runway system will remain unchanged, constraining future aircraft activity. The ADP provides a strategy to accommodate future Airport demand in a safe, cost-effective, operationally efficient, and flexible manner given forecasts of aviation activity constrained by the existing runway layout.

An airfield/airspace simulation analysis of SFO was conducted as part of the ADP[21] to determine airfield performance at various demand levels and then quantify the practical capacity of the SFO runway system. The ADP defined practical capacity as the average daily level of demand that can be accommodated while maintaining an acceptable operational level of service. Because maintaining airline schedule integrity is the primary operational goal of a commercial service airport and determining the operational level of service,

---

16 US Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5060-5, *Airport Capacity and Delay*, September 23, 1983.

17 Under Visual Flight Rules (VFR), pilots rely on visual reference for guidance and to maintain separation from other aircraft.

18 Under Instrument flight rules (IFR), pilots must rely on instruments and air traffic control instructions for guidance and to maintain separation from other aircraft.

19 City and County of San Francisco, San Francisco International Airport, *Draft Final Airport Development Plan*, September 2016. Appendix B, Ultimate Airport Capacity and Delay Simulation Modeling Analysis.

20 City and County of San Francisco, San Francisco International Airport, *Draft Final Airport Development Plan*, September 2016. Executive Summary, p.4.

21 City and County of San Francisco, San Francisco International Airport, *Draft Final Airport Development Plan*, September 2016.

the practical capacity of an airport is the average daily demand that can be accommodated without causing severe or unrecoverable delays. Therefore, the airfield/airspace simulation analysis assessed airfield performance, considering airline schedules and resulting peak periods, along with varying weather conditions affecting airfield capacity.

The ADP examined existing (2013) and unconstrained forecast airline schedules for 2016, 2018, and 2021. It also examined a 2021 scenario that increased operations by 5 percent over the baseline forecast. Because delays are expected in peak periods during IFR operating conditions (fog or low visibility), peak hour delays must dissipate in the following few hours to avoid excessive cancellations and missed connections. Activity levels that result in high delays cascading throughout the day during predominant operating conditions without dissipating were determined to be unacceptable by the City. Thus, average daily delays, delays in each hour of the day, and the percentage of flights delayed were all considered in defining the practical capacity of the SFO airfield. Based on the simulation modeling with inclusion of certain NextGen[22] procedures the FAA is implementing, the existing Airport runway system has a practical capacity of approximately 1,475 daily operations, corresponding to approximately 110-115 aircraft operations during the peak hour.[23] Otherwise stated, 1,475 operations represents the average level of daily activity that can be sustained over time without causing severe or unrecoverable delays under varying weather conditions. Under ideal conditions, higher levels of daily activity can be accommodated without significant delays. Under poor weather conditions, however, delays are likely to occur but not reach an unacceptable level. For reference, during August, the peak month of 2023, an average of approximately 1,041 daily operations were served at the Airport.[24]

The 2014 Forecast was used to identify facility needs to accommodate demand consistent with the City's goal of providing the highest level of international and domestic guest service. The results of the airfield/airspace simulations were used to identify the practical capacity of SFO as being approximately 1,475 daily operations, as stated above. This level of activity was identified as the Base Constrained demand level for SFO in the ADP.[25] For planning purposes, the ADP identified a High Constrained demand level of 1,500 daily operations, which added 25 daily operations during non-peak hours to generate a planning design day for developing terminal and other facility requirements. Under ideal weather conditions, SFO can and has accommodated more than 1,500 aircraft operations in a single day.[26] However, for approximately 40 percent of days during a typical year, SFO experiences periods of low visibility due to morning fog or other weather conditions, curtailing the number of aircraft operations the Airport can accommodate during those periods. The ADP Base Constrained and High Constrained demand levels account for these periods of low visibility by limiting the number of daily operations to a sustainable level without experiencing unacceptable delays.

---

22 NextGen refers to the modernization of the national airspace system (NAS) in the United States through the use of satellite-based air traffic control systems rather than ground-based equipment.
23 City and County of San Francisco, San Francisco International Airport, *Draft Final Airport Development Plan*, Section 2.2.2, 2016.
24 Source: SFO Aviation Management.
25 City and County of San Francisco, San Francisco International Airport, *Draft Final Airport Development Plan*, Section 2, 2016.
26 SFO accommodated 1,544 daily operations on a peak day in August 2019.

Given that no additional physical runway capacity is anticipated at SFO nor considered in the ADP, the High Constrained demand level of 1,500 daily aircraft operations was used for planning purposes. Forecasts of enplaned passengers for those demand levels were then developed based on the number of passenger aircraft operations and assumptions regarding aircraft fleet mix and aircraft load factors. For both the Base Constrained and High Constrained demand levels, it was assumed that the average size of passenger aircraft (the number of seats per aircraft) as well as the load factor (the percentage of seats that are filled) would increase over time, resulting in more passengers being carried per aircraft. **Table 1** shows the annual aircraft operations and enplanements from 2007 through 2015 and the ADP forecasts, including the Base Constrained and High Constrained demand levels. As shown in Table 1, the High Constrained demand level of 1,500 daily operations translates to approximately 35.5 million annual enplanements or 71.1 million annual passengers (MAP).

The regulation of airspace is reserved entirely to the federal government.[27] The FAA regulates air traffic using the National Airspace System, and meters the number of aircraft arriving and departing an airport based on flight tracks, navigational fixes, weather conditions, and air traffic control procedures, but does not regulate how airlines schedule their flights. Thus, airlines can schedule and will try to operate as many flights as they can based on the demand for the markets they serve.[28] Although SFO has identified the practical capacity of the Airport as approximately 1,500 aircraft operations per day for planning, the airlines may schedule more flights if they deem it in their interest to do so. However, SFO, through the ADP process, has concluded that anything beyond 1,500 daily operations could introduce unacceptable levels of delay and provide a poor experience for passengers and airlines. Thus, the ADP was formulated to identify the terminal, landside, and associated airport support facilities needed to accommodate the High Constrained demand level of 1,500 daily aircraft operations (71.1 MAP) at the desired LOS.

---

27 49 U.S.C. § 40103 (Congress has plenary authority over the navigable airspace and has charged FAA with administering the airspace in the public interest.)

28 If an airport becomes extremely congested, however, FAA has the right to impose slot controls to limit scheduled traffic. *e.g.,* 14 CFR § 93.337 (applicable rules for Ronald Reagan Washington National Airport).

TABLE 1 ADP HISTORICAL AND FORECAST OPERATIONS AND PASSENGER ENPLANEMENTS

CALENDAR YEAR OR (F)ORECAST DEMAND LEVEL	ANNUAL OPERATIONS				ANNUAL ENPLANEMENTS		
	COMMERCIAL PASSENGER	ALL-CARGO	NONCOMMERCIAL AIR TAXI, GENERAL AVIATION, AND MILITARY	TOTAL	TOTAL DOMESTIC	TOTAL INTERNATIONAL	TOTAL
2007	330,114	7,140	42,246	379,500	13,212,552	4,474,116	17,686,668
2008	344,834	6,420	36,456	387,710	14,059,207	4,469,067	18,528,274
2009	342,658	7,084	30,009	379,751	14,450,146	4,161,125	18,611,271
2010	349,420	7,036	30,792	387,248	15,145,876	4,393,816	19,539,692
2011	365,372	6,782	31,410	403,564	15,899,323	4,489,394	20,388,717
2012	387,416	6,274	30,876	424,566	17,415,286	4,732,903	22,148,189
2013	386,416	5,920	29,064	421,400	17,577,273	4,840,512	22,417,785
2014	395,306	6,132	30,195	431,633	18,357,357	5,107,071	23,464,428
2015	391,214	6,098	32,503	429,815	19,400,379	5,554,640	24,955,019
2018 (F)	407,804	6,200	32,140	446,144	19,121,730	6,119,470	25,241,200
2023 (F)	451,891	7,000	35,640	494,531	20,628,286	8,199,914	28,828,200
Base Constrained (F)	455,353	7,100	36,400	498,853	21,825,375	9,287,025	31,112,400
High Constrained (F)	463,071	7,100	36,400	506,571	25,004,760	10,532,445	35,537,205

NOTES:

1. The ADP forecast includes historical data through 2015 and four forecast demand levels: 2018, 2023, Base Constrained, and High Constrained. Activity associated with the Base Constrained demand level (1,475 daily aircraft operations) and the High Constrained demand level (1,500 daily aircraft operations) were assumed to occur sequentially, sometime beyond 2023.
2. Sections 2.10.2 and 2.10.3 of the 2016 Airport Development Plan describe the process followed for converting Base Constrained (1,475) and High Constrained (1,500) daily operations to annual operations. The first step included identifying the peak hour operations for each demand level. Based on the forecast, the peak hour of operations for the Base Constrained and High Constrained demand levels were determined to be 117 and120, respectively. Using historical data and statistics, the peak hour operations were further broken down by passenger, cargo, GA and air taxi, and military aircraft operations as 108, 2, 12, and 2 respectively for the Base Constrained demand level and 111, 2, 12, and 2 operations respectively for the High Constrained demand level. Because the overall Airport peak hour is driven by passenger aircraft operations and the peak hours for each of the other types of aircraft operations occur at different times, a single factor converting total peak hour operations to annual operations could not be applied. Instead, it was necessary to consider the conversion to annual operations for each of the four different types of operations to annual operations independently using historical data and then summing the individual annual operations by type to obtain overall Base Constrained and High Constrained annual operations. Table 2.10-3 of the 2016 Airport Development Plan document provides additional detail.

SOURCES: San Francisco International Airport, *Draft Final Airport Development Plan*, Section 2, 2016 (forecast and note regarding conversions from Base Constrained and High Constrained hourly demand to annual operations); Stephen Culberson, Senior Vice President, Ricondo & Associates, Inc, "Forecast Update for Proposed North Gate Area Terminal Enhancements Project at San Francisco International Airport," Draft Memorandum to Audrey Park February 6, 2024.

Terminal, Landside, and Support Facilities

The ADP does not propose any projects that would enhance the existing airfield capacity of SFO; it provides a plan for terminal, landside, and support facilities development to accommodate the passenger and vehicular traffic and other demands up to an ultimate operational level constrained by the existing runway capacity.[29] For airport terminal, landside, and support facilities, the concept of capacity is influenced by the desired LOS. As demand increases, the terminals and other facilities can generally continue to accommodate increasing numbers of passengers, but at a lower LOS, characterized by crowded areas, long service lines, long wait times to access curbs, interruptions in service, and other conditions that adversely affect efficiencies and the overall guest experience. It is important to remember, however, that facilities are generally designed to accommodate demand during peak hours because demand is not evenly spread throughout the day, but rather peaks at different times during the day based on airline schedules. As a result, even as demand increases and terminal, landside, and support facilities must accommodate additional passengers, there typically remain periods of time when these facilities are not operating at peak capacity.

Specific passenger LOS is a metric used by airport planners to reflect how well the airport terminal complex meets the demands of its occupants and at what level of comfort. Passenger LOS differs from engineering level of service inasmuch as engineering LOS is a measure of capacity while passenger LOS is a measure of comfort. **Table 2** presents the LOS framework established by the International Airport Transport Association (IATA) in its Airport Development Reference Manual. The conditions presented in Table 2 describe the operational efficiency of airport facilities and the level of passenger satisfaction and comfort for each LOS assessment level. The LOS assessment applies to individual functional areas of the passenger terminal including check-in, security checkpoints, circulation areas, holdrooms, and baggage claim. IATA and the Airports Council International recommend LOS C as the minimum airport terminal design objective because it represents good service at a reasonable cost. For SFO, the RADP Projects reflect the City's goal to make SFO the premier long-haul and international gateway of choice, providing the highest level of international and domestic guest service and facilitating the economic growth of the San Francisco Bay Area, corresponding to LOS A and B.

---

29 City and County of San Francisco, San Francisco International Airport, *Draft Final Airport Development Plan*, Section 1, 2016.

TABLE 2 INTERNATIONAL AIR TRANSPORTATION ASSOCIATION PASSENGER LEVEL OF SERVICE FRAMEWORK

ASSESSMENT LEVEL	LEVEL OF SERVICE	CONDITIONS
A	Excellent	Free flow, no delays, and excellent levels of comfort.
B	High	Stable flow, very few delays, and high levels of comfort.
C	Good	Stable flow, acceptable delays, and good levels of comfort.
D	Adequate	Unstable flow, acceptable delays for short periods of time, and adequate levels of comfort.
E	Inadequate	Unstable flow, unacceptable delays, and inadequate levels of comfort.
F	Unacceptable	Cross-flows, system breakdowns, unacceptable delays, and unacceptable level of comfort.

SOURCE: International Air Transport Association, *Airport Development Reference Manual*, 9th Edition, Chapter F – Airport Capacity, Page 179, Effective January 2004; National Academies of Sciences, Engineering, and Medicine, Transportation Research Board, Airport Cooperative Research Program (ACRP), *Report 25: Airport Passenger Terminal Planning and Design*, *Volume 1: Guidebook*, Page 148, 2010.

Terminal facilities are sized to accommodate demand at a specific LOS during a peak hour.[30] Many terminal facilities eventually accommodate levels of demand far in excess of the design demand but do so at a much lower LOS than desired, resulting in crowded and uncomfortable conditions. For example, the former LaGuardia Airport Central Terminal Building had a design capacity of 10 MAP[31] yet in 2014 it accommodated a total of 26.8 MAP.[32] The demand for air service at LaGuardia Airport continued despite the crowded terminals, and despite the choice of both John F. Kennedy International and Newark Liberty International Airports as regional alternatives. As another example, in January 2024, the Burbank-Glendale-Pasadena Airport Authority broke ground on a new, safer, modern, and more convenient passenger terminal at Hollywood Burbank Airport.[33] In its Environmental Impact Statement (Burbank EIS) for the replacement terminal, the FAA explained that the purpose of the project was not to increase capacity, but rather to enhance airport safety and efficiency.[34] In addition, the FAA specified that the terminal project did not result in any changes to the airport's runway configuration, aircraft fleet mix, number of operations, timing of operations, air traffic procedures, or airspace, and therefore did not change the capacity of the Airport.[35] Notably, in ensuing litigation, the United States Court of Appeals for the Ninth Circuit upheld the FAA's

---

30 US Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5360-13A, *Airport Terminal Planning*, July 13, 2018, p. 4-1.

31 US Department of Transportation, Federal Aviation Administration, Central Terminal Building Redevelopment Program at La Guardia Airport, Final Environmental Assessment and Section 4(f) Evaluation, November 2014, Chapter 2, Purpose and Need.

32 US Department of Transportation, Federal Aviation Administration, *APO Terminal Area Forecast 2018*, February 2019.

33 See, https://elevatebur.com (accessed February 5, 2024).

34 US Department of Transportation, Federal Aviation Administration, Final Environmental Impact Statement, Proposed Replacement Terminal Project, Bob Hope "Hollywood Burbank" Airport, Burbank, Los Angeles County, California, May 2021, at p. 1-11, n. 19.

35 US Department of Transportation, Federal Aviation Administration, Final Environmental Impact Statement, Proposed Replacement Terminal Project, Bob Hope "Hollywood Burbank" Airport, Burbank, Los Angeles County, California, May 2021, at p. 1-14.

statement of purpose and need for the Burbank terminal replacement project.[36] Aircraft gate availability can become a factor affecting passenger LOS. As the number of flights increases to accommodate demand, there may not be an available gate for incoming aircraft. This results in the aircraft having to wait for a gate to open, or in some cases the aircraft may park at a remote hardstand, with passengers having to walk or be bused to and from the terminal concourse. The West Remote Gates at Los Angeles International Airport are an example of the use of hardstands, which are also common at many European airports. While representing a lower passenger LOS, hardstands effectively accommodate demand at the airport without the expense of constructing terminal facilities and contact gates. Again, at a lower passenger LOS.

Congested traffic conditions may also occur as vehicular traffic increases on the roadways. But experience at SFO and other large airports such as John F. Kennedy International and Los Angeles International Airports has shown that passengers will allot additional time to get to the airport or potentially select a different mode of transportation rather than changing their air travel plans or airport choice. Historical fluctuations in demand at SFO have been a function of economic and other conditions (e.g., reactions to world events such as 9/11) rather than related to improvements to Airport access, such as those improvements from the 1989 Master Plan,[37] including the new interchange at US Highway 101 (US 101) and the Bay Area Rapid Transit (BART) extension to the Airport. **Exhibit 1** depicts annual passengers served at SFO each year since 1999, along with the approximate opening dates of new or updated facilities. As shown, the year over year changes in the numbers of passengers served have generally followed the same trend except for periods when circumstances have affected the trend line (e.g., the recession and then recovery in the early 2000s, the effects of COVID). Otherwise, the graphic shows slight variations in year over year increases occur that are generally unrelated to the completion of various projects.

Passenger traffic at SFO has continued to increase at a rapid pace in recent years, as passengers continue to use SFO despite the opportunity to opt for potentially less congestion at other Bay Area airports. For airports in a region with multiple airports, airport choice is made based on the scheduled service provided at the various airports, and in the case of SFO, access to more long-haul, non-stop, and international service. As further discussed in the Airport Cooperative Research Program (ACRP) Report 98, passengers will consider the following elements in evaluating travel options: air service availability, price, itineraries, flight schedules, airport convenience,[38] airline quality, airport quality, and loyalty programs.[39] Airport accessibility is discussed in the ACRP report as another contributing factor among other factors, such as length of time to travel to the airport, reliability of other modes of transportation, and access cost.[40] In other words, passengers choosing whether to fly and which airport to use are primarily motivated by airport destination options, flight frequency, fares, and convenience.

---

36 *City of Los Angeles v. FAA*, 63 F.4th 835 (9th Cir. 2023) (upholding FAA's statement of purpose and need as reasonable, but concluding that FAA violated NEPA on other grounds).

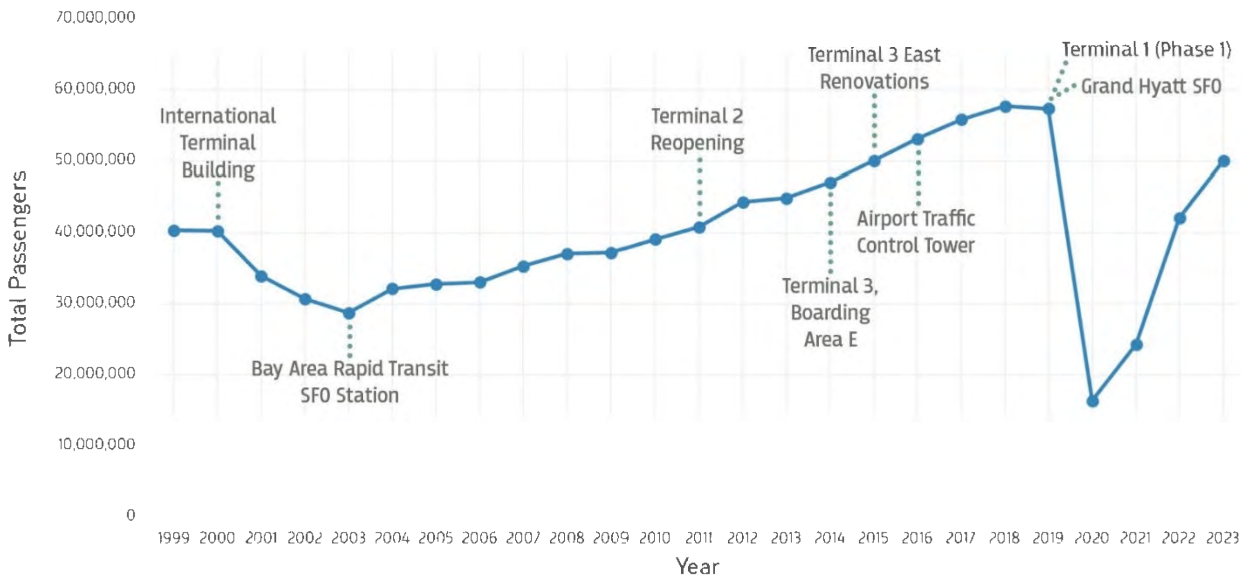
37 1989 SFO Master Plan Environmental Impact Report certified by the San Francisco Planning Commission in May 1992.

38 Convenience in this case refers to the convenience in getting to and from the airport, including the availability of public transportation modes.

39 National Academies of Sciences, Engineering, and Medicine, Transportation Research Board, Airport Cooperative Research Program (ACRP), *Report 98, Understanding Airline and Passenger Choice in Multi-Airport Regions*, 2013, p. 13.

40 National Academies of Sciences, Engineering, and Medicine, Transportation Research Board, Airport Cooperative Research Program (ACRP), *Report 98, Understanding Airline and Passenger Choice in Multi-Airport Regions*, 2013, pp. 13 and 14.

EXHIBIT 1



SOURCES: City and County of San Francisco, *San Francisco International Airport Comparative Traffic Report*, December 1999 (1999 data); DataSF, *Air Traffic Passenger Statistics*, February 20, 2024 (2000 to 2023 data).

Auxiliary facilities such as short- and long-term parking and rental car centers also provide a service to airport customers, but do not contribute to the air service capacity of the airport nor do improvements to those facilities induce growth. If there is a shortage of on-airport parking, passengers will use off-airport parking provided by others or seek other modes of transportation to reach the airport. The availability of parking does not induce people to fly or use a particular airport. Likewise, rental car companies do not affect the overall capacity of an airport, nor do they induce visitors to fly to visit a particular city or fly into a specific airport. Rental car companies will find ways to serve their customers at an airport, regardless of the on-airport facilities available.

In this context, it is critical to understand what the FAA has consistently recognized:

> Air travel is fundamentally a derived demand. In the case of business travel, it represents an input of productivity; in the case of leisure travel, it is part of the consumption of a broader activity (e.g., taking a vacation or visiting friends or relatives). In both cases, air travel demand derives from the desire or need to be at a certain location for a certain purpose and perhaps a certain time.[41]

---

[41] US Department of Transportation, Federal Aviation Administration, Final Environmental Impact Statement, Proposed Replacement Terminal Project, Bob Hope "Hollywood Burbank" Airport, Burbank, Los Angeles County, California, May 2021, at p. 1-17, citing Airport Cooperative Research Program (ACRP), Synthesis Report No. 2, Airport Aviation Activity Forecasting.

The drivers of airport aviation activity include: macroeconomic and demographic factors, airline market factors, air transport production costs and technology, regulatory factors, infrastructure constraints and improvements, and substitutes for air travel. But they do not include airport development projects that do not increase airfield capacity.[42]

Importantly, the federal courts – and the Ninth Circuit in particular – have consistently upheld this logic and have long recognized that because aviation demand is driven primarily by variables other than the efficiency of airport facilities, it is not necessarily true that "if you build it, they will come."[43] In *City of Los Angeles v. FAA*, for example, opponents of the Burbank replacement terminal project argued that had the FAA taken a hard look it could not rationally have concluded that a larger, more convenient terminal will not attract more passengers. The Ninth Circuit disagreed and rejected that argument, noting that the data showed that enplanements would grow *regardless of whether or not the new terminal was built*.[44] Likewise, in *Seattle Community Council Federation v. FAA,* the Ninth Circuit considered a proposed change in flight patterns and agreed with the FAA's conclusion that these changes would not increase capacity, noting in particular that the stated purpose of the change was " 'not to facilitate that expansion, but to ensure that safety and efficiency will be maintained,' meaning that the project 'deal[t] with the *existing air traffic*.' "[45]

Ultimately, implementation of the ADP Projects would not change runway configurations or flight paths, expand Airport property, or increase runway capacity. Its purpose is to align the capacity of SFO's passenger terminals, ground transportation, and support facilities with the practical capacity of the existing runway system, allowing those facilities to accommodate aircraft operations and passengers corresponding to the runway system capacity at the City's desired passenger LOS. It is well established that these types of airport development projects do not increase capacity or induce growth.[46]

Increasing the size of the passenger terminal building does not increase the capacity of the airfield to accommodate additional aircraft operations (takeoffs or landings). Additionally, as stated in Section 1.2.3 of the Burbank EIS, the replacement of existing facilities is not an element or factor affecting aviation activity.

Summary

The SFO ADP identifies the facilities needed to accommodate long-term passenger demand at the Airport with the highest level of domestic and international guest service that passengers expect from a premier long-haul and international gateway of choice. Like the ongoing terminal improvements at Hollywood Burbank Airport, the proposed RADP Projects would not affect or change any airfield movement area

---

42 National Academies of Sciences, Engineering, and Medicine, Transportation Research Board, Airport Cooperative Research Program (ACRP), Synthesis Report No. 2, Airport Aviation Activity Forecasting at p. 13.

43 Nat'l Parks & Conservation Ass'n v. U.S. Dept. of Transp., 222 F.3d 677, 680 (9th Cir. 2000) (finding that even when it comes to runways," it is not necessarily true that ''if you build it, they will come'.")

44 *City of Los Angeles v. FAA*, 138 F.3d 806, 807-8 (9th Cir. 1998) ("Demand for an airport … depends much more on location, runways and ticket prices than on how nifty the terminal is. Even the number of gates, within limits, has little effect, so long as the planes can land. If they can't park next to the terminal, they park farther away and passengers willingly bus back and forth.").

45 Seattle Community Council Fed'n v. F.A.A., 961 F.2d 829, 835 (9th Cir. 1992) (emphasis in the original).

46 *Barnes v. DOT*, 655 F.3d 1124 (9th Cir. 2011) (recognizing that airport improvements like changing flight patterns, improving a terminal, or adding a taxiway, do not induce growth).

components, including the runways, taxiways, or aircraft arrival and departure procedures, and thus would not increase the airfield capacity of SFO. The constrained aviation demand forecast used as the basis for planning facility improvements identified in the ADP reflects that ultimately, the runways constrain the long-term practical capacity of the Airport. While the existing facilities, along with improvements already underway, would technically accommodate the forecast demand, the LOS would deteriorate significantly with inefficiencies in the terminals, access roadways and curbsides, and auxiliary areas such as parking and rental car facilities and not meet the passenger LOS desired by the City for SFO. As demonstrated at airports such as Hollywood Burbank and LaGuardia, terminals, roadways, and other support facilities are not constraints to the ultimate practical airport capacity.

Just as not constructing the planned facilities would not deter passengers from using nor airlines from serving the Airport, the construction of the proposed facilities would not induce demand nor affect the propensity of passengers to use the Airport, as demand is based on factors other than airport facilities. The requirements developed for the ADP that result in the RADP projects were developed based on providing the desired passenger LOS at the forecast level of demand – 71.1 MAP. Further, as none of the RADP projects would increase airfield capacity nor provide new or additional facilities for noncommercial passenger aircraft operations (i.e., cargo, GA and air taxi, and military aircraft), the projects would not induce growth in those types of operations.

As discussed, demand is driven by socioeconomic factors and not the facilities provided at a particular airport. In addition, it has been demonstrated that the types of facilities proposed for development under the ADP (e.g., terminal improvements, access improvements, parking, and rental car improvements) have not constrained airports from accommodating demand. Because of these two factors, the ADP assumes the same level of activity under the No Project scenario as under the Proposed Project scenario. In other words, the improvements proposed under the ADP would not affect the demand for air travel at SFO; if the improvements are not implemented, the passenger LOS would decline as terminal, roadway, and support facilities would remain in their existing configuration. However, this would not affect the ability of aircraft to land or take off from SFO. Therefore, SFO does not anticipate that implementation of the proposed RADP Projects would induce additional demand or substantially affect the propensity of passengers to use the Airport.

cc: 21-06-1216-1
Christopher DiPrima
Michael Li
Avant Ramsey
Stephen Culberson
Lisa Reznar

p:_projects\sfo\21061216-nepa planning\01-adp strategy\facilities to accommodate demand paper\confidential memo-airportfacilitiestoaccommodateaviationdemand_202440330.docx

APPENDIX D

Employee Growth Assumptions

SFO RECOMMENDED AIRPORT DEVELOPMENT PLAN EMPLOYEE GROWTH ASSUMPTIONS MEMORANDUM

This report describes the employee growth assumptions used to develop the environmental analyses in the San Francisco International Airport (SFO) Recommended Airport Development Plan (RADP) Environmental Impact Report (EIR). 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 and approximately 71.1 million annual passengers based on the estimated capacity of the existing runways regardless of whether the RADP is implemented.

As discussed in Draft EIR Chapter 2, Project Description, and in Draft EIR 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 in and out of SFO.

The RADP EIR is a program EIR pursuant to CEQA Guidelines section 15168, in which the environmental analysis assumes implementation of future projects under the RADP would physically change the Airport. Since the RADP is a plan, its approval would not directly result in physical changes in the environment from new development. The analysis of the RADP's physical impacts in the EIR is based in part upon estimated demolition and construction assumptions associated with subsequent projects that could occur with implementation of the RADP and employee growth projections based on new Airport and tenant employees associated with subsequent RADP projects. Employee growth assumptions were developed based on land use assumptions for RADP projects, as discussed in more detail below.

SUMMARY OF EMPLOYMENT GROWTH PROJECTIONS

Table 1 presents the employee information for SFO in 2019 (the baseline year for the environmental analysis or existing conditions, as noted in the Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting published in May 2019), 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 42,800 employees (column [a] in the table), including airlines, tenants, airport commission employees, and construction workers. Future employment growth that could occur with implementation of the RADP amounts to approximately 2,700 additional employees (column [b] in the table) excluding construction employees. As noted in Table 1, 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. 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 construction workers, 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 construction workers, existing conditions, background growth, and the RADP, would total approximately 54,900 employees (column [e] in the table).

Table 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: SFO, 2019, and Fehr & Peers and ESA, 2023

Numbers are rounded to the nearest hundred.

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, http://media.flysfo.com.s3.amazonaws.com/default/downloads/reports/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.

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.

ESTIMATED EMPLOYMENT POPULATION WITH IMPLEMENTATION OF THE RADP

As described above, 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 that would occur regardless of implementation of the RADP. 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. Detailed descriptions of RADP projects are provided in Section 2.H.1, RADP Projects, in Draft EIR Chapter 2, Project Description. **Table 2** provides a detailed breakdown of estimated employment generation for implementation of the RADP, which was used in the environmental analyses in the RADP EIR.

Table 2 Estimated Employment Population with Implementation of the RADP

Project No.	Project Name	Land Use	Employee Generation Rate	Net New Square Footage/ Parking Spaces	Emp Gen
1	Boarding Area H	Airline Club	850 square foot (sf)/employee [a]	23,115	27
		Concessions	350 sf/employee [b]	57,678	165
2	Boarding Area F Modernization	Concessions	350 sf/employee	85,000 [c]	243
3	International Terminal Building (ITB) Main Hall Expansion	Concessions	350 sf/employee	26,000	74
		Airline Club	850 sf/employee	80,000	94
		Office	276 sf/employee [d]	79,250	287
4	ITB Boarding Area A and G Improvements	Concessions	350 sf/employee	23,200 [e]	66
6	Central Hub	Parking Spaces	270 spaces/employee [f]	3,026	11
9	Consolidated Rental Car Center (CONRAC) Facility	Office	276 sf/employee	80,000 [g]	290
10	Consolidated Rental Car Center Quick Turn Around Facility	Rental Car Center	2,000 sf/employee [h]	1,031,000	516
11	Long Term Parking Garage #3	Public Parking	270 spaces/employee	2,140	8
12	Long Term Parking Garage #4	Public Parking	270 spaces/employee	3,700	14
16	AirTrain Maintenance Yard	Office	276 sf/employee	36,000 [i]	130
17	North Field Ground Support Equipment Facility #1	Production, Distribution, and Repair	276 sf/employee [j]	48,000	174
18	Aircraft Maintenance Hangar	Aircraft Maintenance Hangar	N/A	181,000	500 [k]
19	East Field Ground Support Equipment Facility #2	Production, Distribution, and Repair	276 sf/employee	23,000	83
TOTAL					**2,683**

SOURCES: SFO, Potrero Power Station Mixed-Use Development Project EIR, ESA, and Ricondo & Associates

NOTES:

a. An airline club typically does not generate as many employees as retail or office land uses; as such, the "Airline Club" employee generation rate of 850 square feet per employee is based on the "Library" employee generation rate used for the Potrero Power Station Mixed-Use Development Project EIR (Potrero Power Station EIR; Case No. 2017-011878ENV), as shown in Table 4.A-1 on p. 4.A-10 of Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, of that EIR.
b. The "Concessions" employee generation rate was calculated using the "General Retail" rate of 350 square feet per employee from the Potrero Power Station EIR.

Project No.	Project Name	Land Use	Employee Generation Rate	Net New Square Footage/ Parking Spaces	Emp Gen

c. The square footage estimation for the Boarding Area F Modernization project assumes one-fourth of the net new square footage would be concessions.
d. The "Office" employee generation rate was calculated using 276 square feet per employee based on the Potrero Power Station EIR.
e. The square footage estimation conservatively assumed all net new square footage would be concessions.
f. The "Parking" employee generation rate was calculated using 270 parking spaces per employee based on the Potrero Power Station EIR.
g. Estimated square footage for area dedicated to the customer service lobby and operator office space.
h. A Rental Car Center Quick Turn Around Facility typically does not generate as many employees as a production, distribution, and repair; office; or general retail land uses; as such, the "Rental Car Center" employee generation rate was calculated using 2,000 square feet per employee based on the Waterfront Plan EIR (Case No. 2019-023037ENV).
i. Estimated square footage for area dedicated to office use; assumes AirTrain maintenance storage and employee parking would not generate new employees.
j. The "Production, Distribution, and Repair" employee generation rate was calculated using 276 square feet per employee based on the Potrero Power Station EIR.
k. The "Aircraft Maintenance Hangar" employee generation was provided by Ricondo & Associates based on a review of similar facilities at other airports.

APPENDIX E
Transportation Technical Appendix

E.1 Existing SFO Parking Information
E.2 Travel Demand Information (Memorandum in Review)
E.3 Construction Vehicle Information (Memorandum being Revised)
E.4 Transit Assessment Information
E.5 Parking Supply and Demand for Alternatives

E.1 Existing SFO Parking Information

TABLE 1-1 EXISTING PARKING SUPPLY AT PUBLIC AND EMPLOYEE LOTS

FACILITY	SPACES BY TYPE		TOTAL
	PUBLIC	EMPLOYEE	
Central Parking Garage (Short Term Parking)	5,674	785	6,459
Domestic	5,443	0	
Park Fast	105	0	
Park Valet	126	0	
Employee (Level 4)	0	785	
Garages A and G (Short Term Parking)	2,159	831	2,990
South Garage A	1,008	577	
South Garage G	1,151	254	
Long Term Parking	10,137	1,820	11,957
LTP Garage 1	3,109	0	
Surface Lot DD	1,856	0	
LTP Garage 2 (Net)	3,000	0	
Surface Lot D	2,172	1,820	
West Field Employee Parking Garage	0	1,722	1,722
Cargo Buildings[1]	0	517	517
SFO Business Center	0	155	155
UAL Pilot Parking (Lot C)[2]	0	525	525
UAL Cargo Parking Lot (Bldg. 585)	0	517	517
SFO Airport Employee Parking Lot (Bldg. 670)	0	248	248
Building 710 Parking Lot[3]	0	290	290
UAL MOC South Lot	0	386	386
UAL MOC East Lot[4]	0	1,135	1,135
UAL Parking at Lot DD[5]	0	995	995
Superbay Hangar	0	1,046	1,046
Transportation Operations Spaces (Negated)	-327	0	-327
Total Parking Spaces at Public and Employee Lots (Includes 327 Operational Spaces)[5]	**17,643**	**10,972**	**28,615**

NOTES:
ADP = Airport Development Plan LTP = Long Term Parking UAL = United Airlines MOC= Maintenance Operations Center

1 Parking totals for Buildings 710 (144 spaces) and 670 (248 spaces) were negated from the ADP's original Cargo Building line item (909 spaces). This study assumes that parking at all other cargo facilities is accounted for in the remaining Cargo Buildings line item.
2 The ADP identified two parking totals for Parking Lot C. The larger Parking Lot C total (525 spaces) is referenced for purposes of this study.
3 Building 710 provided 144 spaces at the time of the ADP. The lot has since been restriped to provide 290 spaces.
4 The UAL MOC East Lot was not included in the ADP parking inventory. Spaces for the lot were counted via Google Earth aerial images.
5 The flysfo.com aerial map of the Cell Phone Lot shows additional square footage was captured from the UAL lease at Lot DD resulting in the negation of approximately 60 spaces from the UAL Lot DD allocation.

SOURCES: City and County of San Francisco, San Francisco International Airport, *Airport Development Plan – Draft Final*, September 2016; City and County of San Francisco, San Francisco International Airport, Cell Phone Waiting Lot webpage, https://www.flysfo.com/to-from/parking/cell-phone-waiting-lot and Ground Access and Parking webpage, https://www.flysfo.com/about-sfo/sfo-tomorrow/ground-access-and-parking (accessed June 19, 2018); Google Earth, June 2018.

Occupancy of Public Parking Spaces at SFO Airport

flySFO website https://www.flysfo.com/passengers/parking

	Day of Week	Date	Time	Domestic Garage		International Garage A		International Garage G		ParkFast		Long Term Garages 1 & 2		Total		Average Monthly Occupancy
				spaces available	total occupancy	spaces available	total occupancy	spaces available	total occupancy	spaces available	total occupancy	spaces available	total occupancy	spaces available	total occupancy	
1	Friday	01/05/24	10:45AM	2,171	56%	658	60%	465	67%	89	62%	2,351	63%	5,734	61%	
2	Monday	01/08/24	12:45 PM	1,961	60%	690	58%	633	55%	138	42%	2,860	57%	6,282	58%	
3	Wednesday	01/10/24	12:00 PM	1,687	66%	510	69%	427	70%	137	42%	3,057	54%	5,818	61%	
4	Thursday	01/11/24	1:00 PM	1,914	61%	281	83%	542	61%	148	37%	2,958	55%	5,843	60%	
5	Friday	01/12/24	1:50 PM	2,027	59%	562	66%	512	64%	131	44%	2,550	62%	5,782	61%	
6	Tuesday	01/16/24	12:30 PM	2,150	56%	571	66%	502	64%	141	40%	2,926	56%	6,290	58%	
7	Thursday	01/18/24	12:00 PM	1,379	72%	494	70%	466	67%	187	21%	2,835	57%	5,361	64%	
8	Tuesday	01/23/24	12:45 PM	1,566	68%	645	61%	402	71%	132	44%	3,114	53%	5,859	60%	
9	Wednesday	01/24/24	12:15 PM	1,307	73%	486	71%	418	70%	123	48%	3,061	54%	5,395	64%	
10	Thursday	01/25/24	1:50 PM	1,391	72%	379	77%	419	70%	128	46%	2,798	58%	5,115	66%	
11	Tuesday	01/30/24	1:30 PM	1,628	67%	574	65%	422	70%	160	32%	3,214	52%	5,998	60%	61%
12	Tuesday	02/06/24	12:30 PM	1,634	67%	721	56%	527	62%	148	37%	2,906	56%	5,936	60%	
13	Wednesday	02/07/24	12:00 PM	1,108	77%	528	68%	436	69%	128	46%	2,771	58%	4,971	66%	
14	Thursday	02/08/24	12:50 PM	806	84%	267	84%	605	57%	145	39%	2,335	65%	4,158	72%	
15	Tuesday	02/20/24	12:30 PM	970	80%	695	58%	279	80%	52	78%	1,184	82%	3,180	78%	
16	Wednesday	02/21/24	1:20 PM	663	86%	688	58%	169	88%	46	81%	1,090	84%	2,656	82%	
17	Thursday	02/22/24	12:00 PM	491	90%	443	73%	272	81%	61	74%	887	87%	2,154	86%	
18	Friday	02/23/24	1:00 PM	733	85%	482	71%	526	63%	74	69%	554	92%	2,369	84%	76%
19	Monday	05/06/24	12:45 PM	920	81%	596	64%	375	73%	82	65%	1,097	83%	3,070	79%	
20	Wednesday	05/08/24	12:00 PM	555	89%	445	73%	244	83%	53	78%	1,133	83%	2,430	84%	
21	Thursday	05/09/24	12:00 PM	251	95%	158	90%	413	71%	56	76%	475	93%	1,353	91%	
22	Friday	05/03/24	1:30 PM	844	83%	418	75%	111	92%	69	71%	435	93%	1,877	87%	85%
23	Monday	06/17/24	12:15 PM	1,153	77%	460	72%	485	65%	18	92%	857	87%	2,973	80%	
24	Tuesday	06/18/24	12:00 PM	1,171	76%	319	81%	284	80%	42	82%	944	86%	2,760	82%	
25	Wednesday	06/19/24	12:30 PM	930	81%	200	88%	275	80%	38	84%	764	88%	2,207	85%	
26	Thursday	06/20/24	12:20 PM	851	83%	307	81%	491	65%	7	97%	161	98%	1,817	89%	
27	Friday	06/21/24	12:00 PM	872	82%	532	68%	182	87%	49	79%	169	97%	1,804	87%	84%

Presidents' Day/Ski Week

SFO Parking Supply and Demand - June 2017

Garage/Surface Lot	Total	Public	Employee	% Public	% Employee	Parking Demand: Max Hourly Demand	Parking Demand: Max Avg Hourly Demand over the Year	Parking Demand: Demand at 8 AM	Parking Demand: Demand at 12 PM	% Occupied: Max Hourly Demand	% Occupied: Max Avg Hourly Demand over the Year	% Occupied: Demand at 8 AM	% Occupied: Demand at 12 PM	Date of Demand Data
Domestic	6,558	5,542		100%	0%	4,784	3,083	2,876	3,083	86%	56%	52%	56%	6/2016-5/2017
Domestic Level 4 Park Fast		105		100%	0%	92	49	46	49	88%	47%	44%	47%	6/2016-5/2017
Domestic Level 4 Valet		126		100%	0%	77	49	46	48	61%	39%	37%	38%	6/2016-5/2017
Domestic Level 4 Employee (A/B T1 & F/G T3)			785	0%	100%	829	558	463	558	106%	71%	59%	71%	6/2016-5/2017
ITA	1,585	902	683	57%	43%	1,579	903	686	903	100%	57%	43%	57%	6/2016-5/2017
ITG	1,405	1,130	275	80%	20%	1,184	658	517	622	84%	47%	37%	44%	6/2016-5/2017
LT Parking	3,109	3,109		100%	0%	3,114	2,717	2,661	2,717	100%	87%	86%	87%	6/2016-5/2017
LT Surface Lot	882	882		100%	0%	1,502	761	756	724	170%	86%	86%	82%	6/2016-5/2017
WFG	1,722		1,722	0%	100%	1,588	1,312	1,225	1,312	92%	76%	71%	76%	6/2016-5/2017
Lot C	525		525	0%	100%	532	384	367	377	101%	73%	70%	72%	6/2016-5/2017
Lot D	3,585	2,044	1,541	57%	43%	3,139	1,755	1,473	1,745	88%	49%	41%	49%	6/2016-5/2017
Cargo	1,010		1,010	0%	100%									Data unavailable
SFO Business Center (Bldg 575)	165		165	0%	100%	146	83	41	76	88%	50%	25%	46%	6/2016-5/2017
Total	***20,546***	***13,840***	***6,706***	67%	33%	***18,566***	***12,312***	***11,157***	***12,214***	***90%***	***60%***	***54%***	***59%***	

Public Only Demand	9,569	6,659	6,385	6,621	98%	68%	65%	**68%**
Employee Only Demand	3,095	2,337	2,096	2,323	97%	73%	66%	**73%**
Shared (Public + Employee) Demand	5,902	3,316	2,676	3,270	90%	50%	41%	50%
Total Demand	18,566	12,312	11,157	12,214	**95%**	63%	57%	63%

All parking data provided by SFO

13,210 Max hourly demand for public spaces (public only + % public shared)
95% % occupancy

5,356 Max hourly demand for employee spaces (employee only + % employee shared)
80% % occupancy

E.2 Travel Demand Memorandum

Memorandum

Date: March 18, 2025

To: Jenny Delumo, San Francisco Planning Department
Elizabeth White, San Francisco Planning Department
Kei Zushi, San Francisco Planning Department

From: Sarah Chan & Matt Goyne, Fehr & Peers, and Luba Wyznyckyj, LCW Consulting

Subject: SFO Recommended Airport Development Plan CEQA Analysis Travel Demand Memorandum – Final

SF18-1001

This memorandum presents the data sources, travel demand modeling process, and results for the travel demand analysis conducted for the SFO Recommended Airport Development Plan (RADP) Environmental Impact Report (EIR). Results of the travel demand analysis documented in this memorandum are used in the transportation, air quality, and noise operational analyses in the Draft EIR.

This memorandum is organized into the following sections:

1. Background
2. SFO RADP Travel Demand Approach
3. SFO Passenger and Employee Trip Generation
4. SFO Passenger and Employee Trip Distribution
5. SFO Passenger and Employee Way of Travel
6. SFO Cargo Truck Trip Generation
7. SFO Delivery Truck Trip Generation
8. Vehicle Trip Assignment
9. SFO Parking Demand

1. Background

Implementation of the RADP would facilitate 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. 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 (MAP) considering the forecast passenger aircraft fleet mix. As discussed in the Airport Facilities to Accommodate Aviation Demand (Appendix C of the Draft EIR), implementation of the RADP would not induce passenger demand, nor would implementation of the RADP increase the capacity of the airfield, change the configuration of the existing runways, change 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 implementation of the RADP would not change passenger demand, a future baseline of 2045 was determined to be appropriate to assess the operational transportation and circulation impacts of the RADP. Therefore, this memorandum considers the future 2045 baseline conditions without the RADP conditions (i.e., conditions that reflect SFO passenger, employee,[1] and cargo growth projections that would occur regardless of implementation of the RADP) as well as the travel demand associated with subsequent projects that could occur with implementation of the RADP (i.e., the additional employees and delivery trucks associated with the subsequent RADP projects). As described in greater detail below, this technical memorandum also addresses whether implementation of the RADP would result in shifts in passenger ways of travel to and from the Airport.

The results of the travel demand analysis are used in the transportation and circulation, air quality, and noise operational impact analyses by comparing the 2045 future baseline with RADP conditions to the 2045 future baseline without RADP conditions to present those impacts attributable only to subsequent RADP projects.

2. SFO RADP Travel Demand Approach

The SFO RADP travel demand methodology follows a standard four-step process. In this process, travel attributes are analyzed sequentially, beginning with the total number of passenger and employee person trips[2] expected (trip generation), continuing to where those trips are destined to/from (trip distribution), followed by the ways of travel (e.g., driving, taxis/Transportation

[1] Employees refer to Airport commission and tenant employees. Airport commission employees are employees that are employed by SFO Airport. Tenant employees are employed by private companies, including but not limited to airlines, commercial service providers, ground support providers, and rental car companies.

[2] A person trip is a trip made by one person by any means of transportation (e.g., auto, transit, bicycling, walking).

Network Company vehicles [TNCs], car rentals, transit) individuals would choose for that trip. The final step is identifying the expected route each vehicle trip would follow (trip assignment).

The travel demand analysis was prepared for the following conditions:

- **Existing (2019) Conditions:** The existing conditions scenario represents the existing conditions for the RADP project site (defined as SFO property east of U.S. 101) at the time that the NOP was published (2019). 2019 also represents the last full calendar year of operations prior to the COVID-19 pandemic in late 2019/early 2020, when worldwide aircraft operations were restricted. Projects that were under construction in 2019 but have since been completed and are operational include the AirTrain extension, the Grand Hyatt at SFO hotel, and Terminal 1 Boarding Area B, which are not included under existing conditions but are included in the 2045 future baseline without RADP conditions and 2045 future baseline with RADP/cumulative conditions, described below. The 2023 roadway volumes, which include traffic volumes derived from the completed projects at SFO noted above, were collected and compared to 2018 and 2019 data at selected locations within the study area. The comparison showed that the 2018 and 2019 roadway volumes were on average 10 to 15 percent higher than 2023 volumes. Therefore, utilizing a 2019 base year would result in traffic volumes that are more likely to result in greater impacts, such as higher vehicle, including transit, delays on the roadways, as there would be less capacity for additional vehicle traffic in the future.
- **2045 Future Baseline without RADP Conditions**: This is the future baseline that includes the anticipated future regional land use, population, and employment growth; future regional transportation network; future vehicle trips on surrounding roads; approximately 71.1 MAP at the Airport, based on the estimated capacity of the existing runways; and future projections of Airport employment through 2045, not including subsequent projects that could occur with implementation of the RADP. 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. This scenario assumes the cumulative projects identified in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, of the Draft EIR would be complete by 2045. As described above, the 2045 future baseline without RADP conditions serves as the baseline for analysis of transportation operational impacts for subsequent projects that could occur with implementation of the RADP.
- **2045 Future Baseline with RADP Conditions:** This scenario includes the 2045 future baseline without RADP conditions described above, plus the subsequent projects that could occur with implementation of the RADP. The 2045 future baseline with RADP condition adds the travel demand generated by additional employees and delivery trucks associated with subsequent RADP projects. As noted above, the operational impact analyses for transportation are based on comparing the 2045 future baseline with RADP

conditions to the 2045 future baseline without RADP conditions to present those impacts attributable only to subsequent RADP projects.

- **Cumulative Conditions:** The cumulative projects identified in Draft EIR Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, are accounted for in the 2045 future baseline without RADP conditions and are therefore also included in the 2045 future baseline with RADP conditions. Therefore, the 2045 future baseline with RADP conditions also represents cumulative conditions and is presented in this memorandum as the 2045 future baseline with RADP/cumulative conditions.

The Airport accommodated approximately 57.5 MAP in 2019 and is forecast to accommodate approximately 71.1 MAP by roughly 2045. At the time of NOP publication, the Airport employed approximately 42,800 employees (including airline, tenant, airport commission, and construction employees).[3] Under the 2045 future baseline without RADP conditions, employment is expected to increase to 52,200; this employment growth would occur regardless of implementation of the RADP.[4] With implementation of the RADP, employment is projected to increase by approximately 2,700 employees, resulting in a total of 54,900 employees under the 2045 future baseline with RADP/cumulative conditions. **Table 1** summarizes the change in passenger and employee assumptions for each study scenario.

3 San Francisco International Airport, *2017 Economic Impact Study of San Francisco International Airport*, July 2017, http://media.flysfo.com.s3.amazonaws.com/default/downloads/reports/2017_SFO_Economic_Impact_Study_Update.pdf, accessed March 10, 2024.

4 Background employee growth was estimated by applying the ratio of number of passengers per employee (excluding construction workers) for the existing condition to the 2045 condition (57,800,000 MAP / 40,787 employees [i.e., 42,828 total employees minus 2,041 construction workers] = 1,417 passengers per employee; 71,100,000 MAP / 1,417 passengers per employee = 50,176 employees by 2045, for a total of 52,217 employees including 2,041 construction workers, and a net increase of 9,389 employees). The number of construction workers (approximately 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 to ensure ongoing airport operations are not substantially affected.

Table 1: SFO Passenger and Employee Assumptions

Scenario	Passengers[1]	Employees[2]
Existing Conditions (2019)	57.5 MAP	42,800
2045 Future Baseline without RADP Conditions	71.1 MAP	52,200
2045 Future Baseline with RADP/Cumulative Conditions[3]	71.1 MAP	54,900
Delta		
2045 Future Baseline without RADP minus Existing Conditions	*+13.6 MAP*	*+9,400*
2045 Future Baseline with RADP/Cumulative[3] minus Existing Conditions	*+13.6 MAP*	*+12,100*
2045 Future Baseline with RADP/Cumulative Conditions[3] minus 2045 Future Baseline without RADP	*0 MAP*	*+2,700*

1. MAP = million annual passengers
2. Includes airline, tenant, airport commission, and construction employees.
3. The cumulative projects identified in Draft EIR Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, are accounted for in the 2045 future baseline without RADP conditions and are therefore also included in the 2045 future baseline with RADP/cumulative conditions (i.e., the 2045 future baseline with RADP conditions also represents cumulative conditions).

3. SFO Passenger and Employee Trip Generation

Trip generation is estimating the total number of person trips expected to travel to and from the Airport via landside transportation (e.g., passengers/employees traveling to and from the Airport by personal car, taxi, BART) during the peak hour of the weekday a.m. (7 a.m. to 9 a.m.) and p.m. (4 p.m. to 6 p.m.). Passengers transferring between flights are not expected to generate external trips (i.e., trips leaving or arriving to the Airport). A review of annual average daily traffic on Airport ramps shows that peak Airport traffic typically occurs on Fridays during the midday (12 p.m. to 1 p.m.), while roadway counts along U.S. 101, adjacent to the Airport, show that the highest volume of traffic typically occurs on weekdays during the a.m. and p.m. peak hours of travel. Traffic on these roadways are approximately 10 percent higher during the weekday a.m. and p.m. peak periods compared to the Friday midday peak. Therefore, the weekday a.m. and p.m. peak periods were selected for the analysis since they represent the highest amount of traffic on the adjacent roadway network.

Trip generation assumptions are summarized in **Table 2** and **Table 3** for the passenger and employee trip generation, respectively. Detailed calculations for the weekday daily and a.m. and p.m. peak hours can be found in **Attachment A**.

Table 2: SFO Passenger Trip Generation Assumptions

Data	Value	Detail	Source
Total Daily Air Passengers	2019: 157,482 2045: 215,377	Total number of air passengers served by the airport for the peak month average day.[1]	SFO ADP, Appendix C (pg. 3)
Percentage of air passengers with initial origin/final destination at SFO	77%	Share of all air passengers who are expected to begin or end their air travel at SFO, and therefore will use surface transport or BART to access or depart the airport.	SFO ADP, Appendix C (pg. 3)
Percentage of Departing Passengers arriving during each weekday peak hour[2]	6.7% a.m. 4.6% p.m.	Estimates of what share of passengers will be arriving at the airport in each peak hour to take a departing flight.	August 2018 SFO Transportation Security Administration (TSA) queue data (arrival of departing passengers at screening point)[3]
Percentage of Arriving Passengers leaving during each weekday peak hour[2]	5.3% a.m. 6.4% p.m.	Estimates what share of passengers will be leaving the airport in each peak hour after arriving on a flight.	August 2018 airline arrival data and passenger counts

Source: Fehr & Peers, 2024.

1. The total daily air passengers under 2045 future baseline without RADP conditions and 2045 future baseline with RADP/cumulative conditions used in the analysis is 215,377 passengers which was derived from the peak month total passengers of 6,676,687 passengers included in Appendix C of the SFO ADP (page 4), divided by 31 days (i.e., the peak month of August). The 215,377 total daily air passengers also represent the estimated high case design day passengers included Appendix C of the SFO ADP (page 3).
2. Excludes the 23 percent of passengers that are transferring flights and are not expected to generate external trips.
3. Passenger arrivals and departures are modeled based on airport operations; however, it is likely that there is a delay between an individual arriving at security, deplaning, or departing customs and that same individual's trip to and from the Airport. As such, the share of passenger arrivals/departures during the weekday peak hours were assessed utilizing August 2018 SFO TSA queue data (for departures) and airline arrival data during the expanded 7 a.m. to 10 a.m. and 4 p.m. to 7 p.m. periods, and the peak hourly demand for each period was selected, even if it did not correspond to the peak hour of adjacent traffic. This allows for a conservative analysis of persons arriving or departing during each peak hour. The same methodology was also applied to 2045 future baseline without RADP and 2045 future baseline with RADP/cumulative conditions.

Table 3: SFO Employee Trip Generation Assumptions

Data	Value	Detail	Source
Total Employees[1, 2]	2019: 42,800 2045 Future Baseline without RADP: 52,200 2045 Future Baseline with RADP/Cumulative: 54,900	Total number of employees.	2017 Economic Impact Study of San Francisco International Airport, July 2017 2016 SFO Tenant and Commission Survey Prelim Report
Proportion of incoming employee trips occurring during weekday peak hours	20.7% (a.m.) 2.9% (p.m.)	Share of employees entering SFO during the weekday a.m. and p.m. peak hours.	2016 SFO Tenant and Commission Survey Prelim Report
Proportion of outgoing employee trips occurring during weekday peak hours	5.5% (a.m.) 12% (p.m.)	Share of employees leaving SFO during the weekday a.m. and p.m. peak hours.	2016 SFO Tenant and Commission Survey Prelim Report

Source: Fehr & Peers, 2024.
1. Based on employee assumptions included in Table 1.
2. Total employees during weekday conditions represent approximately 85 percent of the total employment population. The adjusted total weekday employees is 36,400 weekday employees for 2019 conditions; 44,400 weekday employees for 2045 future baseline without RADP conditions; and 46,700 weekday employees for 2045 future baseline with RADP/cumulative conditions.

4. SFO Passenger and Employee Trip Distribution

Trip distribution refers to the geographic origins of passengers and employees arriving at the Airport and the destinations of those leaving the Airport. It is presented as a percentage of all trips that travel to or from a given place. For purposes of this analysis, origins and destinations are summarized by county.

4.A SFO Passenger Trip Distribution

For existing conditions, passenger trip distribution data was collected from the 2018 SFO Customer Survey Report, which represents baseline conditions, and includes approximately 2,800 passenger survey responders and includes data ranging from the purpose of travel, travel origin/destination (O/D), and ways of travel.[5] For future conditions, the existing baseline trip distribution from the surveys was adjusted by projected job growth in each county by 2045. Job growth in this case serves as a proxy for overall economic activity, which is one of the primary drivers of air travel demand at SFO.[3] **Table 4** summarizes the trip distribution assumptions and

[5] Corey, Canapary & Galanis (2018). 2018 SFO Customer Survey Report.

source data, and **Table 5** presents the existing trip distribution assumptions by county, the projected job growth assumed for each county, and the resulting 2045 trip distribution assumptions by county that were used in the analysis. For example, for San Francisco County, the Plan Bay Area (PBA) job growth projected to 2045 (100 percent + 25 percent[6]) was multiplied by the existing trip distribution of 45.7 percent, equaling 57 percent. The 57 percent was recalculated based on a weighted average, such that the sum of all of the county's trip distribution equaled 100 percent. The final 2045 trip distribution for San Francisco of 46.4 percent was applied to the total passenger person trips to calculate the total number passenger person trips to and from San Francisco. **Attachment B** includes detailed calculations and results.

Table 4: Passenger Trip Distribution Assumptions and Source Data

Data	Detail	Source
Existing Origin/Destination (O/D) Percentages by County	Percentage of passengers traveling to or from each of the nine Bay Area counties	2018 SFO Customer Survey Report[1]
Job Growth by County	Projected jobs in 2019 and 2045 in each county, as taken PBA 2050	PBA 2050
Total Person Trips by Peak Hour	Total person trips for each peak hour, as well as daily, separated by inbound vs. outbound trips	Trip Generation (See Table 2)

Source: Fehr & Peers, 2024.
1. Corey, Canapary & Galanis (2018). 2018 SFO Customer Survey Report.

Table 5: Existing and 2045 Future Year Passenger Trip Distribution Estimates

County	Existing Trip Distribution (2019)	PBA Job Growth projected to 2045 within County[1]	2045 Trip Distribution
San Francisco	45.7%	25%	46.4%
San Mateo	12.9%	21%	12.6%
Santa Clara	10.0%	33%	10.8%
East Bay (Alameda + Contra Costa + Solano)	20.0%	26%	20.5%
North Bay (Marin + Napa + Sonoma)	11.4%	4%	9.7%
Total	**100%**	**25%**	**100%**

Source: SFO 2018 Passenger Survey, Plan Bay Area (PBA) 2050, Fehr & Peers, 2024.
1. Year 2045 job growth was linearly interpolated between existing and Year 2050 assumptions included in Plan Bay Area 2050.

6 The projected job growth between existing and 2045 conditions was estimated for each Bay Area county based on Plan Bay Area (PBA) 2050 projections. PBA 2050 job growth projections per county are shown on Table 5.

Generally, future job growth is projected to follow similar regional patterns to recent job growth patterns; as such, trip distribution is not projected to substantially change between the existing and the 2045 future baseline without RADP and 2045 future baseline with RADP/cumulative conditions.

4.B SFO Employee Trip Distribution

For existing conditions, employee distribution data was collected from the SFO BART Ridership, Residence, and Mode Summary.[7] The report includes a summary of the most recently available employee transportation survey, completed in 2016, which includes a summary of where tenant and commission employees are traveling to/from and how they arrive to/from the airport (e.g., private car, BART). For 2045 future year without RADP and 2045 future baseline with RADP/cumulative conditions, trip distribution was adjusted by projected PBA housing growth in each county by 2045. Housing growth can serve as a proxy for overall employee trip distribution trends at SFO because it represents the share of where new home-based work trips may originate to and from. **Table 6** summarizes the inputs of the trip distribution model. **Table 7** presents the existing employee trip distribution assumptions by county, the projected housing growth assumed for each county, and the resulting 2045 employee trip distribution assumptions by county that were used in the analysis. For example, for San Francisco County, the PBA housing growth projected to 2045 (100 percent + 40 percent[8]) was multiplied by the existing trip distribution of 24.7 percent, equaling 35 percent. The 35 percent was recalculated based on a weighted average, such that the sum of all the county's trip distribution equaled 100 percent. The final 2045 future year employee trip distribution for San Francisco of 25.5 percent was applied to the total employee person trips to calculate the total number of employee person trips to and from San Francisco. **Attachment C** includes detailed calculations and results.

Table 6: Employee Trip Distribution Assumptions and Source Data

Data	Detail	Source
Existing O/D Percentages by County	Percentage of employees traveling to or from each of the nine Bay Area counties.	SFO BART Ridership, Residence, and Mode Summary (2017)
PBA Housing Growth by County	Projected housing growth in 2019 and 2045 in each county, as taken from PPBA 2050.	PBA 2050
Total Person Trips by Peak Hour	Total person trips for each peak hour, as well as daily, separated by inbound vs. outbound trips.	Trip Generation (See Table 3)

Source: Fehr & Peers, 2024.

[7] SFO BART Ridership, Residence, and Mode Summary (2017). San Francisco International Airport.

[8] The projected housing growth between existing and 2045 conditions was estimated for each Bay Area county based on Plan Bay Area (PBA) 2050 projections. PBA 2050 housing growth projections per county are shown on Table 7.

Table 7: Existing and 2045 Future Year Employee Trip Distribution Estimates

County	Existing Trip Distribution (2019)	PBA Housing Growth within County	2045 Trip Distribution[2]
San Francisco	24.7%	40%	25.5%
San Mateo	39.9%	34%	39.3%
Santa Clara	5.5%	50%	6.0%
East Bay (Alameda + Contra Costa + Solano)	28.1%	65%	27.7%
North Bay (Marin + Napa + Sonoma)	1.8%	16%	1.6%
Total	**100%**	**36%**	**100%**

Notes:
1. Approximately 6 percent of existing employees in the SFO Commission and Tenant Employees Residence Data (2017) stated that they live outside of the Bay Area. Their data was omitted from this exercise and the total trip distribution was recalculated based on employees living within the Bay Area because it can represent the share of where new home-based work trips may originate to and from.
2. The 2045 trip distribution was only applied to the net change in employees between existing conditions (2019) and 2045 future baseline without RADP conditions (9,400 employees), and existing conditions (2019) and 2045 future baseline with RADP conditions/cumulative (12,100 employees), as summarized in Table 1 since existing employee trips are already reflected in the background conditions. See Attachment C for detailed calculations.
Sources: SFO BART Ridership, Residence, and Mode Summary (2017). San Francisco International Airport, Plan Bay Area 2050, Fehr & Peers, 2024.

PBA 2050 estimates a 36 percent increase in housing throughout the Bay Area with a focus on housing growth in San Francisco County, San Mateo County, and East Bay counties (Alameda, Contra Costa, and Solano). As described above, the 2045 future year employee trip distribution was calculated by multiplying the existing employee trip distribution by the estimated job growth. As shown in Table 7, the 2045 future year employee trip distribution is relatively consistent with existing employee trip distribution and is not projected to substantially change between the existing and the 2045 future year conditions.

5. SFO Passenger and Employee Ways of Travel

Ways of travel (also known as mode choice or mode split) reflects how individuals make their trips to and from the Airport.

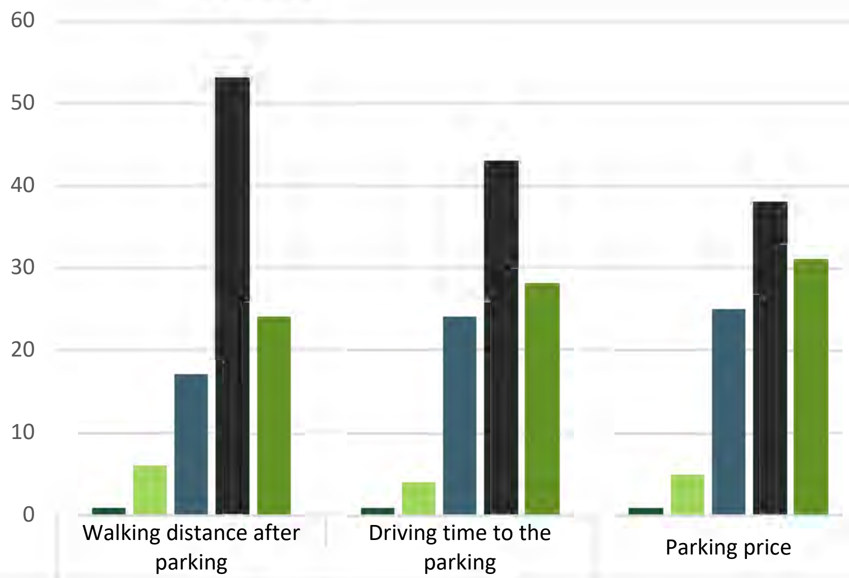
5.A Passenger Way of Travel Choice Considerations

A 2023 study on airport travelers' decision behaviors found the factors that influence the decision to park is based on the walking distance after parking, driving time to the parking, and parking price as seen in **Figure 1**.[9] Studies have also shown that the time to find parking and payment

[9] Qin, Huanmei, Ning Xu, Yonghuan Zhang, Qianqian Pang, and Zhaolin Lu, (2023), Research on Parking Recommendation Methods Considering Travelers' Decision Behaviors and Psychological Characteristics, *Sustainability* 15 (8): 6808. https://doi.org/10.3390/su15086808.

frequency (hourly, daily, monthly) can influence a passenger's decision to drive or use other forms of transportation.[10] Furthermore, a passenger's primary reasons for driving and parking at the airport is if they are departing and arriving at the same airport, if they are local, and/or if they are a business traveler.[11] Additionally, passengers consider length of time it takes to travel to the airport and reliability of those ways of travel.[12]

Figure 1: Primary Factors Influencing Parking Choice



	Walking distance after parking	Driving time to the parking	Parking price
Very unimportant	1	1	1
Unimportant	6	4	5
Generally important	17	24	25
More Important	53	43	38
Very important	24	28	31

[10] Christiansen, P., Engebretsen, Ø., Fearnley, N., & Hanssen, J. U. (2016). Parking facilities and the built environment: Impacts on Travel Behaviour.

[11] Consultancy, J., Walker Parking Consultants, Mannix Group, & DMR Consulting. (2009). Guidebook for Evaluating Airport Parking Strategies and Supporting Technologies. ACRP Report 24, https://doi.org/10.17226/14342.

[12] National Academies of Sciences, Engineering, and Medicine. (2013). Understanding Airline and Passenger Choice in Multi-Airport Regions. ACRP Report 98, https://nap.nationalacademies.org/catalog/22443/understanding-airline-and-passenger-choice-in-multi-airport-regions.

In addition to the factors above, additional considerations that result in barriers to taking transit, walking or bicycling to the airport include:

- **Time/Availability:** [13,14] There is limited late night service available via BART and SamTrans, and therefore, drop-off or ride-share (e.g., TNCs or taxis) are typically the quickest ways of travel to arrive on time for early or late flights.
- **New Mobility:**[15] The rise of TNCs such as Uber and Lyft, makes it more convenient to drop-off rather than spend time parking.
- **First/Last Mile:** The distance of the airport entrance from the parking space can be too far from the origin or destination via walk/bike.
- **Origin-Destination:**[16] There is no need to park if the passenger will not be starting and ending from the same airport.

Implementation of the RADP would increase the total parking supply and therefore could affect a passenger's choice regarding way of travel. Subsequent RADP projects that would affect the passenger and employee parking supply include the following (**Attachment D** includes a parking summary table of these projects):

- Boarding Area F Modernization (RADP Project #2): reconstruction of Boarding Area F would demolish the existing West Field Employee Parking Garage, which contains 1,722 existing parking spaces, and construct a new parking garage with 1,722 parking spaces at the existing Building 682 location; therefore, there would be no net change in the number of parking spaces as part of this project.
- Central Hub (RADP Project #6): construction of the Central Hub, which is proposed to designate different levels for different types of ground transportation (e.g., designated levels for parking, transit, airport shuttles, taxi/TNCs), would replace the existing 6,459 space garage with a 10,000-space garage.
- Consolidated Rental Car Center Facility (CONRAC; RADP Project #9) and Consolidated Rental Car Center Quick Turn-Around Facility (RADP Project #10): construction of the CONRAC would eliminate 1,200 existing parking spaces and airport ground transportation staging, such as TNCs, and construct 2,880 rental car spaces.

---

13 National Academies of Sciences, Engineering, and Medicine. (2012). Exploring Airport Employee Commute and Parking Strategies. Washington, DC: The National Academies Press, https://doi.org/10.17226/22724.

14 Christiansen, P., Engebretsen, Ø., Fearnley, N., & Hanssen, J. U. (2016). Parking facilities and the built environment: Impacts on Travel Behaviour.

15 Streeting, M, Khanna, A, Santha, N. (2019). Where to Now? — The Future of Airport Car Parking

16 Consultancy, J., Walker Parking Consultants, Mannix Group, & DMR Consulting. (2009). Guidebook for evaluating airport parking strategies and supporting technologies. ACRP Report 24, https://doi.org/10.17226/14342.

- Long-Term Parking Garage #3 (RADP Project #11): construction of 3,200 new spaces within long-term public parking facility and employee parking garages would replace the existing 1,060 parking spaces at the United Airlines employee surface parking lot.
- Long-Term Parking Garage #4 (RADP Project #12): construction of 3,700 new spaces within long-term public parking facilities and employee parking garages would replace the existing 2,485 ready return/rental car stalls.
- Rental Car Center Short-Term Storage Log (RADP Project #13): construction of 2,200 new rental car sticking and storage spaces, which is currently used for vehicle fueling facilities and wash bays.
- AirTrain Maintenance Yard (RADP Project #16): modifications at the existing AirTrain Maintenance Yard would include 240 new employee parking spaces.
- North Field Ground Support Equipment Facility #1 (RADP Project #17): construction of the North Field Ground Support Equipment Facility #1 would remove 107 existing employee parking spaces.
- Aircraft Maintenance Hanger (RADP Project #18): construction of Aircraft Maintenance Hanger would demolish 1,046 existing employee spaces.

Overall, subsequent RADP projects would result in a net increase of about 7,300 parking spaces at the Airport (i.e., a net increase of 9,900 public parking spaces and a net reduction of 2,600 employee/tenant parking spaces). A review of existing weekday average occupancy at Airport public parking garages shows that existing SFO parking garages are near constrained during peak travel seasons.[17]

As passenger growth increases, the demand for on-Airport parking may exceed the 2045 future baseline without RADP supply, such that passengers would utilize off-Airport parking facilities. A majority of off-Airport parking spaces are located within a mile of the Airport and would require passengers to use many of the same roadways to access the facilities. Based on the available research presented above, a passenger's preference to drive is not dictated by where the parking is located since both Airport and off-Airport parking facilities are located within proximity to the Airport, provide competitive pricing, and provide direct access to the Airport via shuttle. Therefore, the change in the overall parking supply associated with implementation of the RADP is not anticipated to substantially affect the six factors that influence a passenger's decision to drive, as described in **Table 8**, below.

[17] SFO Airport. (2024). https://www.flysfo.com/passengers/parking. Summarized in Attachment D, Parking Summary: Occupancy of Public Parking Spaces at SFO Airport.

Table 8: Subsequent RADP Projects Effect on Passenger Way of Travel Choice Factors

Primary Factor	Anticipated Change
Walking distance after parking	**No Change:** Parking would be constructed and demolished throughout SFO. Passenger parking would not necessarily be located closer than existing parking locations.
Driving time to parking	**No Change:** The RADP does not propose any transportation network changes that would substantially change travel time to/from the Airport.
Parking Price	**No Change:** Parking price policy changes are not included in the RADP.
Time to find parking	**Potential Change:** As more spaces are provided for passengers, the time to find parking can decrease; however, the total increase in parking is relative to the total increase in passenger growth between 2019 and 2045 conditions.[1]
Payment frequency	**No Change:** Parking policy changes are not included in the RADP.
Origin-Destination/Trip Purpose	**No Change:** The location of the Airport and passenger origin/destinations and trip purposes would not change with implementation of the RADP.

Notes:
1. A 2019 study of the Boston Logan International Airport indicates that a lack of available passenger parking results in an increase in drop-off/pick-up vehicle trips, and an increase in VMT. Source: Massport. (2019). Logan Airport Parking Freeze Amendment Ground Access and Trip Reduction Strategy Studies.

In addition to the factors above, implementation of the RADP would not change transit operations (e.g., result in a change in an existing bus route that would result in greater travel times for that route), nor would it create additional barriers such as time of transit travel, availability of transit operators and routes, or proximity between transit stops and terminal. Therefore, the percentage of passengers using transit is not anticipated to change with implementation of subsequent RADP projects.

In summary, based on the above research and subsequent RADP project types, subsequent RADP projects would not change passenger ways of travel between 2045 future baseline without RADP conditions and 2045 future baseline with RADP/cumulative conditions. As such, the travel demand methodology assumes the same passenger ways of travel under the 2045 future baseline without RADP conditions and 2045 future baseline with RADP/cumulative conditions.

5.A.1 Way of Travel Choice Analysis

Passenger survey data includes private vehicle drop-offs/pick-ups, TNCs, rental car, BART, drive and park, hotel shuttle, taxi, shuttle van (private for-hire vans), charter bus, limo, and SamTrans and the Marin Airporter as potential ways of travel. These individual ways of travel were grouped into categories with similar implications on travel demand:

- **Drive:** Includes private vehicle, for-hire vehicle, and drive-and-park users: [18]
    - **Private Vehicle Pick-up/Drop-off:** Private drop-offs/pick-ups only (i.e., those made in a personal vehicle by friends or family)
    - **For-Hire Vehicle:** TNCs, taxi, limo, shuttle van
    - **Drive & Park:** drive and park, rental car.
- **Surface Transit:** hotel shuttle, charter bus, and public bus (e.g., SamTrans, Marin Airporter)
- **BART**

The travel demand analysis first estimated existing ways of travel based on SFO passenger surveys between 2011 and 2018, and then developed the 2045 future year conditions ways of travel based on trends extrapolated from the existing data. **Table 9** presents the passenger ways of travel from the SFO passenger surveys for each year between 2011 and 2018. As shown in **Table 9**, the total percentage of passengers driving to and from the Airport increased between 2011 and 2018. This is due primarily to the increased demand in for-hire vehicles (TNCs, taxis, etc.), which results in an associated reduction in the percent of passengers using surface transit and BART. Way of travel trends from 2011 to 2018 were forecasted to 2045 future year conditions using a logarithmic line of best fit for each way of travel.[19] **Attachment E** shows the resulting modeled trend lines. Extending ways of travel trends through 2045 yields a more conservative analysis as the trend resulted in an increase in driving modes (personal, TNCs, or rental cars) compared to applying the existing ways of travel to 2045 future year conditions.

[18] 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 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.

[19] A logarithmic model was selected to represent continuing change in current trends, followed by a leveling off. Other alternatives, such as a linear regression, would likely overestimate the degree of change over 20 years, while static mode splits or region-wide trends may not fully capture the continuing effects of ride hailing applications and other disruptive trends.

Table 9: SFO Passenger Changes in Ways of Travel, 2011 to 2018

Year	Drive				Surface Transit	BART
	Private Pick-up/Drop-off	*For-Hire Pick-up/ Drop-off*	*Drive & Park / Rental Car*	Total		
2011	*32%*	*24%*	*23%*	78%	12%	10%
2012	*32%*	*22%*	*24%*	78%	11%	11%
2013	*31%*	*26%*	*22%*	79%	8%	13%
2014	*29%*	*26%*	*26%*	80%	7%	12%
2015	*28%*	*31%*	*27%*	85%	6%	8%
2016	*29%*	*33%*	*21%*	83%	7%	10%
2017	*26%*	*38%*	*21%*	85%	6%	9%
2018	*28%*	*39%*	*17%*	84%	7%	9%

Source: SFO Passenger Surveys, 2011 to 2018; Fehr & Peers, 2024.

Table 10 presents the existing and 2045 future year ways of travel and the percent change for each way of travel (i.e., the growth factor). As described above, by extending trends observed between 2011 and 2018, the share of passengers driving to and from the Airport is forecasted to increase from 84 percent to 88 percent. The percentage of passengers utilizing surface transit is expected to decrease from 7 percent under existing conditions to 4 percent under 2045 future year conditions. In addition, the percentage of passengers utilizing BART is expected to decrease from 9 percent to 8 percent between existing and 2045 future year conditions.

Table 10: SFO Passenger Ways of Travel and Growth Factors

Way of Travel	Existing (2019) Ways of Travel	2045 Future Baseline Forecast Ways of Travel	Growth Factor
Drive	**84%**	**88%**	**+5%**
Private Vehicle Pick-Up/Drop-Off	28%	23%	-18%
For-Hire Pick-Up/Drop-Off	39%	47%	+21%
Drive & Park / Rental Car	17%	18%	+6%
Surface Transit	**7%**	**4%**	**-43%**
BART	**9%**	**8%**	**-11%**

Source: SFO 2018 Passenger Survey; Fehr & Peers, 2024.
Values rounded to nearest percentage point; growth factors may not match 2045/2019 as presented due to rounding.

5.A.2 Passenger Travel Demand Results

Following the modeling of passenger ways of travel, the ways of travel estimates presented in **Table 10** were then applied to the total estimated person trips from the trip distribution phase (**Table 5**) and trip generation phase to obtain person trips by way of travel.

Vehicle trips were calculated by origin and destination by summing person trips by all vehicle ways of travel (e.g., drive and park, drop-off, taxi) and adjusting for number of vehicle trips per passenger and average vehicle occupancy (two airport passengers per vehicle for TNC/taxi, private pick-up and drop-off, drive and park, and rental car). For instance, a private pick-up/drop-off passenger trip typically involves four vehicle trips, an inbound and outbound vehicle trip (two trips) at drop-off and an inbound and outbound vehicle trip (two trips) at pick-up, totaling four trips. Compared to a passenger drive-and-park at the Airport trip, which involves one inbound and one outbound vehicle trip. Adjustments to for-hire pick-up/drop-off were made to account for "rematching," which remained constant for all analysis scenarios. Rematching occurs when taxis/TNCs that arrive at the Airport with an inbound passenger for drop off and leave the Airport with a different outbound passenger.[20] The passenger ways of travel and average vehicle occupancy assumptions were held constant for the 2045 future baseline without RADP conditions and the 2045 future baseline with RADP/cumulative conditions.[21]

Table 11 presents the passenger person trips by ways of travel to and from the Airport (i.e., inbound versus outbound) for existing and 2045 future baseline without RADP conditions and 2045 future baseline with RADP/cumulative conditions on a daily basis and for the a.m. and p.m. peak hours. **Table 12** presents the passenger vehicle trips to and from the Airport for existing and 2045 future baseline without RADP conditions and 2045 future baseline with RADP/cumulative conditions on a daily basis and for the a.m. and p.m. peak hours. The passenger vehicle trips in **Table 12** account for vehicle occupancy. **Attachment F** includes detailed calculations for the passenger travel demand.

As shown on **Table 11**, between existing and 2045 future baseline without RADP conditions and 2045 future baseline with RADP/cumulative conditions, the total number of weekday a.m. and p.m. peak hour person trips is expected to increase by around 2,700 trips and 2,500 trips, respectively, while daily person trips are expected to increase by approximately 45,000 trips. Person trips on BART are expected to increase slightly by 150 trips per peak hour. As described in

[20] Rematch rates were provided by SFO and assume a 23 precent rematch for TNCs (Uber and Lyft) and 100 percent rematch rate for taxis. Meaning, 23 percent of TNCs would enter the Airport with an inbound passenger for drop-off and leave the Airport with a different outbound passenger, and the remaining 77 percent of TNCs would have a passenger one-way (either inbound or outbound). A 100 precent rematch of taxis means that all taxis entering and existing the Airport would contain an Airport passenger.

[21] As described in Section 5.A, no substantial evidence was identified for assuming that implementation of the RADP would change the ways of travel assumptions between 2045 future baseline without RADP and 2045 future baseline with RADP/cumulative conditions.

Table 10, extrapolating trends in ways of travel between 2011 and 2018 results in a 43 percent decrease in surface transit trips, such as those on the Marin Airporter bus and SamTrans bus. Therefore, the total number of passenger surface transit trips during the weekday a.m. and p.m. peak hours, and on a daily basis are estimated to decrease between 2019 and 2045 future baseline conditions without RADP conditions and between 2019 and 2045 future baseline with RADP/cumulative conditions.

Table 11: Estimated SFO Passenger Person Trip Generation by Ways of Travel – 2019, 2045 Future Baseline without RADP and 2045 Future Baseline with RADP/Cumulative Conditions

Study Period/Ways of Travel[1, 2]	Existing (2019)			2045 Future Baseline without and with RADP/Cumulative			Delta (2045 Future Baseline without and with RADP minus Existing)		
	In	Out	Total	In	Out	Total	In	Out	Total
Weekday A.M. Peak Hour									
Drive	3,444	2,706	6,150	4,958	3,896	8,854	1,514	1,190	2,704
Surface Transit	287	226	513	194	152	346	-93	-74	-167
BART	365	287	652	450	354	803	85	67	151
Total	*4,096*	*3,219*	*7,315*	*5,602*	*4,402*	*10,003*	1,506	1,183	2,688
Weekday P.M. Peak Hour									
Drive	2,368	3,270	5,638	3,409	4,708	8,117	1,041	1,438	2,479
Surface Transit	197	272	469	133	184	317	-64	-88	-152
BART	251	347	598	309	427	736	58	80	138
Total	*2,816*	*3,889*	*6,705*	*3,851*	*5,319*	*9,170*	1,035	1,430	2,465
Daily[3]									
Drive	51,252	51,252	102,504	73,791	73,791	147,582	22,539	22,539	45,078
Surface Transit	4,271	4,271	8,542	2,884	2,884	5,768	-1,387	-1,387	-2,774
BART	5,436	5,436	10,872	6,696	6,696	13,392	1,260	1,260	2,520
Total	*60,959*	*60,959*	*121,918*	*83,370*	*83,370*	*166,742*	22,411	22,411	44,824

Notes:
1. Drive includes private vehicle pick-up and drop-off, for-hire vehicles, and drive and park.
2. Surface transit includes hotel shuttles, charter buses, and public bus transit (SamTrans, Marin Airporter).
3. Daily passenger inbound and outbound trips (i.e., in and out) are equal as airplane arrivals and departures are assumed to have identical passenger capacities. Therefore, the number of daily passengers arriving and departing are the same.

Source: Fehr & Peers, 2024.

Table 12: Estimated SFO Passenger Vehicle Trip Generation – 2019, 2045 Future Baseline without RADP and 2045 Future Baseline with RADP/Cumulative Conditions [1]

Weekday Study Period	Existing (2019)			2045 Future Baseline without and with RADP/Cumulative			Delta (2045 Future Baseline without and with RADP minus Existing)		
	In	Out	Total	In	Out	Total	In	Out	Total
A.M. Peak Hour	2,582	2,448	*5,030*	3,659	3,450	*7,109*	*1,077*	*1,002*	*2,079*
P.M. Peak Hour	2,223	2,387	*4,610*	3,131	3,387	*6,518*	*908*	*1,000*	*1,908*
Daily	41,914	41,914	*83,828*	59,246	59,246	*118,492*	*17,332*	*17,332*	*34,664*

1. Vehicle trip generation includes passengers traveling by private vehicle pick-up/drop-off, for-hire vehicles, and drive and park (includes rental cars).
Source: Fehr & Peers, 2024.

As shown on **Table 12**, between existing and 2045 future baseline without RADP conditions and between existing and future baseline with RADP/cumulative conditions, the total number of weekday a.m. and p.m. peak hour vehicle trips generated by passengers is expected to increase by around 2,100 vehicle trips and 1,900 vehicle trips, respectively, while daily person trips are expected to increase by approximately 34,700 vehicle trips.

5.B SFO Employee Way of Travel Choice Considerations

A 2016 study on travel behavior found that the time to find parking, the cost, and payment frequency (hourly, daily, monthly) can influence an employee's decision to drive or use other forms of transportation.[22] Additionally, an employee's reason for driving and parking at the Airport is that oftentimes public transit can be more time consuming and expensive than driving, depending on transit options readily available to the employee, including first-mile/last-mile options and availability of transit during work hours. For example, the SFO operates 24 hours a day; however, regional transit options such as BART provide service between 5 a.m. and 12 a.m. on weekdays; therefore, BART is unavailable for employees who start or end a shift between 12 a.m. and 5 a.m.

The SFO BART Ridership, Residence, and Mode Summary (2017) indicated that approximately 83 percent of employees travel by private vehicle, 15 percent travel by transit, and 2 percent travel by non-auto/other ways of travel, which includes bicycling and walking.

[22] Christiansen, P., Engebretsen, Ø., Fearnley, N., & Hanssen, J. U. (2016). Parking facilities and the built environment: Impacts on Travel Behaviour.

As described above, there are three primary factors that affect an employee's decision to drive: price and payment frequency, time and availability of transit, and first-mile/last-mile connections. There are no foreseeable projects that would alter an employee's chosen way of travel between existing and the 2045 future baseline without RADP conditions or 2045 future baseline with RADP/cumulative conditions, as the Airport has not proposed any parking policy changes in the long term, nor would the availability of transit or first-mile/last-mile options likely change in the foreseeable future. Therefore, for purposes of the travel demand analysis, the employee ways of travel for existing, 2045 future baseline without RADP conditions, and 2045 future baseline with RADP/cumulative conditions was assumed to remain the same at 83 percent utilizing private vehicle, 15 percent utilizing transit, and 2 percent utilizing other ways of travel.

As described above, the RADP includes subsequent projects that would change the Airport parking supply (i.e., decrease employee parking supply by about 2,600 spaces) that has the potential to affect employee way of travel assumptions. However, an employee's opportunity to utilize other travel modes are limited as taking public transit is more time consuming than driving and does not operate during all Airport work shifts changes. Additionally, data from SFO indicates that employees may park in public parking garages that are open to any user (e.g., passengers, visitors, employees, etc.). Therefore, the subsequent RADP projects that would change parking supply are not anticipated to substantially change the existing factors, as described in **Table 13**.

Table 13: Subsequent RADP Projects' Effect on SFO Employee Choice of Ways of Travel Primary Factors

Primary Factor	Anticipated Change
Price and Payment frequency	**No Change:** Parking policy changes are not included in the RADP.
Time/availability of public transit	**No Change:** Headway, pricing, and public transit route changes are not included in the RADP.
First-Mile/Last-Mile	**No Change:** The RADP does not include any changes to transit routes and/or their origins or destinations, and public transit is not influenced by SFO.

Source: Fehr & Peers, 2024.

As described above, implementation of the RADP would not change transit operations, nor would it create additional barriers such as time of transit travel, availability of transit operators and routes, or proximity between transit stops and the terminal. Additionally, implementation of the RADP would not add barriers to using non-drive-alone ways of travel.

Based on the above research and subsequent RADP project types, it is anticipated that the implementation of the RADP would not affect employee ways of travel. As such, the travel demand methodology assumes the same employee ways of travel assumptions under 2045 future baseline without RADP conditions and 2045 future baseline with the RADP/cumulative conditions.

5.B.1 SFO Employee Ways of Travel Choice Analysis

Employee survey data includes private vehicle drive and park, carpool, and transit options including BART, public bus (e.g., SamTrans and Marin Airporter), biking or walking as typical way of travel options. These individual ways of travel were grouped into categories with similar implications on travel demand:

- **Private Vehicle**: Includes drive-and-park alone, and carpool/vanpool
  - **Drive Alone**: Drive-and-park personal vehicle
  - **Carpool/Vanpool**: Ride in a private vehicle with others
- **Transit**: Includes non-private vehicle ways of travel
  - **BART**
  - **Public Bus:** SamTrans and Marin Airporter
- **Other**: Includes biking and walking, or other ways of travel

As described above, the travel demand analysis utilizes data on employee ways of travel from available employee travel surveys, summarized in **Table 14**, which are also applied to the 2045 future baseline without RADP conditions and 2045 future baseline with RADP/cumulative conditions travel demand calculations. There are limited factors that would affect an employee's choice of ways of travel, summarized in **Table 13,** and the anticipated changes to the Airport between existing and 2045 future baseline without RADP and 2045 future baseline with RADP/cumulative conditions are not expected to alter an employee's way of travel. Therefore, the existing ways of travel were also applied to 2045 future baseline without RADP conditions and to 2045 future baseline with RADP/cumulative conditions.

Table 14: Existing and Future SFO Employee Ways of Travel

Private Vehicle	Transit	Other[1]
83%	*15%*	*2%*

1. Other includes biking, walking, or other ways of travel.
Source: SFO BART Ridership, Residence, and Mode Summary (2017) San Francisco International Airport.

5.B.2 SFO Employee Travel Demand Results

The employee ways of travel percentages presented in **Table 14** were then multiplied by the total estimated person trips calculated in **Table 3** to obtain employee person trips by way of travel for the weekday daily and a.m. and p.m. peak hours, as presented in **Table 15**.[23] The SFO BART Ridership, Residence, and Mode Summary (2017) shows that approximately 10 percent of employees driving to and from the Airport carpool and the remaining 90 percent driving alone. The travel demand results assume that all drive-alone users have up to one employee per vehicle and conservatively assume that all carpool participants include up to two employees per vehicle. Using a weighted average, the travel demand analysis assumes an average employee vehicle occupancy of 1.13 employees per vehicle. **Table 16** presented the vehicle travel demand for existing, 2045 future baseline without RADP, and 2045 future baseline with RADP/cumulative conditions. Similar to the passenger travel demand tables, **Table 15** presents employee person trips by ways of travel, whereas **Table 16** presents vehicle trips, which accounts for vehicle occupancy.

As shown in **Table 15,** under the 2045 future baseline without RADP conditions the total number of weekday a.m. and p.m. peak hour employee person trips is expected to increase from existing conditions by around 2,100 trips and 1,200 person trips, respectively. Under daily conditions, the 2045 future baseline without RADP conditions daily employee trips are estimated to increase by approximately 16,000 person trips. Compared to 2045 future baseline without RADP conditions, the number of weekday a.m. and p.m. peak hour employee person trips under 2045 future baseline with RADP/cumulative conditions is expected to increase by approximately 600 person trips and 340 person trips, respectively. Under daily conditions, the increase in daily employee trips between 2045 future baseline without RADP and the 2045 future baseline with RADP/cumulative conditions is expected to be about 4,600 person trips. Because the ways of travel are projected to remain consistent between existing and 2045 future baseline without RADP and 2045 future baseline with RADP/cumulative conditions, all travel modes are expected to exhibit an increase in person trips proportional to the estimated growth in employees.

As shown in **Table 16**, between existing and 2045 future baseline without RADP conditions, the number of weekday a.m. and p.m. peak hour vehicle trips generated by the background growth in employees is around 1,540 vehicle trips and 880 vehicle trips, respectively, while daily vehicle trips are estimated to increase by approximately 11,750 vehicle trips. Between 2045 future baseline without RADP and 2045 future baseline with RADP/cumulative conditions, the number of weekday a.m. and p.m. peak hour vehicle trips due to the increase in employees associated with the subsequent RADP projects would increase by about 440 and 250 vehicles, respectively, while daily vehicle trips would increase by about 3,380 vehicle trips.

[23] Daily Employee Travel Demand by Mode Split = total employees x % of employees working on a weekday x mode split percentage.
Weekday A.M. Peak Hour Travel Demand by Mode Split = total employees x % of employees working on a weekday x % of A.M. peak hour shifts x mode split percentage.
Weekday P.M. Peak Hour Travel Demand by Mode Split = total employees x % of employees working on a weekday x % of P.M. peak hour shifts x mode split percentage.

Table 15: Estimated SFO Employee Person Trip Generation by Way of Travel – 2019, 2045 Future Baseline Without RADP and 2045 Future Baseline With RADP/Cumulative Conditions[1]

Study Period/ Way of Travel [2,3,4]	Existing (2019)			2045 Future Baseline without RADP			2045 Future Baseline with RADP/Cumulative			Delta: 2045 Future Baseline without RADP minus Existing			Delta: 2045 Future Baseline with RADP/Cumulative minus 2045 Future Baseline without RADP		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Weekday A.M. Peak Hour															
Drive	6,278	1,656	7,934	7,657	2,020	9,677	8,053	2,124	10,177	1,379	364	1,743	396	104	500
Transit	1,127	297	1,424	1,375	363	1,738	1,446	381	1,827	248	66	314	71	18	89
Other	126	33	159	153	40	193	161	42	203	27	7	34	8	2	10
Total	*7,531*	*1,986*	*9,517*	*9,185*	*2,423*	*11,608*	*9,660*	*2,547*	12,207	1,654	437	2,091	475	124	599
Weekday P.M. Peak Hour															
Drive	890	3,639	4,529	1,085	4,439	5,524	1,141	4,668	5,809	195	800	995	56	229	285
Transit	160	653	813	195	797	992	205	838	1,043	35	144	179	10	41	51
Other	18	73	91	22	89	111	23	93	116	4	16	20	1	4	5
Total	*1,068*	*4,365*	*5,433*	*1,302*	*5,325*	*6,627*	*1,369*	*5,599*	6,968	234	960	1,194	67	274	341
Daily															
Drive	30,328	30,328	60,656	36,989	36,989	73,978	38,903	38,903	77,806	6,661	6,661	13,322	1,914	1,914	3,828
Transit	5,445	5,445	10,890	6,641	6,641	13,282	6,984	6,984	13,968	1,196	1,196	2,392	343	343	686
Other	607	607	1,214	740	740	1,480	778	778	1,556	133	133	266	38	38	76
Total	*36,380*	*36,380*	*72,760*	*44,370*	*44,370*	*88,740*	*46,665*	*46,665*	*93,330*	*7,990*	*7,990*	*15,980*	*2,295*	*2,295*	*4,590*

Notes:

1. The analysis includes 42,800 employees under 2019 conditions, 52,200 employees under 2045 future baseline without RADP conditions, and 54,900 employees under 2045 future baseline with RADP/cumulative conditions.
2. Drive includes drive alone, carpool and vanpool.
3. Transit includes BART, SamTrans, and Marin Airporter.
4. Other includes walk, bike, or other ways of travel.

Source: Fehr & Peers, 2024.

Table 16: Estimated SFO Employee Vehicle Trip Generation – 2019, 2045 Future Baseline Without RADP and 2045 Future Baseline With RADP/Cumulative Conditions

Study Period	Existing (2019)			2045 Future Baseline without RADP			2045 Future Baseline with RADP/Cumulative			Delta: 2045 Future Baseline without RADP minus Existing			Delta: 2045 Future Baseline with RADP/Cumulative minus 2045 Future Baseline without RADP		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Weekday A.M. Peak Hour	5,541	1,462	*7,003*	6,758	1,783	*8,541*	7,108	1,875	*8,983*	*1,217*	*321*	*1,538*	*350*	*92*	*442*
Weekday P.M. Peak Hour	786	3,212	*3,998*	958	3,918	*4,876*	1,007	4,120	*5,127*	*172*	*706*	*878*	*49*	*202*	*251*
Daily	*26,768*	*26,768*	*53,536*	*32,647*	*32,647*	*65,294*	*34,336*	*34,336*	*68,672*	*5,879*	*5,879*	*11,758*	*1,689*	*1,689*	*3,378*

Source: Fehr & Peers, 2024.

6. SFO Cargo Truck Trip Generation

As described above, the SFO Airport Development Plan forecasts a 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.[24] Thus, an increase of 119,600 annual cargo tonnage was used to determine the additional cargo truck trip activity that would occur between existing (2019) and 2045 future baseline without RADP conditions. Note that employee trips associated with the cargo operations are included as part of the SFO employee projections described in Section 3 above (i.e., cargo employees are included as part of the 9,200 additional SFO employee growth that would occur between existing (2019) and 2045 future baseline without RADP conditions).

The additional cargo truck trips generated by the increase in annual cargo tonnage was estimated as follows:

- The increase of 119,600 annual cargo tonnage (metric tons) was converted to a daily tonnage amount assuming a six-day operating week (i.e., 312 days per year),[25] which results in 383 tons per day.
- The 383 tons per day were divided by an average truck capacity of 18 metric tons[26] to determine the number of daily cargo trucks required to transfer the additional cargo to its destination. Thus, on an average day, there would be an additional 21 daily trucks, which, multiplied by two to account for an inbound and an outbound trip, results in 42 additional cargo truck trips per day.
- A 10 percent peak hour factor was applied to the 42 daily cargo truck trips to determine the additional weekday a.m. and p.m. peak hour truck trips.[27] Thus, under 2045 future baseline without RADP conditions, there would be an additional two inbound and two outbound cargo truck trips during the weekday a.m. and p.m. peak hours.

Attachment G includes the detailed cargo truck calculations.

---

[24] San Francisco International Airport, Airport Development Plan, December 2016, Appendix C, p. 1.

[25] San Francisco International Airport, Airport Development Plan, December 2016, p. 4-39

[26] The maximum overall weight limit for trucks in California is 80,000 pounds, including trucks and cargo, and with the ability of carrying between 42,000 and 48,000 pounds of cargo. Assumed that an average truck carries 40,000 pounds of cargo, which is equal to 18 tons of cargo.

[27] The ratio of daily traffic that occurs in the peak hour is known as a K-Factor by the FHWA. The K-Factor typically ranges from 7 percent to 12 percent depending on land use context. Cargo traffic is less likely to occur during the peak hour so use of the median 10 percent value represents a conservatively high assumption for amount of cargo traffic that would be added during the peak hours. Source: Federal Highway Administration, Traffic Data Computation Method Pocket Guide, August 2018, p. 45. https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/census/peak-hour/f0017710-peak-hour-definitions-k-and-d-factors.pdf, accessed November 7, 2024.

7. SFO Delivery Truck Trip Generation

As described above, some subsequent projects that could occur with implementation of the RADP would generate additional delivery truck trips. These delivery truck trips include deliveries of supplies or goods (e.g., supplies for food carts, restaurants and retail stores and supplies for operations and maintenance activities).

The twelve subsequent RADP projects that would generate new (i.e., for a new facility such as a new boarding area) or additional (i.e., associated with expansion of an existing facility) delivery trucks are presented in **Table 17** below. The Terminal 3 Façade Expansion (RADP Project #5), Domestic Terminal Roadways Reconstruction (RADP Project #7), ITB Curbside Expansion (RADP Project #8), Terminal 2 AirTrain Station Platform Expansion (RADP Project #14), Rental Car AirTrain Station Platform Expansion (RADP Project #5), and Sanitary Sewer Force Main Line Realignment (RADP Project #20) would not generate any additional delivery trips. In addition, the conversion of the existing CONRAC facility to the Long-Term Parking Garage #4 (RADP Project #12) and the conversion of the existing CONRAC Quick Turn-Around Facility into the existing Rental Car Center Short-Term Storage Lot (RADP Project #13) was assumed to not generate additional delivery trips.

Table 17: Subsequent RADP Projects Delivery Truck Trip Generation

Subsequent RADP Project	Daily		A.M./P.M. Peak Hours	
	Trucks	Truck Trips	Trucks	Truck Trips
1. Boarding Area H	78	155	8	15
2. Boarding Area F Modernization	49	98	5	10
3. ITB Main Hall Expansion	15	30	2	3
4. ITB Boarding Area A & G Improvements	1	3	0	0
6. Central Hub	28	56	3	6
9. CONRAC	20	41	2	4
10. CONRAC Quick Turnaround	11	22	1	2
11. Long-Term Garage #3	4	7	0	0
16. AirTrain Maintenance Yard	8	16	1	2
17. North Field GSE #1	8	16	1	2
18. Aircraft Maintenance Hangar	29	59	3	6
19. East Field GSE #2	4	7	0	0
Total	**255**	**510**	**25**	**50**

Due to rounding, numbers in columns may not add up to totals.
Source: Fehr & Peers/LCW Consulting, 2024.

The additional delivery truck trips generated by the other subsequent RADP projects was estimated as follows:

- The net new square footage was obtained from Draft EIR Table 2-2 and Table 2-3 for each of the subsequent RADP projects that would generate new or additional delivery truck trips. However, only a portion of the net new square footage of the subsequent RADP projects would generate new delivery trips; therefore, a factor of 5 percent was applied to the new construction square feet for parking facilities for supplies and a factor of 25 percent was applied to all other projects for additional or new supplies and/or new concessions. The resulting net new square feet were used for the trip generation estimates. The 5 percent and 25 percent factors are estimates based on the project description details. For example, for Boarding Area H (RADP Project #1) with 1,413,000 net new square feet of construction, the 25 percent factor results in 353,325 square feet that were used to calculate additional delivery truck trips; the remaining square footage would accommodate passengers walking between gates, boarding areas, etc.
- Daily delivery trucks were estimated by applying the San Francisco Transportation Impact Analysis Guidelines (SF transportation guidelines) delivery truck trip rates[28] to the net square footage for each subsequent project that would generate delivery trucks. The retail (composite) trip generation rate was used for public-facing terminal projects such as Boarding Area H, Boarding Area F Modernization (RADP Project #2), ITB Main Hall Expansion (RADP Project #3), and ITB Boarding Area A and G Improvements (RADP Project #4). The office trip generation rate was used for Airport-supporting land uses such as the 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), and AirTrain Maintenance Yard (RADP Project #16). The light industrial rate was used for the North Field Ground Support Equipment Facility #1 (RADP Project #17), Aircraft Maintenance Hangar (RADP Project #18), and East Field Ground Support Equipment Facility #2 (RADP Project #19) projects.
- A 10 percent peak hour factor was applied to the 510 daily delivery truck trips to determine the additional weekday a.m. and p.m. peak hour truck trips.[29] Thus, under 2045 future baseline with RADP conditions, there would be an additional 25 inbound and 25 outbound delivery truck trips during the weekday a.m. and p.m. peak hours.

---

[28] San Francisco Planning Department, Transportation Impact Analysis Guidelines, Appendix F, Table 3, p. F-10, October 2019.

[29] The ratio of daily traffic that occurs in the peak hour is known as a K-Factor by the FHWA. The K-Factor typically ranges from 7 percent to 12 percent depending on land use context. Delivery truck traffic is less likely to occur during the peak hour so use of the median 10 percent value represents a conservatively high assumption for amount of delivery trucks that would be added during the peak hours. Source: Federal Highway Administration, Traffic Data Computation Method Pocket Guide, August 2018, p. 45. https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/census/peak-hour/f0017710-peak-hour-definitions-k-and-d-factors.pdf, accessed November 7, 2024.

Attachment H includes the detailed delivery truck calculations.

8. Vehicle Trip Assignment

The trip generation and trip distribution, in combination with the way of travel estimates described above, were used to assign vehicle trips to the local roadway network, roadway segments, and SFO locations. **Figure 2** illustrates the location of the study roadway segments. SFO origins and destinations were based on passenger and employee travel surveys. Passengers had an origin or destination to the terminals, rental car facility, and long-term parking garages. Employees had an origin or destination to the terminals, long-term parking garages, United Airlines Maintenance Operations Center, and employee surface lots throughout the North Field, East Field, West Field, and South Field locations. Cargo truck trips were assigned to travel to or from the West Field cargo facilities, while delivery trucks were assigned to travel to or from the subsequent RADP projects identified as generating new demand for goods and materials. The vehicle assignment assumes the same origins and destinations at the Airport for existing and 2045 future baseline without RADP conditions. However, under 2045 future baseline with RADP/cumulative conditions, the analysis reallocates the share of SFO origins and destinations as some subsequent RADP projects include changes to parking facility supply and locations as summarized in Section 5.A, Passenger Way of Travel Choice Considerations. A summary of the resulting traffic volumes on the study segments are presented in **Tables 18, 19, and 20,** for the weekday a.m. peak hour, p.m. peak hour, and daily conditions, respectively.

Figure 2 – Project Roadway Study Segments

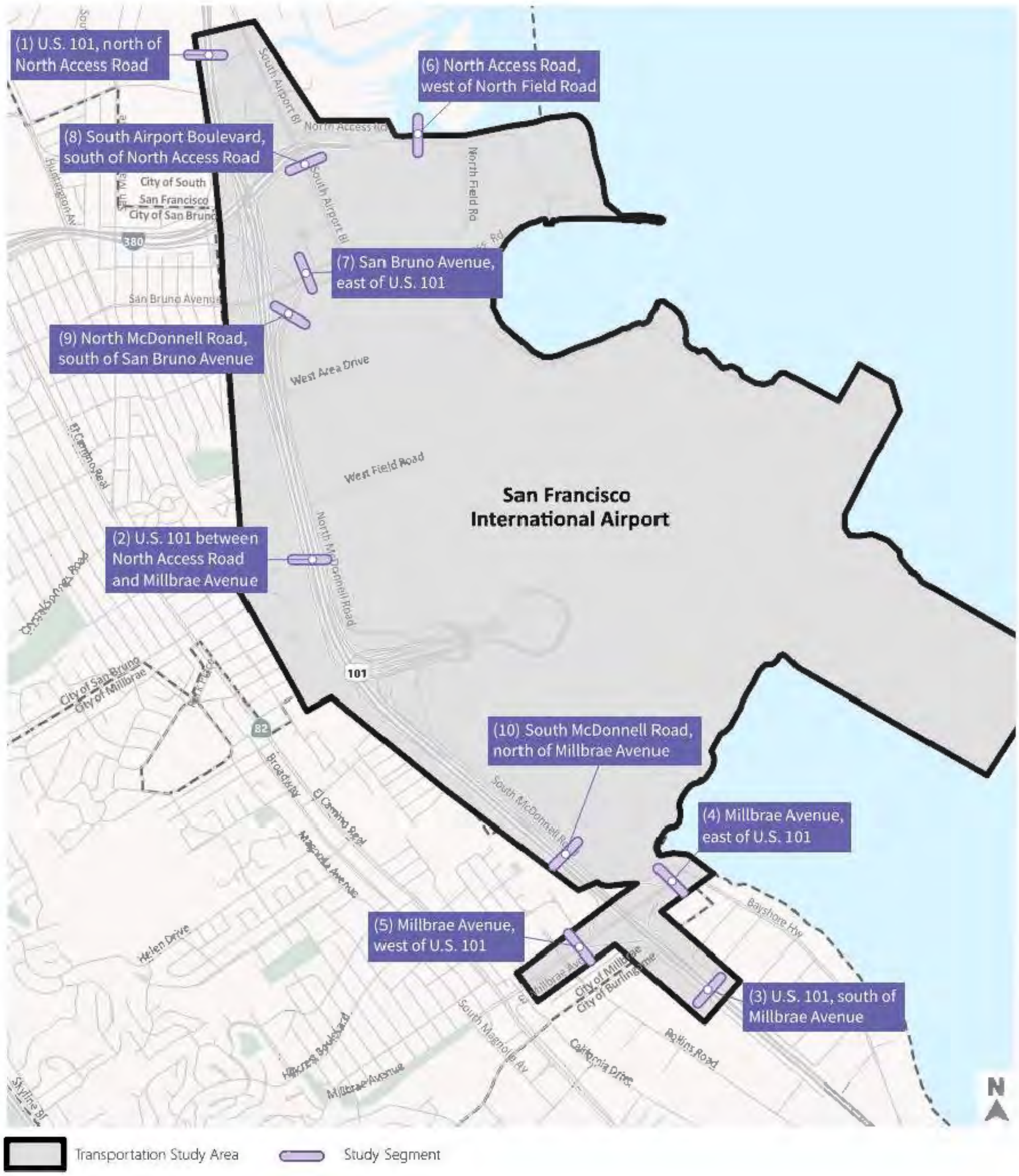


Table 18: Weekday A.M. Peak Hour Estimated Traffic Volumes on Study Roadway Segments – Existing (2019), 2045 Future Baseline without RADP, and 2045 Future Baseline with RADP/Cumulative Conditions[1]

Study Roadway Segment	Direction	Existing (2019)	2045 Future Baseline without RADP	2045 Future Baseline with RADP/Cumulative[1]	Delta	
					2045 Future Baseline without RADP minus Existing	2045 Future Baseline with RADP/Cumulative Conditions minus 2045 Future Baseline without RADP
U.S. 101, north of North Access Road	NB	5,900	8,430	8,465	2,530	35
	SB	6,400	8,650	8,705	2,250	55
U.S. 101, between North Access Road and Millbrae Avenue	NB	6,300	8,440	8,445	2,140	5
	SB	4,800	6,570	6,575	1,770	5
U.S. 101, south of Millbrae Avenue	NB	7,500	9,940	9,975	2,440	35
	SB	7,100	8,800	8,835	1,700	35
Millbrae Avenue, east of U.S. 101	EB	1,140	1,180	1,180	40	0
	WB	550	580	580	30	0
Millbrae Avenue, west of U.S. 101	EB	1,770	2,020	2,020	250	0
	WB	1,720	2,310	2,310	590	0
North Access Road, west of North Field Road	EB	280	490	555	210	65
	WB	300	370	405	70	35
San Bruno Avenue, east of U.S. 101	EB	830	1,320	1,515	490	195
	WB	320	660	715	340	55
South Airport Boulevard, south of North Access Road	NB	470	700	795	230	95
	SB	540	990	1,165	450	175
	NB	490	630	705	140	75

Table 18: Weekday A.M. Peak Hour Estimated Traffic Volumes on Study Roadway Segments – Existing (2019), 2045 Future Baseline without RADP, and 2045 Future Baseline with RADP/Cumulative Conditions[1]

Study Roadway Segment	Direction	Existing (2019)	2045 Future Baseline without RADP	2045 Future Baseline with RADP/Cumulative[1]	Delta	
					2045 Future Baseline without RADP minus Existing	2045 Future Baseline with RADP/Cumulative Conditions minus 2045 Future Baseline without RADP
North McDonnell Road, between San Bruno Avenue and South McDonnell Road	SB	650	750	765	100	15
South McDonnell Road, between North McDonnell Road and Millbrae Avenue	NB	300	350	360	50	10
	SB	210	230	240	20	10

1. The cumulative projects identified in Draft EIR Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, are accounted for in the 2045 future baseline without RADP and are therefore also included in the 2045 future baseline with RADP/cumulative condition (i.e., the 2045 future baseline with RADP conditions also represents the cumulative conditions).

Source: Fehr & Peers, 2024.

Table 19: Weekday P.M. Peak Hour Estimated Traffic Volumes on Study Roadway Segments – Existing (2019), 2045 Future Baseline without RADP, and 2045 Future Baseline with RADP/Cumulative Conditions[1]

Study Roadway Segment	Direction	Existing (2019)	2045 Future Baseline without RADP	2045 Future Baseline with RADP/Cumulative[1]	Delta	
					2045 Future Baseline without RADP minus Existing	2045 Future Baseline with RADP/Cumulative Conditions minus 2045 Future Baseline without RADP
U.S. 101, north of North Access Road	NB	5,600	7,890	7,945	2,290	55
	SB	6,200	10,100	10,135	3,900	35
U.S. 101, between North Access Road and Millbrae Avenue	NB	6,500	8,340	8,345	1,840	5
	SB	4,600	7,770	7,775	3,170	5
U.S. 101, south of Millbrae Avenue	NB	7,000	9,540	9,565	2,540	25
	SB	6,900	10,010	10,065	3,110	55
Millbrae Avenue, east of U.S. 101	EB	780	860	860	80	0
	WB	1,250	1,350	1,350	100	0
Millbrae Avenue, west of U.S. 101	EB	1,810	1,940	1,940	130	0
	WB	2,050	2,620	2,620	570	0
North Access Road, west of North Field Road	EB	170	210	225	40	15
	WB	230	420	475	190	55
San Bruno Avenue, east of U.S. 101	EB	580	1,100	1,135	520	35
	WB	750	1,440	1,555	690	115
South Airport Boulevard, south of North Access Road	NB	650	1,300	1,505	650	205
	SB	520	760	815	240	55
	NB	740	890	965	150	75

Table 19: Weekday P.M. Peak Hour Estimated Traffic Volumes on Study Roadway Segments – Existing (2019), 2045 Future Baseline without RADP, and 2045 Future Baseline with RADP/Cumulative Conditions[1]

Study Roadway Segment	Direction	Existing (2019)	2045 Future Baseline without RADP	2045 Future Baseline with RADP/Cumulative[1]	Delta	
					2045 Future Baseline without RADP minus Existing	2045 Future Baseline with RADP/Cumulative Conditions minus 2045 Future Baseline without RADP
North McDonnell Road, between San Bruno Avenue and South McDonnell Road	SB	600	720	745	120	25
South McDonnell Road, between North McDonnell Road and Millbrae Avenue	NB	330	350	350	20	0
	SB	510	570	580	60	10

1. The cumulative projects identified in Draft EIR Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, are accounted for in the 2045 future baseline without RADP and are therefore also included in the 2045 future baseline with RADP/cumulative condition (i.e., the 2045 future baseline with RADP conditions also represents the cumulative conditions).
Source: Fehr & Peers, 2024.

Table 20: Daily Estimated Traffic Volumes on Study Roadway Segments – Existing (2019), 2045 Future Baseline without RADP, and 2045 Future Baseline with RADP/Cumulative Conditions[1]

Study Roadway Segment	Direction	Existing (2019)	2045 Future Baseline without RADP	2045 Future Baseline with RADP/Cumulative Conditions[1]	Delta	
					2045 Future Baseline without RADP minus Existing	2045 Future Baseline with RADP/Cumulative Conditions minus 2045 Future Baseline without RADP
U.S. 101, north of North Access Road	NB	97,600	131,410	132,040	33,810	630
	SB	104,100	141,910	142,640	37,810	730
U.S. 101, between North Access Road and Millbrae Avenue	NB	104,000	127,810	127,840	23,810	30
	SB	76,700	100,410	100,440	23,710	30
U.S. 101, south of Millbrae Avenue	NB	118,800	150,710	150,940	31,910	230
	SB	120,500	156,110	156,740	35,610	630
Millbrae Avenue, east of U.S. 101	EB	19,000	20,100	20,100	1,100	0
	WB	17,800	18,300	18,200	500	-100
Millbrae Avenue, west of U.S. 101	EB	35,500	42,100	42,100	6,600	0
	WB	37,400	43,400	43,400	6,000	0
North Access Road, west of North Field Road	EB	4,700	5,800	6,140	1,100	340
	WB	5,000	6,500	6,940	1,500	440
San Bruno Avenue, east of U.S. 101	EB	14,000	16,820	17,760	2,820	940
	WB	10,600	16,320	17,360	5,720	1,040
South Airport Boulevard, south of North Access Road	NB	11,100	14,200	15,740	3,100	1,540
	SB	10,400	13,800	14,840	3,400	1,040
	NB	11,800	17,020	15,930	5,220	-1,090

Table 20: Daily Estimated Traffic Volumes on Study Roadway Segments – Existing (2019), 2045 Future Baseline without RADP, and 2045 Future Baseline with RADP/Cumulative Conditions[1]

Study Roadway Segment	Direction	Existing (2019)	2045 Future Baseline without RADP	2045 Future Baseline with RADP/Cumulative Conditions[1]	Delta	
					2045 Future Baseline without RADP minus Existing	2045 Future Baseline with RADP/Cumulative Conditions minus 2045 Future Baseline without RADP
North McDonnell Road, between San Bruno Avenue and South McDonnell Road	SB	10,700	14,520	13,530	3,820	-990
South McDonnell Road, between North McDonnell Road and Millbrae Avenue	NB	7,100	7,600	7,700	500	100
	SB	7,700	8,000	8,100	300	100

1. The cumulative projects identified in Draft EIR Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, are accounted for in the 2045 future baseline without RADP and are therefore also included in the 2045 future baseline with RADP/cumulative condition (i.e., the 2045 future baseline with RADP conditions also represents the cumulative conditions).
Source: Fehr & Peers, 2024.

9. SFO Parking Demand

SFO passenger and employee parking demand under the 2045 future baseline without RADP conditions is anticipated to increase as passenger and employment growth increases. The additional employees under the 2045 future baseline with RADP/cumulative conditions are anticipated to further increase the employee parking demand.

Parking demand for the future year scenarios was calculated using available Airport parking occupancy data between June 2016 through May 2017 and the 2018 SFO Customer Survey Report, which reports that between 2015 and 2018, approximately 25 to 34 percent of passengers that drive and park used off-Airport parking facilities. For purposes of this analysis, the passenger parking demand calculations assume that 30 percent of all passengers would continue to use off-Airport parking facilities under all study scenarios. Parking demand rates were then calculated based on peak SFO parking demand, which typically occurs during the summer months and between the hours of 12 p.m. and 3 p.m. Based on the available data, existing Airport parking facilities for passengers and employees are typically 95 percent occupied during peak conditions. **Attachment D** summarizes the parking occupancy data by parking facility and the change in parking demand by scenario. Note that the total number of parking spaces denoted in the June 2016 to May 2017 dataset is different than the existing parking supply, as total supply changes as the Airport undergoes construction.

As described above in Sections 5.A Passenger Way of Travel Choice Considerations and 5.B Employee Way of Travel Choice Considerations, implementation of the RADP is not expected to change passenger or employee ways of travel; therefore, passenger parking demand is not anticipated to change with the implementation of the RADP. Employee parking demand would increase due to an increase in the number of employees with implementation of the RADP.

Table 21 summarizes the estimated passenger and employee weekday parking demand at SFO facilities for existing (2019), 2045 future baseline without RADP, and 2045 future baseline with RADP/cumulative conditions. As shown in **Table 21**, under 2045 future baseline without RADP conditions, the total passenger and employee parking demand on SFO facilities is estimated to be approximately 32,255 spaces, while under 2045 future baseline with RADP/cumulative conditions the parking demand is estimated to be 32,913 spaces, an increase in parking demand of approximately 660 spaces from 2045 future baseline without RADP conditions.

Table 21: SFO Passenger and Employee Parking Demand at SFO Facilities for 2019, 2045 Future Baseline without RADP, and 2045 Future Baseline with RADP/Cumulative Conditions

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

Source: Fehr & Peers, 2024.

Attachments:

Attachment A – Passenger and Employee Trip Generation Calculations
Attachment B – Passenger Trip Distribution Calculations
Attachment C – Employee Trip Distribution Calculations
Attachment D – Parking Summary
Attachment E – Passenger Way of Travel Choice Trend Lines
Attachment F – Passenger Travel Demand Calculations
Attachment G – Cargo Truck Trip Generation Calculations
Attachment H – Delivery Truck Trip Generation Calculations

Attachment A – Passenger and Employee Trip Generation Calculations

		Source	Existing Conditions (2019)	Existing Conditions (2019) + RADP	2045 Future Baseline Without RADP	2045 Future Baseline With RADP
A	**Daily Total Air Passengers**	*RADP*	157,482	157,482	215,377	215,377
B	*% Departing SFO*	*RADP*	39%	39%	39%	39%
C	*% Transferring / remaining Airside*	*RADP*	23%	23%	23%	23%
D	*% Arriving SFO*	*RADP*	39%	39%	39%	39%
E	**% of Passengers with Origin/ Final Destination at SFO**	*B+D*	77%	77%	77%	77%
F	**Total Passenger Person Trips: IN**	**A*B**	60,959	60,959	83,370	83,370
G	**Total Passenger Person Trips: OUT**	**A*D**	60,959	60,959	83,370	83,370
H	**Total Passenger Person Trips:**	**F+G**	121,918	121,918	166,740	166,740
I	**% of Daily Departures AM Peak Hour, Weekday**	*RADP*	6.7%	6.7%	6.7%	6.7%
J	**% of Daily Arrivals AM Peak, Weekday**	*RADP*	5.3%	5.3%	5.3%	5.3%
K	**% of Daily Departures PM Peak, Weekday**	*RADP*	4.6%	4.6%	4.6%	4.6%
L	**% of Daily Arrivals PM Peak, Weekday**	*RADP*	6.4%	6.4%	6.4%	6.4%
Q	**AM Peak Person Trips - IN**	**F * I * O**	4,096	4,096	5,602	5,602
R	**AM Peak Person Trips - OUT**	**G * J * O**	3,219	3,219	4,402	4,402
S	**PM Peak Person Trips - IN**	**F * K * O**	2,816	2,816	3,852	3,852
T	**PM Peak Person Trips - OUT**	**G * L * O**	3,889	3,889	5,319	5,319

Weekday Share of Employee Arrivals/Departures

	% of Employee Trips In	% of Employee Trips Out	% of all Employee Trips
6AM to 8AM	34.5%	9.1%	21.8%
4PM-6PM	4.4%	18.0%	11.2%

Prorated to Peak Hour	% of Employee Trips In	% of Employee Trips Out	% of all Employee Trips
AM Peak Hour	20.7%	5.5%	13.1%
PM Peak Hour	2.9%	12.0%	7.5%

Employee Assumptions

Employee Type	**Existing (2019)**	**2045 No Project**	**2045 Plus Project**	**Cumulative**
Total Employees (with Construction)	42,828	52,217	54,817	54,817
Total Employees (w/o Construction)	40,787	50,176	52,776	52,776

Sourcce: 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)

Growth

2045 No Project - Existing	**9,400**
2045 Project - Existing	**12,000**
2045 Project - 2045 No Project	**2,600**

Share of Employees Working T/W/Th	85%	Sum of employee shifts T/W/Th divided by total employee responses
Average Weekday Employee Shifts (Daily)		
# of Existing Jobs	**42,800**	
# of Existing Jobs (Average Weekday)	36,380	
# of 2045 No Project Jobs (Average Weekday)	44,385	
# of 2045 Project Jobs (Average Weekday)	46,595	

Attachment B – Passenger Trip Distribution Calculations

		Source	Existing Conditions (2019)	Existing Conditions (2019) + RADP	2045 Future Baseline Without RADP	2045 Future Baseline With RADP
A	**Total Passenger Person Trips: IN**	Passenger Trip Gen Model	60,959	60,959	83,370	83,370
B	**Total Passenger Person Trips: OUT**	Passenger Trip Gen Model	60,959	60,959	83,370	83,370
C	**Total Passenger Person Trips:**	Passenger Trip Gen Model	121,918	121,918	166,740	166,740
D	**AM Peak Person Trips - IN**	Passenger Trip Gen Model	4,096	4,096	5,602	5,602
E	**AM Peak Person Trips - OUT**	Passenger Trip Gen Model	3,219	3,219	4,402	4,402
F	**PM Peak Person Trips - IN**	Passenger Trip Gen Model	2,816	2,816	3,852	3,852
G	**PM Peak Person Trips - OUT**	Passenger Trip Gen Model	3,889	3,889	5,319	5,319
H	**Friday Peak Person Trips - IN**	Passenger Trip Gen Model	4,543	4,543	5,599	5,599
I	**Friday Peak Person Trips - OUT**	Passenger Trip Gen Model	5,333	5,333	7,906	7,906
K	% Trips SF, Central	*Passenger Survey + FP OD Model*	45.7%	45.7%	46.4%	46.4%
L	% Trips SF County, Other	*Passenger Survey + FP OD Model*	0.0%	0.0%	0.0%	0.0%
M	% Trips San Mateo County	*Passenger Survey + FP OD Model*	12.9%	12.9%	12.6%	12.6%
N	% Trips SC County	*Passenger Survey + FP OD Model*	10.0%	10.0%	10.8%	10.8%
O	% Trips Alameda County	*Passenger Survey + FP OD Model*	12.9%	12.9%	13.2%	13.2%
P	% Trips Contra Costa/Solano County	*Passenger Survey + FP OD Model*	7.1%	7.1%	7.3%	7.3%
Q	% Trips Marin/Napa/Sonoma	*Passenger Survey + FP OD Model*	11.4%	11.4%	9.7%	9.7%

R **O/D Matrix**

One for each time period, Total Passenger Person Trips

Existing Conditions (2019)	SF, Central	SM County	SC County	Alameda County	CC County	North Bay + Beyond
Total Passenger Person Trips: IN	27,867	7,838	6,096	7,838	4,354	6,967
Total Passenger Person Trips: OUT	27,867	7,838	6,096	7,838	4,354	6,967
Total Passenger Person Trips:	55,734	15,675	12,192	15,675	8,708	13,933
AM Peak Person Trips - IN	1,872	527	410	527	293	468
AM Peak Person Trips - OUT	1,472	414	322	414	230	368
PM Peak Person Trips - IN	1,287	362	282	362	201	322
PM Peak Person Trips - OUT	1,778	500	389	500	278	444
Friday Peak Person Trips - IN	2,077	584	454	584	325	519
Friday Peak Person Trips - OUT	2,438	686	533	686	381	609

Existing Conditions (2019) + RADP	SF, Central	SM County	SC County	Alameda County	CC County	North Bay + Beyond
Total Passenger Person Trips: IN	27,867	7,838	6,096	7,838	4,354	6,967
Total Passenger Person Trips: OUT	27,867	7,838	6,096	7,838	4,354	6,967
Total Passenger Person Trips:	55,734	15,675	12,192	15,675	8,708	13,933
AM Peak Person Trips - IN	1,872	527	410	527	293	468
AM Peak Person Trips - OUT	1,472	414	322	414	230	368
PM Peak Person Trips - IN	1,287	362	282	362	201	322
PM Peak Person Trips - OUT	1,778	500	389	500	278	444
Friday Peak Person Trips - IN	2,077	584	454	584	325	519
Friday Peak Person Trips - OUT	2,438	686	533	686	381	609

2045 Future Baseline Without RADP	SF, Central	SM County	SC County	Alameda County	CC County	North Bay + Beyond
Total Passenger Person Trips: IN	38,648	10,532	9,001	10,973	6,122	8,094
Total Passenger Person Trips: OUT	38,648	10,532	9,001	10,973	6,122	8,094
Total Passenger Person Trips:	77,295	21,065	18,002	21,946	12,245	16,187
AM Peak Person Trips - IN	2,597	708	605	737	411	544
AM Peak Person Trips - OUT	2,041	556	475	579	323	427
PM Peak Person Trips - IN	1,786	487	416	507	283	374
PM Peak Person Trips - OUT	2,466	672	574	700	391	516
Friday Peak Person Trips - IN	2,596	707	605	737	411	544
Friday Peak Person Trips - OUT	3,665	999	854	1,041	581	768

2045 Future Baseline With RADP	SF, Central	SM County	SC County	Alameda County	CC County	North Bay + Beyond
Total Passenger Person Trips: IN	38,648	10,532	9,001	10,973	6,122	8,094
Total Passenger Person Trips: OUT	38,648	10,532	9,001	10,973	6,122	8,094
Total Passenger Person Trips:	77,295	21,065	18,002	21,946	12,245	16,187
AM Peak Person Trips - IN	2,597	708	605	737	411	544
AM Peak Person Trips - OUT	2,041	556	475	579	323	427
PM Peak Person Trips - IN	1,786	487	416	507	283	374
PM Peak Person Trips - OUT	2,466	672	574	700	391	516
Friday Peak Person Trips - IN	2,596	707	605	737	411	544
Friday Peak Person Trips - OUT	3,665	999	854	1,041	581	768

		Source	Existing Conditions (2019)	Existing Conditions (2019) + RADP	2045 Future Baseline Without RADP	2045 Future Baseline With RADP
A	% Trips SF, Central	*Passenger Survey*	45.71%	45.71%	46.36%	46.36%
B	% Trips SF County, Other	*Passenger Survey*	0.00%	0.00%	0.00%	0.00%
C	% Trips San Mateo County	*Passenger Survey*	12.86%	12.86%	12.63%	12.63%
D	% Trips SC County	*Passenger Survey*	10.00%	10.00%	10.80%	10.80%
E	% Trips Alameda County	*Passenger Survey*	12.86%	12.86%	13.16%	13.16%
F	% Trips Contra Costa County	*Passenger Survey*	7.14%	7.14%	7.34%	7.34%
G	% Trips North Bay + Beyond	*Passenger Survey*	11.43%	11.43%	9.71%	9.71%
I	**Bay Area Jobs Growth, SF, Central**	*PBA 2050*			24.7%	24.7%
J	**Bay Area Jobs Growth, SF County, Other**	*PBA 2050*			0.0%	0.0%
K	**Bay Area Jobs Growth, SMC**	*PBA 2050*			20.9%	20.9%
L	**Bay Area Jobs Growth, SC County**	*PBA 2050*			32.8%	32.8%
M	**Bay Area Jobs Growth, Alameda County**	*PBA 2050*			25.9%	25.9%
N	**Bay Area Jobs Growth, CC County**	*PBA 2050*			26.5%	26.5%
O	**Bay Area Jobs Growth, North Bay + Beyond**	*PBA 2050*			4.5%	4.5%
		A * I			57.02%	57.02%
		B * J			0.00%	0.00%
		C * K			15.54%	15.54%
		D * L			13.28%	13.28%
		E * M			16.19%	16.19%
		F * N			9.03%	9.03%
		G * O			11.94%	11.94%

Attachment C – Employee Trip Distribution Calculations

ATTACHMENT C
Employee Trip Distribution Estimates

County	Existing Trip Distribution (Total Employees)	Existing Trip Distribution %[1]	% Household Growth by County[2]	% Total Growth	2045 Trip Distribution (%)[3]
San Francisco	10,570	24.7%	40.4%	34.7%	25.5%
San Mateo	17,064	39.9%	34.3%	53.5%	39.3%
Santa Clara	2,343	5.5%	49.8%	8.2%	6.0%
Alameda	7,780	18.2%	37.4%	25.0%	18.3%
Contra Costa + Solano	4,255	9.9%	27.5%	12.7%	9.3%
Marin + Napa + Sonoma	788	1.8%	15.7%	2.1%	1.6%
Sum	**42,800**	**100%**	**36%**	**136%**	**100%**

Source:
(1) SFO Commission and Tenant Employees Residence Data (2017)
(2) Planning Bay Area 2050
(3) 2045 Trip Distribution is re-calculated to result in a total distribution of 100%

Attachment D – Parking Summary

ATTACHMENT D: PARKING SUMMARY

Table 1 **Existing Conditions, 2045 Future Baseline Without RADP and 2045 Future Baseline With RADP Vehicle Parking Supply**

Condition	Public Spaces[a]	Employee/Tenant Spaces[b]	Total Public and Employee/Tenant Spaces	Rental Car Spaces[c]
Existing Conditions (2019)	17,643	10,972	28,615	6,019
2045 Future Baseline Without RADP[d]	17,643	11,550	29,193	6,019
RADP Project Net-Change	9,926	-2,658	7,268	7,235
2045 Future Baseline with RADP	27,569	8,892	36,461	13,254

SOURCES: Ricondo Associates, *Memorandum: Parking Supply Analysis, San Francisco International Airport*, revised February 19, 2019; SFO Consolidated Administration Campus Addendum, Case No. 2019-006583ETM, issued on May 17, 2021; and West Field Cargo Redevelopment Addendum, Case No. 2020-008656ENV, issued on May 17, 2021.

NOTES:

a. Public Spaces include short-term and long-term public parking spaces in the Central Parking Garage, International Garages A and B, and Long-Term Parking Garages #1 and #2.
b. Employee/Tenant Spaces include airport commission employees and tenant and contractor parking (e.g., United Airlines).
c. Rental Car Spaces include those spaces in the rental car center facility, quick turnaround facility, and in storage lots.
d. 2045 Future Baseline Without RADP parking supply includes the planned employee parking garage containing 1,400 spaces (net new 1,105 spaces) included as part of the Consolidated Administrative Campus Addendum, and the planned employee parking garage containing 163 spaces (net reduction of 527 spaces) included as part of the West Field Cargo Redevelopment Addendum.

Table 2 **Existing Conditions, 2045 Future Baseline Without RADP and 2045 Future Baseline With RADP Vehicle Parking Supply - Details**

Condition	Public Spaces[a]	Employee/Tenant Spaces[b]	Total Public and Employee Spaces	Rental Car Spaces[c]
Existing Conditions (2019)	17,643	10,972	28,615	6,019
SFO Consolidated Administrative Campus[d]	--	1,105	1,105	--
West Field Cargo Redevelopment[e]	--	-527	-527	--
2045 Future Baseline Without RADP	17,643	11,550	29,193	6,019
RADP Projects				
(2) Boarding Area F[f]	--	0	0	--
(6) Central Hub[g]	3,026	515	3,541	--
(9) CONRAC[h]	--	-1,200	-1,200	4,640
(10) Consolidated Rental Quick Turnaround[h]	--	--	--	2,880
(11) Long-term Garage #3[i]	3,200	-1,060	2,140	--
(12) Long-term Garage #4[j]	3,700	--	3,700	-2,485
(13) Rental Car Center Storage Lot[k]	--	--	--	2,200

ATTACHMENT D: PARKING SUMMARY

Condition	Public Spaces[a]	Employee/Tenant Spaces[b]	Total Public and Employee Spaces	Rental Car Spaces[c]
(16) AirTrain Maintenance Facility[l]	--	240	240	--
(17) North Field Ground Support[m]	--	-107	-107	--
(18) Aircraft Maintenance Hangar[n]	--	-1,046	-1,046	--
RADP Projects Net-Change	***9,926***	***-2,658***	***7,268***	***7,235***
2045 Future Baseline With RADP	27,569	8,892	36,461	13,254

SOURCES: Ricondo Associates, *Memorandum: Parking Supply Analysis, San Francisco International Airport*, revised February 19, 2019; SFO Consolidated Administration Campus Addendum, Case No. 2019-006583ETM, issued on May 17, 2021; and West Field Cargo Redevelopment Addendum, Case No. 2020-008656ENV, issued on May 17, 2021.

NOTES:

-- indicates not applicable to the subsequent RADP project

a. Public Spaces include short-term and long-term public parking spaces in the Central Parking Garage, International Garages A and B, and Long-Term Parking Garages #1 and #2.
b. Employee/Tenant Spaces include airport commission employees and tenant and contractor parking (e.g., United Airlines).
c. Rental Car Spaces include those spaces in the rental car center facility, quick turnaround facility, and in storage lots.
d. The project addressed in the Consolidated Administrative Campus Addendum will provide an employee parking garage containing 1,400 spaces (net addition of 1,105 spaces).
e. The project addressed in the West Field Cargo Redevelopment Addendum will provide an employee parking garage containing 163 spaces (net reduction of 527 spaces).
f. The RADP Boarding Area F project would remove the existing 1,722 employee parking spaces within the existing Building 638 and construct a new parking garage containing 1,722 parking spaces on the Building 682 site. Thus, no net change in the number of employee parking spaces as part of this project.
g. The RADP Central Hub project would replace the existing 6,459 space garage containing 5,674 public parking spaces and 785 employee parking spaces) within a 10,000-space garage containing 8,700 public parking spaces and 1,399 employee parking spaces (net increase of 3,026 public parking spaces and 515 employee parking spaces).
h. The RADP Consolidated Quick Turnaround project containing 2,880 rental car spaces would be constructed on the site of a 1,200-space employee parking lot.
i. The RADP Long-term Parking Garage #3 project would provide 3,200 public parking stalls on the existing 1,060-space United Airlines employee surface parking lot (an increase in 3,200 public parking spaces and decrease of 1,060 employee parking spaces).
j. The RADP Long-term Parking Garage #4 project would convert the existing 2,485 ready return/rental car stalls to a public parking garage containing 3,700 spaces.
k. The RADP Rental Car Center Short Term Storage Lot project would add 2,200 rental car stacking and storage spaces within the area currently used for vehicle fueling facilities and wash bays.
l. The RADP AirTrain Maintenance Facility project would include about 240 employee parking spaces underneath the elevated AirTrain storage tracks.
m. The RADP North Field Ground Support project would eliminate 107 employee surface parking spaces.
n. The RADP Aircraft Maintenance Hangar project would eliminate 1,046 employee surface parking spaces.

Occupancy of Public Parking Spaces at SFO Airport
flySFO website https://www.flysfo.com/passengers/parking

	Day of Week	Date	Time	Domestic Garage		International Garage A		International Garage G		ParkFast		Long Term Garages 1 & 2		Total		Average Monthly Occupancy
				spaces available	total occupancy	spaces available	total occupancy	spaces available	total occupancy	spaces available	total occupancy	spaces available	total occupancy	spaces available	total occupancy	
1	Friday	01/05/24	10:45AM	2,171	56%	658	60%	465	67%	89	62%	2,351	63%	5,734	61%	
2	Monday	01/08/24	12:45 PM	1,961	60%	690	58%	633	55%	138	42%	2,860	57%	6,282	58%	
3	Wednesday	01/10/24	12:00 PM	1,687	66%	510	69%	427	70%	137	42%	3,057	54%	5,818	61%	
4	Thursday	01/11/24	1:00 PM	1,914	61%	281	83%	542	61%	148	37%	2,958	55%	5,843	60%	
5	Friday	01/12/24	1:50 PM	2,027	59%	562	66%	512	64%	131	44%	2,550	62%	5,782	61%	
6	Tuesday	01/16/24	12:30 PM	2,150	56%	571	66%	502	64%	141	40%	2,926	56%	6,290	58%	
7	Thursday	01/18/24	12:00 PM	1,379	72%	494	70%	466	67%	187	21%	2,835	57%	5,361	64%	
8	Tuesday	01/23/24	12:45 PM	1,566	68%	645	61%	402	71%	132	44%	3,114	53%	5,859	60%	
9	Wednesday	01/24/24	12:15 PM	1,307	73%	486	71%	418	70%	123	48%	3,061	54%	5,395	64%	
10	Thursday	01/25/24	1:50 PM	1,391	72%	379	77%	419	70%	128	46%	2,798	58%	5,115	66%	
11	Tuesday	01/30/24	1:30 PM	1,628	67%	574	65%	422	70%	160	32%	3,214	52%	5,998	60%	61%
12	Tuesday	02/06/24	12:30 PM	1,634	67%	721	56%	527	62%	148	37%	2,906	56%	5,936	60%	
13	Wednesday	02/07/24	12:00 PM	1,108	77%	528	68%	436	69%	128	46%	2,771	58%	4,971	66%	
14	Thursday	02/08/24	12:50 PM	806	84%	267	84%	605	57%	145	39%	2,335	65%	4,158	72%	
15	Tuesday	02/20/24	12:30 PM	970	80%	695	58%	279	80%	52	78%	1,184	82%	3,180	78%	
16	Wednesday	02/21/24	1:20 PM	663	86%	688	58%	169	88%	46	81%	1,090	84%	2,656	82%	
17	Thursday	02/22/24	12:00 PM	491	90%	443	73%	272	81%	61	74%	887	87%	2,154	86%	
18	Friday	02/23/24	1:00 PM	733	85%	482	71%	526	63%	74	69%	554	92%	2,369	84%	76%
19	Monday	05/06/24	12:45 PM	920	81%	596	64%	375	73%	82	65%	1,097	83%	3,070	79%	
20	Wednesday	05/08/24	12:00 PM	555	89%	445	73%	244	83%	53	78%	1,133	83%	2,430	84%	
21	Thursday	05/09/24	12:00 PM	251	95%	158	90%	413	71%	56	76%	475	93%	1,353	91%	
22	Friday	05/03/24	1:30 PM	844	83%	418	75%	111	92%	69	71%	435	93%	1,877	87%	85%
23	Monday	06/17/24	12:15 PM	1,153	77%	460	72%	485	65%	18	92%	857	87%	2,973	80%	
24	Tuesday	06/18/24	12:00 PM	1,171	76%	319	81%	284	80%	42	82%	944	86%	2,760	82%	
25	Wednesday	06/19/24	12:30 PM	930	81%	200	88%	275	80%	38	84%	764	88%	2,207	85%	
26	Thursday	06/20/24	12:20 PM	851	83%	307	81%	491	65%	7	97%	161	98%	1,817	89%	
27	Friday	06/21/24	12:00 PM	872	82%	532	68%	182	87%	49	79%	169	97%	1,804	87%	84%

Presidents' Day/Ski Week

All data provided by SFO

Parking Supply June 2017

						Parking Demand				% Occupied				Parking Population				
Garage/Surface Lot	**Total**	**Public**	**Employee**	**% Public**	**% Employee**	**Max Hourly Demand**	**Max Avg Hourly Demand over the Year**	**Demand at 8 AM**	**Demand at 12 PM**	**Max Hourly Demand**	**Max Avg Hourly Demand over the Year**	**Demand at 8 AM**	**Demand at 12 PM**	**Public Only**	**Employee Only**	**Shared**	**All**	**Date of Demand Data**
Domestic	6,558	5,542		100%	0%	4,784	3,083	2,876	3,083	86%	56%	52%	56%	x			x	6/2016-5/2017
Domestic Level 4 Park Fast		105		100%	0%	92	49	46	49	88%	47%	44%	47%	x			x	6/2016-5/2017
Domestic Level 4 Valet		126		100%	0%	77	49	46	48	61%	39%	37%	38%	x			x	6/2016-5/2017
Domestic Level 4 Employee (A/B T1 & F/G T3)			785	0%	100%	829	558	463	558	106%	71%	59%	71%		x		x	6/2016-5/2017
ITA	1,585	902	683	57%	43%	1,579	903	686	903	100%	57%	43%	57%			x	x	6/2016-5/2017
ITG	1,405	1,130	275	80%	20%	1,184	658	517	622	84%	47%	37%	44%			x	x	6/2016-5/2017
LT Parking	3,109	3,109		100%	0%	3,114	2,717	2,661	2,717	100%	87%	86%	87%	x			x	6/2016-5/2017
LT Surface Lot	882	882		100%	0%	1,502	761	756	724	170%	86%	86%	82%	x			x	6/2016-5/2017
WFG	1,722		1,722	0%	100%	1,588	1,312	1,225	1,312	92%	76%	71%	76%		x		x	6/2016-5/2017
Lot C	525		525	0%	100%	532	384	367	377	101%	73%	70%	72%		x		x	6/2016-5/2017
Lot D	3,585	2,044	1,541	57%	43%	3,139	1,755	1,473	1,745	88%	49%	41%	49%			x	x	6/2016-5/2017
Cargo	1,010		1,010	0%	100%													Data unavailable
SFO Business Center (Bldg 575)	165		165	0%	100%	146	83	41	76	88%	50%	25%	46%		x		x	6/2016-5/2017
Total	***20,546***	***13,840***	***6,706***	67%	33%	***18,566***	***12,312***	***11,157***	***12,214***	***90%***	***60%***	***54%***	***59%***					

Public Only Demand	9,569	6,659	6,385	6,621	98%	68%	65%	**68%**
Employee Only Demand	3,095	2,337	2,096	2,323	97%	73%	66%	**73%**
Shared (Public + Employee) Demand	5,902	3,316	2,676	3,270	90%	50%	41%	50%
Total Demand	18,566	12,312	11,157	12,214	**95%**	63%	57%	63%

13,210 Max hourly demand for public spaces (public only + % public shared)

95% % occupancy

5,356 Max hourly demand for employee spaces (employee only + % employee shared)

80% % occupancy

SFO RADP - Parking Assessment
Changes in Public Parking and Employee Parking Space Supply and Demand

	Existing	2045 Future Baseline Without RADP	2045 Future Baseline With RADP
Public Parking			
Supply	17,643	17,643	27,569
Change in Supply	--	0	9,926
Demand	16,767	19,522	19,522
Change in Demand	--	2,755	0
		plus 13.6 MAP	
		110.7%	70.8%
Employee Parking			
Supply	10,972	11,550	8,892
Change in Supply	--	578	-2,658
Demand	10,427	12,733	13,391
Change in Demand	--	2,306	658
		plus 9,400 employees	plus 2,700 employees
		110.2%	150.6%
Total Parking			
Supply	28,615	29,193	36,461
Change in Supply		578	7,268
Demand	27,194	32,255	32,913
Change in Demand		5,061	658
% Occupancy	95%	110%	90%
	1,421	-3,062	3,548

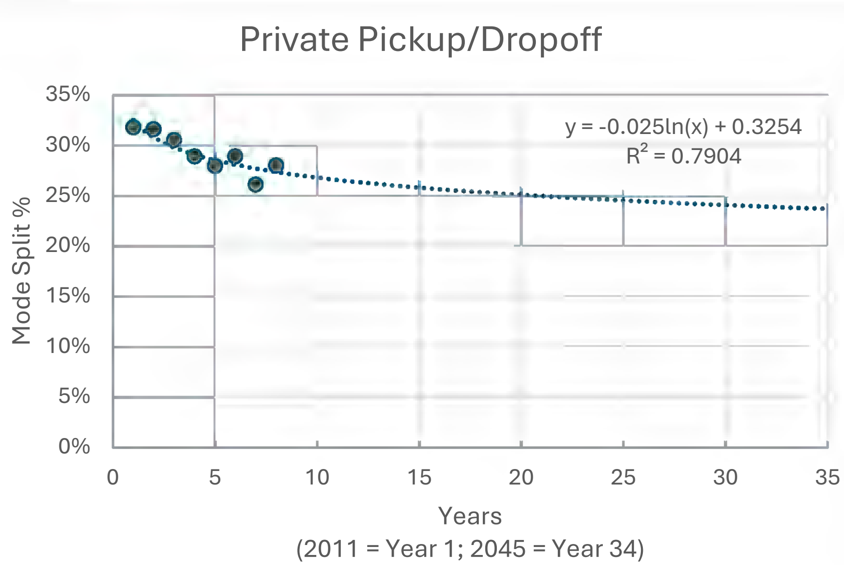
Attachment E – Passenger Mode Choice Trend Lines

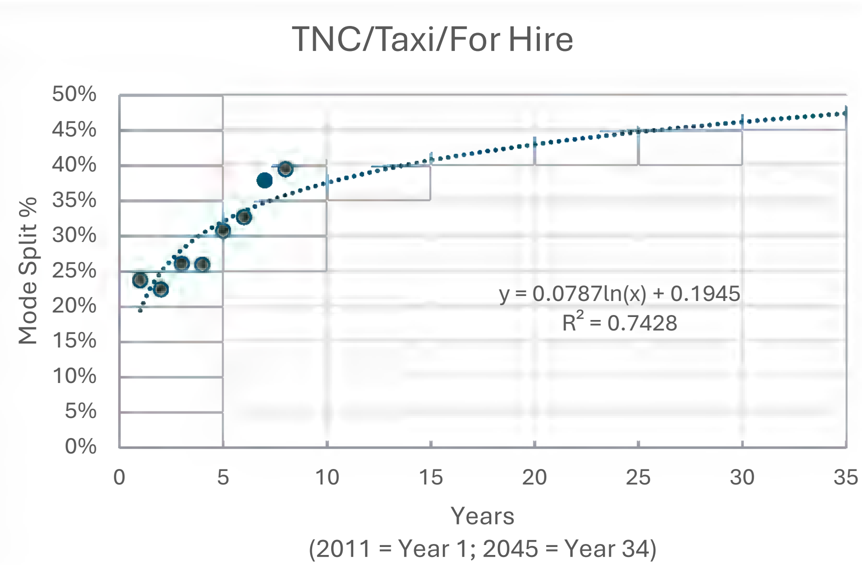
ATTACHMENT E - PASSENGER MODE CHOICE TREND LINES

Passenger Mode Share Changes, 2011 to 2018

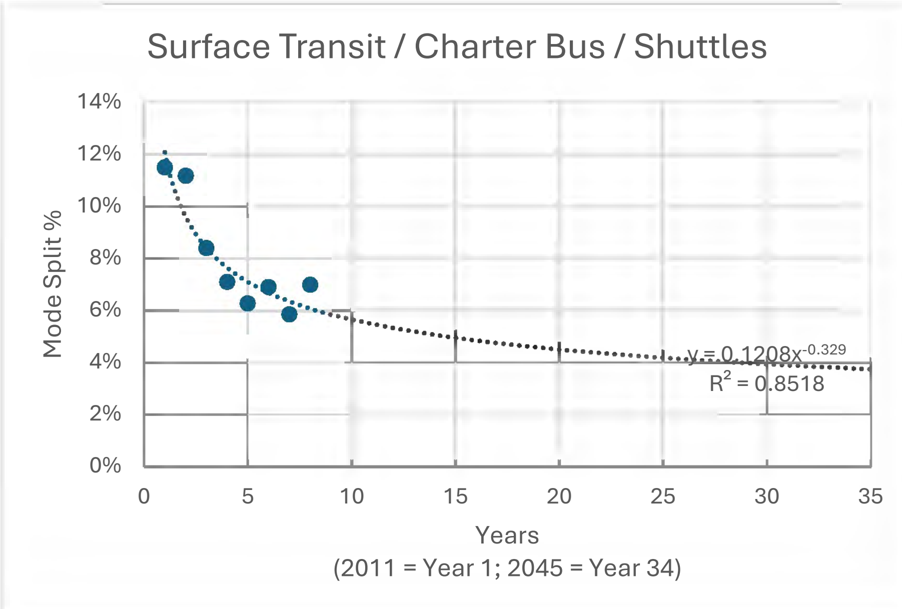
Year	Drive				Surface Transit	BART
	Private Pick-up/Drop-off	*For-Hire Pick-up/ Drop-off*	*Drive & Park / Rental Car*	Total		
2011	*32%*	*24%*	*23%*	78%	12%	10%
2012	*32%*	*22%*	*24%*	78%	11%	11%
2013	*31%*	*26%*	*22%*	79%	8%	13%
2014	*29%*	*26%*	*26%*	80%	7%	12%
2015	*28%*	*31%*	*27%*	85%	6%	8%
2016	*29%*	*33%*	*21%*	83%	7%	10%
2017	*26%*	*38%*	*21%*	85%	6%	9%
2018	*28%*	*39%*	*17%*	84%	7%	9%

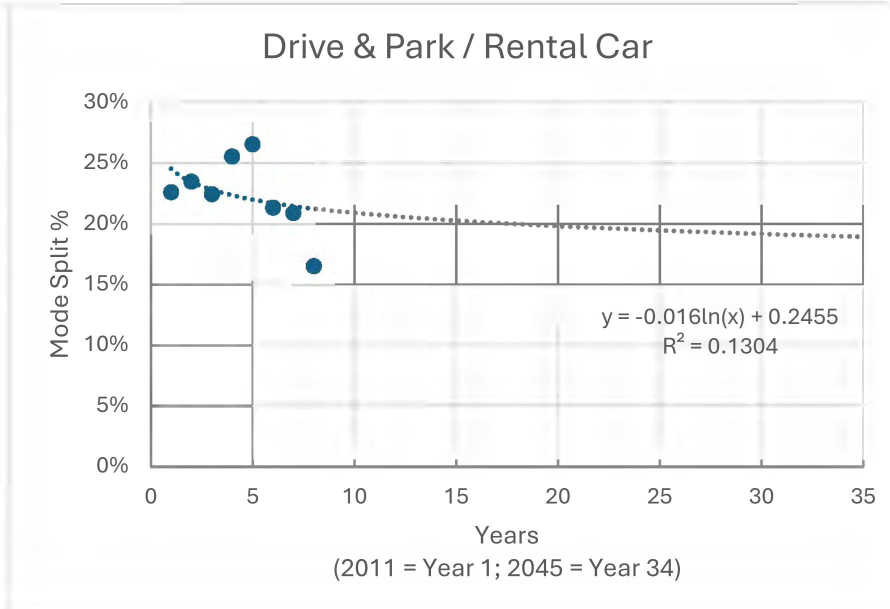
Source: SFO Passenger Surveys, 2011 to 2018; Fehr & Peers, 2024.

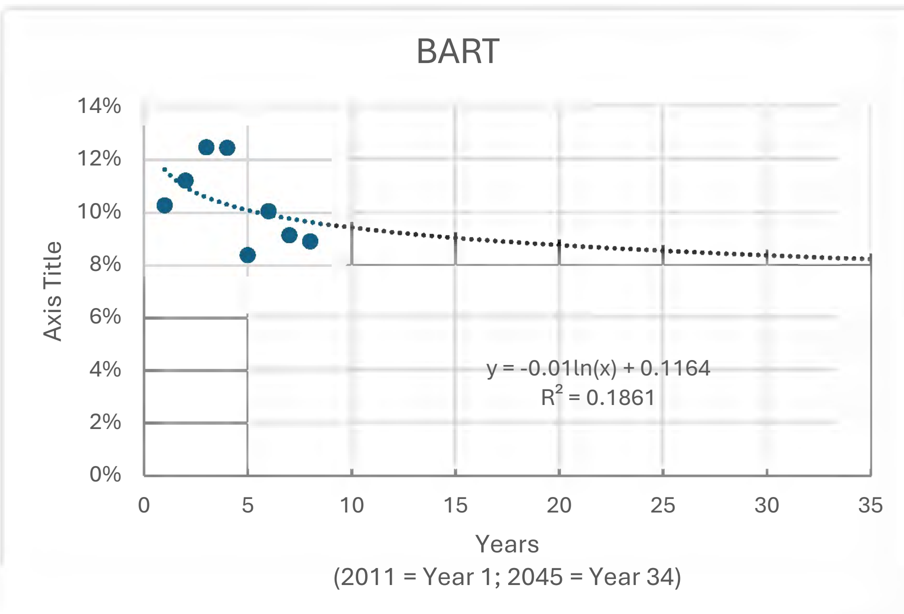




ATTACHMENT E - PASSENGER MODE CHOICE TREND LINES







Attachment F – Passenger Travel Demand Calculations

		Source	2019	2019 + P	2045	2045 + P
A	**Total Passenger Person Trips: IN**	Passenger Trip Gen Model	60,959	60,959	83,370	83,370
B	**Total Passenger Person Trips: OUT**	Passenger Trip Gen Model	60,959	60,959	83,370	83,370
C	**Total Passenger Person Trips:**	Passenger Trip Gen Model	121,918	121,918	166,740	166,740
D	**AM Peak Person Trips - IN**	Passenger Trip Gen Model	4,096	4,096	5,602	5,602
E	**AM Peak Person Trips - OUT**	Passenger Trip Gen Model	3,219	3,219	4,402	4,402
F	**PM Peak Person Trips - IN**	Passenger Trip Gen Model	2,816	2,816	3,852	3,852
G	**PM Peak Person Trips - OUT**	Passenger Trip Gen Model	3,889	3,889	5,319	5,319
K	**% of Passengers using TNC/Taxi/Limo/Shuttle Van**	*Passenger Survey/ Mode by OD Model*	39.5%	39.5%	46.5%	46.5%
L	**% of Passengers using Private Pick-up/Drop-off**	*Passenger Survey/ Mode by OD Model*	28.0%	28.0%	23.0%	23.0%
M	**% of Passengers using BART**	*Passenger Survey/ Mode by OD Model*	8.9%	8.9%	7.9%	7.9%
N	**% of Passengers using Surface Transit**	*Passenger Survey/ Mode by OD Model*	7.0%	7.0%	3.4%	3.4%
O	**% of Passengers Drive + Park**	*Passenger Survey/ Mode by OD Model*	6.4%	6.4%	6.8%	6.8%
P	**% of Passengers Rental Car**	*Passenger Survey/ Mode by OD Model*	10.2%	10.2%	11.2%	11.2%
Q						
R	*Reweight to total 100%*					
S	**% of Passengers using TNC/Taxi/Limo/Shuttle Van**	*L/sum(L,M,N,O,P,Q)*	39.5%	39.5%	47.0%	47.0%
T	**% of Passengers using Private Pick-up/Drop-off**	*M/sum(L,M,N,O,P,Q)*	28.0%	28.0%	23.3%	23.3%
U	**% of Passengers using BART**	*N/sum(L,M,N,O,P,Q)*	8.9%	8.9%	8.0%	8.0%
V	**% of Passengers using Surface Transit**	*O/sum(L,M,N,O,P,Q)*	7.0%	7.0%	3.5%	3.5%
W	**% of Passengers Drive + Park**	*P/sum(L,M,N,O,P,Q)*	6.4%	6.4%	6.9%	6.9%
X	**% of Passengers Rental Car**	*Q/sum(L,M,N,O,P,Q)*	10.2%	10.2%	11.3%	11.3%
Y						
Z	**% of TNC/Taxi Trip Ends Resulting in New Passenger Fare**	Weighted average of 23% rematch for TNC, 100% rematch for taxi/limo	35.6%	35.6%	35.5%	35.5%
AA	**AVO TNC/Taxi/Limo/Shuttle Van**	*SFO*	2	2	2	2
BB	**AVO Private Pick-Up/Drop-Off**	*SFO*	2	2	2	2
CC	**AVO Drive + Park**	*SFO*	2	2	2	2
DD	**AVO Rental Car**	*SFO*	2	2	2	2

Person Trips - AM Peak IN		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	D * S	1,618	1,618	2,635	2,635
Private Pick-up/Drop-off	D * T	1,148	1,148	1,304	1,304
BART	D * U	365	365	450	450
Surface Transit	D * V	287	287	194	194
Drive + Park	D * W	261	261	387	387
Rental Car	D * X	417	417	632	632

Person Trips - AM Peak OUT		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	E * S	1,271	1,271	2,071	2,071
Private Pick-up/Drop-off	E * T	902	902	1,025	1,025
BART	E * U	287	287	354	354
Surface Transit	E * V	226	226	152	152
Drive + Park	E * W	205	205	304	304
Rental Car	E * X	328	328	496	496

Vehicle Trips - AM Peak IN		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	(D*S/AA) + (E*S/AA)* (2 - Z)	1,218	1,218	1,985	1,985
Private Pick-up/Drop-off	(D*T/BB)	1,025	1,025	1,164	1,164
BART	n/a	0	0	0	0
Surface Transit	n/a	0	0	0	0
Drive + Park	(D*W/CC)	130	130	194	194
Rental Car	(D*W/DD)	209	209	316	316

Vehicle Trips - AM Peak OUT		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	(E*S/AA) + (D*S/AA)* (2 - Z)	1,156	1,156	1,885	1,885
Private Pick-up/Drop-off	(E*T/BB)	1,025	1,025	1,164	1,164
BART	n/a	0	0	0	0
Surface Transit	n/a	0	0	0	0
Drive + Park	(E*W/CC)	103	103	152	152
Rental Car	(E*W/EE)	164	164	248	248

Person Trips - PM Peak IN		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	F * S	1,112	1,112	1,812	1,812
Private Pick-up/Drop-off	F * T	789	789	897	897
BART	F * U	251	251	309	309
Surface Transit	F * V	197	197	133	133
Drive + Park	F * W	179	179	266	266
Rental Car	F * X	287	287	434	434

Person Trips - PM Peak OUT		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	G * S	1,536	1,536	2,502	2,502
Private Pick-up/Drop-off	G * T	1,090	1,090	1,238	1,238
BART	G * U	347	347	427	427
Surface Transit	G * V	272	272	184	184
Drive + Park	G * W	248	248	368	368
Rental Car	G * X	396	396	600	600

Vehicle Trips - PM Peak IN		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	(F*S/AA) + (G*S/AA)* (2 - Z)	1,050	1,050	1,713	1,713
Private Pick-up/Drop-off	(F*T/BB)	940	940	1,067	1,067
BART	n/a	0	0	0	0
Surface Transit	n/a	0	0	0	0
Drive + Park	(F*W/CC)	90	90	133	133
Rental Car	(F*W/DD)	143	143	217	217

Vehicle Trips - PM Peak OUT		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	(G*S/AA) + (F*S/AA)* (2 - Z)	1,126	1,126	1,835	1,835
Private Pick-up/Drop-off	(G*T/BB)	940	940	1,067	1,067
BART	n/a	0	0	0	0
Surface Transit	n/a	0	0	0	0
Drive + Park	(G*W/CC)	124	124	184	184
Rental Car	(G*W/EE)	198	198	300	300

Person Trips - Daily IN		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	A * S	24,073	24,073	39,221	39,221
Private Pick-up/Drop-off	A * T	17,084	17,084	19,407	19,407
BART	A * U	5,436	5,436	6,696	6,696
Surface Transit	A * V	4,271	4,271	2,884	2,884
Drive + Park	A * W	3,883	3,883	5,763	5,763
Rental Car	A * X	6,212	6,212	9,399	9,399

Person Trips - Daily OUT		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	B * S	24,073	24,073	39,221	39,221
Private Pick-up/Drop-off	B * T	17,084	17,084	19,407	19,407
BART	B * U	5,436	5,436	6,696	6,696
Surface Transit	B * V	4,271	4,271	2,884	2,884
Drive + Park	B * W	3,883	3,883	5,763	5,763
Rental Car	B * X	6,212	6,212	9,399	9,399

Vehicle Trips - Daily IN		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	(A*S/AA) + (B*S/AA)* (2 - Z)	19,782	19,782	32,257	32,257
Private Pick-up/Drop-off	(A*T/BB)	17,084	17,084	19,407	19,407
BART	n/a	0	0	0	0
Surface Transit	n/a	0	0	0	0
Drive + Park	(A*W/CC)	1,941	1,941	2,882	2,882
Rental Car	(A*W/DD)	3,106	3,106	4,700	4,700

Vehicle Trips - Daily OUT		2019	2019 + P	2045	2045 + P
TNC/Taxi/Limo/Shuttle/Van	(B*S/AA) + (A*S/AA)* (2 - Z)	19,782	19,782	32,257	32,257
Private Pick-up/Drop-off	(B*T/BB)	17,084	17,084	19,407	19,407
BART	n/a	0	0	0	0
Surface Transit	n/a	0	0	0	0
Drive + Park	(B*W/CC)	1,941	1,941	2,882	2,882
Rental Car	(B*W/EE)	3,106	3,106	4,700	4,700

Attachment G – Cargo Truck Trip Generation Calculations

SFO Recommended Airport Development Plan EIR
Calculation of Cargo Truck Trips
for 2045 Future Baseline Without RADP Conditions
October 1, 2024

2018	417,100	annual cargo tonnage	ADP, Appendix C
projections	536,700	annual cargo tonnage	
	119,600	annual cargo tonnage	
	312	days (6 day operating week)	ADP, p. 4-39
	383	tons per day	
	18	metric tons per truck (average capacity)	see below
	21	trucks per day	
	43	truck trips per day (in & out)	
	4	peak hour truck trips (10% of daily)	

Notes:
Only includes trips associated with air cargo trucks
trips associated with employees already accounted for in employee forecasts

max overall weight limit for trucks in CA is 80,000 lbs, including truck and cargo
able to carry between 42,000 and 48,000 lbs of cargo
40,000 pounds = 18.14 metric tons

Assignment Assumptions
50 percent north U.S. 101
50 percent south U.S. 101
North U.S. 101 use San Bruno Avenue Ramps
South U.S. 101 use San Bruno Avenue Ramps
Only trucks from South U.S. 101. show up on U.S. 101 between and Millbrae

Attachment H – Delivery Truck Trip Generation Calculations

SFO Recommended Airport Development Plan EIR
Calculation of Delivery Truck Trips
October 1, 2024

RADP Project	Project Description new construction gsf (b)	Project Description Comments	factor for new loading demand (c)	net gsf used for calcs	SF Transpo Guidelines daily trucks(d) land use	rate per 1,000 gsf	net new Daily trucks	net-new A.M./P.M. pk hr trucks
1 Boarding Area H	1,413,300	small portion of new build would be retail or supplies	25%	353,325	composite retail	0.22	78	7.8
2 Boarding Area F Modernization (a)	893,000	mostly modernization, some concessions	25%	223,250	composite retail	0.22	49	4.9
3 ITB Main Hall Expansion	276,600	mostly circulation, some concessions	25%	69,150	composite retail	0.22	15	1.5
4 ITB Boarding Area A & G Improvements	23,200	mostly new holding areas, some concessions	25%	5,800	composite retail	0.22	1	0.1
5 Terminal 3 Façade Expansion	25,000	primarily circulation				0.22	0	0.0
6 Central Hub	2,650,000	expansion of existing garage, some more supplies	5%	132,500	office	0.21	28	2.8
7 Domestic Terminal Roadways	80,000	roadway replacement					0	0.0
8 ITB Curbside Expansion	52,000	widening of existing roadway					0	0.0
9 CONRAC	1,940,000	replacement & expansion of existing facility, supplies	5%	97,000	office	0.21	20	2.0
10 CONRAC Quick Turnaround	1,031,000	replacement & expansion of existing facility, supplies	5%	51,550	office	0.21	11	1.1
11 Long Term Garage #3	348,000	new parking garage, supplies	5%	17,400	office	0.21	4	0.4
12 Long Term Garage #4	0	conversion of existing CONRAC to parking garage					0	0.0
13 Rental Car Storage Lot	-130,000	rental car storage lot, replaces existing					0	0.0
14 Terminal 2 AirTrain Station expansion	6,900	platform extension					0	0.0
15 Rental Car AirTrain Station Expansion	2,900	platform extension					0	0.0
16 AirTrain Maintenance Yard	151,700	replacement of existing facility + office, supplies	25%	37,925	office	0.21	8	0.8
17 North Field GSE Facility #1	48,000	new facility, supplies	25%	12,000	light industrial	0.65	8	0.8
18 Aircraft Maintenance Hangar	181,000	maintenance and parts storage, supplies	25%	45,250	light industrial	0.65	29	2.9
19 East Field GSE Facility #2	23,000	modernizes an existing facility, supplies	25%	5,750	light industrial	0.65	4	0.4
20 Sanitary Sewer	0	underground infrastructure					0	0.0
						daily trucks	255	25.5
						truck trips	**510**	51

Notes:

a Includes new construction of Building 944 and Boarding Area F.
b EIR Project Description Tables 2-2 and 2-3.
c Terminal façade expansion terminal roadways replacement, curbside expansion, parking facility conversion or replacement facilities, platform extemsion assumed to not generate additional or new loading demand.
A factor of 5 percent was applied to the new construction gsf for parking facilities for supplies, and a factor of 25 percent was applied to all other projects for additional or new supplies and/or concessions.
Factors estimated based on project description and professional judgment.
d SF Transportation Guidelines, Appendix F, Table 3.

E.3 Construction Vehicle Trip Assignment Memorandum

MEMORANDUM

Date: February 12, 2025

To: Jenny Delumo, San Francisco Planning Department
Elizabeth White, San Francisco Planning Department
Kei Zushi, San Francisco Planning Department

From: Luba Wyznyckyj, LCW Consulting and Sarah Chan, Fehr & Peers

Subject: SFO Recommended Airport Development Plan CEQA Analysis – Representative Project Construction Vehicle Trip Assignment – FINAL (Planning Case Number 2017-007468ENV)

The following tables summarize the construction vehicle trip information used in the quantitative and qualitative construction impact analysis for the SFO Recommended Airport Development Plan (RADP) EIR. Because analysis of the RADP is programmatic and detailed information on individual components of the RADP have not been developed, the construction vehicle trip assignment was developed for four of the 20 RADP projects. These projects were selected for the air quality analysis as representative for different sizes of construction projects (i.e., two large projects, one medium project, and one small project). These projects represent the range of projects that could occur with implementation of the RADP and were selected based on the amount of demolition and net new construction, as compared to other RADP projects. The four representative projects include two large projects: the Central Hub (RADP Project #6) and the Consolidated Rental Car Center Facility (CONRAC) (RADP Project #9); one medium project, which is the International Terminal Building (ITB) Main Hall Expansion project (RADP Project #3); and one small project, which is the East Field Ground Support Equipment (GSE) Facility #2 (RADP Project #19). See attached **Figure 1** for location of the four representative projects.

Daily construction truck and worker trip information for the four representative projects was developed as part of the air quality analysis methodology, which is summarized in Air Quality Analysis Methods Memorandum (see Appendix F of the Draft EIR) and was expanded as part of the air quality analysis effort to provide additional detail on types of vendor trucks (e.g., concrete, other materials and supplies) and haul demolition trucks (e.g., concrete, non-concrete) for use in the construction vehicle assignment (see Attachment 2). Each of the representative project construction phases as identified in Table 1 of this memorandum and Table 1 of the Air Quality Analysis Methods Memorandum 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 the analysis, the phase with the greatest number of average daily trucks and workers was selected for each representative project (e.g., the maximum number of haul demolition trucks was selected for the demolition phase, while the maximum number of average daily construction workers was selected for the building construction phase). This represents the maximum average daily number of construction trucks and workers.

Information on staging areas, access routes to the representative project sites, parking areas, origin/destination of truck and worker trips was based on information developed by the construction contractor for the project-level construction analysis of the SFO Shoreline Protection Program (SFO SPP) and additional information provided by SFO for concrete batching needs. The SFO SPP construction vehicle assumptions are documented in the memorandum titled SFO Shoreline Protection Program CEQA Analysis – Estimation of Project Travel Demand during Construction Activities, November 2021 (see Attachment 3 of that memorandum).[1] The information on staging areas, access routes, origin/destination of trucks and workers, and parking areas used in the analysis of the

[1] SFO Shoreline Protection Program CEQA Analysis – Estimation of Project Travel Demand during Construction Activities, November 2021, SFO Shoreline Protection Program EIR, Appendix I, Case No. 2020-0043989ENV. See Attachment 3.

SFO SPP project is similar to past and ongoing construction projects at the Airport, and because subsequent RADP projects would be constructed similar to past and ongoing projects at the Airport these assumptions are therefore applicable to the four representative projects.

Similar to the SFO SPP analysis, the distribution of the construction worker and truck trips assumes that for each RADP project, either the Aviador Lot or the Plot 16D lot, would be designated as the primary staging area, in addition to smaller staging areas in the vicinity of the RADP project site. The Aviador Lot is a 2.5-acre construction staging area located on Airport property, west of U.S. 101 in the City of Millbrae. Plot 16D is a 4-acre construction staging area located on Airport property, north of the U.S. 101/I-380 Interchange in the City of South San Francisco. See attached Figure 1 for location of the Aviador Lot and Plot 16D staging areas.

The construction vehicle trip distribution also assumes that the four representative projects are constructed during daytime hours (defined as between 7 a.m. and 6 p.m.). However, it is anticipated that some RADP projects may require nighttime construction activities (defined as 10 p.m. to 7 a.m.).

Table 1 summarizes each representative project and identifies the assumptions used to estimate construction vehicle trips on the adjacent roadway network. These include:

- Brief description of the representative project
- Identification of RADP representative project, including size.
- Assumed staging area.
- Primary vehicle access road serving the site.
- Daily number and type of haul demolition trucks.
- Daily number of haul import (i.e., fill and soil) trucks.
- Daily number of haul export trucks.
- Daily number and type of vendor trucks.
- Regional access routes for each type of truck.
- Daily number of construction workers.
- Assumed parking area and access routes for construction workers.
- Assumptions for construction worker shuttle.

TABLE 1
SFO RADP REPRESENTATIVE PROJECT INFORMATION AND ASSUMPTIONS FOR CONSTRUCTION ANALYSIS

Representative Project	Central Hub (RADP Project #6)	CONRAC (RADP Project #9)	ITB Main Hall Expansion (RADP Project #3)	East Field GSE Facility #2 (RADP Project #14)
Description	Replacement of the existing Central Parking Garage in the Terminal Area with a new multi-use building. The new Central Hub would provide nine levels of parking and would provide for curbside passenger pickup and commercial ground transportation staging.	Construction of a new Consolidated Rental Car Center Facility (CONRAC) and customer service lobby/offices at the top level linked to the Long-term Parking AirTrain Station.	Demolition of the rear façade of the existing International Terminal Building and expansion of three levels of the building to centralize various international passenger operations.	Demolition of the existing ground support equipment facility located near active taxiways and runways, and construction of a new replacement facility adjacent to North Access Road.
Representative Project Size[a]	Large	Large	Medium	Small
Staging Area(s)[b]	Plot 16D	Plot 16D	Aviador	Plot 16D
Access to Site[c]	airport freeway ramps	South Airport Blvd	airport freeway ramps	North Access Road
Haul Demo Trucks[d]				
Daily trucks[d]	80	5	14	1
Assumptions[e]	80% concrete debris & 20% non-concrete debris	100% non-concrete debris	80% concrete debris & 20% non-concrete debris	100% non-concrete debris
Access Routes[e]	No. U.S. 101/I-80 & So. U.S. 101	So. U.S. 101	So. U.S. 101	So. U.S. 101
Haul Import Trucks[d]				
Daily trucks[d]	4	0	0	0
Access Routes[e]	No. U.S. 101/I-80	No. U.S. 101/I-80	No. U.S. 101/I-80	No. U.S. 101/I-80
Haul Export Trucks[d]				
Daily trucks[d]	9	49	0	0
Access Routes[e]	So. U.S. 101	So. U.S. 101	So. U.S. 101	So. U.S. 101
Vendor Trucks[d]				
Daily trucks[d]	628	232	23	6
Assumptions[e]	22% concrete & 78% material & supplies	11% concrete & 89% material & supplies	100% material & supplies	100% material & supplies
Access Routes[e]	No. U.S. 101/I-80 & So. U.S. 101	No. U.S. 101/I-80 & So. U.S. 101	No. U.S. 101/I-80 & So. U.S. 101	So. U.S. 101

Representative Project	Central Hub (RADP Project #6)	CONRAC (RADP Project #9)	ITB Main Hall Expansion (RADP Project #3)	East Field GSE Facility #2 (RADP Project #14)
Construction Workers				
Daily workers[e]	148	73	59	18
Parking Area[g]	Eastern edge of existing Lot DD			
Access Routes[f]	20% No. U.S. 101/I-80, 25% I-380/I-280, 55% So. U.S. 101			
Shuttles[h]	NA	NA	NA	6 round trips per day

NOTES:

a. Representative project size and haul trucks, vendor trucks, and workers are from the SFO RADP Air Quality Analysis Methods Memorandum. Expanded Table 5 in Attachment 2 of this memorandum highlights in bold and shading the phase with greatest number of average daily workers or vehicles used in the vehicle assignment.

b. Plot 16D is 4 acres in size and Aviador lot is 2.5 acres in size.

c. Access to site assumptions based on local roadway network adjacent to site.

d. Haul demo trucks: concrete vs. non-concrete demolition hauls. Haul Import and Haul Export trucks: soil/fill hauls. Vendor trucks: concrete vs. non-concrete deliveries. SFO RADP Air Quality Analysis Methods Memorandum, See Expanded Table 5 in Attachment 2.

e. Percentage of truck types from AQ models: see Expanded Table 5 in Attachment 2. O/D and Access Route Assumptions from SFO SPP CEQA Analysis – Estimation of Project Travel Demand During Construction Memorandum, November 2021. Concrete: concrete, clay, mud or Non- Concrete: vinyl, asphalt, other landfill, concrete imports from San Francisco, and all other imports from the South Bay. Haul Trucks: Table 5: Project Construction Truck Origin/Destination Assumptions, p. 10.; Demo Off-Haul: Concrete via No. U.S. 101/I-80; Non-concrete (Vinyl, Asphalt, Other Landfill) via So. U.S. 101; Haul Import Soil/Fill via No. U.S. 101/I-80; Haul Export Soil/Fill via So. U.S. 101; Vendor Trucks: Table 5: Project Construction Truck Origin/Destination Assumptions, p. 10.; Workers: Table 6: Project Construction Worker Origin/Destination and Access Route Assumptions, p. 11. Because concrete for some RADP projects would be prepared onsite (i.e., at staging areas instead of being prepared in a facility and transported to the site via a concrete truck with a rear-mounted agitator), the construction truck assignment assumed that cement and aggregate supplies would be delivered to the staging areas from off-site vendors north and south of the Airport and that concrete trucks would transfer the prepared concrete from the staging areas to the representative project sites.

f. Daily workers, SFO RADP Air Quality Analysis Methods Memorandum, See Expanded Table 5 in Attachment 2.

g. Construction worker parking is assumed to be along the eastern edge of the existing Lot DD with access from South Airport Boulevard.

h. Construction worker shuttles between employee parking areas and East Field GSE Facility #2 site. Assume construction workers would use the electrified AirTrain between employee parking areas and Central Hub and ITB Main Hall Expansion sites, and walk to the CONRAC site from Lot DD.

SOURCES: SFO RADP Air Quality Analysis Methods Memorandum (Appendix F of the Draft EIR) and Expanded Table 5 in Attachment 2 of this memorandum; SFO Shoreline Protection Program CEQA Analysis – Estimation of Project Travel Demand During Construction, November 2021 (Attachment 3); Fehr & Peers/LCW Consulting analysis.

The steps involved in determining project construction vehicle trips on the nearby roadway network are described below and include the following:

1. Summarize average daily construction trucks and workers.
2. Determine hourly construction vehicles for the a.m. peak hour.
3. Determine construction vehicle travel paths and study locations.
4. Assign construction truck and worker vehicle trips to roadway network.

Step 1: Summarize average daily construction trucks and workers.

Table 2 summarizes the average daily trucks and workers for the phase of construction with the greatest number of construction trucks or workers (referred to as the maximum average daily trucks and workers). The maximum average daily trucks or workers selected for each representative project is highlighted in Table 5 in Attachment 2.

TABLE 2
REPRESENTATIVE PROJECT CONSTRUCTION TRUCKS, WORKERS, AND WORKER SHUTTLES SUMMARY FOR REPRESENTATIVE PROJECTS

	Maximum Average Daily Construction Trucks, Workers, and Worker Shuttles			
RADP Representative Project	**Trucks**	**Workers**	**Worker Shuttles**	**Total**
Central Hub (large project type)	721	148	0	***869***
CONRAC (large project type)	286	73	6	***365***
ITB Main Hall Expansion (medium project type)	37	59	0	***96***
East Field GSE #2 (small project type)	7	18	6	***31***

NOTES:
a. Due to rounding, numbers in columns may not add to totals.
SOURCES:SFO RADP AQ Analysis Methods Memorandum (Appendix F of the Draft EIR) and Expanded Table 5 in Attachment 2; Fehr & Peers/LCW Consulting analysis.

Each of the project construction activities would generate construction truck trips (haul demo, haul import, haul export, vendor) and construction worker trips. The construction truck trip types were aggregated into three groups:

- Trucks include deliveries of materials (import) and removal of demolition materials (export) between the larger staging areas (i.e., the Aviador Lot and Plot 16D) and off-site locations.
- Trucks include trucks transferring materials (export and import) between the Aviador Lot or Plot 16D staging areas and the representative project sites.
- Concrete trucks: Some projects that could occur with implementation of the RADP would warrant preparation of concrete at the staging areas, instead of being prepared in an off-site facility and transported to the Airport via a concrete truck with a rear-mounted agitator. Preparing the concrete at the staging areas would result in truck deliveries of cement and aggregate supplies from off-site vendors north and south of the project site to the staging areas, and trucks transferring the prepared concrete between the staging areas and the representative project sites.

Construction workers would park within existing SFO parking facilities (i.e., Lot DD), and a construction worker shuttle would transport workers between the parking lots and the representative project sites before and after the work shifts. Construction worker shuttles are included in the construction vehicle summary.

Step 2: Determine hourly construction vehicles for the a.m. peak hour.

Similar to the SFO SPP analysis, 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. The a.m. peak hour volumes were estimated based on the following assumptions for the SFO SPP analysis:

- Materials import or export between off-site locations and the Plot 16D and Aviador Lot staging areas would occur during the daytime hours, with 70 percent of truck trips likely to occur between 6 a.m. and 11 a.m. The analysis assumed that 70 percent of trucks would travel to and from the staging areas over a five-hour period.
- Materials transfer between the Plot 16D and Aviador Lot staging areas and representative project sites would occur between 6 a.m. and 4:30 p.m. The analysis assumed that trucks would travel to and from the representative project sites over a seven-hour period.
- The analysis assumed a daytime worker shift between 7 a.m. and 4 p.m. Workers are anticipated to arrive one hour before the shift starts; all workers are assumed to arrive to the project site between 6 a.m. and 7 a.m.
- Construction worker shuttles would travel between the construction worker parking at Lot DD and the East Field GSE #2 project site one hour before the worker shift starts and one hour after the worker shift ends. As noted above, for the Central Hub and ITB Main Hall Expansion projects, it is anticipated that construction workers would be able to use the electrified AirTrain to travel between the parking facilities and the representative project sites, and that construction workers would walk to the CONRAC project site from Lot DD.

The p.m. peak hour was not analyzed because it is assumed that most RADP projects would be under construction during daytime hours (e.g., 7 a.m. to 4 p.m. construction worker shift) and that nighttime construction would be limited. Thus, daytime construction activities at the RADP projects would be substantially completed prior to the weekday p.m. peak period (i.e., generally between 4:30 p.m. to 6:30 p.m.). During the typical p.m. peak hour, project vehicles would be limited to construction workers leaving the RADP project sites and the number of project vehicles would be substantially less than during the a.m. peak hour.

Before determining the number of vehicle trips during the analysis hours and assigning the construction vehicle trips to the roadway network, the numbers of daily construction trucks, workers, and worker shuttles presented in Table 2 were multiplied by two to reflect one inbound and one outbound trip for each vehicle.

Step 3: Determine study locations and travel paths.

For each representative project, construction truck and worker trips were assigned to the ten study locations shown on the attached **Figure 2**. These locations include:

- Three locations on U.S. 101 to identify trips north and south of the project site and to capture the trips using the Airport ramps to access project sites (e.g., Central Hub, ITB Main Hall Expansion).
- Millbrae Avenue east of U.S. 101.
- Millbrae Avenue west of U.S. 101 which would identify the trips traveling to and from the Aviador Lot either from off-site locations or the representative project sites.
- North Access Road east of U.S. 101 which would serve as the access road to RADP projects such as the North Field GSE Facility #1, Aircraft Maintenance Hangar, and the East Field GSE Facility #2 (i.e., the small representative project).
- San Bruno Avenue east of U.S. 101 which would identify the construction worker trips traveling between the construction worker parking areas and off-site locations via U.S. 101.
- South Airport Boulevard between North Access Road and San Bruno Avenue which would identify the construction worker trips traveling between the construction worker parking areas and off-site locations via I-380/I-280, via the northbound and southbound U.S. 101 ramps at San Bruno Avenue, and construction vehicle trips to and from the CONRAC project.
- North McDonnell Road would serve as an access road to RADP projects such as Boarding Area H, Boarding Area F Modernization, Long-Term Parking Garage #4, Rental Car Center Short Term Storage Lot, Rental Car Center AirTrain Station Expansion.
- South McDonnell Road.

Construction trucks were distributed to the roadway network based on the paths identified in the SFO SPP CEQA Analysis – Estimation of Project Travel Demand During Construction Memorandum based on the type of export or import material (i.e., truck type). **Table 3** presents the access routes for the various truck types. In general, the North Bay and East Bay would be the primary destination of export trucks (e.g., Dutra Materials in Richmond, Altamont Landfill in Livermore), San Francisco would be the primary origin of import trucks for backfill soil, and various sources in the South Bay would be the origin of other vendor trucks. San Francisco/East Bay and the South Bay would be the origins of cement and aggregate used in preparation of concrete at the Aviador Lot and Plot 16D staging areas. Except for the southbound U.S. 101 off- and on-ramps, construction trucks traveling between off-site locations and the Aviador Lot and Plot 16D staging areas, and between the staging areas and the RADP project sites, construction vehicles would not travel on local roadways west of U.S. 101.

TABLE 3
REPRESENTATIVE PROJECT CONSTRUCTION TRUCK ORIGIN/DESTINATION ASSUMPTIONS

Construction Truck Type	Access Route
Trucks between Off-Site Locations and the Plot 16D and Aviador Lot Staging Areas	
Demo Off-Haul – Concrete	North U.S. 101/I-80
Demo Off-Haul – Vinyl, Asphalt, Other Landfill	South U.S. 101
Soil Import from San Francisco	North U.S. 101/I-80
Other Vendor Imports	South U.S. 101
Cement Supplies from SF and East Bay Locations	North U.S. 101/I-80
Cement Supplies from South Bay Locations	South U.S. 101
Trucks between the Plot 16D and Aviador Lot Staging Areas and Representative Project Sites	
Central Hub and International Terminal Expansion	Airport connector ramps to/from U.S. 101
CONRAC	South Airport Boulevard
East Field GSE #2	North Access Road

SOURCE: SFO Shoreline Protection Program CEQA Analysis – Estimation of Project Travel Demand during Construction, November 2021 (Attachment 3); and California's Cement Industry report, February 2017, Figure 4, Map of cement plants and cement terminals in California (Attachment 4)

The analysis conservatively assumes that all construction workers would drive to the Airport and would travel from San Francisco, the South Bay, the East Bay and the North Bay generally in the proportions and via the associated access routes presented in **Table 4**. It is anticipated that construction workers would be primarily drawn from the East Bay and the South Bay, with fewer workers from San Francisco and the North Bay.

TABLE 4
REPRESENTATIVE PROJECT CONSTRUCTION WORKER ORIGIN/DESTINATION AND ACCESS ROUTE ASSUMPTIONS

Origin or Destination (place of residence)	Percentage	Access Road
San Francisco	10%	North U.S. 101/I-80
South Bay Close (Santa Clara, San Mateo)	15%	South U.S. 101
South Bay Far (Monterey, Santa Cruz, Salinas) [a]	10%	North I-380/I-280
South Bay Far (Monterey, Santa Cruz, Salinas) [a]	10%	South U.S. 101
East Bay Close (Alameda, Contra Costa) [b]	10%	North U.S. 101/I-80
East Bay Close (Alameda, Contra Costa) [b]	10%	South U.S. 101
East Bay Far (San Joaquin)	20%	South U.S. 101
North Bay (Napa, Marin, Sonoma)	15%	North I-380/I-280
Total	***100%***	

NOTES:

a. Vehicle access routes to and from South Bay Far split between south U.S. 101 and I-280/I-380.
b. Vehicle access routes to and from East Bay Near split between north U.S. 101 /I-80 and south U.S. 101 and the San Mateo Bridge.

SOURCE: SFO Shoreline Protection Program CEQA Analysis – Estimation of Project Travel Demand During Construction, November 2021 (Attachment 3)

Construction workers traveling to and from the construction worker parking at Lot DD off of South Airport Boulevard were assigned to U.S. 101 and the northbound and southbound ramps at San Bruno Avenue. In addition, construction workers traveling from the North Bay and South Bay via I-280/I-380 were assigned to the I-380 North Access Road ramps and South Airport Boulevard to access Lot DD. Construction worker shuttles would travel between Lot DD and the East Field GSE#2 project site via South Airport Boulevard and North Access Road, while construction worker shuttles would travel between the construction worker parking and the CONRAC project site via South Airport Boulevard and North McDonnell Road. It was assumed that construction workers destined to and from the RADP Central Hub and ITB Main Hall Expansion sites would take the electrified AirTrain to their destination (i.e., no shuttles) and therefore there are no construction worker shuttles associated with these two representative projects.

Step 4: Assign construction truck and worker vehicle trips to the roadway network.

The daily and hourly construction trucks, workers, and worker shuttles were assigned to the roadway network based on information on the type of export or import materials, vendor location, anticipated residence of construction workers, and travel paths presented above for each representative project.

Tables 5 and 6 present the daily and a.m. peak hour construction vehicles by type at the study locations for the four representative projects. Attachment 5 presents the vehicle assignment detail for the study locations for the four representative projects.

TABLE 5
REPRESENTATIVE PROJECT VEHICLE TRIPS DURING CONSTRUCTION PERIOD FOR RADP CONRAC AND EAST FIELD GSE FACILITY #2 PROJECTS

	CONRAC				East Field GSE Facility #2			
	Daily		A.M. Peak Hour		Daily		A.M. Peak Hour	
Roadway Segment[a]/Construction Vehicle Type	**NB/EB**	**SB/WB**	**NB/EB**	**SB/WB**	**NB/EB**	**SB/WB**	**NB/EB**	**SB/WB**
1. U.S. 101 North of North Access Road								
Trucks between off-site and staging area	13	13	2	2	0	0	0	0
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	15	15	0	15	4	4	0	4
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***27***	***27***	***2***	***16***	***4***	***4***	***0***	***4***
2. U.S. 101 Between N. Access Rd and Millbrae Avenue								
Trucks between off-site and staging area	273	273	38	38	7	7	1	1
Trucks between staging areas and project	13	13	2	2	0	0	0	0
Construction workers	40	40	40	0	10	10	10	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***326***	***326***	***80***	***40***	***17***	***17***	***11***	***1***
3. U.S. 101 South of Millbrae Avenue								
Trucks between off-site and staging area	273	273	38	38	7	7	1	1
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	40	40	40	0	10	10	10	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***313***	***313***	***78***	***38***	***17***	***17***	***11***	***1***
4. Millbrae Avenue East of U.S. 101 ramps								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	0	0	0	0	0	0	0	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***

Roadway Segment[a]/Construction Vehicle Type	CONRAC				East Field GSE Facility #2			
	Daily		A.M. Peak Hour		Daily		A.M. Peak Hour	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
5. Millbrae Avenue West of U.S. 101 ramps								
Trucks between off-site and staging area	13	13	2	2	0	0	0	0
Trucks between staging areas and project	13	13	2	2	0	0	0	0
Construction workers	0	0	0	0	0	0	0	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***26***	***26***	***4***	***4***	***0***	***0***	***0***	***0***
6. North Access Rd West of N. Field Road								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	0	0	0	0	7	7	1	1
Construction workers	0	0	0	0	0	0	0	0
Construction worker shuttles	0	0	0	0	6	6	3	3
Total	***0***	***0***	***0***	***0***	***13***	***13***	***4***	***4***
7. San Bruno Avenue East of U.S. 101 ramps								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	13	13	2	2	0	0	0	0
Construction workers	55	55	55	0	14	14	14	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***68***	***68***	***57***	***2***	***14***	***14***	***14***	***0***
8. South Airport Boulevard between North Access Road and San Bruno Ave								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	286	286	41	41	0	0	0	0
Construction workers	73	73	55	18	18	18	14	5
Construction worker shuttles	6	6	3	3	6	6	3	3
Total	***365***	***365***	***99***	***62***	***24***	***24***	***17***	***8***

Roadway Segment[a]/Construction Vehicle Type	CONRAC				East Field GSE Facility #2			
	Daily		A.M. Peak Hour		Daily		A.M. Peak Hour	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
9. No. McDonnell Rd between San Bruno Ave and So. McDonnell Rd								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	0	0	0	0	0	0	0	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
10. So. McDonnell Rd between No. McDonnell Rd and Millbrae Ave								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	0	0	0	0	0	0	0	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***

NOTES:

Due to rounding, numbers in columns may not add to totals.

a. See Figure 2 for study locations.

SOURCES: AQ Analysis Methods Memorandum (Appendix F of the Draft EIR); SFO Shoreline Protection Program CEQA Analysis – Estimation of Project Travel Demand During Construction Memorandum, November 2021 (Attachment 3); Fehr & Peers/LCW Consulting analysis.

TABLE 6
REPRESENTATIVE PROJECT VEHICLE TRIPS DURING CONSTRUCTION PERIOD[A]
FOR RADP ITB MAIN HALL EXPANSION AND CENTRAL HUB PROJECTS

	ITB Main Hall Expansion				Central Hub			
	Daily		A.M. Peak Hour		Daily		A.M. Peak Hour	
Roadway Segment[a]/Construction Vehicle Type	**NB/EB**	**SB/WB**	**NB/EB**	**SB/WB**	**NB/EB**	**SB/WB**	**NB/EB**	**SB/WB**
1. U.S. 101 North of North Access Road								
Trucks between off-site and staging area	11	11	2	2	137	137	19	19
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	12	12	0	12	30	30	0	30
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***23***	***23***	***2***	***13***	***167***	***167***	***19***	***49***
2. U.S. 101 Between N. Access Rd and Millbrae Avenue								
Trucks between off-site and staging area	11	11	2	2	584	584	82	82
Trucks between staging areas and project	37	37	5	5	721	721	103	103
Construction workers	32	32	32	0	81	81	81	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***81***	***81***	***39***	***7***	***1,386***	***1,386***	***266***	***185***
3. U.S. 101 South of Millbrae Avenue								
Trucks between off-site and staging area	26	26	4	4	584	584	82	82
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	32	32	32	0	81	81	81	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***58***	***58***	***36***	***4***	***665***	***665***	***163***	***82***
4. Millbrae Avenue East of U.S. 101 ramps								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	0	0	0	0	0	0	0	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***

Roadway Segment[a]/Construction Vehicle Type	ITB Main Hall Expansion				Central Hub			
	Daily		A.M. Peak Hour		Daily		A.M. Peak Hour	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
5. Millbrae Avenue West of U.S. 101 ramps								
Trucks between off-site and staging area	37	37	5	5	69	69	10	10
Trucks between staging areas and project	37	37	5	5	69	69	10	10
Construction workers	0	0	0	0	0	0	0	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***74***	***74***	***10***	***10***	***138***	***138***	***20***	***20***
6. North Access Rd West of N. Field Road								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	0	0	0	0	0	0	0	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
7. San Bruno Avenue East of U.S. 101 ramps								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	44	44	44	0	111	111	111	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***44***	***44***	***44***	***0***	***111***	***111***	***111***	***0***
8. South Airport Boulevard between North Access Road and San Bruno Ave								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	59	59	44	15	148	148	111	37
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***59***	***59***	***44***	***15***	***148***	***148***	***111***	***37***

Roadway Segment[a]/Construction Vehicle Type	ITB Main Hall Expansion				Central Hub			
	Daily		A.M. Peak Hour		Daily		A.M. Peak Hour	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
9. No. McDonnell Rd between San Bruno Ave and So. McDonnell Rd								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	0	0	0	0	0	0	0	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
10. So. McDonnell Rd between No. McDonnell Rd and Millbrae Ave								
Trucks between off-site and staging area	0	0	0	0	0	0	0	0
Trucks between staging areas and project	0	0	0	0	0	0	0	0
Construction workers	0	0	0	0	0	0	0	0
Construction worker shuttles	0	0	0	0	0	0	0	0
Total	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***

NOTES:

Due to rounding, numbers in columns may not add to totals.

a. See Figure 2 for study locations.

SOURCES:AQ Analysis Methods Memorandum (Appendix F of the Draft EIR); SFO Shoreline Protection Program CEQA Analysis – Estimation of Project Travel Demand During Construction Memorandum, November 2021 (Attachment 3); Fehr & Peers/LCW Consulting analysis.

E.4 Transit Assessment Information

AM Peak Hour Volumes and v/c ratios

Seg ID	Segment Name	Direction	No of Lanes	Capacity per Lane	Total Capacity	Existing AM		2045 NP AM		2045 PP AM	
						Volume	V/C	Volume	V/C	Volume	V/C
4	Millbrae Avenue, east of U.S. 101	EB	2	780	1600	1,140	0.71	1,180	0.74	1,180	0.74
		WB	2	780	1600	550	0.34	580	0.36	580	0.36
5	Millbrae Avenue, west of U.S. 101	EB	4	780	3200	1,770	0.55	2,020	0.63	2,020	0.63
		WB	4	780	3200	1,720	0.54	2,310	0.72	2,310	0.72
6	North Access Road, west of North Field Road	EB	2	780	1600	280	0.18	490	0.31	555	0.35
		WB	2	780	1600	300	0.19	370	0.23	405	0.25
7	San Bruno Avenue, east of U.S. 101 (3 lanes closer to U.S. 101)	EB	3	780	2400	830	0.35	1,320	0.55	1,515	0.63
		WB	2.5	780	2000	320	0.16	660	0.33	715	0.36
8	South Airport Boulevard, south of North Access Road	NB	2	780	1600	470	0.29	700	0.44	795	0.50
		SB	2	780	1600	540	0.34	990	0.62	1,165	0.73
9	North McDonnell Road, between San Bruno Avenue and Access Road 8	NB	2	780	1600	490	0.31	630	0.39	705	0.44
		SB	2	780	1600	650	0.41	750	0.47	765	0.48
10	South McDonnell Road, between North McDonnell Road and Millbrae Avenue	NB	1	780	780	300	0.38	350	0.45	360	0.46
		SB	1	780	780	210	0.27	230	0.29	240	0.31

PM Peak Hour Volumes and v/c ratios

Seg ID	Segment Name	Direction	No of Lanes	Capacity per Lane	Total Capacity	Existing PM		2045 NP PM		2045 PP PM	
						Volume	V/C	Volume	V/C	Volume	V/C
4	Millbrae Avenue, east of U.S. 101	EB	2	780	1600	780	0.49	860	0.54	860	0.54
		WB	2	780	1600	1,250	0.78	1,350	0.84	1,350	0.84
5	Millbrae Avenue, west of U.S. 101	EB	4	780	3200	1,810	0.57	1,940	0.61	1,940	0.61
		WB	4	780	3200	2,050	0.64	2,620	0.82	2,620	0.82
6	North Access Road, west of North Field Road	EB	2	780	1600	170	0.11	210	0.13	225	0.14
		WB	2	780	1600	230	0.14	420	0.26	475	0.30
7	San Bruno Avenue, east of U.S. 101 (3 lanes closer to U.S. 101)	EB	3	780	2400	580	0.24	1,100	0.46	1,135	0.47
		WB	2.5	780	2000	750	0.38	1,440	0.72	1,555	0.78
8	South Airport Boulevard, south of North Access Road	NB	2	780	1600	650	0.41	1,300	0.81	1,505	0.94
		SB	2	780	1600	520	0.33	760	0.48	815	0.51
9	North McDonnell Road, between San Bruno Avenue and Access Road 8	NB	2	780	1600	740	0.46	890	0.56	965	0.60
		SB	2	780	1600	600	0.38	720	0.45	745	0.47
10	South McDonnell Road, between North McDonnell Road and Millbrae Avenue	NB	1	780	780	330	0.42	350	0.45	350	0.45
		SB	1	780	780	510	0.65	570	0.73	580	0.74

A.M. and P.M. Peak Hour Traffic Volumes
Roadway Segments with SamTrans Transit Routes

		Existing		2045 Baseline without RADP		Change from Existing		2045 Baseline with RADP		Change from 2045 Baeline without RADP	
		NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
South Airport Boulevard	AM	470	540	700	990	230	450	795	1,160	95	170
between North Access Road and San Bruno Ave	PM	650	520	1,300	760	650	240	1,555	810	255	50
San Bruno Avenue	AM	830	320	1,320	660	490	340	1,515	710	195	50
east of U.S. 101 ramps	PM	580	750	1,100	1,440	520	690	1,135	1,550	35	110
North McDonnell Rd	AM	490	650	630	750	140	100	705	760	75	10
between San Bruno Ave & Access Road 8	PM	740	600	890	720	150	120	965	740	75	20
South McDonnell Rd	AM	300	210	350	230	50	20	360	240	10	10
between North McDonnell Rd & Millbrae Ave	PM	330	510	350	570	20	60	350	580	0	10
Millbrae Avenue	AM	1,140	550	1,180	580	40	30	1,180	580	0	0
east of U.S. 101 ramps	PM	780	1,250	860	1,350	80	100	860	1,350	0	0

E.5 Parking Supply and Demand for Alternatives

SFO RADP EIR - Parking Supply and Demand
2045 Future Baseline without RADP, 2045 Future Baseline with RADP, and Alternatives

2045 Future Baseline without RADP/No Project Alternative

	Supply	Demand	Surplus/ Deficit	Capacity Utilization
Public Parking	17,643	19,522	-1,879	111%
Employee Parking	11,550	12,733	-1,183	110%
	29,193	32,255	-3,062	110%

2045 Future Baseline with RADP

	Supply	Demand	Surplus/ Deficit	Capacity Utilization
Public Parking	27,569	19,522	8,047	71%
Employee Parking	8,892	13,391	-4,499	151%
	36,461	32,913	3,548	90%

Alternative B: Reduced Development Alternative

	Supply	Demand	Surplus/ Deficit	Capacity Utilization
Public Parking	27,569	19,522	8,047	71%
Employee Parking	9,938	13,111	-3,173	132%
	37,507	32,633	4,874	87%

Alternative C: Boarding Area H Only Alternative

	Supply	Demand	Surplus/ Deficit	Capacity Utilization
Public Parking	17,643	19,522	-1,879	111%
Employee Parking	11,550	12,779	-1,229	111%
	29,193	32,301	-3,108	111%

Notes:

1. Employee parking demand based on parking demand estimates for the additional 2,700 employees with implementation of the RADP, prorated to reflect additional 1,550 employees under the Reduced Development Alternative and additional 190 employees under the Boardi Area H Only Alternative. No change in the number of employees under the No Project Alternative since the number would be the same as the 2045 future baseline without RADP.

Alternative B: Reduced Development Alternative

1. 1,550 employees = 378 parking demand added to 2045 future baseline w/out RADP
2. Additional 1,046 employee parking space supply added to RADP supply because existing parking on Aircraft Maintenance Hangar site would remain.
3. Same passenger parking supply and demand as 2045 future baseline w/out RADP.

Alternative C: Boarding Area H Only Alternative

1. 190 employees = 46 parking space demand added to 2045 future baseline w/out RADP.
2. Same employee parking supply as 2045 future baseline w/out RADP.
3. Same passenger parking supply and demand as 2045 future baseline w/out RADP.

APPENDIX F
Noise Technical Appendix

ESA

575 Market Street
Suite 3700
San Francisco, CA 94105
415.896.5900 phone
415.896.0332 fax

esassoc.com

Technical Memorandum

date	March 18, 2025
to	Chelsea Fordham, Tania Sheyner, and Kei Zushi, San Francisco Planning Department Environmental Planning Division
from	Jyothi Iyer, Chris Sanchez, ESA
cc	Audrey Park, San Francisco International Airport, Planning and Environmental Affairs
subject	Noise Technical Memorandum for the SFO Recommended Airport Development Plan Final (Case No. 2017-007468ENV)

1. Project Description

This memorandum presents the results of the noise and vibration analysis conducted in support of environmental clearance under the California Environmental Quality Act (CEQA) for the San Francisco International Airport (SFO or Airport) Recommended Airport Development Plan (RADP) (Case No. 2017-007468ENV). 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. 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.[1]

This memorandum presents the existing ambient noise levels in the vicinity of RADP projects, the quantitative and qualitative criteria and methods used for the evaluation of program-level and cumulative impacts associated with RADP construction and operations and the results of the analysis. The overall approach to evaluating noise and vibration impacts from construction and operation of the RADP was discussed in the SFO RADP (Planning Department Case No. 2017-007468ENV) Noise and Vibration Technical Memorandum and EIR Analysis Scope of Work (see Appendix B of this memo).

[1] 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.

The construction and operational noise and construction vibration analysis considers the following comparisons:

- The Existing Conditions (2019) and the Existing Conditions with RADP for the construction and cumulative construction analyses and stationary operational analysis.
- 2045 Future Baseline without RADP (2045 without RADP) and the 2045 Future Baseline with RADP (2045 with RADP) for the operational traffic analysis. The cumulative projects identified in Draft EIR Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, are accounted for in the 2045 Future Baseline without RADP conditions and are therefore also included in the 2045 Future Baseline with RADP conditions. Therefore, the 2045 Future Baseline with RADP conditions also represents the cumulative conditions and is presented in this memorandum as the 2045 Future Baseline with RADP/Cumulative conditions.

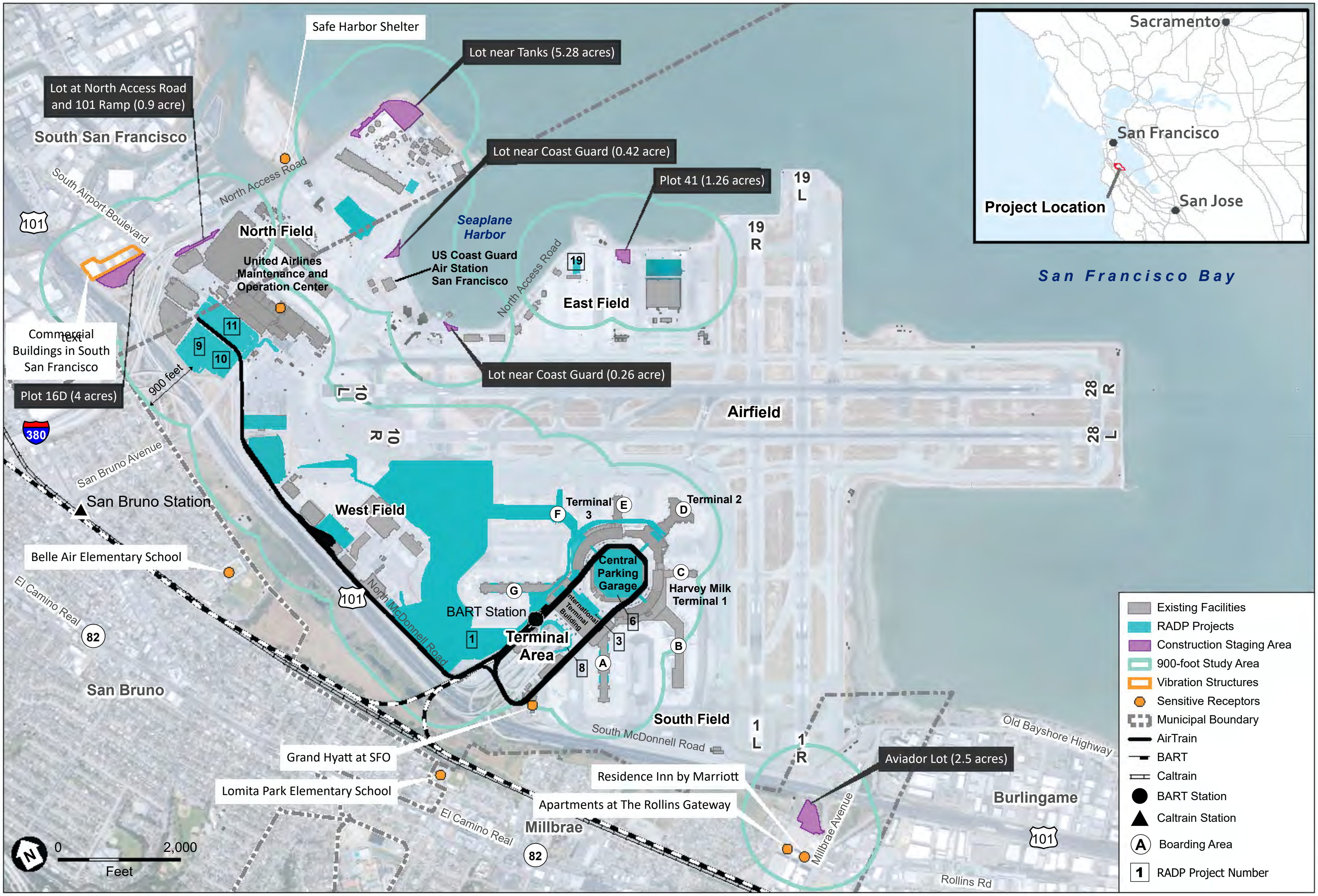
The long-range RADP includes 20 individual projects located in the Terminal Area, West Field, North Field, and East Field of the Airport. Construction staging could occur at seven staging areas: Aviador Lot, Plot 16D, Lot at North Access Road and U.S. 101 Ramp, Lot near Tanks, Lot near Coast Guard (two locations), and Plot 41. **Figure 1** shows the locations of RADP projects and construction staging areas. The Aviador Lot is located in the City of Millbrae north of the intersection of Aviador Avenue and Millbrae Avenue. The other six staging areas are located on Airport property. Additional areas for construction staging may be identified in the vicinity of individual RADP projects; however, these areas would be located on Airport property more than 1,000 feet away from sensitive residential receptors. Therefore, the analysis presented below is conservative in that it considers potential construction staging areas closest to sensitive receptors.

Construction activities associated with implementation of projects that could occur under the RADP would include site preparation (excavation and grading), demolition of existing building and paved areas, new construction, repaving, and laydown area management. The staging areas would be primarily used for the storage of construction related materials such as equipment, vehicles, stockpiles, and concrete batching prior to transport to RADP project sites. No construction activities would take place at staging areas. Construction would primarily occur during the daytime hours of 7 a.m. to 10 p.m.; however, nighttime construction (10 p.m. to 7 a.m.) may be required for projects as necessary to avoid conflicts with the existing Airport operations, utilities connections and switchovers, and concrete pours. For purposes of a conservative analysis that generally yields greater noise or vibration impacts than could actually result from implementation of RADP projects, it is assumed some nighttime (10 p.m. to 7 a.m.) construction activities may be required.

1.1 Project Location

SFO is primarily located in unincorporated San Mateo County, California, with portions of the Airport within the city boundaries of South San Francisco to the north, San Bruno to the west and Millbrae and Burlingame to the south (see Figure 1).[2] The operational area of the Airport, which includes the RADP project sites, is generally bordered by U.S. Highway 101 (U.S. 101) to the west and San Francisco Bay to the east.

[2] 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.



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

SFO RADP Noise Tech Memo

FIGURE 1

RADP PROJECTS AND CONSTRUCTION STAGING AREAS

Land uses in the vicinity consist primarily of commercial and hotel uses to the south and to the west across U.S. 101 in the City of Millbrae, residential uses to the west across U.S. 101 in the Cities of Millbrae and San Bruno, a temporary housing shelter (Safe Harbor Shelter) and commercial and industrial uses to the north in the City of South San Francisco.

1.2 Construction Schedule

Construction of RADP projects is anticipated to begin in 2025 with completion by 2045, for a total approximately 20-year construction period. See **Table 1** for anticipated start and completion dates of RADP projects.

TABLE 1
RADP PROJECTS AND CONSTRUCTION SCHEDULE

RADP Project		Activity	Anticipated Start Date	Anticipated End Date	Anticipated Duration of Construction (months)
1	Boarding Area H	Building 575 demolition (69,500 sf)	10/2027	3/2028	6
		Building 585 demolition (133,100 sf)	10/2027	3/2028	6
		New construction of Boarding Area H (1,618,900 sf)	11/2027	5/2033	55
2	Boarding Area F Modernization	Building 638 demolition (524,000 sf)	7/2036	1/2039	31
		Building 642 demolition (82,100 sf)	4/2027	1/2028	10
		Building 648 demolition (125,000 sf)	1/2028	1/2029	13
		Building 649 demolition (135,000 sf)	7/2027	1/2028	7
		Building 682 demolition (76,000 sf) and new construction (71,000 sf)	7/2035	7/2036	13
		Building 944 demolition (78,000 sf) and reconstruction (101,000 sf)	1/2025	4/2027	18
		Boarding Area F demolition (485,000 sf) and new construction (570,000 sf)	5/2033	11/2039	79
		Racetrack and Remain Overnight Aircraft Parking – New paving of 243,000 sf	1/2029	1/2040	13
		Taxiway A and B Realignment	1/2031	1/2033	25
3	ITB Main Hall Expansion	Expansion of Building 100 – New construction of 140,000 sf	7/2032	1/2037	55
4	ITB Boarding Area A and G Improvements	Expansion of Building 100 Boarding Areas A and G – New construction of 23,000 sf	11/2039	5/2041	19
5	Terminal 3 Façade Expansion	Expansion of Building 400 – New construction of 25,000 sf	1/2039	1/2041	29
6	Central Hub	Building 195 demolition (3,680,000 sf) and new construction of 6,330,000 sf	7/2032	1/2037	55
7	Domestic Terminal Roadways Reconstruction	Roadway Reconstruction – Demolition of 710,000 sf of existing paving and new paving of 790,000 sf	1/2037	1/2039	25
8	International Terminal Building (ITB) Curbside Expansion	Curbside Expansion – New paving of 52,000 sf	7/2034	12/2036	30
9	Consolidated Rental Car Center (CONRAC) Facility	New construction of 1,940,000 sf	5/2027	5/2031	49
10	Consolidated Rental Car Center Quick Turn Around Facility	New construction of 1,031,000 sf	5/2027	5/2031	49

RADP Project		Activity	Anticipated Start Date	Anticipated End Date	Anticipated Duration of Construction (months)
11	Long-Term Parking Garage #3	New construction of 348,000 sf	5/2027	5/2031	49
12	Long-Term Parking Garage #4	Conversion of existing building; no demolition or new construction	5/2031	5/2032	13
13	Rental Car Center Short Term Storage Lot	Building 782 demolition (130,000 sf)	5/2031	5/2032	13
14	Terminal 2 AirTrain Station Expansion	New construction of 6,900 sf	5/2029	5/2031	25
15	Rental Car Center AirTrain Station Expansion	New construction of 2,900 sf	5/2031	5/2033	25
16	AirTrain Maintenance Facility (Demolition and Rebuild)	Building 692 demolition (19,300 sf) and new construction of 530,900 sf	8/2028	5/2031	34
17	North Field Ground Support Equipment Facility #1	New construction of 48,000 sf	7/2027	6/2028	12
18	Aircraft Maintenance Hangar	New construction of 181,000 sf	7/2041	4/2044	34
19	East Field Ground Support Equipment Facility #2	Demolition (10,000 sf) and new construction (33,000 sf)	6/2028	7/2030	26
20	Sanitary Sewer Force Main Line Realignment	Realignment of Pipeline	7/2027	6/2028	12

SOURCE: SFO Bureau of Planning and Environmental Affairs, 2023
ABBREVIATION: sf = square feet

2. Characteristics of Noise and Vibration

2.1 Noise Principles and Descriptors

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), with 0 dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Because sound pressure can vary greatly within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. When assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting is typically applied to community noise measurements. All noise levels presented in this report are A-weighted unless otherwise stated.

2.2 Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given period of time. Community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic. What makes community noise variable throughout a day, besides the slowly changing background noise, is the addition of short-duration, single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment change the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise effects. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: The L_{eq}, or equivalent sound level, is used to describe noise over a specified period of time in terms of a single numerical value; the L_{eq} of a time-varying signal and that of a steady signal are the same if they deliver the same acoustic energy over a given time. The L_{eq} may also be referred to as the average sound level.

L_{max}: The maximum, instantaneous noise level experienced during a given period of time.

L_{90}: The level of noise exceeded 90 percent of the time is sometimes conservatively considered as the background ambient noise level for the purposes of assessing conformity with noise ordinance standards with respect to noise from stationary equipment or entertainment venues.

L_{dn}: Also termed the day-night average noise level (DNL), the L_{dn} is the average A-weighted noise level during a 24-hour day, obtained after an addition of 10 dB to measured noise levels between the hours of 10 p.m. to 7 a.m. to account for greater nighttime noise sensitivity.

CNEL: CNEL, or Community Noise Equivalent Level, is the average A-weighted noise level during a 24-hour day that is obtained after an addition of 5 dB to measured noise levels between the hours of 7 p.m. to 10 p.m. and after an addition of 10 dB to noise levels between the hours of 10 p.m. to 7 a.m. to account for greater noise sensitivity in the evening and nighttime, respectively.

2.3 Effects of Noise on People

Noise is generally loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity that is a nuisance or disruptive. The effects of noise on people include subjective effects (e.g., dissatisfaction, annoyance), interference effects (e.g., communication, sleep, and learning interference), physiological effects (e.g., startle response), and physical effects (e.g., hearing loss). With regard to increases in A-weighted noise level, the following relationships generally occur:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived;
- Outside of the laboratory, a 3 dB change in noise levels is considered to be a barely perceivable difference;
- A change in noise levels of 5 dB is considered to be a readily perceivable difference; and
- A change in noise levels of 10 dB is subjectively heard as doubling of the perceived loudness.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Since the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dB, the combined sound level would be 53 dB, not 100 dB.

2.4 Fundamentals of Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Several different methods are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe physical vibration effects on buildings. Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors to vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick people), and vibration-sensitive equipment.

Another useful vibration descriptor is known as vibration decibels or VdBs. VdBs are generally used when evaluating human response to vibration, as opposed to structural effects (for which PPV is the more commonly used descriptor). Vibration decibels are established relative to a reference quantity, typically 1×10^{-6} inches per second.[3]

The effects of groundborne vibration include movement of building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In limited cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting, use of vibratory equipment, and pile-driving during construction. Annoyance from vibration often occurs when the vibration levels exceed the threshold of perception by only a small margin. A vibration level that causes annoyance will be well below levels that cause damage to normal buildings.

3. Environmental Setting

3.1 Existing Ambient Noise Levels

To characterize the background noise environment at sensitive receptors in the vicinity of RADP projects, a combination of data was collected including ground-level noise monitoring data from SFO, supplemented with long-term (24-hour) and short-term (20-minute) noise measurements conducted by Environmental Science Associates.

SFO operates a network of portable and permanent noise monitoring sites that measure noise in the vicinity of the Airport within San Francisco and San Mateo counties. 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[4] (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

3 U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018.

4 Hotels are a commercial land use that is not considered noise sensitive during daytime hours (7 a.m. to 10 p.m.); however, as a location where people are reasonably expected to sleep, they are considered a noise sensitive receptor during nighttime hours (10 p.m. to 7 a.m.).

collected across U.S. 101 from the recently constructed Residence Inn by Marriott San Francisco Airport (LT-9) across the Aviador Lot on November 29, 2023 (Wednesday). Short-term measurements were collected in the vicinity of the Airport in October 2019 and updated in 2021[5] at locations where off-site sensitive receptors may be impacted by construction haul and delivery trucks, at the nearest off-site sensitive receptors to proposed RADP projects and Lot near Tanks (ST-5, ST-6, and ST-7). A short-term measurement was also conducted at the Grand Hyatt at SFO (ST-2), the only sensitive receptor located on Airport property. Noise monitoring locations are shown in **Figure 2** and noise measurement data collected is included as part of Appendix A to this memo.

A summary of noise measurement results is presented in **Table 2**. Long-term data from the SFO locations in Table 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 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.

3.2 Existing Groundborne Vibration Levels

The nearest sources of vibration within the study area are operations along the Caltrain and BART tracks, located approximately 1,000 feet to the southwest from the closest Airport property line. BART tracks connecting Millbrae station to the SFO station located in the International Terminal run along North McDonnell Road.

Table 3 shows generalized ground-surface vibration levels for locomotive-powered passenger and freight trains published by the Federal Transit Administration (FTA). While many Caltrain operations stop at Millbrae Station, express and bullet trains do not. Hence, train speeds along the rail line can vary from 10 to 50 (for a bullet train) miles per hour on approach.

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 4**.[6] 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.

3.3 Existing 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. In general, residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas generally are more sensitive to noise. Though commercial and industrial uses are considered less sensitive to noise, the analysis presented below also considers the impact of noise to worker receptors[7] who could spend up to eight hours a day in the vicinity of RADP projects.

5 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.

6 U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018. Figure 6-4, p. 137.

7 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.

SOURCE: Google, 2020; ESA, 2021

SFO RADP EIR

FIGURE 2
NOISE MONITORING LOCATIONS

TABLE 2
SUMMARY OF LONG-TERM (LT) AND SHORT-TERM (ST) NOISE MONITORING IN THE AIRPORT VICINITY

Measurement Location		Time Period	Noise Level [a]	Contributing Noise Sources
Long-Term 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 (Ldn)	Aircraft and vehicle traffic on I-380, U.S.101 and local roadways
LT-3	Millbrae. Old Bay shore 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 Bay shore 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; adjacent lawn mower affecting 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
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

Measurement Location		Time Period	Noise Level [a]	Contributing Noise Sources
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 Measurements (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	SFO. 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
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: Environmental Science Associates, 2019, 2021, and 2023 (Appendix A) and 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 monitored at the ground level and include noise from aircraft and vehicle traffic in addition to noise from other sources as detailed above.

TABLE 3
GENERALIZED VIBRATION LEVELS FROM LOCOMOTIVE-POWERED PASSENGER OR FREIGHT TRAINS (VIBRATION DECIBELS)

	Distance from Tracks					
Train Speed	30 Feet	50 Feet	100 Feet	150 Feet	200 Feet	300 Feet
10 mph	74 VdB	71 VdB	64 VdB	61 VdB	58 VdB	53 VdB
20 mph	80 VdB	77 VdB	70 VdB	67 VdB	64 VdB	59 VdB
30 mph	84 VdB	81 VdB	74 VdB	71 VdB	68 VdB	63 VdB
50 mph	88 VdB	85 VdB	78 VdB	75 VdB	72 VdB	67 VdB

SOURCE: 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.

TABLE 4
GENERALIZED VIBRATION LEVELS FROM LIGHT RAIL PASSENGER TRAINS (VIBRATION DECIBELS)

	Distance from Tracks					
Train Speed	30 Feet	50 Feet	100 Feet	150 Feet	200 Feet	300 Feet
10 mph	63 VdB	59 VdB	54 VdB	50 VdB	47 VdB	42 VdB
20 mph	69 VdB	65 VdB	60 VdB	56 VdB	53 VdB	48 VdB
30 mph	73 VdB	69 VdB	64 VdB	60 VdB	57 VdB	52 VdB
50 mph	77 VdB	73 VdB	68 VdB	64 VdB	61 VdB	56 VdB

SOURCE: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
ABBREVIATIONS: mph = miles per hour; VdB = Vibration Decibels

All RADP projects are located on Airport property at a distance of at least 1,000 feet from offsite noise sensitive receptors (see Figure 1, p. 3). However, hotel, residential and commercial uses are located in the vicinity of construction staging areas (see Figure 1). The Grand Hyatt at SFO is located on Airport property between South McDonnell Road and the U.S. 101 NB offramps. Beyond Airport boundaries, residential uses are located to the south and west of U.S. 101 in the Cities of Millbrae and San Bruno, and the Safe Harbor Shelter is located to the north in the City of South San Francisco.

Based on the location of 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 RADP Project #9 CONRAC Facility. 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, respectively from RADP Projects #8 (ITB Curbside Expansion) and #1 (Boarding Area H).

Table 5 summarizes the noise sensitive receptors closest to RADP projects and the representative noise measurement locations for these receptors. 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 to the north of the Airport farther away from the Lot near Tanks construction staging area, approximately 1,050 feet to the northwest. All other construction staging areas for 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 Airport property boundary, respectively. There are no existing daycare facilities, senior care facilities, or hospitals located within 1,500 feet of RADP projects or construction staging areas.

In addition, onsite 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.

TABLE 5
NEAREST NOISE SENSITIVE USES IN THE VICINITY OF RADP PROJECTS AND CONSTRUCTION STAGING AREAS

RADP Project/ Staging Area	Nearest Sensitive Receptor	Location	Minimum Distance from RADP Project	Representative Noise Monitoring Location
RADP Project #9 (CONRAC Facility)	Single family residences	Along 7th Avenue in the City of San Bruno	1,000 feet	LT-1
RADP Project #8 (ITB Curbside Expansion)	Grand Hyatt at SFO	Airport property between South McDonnell Road and U.S. 101 NB offramps	770 feet	ST-2
RADP Project #1 (Boarding Area H)	Grand Hyatt at SFO	Airport property between South McDonnell Road and U.S. 101 NB offramps	990 feet	ST-2
RADP Project #6 (Central Hub)	Single family residences	South of Bay Street in the City of Millbrae	2,800 feet	ST-6
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	—

In addition to noise, groundborne vibration from construction activities and equipment could disturb, damage, or interfere with activities at vibration-sensitive receivers. Vibration-sensitive receptors from a human annoyance perspective include residences and other buildings such as hotels, motels, and hospitals where people sleep. Residences and hotels in the vicinity of RADP projects are shown in Table 5. Buildings are also considered sensitive to vibration due to the potential for structural damage. Due to the location of 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[8] (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.

4. Noise and Vibration Effects and Recommended Reduction Measures

This section describes the tools, methods, and assumptions used for the analysis of noise effects of the implementation of the proposed Plan and identifies the criteria used to evaluate whether these criteria would be exceeded.

4.1 Quantitative Criteria Used for Evaluation

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

8 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.

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 provided below and are considered in the analysis presented in this section. **Table 6** summarizes the quantitative criteria used in this report for the evaluation of noise and vibration impacts from the RADP projects and staging areas. Table 1 of Appendix B includes a summary of noise and vibration standards from all jurisdictions mentioned above and details the reasoning for the selection of quantitative criteria used in the evaluation presented below.

TABLE 6
QUANTITATIVE CRITERIA USED FOR NOISE AND CONSTRUCTION VIBRATION IMPACTS

	Evaluation Criteria	
Receptor	**Daytime**	**Nighttime**
Construction Noise – Construction Equipment		
Noise Sensitive Receptors (Residential and Hotel)	1-hour L_{eq} of 90 dBA 10 dBA above ambient noise level	1-hour L_{eq} of 80 dBA Interior noise level of 45 dBA
Worker Receptors	1-hour L_{eq} of 100 dBA 90 dBA at 25 feet or any point outside the property plane of the project site for South San Francisco worker receptors	N/A
Construction Noise - Traffic		
Noise Sensitive Receptors (Residential and Hotel)	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	
Worker Receptors		
Construction Vibration		
Sensitive Receptors (Residential and Hotel)	N/A	80 VdB during paving and compaction; 72 VdB for pile driving per the FTA vibration annoyance criterion
Buildings and Structures	PPV of 0.5 inch per second for modern industrial/commercial buildings and new residential structures, PPV of 0.3 inch per second for older residential structures, and PPV of 0.25 inch per second for historic and old buildings per Caltrans vibration structural damage criteria for nearby structures	
Operational Noise – Stationary Sources		
Residential Receptors	Greater than 10 dBA above the local ambient noise level at a distance of 25 feet or more	Interior noise level of 45 dBA
Worker Receptors		N/A
Operational Noise - Traffic		
Noise Sensitive Receptors (Residential and Hotel)	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. 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.	
Worker Receptors		

SOURCE: Table 1 in Appendix B.
ABBREVIATION: N/A = Not Applicable

4.2 Methodology

The programmatic analysis presented below focuses on representative RADP projects to analyze the worst-case scenarios. The representative projects chosen for analysis are located closest to sensitive receptors including worker receptors or are the largest of the proposed RADP projects requiring 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 the RADP projects, the analysis considers using both standard construction equipment and impact pile drivers at the chosen representative projects. The CONRAC Facility (RADP Project #9) was chosen as a representative project as it is located closest to off-site noise-sensitive receptors (residential receptors in San Bruno approximately 1,000 feet across U.S. 101). RADP Projects #8 (ITB Curbside Expansion) and #1 (Boarding Area H) are located closest to the Grand Hyatt at SFO (which is considered a noise-sensitive receptor only during nighttime) located on Airport property. In addition, an analysis of the Central Hub (RADP Project #6) is also provided to develop a conservative assessment of potential worst-case construction noise impacts on worker receptors for projects proposed under the RADP. The Central Hub would involve the greatest amount of demolition and the greatest amount of square footage of new construction of any RADP project; therefore, it would be the most construction intensive, generating the highest construction noise levels. Construction of the Central Hub also would expose nearby worker receptors, such as skycaps[9] located at the departure terminals and parking enforcement patrols at the arrival terminals to construction noise. 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. Impacts from other RADP projects are considered, as needed, based on location of receptors for the impact being analyzed. In addition, noise effects to residential, hotel and worker receptors in the vicinity of the Aviador Lot and Plot 16D construction staging areas are analyzed.

Construction Noise

Construction Equipment

Noise from construction equipment was estimated using the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) and the general assessment approach recommended by the FTA.[10] The FTA 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[11] for each piece of equipment, (3) the distance between construction centerline and sensitive receptors, and (4) adjustments for any ground effects, as applicable.[12] This methodology calls for determining the resultant noise levels only the 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.[13]

The nearest off site sensitive receptors from RADP project locations are single-family residences located in the City of San Bruno, approximately 1,000 feet southwest of RADP Project #9 (CONRAC Facility). As detailed in Appendix C, the City of San Bruno Municipal Code contains daytime and nighttime quantitative noise standards for construction activity taking place within 500 feet of residential zones. As the residences in San Bruno closest to RADP Project #9 are located beyond 500 feet, the San Bruno Municipal Code noise standards would not apply.

9 Skycaps porters employed at an airport provides services to airline passengers such handling luggage, strollers, and car seats; performing curbside check-in; and assisting disabled or wheelchair passengers.

10 The Federal Transit Administration does not publish a software noise model; as such, the analysis relies on FHWA's model and impacts were assessed using FTA's methodology for assessing impact.

11 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.

12 In an urban area such as the developed areas surrounding SFO, which has acoustically non-absorptive ground conditions, the ground factor is zero.

13 U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018, pp. 174–179.

Daytime construction noise impacts are also evaluated for RADP Project #6 (Central Hub) as the RADP project involving the greatest amount of construction. The nearest residential receptors to RADP Project #6 are the residences south of Bay Street in the City of Millbrae approximately 2,800 feet to the south. As discussed in Appendix C, the City of Millbrae does not provide quantitative noise standards for construction. For the evaluation of nighttime construction noise, the hotel receptors at the Grand Hyatt at SFO would be located closest to RADP Projects #8 (ITB Curbside Expansion) and #1 (Building Area H) at approximately 770 feet and 990 feet, respectively. Impacts from construction activities at RADP Project #6 (Central Hub) are evaluated with respect to worker receptors (skycaps) working outside the terminal buildings.

First, 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 all other land uses, the FTA criterion is 100 dBA during the daytime and nighttime hours. Second, construction noise levels were assessed based on whether ambient noise levels at nearby sensitive receptors would increase by 10 dBA or more. Consistent with FTA and FHWA 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 FHWA. 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,[14] or if deemed appropriate based on the duration and frequency of nighttime construction activities, a 15 dBA exterior to interior noise reduction that assumes windows to be open).

This analysis also presents impacts of noise from 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 within the City of South San Francisco, respectively. Therefore, quantitative noise standards from these jurisdictions were considered in the analysis. As the City of Millbrae does not provide quantitative construction noise standards, activities at the Aviador Lot construction staging area are evaluated using the FTA criteria detailed above to quantify noise impacts on receptors. Noise from equipment anticipated to be used at the Plot 16D staging area is evaluated relative to 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) as well as the FTA daytime standards for commercial use discussed above. There are no residential uses in the vicinity of the Plot 16D staging area.

If estimated noise levels at the nearest sensitive receptor locations exceed the identified criteria shown in Table 6, 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

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 RADP-related peak hourly increases in construction truck traffic. The construction traffic noise analysis was based on transportation data in the Representative Project Construction Vehicle Trip Assignment

[14] 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.

Memorandum.[15] Daily construction truck and worker trip information for four representative projects was developed as part of the air quality analysis methodology.[16] The four representative projects include RADP Project #6 (Central Hub; large project), RADP Project #9 (CONRAC Facility; large project), RADP Project #3 (ITB Main Hall Expansion; medium project), and RADP Project #19 (East Field Ground Support Equipment Facility #2; 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 the 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 RADP project either the Aviador Lot or the Plot 16D 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 individually, 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 GSE Facility #2). The low scenario assumes simultaneous construction of RADP Project #19 (East Field GSE 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 criteria 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.[17] 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 "Clearly Unacceptable" noise environments, a traffic noise increase greater than 3 dBA is considered a substantial permanent increase in noise.

Groundborne Vibration from Construction

Operation of construction equipment at RADP project sites and 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

---

15 LCW Consulting and Fehr & Peers, *SFO Recommended Airport Development Plan CEQA Analysis – Representative Project Construction Vehicle Trip Assignment*, March 2025.

16 To present an approximation of the anticipated construction impacts that could occur with implementation of the RADP, the planning department, in consultation with ESA, selected four RADP projects that represent large, medium, and small project types, as described further below. These project types would represent the range of projects that could occur under the RADP.

17 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/traffic-noise-protocol-april-2020-a11y.pdf, accessed July 30, 2024.

laboratories or hospitals. The state 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 quantitative standards 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 standards for vibration impacts from construction. 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, activities at the Plot 16D staging area will 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. 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 RADP construction sites would potentially be affected by construction vibration. Impacts to these buildings would depend on the level of vibration generated by construction equipment, the distance between 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 RADP projects and estimating distances within which structural damage could occur based on the vibration standards in Caltrans' Transportation and Construction Vibration Guidance Manual (shown in Table C-4 of Appendix C).

For the evaluation of sleep disturbance impacts from construction vibration, the criteria for human annoyance during nighttime hours established in the FTA's Transit Noise and Vibration Impact Assessment (shown in Table C-2 of Appendix C) are used. If estimated vibration levels at the nearest sensitive receptor locations (such as residences, hotels and other places where people sleep) exceed the FTA's Category 2 criteria (shown in Table C-2 of Appendix C), 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 are consistent with the specific soil types in underlying bay muds and silty clay in the project areas as determined by geotechnical reports.[18]

Operational Noise

Stationary Sources

Upon completion of construction, RADP projects could generate noise from stationary sources such as back-up generators, 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 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 chosen 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 on their

[18] ESA, 2021, telephone conversation with Peter Hudson of Sutro Science, July 6, 2021.

location at RADP project sites and the presence of intervening structures, and the estimated existing noise levels at sensitive receptors potentially affected. There would be no operational noise impacts from staging areas.

The City of Millbrae has not adopted any quantitative operational noise standards. 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 limits 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

Implementation RADP projects would result in employment generation that would in turn increase traffic volumes on local arterial roadways in the communities surrounding the Airport. This would include vehicle trips generated by employee commutes as well as delivery truck trips (vendor trips) and Transport Refrigeration Units. Using data and information developed in support of the transportation analysis, localized increases in traffic noise due to implementation of RADP projects 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 "Clearly 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.

Traffic noise levels were modeled using the algorithms of the FHWA Traffic Noise Model for the Existing Conditions (2019), 2045 without RADP, and 2045 with RADP scenarios. The resulting noise levels with the implementation of the RADP were then compared to modeled noise levels based on traffic volumes without the RADP to evaluate impacts attributable only to subsequent RADP projects (including anticipated employment growth).

Operational Vibration

None of the RADP projects would include any operational sources of vibration. Hence, this topic is not further discussed in this memo.

4.3 Construction Noise Analysis

Noise Impacts from Construction Activities – Daytime

Construction of RADP projects would require the use of heavy equipment during demolition, excavation, and 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 as outlined in Table 1, p. 4. Construction would occur based on a 5-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.

Table 7 shows the maximum noise levels (L_{max}) produced by various types of construction equipment at a reference distance of 50 feet from the equipment. It should be noted that 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. The L_{max} noise levels shown in Table 7 would, therefore, be expected to only occur briefly throughout the construction workday.

General Assessment Construction Noise Criteria of the FTA

The FTA has developed guidelines that can be considered as quantitative 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 non-residential noise sensitive land uses such as schools and hotels. If these criteria are exceeded, the guidelines note that there may be adverse community reaction.[19]

The FTA methodology for general assessment described above was applied to each representative RADP project for an assessment 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 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 staging areas would include an excavator and a forklift. Noise levels were estimated for representative RADP projects #9 (CONRAC Facility – closest to noise-sensitive receptors) and #6 (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.

Input values and calculated daytime noise levels using FTA methodology and the RCNM noise model for representative RADP projects and staging areas are presented in **Table 8**. In the table, input values are presented for FTA methodology considerations for the nearest noise sensitive receptor locations identified in Table 5. 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 8, daytime construction noise from all analyzed 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

[19] U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018. Table 7-2, p. 179.

TABLE 7
MAXIMUM NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level at 50 Feet (dBA, L_{max})
Air Compressor	78
Backhoe	78
Bore/Drill Rig	84
Chain Saw	84
Compactor	83
Concrete Batch Plant	83
Concrete Mixer Truck	79
Concrete Pump Truck	81
Concrete Saw	90
Crane	81
Dozer	82
Excavator	81
Front End Loader	79
Generator Set	81
Grader	85
Haul Truck	77
Impact and Vibratory Pile Driver	101
Jackhammer	89
Paver	77
Pump	81
Rock/Concrete Crusher [a]	90
Roller	80
Rough Terrain Forklift [b]	83
Scraper	84
Sweeper/Scrubber	82
Tractor	84

SOURCES: U.S. Department of Transportation (U.D. DOT), Federal Highway Administration (FHWA), *Construction Noise Handbook*, 9.0, Construction Equipment Noise Levels and Ranges, Table 9.1, RCNM Default Noise Emission Reference Levels and Usage Factors, updated August 24, 2017, accessed February 8, 2024, http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm;
U.S. DOT, FTA, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

NOTES:

a. 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.
b. Used as a proxy for gradall forklift.

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, respectively, noise from daytime construction of all other RADP projects which are smaller in size and farther away from receptors would also be below the 90 dBA daytime criterion at the nearest residential receptors.

TABLE 8
DAYTIME NOISE LEVELS AT NEAREST NOISE SENSITIVE RECEPTORS FROM CONSTRUCTION

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 + 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

SOURCES: FHWA, 2005; ESA, 2024

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.

Consideration of a Temporary Increase in Ambient Noise Levels in the Vicinity

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 standard for sensitive receptors that would reasonably be expected in exterior areas. Such an increase represents a perceived doubling of loudness. Table 8 presents the existing ambient noise level as well as the existing-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 increase 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, respectively, daytime noise increase from the construction of all other RADP projects which 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.

Noise Impacts from Construction Activities – Nighttime

Nighttime construction noise impacts are assessed with respect to the potential to result in sleep disturbance. Consistent with guidance from the SF Planning Department, 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. If so, the evaluation then qualitatively considers the frequency, duration, and intensity of noise levels in determining whether construction associated with RADP projects would result in a substantial noise impact that would warrant noise control measures.

For this analysis, it is conservatively assumed that RADP projects #8 and #1, 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) at RADP Project #8, which is a curbside extension project at the ITB while impact equipment (pile driver and crane) could be used during nighttime hours for RADP Project #1 (construction of Boarding Area H). Additionally, it is assumed that deliveries and transport of materials to RADP projects would occur at the Aviador Lot and Lot near Tanks construction staging areas during some nighttime hours. Nighttime impacts are analyzed only for residential and hotel uses where people are expected to sleep. **Table 9** presents the construction noise levels from RADP Projects #8, #1, 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 Table 9, the exterior nighttime noise standard of 80 dBA is not exceeded at any of the nearby receptors. For the Grand Hyatt Hotel, 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. As shown in Table 9, nighttime noise from construction activities at RADP Projects #8 and #1 would not result in interior noise levels that exceed 45 dBA at the Grand Hyatt Hotel. 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 CNEL with windows closed, attributable to exterior sources shall not exceed an annual CNEL of 45 dB in any habitable room in hotels, motels and multifamily dwelling units. 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 shown in Table 9. Table 9 presents the most conservative analysis for RADP projects closest to nighttime receptors (RADP Projects #1 and #8); therefore, nighttime construction of 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 during the nighttime. As shown in Table 9, 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 resulting exceedance of the interior noise levels at the nearest residential uses.

TABLE 9
NIGHTTIME NOISE LEVELS AT NEAREST NOISE SENSITIVE RECEPTORS FROM CONSTRUCTION

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 #1: Boarding Area H							
Grand Hyatt at SFO	Pile Driver/Crane	101/81	990	20/16	69	No	44	No
	Aviador Lot Construction Staging Area							
Roblar Avenue Residences, Millbrae	Excavator/Gradall forklift	81/83	200	40/40	69	No	**54**	**Yes**
Rollins Gateway Apartments, Residence Inn	Excavator/Gradall forklift	81/83	360	40/40	64	No	39	No

SOURCES: FHWA, 2005; ESA, 2024

ABBREVIATION: NA = not available

NOTES: Monitored average hourly L_{eq} between 10 p.m. and 7 a.m.

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.

Since noise from nighttime construction staging activities at the Aviador Lot would result in an exceedance of the interior noise standard at the residences on Roblar Avenue nearby, **Noise Impact Reduction Measure NO-1, Construction Noise Control**, is identified to address potential construction noise impacts to these residences.

> **Mitigation Measure M-NO-1: Nighttime Construction Noise Control.** For 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.
>
> The plan shall include specific measures to reduce nighttime construction noise such as 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 5 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 and 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.

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 receptor locations. However, due to the distance of more than 1,000 feet separating these projects from the nearest noise sensitive receptors, this increase would not be audible over existing noise levels influenced primarily by traffic on U.S. 101 and therefore would not result in an exceedance of previously identified quantitative criteria.

Noise Impacts to Workers

Airport employees in structures

Construction activities associated with RADP projects would take place in proximity to Airport employees. 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. Accounting for closed windows, the noisiest construction equipment generating 101 dBA L_{max} at a distance of 50 feet (as shown in Table 7, p. 21) would attenuate to 76 dBA L_{max}, well below the FTA assessment criteria 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 Occupational Safety and Health Association (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 the RADP taking place in the vicinity of these workers 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 (RADP Project #6) also would expose nearby worker receptors, such as skycaps[20] 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 identified evaluation criteria.

Workers in commercial structures located outside of SFO

Commercial uses within the City of South San Francisco are located adjacent to the Plot 16D 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 the workers in question would be located indoors. Therefore, the simultaneous use of an excavator and a forklift at Plot 16D 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 assessment criteria for daytime construction noise for workers. Worker receptors are also located in the Residence Inn located approximately 360 feet from construction staging activities at the Aviador Lot. At this distance, daytime construction noise from staging activities at the Aviador Lot would attenuate to 64 dBA, which would be well below the FTA's 100 dBA assessment criterion for daytime construction noise for workers.

Combined Noise at Worker Receptors from Construction of Multiple RADP Projects

Multiple RADP projects located close to each other, if constructed simultaneously, 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 which provide an attenuation of at least 25 dBA. Therefore, this increase in noise from simultaneous construction of multiple projects is not likely to exceed the FTA threshold of 100 dBA to worker receptors.

Noise Impacts from Construction Truck Traffic

Construction of RADP projects is anticipated to begin in late 2025 with completion by 2045, for a total 20-year construction period. As discussed under Section 4.2, *Methodology*, the analysis relies on trip generation and distribution for four representative projects outlined in the Representative Project Construction Vehicle Trip Assignment Memorandum.[21] **Figure 3** shows the ten study segments included in the construction traffic analysis and highlights the five roadway segments 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).

[20] Skycaps porters employed at an airport provide services to airline passengers such as handling luggage, strollers, and car seats; performing curbside check-in; and assisting disabled or wheelchair passengers.

[21] LCW Consulting and Fehr & Peers, *SFO Recommended Airport Development Plan CEQA Analysis – Representative Project Construction Vehicle Trip Assignment*, March 2025.

SOURCE: ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 3

ROADWAY SEGMENTS ANALYZED FOR NOISE FROM CONSTRUCTION TRAFFIC

This analysis evaluates construction traffic noise levels based on algorithms of the FHWA Traffic Noise Model, considering the existing and RADP construction traffic projections developed as part of the transportation analysis. Modeled weekday noise level estimates for roadway segments for the four representative projects are presented in **Table 10**, for the worst-case weekday a.m. peak commute hour. The table presents noise levels for existing and existing-plus-RADP construction traffic for each analyzed project and roadway segment.

TABLE 10
TRAFFIC NOISE INCREASES ALONG ROADWAY SEGMENTS AFFECTED BY REPRESENTATIVE RADP PROJECTS

	Weekday A.M. Peak Hour[a]		
(Study Segment No.) Roadway Segment	**Existing Traffic Noise Level (dBA)[b]**	**Existing with RADP Construction Traffic Noise Level (dBA)**	**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 Boulevard	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 Boulevard	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 Boulevard	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 Boulevard	66.9	66.9	0.0

SOURCES: LCW Consulting and Fehr & Peers, 2024; Environmental Science Associates, 2024.

ABBREVIATIONS: dB = decibels; 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.

As discussed under Section 4.1, Quantitative Criteria Used for Evaluation, a 3 dBA or 5 dBA incremental standard would apply based on the location, existing noise level, and land uses located along the roadway segments. Table 10 shows that the increases in roadside noise levels from the addition of RADP construction worker and truck traffic would be less than the more restrictive 3 dBA standard along all analyzed roadway segments except for South Airport Boulevard south of North Access Road during construction of the CONRAC Facility. 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 10, during construction of the CONRAC Facility, traffic noise levels along this roadway segment would increase by more than 5 dBA. Land uses along this roadway segment include parking structures and lots to the west and the United Airlines Maintenance and Operations Center (MOC) to the east. There are no noise sensitive receptors along this roadway segment and worker receptors at the MOC would be located within a building with no windows and therefore completely shielded from this noise increase, and the impacts would be temporary during construction of the project. Therefore, given the non-sensitive nature of land uses along the roadways segments affected and that this noise level is temporary from the construction traffic noise, this increase would not result in a substantial noise increase along this roadway segment. Noise increases from RADP construction traffic along all other analyzed roadway segments would be below the more restrictive 3 dBA standard and hence would not result in a substantial noise increase along those roadway segments.

Combined Construction Traffic Noise from Multiple RADP Projects

To account for construction schedules for multiple RADP projects that may overlap, **Table 11** presents the combined noise impact from the simultaneous construction of RADP Projects for three overlapping scenarios. The High overlapping scenario assumes the simultaneous construction of RADP Projects #3 (ITB Main Hall Expansion), #6 (Central Hub), and #9 (CONRAC Facility). The Medium overlapping scenario assumes the simultaneous construction of RADP Projects #3 (ITB Main Hall Expansion) and #19 (East Field GSE Facility #2). The Low scenario assumes simultaneous construction of RADP Project #19 (East Field GSE Facility #2) along with another project of similar size.

As shown in Table 11, 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 not result in a substantial noise increase along those roadway segments. For the High overlapping scenario assuming simultaneous construction of RADP Projects #3, #6, and #9, the increases in traffic noise levels would be less than the 3 dBA incremental standard along all analyzed roadway segments except the segment of South Airport Boulevard south of North Access Road where the noise increase would 5.4 dBA.

As discussed earlier, a 5 dBA incremental standard would apply to this roadway segment based on the existing modeled noise level along the roadway segment. The 5-dBA criterion would be exceeded under the High overlapping scenario. However, due to the absence of noise sensitive receptors along this segment, this temporary increase in noise during construction would not result in a substantial increase in noise levels. As the High overlapping scenario represents the most conservative scenario where simultaneous construction of projects would likely create maximum construction truck trips, all other scenarios with simultaneous construction of multiple RADP projects would result in lower less-than-significant impacts.

TABLE 11
TRAFFIC NOISE INCREASES ALONG ROADWAY SEGMENTS FROM SIMULTANEOUS CONSTRUCTION OF RADP PROJECTS

(Study Segment No.) Roadway Segment	Weekday A.M. Peak-Hour [a] Existing [a]	Existing with RADP Construction Traffic	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 Boulevard	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 Boulevard	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 Boulevard	66.9	66.9	0.0

SOURCES: LCW Consulting and Fehr & Peers, 2024; Environmental Science Associates, 2024.

ABBREVIATIONS: dB = decibels; 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 vehicle traffic contributions on roadways.

4.4 Groundborne Vibration from Construction

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, which could disturb sleep. 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.

Most of the construction-related vibration typically occurs during the early phases of construction including:

- Site clearing and removal
- Site grading and soil compaction
- Installation of deep foundations

Site clearing could include the removal of existing vegetation, buildings, and pavement. This process is often performed with vibration-inducing equipment such as excavators, dozers, jackhammers, and large trucks. Once the site has been cleared, fill soil may be brought into the site. Fill is used for grading to raise the ground elevation for drainage purposes, or if the building pad elevation needs to be higher than the existing ground elevation. Fill is compacted to mitigate future settlement issues using compactors, commonly referred to as rollers. Rollers are often equipped with mechanical vibrators, which improve the compaction performance of the roller.

While use of vibratory equipment has its obvious advantages in construction, it can also create adverse effects on adjacent buildings, facilities, and people. If proper precautions are not taken, site compaction methods can create impacts to neighboring building occupants.

For larger buildings, buildings constructed on poor soil, or buildings constructed near open water, oftentimes a deep foundation system is required to support the building. Concrete, steel, and timber piles are the most common types of deep foundations, and they are installed by driving them into the ground with a large pile driving hammer, or by vibratory methods. Both installation methods generate vibration which can be an annoyance to and/or damage adjacent properties.

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 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 roller. Typical vibration levels associated with heavy-duty construction equipment are shown in **Table 12**, at various reference distances from the equipment, based on attenuation.

TABLE 12
GROUNDBORNE VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

	Approximate Peak Particle Velocity (inch per second)		
Equipment	**25 Feet (reference)[a]**	**60 Feet[a]**	**900 Feet[a]**
Impact Pile Driver	0.64	0.25	0.013
Vibratory Roller	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: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, FTA Report No. 0123, Office of Planning and Environment, 2018.
NOTE:
a. Distances as measured from construction equipment.

Structural Damage from Construction Vibration

Caltrans vibration criteria for structural damage depends on the type of structure potentially impacted as shown in Table C-4 of Appendix C. The vibration building damage standards for historic structures and some old structures is a PPV of 0.25 inch per second. The building damage standards for non-historic older residential structures is a PPV of 0.3 inch per second while a PPV of 0.5 inch per second applies to new residential structures and modern industrial/commercial structures.

All 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 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.

At a distance of 25 feet, a vibratory roller would generate groundborne vibration levels of approximately 0.21 inch per second PPV and a large bulldozer would generate groundborne vibration levels of approximately 0.089 inch per second PPV. Therefore, at 25 feet, neither a vibratory roller nor a large bulldozer would exceed the 0.25 inch per /second PPV building damage criterion for historic and some old buildings. However, it is possible that non-pile driving equipment (such as vibratory rollers 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 inch per second PPV, and vibration from a vibratory roller at a distance of 22 feet could result in a vibration level of 0.254 inch per second PPV (see **Table 13**). Therefore, the 0.25 inch per second PPV criterion for historic and some old buildings could be exceeded by non-piling 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 13
VIBRATION IMPACT DISTANCES FOR CONSTRUCTION EQUIPMENT

Distance (feet)	Vibration Level (PPV, inch per second)	Thresholds by Building Type (Continuous/Frequent Intermittent Sources)		
		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*, FTA Report No. 0123, Office of Planning and Environment, 2018.

NOTES: **Bolded** thresholds are expected to be exceeded at the applicable distances. Vibration levels estimated using equation published by FTA: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$; where D is distance from vibration source.

With regard to impact equipment, as shown in Table 12, p. 32, a pile driver typically generates a vibration level of 0.64 inch per second PPV at 25 feet. This vibration level is in excess of the Caltrans continuous/frequent intermittent source criteria, which are designed to prevent structural damage for the building types shown in Table 13, including modern industrial/commercial buildings (the building type shown in Table C-4 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 inch per second PPV) at distances within 46 feet. At a distance of 29 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 C-4 of Appendix C).

Because both 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.

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 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, or alternatively, implement **Noise Impact Reduction Measure M-NO-2, Protection of Adjacent Buildings/Structures and Vibration Monitoring during Construction**. Implementation of 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 may conduct a detailed vibration study or implement this mitigation measure.* 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. 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 to the extent possible 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.

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. As discussed above, the planning department relies on the FTA guidelines for evaluating vibration effects on people, using category 2 criteria[22] presented in Table C-2 of Appendix C. Construction vibration would result in sleep disturbance if nighttime construction activities generate vibration levels that meet or exceed the category 2 VdB impact levels. Should vibration levels meet or exceed the category 2 VdB impact levels during nighttime construction in Table C-2 of Appendix C, an analysis is then required to evaluate the duration, frequency, and intensity of those exceedances to determine whether the nighttime construction vibration impact is substantial.

Construction activities associated with the 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 RADP Project #1, Boarding Area H, and 1,950 feet from RADP Project #6, Central Hub. The residences along 7th Avenue in San Bruno are located approximately 1,000 feet from construction activities associated with RADP Project #9.

Nighttime sleep disturbance impacts at these sensitive receptor locations would occur if vibration levels were to exceed the 72 VdB criteria for human annoyance at Type 2 receptors (residences and hotels) during nighttime hours established in the FTA’s Transit Noise and Vibration Impact Assessment (see Table C-2 of Appendix C).

As shown in **Table 14**, 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; therefore, the potential for human annoyance would not be substantial. Table 14 presents the most conservative analysis based on RADP projects closest to vibration-sensitive receptors. Therefore, construction vibration generated by all other RADP projects located farther away would also generate attenuated groundborne vibration levels well below the 72 VdB human annoyance criterion at the nearest receptors.

Vibration-Sensitive Land Uses and Equipment

There are no land uses such as vibration-sensitive research and manufacturing, hospitals with vibration-sensitive equipment, and university research operations within 1,000 feet of construction areas of RADP projects that could be affected by construction vibration. As such, there would be no impact to vibration-sensitive equipment from RADP-related construction activities.

[22] Category 2 criteria apply to residential land use and buildings where people normally sleep, such as hotels and hospitals.

TABLE 14
VIBRATION LEVELS FROM CONSTRUCTION EQUIPMENT

Nearest Building/Receptor	Vibration Inducing Equipment	Reference Vibration Level (VdB) [a]	Distance to Nearest Sensitive Receptor (feet) [b]	Adjusted Vibration at Receptor (VdB) [c]	Exceed Frequent Event Criterion for Type 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: FTA 2018; Caltrans 2020; ESA 2024; ESA 2021

NOTES:

a. VdB at 25 feet from the construction equipment.
b. Distance between approximate location of vibration-generating 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 is adjusted for distance.
d. Category 2 receptors include residential land use and buildings where people normally sleep, such as hotels and hospitals.

Combined Construction Vibration from Multiple RADP Projects

Based on vibration levels generated by the highest vibration generating equipment likely to be used for construction of RADP projects (an impact pile driver), building damage to historic and non-historic structures and human annoyance impacts would be localized to within approximately 47 feet, and 30 feet, respectively, of structures and 300 feet of receptors, respectively based on the FTA criteria of 0.25 inch per second and 0.5 inch per second for historic and non-historic building damage impacts and 72 VdB for human annoyance impacts. Even if other RADP projects are located within these distances, unlike noise, vibration levels from multiple projects do not combine to increase the intensity of impact. Therefore, it is not likely that vibration levels from the operation of construction equipment associated with multiple projects would combine and compound the impact discussed above.

4.5 Operational Noise Analysis

Noise Impacts from Stationary Sources

Operation of 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 heating, ventilation, and air conditioning (HVAC) systems and emergency generators. Because mechanical equipment is commonly available with noise-attenuating enclosures designed to meet local noise ordinances, the equipment's noise generation would not be expected to exceed the established standards in the Municipal Codes or General Plan policies of jurisdictions within which nearby sensitive receptors are located (see Table 1 of Appendix B).

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 1 hour per week. The noise generated by generator testing would be akin to that of a diesel-powered truck engine, and this occasional testing is not expected to result in a substantial permanent increase in noise levels over ambient conditions.

Based on the quantitative criteria identified earlier, noise from stationary operational sources would be considered significant if it results in more than a 10 dBA increase in ambient noise level 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 at RADP projects is not known. However, based on the location of RADP projects relative to sensitive receptors, attenuated levels of reference noise levels for potential operational sources shown in **Table 15** can be estimated. Based on the location of RADP projects, it can be expected that mechanical equipment of proposed buildings could be located as close as approximately 1,000 feet from existing noise-sensitive receptors (refer to Table 5, p. 13).

TABLE 15
REFERENCE NOISE LEVELS FOR OPERATIONAL STATIONARY NOISE SOURCES AT RADP PROJECTS

Stationary Noise Source	Documented Sound Levels (dBA)	Reference/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.

SOURCE: Table compiled by Environmental Science Associates in 2024 (additional sources noted above).
ABBREVIATIONS: dBA = A-weighted decibels; HVAC = heating, ventilation, and air conditioning

Given the data in Table 15, the highest attenuated noise levels from operational stationary equipment (90 dBA from standby diesel generator) at the nearest residential receptor locations along 7th Avenue in San Bruno located 1,000 feet away from RADP Project #9 (CONRAC Facility) would be 57 dBA, taking into account a 6 dBA reduction for every doubling of distance and no 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 and noise from aircraft activity. Therefore, noise level at the nearest sensitive receptors would not exceed the evaluation criterion 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 RADP, projects would not result in interior noise levels exceeding 45 dBA between 10 p.m. and 7 a.m. at nearest offsite sensitive receptors.

Aggregate Noise from Operation of Multiple RADP Projects

Operational noise from multiple RADP projects located close to each other could result in a combined increase in noise levels at receptors. However, as with construction noise, due to the distance of more than 1,000 feet separating RADP projects from the nearest noise sensitive receptors, this increase would not be audible over existing noise levels influenced by traffic on U.S. 101 and therefore would not result in an exceedance of previously identified quantitative criteria.

Noise Impacts from Aircraft Operations

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 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 in and out of SFO. Implementation of the RADP would not result in runway closures. However, implementation of RADP Project #1 would involve construction of a new Boarding Area H and modernization of Boarding Area F to accommodate aircraft/passengers for domestic or international departures at contact gates with passenger boarding bridges. Boarding Area H would extend west from the base of the ITB, then would shift north and follow North McDonnell Road. Currently, Boarding Area G is located approximately 2,500 feet from the nearest residential uses along San Antonio Avenue, west of U.S. 101. Boarding Area H would be slightly closer at approximately 1,900 feet from these residential receptors. Relocation of gated aircraft from Boarding Area G to Boarding Area H would result in about 600 feet of westward difference; however, this would not constitute any considerable change from existing conditions with respect to noise levels from aircraft. Aircraft already park in the same location where aircraft would park with Boarding Area H. 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 operating on auxiliary engines for lighting and ventilation. Once at the gate, the auxiliary engines are shut down as they run on Auxiliary Power Units or ground-based power, which is much quieter than primary engines. For departures, a tow tractor pushes the aircraft off the gate and into the taxiway, at which point one engine is started with both engines running by the time the aircraft reaches the runway. Although these procedures are dependent on an individual airline’s operating procedures and primarily followed for fuel savings, they also result in noise reduction. Therefore, moving aircraft gates approximately 600 feet closer to noise sensitive receptors with the construction of the new Boarding Area H would not result in a discernable increase in noise levels at the noise sensitive receptors located across U.S. 101.

Noise Impacts from Operational Vehicular Traffic

Implementation of the RADP would lead to an increase in vehicular traffic in the vicinity of the Airport, primarily from additional employees and service 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: 2019 Existing Conditions, 2045 without RADP, and 2045 with RADP. The roadway segments were selected as they represent roadways expected to be most affected by vehicle traffic changes due to subsequent projects implemented under the RADP and include three segments on U.S. 101. There are no receptors located along two analyzed roadway segments: San Bruno Avenue east of U.S. 101 and South McDonnell Road between North McDonnell Road and Millbrae Avenue. Traffic noise increases along the remaining five roadway segments were quantitatively modeled and the results are presented in **Table 16**.

As shown in Table 16, RADP-generated vehicular traffic would increase traffic noise along the modeled segments in 2045 from 0.0 to 0.5 dBA over modeled levels for the 2045 without RADP scenario. As described in the methodology section, 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 increase standard used is based on the land use/noise compatibility standards in the General Plan of the jurisdiction within which the study segment is located, the existing noise level, and the land uses located along the segment. As shown in Table 16, traffic noise increases resulting from implementation of the RADP over the 2045 without RADP conditions would be below the applicable noise increase standards. Therefore, traffic noise generated by subsequent projects under the RADP would not result in a substantial permanent increase in ambient noise levels. Due to the relocation of existing facilities under the 2045 with RADP condition 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 from the 2045 without RADP condition.

4.6 2045 Future Baseline with RADP/Cumulative Construction Noise and Vibration

Cumulative construction impacts could occur when the construction schedules for other projects proposed in the vicinity coincide with RADP projects. Table 3-2 of Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, identifies a list of cumulative projects located within 0.25 mile of RADP projects.

Noise

Construction Equipment Noise

Figure 4 shows the locations of cumulative development and infrastructure projects generally located within 0.25 mile of RADP projects. There are no cumulative projects within 1,500 feet of RADP Project #9, which is the RADP project located closest to noise sensitive receptors (see Figure 1, p. 3). However, there are four cumulative projects in the vicinity of RADP Projects #16 (AirTrain Maintenance Yard) and #1 (Boarding Area H): the Consolidated Administration Campus Phase 2 [2], with an anticipated construction start in 2025; the Boarding Area G Gate Enhancements [11]; the West Field Cargo Redevelopment [3], with an anticipated construction start after 2025; and Plot 10F Demolition/Cargo Building 662 [9], with an anticipated construction to begin in 2027.[23] The construction schedules for these projects could overlap with those for RADP Projects #1 and #16. 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 cumulative projects would attenuate to levels not perceptible over the ambient noise level at the receptors influenced by traffic on U.S. 101. Similarly, construction activities associated with cumulative projects in and near the North Field including the A-1 Self Storage [19], North Field Maintenance Facilities [7], and the Shoreline Protection Program [4] would be located in the vicinity of RADP projects. These projects are located 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

23 The San Francisco Garter Snake Recovery Plan (2019–2029) cumulative project is located approximately 400 feet west of RADP Projects #16 and #1; however, implementation of the Plan does not involve demolition or construction activities. As such, this project would not combine with subsequent RADP projects to result in an increase in construction or operational noise.

TABLE 16
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 Condition (2019) Modeled Traffic Noise Level (dBA, L_{eq})	Land Use Compatibility Designation Based on Existing Noise Level [a]	Applicable Standard for Jurisdiction and Land Use	2045 without RADP Modeled Traffic Noise Level (dBA, L_{eq})	2045 with RADP Modeled Traffic Noise Level (dBA, L_{eq})	Difference between 2045 with RADP and Existing Condition (dBA)	Difference between 2045 with RADP and 2045 without 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: Data compiled by Environmental Science Associates, 2024.

ABBREVIATIONS: dBA = A-weighted decibels; L_{eq} = equivalent sound level over the p.m. peak hour

NOTE:

a. Land use compatibility designation based on guidelines in the general plan of the jurisdiction within which the roadway segment is located.

SOURCE: ESA, 2024

SFO Recommended Airport Development Plan EIR

FIGURE 4

CUMULATIVE PROJECTS ON AND WITHIN 0.25 MILE OF THE RADP PROJECT SITE

not be audible over the existing ambient noise level. The construction schedules for cumulative projects Tanforan [13], 1100 El Camino Real [15], Millbrae Serra Station [16], and Terminal 101 Redevelopment [17] projects are not currently known. In addition, these projects would not overlap spatially with the RADP projects, and therefore construction of these cumulative projects would not combine with the equipment-related noise impacts related to implementation of 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 RADP and cumulative projects from sensitive receptors and the already high ambient noise levels at receptors due to the influence of traffic on U.S. 101 and noise from aircraft activity, construction noise from these cumulative projects would not combine with that of RADP projects to result in a significant increase in cumulative construction noise.

Construction Traffic Noise

Construction traffic generated by cumulative projects could combine with construction traffic from RADP projects if their schedules overlap and if they use similar access routes. Of the 20 cumulative projects shown in Figure 4, the transportation analysis identified 11 cumulative projects that would be on Airport property (one located in West of Bayshore and 10 within SFO property east of U.S. 101). These projects could partially or completely overlap temporally with 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 Airport Operations division. 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, the noise impacts from construction traffic from cumulative projects would not combine with projects that could occur with implementation of the RADP to result in a significant cumulative traffic noise impact.

Construction Vibration

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 RADP projects would not combine with cumulative projects to increase construction vibration levels at structures/receptors.

4.7 Cumulative Operational Noise

Operational Stationary Sources

Noise from operational stationary sources such as mechanical equipment would be localized (generally within 150 feet).[24] For the RADP project closest to noise sensitive receptors (RADP Project #9), there are no cumulative projects in the vicinity; therefore, operational noise associated with the RADP project would not combine with cumulative projects to increase operational noise at a noise sensitive receptor. For RADP projects in the West Field, which are located approximately 300 feet north of the West Field Cargo Redevelopment cumulative project, the nearest noise sensitive receptor is located approximately 2,000 feet to the west and across U.S. 101. Given that noise from operational stationary sources are 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 RADP West Field projects to result in an increase in operational stationary noise.

Operational Traffic

The operational traffic noise analysis presented in Table 16, p. 42, includes traffic from cumulative projects in the 2045 analysis scenarios. Therefore, the 2045 Future Baseline with RADP is also a cumulative analysis and will be presented below with the 2045 Future Baseline with RADP scenario. As shown in the table, the increase in noise from 2045 Future Baseline with RADP cumulative traffic compared to 2045 Future Baseline without RADP modeled traffic noise levels would be less than the applicable incremental noise increase standards along all analyzed roadway segments.

[24] 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 section 2909(d) from the nearest building.

Intentionally Blank

Appendix A

Supporting Materials for Noise Analysis

A.1 Sound Level Meter Reports

Summary

File Name on Meter	LxT_Data.033		
File Name on PC	SLM_0004435_LxT_Data_033.00.ldbin		
Serial Number	0004435		
Model	SoundTrack LxT®		
Firmware Version	2.302		
User	C. Sanchez		
Location	ST-1: San Bruno Ave		
Job Description	SFO		
Note			

Measurement

Description			
Start	2019-10-15 13:12:19		
Stop	2019-10-15 13:32:52		
Duration	00:20:33.1		
Run Time	00:19:52.4		
Pause	00:00:40.7		
Pre Calibration	2019-10-15 10:16:03		
Post Calibration	None		
Calibration Deviation	---		

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Linear			
Overload	142.7 dB			
	A	**C**	**Z**	
Under Range Peak	98.9	95.9	**100.9**	dB
Under Range Limit	**47.9**	45.9	53.9	dB
Noise Floor	34.8	35.4	43.0	dB

Results

LAeq	71.8 dB	
LAE	102.6 dB	
EA	1.999 mPa²h	
EA8	48.292 mPa²h	
EA40	241.462 mPa²h	
LZpeak (max)	2019-10-15 13:18:54	108.3 dB
LASmax	2019-10-15 13:18:53	87.8 dB
LASmin	2019-10-15 13:26:07	57.6 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	2	8.9 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s
LCeq	79.4 dB	
LAeq	71.8 dB	
LCeq - LAeq	7.6 dB	
LAIeq	73.4 dB	
LAeq	71.8 dB	
LAIeq - LAeq	1.6 dB	

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	71.8		79.4			
Ls(max)	87.8	2019/10/15 13:18:53				
Ls(min)	57.6	2019/10/15 13:26:07				
LPeak(max)					108.3	2019/10/15 13:18:54

# Overloads	0
Overload Duration	0.0 s

Summary

File Name on Meter	LxT_Data.030
File Name on PC	SLM_0004435_LxT_Data_030.01.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.302
User	C. Sanchez
Location	ST-2: SFO Grand Hyatt Hotel
Job Description	SFO
Note	

Measurement

Description	
Start	2019-10-15 10:16:50
Stop	2019-10-15 10:36:52
Duration	00:20:02.3
Run Time	00:20:02.3
Pause	00:00:00.0
Pre Calibration	2019-10-15 10:16:05
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Linear			
Overload	142.7 dB			
	A	**C**	**Z**	
Under Range Peak	98.9	95.9	**100.9**	dB
Under Range Limit	**47.9**	45.9	53.9	dB
Noise Floor	34.8	35.4	43.0	dB

Results

LAeq	65.5 dB	
LAE	96.3 dB	
EA	478.184 µPa²h	
EA8	11.454 mPa²h	
EA40	57.272 mPa²h	
LZpeak (max)	2019-10-15 10:17:07	96.2 dB
LASmax	2019-10-15 10:17:08	70.4 dB
LASmin	2019-10-15 10:19:04	62.4 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s
LCeq	75.3 dB	
LAeq	65.5 dB	
LCeq - LAeq	9.7 dB	
LAIeq	66.1 dB	
LAeq	65.5 dB	
LAIeq - LAeq	0.6 dB	

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	65.5		75.3			
Ls(max)	70.4	2019/10/15 10:17:08				
Ls(min)	62.4	2019/10/15 10:19:04				
LPeak(max)					96.2	2019/10/15 10:17:07

# Overloads	0
Overload Duration	0.0 s

Summary

File Name on Meter	LxT_Data.031
File Name on PC	SLM_0004435_LxT_Data_031.00.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.302
User	C. Sanchez
Location	ST-3: I-Loft Hotel
Job Description	SFO
Note	

Measurement

Description	
Start	2019-10-15 11:01:29
Stop	2019-10-15 11:21:30
Duration	00:20:01.0
Run Time	00:20:01.0
Pause	00:00:00.0
Pre Calibration	2019-10-15 10:16:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Linear			
Overload	142.7 dB			
	A	**C**	**Z**	
Under Range Peak	98.9	95.9	**100.9**	dB
Under Range Limit	**47.9**	45.9	53.9	dB
Noise Floor	34.8	35.4	43.0	dB

Results

LAeq	68.0 dB	
LAE	98.8 dB	
EA	841.856 µPa²h	
EA8	20.188 mPa²h	
EA40	100.939 mPa²h	
LZpeak (max)	2019-10-15 11:11:16	107.3 dB
LASmax	2019-10-15 11:18:04	81.7 dB
LASmin	2019-10-15 11:06:07	60.8 dB
SEA	-99.9 dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LCeq	81.9 dB
LAeq	68.0 dB
LCeq - LAeq	13.9 dB
LAIeq	68.8 dB
LAeq	68.0 dB
LAIeq - LAeq	0.8 dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	68.0		81.9			
Ls(max)	81.7	2019/10/15 11:18:04				
Ls(min)	60.8	2019/10/15 11:06:07				
LPeak(max)					107.3	2019/10/15 11:11:16

# Overloads	0
Overload Duration	0.0 s

Summary

File Name on Meter	LxT_Data.032
File Name on PC	SLM_0004435_LxT_Data_032.00.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.302
User	C. Sanchez
Location	ST-4: ECR Milbrae Ave
Job Description	SFO
Note	

Measurement

Description	
Start	2019-10-15 11:40:57
Stop	2019-10-15 12:00:58
Duration	00:20:01.0
Run Time	00:20:01.0
Pause	00:00:00.0
Pre Calibration	2019-10-15 10:16:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting		
Peak Weight	Z Weighting		
Detector	Slow		
Preamp	PRMLxT2B		
Microphone Correction	Off		
Integration Method	Linear		
Overload	142.7 dB		
	A	**C**	**Z**
Under Range Peak	98.9	95.9	**100.9** dB
Under Range Limit	**47.9**	45.9	53.9 dB
Noise Floor	34.8	35.4	43.0 dB

Results

LAeq	68.1 dB	
LAE	98.9 dB	
EA	863.143 µPa²h	
EA8	20.698 mPa²h	
EA40	103.491 mPa²h	
LZpeak (max)	2019-10-15 11:44:55	101.2 dB
LASmax	2019-10-15 11:44:56	79.6 dB
LASmin	2019-10-15 11:56:23	57.6 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s
LCeq	75.7 dB	
LAeq	68.1 dB	
LCeq - LAeq	7.5 dB	
LAIeq	69.2 dB	
LAeq	68.1 dB	
LAIeq - LAeq	1.1 dB	

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	68.1		75.7			
Ls(max)	79.6	2019/10/15 11:44:56				
Ls(min)	57.6	2019/10/15 11:56:23				
LPeak(max)					101.2	2019/10/15 11:44:55

# Overloads	0
Overload Duration	0.0 s

Summary

File Name on Meter	LxT_Data.168.s
File Name on PC	LxT_0004435-20231128 110000-LxT_Data.168.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.404
User	Nick Reynoso
Location	LT-9: Residence Inn By Marriott San Francisco Airport
Job Description	SFO
Note	

Measurement

Description	
Start	2023-11-28 11:00:00
Stop	2023-11-30 11:00:00
Duration	48:00:00.0
Run Time	48:00:00.0
Pause	00:00:00.0
Pre-Calibration	2023-11-28 06:41:54
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamplifier	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	143.4 dB			
	A	**C**	**Z**	
Under Range Peak	99.7	96.7	**101.7**	dB
Under Range Limit	**38.0**	37.6	44.3	dB
Noise Floor	28.9	28.4	35.2	dB
	First	**Second**	**Third**	
Instrument Identification				

Results

LAS$_{eq}$	61.3	
LASE	113.6	
EAS	25.696 mPa²h	
EAS8	4.283 mPa²h	
EAS40	21.413 mPa²h	
LZ$_{peak (max)}$	2023-11-30 10:42:08	114.8 dB
LAS$_{max}$	2023-11-28 12:26:28	88.5 dB
LAS$_{min}$	2023-11-29 03:13:07	47.3 dB
SEA	-99.9 dB	

	Exceedance Counts	**Duration**
LAS > 85.0 dB	4	9.7 s
LAS > 115.0 dB	0	0.0 s
LZ$_{peak}$ > 135.0 dB	0	0.0 s
LZ$_{peak}$ > 137.0 dB	0	0.0 s
LZ$_{peak}$ > 140.0 dB	0	0.0 s

LCS$_{eq}$	73.1 dB
LAS$_{eq}$	61.3 dB
LCS$_{eq}$ - LAS$_{eq}$	11.9 dB
LAI$_{eq}$	63.4 dB
LA$_{eq}$	61.3 dB
LAI$_{eq}$ - LA$_{eq}$	2.2 dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L$_{eq}$	61.3					
L$_{S(max)}$	88.5	2023/11/28 12:26:28				
L$_{S(min)}$	47.3	2023/11/29 3:13:07				
L$_{Peak(max)}$					114.8	2023/11/30 10:42:08

Overload Count	0
Overload Duration	0.0 s

Calculated Ldn from Long-Term Noise Monitoring Data

LT-1 Residence Inn Marriott
11/29/2024
Wednesday

		TIME	dBA	Numbers...	10 dBA More Numbers...	5 dBA
Midnight	0 / 24		58.5	713894	7138944	2257532
am	1:00	100	57.2	524615	5246154	1658979
	2:00	200	59.1	819266	8192661	2590747
	3:00	300	54.5	279193	2791933	882887
	4:00	400	59.6	921701	9217009	2914674
	5:00	500	63.6	2269165	22691646	7175729
	6:00	600	65.3	3419653	34196527	10813891
	7:00	700	62.4	1740147	17401473	5502829
	8:00	800	59.7	933138	9331383	2950842
	9:00	900	61.8	1507856	15078565	4768261
	10:00	1000	60.6	1148095	11480955	3630597
	11:00	1100	62.2	1665007	16650068	5265214
	12:00	1200	61.1	1276139	12761391	4035506
pm	13:00	1300	60.4	1099067	10990666	3475554
	14:00	1400	61.0	1268504	12685045	4011363
	15:00	1500	60.3	1067931	10679305	3377093
	16:00	1600	62.1	1630703	16307035	5156737
	17:00	1700	60.6	1158775	11587747	3664367
	18:00	1800	65.2	3285791	32857915	10390585
	19:00	1900	63.7	2344569	23445689	7414178
	20:00	2000	61.5	1425174	14251744	4506797
	21:00	2100	62.9	1969423	19694230	6227862
	22:00	2200	62.6	1826123	18261229	5774708
pm	23:00	2300	61.3	1349606	13496060	4267829

Leq Nighttime 10:00 p.m.-7:00 a.m. (not penalized)
61 dBA

Leq Daytime 7:00 am-10:00 p.m.
63 dBA

Leq 24-Hour
62 dBA

Ldn: 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.
68 dBA

CNEL: 5 dBA penalty for noise between 7:00p.m. and 10:00 p.m., and 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.
68 dBA

CNEL - Ldn = 0.3572195

Summary

File Name on Meter	831_Data.043
File Name on PC	SLM_0002783_831_Data_043.00.ldbin
Serial Number	0002783
Model	Model 831
Firmware Version	2.402
User	C. Sanchez
Location	SFO LT-3 Old Bayshore Hwy, Across from Westin
Job Description	SFO SPP
Note	

Measurement

Description	
Start	2021-02-08 12:00:00
Stop	2021-02-10 12:00:00
Duration	48:00:00.0
Run Time	48:00:00.0
Pause	00:00:00.0
Pre Calibration	2021-02-08 10:24:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRM831			
Microphone Correction	Off			
Integration Method	Linear			
OBA Range	Low			
OBA Bandwidth	1/1 and 1/3			
OBA Freq. Weighting	A Weighting			
OBA Max Spectrum	Bin Max			
Gain	20.0 dB			
Overload	124.6 dB			
	A	**C**	**Z**	
Under Range Peak	57.2	54.2	**59.2**	dB
Under Range Limit	**24.8**	25.5	33.2	dB
Noise Floor	15.6	16.3	21.5	dB

Results

LAeq	66.3	
LAE	118.7	
EA	82.091 mPa²h	
LZpeak (max)	2021-02-09 13:30:58	116.6 dB
LASmax	2021-02-10 10:33:45	94.2 dB
LASmin	2021-02-09 01:33:59	40.6 dB
SEA	-99.9 dB	

LAS > 65.0 dB (Exceedance Counts / Duration)	5020	51879.6 s
LAS > 85.0 dB (Exceedance Counts / Duration)	22	214.0 s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**
	69.5	67.7	61.5	69.8	68.3	63.8

LCeq	75.9 dB
LAeq	66.3 dB
LCeq - LAeq	9.5 dB
LAIeq	67.6 dB
LAeq	66.3 dB
LAIeq - LAeq	1.3 dB

Record #	Record Type	Date	Time	LAeq	LApeak	LZpeak	LA2.00	LA8.00	LA25.00	LA50.00	LA66.60	LA90.00	OVLD	Marker
1	Run	2021-02-08	12:00:00											
2		2021-02-08	12:00:00	66.8	104.7	110.9	73.4	70.3	67.2	63.7	61.6	56.7	No	
3		2021-02-08	13:00:00	67.4	97.5	106.6	74.9	71.4	67.6	63.7	61.7	57.4	No	
4		2021-02-08	14:00:00	65.4	99.9	105.8	71.9	69.3	66.2	62.7	60.4	56.0	No	
5		2021-02-08	15:00:00	65.0	92.9	101.8	72.0	69.1	66.0	62.3	59.9	55.5	No	
6		2021-02-08	16:00:00	65.5	105.7	113.9	72.1	69.1	66.1	62.3	60.0	55.9	No	
7		2021-02-08	17:00:00	65.5	100.0	105.5	72.4	69.5	66.2	62.8	60.6	56.8	No	
8		2021-02-08	18:00:00	65.4	95.0	105.6	72.7	69.6	66.1	62.9	60.7	56.3	No	
9		2021-02-08	19:00:00	62.8	91.1	104.2	70.8	67.3	62.7	59.2	57.4	54.2	No	
10		2021-02-08	20:00:00	62.5	95.6	100.8	70.4	66.9	62.5	59.0	56.9	52.5	No	
11		2021-02-08	21:00:00	60.5	90.2	102.1	68.9	65.0	60.5	56.8	54.3	49.6	No	
12		2021-02-08	22:00:00	62.7	99.0	112.9	70.2	66.1	61.0	57.2	55.2	51.8	No	
13		2021-02-08	23:00:00	61.8	93.9	110.1	70.6	64.9	59.9	56.5	54.5	51.6	No	
14		2021-02-09	0:00:00	60.1	93.0	106.1	69.2	62.2	57.5	53.5	51.3	49.2	No	
15		2021-02-09	1:00:00	53.7	87.4	94.7	63.3	57.2	51.0	47.0	44.8	42.6	No	
16		2021-02-09	2:00:00	53.8	87.5	99.8	62.6	57.1	51.1	48.0	46.6	43.4	No	
17		2021-02-09	3:00:00	57.9	92.4	104.1	68.1	61.1	54.9	49.5	47.4	45.3	No	
18		2021-02-09	4:00:00	58.3	93.3	98.4	66.8	61.3	56.5	51.5	49.2	47.5	No	
19		2021-02-09	5:00:00	61.2	93.6	98.6	69.5	65.2	60.4	57.0	54.8	51.9	No	
20		2021-02-09	6:00:00	64.8	96.6	109.9	73.4	68.7	64.1	60.6	58.9	56.5	No	
21		2021-02-09	7:00:00	65.1	95.0	105.0	73.4	69.4	65.1	61.4	59.6	56.4	No	
22		2021-02-09	8:00:00	64.5	93.7	103.9	71.7	68.5	65.1	61.8	59.2	54.3	No	
23		2021-02-09	9:00:00	65.2	96.7	108.2	72.2	69.5	65.8	62.4	60.2	56.4	No	
24		2021-02-09	10:00:00	64.3	91.9	103.8	71.8	68.6	64.9	61.3	59.3	54.7	No	
25		2021-02-09	11:00:00	65.3	95.3	104.5	72.4	69.2	66.1	62.6	60.0	55.1	No	
26		2021-02-09	12:00:00	65.5	96.3	102.1	73.1	69.6	66.3	62.6	60.3	55.9	No	
27		2021-02-09	13:00:00	66.2	107.1	116.6	73.7	70.3	66.3	62.4	60.1	56.8	No	
28		2021-02-09	14:00:00	65.8	99.0	113.4	73.4	69.7	66.3	62.6	60.2	57.0	No	
29		2021-02-09	15:00:00	65.6	94.8	109.5	73.0	69.5	66.1	62.7	60.6	57.2	No	
30		2021-02-09	16:00:00	65.7	96.0	110.0	72.6	69.3	66.3	63.1	61.2	58.4	No	
31		2021-02-09	17:00:00	65.7	94.5	105.5	72.6	69.5	66.4	62.8	60.9	58.2	No	
32		2021-02-09	18:00:00	65.7	99.7	104.9	72.8	69.5	65.9	62.5	60.7	58.4	No	
33		2021-02-09	19:00:00	65.6	96.4	105.8	73.1	69.4	65.0	61.5	59.8	56.9	No	
34		2021-02-09	20:00:00	65.3	92.6	107.8	72.0	69.4	66.4	62.4	60.2	56.7	No	
35		2021-02-09	21:00:00	64.1	101.1	104.4	71.8	68.5	64.7	60.2	57.7	53.4	No	
36		2021-02-09	22:00:00	62.7	93.6	107.6	71.0	67.6	62.4	58.0	55.6	50.6	No	
37		2021-02-09	23:00:00	60.3	92.6	98.8	68.7	65.4	59.8	55.9	53.6	50.3	No	
38		2021-02-10	0:00:00	61.2	94.6	106.4	70.7	65.2	58.7	55.1	53.0	50.0	No	
39		2021-02-10	1:00:00	57.4	90.7	101.6	67.3	60.9	55.1	51.0	49.3	47.5	No	
40		2021-02-10	2:00:00	59.0	93.1	103.3	68.3	62.3	55.7	52.4	50.7	47.4	No	
41		2021-02-10	3:00:00	58.0	96.3	101.3	67.0	60.8	54.8	51.6	48.8	45.4	No	
42		2021-02-10	4:00:00	61.2	102.0	109.4	69.9	65.3	59.7	55.9	54.2	52.2	No	
43		2021-02-10	5:00:00	64.8	95.6	102.0	72.5	68.5	64.5	62.5	61.4	57.9	No	
44		2021-02-10	6:00:00	66.4	99.4	104.6	75.0	70.1	65.7	63.2	61.7	59.2	No	
45		2021-02-10	7:00:00	69.9	114.1	115.1	80.3	71.6	67.0	63.6	61.7	58.8	No	
46		2021-02-10	8:00:00	65.6	94.7	103.7	72.0	69.4	66.4	63.3	61.5	58.2	No	
47		2021-02-10	9:00:00	66.2	102.9	104.4	74.0	70.5	66.3	63.0	61.3	57.8	No	
48		2021-02-10	10:00:00	78.1	113.1	114.9	90.8	79.4	71.9	66.8	64.5	60.9	No	
49		2021-02-10	11:00:00	71.6	102.4	112.7	81.5	75.0	69.6	66.1	64.2	61.2	No	
50	Stop	2021-02-10	12:00:00											

Summary

File Name on Meter	LxT_Data.033
File Name on PC	SLM_0004435_LxT_Data_033.00.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.302
User	C. Sanchez
Location	ST-1: San Bruno Ave
Job Description	SFO
Note	

Measurement

Description	
Start	2019-10-15 13:12:19
Stop	2019-10-15 13:32:52
Duration	00:20:33.1
Run Time	00:19:52.4
Pause	00:00:40.7
Pre Calibration	2019-10-15 10:16:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT2B
Microphone Correction	Off
Integration Method	Linear
Overload	142.7 dB

	A	C	Z	
Under Range Peak	98.9	95.9	**100.9**	dB
Under Range Limit	**47.9**	45.9	53.9	dB
Noise Floor	34.8	35.4	43.0	dB

Results

LAeq	71.8 dB	
LAE	102.6 dB	
EA	1.999 mPa²h	
EA8	48.292 mPa²h	
EA40	241.462 mPa²h	
LZpeak (max)	2019-10-15 13:18:54	108.3 dB
LASmax	2019-10-15 13:18:53	87.8 dB
LASmin	2019-10-15 13:26:07	57.6 dB
SEA	-99.9 dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	2	8.9 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LCeq	79.4 dB
LAeq	71.8 dB
LCeq - LAeq	7.6 dB
LAIeq	73.4 dB
LAeq	71.8 dB
LAIeq - LAeq	1.6 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	71.8		79.4			
Ls(max)	87.8	2019/10/15 13:18:53				
Ls(min)	57.6	2019/10/15 13:26:07				
LPeak(max)					108.3	2019/10/15 13:18:54

# Overloads	0
Overload Duration	0.0 s

Summary

File Name on Meter	LxT_Data.032
File Name on PC	SLM_0004435_LxT_Data_032.00.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.302
User	C. Sanchez
Location	ST-4: ECR Milbrae Ave
Job Description	SFO
Note	

Measurement

Description	
Start	2019-10-15 11:40:57
Stop	2019-10-15 12:00:58
Duration	00:20:01.0
Run Time	00:20:01.0
Pause	00:00:00.0
Pre Calibration	2019-10-15 10:16:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Linear			
Overload	142.7 dB			
	A	**C**	**Z**	
Under Range Peak	98.9	95.9	**100.9**	dB
Under Range Limit	**47.9**	45.9	53.9	dB
Noise Floor	34.8	35.4	43.0	dB

Results

LAeq	68.1 dB	
LAE	98.9 dB	
EA	863.143 µPa²h	
EA8	20.698 mPa²h	
EA40	103.491 mPa²h	
LZpeak (max)	2019-10-15 11:44:55	101.2 dB
LASmax	2019-10-15 11:44:56	79.6 dB
LASmin	2019-10-15 11:56:23	57.6 dB
SEA	-99.9 dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LCeq	75.7 dB
LAeq	68.1 dB
LCeq - LAeq	7.5 dB
LAIeq	69.2 dB
LAeq	68.1 dB
LAIeq - LAeq	1.1 dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	68.1		75.7			
Ls(max)	79.6	2019/10/15 11:44:56				
Ls(min)	57.6	2019/10/15 11:56:23				
LPeak(max)					101.2	2019/10/15 11:44:55

# Overloads	0
Overload Duration	0.0 s

Summary

File Name on Meter	831_Data.049
File Name on PC	SLM_0002783_831_Data_049.00.ldbin
Serial Number	0002783
Model	Model 831
Firmware Version	2.403
User	C. Sanchez
Location	Safe Harbor Shelter
Job Description	SFO SPP
Note	

Measurement

Description	
Start	2021-05-21 10:05:27
Stop	2021-05-21 10:25:28
Duration	00:20:01.1
Run Time	00:20:01.1
Pause	00:00:00.0
Pre Calibration	2021-05-21 08:58:57
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRM831			
Microphone Correction	Off			
Integration Method	Linear			
OBA Range	Low			
OBA Bandwidth	1/1 and 1/3			
OBA Freq. Weighting	Z Weighting			
OBA Max Spectrum	Bin Max			
Gain	0.0	dB		
Overload	144.4	dB		
	A	**C**	**Z**	
Under Range Peak	76.9	73.9	**78.9**	dB
Under Range Limit	**26.6**	27.0	32.9	dB
Noise Floor	17.4	17.9	23.3	dB

Results

LAeq	58.6		
LAE	89.4		
EA	97.539 µPa²h		
LZpeak (max)	2021-05-21 10:22:41	118.7	dB
LASmax	2021-05-21 10:08:10	72.2	dB
LASmin	2021-05-21 10:14:14	52.9	dB
SEA	-99.9 dB		
LAS > 65.0 dB (Exceedance Counts / Duration)	6	40.0	s
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**
	58.6	58.6	-99.9	58.6	58.6	-99.9

LCeq	80.2	dB
LAeq	58.6	dB
LCeq - LAeq	21.6	dB
LAIeq	62.4	dB
LAeq	58.6	dB
LAIeq - LAeq	3.8	dB

Record #	Record Type	Date	Time	LAeq	LASmax	LASmin	OVLD	Marker
1	Run	2021-05-21	10:05:27					
2		2021-05-21	10:05:27	60.0	70.2	55.3	No	
3		2021-05-21	10:06:27	56.5	61.1	53.3	No	
4		2021-05-21	10:07:27	64.6	72.2	55.2	No	
5		2021-05-21	10:08:27	58.8	65.5	53.5	No	
6		2021-05-21	10:09:27	58.0	64.5	55.3	No	
7		2021-05-21	10:10:27	58.1	63.5	55.0	No	
8		2021-05-21	10:11:27	57.9	63.6	54.5	No	
9		2021-05-21	10:12:27	57.5	64.3	53.1	No	
10		2021-05-21	10:13:27	54.8	58.4	52.9	No	
11		2021-05-21	10:14:27	55.5	58.8	53.6	No	
12		2021-05-21	10:15:27	58.5	62.6	54.2	No	
13		2021-05-21	10:16:27	57.3	61.8	54.2	No	
14		2021-05-21	10:17:27	56.2	58.6	53.6	No	
15		2021-05-21	10:18:27	56.0	60.3	53.8	No	
16		2021-05-21	10:19:27	57.3	60.3	54.9	No	
17		2021-05-21	10:20:27	58.2	63.2	54.3	No	
18		2021-05-21	10:21:27	56.1	59.9	54.0	No	
19		2021-05-21	10:22:27	56.9	60.1	53.5	No	
20		2021-05-21	10:23:27	62.5	70.0	54.3	No	
21		2021-05-21	10:24:27	56.8	65.5	53.3	No	
22		2021-05-21	10:25:27	61.1	61.4	60.3	No	
23	Stop	2021-05-21	10:25:28					

Summary

File Name on Meter	LxT_Data.110		
File Name on PC	SLM_0004435_LxT_Data_110.00.ldbin		
Serial Number	0004435		
Model	SoundTrack LxT®		
Firmware Version	2.404		
User	C. Sanchez		
Location	350 Bay Street Millbrae		
Job Description	SFO SPP		
Note			

Measurement

Description			
Start	2021-07-01 10:32:59		
Stop	2021-07-01 10:53:00		
Duration	00:20:01.1		
Run Time	00:20:01.1		
Pause	00:00:00.0		
Pre Calibration	2021-07-01 10:31:05		
Post Calibration	None		
Calibration Deviation	---		

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	143.6 dB			
	A	**C**	**Z**	
Under Range Peak	99.8	96.8	**101.8**	dB
Under Range Limit	**38.2**	37.7	44.5	dB
Noise Floor	29.0	28.6	35.4	dB

Results

LASeq	63.6	
LASE	94.3	
EAS	302.349 µPa²h	
EAS8	7.250 mPa²h	
EAS40	36.249 mPa²h	
LZSpeak (max)	2021-07-01 10:41:51	101.3 dB
LASmax	2021-07-01 10:41:03	69.4 dB
LASmin	2021-07-01 10:45:37	57.8 dB
SEA	-99.94 dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LCSeq	72.3 dB
LASeq	63.6 dB
LCSeq - LASeq	8.7 dB
LAIeq	64.3 dB
LAeq	63.6 dB
LAIeq - LAeq	0.8 dB

Record #	Record Type	Date	Time	LASeq	LASmax	LASmin	OVLD	Marker
1	Calibration Change	2021-07-01	10:31:05					
2	Run	2021-07-01	10:32:59					
3		2021-07-01	10:32:59	63.9	66.8	62.1	No	
4		2021-07-01	10:33:59	63.3	66.3	58.8	No	
5		2021-07-01	10:34:59	63.3	65.7	60.6	No	
6		2021-07-01	10:35:59	64.3	65.3	62.6	No	
7		2021-07-01	10:36:59	64.3	66.5	62.6	No	
8		2021-07-01	10:37:59	64.0	66.1	60.7	No	
9		2021-07-01	10:38:59	62.3	64.1	59.8	No	
10		2021-07-01	10:39:59	63.4	67.2	60.5	No	
11		2021-07-01	10:40:59	64.8	69.4	61.7	No	
12		2021-07-01	10:41:59	63.2	65.1	61.2	No	
13		2021-07-01	10:42:59	62.3	64.8	58.8	No	
14		2021-07-01	10:43:59	62.6	64.0	60.2	No	
15		2021-07-01	10:44:59	62.9	65.8	57.8	No	
16		2021-07-01	10:45:59	63.4	65.8	60.8	No	
17		2021-07-01	10:46:59	63.2	65.1	61.3	No	
18		2021-07-01	10:47:59	64.3	67.1	59.4	No	
19		2021-07-01	10:48:59	63.2	66.4	59.0	No	
20		2021-07-01	10:49:59	63.9	66.2	62.1	No	
21		2021-07-01	10:50:59	64.2	66.3	62.1	No	
22		2021-07-01	10:51:59	63.0	64.5	61.0	No	
23		2021-07-01	10:52:59	63.2	63.2	63.1	No	
24	Stop	2021-07-01	10:53:00					

Summary			
File Name on Meter	LxT_Data.111		
File Name on PC	SLM_0004435_LxT_Data_111.00.ldbin		
Serial Number	0004435		
Model	SoundTrack LxT®		
Firmware Version	2.404		
User	C. Sanchez		
Location	740 San Antonio Avenue San Bruno		
Job Description	SFO SPP		
Note			

Measurement		
Description		
Start	2021-07-01 11:06:56	
Stop	2021-07-01 11:26:57	
Duration	00:20:01.2	
Run Time	00:20:01.2	
Pause	00:00:00.0	
Pre Calibration	2021-07-01 10:31:04	
Post Calibration	None	
Calibration Deviation	---	

Overall Settings				
RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	143.6 dB			
	A	**C**	**Z**	
Under Range Peak	99.8	96.8	**101.8**	dB
Under Range Limit	**38.2**	37.7	44.5	dB
Noise Floor	29.0	28.6	35.4	dB

Results			
LASeq	60.1		
LASE	90.9		
EAS	136.465 µPa²h		
EAS8	3.272 mPa²h		
EAS40	16.359 mPa²h		
LZSpeak (max)	2021-07-01 11:21:28	101.6 dB	
LASmax	2021-07-01 11:12:16	78.2 dB	
LASmin	2021-07-01 11:26:00	44.7 dB	
SEA	-99.94 dB		
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LCSeq	70.7 dB		
LASeq	60.1 dB		
LCSeq - LASeq	10.6 dB		
LAIeq	62.8 dB		
LAeq	60.1 dB		
LAIeq - LAeq	2.7 dB		

Record #	Record Type	Date	Time	LASeq	LASmax	LASmin	OVLD	Marker
1	Run	2021-07-01	11:06:56					
2		2021-07-01	11:06:56	50.8	55.3	46.7	No	
3		2021-07-01	11:07:56	62.5	73.1	45.8	No	
4		2021-07-01	11:08:56	54.4	67.2	45.7	No	
5		2021-07-01	11:09:56	48.5	60.8	45.3	No	
6		2021-07-01	11:10:56	54.7	63.8	48.3	No	
7		2021-07-01	11:11:56	67.0	78.2	48.8	No	
8		2021-07-01	11:12:56	61.7	73.5	46.7	No	
9		2021-07-01	11:13:56	57.1	69.3	46.2	No	
10		2021-07-01	11:14:56	48.6	56.2	46.1	No	
11		2021-07-01	11:15:56	48.7	54.4	46.4	No	
12		2021-07-01	11:16:56	55.3	66.2	47.1	No	
13		2021-07-01	11:17:56	53.2	62.8	46.8	No	
14		2021-07-01	11:18:56	63.3	72.2	46.6	No	
15		2021-07-01	11:19:56	60.3	73.0	45.5	No	
16		2021-07-01	11:20:56	48.2	50.5	46.1	No	
17		2021-07-01	11:21:56	47.7	53.7	46.2	No	
18		2021-07-01	11:22:56	63.2	72.2	47.0	No	
19		2021-07-01	11:23:56	62.1	72.4	48.3	No	
20		2021-07-01	11:24:56	62.6	72.1	45.6	No	
21		2021-07-01	11:25:56	61.5	76.1	44.7	No	
22		2021-07-01	11:26:56	47.2	47.3	47.1	No	
23	Stop	2021-07-01	11:26:57					

Location ID	Date Time	Hour	Uptime	Aircraft Leq	Aircraft Leq Count	Local Leq	Local Leq Count	Community Leq	Community Leq Count	Total Leq	Mixed Leq	Mixed Leq Count	Non Local Leq	Non Local Leq Count
1	10/14/2019 0:00	0	3600	68.5	4	68.5	4	58	0	68.8	0	0	0	0
1	10/14/2019 1:00	1	3600	69.7	7	69.7	7	57	0	69.9	0	0	0	0
1	10/14/2019 2:00	2	3600	66.9	2	66.9	2	57.5	0	67.3	0	0	0	0
1	10/14/2019 3:00	3	3600	63.7	2	63.7	2	59.3	0	65	0	0	0	0
1	10/14/2019 4:00	4	3600	55	4	55	4	61.4	0	62.2	0	0	0	0
1	10/14/2019 5:00	5	3600	65.6	2	65.6	2	63.1	5	67.5	0	0	0	0
1	10/14/2019 6:00	6	3600	53.7	2	53.7	2	65.1	10	64.4	0	0	0	0
1	10/14/2019 7:00	7	3600	63.6	5	63.6	5	65.1	14	66.9	0	0	0	0
1	10/14/2019 8:00	8	3600	60.5	4	60.5	4	63.1	8	64.9	0	0	0	0
1	10/14/2019 9:00	9	3600	65.7	10	65.7	10	63.1	2	67.5	0	0	0	0
1	10/14/2019 10:00	10	3600	52.8	1	52.8	1	62.2	0	62.7	0	0	0	0
1	10/14/2019 11:00	11	3600	69	12	69	12	62	0	69.8	0	0	0	0
1	10/14/2019 12:00	12	3600	68.8	6	68.8	6	61.5	0	69.5	0	0	0	0
1	10/14/2019 13:00	13	3600	69.6	7	69.6	7	62.7	2	70.4	0	0	0	0
1	10/14/2019 14:00	14	3600	66.9	12	66.9	12	64.2	13	68.6	0	0	0	0
1	10/14/2019 15:00	15	3600	68.8	14	68.8	14	63.8	7	69.9	0	0	0	0
1	10/14/2019 16:00	16	3600	66.4	11	66.4	11	63.5	1	68.1	0	0	0	0
1	10/14/2019 17:00	17	3600	71.5	13	71.5	12	63.2	1	72	0	0	40.6	1
1	10/14/2019 18:00	18	3600	65.1	12	65.1	12	64.1	8	67.4	0	0	0	0
1	10/14/2019 19:00	19	3600	64.8	14	64.8	14	63.9	6	67.6	0	0	0	0
1	10/14/2019 20:00	20	3600	68.1	13	68.1	13	63.8	6	69.1	0	0	0	0
1	10/14/2019 21:00	21	3600	65.9	15	65.9	15	63.6	9	67.8	0	0	0	0
1	10/14/2019 22:00	22	3600	55	5	55	5	62.8	9	63.3	0	0	0	0
1	10/14/2019 23:00	23	3600	64.8	7	64.8	6	62.2	5	66.6	0	0	43	1
1	10/15/2019 0:00	0	3600	69.5	5	69.5	5	58.9	1	69.9	0	0	0	0
1	10/15/2019 1:00	1	3600	70.8	5	70.8	5	56.6	0	71	0	0	0	0
1	10/15/2019 2:00	2	3600	60	1	60	1	55.8	2	61.5	0	0	0	0
1	10/15/2019 3:00	3	3600	60	2	60	2	55.8	0	61.4	0	0	0	0
1	10/15/2019 4:00	4	3600	0	0	0	0	58.8	0	58.8	0	0	0	0
1	10/15/2019 5:00	5	3600	66.3	3	66.3	3	63.3	3	68	0	0	0	0
1	10/15/2019 6:00	6	3600	57.7	4	57.7	4	63	4	64	0	0	0	0
1	10/15/2019 7:00	7	3600	0	0	0	0	62.6	0	62.6	0	0	0	0
1	10/15/2019 8:00	8	3600	59.6	2	59.6	2	61.9	3	63.8	0	0	0	0
1	10/15/2019 9:00	9	3600	64.3	5	64.3	5	62.1	3	66.3	0	0	0	0
1	10/15/2019 10:00	10	3600	60.9	5	60.9	5	63.7	17	65.3	0	0	0	0
1	10/15/2019 11:00	11	3600	68.6	12	68.6	12	63	4	69.6	0	0	0	0
1	10/15/2019 12:00	12	3600	68.7	7	68.7	7	62.5	0	69.6	0	0	0	0
1	10/15/2019 13:00	13	3600	68.3	7	68.3	7	61.8	2	69.2	0	0	0	0
1	10/15/2019 14:00	14	3600	68.8	8	68.8	7	61.7	0	69.5	0	0	44	1
1	10/15/2019 15:00	15	3600	69.4	12	69.4	11	61.2	0	70	0	0	42.5	1
1	10/15/2019 16:00	16	3600	67.8	5	67.8	5	61.4	1	68.7	0	0	0	0
1	10/15/2019 17:00	17	3600	69.6	11	69.6	10	63.9	5	70.6	0	0	40.3	1
1	10/15/2019 18:00	18	3600	66.5	19	66.3	16	65.4	18	68.3	0	0	53.1	4
1	10/15/2019 19:00	19	3600	65.1	12	65.1	12	64.6	13	67.6	0	0	0	0
1	10/15/2019 20:00	20	3600	68.3	9	68.3	9	63.2	6	69.4	0	0	0	0
1	10/15/2019 21:00	21	3600	66.8	5	66.8	5	63.1	5	68.3	0	0	0	0
1	10/15/2019 22:00	22	3600	70	3	70	3	63.4	4	70.8	0	0	0	0
1	10/15/2019 23:00	23	3600	70.4	5	70.4	5	61.7	1	70.9	0	0	0	0
1	10/16/2019 0:00	0	3600	68.2	3	68.2	3	58.3	0	68.6	0	0	0	0
1	10/16/2019 1:00	1	3600	70.4	6	70.4	6	59.5	1	70.8	0	0	0	0
1	10/16/2019 2:00	2	3600	65	1	65	1	59.8	0	66.2	0	0	0	0
1	10/16/2019 3:00	3	3600	63.8	1	63.8	1	64.2	11	66.7	0	0	0	0
1	10/16/2019 4:00	4	3600	0	0	0	0	66.3	24	65.1	0	0	0	0
1	10/16/2019 5:00	5	3600	49.7	4	49.7	4	62.4	3	62.5	0	0	0	0
1	10/16/2019 6:00	6	3600	44.3	1	44.3	1	63.3	0	63.3	0	0	0	0
1	10/16/2019 7:00	7	3600	59.1	2	59.1	2	63.4	2	64.7	0	0	0	0
1	10/16/2019 8:00	8	3600	62.6	4	62.6	4	61.8	1	65.2	0	0	0	0
1	10/16/2019 9:00	9	3600	63.4	3	63.4	3	62.8	0	66.1	0	0	0	0
1	10/16/2019 10:00	10	3600	46	2	42	1	62.3	0	62.4	0	0	43.8	1
1	10/16/2019 11:00	11	3600	69.4	9	69.4	9	62	1	70	0	0	0	0
1	10/16/2019 12:00	12	3600	66.9	5	66.9	5	61.7	0	68	0	0	0	0
1	10/16/2019 13:00	13	3600	69.7	12	69.7	12	61.6	0	70.5	0	0	0	0
1	10/16/2019 14:00	14	3600	66.7	7	66.7	7	62.7	1	67.8	0	0	0	0
1	10/16/2019 15:00	15	3600	68.6	10	68.6	10	62.4	0	69.5	0	0	0	0
1	10/16/2019 16:00	16	3600	66.7	5	66.7	5	62.2	1	68	0	0	0	0
1	10/16/2019 17:00	17	3600	69	8	69	8	61.1	0	69.6	0	0	0	0
1	10/16/2019 18:00	18	3600	62.9	4	62.9	4	60.2	0	65	0	0	0	0
1	10/16/2019 19:00	19	3600	66.2	5	66.2	5	61.1	0	67.3	0	0	0	0
1	10/16/2019 20:00	20	3600	67.4	8	67.4	8	61.3	0	68.3	0	0	0	0
1	10/16/2019 21:00	21	3600	65.9	5	65.9	5	60	0	66.8	0	0	0	0
1	10/16/2019 22:00	22	3600	69.9	2	69.9	2	59.2	0	70.3	0	0	0	0
1	10/16/2019 23:00	23	3600	69.5	7	69.5	7	57.8	0	69.8	0	0	0	0
1	10/17/2019 0:00	0	3600	66.9	3	66.9	3	55.9	0	67.3	0	0	0	0
1	10/17/2019 1:00	1	3600	67.9	7	67.9	7	54.1	0	68.1	0	0	0	0
1	10/17/2019 2:00	2	3600	65	1	65	1	54.3	0	65.4	0	0	0	0
1	10/17/2019 3:00	3	3600	61.9	1	61.9	1	53.9	0	62.6	0	0	0	0
1	10/17/2019 4:00	4	3600	45.8	1	45.8	1	58.9	0	59.1	0	0	0	0
1	10/17/2019 5:00	5	3600	0	0	0	0	63	0	63	0	0	0	0
1	10/17/2019 6:00	6	3600	50	4	50	4	64.3	10	64.2	0	0	0	0
1	10/17/2019 7:00	7	3600	57.6	4	57.6	4	63.5	1	64.4	0	0	0	0
1	10/17/2019 8:00	8	3600	62.8	6	62.8	6	62.7	0	65.7	0	0	0	0
1	10/17/2019 9:00	9	3600	62.8	8	62.7	7	62.7	4	65.6	0	0	43.8	1
1	10/17/2019 10:00	10	3588	53.2	5	51.3	3	64.1	7	64.2	0	0	48.7	2
1	10/17/2019 11:00	11	3600	67.7	12	67.7	12	63.3	2	68.9	0	0	0	0
1	10/17/2019 12:00	12	3600	67	13	67	13	63.9	4	68.5	0	0	0	0
1	10/17/2019 13:00	13	3600	69.6	11	69.6	11	63.9	7	70.5	0	0	0	0
1	10/17/2019 14:00	14	3587	65.3	12	65.3	11	64.9	7	67.8	0	0	44.5	1
1	10/17/2019 15:00	15	3600	70.6	29	70.6	29	64.7	9	71.1	0	0	0	0
1	10/17/2019 16:00	16	3500	68.1	34	68.1	34	61.6	5	68.9	0	0	0	0
1	10/17/2019 17:00	17	3589	70.3	32	70.3	32	63.7	1	70.9	0	0	0	0
1	10/17/2019 18:00	18	3600	68	31	68	31	63.5	2	69	0	0	0	0
1	10/17/2019 19:00	19	3600	68.3	30	68.3	30	63.6	1	69.3	0	0	0	0
1	10/17/2019 20:00	20	3600	69.2	30	69.2	30	62.8	0	69.9	0	0	0	0
1	10/17/2019 21:00	21	3600	61.5	8	61.5	8	62.3	0	64.8	0	0	0	0
1	10/17/2019 22:00	22	3600	60.2	4	60.2	4	62.4	1	64.4	0	0	0	0
1	10/17/2019 23:00	23	3600	69.6	10	69.6	10	61.2	0	70.1	0	0	0	0
1	10/18/2019 0:00	0	3600	65.3	3	65.3	3	58.4	0	66.1	0	0	0	0
1	10/18/2019 1:00	1	3600	68.3	5	68.3	5	55.6	0	68.5	0	0	0	0
1	10/18/2019 2:00	2	3600	50.2	1	50.2	1	56.8	0	57.7	0	0	0	0
1	10/18/2019 3:00	3	3600	63.1	2	63.1	2	58.9	0	64.5	0	0	0	0

1	10/18/2019 4:00	4	3600	0	0	0	0	59.2	0	59.2	0	0	0	0
1	10/18/2019 5:00	5	3600	56.4	2	56.4	2	63.1	2	63.8	0	0	0	0
1	10/18/2019 6:00	6	3600	48.1	1	48.1	1	63.7	5	63.8	0	0	0	0
1	10/18/2019 7:00	7	3600	57.7	4	57.7	4	64.1	6	64.8	0	0	0	0
1	10/18/2019 8:00	8	3600	63.5	9	63.5	9	63.8	7	66.4	0	0	0	0
1	10/18/2019 9:00	9	3600	61.1	4	61.1	4	63.2	1	65.2	0	0	0	0
1	10/18/2019 10:00	10	3600	58.5	2	58.5	2	62.1	0	63.6	0	0	0	0
1	10/18/2019 11:00	11	3600	67.6	7	67.6	7	60.8	0	68.4	0	0	0	0
1	10/18/2019 12:00	12	3600	69.8	11	69.8	11	60.9	1	70.3	0	0	0	0
1	10/18/2019 13:00	13	3600	69.5	7	69.5	7	60.3	0	70	0	0	0	0
1	10/18/2019 14:00	14	3600	67.9	6	67.9	6	61	0	68.7	0	0	0	0
1	10/18/2019 15:00	15	3600	67.4	7	67.4	7	61.9	0	68.4	0	0	0	0
1	10/18/2019 16:00	16	3600	67.2	10	67.1	9	61.7	0	68.2	0	0	42	1
1	10/18/2019 17:00	17	3600	69.6	7	69.6	7	62.2	0	70.3	0	0	0	0
1	10/18/2019 18:00	18	3600	64.1	7	64	5	62.6	3	66.3	0	0	43.5	2
1	10/18/2019 19:00	19	3600	66.5	7	66.5	7	61.8	0	67.8	0	0	0	0
1	10/18/2019 20:00	20	3600	64.1	7	64	7	62.2	0	66.2	0	0	38.7	1
1	10/18/2019 21:00	21	3600	61.7	3	61.7	3	62	1	64.8	0	0	0	0
1	10/18/2019 22:00	22	3600	68	3	68	3	61.4	0	68.8	0	0	0	0
1	10/18/2019 23:00	23	3600	63.8	6	63.8	6	60.1	0	65.3	0	0	0	0
1	10/19/2019 0:00	0	3600	68.5	6	68.5	6	58.3	0	68.9	0	0	0	0
1	10/19/2019 1:00	1	3600	70	7	70	7	56.4	0	70.2	0	0	0	0
1	10/19/2019 2:00	2	3600	66.2	1	66.2	1	55.3	0	66.6	0	0	0	0
1	10/19/2019 3:00	3	3600	0	0	0	0	56.1	0	56.1	0	0	0	0
1	10/19/2019 4:00	4	3600	61.8	1	61.8	1	57	0	63.1	0	0	0	0
1	10/19/2019 5:00	5	3600	53.8	1	53.8	1	58.3	0	59.7	0	0	0	0
1	10/19/2019 6:00	6	3600	43.7	1	43.7	1	59.8	0	60	0	0	0	0
1	10/19/2019 7:00	7	3600	57.1	2	57.1	2	61.5	0	62.8	0	0	0	0
1	10/19/2019 8:00	8	3600	64.5	9	64.5	9	62.3	2	66.4	0	0	0	0
1	10/19/2019 9:00	9	3600	64.9	4	64.9	4	61.6	0	66.5	0	0	0	0
1	10/19/2019 10:00	10	3600	59.5	4	58.9	1	61.3	0	63.5	0	0	50.4	3
1	10/19/2019 11:00	11	3600	70.8	10	70.8	10	61.2	0	71.2	0	0	0	0
1	10/19/2019 12:00	12	3600	71.6	7	71.6	7	60.4	0	71.9	0	0	0	0
1	10/19/2019 13:00	13	3600	69.8	7	69.8	7	59.8	0	70.2	0	0	0	0
1	10/19/2019 14:00	14	3600	70.8	13	70.8	12	60.4	0	71.2	0	0	45	1
1	10/19/2019 15:00	15	3600	71.4	11	71.4	11	60.1	0	71.7	0	0	0	0
1	10/19/2019 16:00	16	3600	68.7	6	68.7	6	61.5	0	69.4	0	0	0	0
1	10/19/2019 17:00	17	3600	69.2	6	69.2	6	62.1	0	70	0	0	0	0
1	10/19/2019 18:00	18	3600	67.7	5	67.7	5	61.7	0	68.7	0	0	0	0
1	10/19/2019 19:00	19	3600	64.9	3	64.9	3	60.9	0	66.3	0	0	0	0
1	10/19/2019 20:00	20	3600	68.8	7	68.8	7	60.8	1	69.4	0	0	0	0
1	10/19/2019 21:00	21	3600	71.2	5	71.2	5	61.9	0	71.7	0	0	0	0
1	10/19/2019 22:00	22	3600	43.6	1	43.6	1	64.1	1	64.1	0	0	0	0
1	10/19/2019 23:00	23	3600	70.6	6	70.6	6	61	1	71	0	0	0	0
1	10/20/2019 0:00	0	3600	67.5	4	67.5	4	58.7	0	68	0	0	0	0
1	10/20/2019 1:00	1	3600	70.7	6	70.7	6	59.1	0	71	0	0	0	0
1	10/20/2019 2:00	2	3600	0	0	0	0	60.7	2	60.7	0	0	0	0
1	10/20/2019 3:00	3	3600	62.8	2	62.8	2	61.6	3	65.2	0	0	0	0
1	10/20/2019 4:00	4	3600	0	0	0	0	62.3	2	62.3	0	0	0	0
1	10/20/2019 5:00	5	3600	42.6	1	42.6	1	63.4	9	63	0	0	0	0
1	10/20/2019 6:00	6	3600	50.9	2	50.9	2	62.5	5	62.6	0	0	0	0
1	10/20/2019 7:00	7	3600	60.3	9	60.3	9	64	5	65.2	0	0	0	0
1	10/20/2019 8:00	8	3600	61.8	10	61.8	10	63.9	10	65.7	0	0	0	0
1	10/20/2019 9:00	9	3600	63.5	3	63.5	3	61	1	65.4	0	0	0	0
1	10/20/2019 10:00	10	3600	62.1	3	62.1	3	61.4	0	64.8	0	0	0	0
1	10/20/2019 11:00	11	3600	70.5	11	70.5	11	61.6	0	71	0	0	0	0
1	10/20/2019 12:00	12	3600	68	7	68	7	60.4	0	68.7	0	0	0	0
1	10/20/2019 13:00	13	3600	67.2	6	67.2	6	60.7	0	68.1	0	0	0	0
1	10/20/2019 14:00	14	3600	67.8	8	67.7	6	61.9	0	68.7	0	0	47	2
1	10/20/2019 15:00	15	3600	69	10	69	10	61.9	0	69.7	0	0	0	0
1	10/20/2019 16:00	16	3600	67.1	5	67.1	5	63.1	2	68.5	0	0	0	0
1	10/20/2019 17:00	17	3600	65.5	7	65.5	6	63.3	2	67.4	0	0	41.1	1
1	10/20/2019 18:00	18	3600	66.5	10	66.5	10	62.5	1	67.9	0	0	39.4	1
1	10/20/2019 19:00	19	3600	67.1	3	67.1	3	62	0	68.3	0	0	0	0
1	10/20/2019 20:00	20	3600	67.7	10	67.7	10	62.5	4	68.8	0	0	41.8	1
1	10/20/2019 21:00	21	3600	67.9	8	67.9	7	63.2	8	69.1	0	0	40.7	1
1	10/20/2019 22:00	22	3600	68.7	4	68.7	4	61.8	3	69.6	0	0	0	0
1	10/20/2019 23:00	23	3600	68.8	7	68.8	7	62.5	10	69.7	0	0	0	0
5	10/14/2019 0:00	0	3600	62.8	4	62.8	4	52.3	0	63.2	0	0	0	0
5	10/14/2019 1:00	1	3600	64.4	6	64.4	6	52	0	64.7	0	0	0	0
5	10/14/2019 2:00	2	3600	58.3	2	58.3	2	53.6	0	59.6	0	0	0	0
5	10/14/2019 3:00	3	3600	54.5	2	54.5	2	55	0	57.7	0	0	0	0
5	10/14/2019 4:00	4	3600	48.7	3	48.7	3	57.1	0	57.7	0	0	0	0
5	10/14/2019 5:00	5	3600	56.7	2	56.7	2	57.2	0	60	0	0	0	0
5	10/14/2019 6:00	6	3600	40.2	1	40.2	1	60	2	60	0	0	0	0
5	10/14/2019 7:00	7	3600	56.3	4	56.3	4	60.9	2	62.1	0	0	0	0
5	10/14/2019 8:00	8	3600	53.1	2	53.1	2	58.7	1	59.8	0	0	0	0
5	10/14/2019 9:00	9	3600	59.4	8	59.4	8	55.4	0	60.8	0	0	0	0
5	10/14/2019 10:00	10	3600	44.2	1	44.2	1	53.8	0	54.3	0	0	0	0
5	10/14/2019 11:00	11	3600	62.8	11	62.8	11	55.5	0	63.5	0	0	0	0
5	10/14/2019 12:00	12	3600	63.7	4	63.7	4	54.9	0	64.3	0	0	0	0
5	10/14/2019 13:00	13	3600	65.2	6	65.2	6	55.3	0	65.6	0	0	0	0
5	10/14/2019 14:00	14	3600	60.8	5	60.8	5	58.2	1	62.7	0	0	0	0
5	10/14/2019 15:00	15	3600	63.1	9	63.1	9	58.7	2	64.4	0	0	0	0
5	10/14/2019 16:00	16	3600	61.3	6	61.3	6	57.9	0	62.9	0	0	0	0
5	10/14/2019 17:00	17	3600	64	9	64	9	58.9	0	65.1	0	0	0	0
5	10/14/2019 18:00	18	3600	58.3	5	58.3	5	58.9	1	61.6	0	0	0	0
5	10/14/2019 19:00	19	3600	58.5	7	58.5	7	58.7	1	61.8	0	0	0	0
5	10/14/2019 20:00	20	3600	62.6	7	62.6	7	59.1	2	64	0	0	0	0
5	10/14/2019 21:00	21	3600	59.1	9	59.1	9	59.2	5	62	0	0	0	0
5	10/14/2019 22:00	22	3600	47.1	2	47.1	2	58.3	3	58.6	0	0	0	0
5	10/14/2019 23:00	23	3600	58.6	5	58.6	5	59.1	2	61.8	0	0	0	0
5	10/15/2019 0:00	0	3600	62.8	5	62.8	5	55.4	0	63.5	0	0	0	0
5	10/15/2019 1:00	1	3600	64.8	5	64.8	5	53.4	0	65.2	0	0	0	0
5	10/15/2019 2:00	2	3600	55	1	55	1	49.8	0	56.2	0	0	0	0
5	10/15/2019 3:00	3	3600	51.3	2	51.3	2	50.2	0	53.9	0	0	0	0
5	10/15/2019 4:00	4	3600	0	0	0	0	52.4	0	52.4	0	0	0	0
5	10/15/2019 5:00	5	3600	57.7	3	57.7	3	56.8	1	60.3	0	0	0	0
5	10/15/2019 6:00	6	3600	50.7	3	50.7	3	57.5	1	58.3	0	0	0	0
5	10/15/2019 7:00	7	3600	0	0	0	0	54.7	0	54.7	0	0	0	0
5	10/15/2019 8:00	8	3600	53.4	2	53.4	2	54.5	1	57	0	0	0	0

5	10/15/2019 9:00	9	3600	58.5	6	58.5	6	54.7	1	60	0	0	0	0
5	10/15/2019 10:00	10	3600	54	2	54	2	54.4	0	57.2	0	0	0	0
5	10/15/2019 11:00	11	3600	61.8	8	61.8	8	56.5	1	62.9	0	0	0	0
5	10/15/2019 12:00	12	3600	63.2	6	63.2	6	55.4	0	63.8	0	0	0	0
5	10/15/2019 13:00	13	3600	63.5	5	63.5	5	55.5	0	64.1	0	0	0	0
5	10/15/2019 14:00	14	3600	63.6	9	63.6	9	54.1	0	64	0	0	0	0
5	10/15/2019 15:00	15	3600	62.7	10	62.7	10	55	0	63.4	0	0	0	0
5	10/15/2019 16:00	16	3600	60.7	4	60.7	4	54.5	0	61.7	0	0	0	0
5	10/15/2019 17:00	17	3600	63.3	6	63.3	6	59.2	1	64.7	0	0	0	0
5	10/15/2019 18:00	18	3600	60.1	5	60.1	5	60.5	4	63.2	0	0	0	0
5	10/15/2019 19:00	19	3600	58.2	7	58.2	7	59.3	1	61.7	0	0	0	0
5	10/15/2019 20:00	20	3600	63.7	7	63.7	7	58.3	3	64.8	0	0	0	0
5	10/15/2019 21:00	21	3600	61.1	3	61.1	3	58.8	1	63.1	0	0	0	0
5	10/15/2019 22:00	22	3600	59.3	3	59.3	3	59.6	1	62.4	0	0	0	0
5	10/15/2019 23:00	23	3600	63.7	5	63.7	5	58.6	0	64.8	0	0	0	0
5	10/16/2019 0:00	0	3600	63.1	3	63.1	3	55.1	0	63.7	0	0	0	0
5	10/16/2019 1:00	1	3600	65.6	6	65.6	6	53.4	0	65.9	0	0	0	0
5	10/16/2019 2:00	2	3600	56.5	1	56.5	1	47.7	0	57.1	0	0	0	0
5	10/16/2019 3:00	3	3600	55.5	1	55.5	1	50.6	0	56.7	0	0	0	0
5	10/16/2019 4:00	4	3600	0	0	0	0	52	0	52	0	0	0	0
5	10/16/2019 5:00	5	3600	0	0	0	0	55.3	0	55.3	0	0	0	0
5	10/16/2019 6:00	6	3600	41	1	41	1	57	1	57.1	0	0	0	0
5	10/16/2019 7:00	7	3600	55.2	3	55.2	3	58.4	2	60	0	0	0	0
5	10/16/2019 8:00	8	3600	58.7	5	58.7	5	55.8	1	60.5	0	0	0	0
5	10/16/2019 9:00	9	3600	58.7	3	58.7	3	55.7	1	60.5	0	0	0	0
5	10/16/2019 10:00	10	3600	50.7	1	50.7	1	57.2	1	58	0	0	0	0
5	10/16/2019 11:00	11	3600	62.9	9	62.9	9	54.6	0	63.5	0	0	0	0
5	10/16/2019 12:00	12	3600	62.4	4	62.4	4	54.1	0	63	0	0	0	0
5	10/16/2019 13:00	13	3600	64.5	8	64.5	8	56.7	1	65.2	0	0	0	0
5	10/16/2019 14:00	14	3600	60.7	6	60.7	6	55.9	0	61.7	0	0	0	0
5	10/16/2019 15:00	15	3600	62.5	8	62.5	8	56.1	1	63.4	0	0	0	0
5	10/16/2019 16:00	16	3600	60.8	5	60.8	5	55.9	0	62	0	0	0	0
5	10/16/2019 17:00	17	3600	62.6	7	62.6	7	56	0	63.5	0	0	0	0
5	10/16/2019 18:00	18	3600	56.5	3	56.5	3	55.3	1	58.9	0	0	0	0
5	10/16/2019 19:00	19	3600	61.1	5	61.1	5	55.2	0	62.1	0	0	0	0
5	10/16/2019 20:00	20	3600	62.6	7	62.6	7	55.2	0	63.3	0	0	0	0
5	10/16/2019 21:00	21	3600	61.2	4	61.2	4	54.1	0	62	0	0	0	0
5	10/16/2019 22:00	22	3600	60.6	2	60.6	2	52.5	0	61.2	0	0	0	0
5	10/16/2019 23:00	23	3600	62.5	6	62.5	6	54	1	63.1	0	0	0	0
5	10/17/2019 0:00	0	3600	60.7	3	60.7	3	51.4	1	61.2	0	0	0	0
5	10/17/2019 1:00	1	3600	62.4	6	62.4	6	50	0	62.7	0	0	0	0
5	10/17/2019 2:00	2	3600	55.9	1	55.9	1	50	0	56.9	0	0	0	0
5	10/17/2019 3:00	3	3600	52.8	1	52.8	1	46.4	0	53.8	0	0	0	0
5	10/17/2019 4:00	4	3600	0	0	0	0	51.2	0	51.2	0	0	0	0
5	10/17/2019 5:00	5	3600	0	0	0	0	56.1	1	56.1	0	0	0	0
5	10/17/2019 6:00	6	3600	53	2	53	2	58.1	1	59.2	0	0	0	0
5	10/17/2019 7:00	7	3600	53.6	3	53.6	3	57.7	0	59.1	0	0	0	0
5	10/17/2019 8:00	8	3600	58.2	3	58.2	3	57.5	0	60.8	0	0	0	0
5	10/17/2019 9:00	9	3600	58.2	4	58.2	4	57.2	0	60.7	0	0	0	0
5	10/17/2019 10:00	10	3600	41.1	1	41.1	1	57.4	0	57.5	0	0	0	0
5	10/17/2019 11:00	11	3600	62.7	10	62.7	10	56.9	0	63.7	0	0	0	0
5	10/17/2019 12:00	12	3600	62.6	8	62.6	8	57.1	0	63.6	0	0	0	0
5	10/17/2019 13:00	13	3600	65.7	9	65.7	9	57.7	0	66.3	0	0	0	0
5	10/17/2019 14:00	14	3600	60.7	3	60.7	3	57.4	0	62.3	0	0	0	0
5	10/17/2019 15:00	15	3600	66.1	27	66.1	27	59.3	1	66.8	0	0	0	0
5	10/17/2019 16:00	16	3600	63.2	24	63.2	24	59.9	3	64.7	0	0	0	0
5	10/17/2019 17:00	17	3600	64.9	28	64.9	28	59	1	65.8	0	0	0	0
5	10/17/2019 18:00	18	3600	64	22	64	22	59	2	65.1	0	0	0	0
5	10/17/2019 19:00	19	3600	64.5	21	64.5	21	58.4	0	65.4	0	0	0	0
5	10/17/2019 20:00	20	3600	65.4	28	65.4	28	58	0	66	0	0	0	0
5	10/17/2019 21:00	21	3600	59.1	6	59.1	6	56.5	0	61	0	0	0	0
5	10/17/2019 22:00	22	3600	56.8	4	56.8	4	56.2	0	59.5	0	0	0	0
5	10/17/2019 23:00	23	3600	65	10	65	10	56.1	0	65.5	0	0	0	0
5	10/18/2019 0:00	0	3600	59	3	59	3	54.8	0	60.4	0	0	0	0
5	10/18/2019 1:00	1	3600	61.5	5	61.5	5	52.4	0	62	0	0	0	0
5	10/18/2019 2:00	2	3600	0	0	0	0	52.2	1	52.2	0	0	0	0
5	10/18/2019 3:00	3	3600	55.5	2	55.5	2	52.9	0	57.4	0	0	0	0
5	10/18/2019 4:00	4	3600	0	0	0	0	52.8	0	52.8	0	0	0	0
5	10/18/2019 5:00	5	3600	49.3	2	49.3	2	58	1	58.5	0	0	0	0
5	10/18/2019 6:00	6	3600	0	0	0	0	58.8	2	58.8	0	0	0	0
5	10/18/2019 7:00	7	3600	52.9	2	52.9	2	58.3	0	59.4	0	0	0	0
5	10/18/2019 8:00	8	3600	57.8	4	57.8	4	57.7	2	60.8	0	0	0	0
5	10/18/2019 9:00	9	3600	55	2	55	2	56.9	2	59	0	0	0	0
5	10/18/2019 10:00	10	3600	52.5	2	52.5	2	55.2	0	57.1	0	0	0	0
5	10/18/2019 11:00	11	3600	62.1	7	62.1	7	54.8	0	62.8	0	0	0	0
5	10/18/2019 12:00	12	3600	63.9	10	63.9	10	54.8	0	64.3	0	0	0	0
5	10/18/2019 13:00	13	3600	64.2	7	64.2	7	53.8	0	64.7	0	0	0	0
5	10/18/2019 14:00	14	3600	61.7	6	61.7	6	54.7	0	62.4	0	0	0	0
5	10/18/2019 15:00	15	3600	62.5	6	62.5	6	56.5	0	63.4	0	0	0	0
5	10/18/2019 16:00	16	3600	61.6	6	61.6	6	56.4	0	62.7	0	0	0	0
5	10/18/2019 17:00	17	3600	62.6	5	62.6	5	56.6	0	63.5	0	0	0	0
5	10/18/2019 18:00	18	3600	59.7	5	59.7	5	57	0	61.6	0	0	0	0
5	10/18/2019 19:00	19	3600	60.7	6	60.7	6	56.2	0	62	0	0	0	0
5	10/18/2019 20:00	20	3600	59.1	3	59.1	3	56.6	0	61	0	0	0	0
5	10/18/2019 21:00	21	3600	57.5	3	57.5	3	56.3	1	59.9	0	0	0	0
5	10/18/2019 22:00	22	3600	59.8	2	59.8	2	55	0	61	0	0	0	0
5	10/18/2019 23:00	23	3600	59.3	6	59.3	6	53.6	0	60.4	0	0	0	0
5	10/19/2019 0:00	0	3600	64.3	6	64.3	6	51.6	0	64.5	0	0	0	0
5	10/19/2019 1:00	1	3600	65	7	65	7	51.7	0	65.2	0	0	0	0
5	10/19/2019 2:00	2	3600	57.6	1	57.6	1	51.4	0	58.5	0	0	0	0
5	10/19/2019 3:00	3	3600	0	0	0	0	50	0	50	0	0	0	0
5	10/19/2019 4:00	4	3600	53.2	1	53.2	1	50.6	0	55.2	0	0	0	0
5	10/19/2019 5:00	5	3600	49.9	1	49.9	1	52.2	0	54.3	0	0	0	0
5	10/19/2019 6:00	6	3600	0	0	0	0	53.4	0	53.4	0	0	0	0
5	10/19/2019 7:00	7	3600	52.8	2	52.8	2	56.2	0	57.8	0	0	0	0
5	10/19/2019 8:00	8	3600	59.4	6	59.4	6	57.2	1	61.4	0	0	0	0
5	10/19/2019 9:00	9	3600	58.5	4	58.5	4	54.1	0	59.9	0	0	0	0
5	10/19/2019 10:00	10	3600	52.2	1	52.2	1	54.3	0	56.4	0	0	0	0
5	10/19/2019 11:00	11	3600	64.1	10	64.1	10	54.5	0	64.5	0	0	0	0
5	10/19/2019 12:00	12	3600	65.1	7	65.1	7	53.9	0	65.4	0	0	0	0
5	10/19/2019 13:00	13	3600	64.2	8	64.2	8	54.4	0	64.7	0	0	0	0

5	10/19/2019 14:00	14	3600	63.8	11	63.8	11	56.3	0	64.5	0	0	0	0
5	10/19/2019 15:00	15	3600	64.7	11	64.7	11	54.9	0	65.2	0	0	0	0
5	10/19/2019 16:00	16	3600	60.2	4	60.2	4	56.2	1	61.6	0	0	0	0
5	10/19/2019 17:00	17	3600	62.2	6	62.2	6	55.5	0	63	0	0	0	0
5	10/19/2019 18:00	18	3600	59.8	4	59.8	4	55.7	0	61.2	0	0	0	0
5	10/19/2019 19:00	19	3600	59.6	3	59.6	3	54.5	0	60.8	0	0	0	0
5	10/19/2019 20:00	20	3600	64	7	64	7	54.6	0	64.4	0	0	0	0
5	10/19/2019 21:00	21	3600	61	4	61	4	55	0	62	0	0	0	0
5	10/19/2019 22:00	22	3600	0	0	0	0	54.6	0	54.6	0	0	0	0
5	10/19/2019 23:00	23	3600	64.1	6	64.1	6	57.8	4	65	0	0	0	0
5	10/20/2019 0:00	0	3600	62	4	62	4	56	2	63	0	0	0	0
5	10/20/2019 1:00	1	3600	65.7	6	65.7	6	55.5	0	66.1	0	0	0	0
5	10/20/2019 2:00	2	3600	0	0	0	0	54.2	0	54.2	0	0	0	0
5	10/20/2019 3:00	3	3600	54.1	2	54.1	2	56	0	58.2	0	0	0	0
5	10/20/2019 4:00	4	3600	0	0	0	0	55.6	0	55.6	0	0	0	0
5	10/20/2019 5:00	5	3600	42.7	1	42.7	1	57.7	0	57.8	0	0	0	0
5	10/20/2019 6:00	6	3600	0	0	0	0	59.2	0	59.2	0	0	0	0
5	10/20/2019 7:00	7	3600	55.2	3	55.2	3	60	0	61.2	0	0	0	0
5	10/20/2019 8:00	8	3600	57.3	5	57.3	5	60.8	1	62.3	0	0	0	0
5	10/20/2019 9:00	9	3600	57.4	3	57.4	3	52.6	0	58.6	0	0	0	0
5	10/20/2019 10:00	10	3600	56.3	3	56.3	3	52.9	0	57.9	0	0	0	0
5	10/20/2019 11:00	11	3600	63.4	10	63.4	10	54.4	0	64	0	0	0	0
5	10/20/2019 12:00	12	3600	63.4	7	63.4	7	53.8	0	63.8	0	0	0	0
5	10/20/2019 13:00	13	3600	63.1	6	63.1	6	54.3	0	63.7	0	0	0	0
5	10/20/2019 14:00	14	3600	62.5	7	62.5	6	55.7	0	63.3	0	0	42.7	1
5	10/20/2019 15:00	15	3600	62.7	10	62.7	10	56.4	0	63.6	0	0	0	0
5	10/20/2019 16:00	16	3600	60.6	3	60.6	3	56.4	0	62	0	0	0	0
5	10/20/2019 17:00	17	3600	60.1	4	60.1	4	57.2	0	61.8	0	0	0	0
5	10/20/2019 18:00	18	3600	60.7	7	60.7	7	57.4	1	62.3	0	0	0	0
5	10/20/2019 19:00	19	3600	60.3	3	60.3	3	56.3	0	61.8	0	0	0	0
5	10/20/2019 20:00	20	3600	63.1	8	63.1	8	57.1	1	64	0	0	0	0
5	10/20/2019 21:00	21	3600	62.8	8	62.7	7	57.7	2	63.9	0	0	41	1
5	10/20/2019 22:00	22	3600	60.9	3	60.9	3	56.6	1	62.3	0	0	0	0
5	10/20/2019 23:00	23	3600	63	6	63	6	58	7	64.1	0	0	0	0
8	10/14/2019 0:00	0	3600	51.3	2	51.3	2	60.7	0	61.2	0	0	0	0
8	10/14/2019 1:00	1	3600	51.1	7	51.1	7	59.1	0	59.7	0	0	0	0
8	10/14/2019 2:00	2	3600	51.2	5	51.2	5	56.5	0	57.6	0	0	0	0
8	10/14/2019 3:00	3	3600	41.2	1	41.2	1	57.7	0	57.8	0	0	0	0
8	10/14/2019 4:00	4	3600	0	0	0	0	61.9	1	61.9	0	0	0	0
8	10/14/2019 5:00	5	3600	51.3	4	51.3	4	63.1	3	63.3	0	0	0	0
8	10/14/2019 6:00	6	3600	63	23	63	23	64.5	4	65.6	0	0	0	0
8	10/14/2019 7:00	7	3600	64.2	41	64.2	41	64.2	1	65.8	0	0	0	0
8	10/14/2019 8:00	8	3600	56.6	9	56.6	9	61.4	0	62.5	0	0	0	0
8	10/14/2019 9:00	9	3600	53.7	4	53.7	4	60.7	0	61.5	0	0	0	0
8	10/14/2019 10:00	10	3600	54.2	8	54.2	8	62.5	0	63	0	0	0	0
8	10/14/2019 11:00	11	3600	54.5	13	54.5	13	63.5	0	63.8	0	0	0	0
8	10/14/2019 12:00	12	3600	55.5	14	55.3	13	63.1	0	63.6	0	0	41.7	2
8	10/14/2019 13:00	13	3600	58.9	20	58.9	20	62.6	0	63.6	0	0	41.4	1
8	10/14/2019 14:00	14	3600	59.9	10	59.9	10	61.4	0	63.6	0	0	35.5	1
8	10/14/2019 15:00	15	3600	51.8	7	51.8	7	61.4	0	61.7	0	0	0	0
8	10/14/2019 16:00	16	3600	51.2	5	51.2	5	61.4	0	61.7	0	0	0	0
8	10/14/2019 17:00	17	3600	47.4	3	47.4	3	61.1	0	61.3	0	0	0	0
8	10/14/2019 18:00	18	3600	53.3	10	53.3	10	62.5	1	62.8	0	0	0	0
8	10/14/2019 19:00	19	3600	61.7	28	61.7	28	63.2	0	64.8	0	0	0	0
8	10/14/2019 20:00	20	3600	57.3	24	57.2	24	63.8	1	64.2	0	0	41.1	1
8	10/14/2019 21:00	21	3600	52.8	8	52.8	8	62.9	0	63.2	0	0	0	0
8	10/14/2019 22:00	22	3600	56.8	20	56.8	20	62.7	0	63.3	0	0	0	0
8	10/14/2019 23:00	23	3600	55.4	8	55.2	8	62.1	0	62.8	0	0	41.7	1
8	10/15/2019 0:00	0	3600	49.3	5	49.3	5	60.3	1	60.6	0	0	0	0
8	10/15/2019 1:00	1	3600	46.9	4	46.9	4	59.4	3	59.6	0	0	0	0
8	10/15/2019 2:00	2	3600	0	0	0	0	56	0	56	0	0	0	0
8	10/15/2019 3:00	3	3600	0	0	0	0	57	0	57	0	0	0	0
8	10/15/2019 4:00	4	3600	0	0	0	0	59.7	0	59.7	0	0	0	0
8	10/15/2019 5:00	5	3600	55	5	55	5	63.8	13	63.9	0	0	0	0
8	10/15/2019 6:00	6	3600	63.7	21	63.7	21	63	4	65.4	0	0	0	0
8	10/15/2019 7:00	7	3600	48.5	4	48.5	4	60.4	0	60.7	0	0	0	0
8	10/15/2019 8:00	8	3600	50	2	50	2	60	0	60.4	0	0	0	0
8	10/15/2019 9:00	9	3600	41	1	41	1	60.7	0	60.7	0	0	0	0
8	10/15/2019 10:00	10	3600	38.4	1	38.4	1	58.7	0	58.8	0	0	0	0
8	10/15/2019 11:00	11	3600	60.9	20	60.9	20	63	0	64.4	0	0	0	0
8	10/15/2019 12:00	12	3600	62.1	27	62.1	27	63.7	1	65.2	0	0	0	0
8	10/15/2019 13:00	13	3600	56.2	14	56.2	14	62.5	0	63.2	0	0	0	0
8	10/15/2019 14:00	14	3600	57.9	23	57.8	23	63.4	0	64.1	0	0	41.1	2
8	10/15/2019 15:00	15	3600	59.5	10	59.4	10	62.2	0	64	0	0	40.8	2
8	10/15/2019 16:00	16	3600	52.5	4	52.5	4	62	0	62.4	0	0	35.5	1
8	10/15/2019 17:00	17	3600	46.4	4	46.4	4	61.2	0	61.3	0	0	0	0
8	10/15/2019 18:00	18	3600	58.7	28	58.2	26	63.6	0	64.2	0	0	48.7	5
8	10/15/2019 19:00	19	3600	60.2	32	60.2	32	63.9	1	64.7	0	0	0	0
8	10/15/2019 20:00	20	3600	58	27	58	27	63.6	0	64.2	0	0	0	0
8	10/15/2019 21:00	21	3600	50.5	9	50.5	9	62.3	0	62.5	0	0	0	0
8	10/15/2019 22:00	22	3600	61.8	26	61.8	26	63.3	1	64.9	0	0	0	0
8	10/15/2019 23:00	23	3600	61.7	26	61.7	26	62.8	2	64.5	0	0	0	0
8	10/16/2019 0:00	0	3600	55.9	7	55.9	7	61.4	0	62.3	0	0	0	0
8	10/16/2019 1:00	1	3600	48.4	4	48.4	4	60.5	5	60.7	0	0	0	0
8	10/16/2019 2:00	2	3600	0	0	0	0	57.9	0	57.9	0	0	0	0
8	10/16/2019 3:00	3	3600	0	0	0	0	58.5	0	58.5	0	0	0	0
8	10/16/2019 4:00	4	3600	0	0	0	0	62.7	6	62.6	0	0	0	0
8	10/16/2019 5:00	5	3600	58.4	10	58.4	10	64.7	7	64.6	0	0	0	0
8	10/16/2019 6:00	6	3600	65.6	32	65.6	32	64.8	6	66.8	0	0	0	0
8	10/16/2019 7:00	7	3600	66.4	28	66.4	28	64.8	2	67	0	0	0	0
8	10/16/2019 8:00	8	3600	63.8	29	63.8	29	64	0	65.7	0	0	0	0
8	10/16/2019 9:00	9	3600	58.2	7	58.2	7	62.2	0	63.1	0	0	0	0
8	10/16/2019 10:00	10	3600	51.7	3	51.7	3	61.6	0	61.9	0	0	0	0
8	10/16/2019 11:00	11	3600	59.6	24	59.5	24	62.9	0	64.2	0	0	45.1	1
8	10/16/2019 12:00	12	3600	58.6	22	58.6	22	63.6	0	64.3	0	0	0	0
8	10/16/2019 13:00	13	3600	56	9	56	9	62.6	0	63.3	0	0	35.3	1
8	10/16/2019 14:00	14	3600	54.9	9	54.9	9	62	0	62.6	0	0	0	0
8	10/16/2019 15:00	15	3600	48.6	2	48.6	2	59	0	59.3	0	0	0	0
8	10/16/2019 16:00	16	3600	46.2	2	46.2	2	59.1	0	59.3	0	0	0	0
8	10/16/2019 17:00	17	3600	49.6	3	49.6	3	59.5	0	59.9	0	0	0	0
8	10/16/2019 18:00	18	3600	0	0	0	0	58.2	0	58.2	0	0	0	0

8	10/16/2019 19:00	19	3600	43	2	41.4	2	59.9	0	60	0	0	38	1
8	10/16/2019 20:00	20	3600	45.5	2	45.5	2	60.5	0	60.7	0	0	0	0
8	10/16/2019 21:00	21	3600	39	1	39	1	60.5	0	60.5	0	0	0	0
8	10/16/2019 22:00	22	3600	51.5	1	51.5	1	58.8	0	59.6	0	0	0	0
8	10/16/2019 23:00	23	3600	43.1	1	43.1	1	58.1	0	58.3	0	0	0	0
8	10/17/2019 0:00	0	3600	0	0	0	0	55.4	0	55.4	0	0	0	0
8	10/17/2019 1:00	1	3600	0	0	0	0	54.4	0	54.4	0	0	0	0
8	10/17/2019 2:00	2	3600	0	0	0	0	56.4	0	56.4	0	0	0	0
8	10/17/2019 3:00	3	3600	0	0	0	0	56	0	56	0	0	0	0
8	10/17/2019 4:00	4	3600	0	0	0	0	57.2	0	57.2	0	0	0	0
8	10/17/2019 5:00	5	3600	0	0	0	0	60.1	0	60.1	0	0	0	0
8	10/17/2019 6:00	6	3600	53.1	9	53.1	9	62.7	0	63	0	0	0	0
8	10/17/2019 7:00	7	3600	57.2	11	57.2	11	62.9	1	63.8	0	0	0	0
8	10/17/2019 8:00	8	3600	54.9	13	54.9	13	62.6	0	63.1	0	0	0	0
8	10/17/2019 9:00	9	3600	50.5	5	50	5	61.8	0	62.1	0	0	41.1	1
8	10/17/2019 10:00	10	3600	47.7	4	46.2	4	60.9	0	61.1	0	0	42.4	1
8	10/17/2019 11:00	11	3600	54.8	10	54.8	10	62.4	0	62.9	0	0	0	0
8	10/17/2019 12:00	12	3600	55.5	7	55.5	7	62.2	0	62.9	0	0	0	0
8	10/17/2019 13:00	13	3600	53.3	6	53.2	6	61.4	0	62	0	0	37.6	1
8	10/17/2019 14:00	14	3600	58.4	10	58.4	10	61.7	0	63.2	0	0	0	0
8	10/17/2019 15:00	15	3588	46.3	2	46.3	2	61.2	0	61.2	0	0	0	0
8	10/17/2019 16:00	16	3600	41.8	1	41.8	1	60.9	0	61	0	0	0	0
8	10/17/2019 17:00	17	3600	50.5	3	50.5	3	61.1	0	61.4	0	0	0	0
8	10/17/2019 18:00	18	3600	48.6	5	48.6	5	62.8	0	62.9	0	0	0	0
8	10/17/2019 19:00	19	3600	56.3	11	56.3	11	63.3	0	63.9	0	0	0	0
8	10/17/2019 20:00	20	3600	46.8	3	46.8	3	61.6	0	61.7	0	0	0	0
8	10/17/2019 21:00	21	3600	46.1	1	46.1	1	60	0	60.2	0	0	0	0
8	10/17/2019 22:00	22	3600	56.6	14	56.6	14	62.1	0	62.9	0	0	0	0
8	10/17/2019 23:00	23	3600	58.3	20	58.3	20	62.9	2	63.7	0	0	0	0
8	10/18/2019 0:00	0	3600	43.3	2	43.3	2	59.6	0	59.7	0	0	0	0
8	10/18/2019 1:00	1	3600	0	0	0	0	57.9	0	57.9	0	0	0	0
8	10/18/2019 2:00	2	3600	0	0	0	0	56.7	0	56.7	0	0	0	0
8	10/18/2019 3:00	3	3600	0	0	0	0	56.7	0	56.7	0	0	0	0
8	10/18/2019 4:00	4	3600	0	0	0	0	60	0	60	0	0	0	0
8	10/18/2019 5:00	5	3600	51.3	6	51.3	6	62.2	2	62.4	0	0	0	0
8	10/18/2019 6:00	6	3600	58.3	16	58.3	16	63.5	1	64.1	0	0	0	0
8	10/18/2019 7:00	7	3600	57.3	17	57.3	17	63.3	0	63.9	0	0	0	0
8	10/18/2019 8:00	8	3600	54.9	9	54.9	9	61.3	0	61.9	0	0	0	0
8	10/18/2019 9:00	9	3600	59	19	59	19	63.1	0	64.1	0	0	0	0
8	10/18/2019 10:00	10	3600	52.3	6	52.3	6	59.6	0	60.3	0	0	0	0
8	10/18/2019 11:00	11	3600	0	0	0	0	58.5	0	58.5	0	0	0	0
8	10/18/2019 12:00	12	3600	43.6	1	43.6	1	57.9	0	58.1	0	0	0	0
8	10/18/2019 13:00	13	3600	55.9	1	55.9	1	56.7	0	59.3	0	0	0	0
8	10/18/2019 14:00	14	3600	55.5	2	55.5	2	57.3	0	59.5	0	0	0	0
8	10/18/2019 15:00	15	3600	43	1	43	1	58.7	0	58.8	0	0	0	0
8	10/18/2019 16:00	16	3600	43.5	1	43.5	1	58.8	0	59	0	0	0	0
8	10/18/2019 17:00	17	3600	45.3	2	44.5	2	59.3	0	59.5	0	0	37.4	1
8	10/18/2019 18:00	18	3600	45.7	1	45.7	1	59.8	0	59.9	0	0	0	0
8	10/18/2019 19:00	19	3600	49.1	3	49.1	3	61	0	61.3	0	0	0	0
8	10/18/2019 20:00	20	3600	49.5	3	49.5	3	60.1	0	60.4	0	0	0	0
8	10/18/2019 21:00	21	3600	40.1	1	40.1	1	60.8	0	60.8	0	0	0	0
8	10/18/2019 22:00	22	3600	43.7	2	43.7	2	61.1	1	61.1	0	0	0	0
8	10/18/2019 23:00	23	3600	51.2	8	51.2	8	61.5	0	61.8	0	0	0	0
8	10/19/2019 0:00	0	3600	0	0	0	0	58.8	0	58.8	0	0	0	0
8	10/19/2019 1:00	1	3600	0	0	0	0	57.8	0	57.8	0	0	0	0
8	10/19/2019 2:00	2	3600	0	0	0	0	55.4	0	55.4	0	0	0	0
8	10/19/2019 3:00	3	3600	0	0	0	0	56	0	56	0	0	0	0
8	10/19/2019 4:00	4	3600	0	0	0	0	56.9	0	56.9	0	0	0	0
8	10/19/2019 5:00	5	3600	0	0	0	0	59.5	0	59.5	0	0	0	0
8	10/19/2019 6:00	6	3600	0	0	0	0	58.9	0	58.9	0	0	0	0
8	10/19/2019 7:00	7	3600	0	0	0	0	60.6	0	60.6	0	0	0	0
8	10/19/2019 8:00	8	3600	51	7	51	7	62.8	0	63	0	0	0	0
8	10/19/2019 9:00	9	3600	39	1	39	1	60.2	0	60.2	0	0	0	0
8	10/19/2019 10:00	10	3600	49	3	40.2	1	60.5	0	60.8	0	0	48.3	2
8	10/19/2019 11:00	11	3600	0	0	0	0	59.5	0	59.5	0	0	0	0
8	10/19/2019 12:00	12	3600	46.7	2	46.7	2	57.7	0	58.1	0	0	0	0
8	10/19/2019 13:00	13	3600	0	0	0	0	57.5	0	57.5	0	0	0	0
8	10/19/2019 14:00	14	3600	51.1	1	48.1	1	55.6	0	57	0	0	48.1	1
8	10/19/2019 15:00	15	3600	48.8	1	48.8	1	55.8	0	56.6	0	0	0	0
8	10/19/2019 16:00	16	3600	48.1	3	48.1	3	56	0	56.7	0	0	0	0
8	10/19/2019 17:00	17	3600	43.2	1	43.2	1	57.5	0	57.6	0	0	0	0
8	10/19/2019 18:00	18	3600	43.6	1	43.6	1	58.4	0	58.6	0	0	0	0
8	10/19/2019 19:00	19	3600	0	0	0	0	59.5	0	59.5	0	0	0	0
8	10/19/2019 20:00	20	3600	47.5	2	47.5	2	62.1	0	62.2	0	0	0	0
8	10/19/2019 21:00	21	3600	55.3	5	55.3	5	61.5	0	62.1	0	0	0	0
8	10/19/2019 22:00	22	3600	58.4	11	58.4	11	62.5	2	63.5	0	0	0	0
8	10/19/2019 23:00	23	3600	53.1	8	53.1	8	62	4	62.4	0	0	0	0
8	10/20/2019 0:00	0	3600	42.3	2	42.3	2	62	1	62	0	0	0	0
8	10/20/2019 1:00	1	3600	53.6	5	53.6	5	60.9	2	61.5	0	0	0	0
8	10/20/2019 2:00	2	3600	41.5	1	41.5	1	58.5	0	58.6	0	0	0	0
8	10/20/2019 3:00	3	3600	0	0	0	0	57	0	57	0	0	0	0
8	10/20/2019 4:00	4	3600	0	0	0	0	57.3	0	57.3	0	0	0	0
8	10/20/2019 5:00	5	3600	50.4	3	50.4	3	59.9	2	60.3	0	0	0	0
8	10/20/2019 6:00	6	3600	59.2	21	59.2	21	63.7	11	64.3	0	0	0	0
8	10/20/2019 7:00	7	3600	66.4	39	66.4	39	64.1	1	67.3	0	0	0	0
8	10/20/2019 8:00	8	3600	62.1	23	62.1	23	62.7	0	64.7	0	0	0	0
8	10/20/2019 9:00	9	3600	49.4	7	49.4	7	62.3	0	62.5	0	0	0	0
8	10/20/2019 10:00	10	3600	51.4	9	51.4	9	62.7	0	62.8	0	0	0	0
8	10/20/2019 11:00	11	3600	53.8	7	53.6	7	62.9	0	63.2	0	0	41.1	1
8	10/20/2019 12:00	12	3600	43.6	1	43.6	1	62	0	62	0	0	0	0
8	10/20/2019 13:00	13	3600	0	0	0	0	58.9	0	58.9	0	0	0	0
8	10/20/2019 14:00	14	3600	44.5	2	38.8	1	61.4	0	61.4	0	0	43.1	2
8	10/20/2019 15:00	15	3600	50.1	4	50.1	4	60.9	0	61.2	0	0	0	0
8	10/20/2019 16:00	16	3600	55.5	2	55.5	2	60.8	0	61.9	0	0	0	0
8	10/20/2019 17:00	17	3600	40.1	1	40.1	1	59.8	0	59.9	0	0	0	0
8	10/20/2019 18:00	18	3600	43.1	1	43.1	1	60	0	60	0	0	0	0
8	10/20/2019 19:00	19	3600	44	1	44	1	61	0	61	0	0	0	0
8	10/20/2019 20:00	20	3600	45.3	2	45.3	2	61.1	0	61.2	0	0	0	0
8	10/20/2019 21:00	21	3600	54.3	12	54.3	12	62.7	0	63.1	0	0	0	0
8	10/20/2019 22:00	22	3600	56	17	56	17	62.6	0	63.2	0	0	0	0
8	10/20/2019 23:00	23	3600	54.1	15	54.1	15	62.1	2	62.6	0	0	0	0

22	10/14/2019 0:00	0	3600	51.6	4	51.6	4	54.6	1	56.4	0	0	0	0
22	10/14/2019 1:00	1	3600	52.8	5	52.8	5	56.9	0	58.3	0	0	0	0
22	10/14/2019 2:00	2	3600	50.8	2	50.8	2	54.3	0	55.9	0	0	0	0
22	10/14/2019 3:00	3	3600	40.9	1	40.9	1	54.3	0	54.5	0	0	0	0
22	10/14/2019 4:00	4	3600	44.4	1	44.4	1	55.4	0	55.8	0	0	0	0
22	10/14/2019 5:00	5	3600	48.5	2	48.5	2	58.9	1	59.3	0	0	0	0
22	10/14/2019 6:00	6	3600	51.1	6	51.1	6	62.7	3	62.8	0	0	0	0
22	10/14/2019 7:00	7	3600	49	5	49	5	61.6	0	61.8	0	0	0	0
22	10/14/2019 8:00	8	3600	50.7	7	50.7	7	60	0	60.4	0	0	0	0
22	10/14/2019 9:00	9	3600	46.7	2	46.7	2	57.5	0	57.8	0	0	0	0
22	10/14/2019 10:00	10	3600	40.5	1	40.5	1	57.1	0	57.2	0	0	0	0
22	10/14/2019 11:00	11	3600	50.4	3	50.4	3	60.2	0	60.6	0	0	0	0
22	10/14/2019 12:00	12	3600	53.2	5	53.2	5	57.5	0	58.9	0	0	0	0
22	10/14/2019 13:00	13	3600	54	5	54	5	57.5	0	59.1	0	0	0	0
22	10/14/2019 14:00	14	3600	52.7	4	52.7	4	58.3	0	59.3	0	0	0	0
22	10/14/2019 15:00	15	3600	52.5	7	52.5	7	57.1	0	58.4	0	0	0	0
22	10/14/2019 16:00	16	3600	50.2	3	50.2	3	57.4	0	58.1	0	0	0	0
22	10/14/2019 17:00	17	3600	54.4	8	54.4	8	58.5	0	59.8	0	0	0	0
22	10/14/2019 18:00	18	3600	53.9	8	53.9	8	60	1	60.9	0	0	0	0
22	10/14/2019 19:00	19	3600	51.5	4	51.5	4	59.2	0	59.8	0	0	0	0
22	10/14/2019 20:00	20	3600	53.3	8	53.3	8	59.6	0	60.5	0	0	0	0
22	10/14/2019 21:00	21	3600	48.6	4	48.6	4	59.2	0	59.5	0	0	0	0
22	10/14/2019 22:00	22	3600	47.9	2	47.9	2	57.5	0	58	0	0	0	0
22	10/14/2019 23:00	23	3600	53.7	6	53.6	5	59.6	3	60.5	0	0	39.3	1
22	10/15/2019 0:00	0	3600	60	15	60	15	58.7	2	62.3	0	0	0	0
22	10/15/2019 1:00	1	3600	53	4	53	4	54.9	0	57.1	0	0	0	0
22	10/15/2019 2:00	2	3600	44.2	1	44.2	1	52.2	0	52.9	0	0	0	0
22	10/15/2019 3:00	3	3600	41.4	1	41.4	1	51.4	0	51.9	0	0	0	0
22	10/15/2019 4:00	4	3600	0	0	0	0	54.6	0	54.6	0	0	0	0
22	10/15/2019 5:00	5	3600	49.6	2	49.6	2	60.6	3	60.9	0	0	0	0
22	10/15/2019 6:00	6	3600	42.2	1	42.2	1	59.9	0	60	0	0	0	0
22	10/15/2019 7:00	7	3600	41	1	41	1	55.9	1	56	0	0	0	0
22	10/15/2019 8:00	8	3600	0	0	0	0	56.2	0	56.2	0	0	0	0
22	10/15/2019 9:00	9	3600	0	0	0	0	56.5	0	56.5	0	0	0	0
22	10/15/2019 10:00	10	3600	0	0	0	0	54.2	0	54.2	0	0	0	0
22	10/15/2019 11:00	11	3600	54	6	54	6	55.9	0	58.1	0	0	0	0
22	10/15/2019 12:00	12	3600	51.5	4	51.5	4	57.1	0	58.1	0	0	0	0
22	10/15/2019 13:00	13	3600	54.5	6	54.5	6	58.9	3	60.2	0	0	0	0
22	10/15/2019 14:00	14	3600	53.4	4	53.4	4	57.4	0	58.8	0	0	0	0
22	10/15/2019 15:00	15	3600	51.2	3	51.2	3	57.8	0	58.6	0	0	0	0
22	10/15/2019 16:00	16	3600	50	3	50	3	58.4	0	58.9	0	0	0	0
22	10/15/2019 17:00	17	3600	55.2	12	55.2	12	58.9	1	60.4	0	0	0	0
22	10/15/2019 18:00	18	3600	54.6	10	54.6	10	60.2	0	61.2	0	0	0	0
22	10/15/2019 19:00	19	3600	53	5	53	5	60	2	60.7	0	0	0	0
22	10/15/2019 20:00	20	3600	57.7	12	57.7	12	60.9	1	62.4	0	0	0	0
22	10/15/2019 21:00	21	3600	59.9	22	59.9	22	60.1	2	62.9	0	0	0	0
22	10/15/2019 22:00	22	3600	60.1	16	60.1	16	61.2	4	63.5	0	0	0	0
22	10/15/2019 23:00	23	3600	60	21	60	21	61.2	7	63.4	0	0	40.2	1
22	10/16/2019 0:00	0	3600	53.1	4	53.1	4	58.2	4	59.3	0	0	0	0
22	10/16/2019 1:00	1	3600	55.2	6	55.2	6	56	1	58.6	0	0	0	0
22	10/16/2019 2:00	2	3600	45.6	1	45.6	1	51.5	0	52.6	0	0	0	0
22	10/16/2019 3:00	3	3600	44.6	1	44.6	1	51.7	0	52.5	0	0	0	0
22	10/16/2019 4:00	4	3600	0	0	0	0	52.9	0	52.9	0	0	0	0
22	10/16/2019 5:00	5	3600	0	0	0	0	56.6	1	56.6	0	0	0	0
22	10/16/2019 6:00	6	3600	0	0	0	0	57.2	0	57.2	0	0	0	0
22	10/16/2019 7:00	7	3600	49.6	3	49.6	3	59.3	1	59.7	0	0	0	0
22	10/16/2019 8:00	8	3600	45.9	2	45.9	2	59.9	1	60.1	0	0	0	0
22	10/16/2019 9:00	9	3600	59.8	3	59.8	3	57.1	0	61.6	0	0	0	0
22	10/16/2019 10:00	10	3600	58.1	1	58.1	1	57.2	1	60.7	0	0	0	0
22	10/16/2019 11:00	11	3600	50	3	50	3	57.9	0	58.5	0	0	0	0
22	10/16/2019 12:00	12	3600	52.1	4	52.1	4	55.8	0	57.4	0	0	0	0
22	10/16/2019 13:00	13	3600	52.5	5	51.9	4	56.8	0	58.1	0	0	43.5	1
22	10/16/2019 14:00	14	3600	44.8	1	44.8	1	56.5	0	56.8	0	0	0	0
22	10/16/2019 15:00	15	3600	52.8	5	52.8	5	56.7	0	58.2	0	0	0	0
22	10/16/2019 16:00	16	3600	50.4	3	50.4	3	56.6	0	57.5	0	0	0	0
22	10/16/2019 17:00	17	3600	49.6	2	49.6	2	57	0	57.7	0	0	0	0
22	10/16/2019 18:00	18	3600	47.1	1	47.1	1	55.6	0	56.2	0	0	0	0
22	10/16/2019 19:00	19	3600	49.6	4	49	3	55.5	0	56.5	0	0	40.6	1
22	10/16/2019 20:00	20	3600	54.7	4	54.7	4	56	0	58.4	0	0	0	0
22	10/16/2019 21:00	21	3600	49.5	3	49.5	3	56	0	56.9	0	0	0	0
22	10/16/2019 22:00	22	3600	48.6	1	48.6	1	54.8	1	55.7	0	0	0	0
22	10/16/2019 23:00	23	3600	49.3	2	49.3	2	54.9	1	56	0	0	0	0
22	10/17/2019 0:00	0	3600	49.8	2	49.8	2	51.7	0	53.9	0	0	0	0
22	10/17/2019 1:00	1	3600	52.1	4	52.1	4	49.2	0	54.1	0	0	0	0
22	10/17/2019 2:00	2	3600	45.8	1	45.8	1	46.7	0	49.4	0	0	0	0
22	10/17/2019 3:00	3	3600	0	0	0	0	48.4	0	48.4	0	0	0	0
22	10/17/2019 4:00	4	3600	0	0	0	0	51.3	0	51.3	0	0	0	0
22	10/17/2019 5:00	5	3600	0	0	0	0	58.6	3	58.6	0	0	0	0
22	10/17/2019 6:00	6	3600	0	0	0	0	58.2	0	58.2	0	0	0	0
22	10/17/2019 7:00	7	3600	47.2	2	47.2	2	58.9	0	59.2	0	0	0	0
22	10/17/2019 8:00	8	3600	47.1	2	47.1	2	58.2	0	58.5	0	0	0	0
22	10/17/2019 9:00	9	3600	48.9	3	48.9	3	57.7	0	58.2	0	0	0	0
22	10/17/2019 10:00	10	3600	60.3	2	60.3	2	59.3	0	62.8	0	0	0	0
22	10/17/2019 11:00	11	3600	47.9	2	47.9	2	59.2	0	59.5	0	0	0	0
22	10/17/2019 12:00	12	3600	51.7	4	51.7	4	58.8	0	59.5	0	0	0	0
22	10/17/2019 13:00	13	3600	55.3	5	55.3	5	58.7	0	60.3	0	0	0	0
22	10/17/2019 14:00	14	3600	51.2	3	51.2	3	58.3	0	59	0	0	0	0
22	10/17/2019 15:00	15	3600	55.9	10	55.9	10	60.7	0	61.7	0	0	0	0
22	10/17/2019 16:00	16	3600	54.6	8	54.6	8	60.6	0	61.5	0	0	0	0
22	10/17/2019 17:00	17	3600	55.3	9	55.3	9	60.7	0	61.7	0	0	0	0
22	10/17/2019 18:00	18	3600	55.1	8	55.1	8	60.5	1	61.5	0	0	0	0
22	10/17/2019 19:00	19	3600	55.7	7	55.7	7	60.1	0	61.4	0	0	0	0
22	10/17/2019 20:00	20	3600	55.9	13	55.9	13	59	0	60.6	0	0	0	0
22	10/17/2019 21:00	21	3600	51.7	5	51.7	5	57.8	0	58.7	0	0	0	0
22	10/17/2019 22:00	22	3600	44.8	1	44.8	1	56.9	0	57.2	0	0	0	0
22	10/17/2019 23:00	23	3600	52.6	3	52.6	3	57.1	0	58.4	0	0	0	0
22	10/18/2019 0:00	0	3600	44.6	1	44.6	1	54.7	1	55.1	0	0	0	0
22	10/18/2019 1:00	1	3600	49.9	3	49.9	3	52	0	54.1	0	0	0	0
22	10/18/2019 2:00	2	3600	0	0	0	0	50.9	1	51	0	0	0	0
22	10/18/2019 3:00	3	3600	0	0	0	0	52	0	52	0	0	0	0
22	10/18/2019 4:00	4	3600	0	0	0	0	54.2	0	54.2	0	0	0	0

22	10/18/2019 5:00	5	3600	50.3	3	50.3	3	59	1	59.5	0	0	0	0
22	10/18/2019 6:00	6	3600	0	0	0	0	58.8	0	58.8	0	0	0	0
22	10/18/2019 7:00	7	3600	40.4	1	40.4	1	58.9	0	58.9	0	0	0	0
22	10/18/2019 8:00	8	3600	52.2	4	52.2	4	57.5	0	58.6	0	0	0	0
22	10/18/2019 9:00	9	3600	48.4	2	48.4	2	58	0	58.4	0	0	0	0
22	10/18/2019 10:00	10	3600	48.9	1	48.9	1	56.2	0	56.9	0	0	0	0
22	10/18/2019 11:00	11	3600	50	3	50	3	55.3	0	56.4	0	0	0	0
22	10/18/2019 12:00	12	3600	52.2	5	52.2	5	56.6	0	57.9	0	0	0	0
22	10/18/2019 13:00	13	3600	56.2	5	56.2	5	57.9	0	60.1	0	0	0	0
22	10/18/2019 14:00	14	3600	48.7	4	48.7	4	63.3	1	63.4	0	0	0	0
22	10/18/2019 15:00	15	3600	49.8	2	49.8	2	56.6	0	57.4	0	0	0	0
22	10/18/2019 16:00	16	3600	53	5	53	5	58.3	0	59.3	0	0	0	0
22	10/18/2019 17:00	17	3600	52.2	3	52.2	3	57.7	0	58.8	0	0	0	0
22	10/18/2019 18:00	18	3600	47.7	2	47.7	2	57.1	0	57.6	0	0	0	0
22	10/18/2019 19:00	19	3600	47.5	2	47.5	2	56.7	0	57.2	0	0	0	0
22	10/18/2019 20:00	20	3600	49.3	3	49.3	3	56.6	1	57.4	0	0	0	0
22	10/18/2019 21:00	21	3600	0	0	0	0	57.8	0	57.8	0	0	0	0
22	10/18/2019 22:00	22	3600	50.4	1	50.4	1	55.9	1	57	0	0	0	0
22	10/18/2019 23:00	23	3600	0	0	0	0	55.1	0	55.1	0	0	0	0
22	10/19/2019 0:00	0	3600	53.5	4	53.5	4	53.6	0	56.5	0	0	0	0
22	10/19/2019 1:00	1	3600	54.1	5	54.1	5	52.2	0	56.3	0	0	0	0
22	10/19/2019 2:00	2	3600	47.1	1	47.1	1	50.7	0	52.3	0	0	0	0
22	10/19/2019 3:00	3	3600	0	0	0	0	52.3	0	52.3	0	0	0	0
22	10/19/2019 4:00	4	3600	0	0	0	0	52.6	0	52.6	0	0	0	0
22	10/19/2019 5:00	5	3600	50.3	2	50.3	2	52.4	0	54.5	0	0	0	0
22	10/19/2019 6:00	6	3600	0	0	0	0	53.6	0	53.6	0	0	0	0
22	10/19/2019 7:00	7	3600	40.6	1	40.6	1	59.1	0	59.2	0	0	0	0
22	10/19/2019 8:00	8	3600	50.3	5	50.3	5	59.4	0	59.9	0	0	0	0
22	10/19/2019 9:00	9	3600	46.1	1	46.1	1	56.2	0	56.6	0	0	0	0
22	10/19/2019 10:00	10	3600	0	0	0	0	55.6	0	55.6	0	0	0	0
22	10/19/2019 11:00	11	3600	50.6	3	50.6	3	56.6	0	57.6	0	0	0	0
22	10/19/2019 12:00	12	3600	53.7	5	53.7	5	55.9	0	57.9	0	0	0	0
22	10/19/2019 13:00	13	3600	60	7	60	7	55.9	0	61.4	0	0	0	0
22	10/19/2019 14:00	14	3600	53.4	4	53.4	4	55.7	0	57.7	0	0	0	0
22	10/19/2019 15:00	15	3600	53.1	6	53.1	6	56.6	0	58.2	0	0	0	0
22	10/19/2019 16:00	16	3600	48.9	2	48.9	2	54.9	0	55.9	0	0	0	0
22	10/19/2019 17:00	17	3600	50.4	2	50.4	2	57.9	0	58.6	0	0	0	0
22	10/19/2019 18:00	18	3600	48.8	2	48.8	2	55.1	0	56	0	0	0	0
22	10/19/2019 19:00	19	3600	44.2	1	44.2	1	54.8	0	55.2	0	0	0	0
22	10/19/2019 20:00	20	3600	54.2	6	54.2	6	55.8	0	58.1	0	0	0	0
22	10/19/2019 21:00	21	3600	50.5	3	50.5	3	57.2	0	58	0	0	0	0
22	10/19/2019 22:00	22	3600	0	0	0	0	56.6	0	56.6	0	0	0	0
22	10/19/2019 23:00	23	3600	54.5	5	54.5	5	57.2	0	59	0	0	0	0
22	10/20/2019 0:00	0	3600	50.4	2	50.4	2	57.6	0	58.3	0	0	0	0
22	10/20/2019 1:00	1	3600	54.9	5	54.9	5	57.2	0	59.2	0	0	0	0
22	10/20/2019 2:00	2	3600	50.6	1	50.6	1	54.6	0	56.1	0	0	0	0
22	10/20/2019 3:00	3	3600	0	0	0	0	56	0	56	0	0	0	0
22	10/20/2019 4:00	4	3600	0	0	0	0	56.6	0	56.6	0	0	0	0
22	10/20/2019 5:00	5	3600	0	0	0	0	57.8	0	57.8	0	0	0	0
22	10/20/2019 6:00	6	3600	48.5	4	48.5	4	61.4	0	61.6	0	0	0	0
22	10/20/2019 7:00	7	3600	50.4	5	50.4	5	62	1	62.2	0	0	0	0
22	10/20/2019 8:00	8	3600	50.4	5	50.4	5	60.9	0	61.2	0	0	0	0
22	10/20/2019 9:00	9	3600	46.6	1	46.6	1	55.7	0	56.2	0	0	0	0
22	10/20/2019 10:00	10	3600	43.3	1	43.3	1	56.4	0	56.6	0	0	0	0
22	10/20/2019 11:00	11	3600	50.2	2	50.2	2	58.7	0	59.2	0	0	0	0
22	10/20/2019 12:00	12	3600	51.3	3	51.3	3	56	0	57.3	0	0	0	0
22	10/20/2019 13:00	13	3600	52.1	3	52.1	3	55	0	56.8	0	0	0	0
22	10/20/2019 14:00	14	3600	51	5	49.6	4	55.9	0	57.1	0	0	45.5	2
22	10/20/2019 15:00	15	3600	48.8	2	48.8	2	57.4	0	57.9	0	0	0	0
22	10/20/2019 16:00	16	3600	50.3	2	50.3	2	56.7	0	57.6	0	0	0	0
22	10/20/2019 17:00	17	3600	48.2	1	48.2	1	57.5	0	58	0	0	0	0
22	10/20/2019 18:00	18	3600	45.5	1	45.5	1	57.1	0	57.4	0	0	0	0
22	10/20/2019 19:00	19	3600	49.1	2	49.1	2	56.4	1	57.1	0	0	0	0
22	10/20/2019 20:00	20	3600	51.1	5	51.1	5	56.4	0	57.5	0	0	0	0
22	10/20/2019 21:00	21	3600	52.5	4	52.5	4	57.3	1	58.5	0	0	0	0
22	10/20/2019 22:00	22	3600	51.2	2	51.2	2	56.6	1	57.7	0	0	0	0
22	10/20/2019 23:00	23	3600	57.4	11	57.4	11	59.3	1	61.3	0	0	0	0

A.2 Construction Noise Modeling Outputs

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/24/2024
Case Description: RADP Project #9 - CONRAC Facility

**** Receptor #1 ****

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residences along 7th Avenue	Residential	68.0	68.0	68.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	1000.0	0.0
Grader	No	40	85.0		1000.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	63.6	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	59.0	55.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	63.6	58.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/24/2024
Case Description: RADP Project #9 - CONRAC Facility

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residences along 7th Avenue	Residential	68.0	68.0	68.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1000.0	0.0
Impact Pile Driver	Yes	20		101.3	1000.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	54.5	46.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact Pile Driver	75.2	68.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	75.2	68.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/24/2024
Case Description: RADP Project #6 Central Hub

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Residences South of Bay Street, Millbrae	Residential	64.0	64.0	64.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85.0		2800.0	0.0
Concrete Saw	No	20		89.6	2800.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	50.0	46.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	54.6	47.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	54.6	49.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/24/2024
Case Description: RADP Project #6 Central Hub

**** Receptor #1 ****

Description	Land Use	Daytime	Evening	Night
	Baselines (dBA)			
Residences South of Bay Street, Millbrae	Residential	64.0	64.0	64.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	2800.0	0.0
Impact Pile Driver	Yes	20		101.3	2800.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Calculated (dBA) Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Crane	45.6	37.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact Pile Driver	66.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	66.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 07/30/2024
Case Description: Aviador Lot Daytime

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Roblar Ave Residences	Residential	63.0	63.0	63.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Gradall	No	40		83.4	200.0	0.0
Excavator	No	40		80.7	200.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Gradall	71.4	67.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	68.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	71.4	69.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/24/2024
Case Description: RADP #9 ITB Curbside Expansion Nighttime

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SFO Grand Hyatt Hotel	Residential	72.0	72.0	61.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	770.0	0.0
Grader	No	40	85.0		770.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	65.8	58.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	61.2	57.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	65.8	61.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/24/2024
Case Description: RADP #1 Boarding Area H Nighttime

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SFO Grand Hyatt Hotel	Residential	72.0	72.0	61.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Impact Pile Driver	Yes	20		101.3	990.0	0.0
Crane	No	16		80.6	990.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Impact Pile Driver	75.3	68.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	54.6	46.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	75.3	68.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 07/30/2024
Case Description: Aviador Lot Nighttime

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Roblar Avenue Residences	Residential	61.0	61.0	61.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Gradall	No	40		83.4	200.0	0.0
Excavator	No	40		80.7	200.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Gradall	71.4	67.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	68.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	71.4	69.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 07/30/2024
Case Description: Aviador Lot Daytime

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Rollins Apts, Residence Inn	Residential	61.0	61.0	61.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Gradall	No	40		83.4	360.0	0.0
Excavator	No	40		80.7	360.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Gradall	66.3	62.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	63.6	59.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	66.3	64.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

A.3 Construction Vibration Worksheets

Vibration Propagation from Construction Equipment

Project: SFO RADP

RADP Project #1: Boarding Area H

Vibration Source Levels for Construction Equipment

Construction Equipment	PPV @ reference distance of 25ft	Lv @ Reference Distance of 25 ft
Pile Driver (impact)	0.65	104
Vibratory Roller	0.21	94
Caisson Drill, Large Bulldozer	0.089	87
Truck (loaded)	0.076	86
Jackhammer	0.035	79

Source: Table 7-4 of FTA, 2018

Distance to Nearest Receptor (feet) = 990 SFO Grand Hyatt Hotel

Human Annoyance Assessment

$L_{v.distance} = L_{vref} - 30\log(D/25)$ Equation 7-3, page 185 in FTA, 2018

where:

$L_{v.distance}$ = the rms velocity level adjusted for distance, VdB

L_{vref} = the source reference vibration level at 25 feet, VdB

D = distance from the equipment to the receiver, feet

Construction Equipment	Lv @ nearest receptor	PPV @ nearest receptor
Pile Driver (impact)	56	0.0026
Vibratory Roller	46	0.0008
Caisson Drill, Large Bulldozer	39	0.0004
Truck (loaded)	38	0.0003
Jackhammer	31	0.0001

Vibration Propagation from Construction Equipment

Project: SFO RADP

RADP Project #6: Central Hub

Vibration Source Levels for Construction Equipment

Construction Equipment	PPV @ reference distance of 25ft	Lv @ Reference Distance of 25 ft
Pile Driver (impact)	0.65	104
Vibratory Roller	0.21	94
Caisson Drill, Large Bulldozer	0.089	87
Truck (loaded)	0.076	86
Jackhammer	0.035	79

Source: Table 7-4 of FTA, 2018

Distance to Nearest Receptor (feet) = 1950 SFO Grand Hyatt Hotel

Human Annoyance Assessment

$L_{v.distance} = L_{vref} - 30\log(D/25)$ Equation 7-3, page 185 in FTA, 2018

where:

$L_{v.distance}$ = the rms velocity level adjusted for distance, VdB

L_{vref} = the source reference vibration level at 25 feet, VdB

D = distance from the equipment to the receiver, feet

Construction Equipment	Lv @ nearest receptor	PPV @ nearest receptor
Pile Driver (impact)	47	0.0009
Vibratory Roller	37	0.0003
Caisson Drill, Large Bulldozer	30	0.0001
Truck (loaded)	29	0.0001
Jackhammer	22	0.0001

Vibration Propagation from Construction Equipment

Project: SFO RADP

RADP Project #9: CONRAC Facility

Vibration Source Levels for Construction Equipment

Construction Equipment	PPV @ reference distance of 25ft	Lv @ Reference Distance of 25 ft
Pile Driver (impact)	0.65	104
Vibratory Roller	0.21	94
Caisson Drill, Large Bulldozer	0.089	87
Truck (loaded)	0.076	86
Jackhammer	0.035	79

Source: Table 7-4 of FTA, 2018

Distance to Nearest Receptor (feet) = 1000 Residences along 7th Avenue in San Bruno

Human Annoyance Assessment

$L_{v.distance} = L_{vref} - 30\log(D/25)$ Equation 7-3, page 185 in FTA, 2018

where:

$L_{v.distance}$ = the rms velocity level adjusted for distance, VdB

L_{vref} = the source reference vibration level at 25 feet, VdB

D = distance from the equipment to the receiver, feet

Construction Equipment	Lv @ nearest receptor	PPV @ nearest receptor
Pile Driver (impact)	56	0.0026
Vibratory Roller	46	0.0008
Caisson Drill, Large Bulldozer	39	0.0004
Truck (loaded)	38	0.0003
Jackhammer	31	0.0001

Vibration Propagation from Construction Equipment

Project: SFO RADP

Aviador Lot Construction Staging Area

Vibration Source Levels for Construction Equipment

Construction Equipment	PPV @ reference distance of 25ft	Lv @ Reference Distance of 25 ft
Pile Driver (impact)	0.65	104
Vibratory Roller	0.21	94
Caisson Drill, Large Bulldozer	0.089	87
Truck (loaded)	0.076	86
Jackhammer	0.035	79

Source: Table 7-4 of FTA, 2018

Human Annoyance Assessment

$L_{v.distance} = L_{vref} - 30\log(D/25)$ Equation 7-3, page 185 in FTA, 2018

where:

$L_{v.distance}$ = the rms velocity level adjusted for distance, VdB

L_{vref} = the source reference vibration level at 25 feet, VdB

D = distance from the equipment to the receiver, feet

Construction Equipment	Lv @ nearest receptor	PPV @ nearest receptor
Pile Driver (impact)	77	0.0287
Vibratory Roller	67	0.0093
Caisson Drill, Large Bulldozer	60	0.0039
Truck (loaded)	59	0.0034
Jackhammer	52	0.0015

A.4 Traffic Noise Modeling Reports

TRAFFIC NOISE LEVEL ESTIMATES - CONSTRUCTION 8/14/2024

Project: SFO RADP Project #6 Central Hub

Scenario: Existing AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE %						VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)
						Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT	
						%	# of Auto	%	# of MT	%	# of HT	mph	kmph	mph	kmph	mph	kmph	dBA			
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9
				WB	550	97	534	2	11	1	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7
				Total	1,690	97	1,639	2	34	1	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	1,770	97	1,717	2	35	1	18	35	56	35	56	35	56	66.7	59.5	63.2	68.8
				WB	1,720	97	1,668	2	34	1	17	35	56	35	56	35	56	66.5	59.4	63.1	68.7
				Total	3,490	97	3,385	2	70	1	35	35	56	35	56	35	56	69.6	62.5	66.2	71.8
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	280	97	272	2	6	1	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8
				WB	300	97	291	2	6	1	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1
				Total	580	97	563	2	12	1	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	470	97	456	2	9	1	5	35	56	35	56	35	56	60.9	53.8	57.5	63.1
				SB	540	97	524	2	11	1	5	35	56	35	56	35	56	61.5	54.4	58.1	63.7
				Total	1,010	97	980	2	20	1	10	35	56	35	56	35	56	64.2	57.1	60.8	66.4
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	97	475	2	10	1	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2
				SB	650	97	631	2	13	1	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5
				Total	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9

Scenario: RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE		
						# of Auto	# of MT	# of HT
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	0	0	0	0
				WB	0	0	0	0
				Total	0	0	0	0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	20	0	0	20
				WB	20	0	0	20
				Total	40	0	0	40
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	0	0	0	0
				WB	0	0	0	0
				Total	0	0	0	0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	111	111	0	0
				SB	37	37	0	0
				Total	148	148	0	0
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	0	0	0	0
				SB	0	0	0	0
				Total	0	0	0	0

Scenario: Eisti + RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE			VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)	Increase Over Existing Noise Level (dBA) (15 m from roadway center)
									Auto		MT		HT		Auto	MT	HT		
						# of Auto	# of MT	# of HT	mph	kmph	mph	kmph	mph	kmph	dBA				
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0
				WB	550	534	11	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7	0.0
				Total	1,690	1,639	34	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6	0.0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	1,790	1,717	35	38	35	56	35	56	35	56	66.7	59.5	66.5	70.0	1.2
				WB	1,740	1,668	34	37	35	56	35	56	35	56	66.5	59.4	66.4	69.9	1.2
				Total	3,530	3,385	70	75	35	56	35	56	35	56	69.6	62.5	69.5	73.0	1.2
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	280	272	6	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8	0.0
				WB	300	291	6	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1	0.0
				Total	580	563	12	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0	0.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	581	567	9	5	35	56	35	56	35	56	61.8	53.8	57.5	63.7	0.6
				SB	577	561	11	5	35	56	35	56	35	56	61.8	54.4	58.1	63.9	0.2
				Total	1,158	1,128	20	10	35	56	35	56	35	56	64.8	57.1	60.8	66.8	0.4
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	475	10	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2	0.0
				SB	650	631	13	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5	0.0
				Total	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0

TRAFFIC NOISE LEVEL ESTIMATES - CONSTRUCTION 8/14/2024

Project: SFO RADP Project #9 CONRAC Facility

Scenario: Existing AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE % Auto %	Auto # of Auto	Medium Truck %	Medium Truck # of MT	Heavy Truck %	Heavy Truck # of HT	VEHICLE SPEED Auto mph	Auto kmph	MT mph	MT kmph	HT mph	HT kmph	Noise Level (Calveno Factors) Auto dBA	MT dBA	HT dBA	Calculated Noise Level (dBA) (15 m from roadway center)
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9
				WB	550	97	534	2	11	1	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7
				Total	1,690	97	1,639	2	34	1	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	1,770	97	1,717	2	35	1	18	35	56	35	56	35	56	66.7	59.5	63.2	68.8
				WB	1,720	97	1,668	2	34	1	17	35	56	35	56	35	56	66.5	59.4	63.1	68.7
				Total	3,490	97	3,385	2	70	1	35	35	56	35	56	35	56	69.6	62.5	66.2	71.8
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	280	97	272	2	6	1	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8
				WB	300	97	291	2	6	1	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1
				Total	580	97	563	2	12	1	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	470	97	456	2	9	1	5	35	56	35	56	35	56	60.9	53.8	57.5	63.1
				SB	540	97	524	2	11	1	5	35	56	35	56	35	56	61.5	54.4	58.1	63.7
				Total	1,010	97	980	2	20	1	10	35	56	35	56	35	56	64.2	57.1	60.8	66.4
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	97	475	2	10	1	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2
				SB	650	97	631	2	13	1	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5
				Total	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9

Scenario: RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE # of Auto	# of MT	# of HT
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	0	0	0	0
				WB	0	0	0	0
				Total	0	0	0	0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	4	0	0	4
				WB	4	0	0	4
				Total	8	0	0	8
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	0	0	0	0
				WB	0	0	0	0
				Total	0	0	0	0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	99	55	3	41
				SB	62	18	3	41
				Total	161	73	6	82
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	0	0	0	0
				SB	0	0	0	0
				Total	0	0	0	0

Scenario: Eisti + RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE # of Auto	# of MT	# of HT	VEHICLE SPEED Auto mph	Auto kmph	MT mph	MT kmph	HT mph	HT kmph	Noise Level (Calveno Factors) Auto dBA	MT dBA	HT dBA	Calculated Noise Level (dBA) (15 m from roadway center)	Increase Over Existing Noise Level (dBA) (15 m from roadway center)
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0
				WB	550	534	11	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7	0.0
				Total	1,690	1,639	34	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6	0.0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	1,774	1,717	35	22	35	56	35	56	35	56	66.7	59.5	64.1	69.1	0.3
				WB	1,724	1,668	34	21	35	56	35	56	35	56	66.5	59.4	64.0	69.0	0.3
				Total	3,498	3,385	70	43	35	56	35	56	35	56	69.6	62.5	67.1	72.0	0.3
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	280	272	6	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8	0.0
				WB	300	291	6	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1	0.0
				Total	580	563	12	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0	0.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	569	511	12	46	35	56	35	56	35	56	61.4	55.0	67.3	68.5	5.5
				SB	602	542	14	46	35	56	35	56	35	56	61.6	55.4	67.4	68.6	5.0
				Total	1,171	1,053	26	92	35	56	35	56	35	56	64.5	58.2	70.4	71.6	5.2
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	475	10	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2	0.0
				SB	650	631	13	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5	0.0
				Total	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0

TRAFFIC NOISE LEVEL ESTIMATES - CONSTRUCTION 8/14/2024

Project: SFO RADP Project #3 ITB Main Hall Expansion

Scenario: Existing AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE %						VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)
						Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT	
						%	# of Auto	%	# of MT	%	# of HT	mph	kmph	mph	kmph	mph	kmph	dBA			
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9
				WB	550	97	534	2	11	1	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7
				Total	1,690	97	1,639	2	34	1	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	1,770	97	1,717	2	35	1	18	35	56	35	56	35	56	66.7	59.5	63.2	68.8
				WB	1,720	97	1,668	2	34	1	17	35	56	35	56	35	56	66.5	59.4	63.1	68.7
				Total	3,490	97	3,385	2	70	1	35	35	56	35	56	35	56	69.6	62.5	66.2	71.8
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	280	97	272	2	6	1	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8
				WB	300	97	291	2	6	1	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1
				Total	580	97	563	2	12	1	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	470	97	456	2	9	1	5	35	56	35	56	35	56	60.9	53.8	57.5	63.1
				SB	540	97	524	2	11	1	5	35	56	35	56	35	56	61.5	54.4	58.1	63.7
				Total	1,010	97	980	2	20	1	10	35	56	35	56	35	56	64.2	57.1	60.8	66.4
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	97	475	2	10	1	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2
				SB	650	97	631	2	13	1	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5
				Total	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9

Scenario: RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE		
						# of Auto	# of MT	# of HT
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	0	0	0	0
				WB	0	0	0	0
				Total	0	0	0	0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	10	0	0	10
				WB	10	0	0	10
				Total	20	0	0	20
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	0	0	0	0
				WB	0	0	0	0
				Total	0	0	0	0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	44	44	0	0
				SB	15	15	0	0
				Total	59	59	0	0
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	0	0	0	0
				SB	0	0	0	0
				Total	0	0	0	0

Scenario: Eisti + RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE			VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)	Increase Over Existing Noise Level (dBA) (15 m from roadway center)
									Auto		MT		HT		Auto	MT	HT		
						# of Auto	# of MT	# of HT	mph	kmph	mph	kmph	mph	kmph	dBA				
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0
				WB	550	534	11	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7	0.0
				Total	1,690	1,639	34	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6	0.0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	1,780	1,717	35	28	35	56	35	56	35	56	66.7	59.5	65.2	69.5	0.6
				WB	1,730	1,668	34	27	35	56	35	56	35	56	66.5	59.4	65.1	69.3	0.6
				Total	3,510	3,385	70	55	35	56	35	56	35	56	69.6	62.5	68.1	72.4	0.6
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	280	272	6	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8	0.0
				WB	300	291	6	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1	0.0
				Total	580	563	12	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0	0.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	514	500	9	5	35	56	35	56	35	56	61.3	53.8	57.5	63.3	0.2
				SB	555	539	11	5	35	56	35	56	35	56	61.6	54.4	58.1	63.7	0.1
				Total	1,069	1,039	20	10	35	56	35	56	35	56	64.5	57.1	60.8	66.5	0.2
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	475	10	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2	0.0
				SB	650	631	13	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5	0.0
				Total	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0

TRAFFIC NOISE LEVEL ESTIMATES - CONSTRUCTION 8/14/2024

Project: SFO RADP Project #19 E Field GSE #2

Scenario: Existing AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE %						VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)
						Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT	
						%	# of Auto	%	# of MT	%	# of HT	mph	kmph	35	kmph	mph	kmph	dBA			
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9
				WB	550	97	534	2	11	1	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7
				Total	1,690	97	1,639	2	34	1	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	1,770	97	1,717	2	35	1	18	35	56	35	56	35	56	66.7	59.5	63.2	68.8
			Commercial	WB	1,720	97	1,668	2	34	1	17	35	56	35	56	35	56	66.5	59.4	63.1	68.7
			Residential	Total	3,490	97	3,385	2	70	1	35	35	56	35	56	35	56	69.6	62.5	66.2	71.8
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses	EB	280	97	272	2	6	1	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8
			Safe Harbor Shelter	WB	300	97	291	2	6	1	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1
			at 320 feet	Total	580	97	563	2	12	1	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	470	97	456	2	9	1	5	35	56	35	56	35	56	60.9	53.8	57.5	63.1
				SB	540	97	524	2	11	1	5	35	56	35	56	35	56	61.5	54.4	58.1	63.7
				Total	1,010	97	980	2	20	1	10	35	56	35	56	35	56	64.2	57.1	60.8	66.4
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	97	475	2	10	1	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2
				SB	650	97	631	2	13	1	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5
				Total	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9

Scenario: RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE		
						# of Auto	# of MT	# of HT
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	0	0	0	0
				WB	0	0	0	0
				Total	0	0	0	0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	0	0	0	0
			Commercial	WB	0	0	0	0
			Residential	Total	0	0	0	0
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses	EB	4	0	3	1
			Safe Harbor Shelter	WB	4	0	3	1
			at 320 feet	Total	8	0	6	2
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	17	14	3	0
				SB	8	5	3	0
				Total	25	19	6	0
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	0	0	0	0
				SB	0	0	0	0
				Total	0	0	0	0

Scenario: Eisti + RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE			VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)	Increase Over Existing Noise Level (dBA) (15 m from roadway center)
									Auto		MT		HT		Auto	MT	HT		
						# of Auto	# of MT	# of HT	mph	kmph	mph	kmph	mph	kmph	dBA				
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0
				WB	550	534	11	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7	0.0
				Total	1,690	1,639	34	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6	0.0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	1,770	1,717	35	18	35	56	35	56	35	56	66.7	59.5	63.2	68.8	0.0
			Commercial	WB	1,720	1,668	34	17	35	56	35	56	35	56	66.5	59.4	63.1	68.7	0.0
			Residential	Total	3,490	3,385	70	35	35	56	35	56	35	56	69.6	62.5	66.2	71.8	0.0
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses	EB	284	272	9	4	35	56	35	56	35	56	58.6	53.4	56.5	61.5	0.6
			Safe Harbor Shelter	WB	304	291	9	4	35	56	35	56	35	56	58.9	53.6	56.8	61.7	0.6
			at 320 feet	Total	588	563	18	8	35	56	35	56	35	56	61.8	56.5	59.7	64.6	0.6
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	487	470	12	5	35	56	35	56	35	56	61.0	55.0	57.5	63.3	0.2
				SB	548	529	14	5	35	56	35	56	35	56	61.5	55.4	58.1	63.8	0.2
				Total	1,035	999	26	10	35	56	35	56	35	56	64.3	58.2	60.8	66.6	0.2
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	475	10	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2	0.0
				SB	650	631	13	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5	0.0
				Total	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0

TRAFFIC NOISE LEVEL ESTIMATES - CONSTRUCTION 8/14/2024

Project: High Overlapping Scenario - SFO RADP Projects #6 (Central Hub), #9 (CONRAC Facility) & #3 (ITB Main Hall Expansion)

Scenario: Existing AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE % Auto %	Auto # of Auto	Medium Truck %	Medium Truck # of MT	Heavy Truck %	Heavy Truck # of HT	VEHICLE SPEED Auto mph	Auto kmph	MT mph	MT kmph	HT mph	HT kmph	Noise Level (Calveno Factors) Auto dBA	MT dBA	HT dBA	Calculated Noise Level (dBA) (15 m from roadway center)
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9
				WB	550	97	534	2	11	1	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7
				Total	1,690	97	1,639	2	34	1	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	1,770	97	1,717	2	35	1	18	35	56	35	56	35	56	66.7	59.5	63.2	68.8
			Commercial	WB	1,720	97	1,668	2	34	1	17	35	56	35	56	35	56	66.5	59.4	63.1	68.7
			Residential	Total	3,490	97	3,385	2	70	1	35	35	56	35	56	35	56	69.6	62.5	66.2	71.8
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses	EB	280	97	272	2	6	1	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8
			Safe Harbor Shelter	WB	300	97	291	2	6	1	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1
			at 320 feet	Total	580	97	563	2	12	1	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	470	97	456	2	9	1	5	35	56	35	56	35	56	60.9	53.8	57.5	63.1
				SB	540	97	524	2	11	1	5	35	56	35	56	35	56	61.5	54.4	58.1	63.7
				Total	1,010	97	980	2	20	1	10	35	56	35	56	35	56	64.2	57.1	60.8	66.4
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	97	475	2	10	1	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2
				SB	650	97	631	2	13	1	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5
				Total	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9

Scenario: RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE # of Auto	# of MT	# of HT
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	0	0	0	0
				WB	0	0	0	0
				Total	0	0	0	0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	34	0	0	34
			Commercial	WB	34	0	0	34
			Residential	Total	68	0	0	68
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses	EB	0	0	0	0
			Safe Harbor Shelter	WB	0	0	0	0
			at 320 feet	Total	0	0	0	0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	254	210	3	41
				SB	114	70	3	41
				Total	368	280	6	82
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	0	0	0	0
				SB	0	0	0	0
				Total	0	0	0	0

Scenario: Eisti + RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE # of Auto	# of MT	# of HT	VEHICLE SPEED Auto mph	Auto kmph	MT mph	MT kmph	HT mph	HT kmph	Noise Level (Calveno Factors) Auto dBA	MT dBA	HT dBA	Calculated Noise Level (dBA) (15 m from roadway center)	Increase Over Existing Noise Level (dBA) (15 m from roadway center)
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0
				WB	550	534	11	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7	0.0
				Total	1,690	1,639	34	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6	0.0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	1,804	1,717	35	52	35	56	35	56	35	56	66.7	59.5	67.9	70.7	1.8
			Commercial	WB	1,754	1,668	34	51	35	56	35	56	35	56	66.5	59.4	67.8	70.6	1.9
			Residential	Total	3,558	3,385	70	103	35	56	35	56	35	56	69.6	62.5	70.9	73.6	1.9
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses	EB	280	272	6	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8	0.0
			Safe Harbor Shelter	WB	300	291	6	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1	0.0
			at 320 feet	Total	580	563	12	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0	0.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	724	666	12	46	35	56	35	56	35	56	62.5	55.0	67.3	68.8	5.7
				SB	654	594	14	46	35	56	35	56	35	56	62.0	55.4	67.4	68.7	5.1
				Total	1,378	1,260	26	92	35	56	35	56	35	56	65.3	58.2	70.4	71.8	5.4
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	475	10	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2	0.0
				SB	650	631	13	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5	0.0
				Total	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0

TRAFFIC NOISE LEVEL ESTIMATES - CONSTRUCTION 8/14/2024

Project: **Medium Overlapping Scenario - SFO RADP Projects #3 (ITB Main Hall Expansion) & #19 (E Field GSE #2)**

Scenario: Existing AM Peak Hour

Seg ID	*Segment Name*	*Jurisdiction*	*Adjacent Land Uses*	*Direction*	*Total # Vehicles*	*VEHICLE TYPE %*						*VEHICLE SPEED*						*Noise Level (Calveno Factors)*			*Calculated Noise Level (dBA)*
						Auto		*Medium Truck*		*Heavy Truck*		*Auto*		*MT*		*HT*		*Auto*	*MT*	*HT*	
						%	*# of Auto*	*%*	*# of MT*	*%*	*# of HT*	*mph*	*kmph*	*mph*	*kmph*	*mph*	*kmph*	*dBA*			*(15 m from roadway center)*
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9
				WB	550	97	534	2	11	1	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7
				Total	1,690	97	1,639	2	34	1	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	1,770	97	1,717	2	35	1	18	35	56	35	56	35	56	66.7	59.5	63.2	68.8
			Commercial	WB	1,720	97	1,668	2	34	1	17	35	56	35	56	35	56	66.5	59.4	63.1	68.7
			Residential	Total	3,490	97	3,385	2	70	1	35	35	56	35	56	35	56	69.6	62.5	66.2	71.8
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses	EB	280	97	272	2	6	1	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8
			Safe Harbor Shelter	WB	300	97	291	2	6	1	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1
			at 320 feet	Total	580	97	563	2	12	1	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	470	97	456	2	9	1	5	35	56	35	56	35	56	60.9	53.8	57.5	63.1
				SB	540	97	524	2	11	1	5	35	56	35	56	35	56	61.5	54.4	58.1	63.7
				Total	1,010	97	980	2	20	1	10	35	56	35	56	35	56	64.2	57.1	60.8	66.4
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	97	475	2	10	1	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2
				SB	650	97	631	2	13	1	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5
				Total	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9

Scenario: RADP Construction Traffic AM Peak Hour

Seg ID	*Segment Name*	*Jurisdiction*	*Adjacent Land Uses*	*Direction*	*Total # Vehicles*	*VEHICLE TYPE*		
						# of Auto	*# of MT*	*# of HT*
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	0	0	0	0
				WB	0	0	0	0
				Total	0	0	0	0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	10	0	0	10
			Commercial	WB	10	0	0	10
			Residential	Total	20	0	0	20
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses	EB	4	0	3	1
			Safe Harbor Shelter	WB	4	0	3	1
			at 320 feet	Total	8	0	6	2
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	61	58	3	0
				SB	23	20	3	0
				Total	84	78	6	0
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	0	0	0	0
				SB	0	0	0	0
				Total	0	0	0	0

Scenario: Eisti + RADP Construction Traffic AM Peak Hour

Seg ID	*Segment Name*	*Jurisdiction*	*Adjacent Land Uses*	*Direction*	*Total # Vehicles*	*VEHICLE TYPE*			*VEHICLE SPEED*						*Noise Level (Calveno Factors)*			*Calculated Noise Level (dBA)*	*Increase Over Existing Noise Level (dBA)*
									Auto		*MT*		*HT*		*Auto*	*MT*	*HT*		
						# of Auto	*# of MT*	*# of HT*	*mph*	*kmph*	*mph*	*kmph*	*mph*	*kmph*	*dBA*			*(15 m from roadway center)*	*(15 m from roadway center)*
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0
				WB	550	534	11	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7	0.0
				Total	1,690	1,639	34	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6	0.0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	1,780	1,717	35	28	35	56	35	56	35	56	66.7	59.5	65.2	69.5	0.6
			Commercial	WB	1,730	1,668	34	27	35	56	35	56	35	56	66.5	59.4	65.1	69.3	0.6
			Residential	Total	3,510	3,385	70	55	35	56	35	56	35	56	69.6	62.5	68.1	72.4	0.6
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses	EB	284	272	9	4	35	56	35	56	35	56	58.6	53.4	56.5	61.5	0.6
			Safe Harbor Shelter	WB	304	291	9	4	35	56	35	56	35	56	58.9	53.6	56.8	61.7	0.6
			at 320 feet	Total	588	563	18	8	35	56	35	56	35	56	61.8	56.5	59.7	64.6	0.6
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	531	514	12	5	35	56	35	56	35	56	61.4	55.0	57.5	63.5	0.5
				SB	563	544	14	5	35	56	35	56	35	56	61.7	55.4	58.1	63.9	0.2
				Total	1,094	1,058	26	10	35	56	35	56	35	56	64.6	58.2	60.8	66.7	0.3
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	475	10	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2	0.0
				SB	650	631	13	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5	0.0
				Total	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0

TRAFFIC NOISE LEVEL ESTIMATES - CONSTRUCTION 8/14/2024

Project: Low Overlapping Scenario - SFO RADP Projects #19 (E Field GSE #2) & another small project simiar in size to #19

Scenario: Existing AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE % Auto %	Auto # of Auto	Medium Truck %	Medium Truck # of MT	Heavy Truck %	Heavy Truck # of HT	VEHICLE SPEED Auto mph	Auto kmph	MT mph	MT kmph	HT mph	HT kmph	Noise Level (Calveno Factors) Auto dBA	MT dBA	HT dBA	Calculated Noise Level (dBA) (15 m from roadway center)
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9
				WB	550	97	534	2	11	1	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7
				Total	1,690	97	1,639	2	34	1	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	1,770	97	1,717	2	35	1	18	35	56	35	56	35	56	66.7	59.5	63.2	68.8
				WB	1,720	97	1,668	2	34	1	17	35	56	35	56	35	56	66.5	59.4	63.1	68.7
				Total	3,490	97	3,385	2	70	1	35	35	56	35	56	35	56	69.6	62.5	66.2	71.8
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	280	97	272	2	6	1	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8
				WB	300	97	291	2	6	1	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1
				Total	580	97	563	2	12	1	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	470	97	456	2	9	1	5	35	56	35	56	35	56	60.9	53.8	57.5	63.1
				SB	540	97	524	2	11	1	5	35	56	35	56	35	56	61.5	54.4	58.1	63.7
				Total	1,010	97	980	2	20	1	10	35	56	35	56	35	56	64.2	57.1	60.8	66.4
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	97	475	2	10	1	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2
				SB	650	97	631	2	13	1	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5
				Total	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9

Scenario: RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE # of Auto	# of MT	# of HT
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	0	0	0	0
				WB	0	0	0	0
				Total	0	0	0	0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	0	0	0	0
				WB	0	0	0	0
				Total	0	0	0	0
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	8	0	6	2
				WB	8	0	6	2
				Total	16	0	12	4
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	34	28	6	0
				SB	16	10	6	0
				Total	50	38	12	0
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	0	0	0	0
				SB	0	0	0	0
				Total	0	0	0	0

Scenario: Eisti + RADP Construction Traffic AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE # of Auto	# of MT	# of HT	VEHICLE SPEED Auto mph	Auto kmph	MT mph	MT kmph	HT mph	HT kmph	Noise Level (Calveno Factors) Auto dBA	MT dBA	HT dBA	Calculated Noise Level (dBA) (15 m from roadway center)	Increase Over Existing Noise Level (dBA) (15 m from roadway center)
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0
				WB	550	534	11	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7	0.0
				Total	1,690	1,639	34	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6	0.0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel Commercial Residential	EB	1,770	1,717	35	18	35	56	35	56	35	56	66.7	59.5	63.2	68.8	0.0
				WB	1,720	1,668	34	17	35	56	35	56	35	56	66.5	59.4	63.1	68.7	0.0
				Total	3,490	3,385	70	35	35	56	35	56	35	56	69.6	62.5	66.2	71.8	0.0
6	North Access Road, west of North Field Road	Airport/South San Francisco Boundary	Airport uses Safe Harbor Shelter at 320 feet	EB	288	272	12	5	35	56	35	56	35	56	58.6	54.7	57.6	62.0	1.2
				WB	308	291	12	5	35	56	35	56	35	56	58.9	54.8	57.7	62.3	1.1
				Total	596	563	24	10	35	56	35	56	35	56	61.8	57.8	60.7	65.2	1.2
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	504	484	15	5	35	56	35	56	35	56	61.2	55.9	57.5	63.5	0.5
				SB	556	534	17	5	35	56	35	56	35	56	61.6	56.3	58.1	64.0	0.3
				Total	1,060	1,018	32	10	35	56	35	56	35	56	64.4	59.1	60.8	66.8	0.4
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	475	10	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2	0.0
				SB	650	631	13	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5	0.0
				Total	1,140	1,106	23	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9	0.0

OPERATIONAL TRAFFIC NOISE LEVEL ESTIMATES 7/29/2024

Project: SFO RADP

Scenario: Existing AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE %						VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)
						Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT	
						%	# of Auto	%	# of MT	%	# of HT	mph	kmph	mph	kmph	mph	kmph	dBA			
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9
				WB	550	97	534	2	11	1	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7
				Total	1,690	97	1,639	2	34	1	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	1,770	97	1,717	2	35	1	18	35	56	35	56	35	56	66.7	59.5	63.2	68.8
			Commercial	WB	1,720	97	1,668	2	34	1	17	35	56	35	56	35	56	66.5	59.4	63.1	68.7
			Residential	Total	3,490	97	3,385	2	70	1	35	35	56	35	56	35	56	69.6	62.5	66.2	71.8
6	North Access Road, west of North Field Road	Airport/South San Francisco boundary	Airport uses	EB	280	97	272	2	6	1	3	35	56	35	56	35	56	58.6	51.5	55.2	60.8
			Safe Harbor Shelter	WB	300	97	291	2	6	1	3	35	56	35	56	35	56	58.9	51.8	55.5	61.1
			at 320 feet	Total	580	97	563	2	12	1	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	470	97	456	2	9	1	5	35	56	35	56	35	56	60.9	53.8	57.5	63.1
				SB	540	97	524	2	11	1	5	35	56	35	56	35	56	61.5	54.4	58.1	63.7
				Total	1,010	97	980	2	20	1	10	35	56	35	56	35	56	64.2	57.1	60.8	66.4
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	490	97	475	2	10	1	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2
				SB	650	97	631	2	13	1	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5
				Total	1,140	97	1,106	2	23	1	11	35	56	35	56	35	56	64.7	57.6	61.3	66.9

Scenario: 2045 No Project AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE %						VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)	Increase Over Existing Noise Level (dBA) (15 m from roadway center)
						Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT		
						%	# of Auto	%	# of MT	%	# of HT	mph	kmph	mph	kmph	mph	kmph	dBA				
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,180	97	1,145	2	24	1	12	35	56	35	56	35	56	64.9	57.8	61.5	67.1	0.1
				WB	580	97	563	2	12	1	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0	0.2
				Total	1,760	97	1,707	2	35	1	18	35	56	35	56	35	56	66.6	59.5	63.2	68.8	0.2
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	2,020	97	1,959	2	40	1	20	35	56	35	56	35	56	67.2	60.1	63.8	69.4	0.6
			Commercial	WB	2,310	97	2,241	2	46	1	23	35	56	35	56	35	56	67.8	60.7	64.4	70.0	1.3
			Residential	Total	4,330	97	4,200	2	87	1	43	35	56	35	56	35	56	70.5	63.4	67.1	72.7	0.9
6	North Access Road, west of North Field Road	Airport/South San Francisco boundary	Airport uses	EB	490	97	475	2	10	1	5	35	56	35	56	35	56	61.1	53.9	57.6	63.2	2.4
			Safe Harbor Shelter	WB	370	97	359	2	7	1	4	35	56	35	56	35	56	59.9	52.7	56.4	62.0	0.9
			at 320 feet	Total	860	97	834	2	17	1	9	35	56	35	56	35	56	63.5	56.4	60.1	65.7	1.7
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	700	97	679	2	14	1	7	35	56	35	56	35	56	62.6	55.5	59.2	64.8	1.7
				SB	990	97	960	2	20	1	10	35	56	35	56	35	56	64.1	57.0	60.7	66.3	2.6
				Total	1,690	97	1,639	2	34	1	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6	2.2
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	630	97	611	2	13	1	6	35	56	35	56	35	56	62.2	55.0	58.7	64.3	1.1
				SB	750	97	728	2	15	1	8	35	56	35	56	35	56	62.9	55.8	59.5	65.1	0.6
				Total	1,380	97	1,339	2	28	1	14	35	56	35	56	35	56	65.6	58.4	62.1	67.7	0.8

Scenario: 2045 + Project AM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE %						VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)	Increase Over Existing Noise Level (dBA) (15 m from roadway center)	Increase Over 2045 NP Noise Level (dBA) (15 m from roadway center)
						Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT			
						%	# of Auto	%	# of MT	%	# of HT	mph	kmph	mph	kmph	mph	kmph	dBA					
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	1,180	97	1,145	2	24	1	12	35	56	35	56	35	56	64.9	57.8	61.5	67.1	0.1	0.0
				WB	580	97	563	2	12	1	6	35	56	35	56	35	56	61.8	54.7	58.4	64.0	0.2	0.0
				Total	1,760	97	1,707	2	35	1	18	35	56	35	56	35	56	66.6	59.5	63.2	68.8	0.2	0.0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	2,020	97	1,959	2	40	1	20	35	56	35	56	35	56	67.2	60.1	63.8	69.4	0.6	0.0
			Commercial	WB	2,310	97	2,241	2	46	1	23	35	56	35	56	35	56	67.8	60.7	64.4	70.0	1.3	0.0
			Residential	Total	4,330	97	4,200	2	87	1	43	35	56	35	56	35	56	70.5	63.4	67.1	72.7	0.9	0.0
6	North Access Road, west of North Field Road	Airport/South San Francisco boundary	Airport uses	EB	550	97	534	2	11	1	6	35	56	35	56	35	56	61.6	54.4	58.1	63.7	2.9	0.5
			Safe Harbor Shelter	WB	400	97	388	2	8	1	4	35	56	35	56	35	56	60.2	53.1	56.8	62.4	1.2	0.3
			at 320 feet	Total	950	97	922	2	19	1	10	35	56	35	56	35	56	64.0	56.8	60.5	66.1	2.1	0.4
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	790	97	766	2	16	1	8	35	56	35	56	35	56	63.2	56.0	59.7	65.3	2.3	0.5
				SB	1,160	97	1,125	2	23	1	12	35	56	35	56	35	56	64.8	57.7	61.4	67.0	3.3	0.7
				Total	1,950	97	1,892	2	39	1	20	35	56	35	56	35	56	67.1	59.9	63.6	69.2	2.9	0.6
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	700	97	679	2	14	1	7	35	56	35	56	35	56	62.6	55.5	59.2	64.8	1.5	0.5
				SB	760	97	737	2	15	1	8	35	56	35	56	35	56	63.0	55.9	59.6	65.2	0.7	0.1
				Total	1,460	97	1,416	2	29	1	15	35	56	35	56	35	56	65.8	58.7	62.4	68.0	1.1	0.2

OPERATIONAL TRAFFIC NOISE LEVEL ESTIMATES 7/29/2024

Project: SFO RADP

Scenario Existing PM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE %						VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)
						Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT	
						%	# of Auto	%	# of MT	%	# of HT	mph	kmph	mph	kmph	mph	kmph	dBA			
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	780	97	757	2	16	1	8	35	56	35	56	35	56	63.1	56.0	59.7	65.3
				WB	1,250	97	1,213	2	25	1	13	35	56	35	56	35	56	65.1	58.0	61.7	67.3
				Total	2,030	97	1,969	2	41	1	20	35	56	35	56	35	56	67.3	60.1	63.8	69.4
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	1,810	97	1,756	2	36	1	18	35	56	35	56	35	56	66.8	59.6	63.3	68.9
			Commercial	WB	2,050	97	1,989	2	41	1	21	35	56	35	56	35	56	67.3	60.2	63.9	69.5
			Residential	Total	3,860	97	3,744	2	77	1	39	35	56	35	56	35	56	70.0	62.9	66.6	72.2
6	North Access Road, west of North Field Road	Airport/South San Francisco boundary	Airport uses	EB	170	97	165	2	3	1	2	35	56	35	56	35	56	56.5	49.3	53.0	58.6
			Safe Harbor Shelter	WB	230	97	223	2	5	1	2	35	56	35	56	35	56	57.8	50.7	54.4	60.0
			at 320 feet	Total	400	97	388	2	8	1	4	35	56	35	56	35	56	60.2	53.1	56.8	62.4
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	650	97	631	2	13	1	7	35	56	35	56	35	56	62.3	55.2	58.9	64.5
				SB	520	97	504	2	10	1	5	35	56	35	56	35	56	61.3	54.2	57.9	63.5
				Total	1,170	97	1,135	2	23	1	12	35	56	35	56	35	56	64.9	57.7	61.4	67.0
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	740	97	718	2	15	1	7	35	56	35	56	35	56	62.9	55.7	59.4	65.0
				SB	600	97	582	2	12	1	6	35	56	35	56	35	56	62.0	54.8	58.5	64.1
				Total	1,340	97	1,300	2	27	1	13	35	56	35	56	35	56	65.4	58.3	62.0	67.6

Scenario 2045 No Project PM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE %						VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)	Increase Over Existing Noise Level (dBA) (15 m from roadway center)
						Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT		
						%	# of Auto	%	# of MT	%	# of HT	mph	kmph	mph	kmph	mph	kmph	dBA				
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	850	97	860	2	17	1	9	35	56	35	56	35	56	63.7	56.3	60.0	65.8	0.5
				WB	1,730	97	1,350	2	35	1	17	35	56	35	56	35	56	65.6	59.4	63.1	68.2	0.9
				Total	2,580	97	2,503	2	52	1	26	35	56	35	56	35	56	68.3	61.2	64.9	70.5	1.0
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	1,940	97	1,940	2	39	1	19	35	56	35	56	35	56	67.2	59.9	63.6	69.3	0.4
			Commercial	WB	2,620	97	2,620	2	52	1	26	35	56	35	56	35	56	68.5	61.2	64.9	70.6	1.1
			Residential	Total	4,560	97	4,423	2	91	1	46	35	56	35	56	35	56	70.8	63.6	67.3	72.9	0.7
6	North Access Road, west of North Field Road	Airport/South San Francisco boundary	Airport uses	EB	210	97	204	2	4	1	2	35	56	35	56	35	56	57.4	50.3	54.0	59.6	0.9
			Safe Harbor Shelter	WB	420	97	407	2	8	1	4	35	56	35	56	35	56	60.4	53.3	57.0	62.6	2.6
			at 320 feet	Total	630	97	611	2	13	1	6	35	56	35	56	35	56	62.2	55.0	58.7	64.3	2.0
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	1,310	97	1,271	2	26	1	13	35	56	35	56	35	56	65.3	58.2	61.9	67.5	3.0
				SB	760	97	737	2	15	1	8	35	56	35	56	35	56	63.0	55.9	59.6	65.2	1.6
				Total	2,070	97	2,008	2	41	1	21	35	56	35	56	35	56	67.3	60.2	63.9	69.5	2.5
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	890	97	863	2	18	1	9	35	56	35	56	35	56	63.7	56.5	60.2	65.8	0.8
				SB	720	97	698	2	14	1	7	35	56	35	56	35	56	62.7	55.6	59.3	64.9	0.8
				Total	1,610	97	1,562	2	32	1	16	35	56	35	56	35	56	66.2	59.1	62.8	68.4	0.8

Scenario 2045 + Project PM Peak Hour

Seg ID	Segment Name	Jurisdiction	Adjacent Land Uses	Direction	Total # Vehicles	VEHICLE TYPE %						VEHICLE SPEED						Noise Level (Calveno Factors)			Calculated Noise Level (dBA) (15 m from roadway center)	Increase Over Existing Noise Level (dBA) (15 m from roadway center)	Increase Over 2045 NP Noise Level (dBA) (15 m from roadway center)
						Auto		Medium Truck		Heavy Truck		Auto		MT		HT		Auto	MT	HT			
						%	# of Auto	%	# of MT	%	# of HT	mph	kmph	mph	kmph	mph	kmph	dBA					
4	Millbrae Avenue, east of U.S. 101	Millbrae	Industrial	EB	860	97	834	2	17	1	9	35	56	35	56	35	56	63.5	56.4	60.1	65.7	0.4	-0.1
				WB	1,350	97	1,310	2	27	1	14	35	56	35	56	35	56	65.5	58.3	62.0	67.6	0.3	-0.5
				Total	2,210	97	2,144	2	44	1	22	35	56	35	56	35	56	67.6	60.5	64.2	69.8	0.4	-0.7
5	Millbrae Avenue, west of U.S. 101	Millbrae	Hotel	EB	1,940	97	1,882	2	39	1	19	35	56	35	56	35	56	67.1	59.9	63.6	69.2	0.3	-0.1
			Commercial	WB	2,620	97	2,541	2	52	1	26	35	56	35	56	35	56	68.4	61.2	64.9	70.5	1.1	-0.1
			Residential	Total	4,560	97	4,423	2	91	1	46	35	56	35	56	35	56	70.8	63.6	67.3	72.9	0.7	0.0
6	North Access Road, west of North Field Road	Airport/South San Francisco boundary	Airport uses	EB	220	97	213	2	4	1	2	35	56	35	56	35	56	57.6	50.5	54.2	59.8	1.1	0.2
			Safe Harbor Shelter	WB	470	97	456	2	9	1	5	35	56	35	56	35	56	60.9	53.8	57.5	63.1	3.1	0.5
			at 320 feet	Total	690	97	669	2	14	1	7	35	56	35	56	35	56	62.6	55.4	59.1	64.7	2.4	0.4
8	South Airport Boulevard, south of North Access Road	South San Francisco	Airport buildings	NB	1,500	97	1,455	2	30	1	15	35	56	35	56	35	56	65.9	58.8	62.5	68.1	3.6	0.6
				SB	810	97	786	2	16	1	8	35	56	35	56	35	56	63.3	56.1	59.8	65.4	**1.9**	0.3
				Total	2,310	97	2,241	2	46	1	23	35	56	35	56	35	56	67.8	60.7	64.4	70.0	3.0	0.5
9	North McDonnell Road, between San Bruno Avenue and South McDonnell Road	Airport	Airport buildings	NB	960	97	931	2	19	1	10	35	56	35	56	35	56	64.0	56.9	60.6	66.2	1.1	0.3
				SB	740	97	718	2	15	1	7	35	56	35	56	35	56	62.9	55.7	59.4	65.0	0.9	0.1
				Total	1,700	97	1,649	2	34	1	17	35	56	35	56	35	56	66.5	59.3	63.0	68.6	1.0	0.2

Appendix B
Scope of Work

SFO RECOMMENDED AIRPORT DEVELOPMENT PLAN (PLANNING DEPARTMENT CASE NO. 2017-007468ENV) NOISE AND VIBRATION TECHNICAL MEMORANDUM AND EIR ANALYSIS

Scope of Work

Project Description

The proposed Recommended Airport Development Plan (RADP) is a plan for accommodating future passenger growth at San Francisco International Airport (SFO). According to SFO, the RADP is not inducing passenger demand, but rather serves as a roadmap to guide long-term Airport development to address the estimated maximum capacity of the existing runway system anticipated to occur in the future and supports SFO's overarching strategic objectives. The RADP identifies recommended projects that would accommodate anticipated passenger growth at the Airport, forecast to reach 71.1 million annual passengers at the estimated maximum capacity of the existing runway system.[1] Collectively, these projects constitute the RADP. No runway expansion or extension projects are proposed as part of the RADP. Rather, the RADP projects would develop landside and terminal facilities to better accommodate the passenger growth forecast.

Based on the FAA-approved aviation activity forecast and the current estimated timeline for implementation, construction of individual RADP projects is anticipated to begin in 2024, with full buildout of the RADP projects by 2045. As such, the operational analysis year for the RADP EIR will be 2045. Therefore, the noise analysis for the EIR will consider the following comparisons:

Program-Level Analysis

– The Existing Conditions (2019) and the Existing Conditions plus RADP for the construction analysis

– 2045 Future Without RADP and the 2045 Future With RADP for the operational traffic noise analysis.

– To the extent stationary noise sources are evaluated based on ambient noise levels, ambient noise levels will be based on existing conditions collected from noise measurements.

1 Landrum & Brown, Inc., *San Francisco International Airport Aviation Activity Forecast*, April 2014, approved by the Federal Aviation Administration (FAA) on June 9, 2014. FAA approval for the maximum annual passengers that SFO can accommodate to ensure an acceptable level of passenger service is based on the existing runway configuration, which has not changed since FAA's approval.

Cumulative Analysis

- The Existing Conditions (2019) plus construction impacts of the RADP plus construction impacts of cumulative projects
- 2045 Future With RADP plus operational traffic noise impacts of cumulative projects
- To the extent cumulative stationary noise sources are evaluated based on ambient noise levels, ambient noise levels will be based on existing conditions collected from noise measurements.

Task 1: Noise Standards

Table 1 presents quantitative noise and vibration standards proposed for use in the RADP EIR for each sub-topic that will be evaluated. The Airport is not subject to the General Plans or city or county codes of San Francisco, San Mateo County, the City of Millbrae, or the City of South San Francisco.[2] However, Table 1 identifies all noise standards for construction and operation for San Francisco and the adjacent jurisdictions. Based on an initial analysis of the noise standards for all of the jurisdictions as shown in Table 1, ESA recommends those noise standards shown in bold be used for the construction and operational analysis in the RADP EIR. Note that nighttime construction work would occur for several phases as necessary to avoid conflicts with the existing Airport operations, utilities connections and switchovers, and for concrete pours.

Task 2: Defining the Existing Noise Environment

Given the extensive size of the Plan area, this scope of work proposes to establish the existing noise environment based on the substantial library of existing noise level data collected in 2019 (see **Figure 1**). These include noise level measurements conducted at established SFO monitoring stations and data collected by ESA. This data will be supplemented by a new long-term measurement proposed near the City of Millbrae Gateway Development (which includes a hotel) adjacent to the Aviador Lot construction staging area, which was under construction in 2019 and is now complete. The location of the new long-term measurement is shown on **Figure 2**.

[2] California Government Code sections 53090–53091.

TABLE 1
POTENTIAL STANDARDS FOR NOISE AND VIBRATION IMPACTS OF THE SFO RECOMMENDED AIRPORT DEVELOPMENT PLAN EIR

Agency/Jurisdiction	Code Section	Quantitative Noise and Vibration Standards	Allowed Construction Hours	Notes
Construction Noise				
Federal Transit Administration (FTA)	FTA Transit Noise and Vibration Impact Assessment Manual, Table 7-2, *General Assessment Construction Noise Criteria* [a]	**1-hour Leq of 90 dBA at residential uses during daytime**, 80 dBA during nighttime **1-hour L_{eq} of 100 dBA at commercial and industrial uses during daytime** and nighttime.	**Daytime is 7 a.m. to 10 p.m.** Nighttime is 10 p.m. to 7 a.m.	Assumes simultaneous operation of two noisiest pieces of equipment at the boundary of the construction area closest to the receptor. Only daytime standards proposed for analysis. Residential standards are applied to both residential and non-residential noise sensitive receptors (such as hotels, schools, hospitals). Commercial standards are used for worker receptors.
United States Environmental Protection Agency (U.S. EPA)	Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, page 31	24-hour interior noise level of 45 dBA, L_{eq} to protect indoor activity interference, and a 45 dBA, L_{dn} for indoor residential areas	—	
Federal Interagency Committee on Noise (FICON)	Federal Agency Review of Selected Airport Noise Analysis Issues	Provides recommendations based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. The term "annoyance" summarizes the general adverse reaction of people to noise that interferes with speech, disturbs sleep, or interferes with the desire for a tranquil environment. Although the FICON recommendations were specifically developed to assess aircraft noise effects, they apply to all sources of transportation noise described in terms of cumulative noise exposure metrics such as the DNL. The rationale for these standards is that, as ambient noise levels increase, a small increase in decibel levels is sufficient to cause significant annoyance. The quieter the ambient noise level is, the more the noise can increase (in decibels) before it causes significant annoyance. The 5-dBA and 3-dBA noise level increases also correlate directly with noise level increases that Caltrans considers to represent "readily perceivable" and "barely perceivable," respectively, short-term noise increases.		
San Francisco	Not applicable based on guidance from EP	**Compare the noise level resulting from simultaneous operation of the two loudest pieces of equipment (including impact equipment) with the FTA's general construction assessment criterion of 90 dBA 1-hour L_{eq} at the nearest residential or other noise sensitive receptor.**	—	Same as FTA daytime standards. Proposed for analysis of daytime residential and other noise-sensitive receptors.
		Determine if the noise level resulting from the simultaneous operation of the two loudest pieces of equipment (including impact equipment) would be greater than 10 dBA above the background noise level at sensitive receptor locations.	—	Same as FTA standards. Proposed for analysis of noise-sensitive receptors.
		Quantitative analysis of nighttime construction noise should be evaluated based on the potential for construction noise to result in interior noise levels of 45 dBA or more at sensitive receptor locations.	—	Proposed for analysis of nighttime impacts to noise-sensitive receptors.
		For construction traffic noise a 5 dBA increase in the ambient noise level is considered a substantial increase in noise environments designated as Satisfactory based on the Land Use Compatibility Chart for Community Noise in the General Plan Noise Element. For conditionally acceptable, conditionally unacceptable, or unacceptable noise environments, a traffic noise increase greater than 3 dBA is considered a substantial increase.		Proposed for analysis for both noise-sensitive and worker receptors.
	San Francisco Police Code Article 29, Section 2907, Construction Equipment [c]	Noise from any construction equipment to not exceed 80 dBA at 100 feet from equipment or 100 feet from the construction site boundary.	Daytime 7 a.m. to 8 p.m., all days	Restriction does not apply to impact tools such as jackhammers. Non-impact equipment will be evaluated against this standard.
	San Francisco Police Code Article 29, Section 2908, Construction Work at Night [c]	Cumulative noise from construction equipment to not exceed 5 dBA above ambient measured at the nearest property plane. A special nighttime construction permit is required should noise from construction equipment exceed 5 dBA above the ambient noise level at the nearest property plane.	Nighttime 8 p.m. to 7 a.m., all days	This nighttime exterior noise standard is not proposed for the analysis. The interior sleep disturbance standard is proposed for assessment of nighttime construction noise because sleep disturbance is the primary noise impact during nighttime.
County of San Mateo	San Mateo County Municipal Code Section 4.88.360(e)[d]	No quantitative standards	7 a.m. to 6 p.m. on weekdays 9 a.m. to 5 p.m. on Saturdays No construction on Sundays, Thanksgiving and Christmas	No quantitative standards. Analysis will evaluate consistency with construction day and time restrictions in the San Mateo County Municipal Code but will use the San Francisco/FTA standards to quantify construction noise impacts on receptors within this jurisdiction.

Agency/Jurisdiction	Code Section	Quantitative Noise and Vibration Standards	Allowed Construction Hours	Notes
City of Millbrae	City of Millbrae Municipal Code Section 9.05.180 [e]	No quantitative standards	7:30 a.m. to 7 p.m., Monday through Friday 8 a.m. to 6 p.m., Saturdays 9 a.m. to 6 p.m., Sundays and holidays	No quantitative standards. Analysis will evaluate consistency with construction day and time restrictions in the City of Millbrae Municipal Code but will use the San Francisco/FTA standards to quantify noise impacts on receptors within this jurisdiction.
City of San Bruno	City of San Bruno Municipal Code Section 6.16.070 [f]	85 dB at 100 feet 60 dB at 100 feet	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	Restrictions apply to residential zones within a radius of 500 feet of construction activity. The nighttime standard is more stringent than the San Francisco interior noise standard of 45 dB but there are no residential uses within 500 feet of RADP projects within this jurisdiction; therefore, this standard is not applicable.
City of South San Francisco	City of South San Francisco Municipal Code Section 8.32.050(d) [g]	No individual piece of equipment shall produce a noise level exceeding 90 dB at 25 feet The noise level at any point outside of the property plane of the project site shall not exceed 90 dB	8 a.m. to 8 p.m. on weekdays 9 a.m. to 8 p.m. on Saturdays 10 a.m. to 6 p.m. on Sundays and holidays	There would be no construction equipment operating within the City of South San Francisco except at the existing Plot 16D staging area, the use of which as a staging area would not change with implementation of the RADP. Noise from equipment anticipated to be used at the staging area will be evaluated relative to the City of South San Francisco Municipal Code noise standards, as well as the FTA daytime standards for commercial and industrial uses. There are no residential uses in the vicinity of this staging area.
Construction Vibration				
San Francisco	Caltrans Transportation and Construction Vibration Guidance Manual, Table 19, *Guideline Vibration Damage Potential Threshold Criteria* [b]	**0.25 in/sec – Historic and some old buildings** **0.5 in/sec – New residential structures** **2.0 in/sec – Modern industrial/commercial buildings**	—	Proposed for analysis to evaluate potential building damage impacts.
	FTA Transit Noise and Vibration Impact Assessment Manual, Table 6-3, *Indoor Ground-Borne Vibration (GBV) and Ground-Borne Noise (GBN) Impact Criteria for General Vibration Assessment* [a]	**80 VdB for infrequent events (fewer than 30 vibration events from the same source per day) such as paving compaction and 72 VdB for frequent events (more than 70 vibration events from the same source per day) such as impact pile driving at residences and buildings where people normally sleep (FTA Category 2 land uses).**	—	Proposed for analysis to evaluate nighttime impacts to sleep disturbance.
County of San Mateo	No quantitative vibration standards or restriction on hours of construction. SF standards proposed for analysis within this jurisdiction.	—	—	—
City of Millbrae	City of Millbrae Municipal Code Section 6.25.050 [e]	Maintenance or condition of property so that the property becomes defective or in a condition of deterioration or disrepair causing visual blight, reduces the aesthetic appearance of the neighborhood, offends the senses, is detrimental to nearby properties or is a danger to public safety, including but not limited to 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 neighboring property.	—	No quantitative vibration standards or restriction on hours of construction. SF standards proposed for analysis within this jurisdiction.
City of San Bruno	No quantitative vibration standards or restriction on hours of construction. SF standards proposed for analysis within this jurisdiction.	—	—	—
City of South San Francisco	City of South San Francisco 2040 General Plan Policies NOI-2.1 and NOI-3.1 [h]	Vibration analysis 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 historic structure protection 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 the historic structure limited to 0.12 in/sec.	—	There would be no construction equipment operating within the City of South San Francisco except at the existing Plot 16D staging area, the use of which as a staging area would not change with implementation of the RADP. Activities at the staging area would not include vibration generating activities such as pile driving. Additionally, there are no historic structures in the vicinity. As such the City of South San Francisco's vibration standards will not be applied in the analysis.

Agency/Jurisdiction	Code Section	Quantitative Noise and Vibration Standards	Allowed Construction Hours	Notes
Operational Noise – Stationary Sources				
San Francisco	San Francisco Police Code Article 29, Section 2909(a), Residential Property Noise Limits [c]	5 dBA above the local ambient noise level at the property plane of residential or within multi-unit residential properties.	—	Not applicable. Applicable to stationary noise sources located on a residential property or within a residential use in a mixed-use property.
	San Francisco Police Code Article 29, Section 2909(b), Commercial and Industrial Property Noise Limits [c]	8 dBA above the local ambient noise level at the property plane of commercial, mixed-use, or industrial properties.	—	Not applicable. Applicable to stationary noise sources located on commercial and industrial properties.
	San Francisco Police Code Article 29, Section 2909(c), Public Property Noise Limits [c]	**Greater than 10 dBA above the local ambient noise level at a distance of 25 feet or more**	—	Proposed for use to evaluate daytime noise impacts from operational stationary sources.
	San Francisco Police Code Article 29, Section 2909(d), Fixed Residential Interior Noise Limits [c]	**Interior noise within dwelling to not exceed:** • **45 dBA between 10 p.m. to 7 a.m.** • **55 dBA between 7 a.m. to 10 p.m.**	—	Proposed for use to evaluate impacts for noise from operational stationary sources.
County of San Mateo	San Mateo County Municipal Code Section 4.88.330 [d]	Single or multiple family residence, school, hospital, church, public library properties not to be subject to exterior noise exceeding: • 55 dBA L50 from 7 a.m. to 10 p.m. and • 50 dBA L50 from 10 p.m. to 7 a.m. The maximum allowable noise levels vary depending on the length of time during which the maximum allowable noise levels are exceeded. In the event the measured background noise level exceeds the applicable noise level standard, the applicable standard shall be adjusted in 5 dBA increments so as to encompass the background noise level.	—	The nearest sensitive receptors in unincorporated San Mateo County are more than one mile away from RADP projects. Therefore, these standards will not be applied in the analysis.
City of Millbrae	City of Millbrae Municipal Code Section 6.25.050, Unlawful Property Nuisances [e]	Maintenance or condition of property so that the property becomes defective or in a condition of deterioration or disrepair causing visual blight, reduces the aesthetic appearance of the neighborhood, offends the senses, is detrimental to nearby properties or is a danger to public safety, including but not limited to 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 neighboring property,	—	No quantitative standard. SF standards proposed for analysis for receptors within this jurisdiction.
City of San Bruno	City of San Bruno Municipal Code Section 6.16.050 [f]	Prohibits any noise level 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.	—	The first portion of this standard is consistent with the San Francisco's operational noise standard. Application of the San Francisco standard is more stringent than the second portion of this standard and will therefore be applied for operational noise impacts to receptors in this jurisdiction.
City of South San Francisco	City of South San Francisco Municipal Code Section 8.32.030 [g]	Restricts operation of any source of sound at any location within the City to an L50 of 60 dB during daytime hours, and 50 or 55 dB during nighttime hours, depending on land use designation	—	There would be no operational sources of noise related to the RADP projects within the City of South San Francisco. As such these standards will not be applied in the analysis.

Agency/Jurisdiction	Code Section	Quantitative Noise and Vibration Standards	Allowed Construction Hours	Notes
Operational Noise – Traffic				
San Francisco	Not Applicable: based on guidance from SF Planning	**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. In conditionally acceptable, conditionally unacceptable, or unacceptable, noise environments, a traffic noise increase greater than 3 dBA is considered a significant impact.**	—	Proposed for use in the evaluation of operational traffic noise. Based on the location of intersections proposed for analysis and the types of land uses in their vicinity, the analysis will use the land use compatibility standards for community noise in the General Plan of the jurisdiction in question to determine if a 3 dBA or 5 dBA threshold would be applicable for the analysis of operational traffic noise.

SOURCES:

a. 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
b. http://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf
c. https://www.sfdph.org/dph/files/ehsdocs/ehsnoise/guidelinesnoiseenforcement.pdf
d. https://library.municode.com/ca/san_mateo_county/codes/code_of_ordinances?nodeId=16029
e. https://www.codepublishing.com/CA/Millbrae
f. https://library.qcode.us/lib/san_bruno_ca/pub/municipal_code
g. https://library.qcode.us/lib/south_san_francisco_ca/pub/municipal_code
h. https://shapessf.com/wp-content/uploads/2022/11/SSFGPU_PDFPlan_FinalPlan_Resolution_11082022.pdf
i. https://generalplan.sfplanning.org/I6_Environmental_Protection.htm
j. https://millbrae2040.com/wp-content/uploads/2022/06/Millbrae%20General%20Plan%20Public%20Review%20Draft%20June%202022.pdf
k. https://www.sanbruno.ca.gov/DocumentCenter/View/1664/Chapter-7-Health-and-Safety-PDF

SOURCE: Google, 2020; ESA, 2021

SFO RADP EIR

FIGURE 1
NOISE MONITORING LOCATIONS

SOURCE: Google Earth Pro, 2022; ESA, 2023

SFO RADP EIR

FIGURE 2

PROPOSED LONG-TERM MONITORING LOCATION

Task 3: Noise and Vibration Analysis

The analysis approach discussed under Tasks 3.1 through 3.5 will adequately address all three Appendix G checklist questions related to noise and vibration.

Task 3.1: Construction Noise and Vibration

Noise

ESA will assess construction-related noise levels in terms of the overall increase in ambient noise levels based on operation of the two noisiest pieces of typical construction equipment anticipated to be used for demolition, excavation, and construction. As the analysis will be programmatic, ESA will analyze a representative project closest to sensitive receptors, including worker receptors, using both standard construction equipment and impact pile drivers for purposes of a conservative analysis. Additionally, we will include an analysis of the Central Hub to develop a conservative assessment of potential worst-case construction noise impacts on worker[3] receptors for projects proposed under the RADP. The Central Hub would involve the greatest amount of demolition and the greatest amount of square footage of new construction of any RADP project; therefore, it would be the most construction intensive. Construction of Central Hub also would expose nearby worker receptors, such as those located at the skycaps and parking enforcement patrols at the arrival terminals to construction noise. Additionally, the analysis will consider construction activities for the Long-Term Parking Garage #4 (RADP Project #13), which is the closest to residential receptors across U.S. 101. The analysis will also evaluate construction noise from activity at staging areas shown in **Figure 3.** The analysis will compare estimated construction noise levels against FTA daytime noise criteria for residential land uses as well as for worker receptors at commercial and industrial land uses. The analysis will apply FTA's general assessment methodology, analyzing simultaneous operations of the two noisiest pieces of equipment.

In addition to comparison to FTA noise standards, construction noise levels will be assessed based on whether ambient noise levels at nearby sensitive receptors[4] would increase by 10 dBA or more. Some construction activities are proposed to occur between the hours of 10 p.m. and 7 a.m.; therefore, nighttime construction noise will be assessed based on its potential to result in sleep disturbance at nearby residential or hotel land uses (an increase interior noise levels above 45 dBA, based on a standard 25 dBA exterior to interior noise reduction assumed for typical buildings with windows closed, or if determined appropriate due to the frequency and duration of nighttime activities, a 15 dBA exterior to interior noise reduction that assumes windows open).[5] In addition to the quantitative metrics, the analysis will also consider other qualitative factors

[3] Worker receptors include on-site Airport workers (SFO employees 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 (OSHA) mandates for hearing conservation programs.

[4] As defined in the Governor's Office of Planning and Research General Plan Guidelines with respect to noise.

[5] U.S. Environmental Protection Agency (U.S. EPA), *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974.

SOURCE: SFO, 2023; ESA, 2023

SFO RADP EIR

FIGURE 3
CONSTRUCTION STAGING AREAS

such as the intensity (noise levels above the analyzed metrics), frequency and duration of the noise events. Based on the existing noise levels and the projected construction noise levels, ESA will estimate future noise levels from implementation of the RADP at identified existing sensitive receptors during construction.

In addition, given the 20-plus year implementation timeframe, ESA will provide additional analysis that considers all program construction through 2045, assessing the overall intensity, frequency, and duration of construction noise impacts from implementation of the RADP based on the construction noise standards identified in Table 1. This aggregate noise impact analysis will be qualitative in nature given the lack of specificity in details and timing of projects under the RADP.

Vibration

ESA will also assess construction-related vibration levels from pile driving and compaction based on proximity to structures (both historic, if any, and non-historic) and vibration exposure standards developed by the FTA. In addition, potential annoyance impacts related to construction vibration associated with nighttime construction will be assessed using FTA's vibration impact standards. SFO has confirmed there is no vibration-sensitive equipment as defined by the FTA located at the Airport.

Task 3.2: Cumulative Construction Noise and Vibration

ESA will qualitatively assess the potential for construction noise and vibration from other cumulative projects in the area to combine with construction noise and vibration from implementation of the RADP based on the noise and vibration standards identified in bold in Table 1.

Task 3.3: Operational Traffic Noise Evaluation

Implementation of projects under the RADP can be expected to result in increased traffic volumes on local arterial roadways in the communities surrounding the Airport as a result of employment generation that could occur with implementation of the RADP. Using data and information developed in support of the transportation analysis, ESA will estimate localized increases in traffic noise for up to five roadway segments using algorithms of the Traffic Noise Model (TNM) of the Federal Highway Administration (FHWA). Model results for existing conditions will be verified/calibrated using peak hour short-term noise measurements along up to three analyzed roadways. Traffic noise will be estimated for the existing condition, the 2045 baseline condition without the RADP, and the 2045 baseline condition plus the RADP. Specific roadways to be analyzed will be determined in consultation with EP and the transportation consultant but would likely include San Bruno Avenue in San Bruno and Millbrae Avenue in Millbrae. Results of the modeling and evaluation effort will be included in the noise technical memorandum described below.

Task 3.4 Operational Stationary Source Noise Evaluation

RAPD projects may result in operation of new stationary noise sources such as back-up diesel generators, 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. The analysis of potential noise impacts associated with these new operational noise sources will consider available data on the generalized noise levels associated with such equipment and a generalized conservative location assumption to estimate their distance to nearby noise sensitive land uses, the presence of intervening structures, and the existing noise levels at the sensitive receptors potentially affected. As discussed in Table 1, operational noise impacts will apply standards of San Francisco Police Code sections 2909(c) and 2909(d).

Task 3.5: Cumulative Operational Noise Evaluation

ESA will qualitatively assess the potential for operational noise from other cumulative projects in the area to combine with operational noise of projects that could occur with implementation of the RADP based on the noise standards identified in bold in Table 1.

Task 3.6: Impact Previews and Identification of Noise Control Measures

ESA will present preliminary results of identified noise and vibration impacts at up to two meetings. These meetings will focus on the results, whether analysis refinements are necessary, if noise or vibration control measures are required, and how to account for such control measures in the analysis.

Task 3.7: Noise and Vibration Technical Memorandum

ESA will prepare a Noise and Vibration Technical Memorandum based on Task 3. The memorandum will clearly describe the analysis approach, methodology (including models used, and model inputs), assumptions, and results. The memorandum will identify whether the assumptions and therefore results are reasonable or conservative (likely to yield worst case outcomes) and will include all model inputs and assumptions as an appendix to the memorandum. The technical memorandum will be submitted to SFO and EP for review. The memorandum will present the analysis of construction noise and vibration outlined in Task 3.1 through Task 3.5. There are no operational sources of vibration proposed by the RADP, and the memorandum will include a brief statement to this effect.

Deliverables

- One electronic copy of the proposed long-term stationary noise sources and their location to be considered for the noise analysis (includes a meeting with EP to discuss)
- One electronic copy of the proposed roadways to be considered for the operational traffic noise analysis (includes a meeting with EP to discuss)
- One electronic copy of the Administrative Draft Technical Memo #1

- One electronic copy of the Administrative Draft Technical Memo #2
- One electronic copy of the Screencheck Draft Technical Memo
- One electronic copy of the final draft Technical Memo

Intentionally Blank

Appendix C
Regulatory Setting

C. Regulatory Setting

Federal

Federal Noise Standards

The FTA Transit Noise and Vibration Impact Assessment Manual 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 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 Code of Federal Regulations (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.

The Office of Safety and Health Administration (OSHA) enforce regulations to safeguard the hearing of workers exposed to occupational noise. OSHA 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.

Federal Vibration Standards

The FTA has adopted vibration standards that are used to evaluate potential building damage impacts related to construction activities. The vibration damage criteria adopted by the FTA are shown in **Table C-1**.

TABLE C-1
CONSTRUCTION VIBRATION DAMAGE CRITERIA

Building Category	PPV (in/sec)
I. Reinforced-concrete, steel or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

SOURCE: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, Table 7-5, September 2018.

Table C-2 shows the FTA's adopted standards 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. FTA 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.

TABLE C-2
FTA 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: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, FTA Report No. 0123, Office of Planning and Environment, 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.
d. 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

State Noise Standards

The California Department of Health Services (DHS) has established guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. These guidelines for land use and noise exposure compatibility are shown in **Table C-3**. In addition, section 65302(f) of the California Government Code requires each county and city in the State to prepare and adopt a comprehensive long-range general plan for its physical development, with section 65302(g) requiring a noise element to be included in the general plan. The noise element must (1) identify and appraise noise problems in the community; (2) recognize Office of Noise Control guidelines; and (3) analyze and quantify current and projected noise levels.

The State of California also establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State pass-by standard is consistent with the federal limit of 80 dB. The State pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dB at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

TABLE C-3
COMMUNITY NOISE EXPOSURE (L_{DN} OR CNEL)

Land Use	Normally Acceptable[a]	Conditionally Acceptable[b]	Normally Unacceptable[c]	Clearly Unacceptable[d]
Single-family, Duplex, Mobile Homes	50–60	55–70	70–75	above 75
Multi-Family Homes	50–65	60–70	70–75	above 75
Schools, Libraries, Churches, Hospitals, Nursing Homes	50–70	60–70	70–80	above 80
Transient Lodging – Motels, Hotels	50–65	60–70	70–80	above 75
Auditoriums, Concert Halls, Amphitheaters	—	50–70	—	above 70
Sports Arena, Outdoor Spectator Sports	—	50–75	—	above 75
Playgrounds, Neighborhood Parks	50–70	—	67–75	above 75
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50–75	—	70–80	above 80
Office Buildings, Business and Professional Commercial	50–70	67–77	above 75	—
Industrial, Manufacturing, Utilities, Agriculture	50–75	70–80	above 75	—

SOURCE: Office of Planning and Research, *State of California Genera Plan Guidelines*, October 2003 (in coordination with the California Department of Health Services).

NOTES:

a. Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
b. Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and required noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
c. Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and required noise insulation features included in the design.
d. Clearly Unacceptable: New construction or development should generally not be undertaken.

The State has also established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards (Title 24, California Code of Regulations). The noise insulation standards set forth an interior standard of 45 dB CNEL in any habitable room. They require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than 60 dB CNEL. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

State Vibration Standards

There are no State vibration standards available for the evaluation of vibration impacts. According to the California Department of Transportation's (Caltrans) *Transportation and Construction Vibration Guidance Manual* (2013), there are no official Caltrans standards for vibration. However, this manual provides guidelines for assessing vibration damage potential to various types of buildings as shown in **Table C-4**. These state vibration standards are generally consistent with the federal standards provided in Table C-1, above.

TABLE C-4
CALTRANS CRITERIA FOR BUILDING DAMAGE POTENTIAL FROM CONSTRUCTION VIBRATION

Structure and Condition	Maximum PPV (in/sec) Transient Sources	Maximum PPV (in/sec) Continuous/Frequent Intermittent Sources
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

NOTE:
Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans, Transportation and Construction Vibration Guidance Manual, Table 19, Guideline Vibration Damage Potential Threshold Criteria, April 2020.

Local

Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans; local noise ordinances establish standards and procedures for addressing specific noise sources and activities. Though the Airport is not subject to local General Plans or city or county codes,[1] noise standards for jurisdictions in the vicinity of the Airport are summarized below. The Airport is owned by the City and County of San Francisco (the City); therefore, applicable noise standards for the City are provided. RADP projects are located in the vicinity of sensitive receptors located within the jurisdictions of unincorporated San Mateo County and the cities of Millbrae, San Bruno and South San Francisco; relevant noise and vibration policies and standards in the general plans and municipal codes of these jurisdictions are detailed below.

City and County of San Francisco

The San Francisco Police Code Article 29 provides guidelines for the regulation, monitoring, and enforcement of the noise control ordinance in the City and county of San Francisco. Relevant sections of the code are summarized below.

Section 2907 applies to noise generated by any construction equipment on a permitted construction site and restricts maximum allowable level of noise produced from any powered construction equipment (except impact tools such as jackhammers) to 80 dBA when measured at a distance of 100 feet from the equipment or 100 feet from the construction site boundary. Construction hours are limited to the daytime hours 7 a.m. to 8 p.m. every day of the week.

Section 2908 applies to noise generated by any non-emergency construction activities during the nighttime hours (8 p.m.–7 a.m.). It restricts the maximum allowable level of noise produced from any

[1] California Government Code sections 53090–53091.

cumulative level of noise produced from any construction equipment located on a permitted construction site to 5 dBA above the ambient measured at the nearest property plane.

Section 2909(c) applies to noise generated from a source located on public property. Section 2909(c) limits the maximum allowable cumulative level of noise produced from any combination of mechanical device(s) and implied sound systems(s) originating on a public property to 10 dBA above the ambient at a distance greater than 25 feet from the noise source. 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 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 10:00p.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 San Francisco Planning Noise Impact Analysis Guidelines considers a 5 dBA increase in the ambient noise level as 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. In “conditionally acceptable,” “conditionally unacceptable,” or “unacceptable,” noise environments, a traffic noise increase greater than 3 dBA is considered significant.

Based on the City of San Francisco General Plan Land Use Compatibility Chart for Community Noise, an ambient noise environment of up to 60 dB Ldn is considered “satisfactory” for residential uses and transient lodging. Ambient noise environments up to 65 dB Ldn are considered “satisfactory” for schools, Classrooms, Libraries, Churches, Hospitals, Nursing Homes are considered “satisfactory” in noise environments while playgrounds, parks, office buildings, commercial uses are considered “satisfactory” up to 70 dB Ldn. Noise levels of up to 77.5 dB Ldn are considered “satisfactory” for industrial/manufacturing uses and transportation.

San Mateo County

The San Mateo County Noise Ordinance (Chapter 4.88 of the Municipal Code) identifies noise standards for various sources and includes specific noise restrictions for sources of noise within the County. Section 4.88.360 of the Municipal Code states exemptions for specified events. Noise sources associated with demolition, construction, repair, remodeling, or grading of any real property, provided the construction activities occur between the hours of 7 a.m. and 6 p.m. on weekdays and 9 a.m. and 5 p.m. on Saturdays and do not occur on Sundays, Thanksgiving, or Christmas, are exempt from the noise standards. Section 4.88.330 designates exterior noise standards for receiving land use categories including single or multiple family residences, schools, hospitals, churches, or public libraries in the incorporated or unincorporated County. The exterior noise standards are based on the cumulative number of minutes in any one-hour time period that noise is generated at the receiving land use. **Table C-5** shows the allowable noise levels and corresponding times of day for the receiving land uses.

TABLE C-5
EXTERIOR NOISE STANDARDS AT RECEIVING LAND USES:
RESIDENTIAL SCHOOL, HOSPITAL, CHURCH OR PUBLIC LIBRARY PROPERTIES

Cumulative Number of Minutes in any one hour time period	Noise Level Standards, dBA	
	Daytime 7 a.m.— 10 p.m.	Nighttime 10 p.m.— 7 a.m.
30	55	50
15	60	55
5	65	60
1	70	65
0	75	70

NOTES:
a. 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.
b. 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.
c. 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 C-5.

SOURCE: San Mateo County, 1982.

There are no land use compatibility standards for community noise in the current San Mateo County General Plan. The new general plan, which is not yet adopted, identifies 60 dB Ldn as the maximum normally acceptable level for residential uses.

City of Millbrae

The City of Millbrae Municipal Code does not specify quantitative construction noise standards, but Section 6.25.050 of the Municipal Code restricts the hours of noise generating construction activity to the hours of 7:30 a.m. to 7 p.m., Monday through Friday, 8 a.m. to 6 p.m. on Saturdays, and 9 a.m. to 6 p.m. on Sundays and holidays. The Municipal Code does not include any quantitative vibration or operational noise standards.

The Health, Safety and Hazardous Materials Element of the City of Millbrae General Plan identifies exterior noise compatibility standards for various land uses. A maximum exterior noise level of 60 dB Ldn 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 Ldn. Urban residential infill and mixed-use projects, schools, libraries, churches, hospitals, nursing homes, playgrounds, parks, and office buildings are considered normally acceptable up to 70 dB Ldn. Industrial uses are considered normally acceptable in exterior noise environments of up to 75 dB Ldn.

City of San Bruno

Section 6.16.070 of the City of San Bruno Municipal Code restricts noise from construction activities within any residential zone, or within a radius of 500 feet therefrom, 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.

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 Ldn. For multi-family residential uses and transient lodging, up to 65 dB Ldn is considered normally acceptable. Schools, libraries, churches, hospitals, nursing homes, playgrounds, parks, office buildings are considered normally acceptable in noise environments up to 70 dB Ldn while up to 75 dBA Ldn is considered normally acceptable for industrial uses.

City of South San Francisco

Section 8.32.050 of the City of South San Francisco Municipal Code restricts construction, alteration, repair or landscape maintenance activities to between the hours of 8 a.m. and 8 p.m. on weekdays, 9 a.m. and 8 p.m. on Saturdays, and 10 a.m. and 6 p.m. on Sundays and holidays 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 to an L_{50} of 60 dB during daytime hours, and 50 or 55 dB during nighttime hours, depending on land use designation.

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 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 the historic structure. Vibration levels at historic structures is limited to 0.12 in/sec.

The City of South San Francisco 2040 General Plan provides a land use/noise compatibility matrix to guide new development. Residential & transient lodging and schools are considered acceptable in noise environments of up to 45 dB CNEL interior and 65 dB CNEL exterior. Hospitals, churches, libraries are considered acceptable with an interior CNEL of up to 45 dB. A CNEL of 50 to 65 CNEL interior is considered acceptable for commercial uses while an exterior CNEL of 65 dB is considered acceptable for open spaces.

Intentionally Blank

APPENDIX G
Air Quality Technical Appendix

G.1 Air Quality Methodology Memo

ESA

575 Market Street
Suite 3700
San Francisco, CA 94105
415.896.5900 phone
415.896.0332 fax

esassoc.com

memorandum

date	February 12, 2025
to	Josh Pollak, Senior Planner, San Francisco Planning Department Environmental Planning Division
cc	Audrey Park, Environmental Affairs Manager, SFO; David Kim, Senior Environmental Planner, SFO
from	Brian Schuster, Cheri Velzy, Sarah Patterson, ESA
subject	Final Air Quality Analysis Methods Memorandum for the SFO Recommended Airport Development Plan (Case No. 2017-007468ENV)

Introduction

This memorandum presents the proposed methods to prepare an air quality analysis and associated Air Quality Results Memorandum (AQRM) in support of environmental clearance under the California Environmental Quality Act (CEQA) for the San Francisco International Airport (SFO) Recommended Airport Development Plan (RADP; Case No. 2017-007468ENV). 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 and approximately 71.1 million annual passengers based on the estimated capacity of the existing runways regardless of whether the RADP is implemented.

This memorandum presents the methods that will be used to evaluate program-level and cumulative impacts associated with RADP construction and operations. Specifically, this memorandum presents the assumptions, inputs, and sources of data and information for modeling construction criteria pollutant and toxic air contaminant (TAC) emissions from representative RADP projects and operational criteria pollutant and TAC emissions for full buildout of the RADP. The overall approach to estimating air quality impacts from construction and operation of the RADP was discussed in the SFO RADP (Planning Department Case No. 2017-007468ENV) Air Quality Technical Memorandum and Greenhouse Gas Analysis Scope of Work (RADP AQ SOW). This memorandum augments the RADP AQ SOW by providing specific assumptions to be used in the modeling and analysis for review and approval by the San Francisco Planning Department Environmental Planning (EP) Division.

The air quality analysis considers the following comparisons:

- The Existing Conditions (2019) and the Existing Conditions with RADP for the construction and cumulative construction analyses.

- 2045 Future Baseline without RADP and the 2045 Future Baseline with RADP for the operational and cumulative operational analyses (assuming 2035 emission factors). The cumulative projects identified in Draft EIR Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, are accounted for in the 2045 Future Baseline without RADP conditions and are therefore also included in the 2045 Future Baseline with RADP conditions. Therefore, the 2045 Future Baseline with RADP conditions also represents the cumulative conditions and is presented in this memorandum as the 2045 Future Baseline with RADP/Cumulative conditions.

Aircraft related sources of air quality emissions as part of operations are not evaluated in the analysis because implementation of the RADP would not induce passenger travel or increase aircraft operations at SFO (see Appendix C, Airport Facilities to Accommodate Aviation Demand, of the Draft Environmental Impact Report [EIR]). However, aircraft related sources of TAC emissions will be accounted for in the discussion of 2045 Future Baseline without RADP and the 2045 Future Baseline with RADP. This includes but is not limited to aircraft landing and takeoff (LTO), aircraft taxiing,[1] aircraft refueling, auxiliary power unit (APU) operation, and ground support equipment (GSE) operation. Growth at SFO will occur by 2045 regardless of implementation of the RADP. Thus, the analysis uses a future baseline for the operational scenario by comparing 2045 Future without the RADP to 2045 Future with the RADP to more adequately capture the full range of environmental effects that could occur with implementation of the RADP. Note that the construction analysis evaluates the environmental impacts of implementation of the RADP against 2019 Existing Conditions because the Notice of Preparation of an Environmental Impact Report and Notice of Public Scoping Meeting was published in May 2019; therefore, the baseline is 2019.

The air quality analysis for the RADP will include both a programmatic and a representative project-level air quality analysis. This memorandum discusses the assumptions used for the representative project-level approach. The programmatic approach is mostly qualitative and will follow the Bay Area Air Quality Management District (air district) significance thresholds for plans, which includes one quantitative numeric threshold comparing growth in service population to vehicle miles traveled. The programmatic approach does not involve the variability in inputs and methods that a representative project-level analysis does. Therefore, this document focuses on the methods used for the representative project-level approach.

The sections below describe:

- Representative RADP project emissions inputs and calculations for construction
- Operational emissions inputs and calculations
- Construction and operational health risk assessment inputs

[1] Boarding Area H (RADP Project #1) would result in a 600-foot westward shift of gated aircraft. However, this would not constitute a considerable change from 2019 existing conditions or 2045 Future Baseline Without RADP conditions as aircraft currently parked in the same location where Boarding Area H would be constructed.

Representative Project Types for Construction

As discussed in the RADP AQ SOW, to present an approximation of the anticipated construction impacts that could occur with implementation of the RADP, ESA has selected four RADP projects that represent large, medium, and small project types, as described further below. These project types would represent the range of projects that could occur under the RADP. RADP projects to be quantitatively evaluated in the EIR as representative projects for each project type include:

- Large project type – Central Hub (RADP Project #6) and the Consolidated Rental Car Center (CONRAC) Facility (RADP Project #9)
- Medium project type – International Terminal Building (ITB) Main Hall Expansion (RADP Project #3)
- Small project type – East Field Ground Support Equipment (GSE) Facility #2 (RADP Project #19)

To determine air quality impacts, including criteria pollutant emissions and health risks, the AQRM will evaluate three "overlap scenarios." Because the RADP is a single program for CEQA analysis purposes, air quality impacts associated with the RADP must account for construction activities of individual RADP projects that overlap with one another. The AQRM will estimate total combined annual construction-related criteria pollutant emissions and TAC emissions to inform the impact analysis. The AQRM will evaluate the following three overlap scenarios:

1. Low Overlap: two small projects
2. Mid Overlap: one medium project and one small project
3. High Overlap: two large projects and one medium project

The high overlap scenario represents construction of two concurrent large RADP projects and one medium RADP project. This scenario constitutes the worst-case air quality impacts anticipated with buildout of the RADP through 2045.

Activity Data

This section includes construction and operational activity data and assumptions used for the analysis of criteria pollutant and TAC emissions from the RADP. Some of the following information was provided by SFO for aspects of the RADP that are currently known, such as new building and parking areas, and some information was obtained by model defaults and other, similar projects that have been built at SFO. Details of the information for each representative construction project and for operational buildout are further described below.

Construction

Construction Schedule

Table 1 presents the construction schedule for each of the representative project types. As stated in the RADP AQ SOW, emissions will be presented for each representative project type individually and with the overlap schedules noted above.

TABLE 1
RADP REPRESENTATIVE PROJECT TYPE SCHEDULE

RADP Representative Project Type and Component	Start	Finish	Duration (workdays)
Large Projects			
Central Parking Garage (phased demolition) – Part 1	7/1/2032	7/24/2033	277
Central Hub (build) – Part 1	7/1/2033	7/7/2034	266
Central Parking Garage (phased demolition) – Part 2	7/8/2034	6/29/2035	255
Central Hub (build) – Part 2	6/6/2035	1/2/2037	413
Consolidated Rental Car Facility (CONRAC)	5/27/2027	5/28/2031	1,045
Medium Project			
ITB Main Hall Expansion	7/5/2032	1/7/2037	1,175
Small Project			
East Field GSE Maintenance Facility #2	6/30/2028	7/1/2030	522

SOURCE: SFO 2023

Large Project Types

The large project types, selected based on the amount of demolition and net new construction, include the Central Hub and the Consolidated Rental Car Center (CONRAC) Facility. The Airport Construction Emissions Inventory Tool (ACEIT)[2] was used to develop the construction information for these representative project types. ACEIT was used to generate certain construction activity information because it has refined activity assumptions for these RADP project types, which are unique land uses not well represented in the California Emissions Estimator Model (CalEEMod).[3] CalEEMod was used to generate the remaining activity data. Project specific information related to square footage of areas to be demolished or built is used in these tools to develop construction activity. The information generated by ACEIT versus CalEEMod for all project types is presented in **Table 2**.

Medium and Small Project Types

For the ITB Main Hall Expansion (medium project type) and East Field GSE Facility #2 (small project type), the information generated by ACEIT versus CalEEMod is presented in Table 2. The ITB Main Hall Expansion would involve demolition of approximately 116,400 square feet of the rear façade. The East Field GSE Facility #2 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. Both projects would require haul trucks for export of concrete demolition debris. These projects were chosen as representative of medium and small projects based on the amount of demolition and net new construction as compared to other projects, including the large project types.

---

2 Transportation Research Board Airport Cooperative Research Program, *Guidance for Estimating Airport Construction Emissions*, 2016, https://www.trb.org/Publications/Blurbs/170234.aspx, accessed February 29, 2024.

3 CalEEMod California Emissions Estimator Model version 2022.1.1.21, http://www.caleemod.com, accessed February 2, 2024.

TABLE 2
CONSTRUCTION DATA AND INPUT SOURCES FOR ALL REPRESENTATIVE PROJECT TYPES

Project Type/Project Input	ACEIT	CalEEMod	Project Specific[a]
Large Projects			
Quantity of Demolition Debris		x	x
Haul Truck Trip Count		x	x
Haul Truck Trip Distance		x	
Vendor Trip Count	x		x
Vendor Trip Distance		x	
Worker Trip Count		x	
Worker Trip Distance		x	
Off-Road Equipment Types – Demo	x		
Off-Road Equipment Activity – Demo	x		x
Off-Road Equipment Types	x		
Off-Road Equipment Activity	x		x
Off-Road Equipment Horsepower		x	
Off-Road Equipment Load Factors		x	
Construction Phase Durations			x
Architectural Coating Area for Buildings		x	x
Architectural Coating Area for Parking Lots		x	x
Medium and Small Projects			
Quantity of Demolition Debris		x	x
Haul Truck Trip Count		x	x
Haul Truck Trip Distance		x	
Vendor Trip Count		x	x
Vendor Trip Distance		x	
Worker Trip Count		x	
Worker Trip Distance		x	
Off-Road Equipment Types – Demo	x		
Off-Road Equipment Activity – Demo	x		x
Off-Road Equipment Types		x	
Off-Road Equipment Activity		x	
Off-Road Equipment Horsepower		x	
Off-Road Equipment Load Factors		x	
Construction Phase Durations		x	x
Architectural Coating Area for Buildings		x	x
Architectural Coating Area for Parking Lots		x	x

SOURCES: California Air Pollution Control Officers Association (CAPCOA) and ICF, *User Guide for CalEEMod Version 2022.1*, April 2022, https://www.caleemod.com/user-guide, accessed February 15, 2024;
Transportation Research Board Airport Cooperative Research Program, *Guidance for Estimating Airport Construction Emissions*, 2016, https://www.trb.org/Publications/Blurbs/170234.aspx, accessed February 15, 2024.

ABBREVIATIONS: ACEIT = Airport Construction Emissions Inventory Tool; CalEEMod = California Emission Estimator Model; demo = demolition

NOTE:

a. Project-specific information includes square footage of buildings to be demolished and constructed, the number of parking spaces, construction duration, and height of structure above grade and/or excavated amount, as provided by SFO staff.

Table 3 presents the haul truck, worker, and vendor trip assumptions used for all representative RADP project types based on CalEEMod defaults. **Table 4** presents the on-road vehicle trip length assumptions used for all representative RADP project types based on CalEEMod defaults. **Table 5** presents the number of haul truck trips per day used for all phases of construction based on CalEEMod defaults, as well as vendor and worker trip per day estimates by representative project type. Haul trucks and vendor vehicles are assumed to be diesel, and worker vehicles are based on CalEEMod default vehicle class and fuel type (gasoline, diesel, and electric).

TABLE 3
HAUL TRUCK, WORKER TRIP, AND VENDOR TRIP ASSUMPTIONS FOR ALL REPRESENTATIVE PROJECT TYPES

Phase	Factor	Units
Haul Truck Assumptions		
Demo Conversion	0.046	ton/SF demo
	0.50	ton demo debris/cubic yard
Cut/Fill Conversion	1.26	ton/cubic yard
Haul Truck Capacity	16	cubic yard/truck

Land Use Subtype	Rate Metric	Worker Trip Rate[a]	Vendor Trip Rate
Building Construction Phase - Worker and Vendor Trip Rates			
Commercial/Retail	Daily trips per 1,000 square feet	0.32	0.1639
Office/Industrial	Daily trips per 1,000 square feet	0.42	0.1639

SOURCES: California Air Pollution Control Officers Association (CAPCOA) and ICF, *User Guide for CalEEMod Version 2022.1*, https://www.caleemod.com/user-guide, accessed February 15, 2024.

ABBREVIATIONS: CalEEMod = California Emission Estimator Model; DU = daily trips; demo = demolition; SF = square feet

NOTE:

a. Worker trips for all construction phases except building construction and architectural coating are based on 1.25 workers per off-road equipment piece. Architectural coating worker trips are 20 percent of building construction phase trips. A work to office (W-O) trip is made by an employee traveling in either direction between a work location and all other locations that are not home and is used to define construction vendor trips. (CAPCOA and ICF 2022)

TABLE 4
ON-ROAD VEHICLE TRIP LENGTHS FOR ALL REPRESENTATIVE PROJECT TYPES

Trip Type	Miles
Trip Length Assumptions	
Haul Truck	20 miles per one-way trip
Vendor	8.4 miles per one-way trip
Worker	11.7 miles per one-way trip

SOURCES: California Air Pollution Control Officers Association (CAPCOA) and ICF, *User Guide for CalEEMod Version 2022.1*, https://www.caleemod.com/user-guide, accessed February 15, 2024.

ABBREVIATION: CalEEMod = California Emission Estimator Model

TABLE 5
AVERAGE DAILY VEHICLE TRIP ESTIMATES BY REPRESENTATIVE PROJECT TYPE FOR CONSTRUCTION PHASES

	Start Date	End Date	Workdays	Worker (one-way trips/day)[a]	Vendor (one-way trips/day)[b]	Haul (one-way trips/days)[c]
Central Hub						
Phased Demolition – Part 1	7/1/2032	7/24/2033	277	113	0	80
Build – Part 1	7/1/2033	7/7/2034	266	148	628	13
Phased Demolition – Part 2	7/8/2034	6/29/2035	255	113	0	80
Build – Part 2	6/6/2035	1/2/2037	413	148	628	13
CONRAC						
Build	5/27/2027	5/28/2031	1,045	73	232	54
ITB Main Hall Expansion						
Demolition	7/5/2032	11/15/2032	96	20	0	14
Site Preparation	11/16/2032	11/29/2032	10	8	0	0
Grading	11/30/2032	12/26/2032	19	10	0	0
Building Construction	12/27/2032	8/24/2036	955	59	23	0
Paving	8/25/2036	10/31/2036	48	13	0	0
Architectural Coating	11/1/2036	1/7/2037	48	12	0	0
East Field GSE Facility #2						
Demolition	7/2/2029	7/1/2030	261	8	0	1
Site Preparation	6/30/2028	7/3/2028	2	5	0	0
Grading	7/4/2028	7/10/2028	5	8	0	0
Building Construction	7/11/2028	5/29/2029	231	14	6	0
Paving	5/30/2029	6/13/2029	12	18	0	0
Architectural Coating	6/14/2029	6/30/2029	12	3	0	0

SOURCES: California Air Pollution Control Officers Association (CAPCOA) and ICF, User Guide for CalEEMod Version 2022.1, https://www.caleemod.com/user-guide, accessed February 15, 2024; Transportation Research Board (TRB) Airport Cooperative Research Program, Guidance for Estimating Airport Construction Emissions, https://www.trb.org/Publications/Blurbs/170234.aspx, accessed February 15, 2024.

ABBREVIATIONS: ACEIT = Airport Construction Emissions Inventory Tool; CalEEMod = California Emissions Estimator Model

NOTES:

a. Worker trip estimates for medium and small project types are based on CalEEMod defaults in Table 3. Worker trip estimates for the large projects are based on the CalEEMod default of 1.25 workers per day per piece of off-road construction equipment. (CAPCOA and ICF 2022)
b. Vendor trip estimates for medium and small representative project types are based on CalEEMod defaults in Table 3. For large project types, vendor trips were estimated with ACEIT activity rates, a one-way vendor trip distance from CalEEMod defaults in Table 4, and an average speed of 35 mph. (CAPCOA and ICF 2022; TRB 2016).
c. Haul truck trip estimates for all representative project types are based on demolition quantities and import/export material amounts with the application of CalEEMod defaults in Table 3 (CAPCOA and ICF 2022).

Table 6 and **Table 7** present the list of off-road construction equipment and hours developed by the ACEIT and CalEEMod models, respectively, for each of the representative projects. The fuel type of all off-road equipment is assumed to be diesel based on ACEIT and CalEEMod defaults. Because ACEIT does not provide a construction phasing schedule, for the two large projects, the "Total Equipment Hours" as presented in Table 6, will be evenly allocated to the scheduled workdays as shown in Table 1 to estimate emissions.

TABLE 6
OFF-ROAD CONSTRUCTION EQUIPMENT LIST AND HOURS OF OPERATION FROM ACEIT

Representative Project/ Construction Phase	ACEIT Equipment Name	CalEEMod Equipment Name	ACEIT Equipment Activity Rate	Total Equipment Hours[a]
Central Hub[b]				
Building Demolition	Bob Cat	Skid Steer Loaders	0.0240 Hours per 1 SF	88,320
	Excavator with Bucket	Excavators	0.0120 Hours per 1 SF	44,160
	Generator Sets	Generator Sets	0.0120 Hours per 1 SF	44,160
Concrete Demolition	Excavator with Bucket	Excavators	8 Hours per 6,000 SF	583
	Excavator with Hoe Ram	Excavators	8 Hours per 6,000 SF	583
Concrete Foundations *(Building)*	Backhoe	Tractors/Loaders/Backhoes	0.00096 Hours per 1 SF	2,237
	Caisson Drilling Rig	Bore/Drill Rigs	0.00032 Hours per 1 SF	746
	Concrete Pump	Pumps	0.000288 Hours per 1 SF	671
	Excavator	Excavators	0.00032 Hours per 1 SF	746
	Fork Truck	Forklifts	0.00128 Hours per 1 SF	2,982
	Pile Driver	Bore/Drill Rigs	0.00032 Hours per 1 SF	746
Construction Mob & Layout *(Building)*	Tractor Trailers Temp Fac.	Generator Sets	0.000008 Hours per 1 SF	19
Exterior Wall Framing *(Building)*	Fork Truck	Forklifts	0.0016 Hours per 1 SF	3,728
	Generator	Generator Sets	0.00048 Hours per 1 SF	1,118
	Grout Mixer	Cement and Mortar Mixers	0.0032 Hours per 1 SF	7,456
	Grout Wheel Truck	Off-Highway Trucks	0.00048 Hours per 1 SF	1,118
	Man Lift	Aerial Lifts	0.0064 Hours per 1 SF	14,912
	Tower Crane	Cranes	0.00048 Hours per 1 SF	1,118
Interior Build-Out/Finishes *(Building)*	Fork Truck	Forklifts	0.0064 Hours per 1 SF	14,912
	Man Lift	Aerial Lifts	0.0064 Hours per 1 SF	14,912
Roofing *(Building)*	High Lift	Aerial Lifts	0.00032 Hours per 1 SF	746
	Man Lift (Fascia Construction)	Aerial Lifts	0.00008 Hours per 1 SF	186
	Tower Crane	Cranes	0.00024 Hours per 1 SF	559
Security & Safety Systems *(Building)*	High Lift	Aerial Lifts	0.0048 Hours per 1 SF	11,184
Structural Concrete Frame *(Building)*	90 Ton Crane Supplemental Hoisting	Cranes	0.00048 Hours per 1 SF	1,118
	Concrete Truck Pump	Pumps	0.00228 Hours per 1 SF	5,312
	Fork Truck	Forklifts	0.00064 Hours per 1 SF	1,491
	Tower Crane	Cranes	0.0032 Hours per 1 SF	7,456
	Trowel Machine	Paving Equipment	0.00152 Hours per 1 SF	3,542
Asphalt Pavement-Ground Floor *(Parking Structure)*	Asphalt Paver	Pavers	0.00033 Hours per 1 SF	1,320
	Front Loader for Subgrade Materials	Tractors/Loaders/Backhoes	0.00033 Hours per 1 SF	1,320

Representative Project/ Construction Phase	ACEIT Equipment Name	CalEEMod Equipment Name	ACEIT Equipment Activity Rate	Total Equipment Hours[a]
Concrete Foundations *(Parking Structure)*	40 Ton Rough Terrain Crane	Cranes	0.0005 Hours per 1 SF	2,000
	Backhoe	Tractors/Loaders/Backhoes	0.00167 Hours per 1 SF	6,680
	Caisson Drilling Rig	Bore/Drill Rigs	0.0005 Hours per 1 SF	2,000
	Concrete Pump	Pumps	0.000375 Hours per 1 SF	1,500
	Excavator	Excavators	0.00067 Hours per 1 SF	2,680
	Fork Truck	Forklifts	0.00167 Hours per 1 SF	6,680
	Front Loader	Tractors/Loaders/Backhoes	0.00083 Hours per 1 SF	3,320
	Trencher for U/G Piping	Trenchers	0.00083 Hours per 1 SF	3,320
Concrete Post-Tensioned Frame *(Parking Structure)*	90 Ton Crane	Cranes	0.002 Hours per 1 SF	8,000
	Concrete Boom Pump	Pumps	0.0015 Hours per 1 SF	6,000
	Trowel Machines (4) machines	Paving Equipment	0.001 Hours per 1 SF	4,000
Construction Mob & Layout *(Parking Structure)*	Tractor Trailers Temp Fac.	Generator Sets	0.00002 Hours per 1 SF	80
Lights and Power *(Parking Structure)*	Forklift	Forklifts	0.001 Hours per 1 SF	4,000
	High Lift	Aerial Lifts	0.001 Hours per 1 SF	4,000
	Trencher	Trenchers	0.0005 Hours per 1 SF	2,000
Precast Concrete Exterior Panels *(Parking Structure)*	40 Ton Rough Terrain	Off-Highway Trucks	0.00067 Hours per 1 SF	2,680
	Fork Truck	Forklifts	0.00067 Hours per 1 SF	2,680
Security & Safety Systems *(Parking Structure)*	High Lift	Aerial Lifts	0.00067 Hours per 1 SF	2,680
Site Prep/Landscaping *(Parking Structure)*	Front Loader	Tractors/Loaders/Backhoes	0.00033 Hours per 1 SF	1,320
CONRAC				
Concrete Demolition	Excavator with Bucket	Excavators	8 Hours per 6,000 SF	1,862
	Excavator with Hoe Ram	Excavators	8 Hours per 6,000 SF	621
Concrete Foundations	Backhoe	Tractors/Loaders/Backhoes	0.00096 Hours per 1 SF	559
	Caisson Drilling Rig	Bore/Drill Rigs	0.00032 Hours per 1 SF	621
	Concrete Pump	Pumps	0.000288 Hours per 1 SF	2,483
	Excavator	Excavators	0.00032 Hours per 1 SF	621
	Fork Truck	Forklifts	0.00128 Hours per 1 SF	16
	Pile Driver	Bore/Drill Rigs	0.00032 Hours per 1 SF	3,104
Construction Mob & Layout	Tractor Trailers Temp Fac.	Generator Sets	0.000008 Hours per 1 SF	931
Exterior Wall Framing	Fork Truck	Forklifts	0.0016 Hours per 1 SF	6,208
	Generator	Generator Sets	0.00048 Hours per 1 SF	931
	Grout Mixer	Cement and Mortar Mixers	0.0032 Hours per 1 SF	12,416
	Grout Wheel Truck	Off-Highway Trucks	0.00048 Hours per 1 SF	931

Representative Project/ Construction Phase	ACEIT Equipment Name	CalEEMod Equipment Name	ACEIT Equipment Activity Rate	Total Equipment Hours[a]
	Man Lift	Aerial Lifts	0.0064 Hours per 1 SF	12,416
	Tower Crane	Cranes	0.00048 Hours per 1 SF	12,416
Interior Build-Out/Finishes	Fork Truck	Forklifts	0.0064 Hours per 1 SF	621
	Man Lift	Aerial Lifts	0.0064 Hours per 1 SF	155
Roofing	High Lift	Aerial Lifts	0.00032 Hours per 1 SF	466
	Man Lift (Fascia Construction)	Aerial Lifts	0.00008 Hours per 1 SF	9,312
	Tower Crane	Cranes	0.00024 Hours per 1 SF	931
Security & Safety Systems	High Lift	Aerial Lifts	0.0048 Hours per 1 SF	4,423
Structural Concrete Frame	90-Ton Crane Supplemental Hoisting	Cranes	0.00048 Hours per 1 SF	1,242
	Concrete Truck Pump	Pumps	0.00228 Hours per 1 SF	6,208
	Fork Truck	Forklifts	0.00064 Hours per 1 SF	2,949
	Tower Crane	Cranes	0.0032 Hours per 1 SF	553
	Trowel Machine	Paving Equipment	0.00152 Hours per 1 SF	553
ITB Main Hall Expansion – Demolition ONLY				
Building Demolition	Bob Cat	Skid Steer Loaders	0.0240 Hours per 1 SF	2,794
	Excavator with Bucket	Excavators	0.0120 Hours per 1 SF	1,397
	Generator Sets	Generator Sets	0.0120 Hours per 1 SF	1,397
East Field GSE Facility #2 – Demolition ONLY				
Building Demolition	Bob Cat	Skid Steer Loaders	0.0240 Hours per 1 SF	240
	Excavator with Bucket	Excavators	0.0120 Hours per 1 SF	120
	Generator Sets	Generator Sets	0.0120 Hours per 1 SF	120

SOURCES: Transportation Research Board, Airport Cooperative Research Program, Guidance for Estimating Airport Construction Emissions, https://www.trb.org/Publications/Blurbs/170234.aspx, accessed February 15, 2024.
California Air Pollution Control Officers Association (CAPCOA) and ICF, User Guide for CalEEMod Version 2022.1, https://www.caleemod.com/user-guide, accessed February 15, 2024.

ABBREVIATIONS: ACEIT = Airport Construction Emissions Inventory Tool; CalEEMod = California Emissions Estimator Model; SF= square feet; U/G = underground

NOTES:

a. Equipment hours for Building Demolition are based on the square footage of structures to be demolished. Equipment hours for Concrete Demolition for large projects are based on the square feet of the footprint of the structures to be demolished. Equipment hours for all other phases are based on the square feet of the structure to be constructed.
b. For the Central Hub, construction activities with the "Building" label applies to components of the Central Hub that are not designated as parking. Conversely, the "Parking Structure" label applies to components of the Central Hub that are designated as parking. Parking square footage was based on CalEEMod assumption of 400 SF per parking spot.

TABLE 7
OFF-ROAD CONSTRUCTION EQUIPMENT LIST AND HOURS OF OPERATION FROM CALEEMOD

Project/Construction Activity[a]	CalEEMod Equipment Name	CalEEMod Equipment per Day	CalEEMod Hours per Day per Equipment	Total Equipment Hours[b]
ITB Main Hall Expansion				
Site Preparation	Graders	1	8	80
	Rubber Tired Dozers	1	7	70
	Tractors/Loaders/Backhoes	1	8	80
Grading	Graders	1	8	152
	Rubber Tired Dozers	1	8	152
	Tractors/Loaders/Backhoes	2	7	266
Building Construction	Cranes	1	6	5,730
	Forklifts	1	6	5,730
	Generator Sets	1	8	7,640
	Tractors/Loaders/Backhoes	1	6	5,730
	Welders	3	8	22,920
Paving	Cement and Mortar Mixers	1	6	288
	Pavers	1	6	288
	Paving Equipment	1	8	384
	Rollers	1	7	336
	Tractors/Loaders/Backhoes	1	8	384
Architectural Coating	Air Compressors	1	6	288
East Field GSE Facility #2				
Site Preparation	Graders	1	8	16
	Tractors/Loaders/Backhoes	1	8	16
Grading	Graders	1	6	30
	Rubber Tired Dozers	1	6	30
	Tractors/Loaders/Backhoes	1	7	35
Building Construction	Cranes	1	4	924
	Forklifts	2	6	2,772
	Tractors/Loaders/Backhoes	2	8	3,696
Paving	Cement and Mortar Mixers	4	6	288
	Pavers	1	7	84
	Rollers	1	7	84
	Tractors/Loaders/Backhoes	1	7	84
Architectural Coating	Air Compressors	1	6	72

SOURCE: California Air Pollution Control Officers Association (CAPCOA) and ICF, *User Guide for CalEEMod Version 2022.1*, https://www.caleemod.com/user-guide, accessed February 15, 2024.

ABBREVIATION: CalEEMod = California Emissions Estimator Model

NOTES:

a. Demolition activity for ITB Main Hall Expansion and East Field GSE Facility #2 is presented in Table 6.
b. Equipment hours equals the equipment count multiplied by the equipment hours per day multiplied by the total phase workdays presented in Table 5.

Operations

Operational emissions sources associated with the RADP would include new emergency backup generators, employee and delivery vehicle trips, consumer product use, and architectural coatings. Each of these is described further below.

Emergency Diesel Generators

The RADP would result in additional building and parking square footage compared to existing conditions. These new buildings are assumed to require emergency backup generator capacity. Existing generators at SFO were considered to estimate the number and location of new generators. New generators would likely be located at the largest buildings constructed with implementation of the RADP; however, it is conservatively assumed that all RADP projects would require emergency generators.

On-Road Mobile Sources

Employee Vehicle Trips

Implementation of projects under the RADP would result in new airport employee vehicles and employees of concessioners in the new terminal shops and restaurants. Emission estimates for on-road vehicles on local roadways are based on RADP project-specific trip generation rates and CalEEMod default vehicle mile estimates.

Delivery Trucks

Implementation of projects under the RADP would also include medium- and heavy-duty trucks operating at the Airport for delivering materials and goods to the project site (such as food and vendor trucks); these vehicles may be diesel-powered. The number of delivery trucks was estimated based on the Transportation Impact Analysis Guidelines for Environmental Review and the square footage of land uses for each RADP building.[4] For RADP Terminal projects (RADP Projects #1 through #5), a land use type of *Retail (Composite)* was used for the delivery truck estimates, while for Ground Access and Parking projects (RADP Projects #6 through #16), a land use type of *Office* was selected, and for the Airport/Airline Support Facilities and Utilities projects (RADP Projects #17 through #20) a land use type of *Light Industrial* was selected.

Transport Refrigeration Units

Implementation of projects under the RADP would also include medium- and heavy-duty trucks operating at the Airport for delivering materials and goods to the project site. A fraction of delivery trucks, such as food delivery trucks, will have transport refrigeration units (TRUs). It is conservatively assumed 50 percent of large semi-truck deliveries and 20 percent of small box truck deliveries to RADP terminal projects (RADP Projects #1 through #5) would have TRUs.[5] It is assumed there would be no TRUs associated with deliveries to the ground access and parking projects and the support facilities projects.

---

4 San Francisco Planning Department, *Transportation Impact Analysis Guidelines for Environmental Review*, 2019, https://sfplanning.org/project/transportation-impact-analysis-guidelines-environmental-review-update, accessed March 22, 2024.

5 Environmental Science Associates, *New Flower Market Project Air Quality Technical Report – Final Draft*, January 2018.

Area Sources

Consumer products

Area sources of emissions associated with a project that could occur with implementation of the RADP include consumer product use such as solvents, cleaning aerosols, and kitchen supplies. Because buildout under the RADP would increase the area of some of the existing buildings at SFO as well as construct new structures, an increase in emissions of reactive organic gases (ROG) from new consumer product use is expected and will be estimated using CalEEMod defaults.

Architectural coatings

Architectural coatings would be applied both externally and internally to new and expanded buildings implemented under the RADP. The use of architectural coatings is therefore expected to increase with implementation of RADP projects, and this would result in additional ROG emissions.

Landscaping

Any new landscaping associated with new buildings under the RADP are assumed to only occur for Ground Access and Parking projects as well as Airport/Airline 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 construction of any new landscaped area. Therefore, there would be no emissions associated with landscaping activities for Terminal projects. Ground Access and Parking projects and Airport/Airline Support Facilities and Utilities projects landscaping emissions will be modeled in CalEEMod using default settings.

Emissions Calculations

Construction

The AQRM will present criteria pollutant emissions from construction activities associated with the small project, the medium project, and the two large projects. Construction emission sources include off-road equipment, on-road vehicles, truck idling, and evaporative sources (e.g., asphalt and architectural coatings). Criteria air pollutants studied include ROG, nitrogen oxides (NO_X), particulate matter from vehicle exhaust with an aerodynamic diameter equal to or less than 10 microns (PM_{10}), and particulate matter from vehicle exhaust with an aerodynamic diameter equal to or less than 2.5 microns ($PM_{2.5}$). Fugitive emissions of PM_{10} and $PM_{2.5}$ during construction (dust from construction) will not be included because implementation of projects under the RADP would comply with SFO's Airport Standard Construction Measures. With respect to air quality, dust control measures, specified in the Airport's Division Document 01 57 00 (Temporary Controls), are required for projects involving earthwork; excavation; demolition; remediation and removal of contaminated soil, sludge, and water; and activities that may result in the use or discovery of hazardous materials. Temporary Controls require contractors to implement an on-site maintenance program, avoid or minimize emissions from construction vehicles and equipment, and minimize the direct and fugitive emissions from coating, blasting, and painting activities through equipment maintenance and best management practices.[6] ESA will estimate average daily and total annual construction-related criteria pollutant emissions and total annual diesel particulate matter (DPM) and $PM_{2.5}$ emissions for the health risk assessment (HRA) (discussed further below) for each of the representative project types. ESA will conservatively assume that all diesel combustion emissions of PM_{10} are DPM.[7]

Calculation methods for each source of construction emissions are explained separately below. Construction emissions under a controlled scenario, if required, will also be estimated in consultation with EP staff and SFO regarding specific control measures to include.

Off-Road Equipment

Factors used to calculate emissions from off-road equipment were obtained from the California Air Resources Board's (CARB) 2017 Off-Road Equipment Model (OFFROAD2017-ORION).[8] Note that CARB has an updated version of the model, OFFROAD2021-ORION, but CalEEMod still uses OFFROAD2017-ORION, so for consistency ESA will use this version.[9] ESA will assume that all off-road equipment is diesel-powered. CalEEMod default values will be used for horsepower per equipment type, load factors, and emission factors (which includes engine tier levels). Emission factors are based on each representative project's construction start year, which is further discussed below. Estimated off-road emissions of DPM and $PM_{2.5}$ will be calculated for each year to estimate total cancer risk and annual average $PM_{2.5}$ concentration for the HRA.

Emissions will be calculated based on **Equation 1**.

Equation 1: $$E_{phase} = \sum_{i}(Activity_i * EF_i * LF_i * HP_i) * Conv$$

Where:

E_{phase} = Total exhaust emissions for the phase, pounds per day
Activity = Equipment activity, hours per day
EF = Engine emissions factor, grams/horsepower-hour (CalEEMod/OFFROAD2017-ORION)
LF = Engine load factor, unitless (CalEEMod/OFFROAD2017-ORION)
HP = Engine horsepower, hp (CalEEMod/OFFROAD2017-ORION)
Conv = Conversion factor, 0.002205 pounds/grams
i = Equipment type

6 Airport Standard Construction Measures that address air quality include Division 01 33 16: Hazard and Hazardous Material Investigation and Remediation; Division 01 35 13.43: Regulatory Requirements for Hazardous Waste; Division 01 35 43.01: Demolition; Division 01 35 43.06: Earthwork; Division 01 35 43.16 Excavation and Disposal of Contaminated Soil, Sludge, and Water; and Division 01 57 00: Temporary Controls.

7 Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, 2022, Appendix E: Recommended Methods for Screening and Modeling Local Risks and Hazards, 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 February 2024.

8 California Air Resources Board, MSEI Modeling Tools, https://arb.ca.gov/emfac/, accessed February 2, 2024.

9 ESA completed a preliminary assessment comparing model runs from both OFFROAD2017-ORION and OFFROAD2021-ORION and determined it neither to be conservative nor underestimating. The updated model includes revised inventories where some emission factors are slightly higher and others are slightly lower than the previous version.

On-Road Mobile Sources

Construction of projects that could occur with implementation of the RADP would require on-road vehicles for materials import/export (i.e., haul trucks), construction worker commute trips, and vendor trips. Haul trucks and vendor trips are assumed to be diesel-powered vehicles; construction employee trips are based on CalEEMod default vehicle class and fuel type (gasoline, diesel, and electric).

Haul truck trip estimates were obtained from CalEEMod defaults or based on demolition amounts from ACEIT. Vendor trips were calculated using the ACEIT model and construction worker trips were obtained from CalEEMod defaults, as listed in the *Activity Data* section above and in Table 5. Trip lengths are all based on CalEEMod defaults, as shown above in the *Activity Data* section and in Table 4.

On-road emissions will be calculated using the CARB's EMission FACtor (EMFAC2021) emission rate program.[10] Additionally, scaling factors provided by CARB that incorporate CARB's Clean Mile Standard (CMS), Advanced Clean Cars II (ACC II), Clean Truck Check (Heavy-Duty Inspection and Maintenance [HD I/M]), and Federal Clean Trucks Plan (CTP)will be applied to the EMFAC2021 emission rates because the model does not yet include these regulations.

Estimated on-road construction criteria pollutant emission for each construction phase will be totaled for each year of construction and, consistent with the air district's guidance, averaged over the number of work days in the construction phase for each year of construction to determine average daily emissions on an annual basis. Estimated on-road emissions of DPM and $PM_{2.5}$ will be calculated for each year to estimate total cancer risk and annual average $PM_{2.5}$ concentration for the HRA.

Criteria pollutants generated by on-road vehicle trips will be calculated for each phase using **Equation 2**.

Equation 2: $$E_{phase} = \sum_i (Activity_i * EF_i * Distance_i) * Conv$$

Where

E_{phase} = Total exhaust emissions for the phase, pounds per day
Activity = Vehicle trips, trips per day (ACEIT and CalEEMod)
Distance = Vehicle length, miles per trip (SFO, Travel Demand Memorandum)
EF = Engine emissions factor, grams/mile (EMFAC2021)
Conv = Conversion factor, 0.002205 grams/pound
i = Vehicle type

10 Ibid.

Haul Truck Idling

Idling emissions associated with heavy-duty trucks (haul trucks, concrete trucks, material delivery trucks, water trucks, etc.) will be estimated based on the anticipated number of truck trips and idling emission factors for heavy-duty vehicles from EMFAC2021. It is assumed that idling activities would total 15 minutes per trip, representing three separate 5-minute idling occurrences: check-in to the site or queuing at the site boundary upon arrival, on-site idling during loading/unloading, and check-out of the site or queuing at the site boundary upon departure. The 5-minute limit per idling occurrence is consistent with the CARB's Air Toxics Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.[11]

Asphalt Paving

Emissions of ROG from asphalt paving will be estimated within CalEEMod based on the acres of paving for each RADP project as applicable. CalEEMod estimates volatile organic compounds (VOC) off-gassing emissions associated with paving of asphalt surfaces using the surface area and an emission factor of 2.62 pounds of VOC per acre paved. VOC will be included in the ROG emission totals consistent with CalEEMod summary outputs.[12]

Architectural Coatings

Emissions of ROG from architectural coatings will be estimated within CalEEMod based on the square footage of new RADP facilities as provided in the project description and shown in Table 8 through Table 10. The VOC content of the architectural coatings is based on the air district's Rule 8.3 (Architectural Coatings): 150 grams VOC per liter for non-residential exterior coatings and 100 grams VOC per liter for non-residential interior coatings.[13] ROG is assumed to equal VOC.

Operations

The AQRM will include operational criteria pollutant emissions associated with the full buildout of the projects that could occur with implementation of the RADP in 2045. The sources of operational emissions include those from an increase in employee vehicle trips and new emergency backup diesel generators. In addition, consumer product use in new buildings, architectural coatings, landscaping equipment would generate operational emissions and are estimated based on net new building and parking square footage. All new buildings will be all-electric, consistent with SFO and City policy, so the analysis will not include emissions from natural gas combustion. Each source is described below.

Table 8, **Table 9**, and **Table 10** present buildout information for RADP terminal projects, ground access and parking projects, and support facilities and utilities projects, respectively. These tables include demolition amounts and net increases in square footage for buildings and parking, based on the type of project.

---

[11] California Air Resources Board, Airborne Toxic Control Measures to Limit Diesel-Fueled Commercial Motor Vehicle Idling, https://ww2.arb.ca.gov/our-work/programs/atcm-to-limit-vehicle-idling, accessed February 2, 2024.

[12] California Air Pollution Control Officers Association (CAPCOA) and ICF, *User Guide for CalEEMod Version 2022.1*, April 2022, https://www.caleemod.com/user-guide, accessed June 13, 2024

[13] 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.

TABLE 8
RADP TERMINAL PROJECTS SUMMARY OF NET NEW OPERATIONAL AREA

Building	Building Area Demolition (sf)	New Construction (sf)	Net New Construction (sf)	New Paving (sf)	CalEEMod Land Use	CalEEMod Area (sf)
Boarding Area H (1)						
Boarding Area H	N/A	1,618,900	1,413,300		Industrial Park	1,413,300
Boarding Area F Modernization (2)						
Building 944	78,000	101,000	23,000		Industrial Park	23,000
Boarding Area F	1,230,000	2,100,000	870,000		Industrial Park	870,000
RON/Race Track				243,000	Other asphalt surfaces	243,000
International Terminal Building Main Hall Expansion (3)						
Building 100	116,400	393,000	276,600		Industrial Park	276,600
International Terminal Building Boarding Areas A and G Improvements (4)						
Building 100 (Boarding Areas A and G)			23,200		Industrial Park	23,200
Terminal 3 Façade Expansion (5)						
Building 400 (Terminal 3)			25,000		Industrial Park	25,000

SOURCE: SFO 2023

Employee Vehicle Trips

Operational on-road vehicle source criteria pollutant emissions for project types that could occur with implementation of the RADP will be estimated using traffic data from the Travel Demand Memorandum[14] and emission factors from EMFAC2021 (see Equation 2, above). RADP buildout is expected to occur by 2045, but emission calculations for on-road vehicles will be conservatively based on year 2035 emissions factors to capture the maximum annual worst-case criteria pollutant emissions for RADP operations that may occur during a year prior to full buildout when operational activities are lower than full buildout operations, but emission factors are higher.[15] $PM_{2.5}$ from entrained road dust will be calculated using CARB and United States Environmental Protection Agency (U.S. EPA) AP-42 factors, as stated in the air district's 2022 CEQA Guidelines.[16]

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 thus will be evaluated in the HRA, if warranted, based on the number of daily and annual vehicles estimated in the Travel Demand Memorandum.

14 Fehr & Peers & LCW Consulting, 2024. *SFO Recommended Airport Development Plan CEQA Analysis - Travel Demand Memorandum*, March 2025.

15 The year 2035 is the midpoint year of construction and applying 2035 emissions factors to 2045 full buildout operational traffic will provide a conservative estimate of traffic emissions.

16 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.

TABLE 9
GROUND ACCESS AND PARKING PROJECTS SUMMARY OF NET NEW OPERATIONAL AREA

Building/Area	Building Area Demolition (sf)	Paving Area Demolition (sf)	New Construction (sf)	New Paved Area (sf)	Net New Construction (sf)	Net New Paved Area (sf)	CalEEMod Land Use	CalEEMod Area (sf)
Central Hub (6)								
Building 195	3,680,000		6,330,000		2,650,000		Parking Garage 8 levels (175' tall)	2,650,000
Domestic Terminal Roadways Reconstruction (7)								
Domestic Terminal Roadways Reconstruction		710,000		790,000		80,000	Other asphalt surfaces	80,000
International Terminal Building Curbside Expansion 8)								
International Terminal Building Curbside Expansion						52,000	Other non-asphalt surfaces	52,000
Consolidated Rental Car Center (CONRAC) Facility (9)								
Lot DD			1,940,000		1,940,000		Parking Lot	1,940,000
Consolidated Rental Car Center Quick Turn Around Facility (10)								
Lot DD			1,031,000		1,031,000		Parking Lot	1,031,000
Long-Term Parking Garage #3 (11)								
Lot DD			348,000		348,000		Parking Garage 67' avg height	348,000
Long-Term Parking Garage #4 (12)								
Building 780							Parking Garage 66' tall	0
Rental Car Center Short Term Storage Lot (13)								
Building 782	130,000				-130,000			
Terminal 2 AirTrain Station Expansion (14)								
Building 379			6,900		6,900		Industrial Park	6,900
Rental Car Center AirTrain Station Expansion (15)								
Building 797			2,900		2,900		Industrial Park	2,900
AirTrain Maintenance Facility (16)								
Building 692	19,300		171,000		151,700		General Heavy Industry	151,700

SOURCE: SFO 2023

TABLE 10
SUPPORT FACILITIES AND UTILITIES PROJECTS SUMMARY OF NET NEW OPERATIONAL AREA

Building/Area	Building Area Demolition (sf)	New Construction (sf)	Net New Construction (sf)	CalEEMod Land Use	CalEEMod Area (sf)
North Field Ground Support Equipment Facility #1 (17)					
Aircraft apron		48,000	48,000	General Heavy Industry	48,000
Aircraft Maintenance Hangar (18)					
Employee surface parking lot		181,000	181,000	General Heavy Industry	181,000
East Field GSE Facility #2 (19)					
Unnumbered building	10,000	33,000	23,000	General Heavy Industry	23,000
Sanitary Sewer Force Main Line Realignment (20)					
No construction details are available for this project.					
SOURCE: SFO 2023					

Delivery Trucks

Exhaust emissions of DPM and $PM_{2.5}$ from delivery vehicles will be estimated using Equation 2, above. Any TRU associated with deliveries will be calculated using Equation 2 and modeling output from OFFROAD2021-ORION.[17]

Area Sources

One CalEEMod run incorporating the square footage of all RADP projects will be used to estimate area source emissions from consumer product use and architectural coatings. All operational land uses in this run will be organized by buildings, parking lots, parking structures, and support facilities.

Architectural coatings are calculated in CalEEMod as described above for construction emissions. Emission factors used by CalEEMod for consumer product use in new buildings are as follows:

- Parking degreasers: 5.68×10^{-7} pounds per square foot per day (for parking land uses)

For the CalEEMod “General category” for consumer products, an emission factor of 1.46×10^{-5} pounds per square foot per day (for non-parking land uses).[18]

Generators

New generator emissions will be calculated assuming they would meet CARB/EPA Tier 4 Final standards for generators equal to or greater than 50 horsepower and CARB/EPA Tier 2 standards for generators less than 50 horsepower, consistent with BAAQMD’s Best Available Control Technology workbook.[19] The horsepower is

---

17 California Air Resources Board, MSEI Modeling Tools, https://arb.ca.gov/emfac/, accessed February 2, 2024.

18 San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, July 2024, https://sfplanning.org/air-quality, accessed July 25, 2024.

19 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 31, 2025.

assumed to be the same for similar existing buildings. The emissions calculations for the generators will assume 50 hours for testing and maintenance annually.[20]

Health Risk Assessment

The HRA will evaluate the following TAC emissions and sources associated with construction of projects under the RADP:

- Excess lifetime cancer risks resulting from exposure to emissions of DPM from off-road and on-road equipment
- Annual average $PM_{2.5}$ concentrations from exhaust sources (off-road and on-road) and $PM_{2.5}$ from entrained road dust, tire wear, and brake wear (on-road)

The HRA will evaluate the following health risks to sensitive and worker receptors from emissions associated with the operation of projects under the RADP:

- Excess lifetime cancer risks resulting from exposure to emissions of DPM from new emergency backup generators
- Excess lifetime cancer risks resulting from exposure to emissions of DPM associated with on-road diesel delivery truck trips
- Excess lifetime cancer risks resulting from exposure to emissions of DPM associated with idling of diesel delivery vehicles in loading areas
- Annual average $PM_{2.5}$ concentrations from new emergency backup generators' exhaust
- Annual average $PM_{2.5}$ concentrations from combustion exhaust, entrained road dust, tire wear, and brake wear associated with on-road vehicle trips
- Annual average $PM_{2.5}$ concentrations from idling of delivery vehicles in loading areas

The HRA will be conducted following methods in the air district's Health Risk Screening Analysis Guidelines,[21] the California Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program Guidance,[22] and the 2024 San Francisco Planning Department Air Quality and Greenhouse Gas Analysis Guidelines.[23]

[20] San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, July 2024, https://sfplanning.org/air-quality, accessed July 25, 2024.

[21] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, 2022, Appendix E: Recommended Methods for Screening and Modeling Local Risks and Hazards, 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 February 2, 2024.

[22] Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Risk Assessment Guidelines: Guidance Manual for the Preparation of Health Risk Assessments*, February 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html, accessed February 2, 2024.

[23] San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, July 2024, https://sfplanning.org/air-quality, accessed July 25, 2024.

Exposure Scenarios

Construction of Representative Projects

The AQRM will include health risks associated with construction of the Central Hub, CONRAC, ITB Main Hall Expansion, and East Field Ground Support Equipment Facility #2 for two exposure scenarios to capture the maximum potential health risks:

1. Worker receptor maximum: exposure of on-site Airport employees and tenants' employees located in SFO terminal and administrative buildings to construction TAC emissions. This will identify the maximum exposed individual worker (MEIW) from the representative projects.
2. Sensitive receptor maximum: exposure of off-site residential, school, and childcare receptors to construction TAC emissions. This will identify the maximum exposed individual sensitive receptor (MEISR) from the representative projects.

Construction Cancer Risk for all RADP Projects

To estimate lifetime excess cancer risks (a maximum of 25 years of exposure for worker receptors and 30 years of exposure for residential receptors), the HRA will include an estimate of the average annual exposure to DPM emissions of the entirety of RADP project construction activities. Because lifetime excess cancer risk for residential receptors is most sensitive at the earliest stages of life, the high overlap scenario will be used to represent the worst-case exposure for the starting years of the RADP build out. In other words, for the age sensitive bins of third trimester, zero to two, and two to sixteen, ESA will conservatively model exposure from construction of Central Hub, CONRAC, and ITB Main Hall Expansion as if these projects will happen simultaneously (as represented by the high overlap scenario). Although worker receptors do not have varying ages of sensitivity, the high overlap scenario will also be used to capture worst-case exposure from buildout of the RADP due to overlapping construction activities. The exposure duration for the high overlap scenario and the remainder of RADP project construction activities for both receptor types is presented in **Table 11**.

TABLE 11
EXPOSURE DURATION TO CONSTRUCTION OF THE RADP BY RECEPTOR TYPE AND AGE BIN

	Exposure Duration (total days)				
	Off-Site Resident				On-Site Worker
Construction Phase	3rd Trimester	Age 0<2	Age 2<16	Age 16<30	Age 16<70
High Overlap Scenario (days)	90	730	827	0	1,647
Remainder of RADP (days)	0	0	4,283	766	5,049
Total Exposure (days)	**90**	**730**	**5110**	**766**	**6,696**

SOURCE: ESA, 2024

NOTES: High Overlap Scenario represents exposure from construction of the high overlap scenario. Remainder of RADP represents exposure from construction of the rest of the RADP projects not already captured in the high overlap scenario.

As shown in Table 11, the high overlap scenario construction duration is approximately 1,650 days or four and half years long, which represents the greatest amount of construction to occur in the most sensitive age bins (ages less than 16) for residential exposure. As shown in Table 11, the remainder of RADP construction is approximately 5,000 days or 14 years long and includes the off-site resident's remaining age bins including days in Age 2<16 and Age 16<30. Worker receptors are only evaluated as having exposure to the adult age grouping; therefore, all exposure to on-site workers from construction of RADP projects falls into the Age 16<70 category.

The DPM concentrations modeled from construction of the Central Hub, CONRAC, and ITB Main Hall Expansion, will be used to estimate DPM concentrations from the construction of all other RADP projects. For each of these three representative projects, an average DPM concentration at all modeled receptor locations will be estimated using a mean of the construction years as shown in **Equation 3**.

$$Equation\ 3: \quad \overline{C_{p,r}} = \frac{1}{n} * \sum_{y=1}^{n} C_{p,r,y}$$

Where:

$\overline{C_{p,r}}$ = Mean average annual air concentration of DPM (micrograms per cubic meter [μ/m³]) for each representative project in the high overlap scenario (Central Hub, CONRAC, and ITB Main Hall Expansion) at each receptor location

$C_{p,r,y}$ = Average annual air concentration of DPM, from AERMOD (μ/m³) for each representative project in the high overlap scenario for each year of construction at each receptor location

p = for each project in the high overlap scenario

r = for each receptor

n = number of years of construction for each representative project

y = for each year of construction

Once the mean DPM concentration at all receptor locations is established for each of the three representative projects, the mean from those three projects will be generated to estimate the average annual DPM concentration resulting from construction of all remaining RADP projects. The method of averaging is shown in **Equation 4**.

$$Equation\ 4: \quad \overline{C_r} = \frac{1}{3} * \sum_{p=1}^{3} \overline{C_{p,r}}$$

Where:

$\overline{C_r}$ = Mean average annual air concentration (micrograms per cubic meter [μ/m³]) at each receptor location to represent construction of all remaining RADP projects

$\overline{C_{p,r}}$ = Mean average annual air concentration (μ/m³) for each representative project in the high overlap scenario at each receptor location, calculated in Equation 3

p = for each project in the high overlap scenario

r = for each receptor

The average DPM concentrations, as calculated in Equation 4, will be used to represent a constant concentration over the 20-year buildout period from 2025 to 2045 and will be used in **Equation 6** below to calculate cancer risk for each receptor point. The cancer risk from the remainder of the RADP buildout will be added to the MEISR and MEIW risks from the construction of representative projects in the high overlap scenario to determine the construction cancer risk from full construction of the RADP.

Because health effects from exposure to $PM_{2.5}$ are assessed on an annual basis, only the worst-case year from construction of all RADP projects needs to be determined. The high overlap scenario will very likely produce the highest annual average $PM_{2.5}$ concentration results during any year of the 20-year buildout period given the amount of construction activity. Therefore, the high overlap scenario will represent the maximum annual average $PM_{2.5}$ concentration impacts for any year of construction for all RADP projects.

Operations

The AQRM will include health risks associated with full buildout of the RADP projects. The analysis will focus on the health risks associated with emissions from operations after full buildout of all the RADP projects (2045). Like the construction HRA discussed above, the AQRM will include health risks associated with two RADP operational scenarios to capture the maximum potential health risks from operation of projects that could occur with implementation of the RADP:

1. Worker receptor maximum: exposure of on-site Airport employees and tenant's employees located in SFO terminal and administrative buildings to mobile sources and emergency generators. This will identify the MEIW.
2. Sensitive receptor maximum: exposure of off-site residential, school, and childcare receptors to TAC emissions from mobile sources and emergency generators. This will identify the MEISR.

Combined Construction and Operations

The AQRM will also include a combined construction plus operational health risk analysis. This scenario will combine maximum anticipated construction TAC exposure with operational TAC exposure for both the worker receptor maximum and sensitive receptor maximum scenarios. Receptors will be assessed to account for exposure to full buildout operational emissions occurring after the last RADP project is complete in 2045 for a total of 25 years of exposure for worker receptors and 30 years of exposure for residential receptors.

Estimated Air Concentrations

The construction HRA will model TACs and annual average $PM_{2.5}$ concentrations at all sensitive receptors located within 1,000 meters of the Central Hub's, CONRAC's, and ITB Main Hall Expansion's boundaries. The operational HRA will model TAC and annual average $PM_{2.5}$ concentrations at all sensitive and worker receptors located within 1,000 meters of identified roadway segments and emergency diesel generator locations.

The HRA will use the most recent version of the American Meteorological Society/Environmental Protection Agency regulatory air dispersion model (AERMOD version 23132) to estimate concentrations of TACs and $PM_{2.5}$ at off-site (residents, daycares, and schools) sensitive receptors. For each receptor location, AERMOD generates air concentrations that result from emissions from multiple sources. The AERMOD model requires numerous inputs, such as meteorological data, source parameters, topographical data, and receptor characteristics. These inputs are discussed below.

Exposure to TAC emissions from truck and material staging areas will be approximated using the HRA prepared for the SFO Shoreline Protection Program (SPP) EIR.[24] The SPP TAC concentrations will be scaled based on the

[24] San Francisco Planning Department and Environmental Science Associates, *San Francisco International Airport Shoreline Protection Program Air Quality and Technical Memorandum and Health Risk Assessment*, March 2022, https://sfplanning.org/environmental-review-documents?title=sfo&field_environmental_review_categ_target_id=All&items_per_page=10, accessed February 12, 2024.

number of trucks anticipated for the RADP projects modeled in the HRA (for example, if SPP assumes 200 daily trucks and the RADP projects assume 50 daily trucks, the resulting TAC concentrations from SPP will be scaled by 0.25 [50 ÷ 200]).

Receptors

Off-Site Sensitive Receptors

The HRA will use a cartesian coordinate system to model ground-level concentrations of TACs and $PM_{2.5}$ at receptor locations defined by Universal Transverse Mercator northing and easting coordinates. The 20-meter receptor grid will cover the domain extending 1,000 meters from identified TAC emissions sources (see discussion above) and will also include discrete, non-residential sensitive receptor locations (including daycares and schools), as shown in **Figure 1**. The off-site, non-residential sensitive receptors shown are also listed in **Table 12**.

On-Site Worker Receptors

The HRA will include an analysis of on-site workers in the terminal and support buildings. The modeling will be based on a 20-meter grid extending 1,000 meters from the Central Hub, CONRAC, and ITB Main Hall Expansion project boundaries (for the construction HRA) and 1,000 meters from identified roadway segments and emergency diesel generator locations (for the operational HRA). Worker receptors will be located at physical buildings within the airport property boundary. These receptors are shown in **Figure 2**. Airfield and ground support workers will not be modeled in the HRA because they are required to have Occupational Safety and Health Administration (OSHA) safety protocols as part of their employment.[25] Off-site worker receptors are assumed to have less impact than on-site workers given the on-site workers' proximity to RADP activities, and therefore would not be modeled.

Meteorological Data

Meteorological data from the San Francisco International Airport monitoring site, the nearest meteorological air monitoring site to the project site, will be used. The HRA will use the most recently available five-year dataset. The dataset will be AERMOD-ready meteorological data provided by the air district.[26]

Terrain and Land Use Considerations

Terrain and elevation data will be imported from the United States Geological Survey's (USGS) National Elevation Dataset.[27] Based on the land use characteristics in the vicinity of the project site, rural dispersion coefficients will be used in AERMOD. The rural dispersion option is consistent with the Auer analysis completed for the SPP EIR.[28]

---

25 Bay Area Air Quality Management District, Phone Call with Virginia Lau (BAAQMD) and Brian Schuster (ESA), August 31, 2023.

26 Bay Area Air Quality Management District, AERMOD-Ready Meteorological Data Sets for 35 Sites in the Bay Area, 2022, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/ceqa-modeling-data, accessed February 12, 2024.

27 United States Geological Survey, National Elevation Dataset 2013, http://www.mrlc.gov/viewerjs/, accessed September 10, 2024.

28 San Francisco Planning Department and Environmental Science Associates, *San Francisco International Airport Shoreline Protection Program Air Quality Technical Memorandum and Health Risk Assessment*, March 2022, https://sfplanning.org/environmental-review-documents?title=sfo&field_environmental_review_categ_target_id=All&items_per_page=10, accessed February 12, 2024.

Figure 1 Non-residential Sensitive Receptors

TABLE 12
NON-RESIDENTIAL SENSITIVE RECEPTORS WITHIN 1,000 METERS OF THE RADP BOUNDARY

Sensitive Receptor	Address	Distance from RADP Boundary (meters)	Direction
Angel Star Home Daycare	50 Spruce St	229	West
California Montessori School	480 San Anselmo Ave N	850	West
Belle Air Elementary School	450 3rd Ave	407	West
LifeTime Home	356 Mastick Ave	922	West
Stratford School	300 El Camino Real	950	West
Blossom Bilingual Family Childcare	185 Linden Ave	967	West
Millbrae Nursery School	86 Center St	441	West
Elle's Care Home	18 Rosalita Ln	972	West
Brenner's Retirement Home	1562 Magnolia Ave	829	West
Happy Hall Schools	233 Santa Inez Ave	457	West
Lomita Park Elementary School	200 Santa Helena	443	West
Capuchino High School	1501 Magnolia Ave	958	West
Cadence Millbrae Retirement Home	1201 Broadway	763	West
St. Dunstan School	1150 Magnolia Ave	786	West
St. Dunstan School Extension Program	1133 Broadway	789	West
Millbrae Skilled Care	33 Mateo Ave	974	West
San Mateo County ROP School	1800 Rollins Rd	491	Southeast
Burlingame Skilled Nursing	1100 Trousdale Dr	817	Southwest

SOURCE: Google Maps, 2024

Emission Rates

Emission rates from the various emission sources described above will be represented in the AERMOD modeling as a unitized (1 gram/second) emission rate for each source. The modeled concentration at each receptor (micrograms per cubic meter [μ/m^3]/[g/s]) represents a "dispersion factor," which will then be multiplied by the actual emission rate of each source to determine actual concentrations, and the result from all the sources at each receptor will be combined.

Figure 2 On-Site Worker Receptors

Source Parameters

Each of the emissions sources is input to AERMOD with unique parameters based on the type of source (e.g., point source, area source, volume source). The source parameters will be consistent with the 2020 San Francisco Citywide HRA.[29] Construction sources and vehicle idling will be modeled as area sources; roadways will be modeled as line-volume sources; and emergency backup generators will be modeled as point sources. **Table 13** and **Table 14** summarize the overall modeling parameters and the source modeling parameters, respectively, to be used in AERMOD.

TABLE 13
AERMOD OVERALL MODELING PARAMETERS

Pathway	Input Parameter	Input Value
Control	Averaging Time	Period average
	Dispersion Coefficient	Rural
	Model Version	v23132
Source	Source Dimension	*See Table 14*
	Release Height	*See Table 14*
	Initial Vertical Dimension	*See Table 14*
	Initial Lateral Dimension	*See Table 14*
	Variable Emission Factor	Construction = 7 a.m. to 8 p.m.[a] Operations = no variable emissions
Receptor	Receptor Height	1.8 m[b]
	Grid	20 m x 20 m[b]
Meteorology[c]	Surface Data	San Francisco International Airport (KSFO)
	Upper Air	San Francisco Bay Oakland International Airport (KOAK)[d]
	Meteorological Years	2013-2017
	Station Elevation	2.4 m

SOURCES:
City and County of San Francisco, Noise Control Ordinance – Police Code Section 2908, https://sfpublicworks.org/sites/default/files/Noise_Control_Ordinance_0.pdf, accessed February 15, 2024.
San Francisco Planning Department, Air Quality and Greenhouse Gas Analysis Guidelines, July 2024, https://sfplanning.org/air-quality, accessed July 25, 2024.
Bay Area Air Quality Management District, AERMOD-Ready Meteorological Data Sets for 35 Sites in the Bay Area, 2022, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/ceqa-modeling-data, accessed February 15, 2024.

ABBREVIATION: m = meters

NOTES:

a. Lawful construction noise times of day are conservatively used for dispersion modeling since the actual hours of construction are unknown currently (City and County of San Francisco 2008).
b. From the Citywide HRA (SF DPH and SF Planning 2020).
c. AERMOD ready data from BAAQMD (BAAQMD 2022).
d. The upper air meteorological station at KOAK is the nearest source of upper air data to SFO.

29 San Francisco Department of Public Health, San Francisco Planning Department, and Ramboll, *San Francisco Citywide Health Risk Assessment: Technical Support Documentation*, 2020, https://www.sfdph.org/dph/files/EHSdocs/AirQuality/Air_Pollutant_Exposure_Zone_Technical_Documentation_2020.pdf, accessed February 2, 2024.

TABLE 14
AERMOD SOURCE MODELING PARAMETERS

Parameter	Off-Road Construction Equipment	Haul/Vendor Onsite Idling	On-Road Trucks	Operational Generators	Operational Mobile Sources[a]
Construction Period					
Source Type[b]	Area	Area	Line Volume	Point	Line Volume
Source Dimension	Representative Project Areas	Representative Project Areas	Variable	At all RADP Projects	Variable
Number of Sources[c]	3	3	Variable	18	Variable
Release Height (m)[d]	5.0	3.4	3.4	3.66	1.7
Initial Vertical Dimension (m)[e]	1.4	3.16	3.16	NA	1.58
Initial Lateral Dimension (m)[f]	NA	4.65	4.65	NA	3.72
Gas Exit Temperature (°C)[g]	NA	NA	NA	467	NA
Stack Inside Diameter (m)[g]	NA	NA	NA	0.183	NA
Gas Exit Velocity (m/s)[g]	NA	NA	NA	45.3	NA

SOURCES:
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, 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&sc, accessed February 15, 2024.
San Francisco Planning Department, Air Quality and Greenhouse Gas Analysis Guidelines, July 2024, https://sfplanning.org/air-quality, accessed July 25, 2024.ABBREVIATION: m = meters; K = degrees Kelvin; m/s = meters per second; NA = not applicable

NOTES:

a. Speciated TOG from operational, gasoline-powered mobile sources will be included in the HRA if traffic volumes warrant the analysis.
b. Construction will be modeled as area sources covering the representative project sites, consistent with the BAAQMD Appendix E guidelines (BAAQMD 2023).
c. Construction, off-road and on-site idling from trucks will be modeled as three separate sources to represent off-road construction activities at the following three representative projects: Central Hub, CONRAC, and ITB. Operational generator numbers and locations will be determined based on scaling existing generator locations/quantities at SFO using current square footage values to RADP increases in square footage. Operational Mobile Source locations will be dependent on traffic analysis and roadway segment volumes.
d. Release height for off-road construction equipment, on-road construction vehicles, and operational generators are from the BAAQMD Appendix E guidelines. The on-road operational mobile source parameters are from the Citywide-HRA (BAAQMD 2023) (SFEP 2020).
e. Initial vertical dimensions for off-road construction equipment, on-road construction vehicles, and operational generators are from the BAAQMD Appendix E guidelines. The on-road operational mobile source parameters are from the Citywide-HRA (BAAQMD 2023) (SFEP 2020).
f. Initial lateral dimensions for off-road construction equipment, on-road construction vehicles, and operational generators are from the BAAQMD Appendix E guidelines. The on-road operational mobile source parameters are from the Citywide-HRA (BAAQMD 2023) (SFEP 2020).
g. Gas exit temperature, stack inside diameter, and gas exit velocity for operational generators are from the BAAQMD Appendix E guidelines and are consistent with the Citywide-HRA (BAAQMD 2023) (SFEP 2020).

Risk Characterization Methods

The HRA will calculate health risks from construction of the representative project types and full buildout operational TAC and $PM_{2.5}$ emissions sources using risk parameters from the air district's Health Risk Screening Analysis Guidelines,[30] the San Francisco Planning Department's Air Quality and Greenhouse Gas Analysis Guidelines,[31] and the 2015 OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines.[32] These calculations will be based on the emission calculation methods and annual average pollutant concentrations from AERMOD discussed above, together with the risk parameters from OEHHA and the air district, as discussed below.

Exposure Assessment

Cancer risk from exposure to DPM occurs exclusively through the inhalation pathway.[33] Therefore, the HRA will only evaluate cancer risks from inhalation and no other exposure pathways (e.g., dermal or ingestion pathways). The HRA will also calculate chronic hazard index, acute hazard index as appropriate (e.g., from gasoline vehicle TOGs), and annual average $PM_{2.5}$ concentrations associated with exhaust, road dust, tire wear, and brake wear.

Potentially Exposed Populations

This analysis will conservatively evaluate the following receptor populations:

- Off-site residential receptors
- Off-site daycare receptors
- Off-site school receptors
- On-site worker receptors

Because child resident exposure assumptions are more conservative than those for adult residents, the HRA will use the conservative approach of considering all off-site receptors as child residents. Once child receptors have been exposed for 16 years, adult exposure parameters will be used (see **Table 15**).

Off-site sensitive receptors are predominantly residential land uses. As noted above, on-site worker receptors will be included in the analysis because of their proximity to the TAC and $PM_{2.5}$ emissions that could occur with implementation of RADP projects.

---

30 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, 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&sc, accessed February 2, 2024.

31 San Francisco Planning Department, Air Quality and Greenhouse Gas Analysis Guidelines, July 2024, https://sfplanning.org/air-quality, accessed July 25, 2024.

32 Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments*, February 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html, accessed February 1, 2024.

33 Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments*, February 2015, https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, accessed February 1, 2024.

TABLE 15
EXPOSURE PARAMETERS

Receptor Type	Age Group (construction or operations)	Daily Breathing Rate (L/kg day or L/kg 8hrs)[a]	Exposure Duration (years)[b]	Fraction of Time at Home (unitless)[c]	Exposure Frequency (days/year)[d]	Averaging Time (days)[e]	Model Adjustment Factor (unitless)[f]	Age Sensitivity Factor (unitless)[g]
Off-site resident	Third Trimester	361	0.25	1	350	25,550	1	10
	Age 0–2 Years	1,090	2	1	350	25,550	1	10
	Age 2–16 Years	572	14	1	350	25,550	1	3
	Age 16-30 Years	261	14	0.73	350	25,550	1	1
Off-site childcare	Age 0–2 Years	1,090	2	n/a	250	25,550	1	10
	Age 2–16 Years	572	4	n/a	250	25,550	1	3
Off-site school	Age 2–16 Years[h]	572	9	n/a	180	25,550	1	3
On-site worker	Age 16–70 Years	230	25	n/a	250	25,550	2.8 and 1	1

SOURCES:
Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments*, February 2015, https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, accessed February 1, 2024.
Bay Area Air Quality Management District, Appendix E, "Recommended Methods for Screening and Modeling Local Risks and Hazards", August 2023, 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 February 1, 2024.

San Francisco Planning Department, Air Quality and Greenhouse Gas Analysis Guidelines, July 2024, https://sfplanning.org/air-quality, accessed July 25, 2024.

ABBREVIATIONS: kg = kilogram; L = liter; m^3 = cubic meters

NOTES:

a. Daily breathing rates are from OEHHA (2015) based on BAAQMD guidance (2023) as follows: for residents, 95th percentile 24-hour breathing rates (OEHHA Table 5.6) for third trimester and age 0–2 years and 80th percentile 24-hour breathing rates (OEHHA Table 5.7) for age 2–16 years and age 16–30 years; for worker, 95th percentile 8-hour moderate-intensity breathing rates (OEHHA Table 5.8) for age 16–70 years. For off-site childcare and off-site school, daily breathing rates are analyzed using residential exposure parameters consistent with San Francisco Planning Department guidance (2024).
b. The exposure duration will be specific to each representative project type's construction duration; exposure duration for operations will be evaluated for the full exposure term: 30.25 years for a resident, 6 years for childcare, 9 years for school, and 25 years for worker.
c. Fraction of time at home (FAH) is set to 1 for all age groups less than 2 years and for age group 2 to 16, if there is a school within cancer risk isopleths of one in a million or greater, per BAAQMD guidance (2023). The FAH will be 0.72 for these age bins if there is no school within cancer risk isopleths of one in a million or greater.
d. Exposure frequency represents default residential exposure frequency from BAAQMD guidance (2023).
e. Averaging time represents 70 years for lifetime cancer risk, per OEHHA (2015).
f. The Model Adjustment Factor is applied to adjust the annual average concentration (24 hours per day, 7 days per week) from AERMOD associated with construction emissions, which assumes emissions occur seven days per week; to the actual construction emission schedule and receptor exposure for worker receptors, which is based on 5 days per week of both construction emissions and receptor exposure (equation = [7 days / 5 days] * (24 hours residential/8 hours when construction coincides with worker hours of operation) = 4.2 * (8 hours of an employee shift/12 hours of construction activity). Operational emissions are continuous and therefore no modeling adjustment factor is applied for on-site worker. No modeling adjustment factor is applied to the school or childcare receptor which is consistent with San Francisco Planning Department guidance (2024).
g. Age sensitivity factors from OEHHA (2015) Table 8.3
h. The earliest age at the school is assumed to be 2 years and based on a 9-year exposure duration, based on BAAQMD guidance (2023).

Calculation of Intake

The dose estimated for each exposure pathway is a function of the concentration of a chemical and the intake of that chemical. The intake factor for inhalation, IF_{inh}, will be calculated as follows using **Equation 5**. The values used in this equation are presented in Table 15.

Equation 5: $$I_{inh} = \frac{DBR * FAH * EF * ED * MAF * ASF * CF}{AT}$$

Where:

I_{inh} = Intake Factor for Inhalation (cubic meters per kilogram body weight per day [m^3/kg-day])
DBR = Daily Breathing Rate (liters per kilogram body weight per day [L/kg-day])
FAH = Frequency of time at home (unitless)
EF = Exposure Frequency (days per year)
ED = Exposure Duration (years)
AT = Averaging Time (days)
MAF = Model Adjustment Factor (unitless)
ASF = Age Sensitivity Factor (unitless)
CF = Conversion Factor, 0.001 (cubic meters per liter [m^3/L])

The chemical intake or dose is estimated by multiplying the intake factor for inhalation, IF_{inh}, by the chemical concentration in air, C_i. This calculation is mathematically equivalent to the dose algorithm given in the current OEHHA guidance.

Age Sensitivity Factors (ASF)

The estimated excess lifetime cancer risks for children receptors (resident, daycare, and school) will be adjusted using the age sensitivity factors (ASFs) recommended in the OEHHA guidance. This approach accounts for an "anticipated special sensitivity to carcinogens" of infants and children. Cancer risk estimates are weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to two years of age and by a factor of three for exposures that occur from two years through 15 years of age. No weighting factor (i.e., an ASF of one, which is equivalent to no adjustment) is applied to ages 16 to 70 years. Table 15 shows the ASFs to be used for all child receptors.

Cancer Risk Characterization

Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to carcinogens. The risk is expressed as a unitless probability and will be calculated as the number of cancer incidences per million individuals in the HRA. The cancer risk for each chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs) by the chemical-specific cancer potency factor.

Excess lifetime cancer risk occurs exclusively through the inhalation pathway and will be calculated according to **Equation 6**.

Equation 6: $Risk_{inh} = C_i * IF_{inh} * CPF_i * CF_1 * CF_2$

Where:

$Risk_{inh}$	=	Cancer risk; the incremental probability of an individual developing cancer as a result of inhalation exposure to a particular carcinogen (per million)
C_i	=	Average annual air concentration of chemical, from AERMOD (micrograms per cubic meter [μ/m^3])
IF_{inh}	=	Intake Factor for Inhalation (cubic meters per kilogram body weight per day [m^3/kg-day])
CPF_i	=	Cancer potency factor for chemical (milligrams chemical per kilogram body weight per day)
CF_1	=	Conversion factor, micrograms to milligrams (milligrams per microgram [mg/μg])
CF_2	=	Risk per million individuals
i	=	Chemical

2045 Future Baseline without RADP and 2045 Future Baseline with RADP

The AQRM will analyze RADP impacts at the MEISR and MEIW locations identified by modeling, with consideration of estimated existing (2019) health risks. The existing health risks are characterized by the contributions to ambient concentrations from emission sources within 1,000 feet of the sensitive receptor and worker receptor locations that were identified by the RADP modeling. The existing risks will be based on estimated background health risks from nearby high-volume roadways and permitted stationary sources using the air district's HRA screening tools.[34] BAAQMD provides these tools for characterizing the contributions from regional sources.

The BAAQMD's regional source contribution tool does not consider the influence of existing airport contributions. At EP's request, a review of existing literature and reports was conducted to assess whether order-of-magnitude contributions from SFO's existing activities could be readily approximated using other airports as a proxy. The review included publicly available studies conducted by the International Civil Aviation Organization (ICAO), as well as a review of health risk assessments conducted for other California airports. The outcome of the review could provide an estimate of background airport contributions at the MEISR and MEIW locations.

A report published by the ICAO indicates that aircraft-related emissions typically contribute 1 to 5 percent of a region's background annual average $PM_{2.5}$ concentration.[35] However, the 1 to 5 percent is only representative of emissions from aircraft (LTO, aircraft taxiing, APUs, and aircraft refueling), so estimates of additional contributions from other airport-related $PM_{2.5}$ sources such as GSE operation and ground access vehicles are not considered. Additionally, it is expected that such contributions from airports are primarily found in regions that are predominantly downwind of airports studied. The ICAO report also focused on $PM_{2.5}$ and did not provide valuable input for other pollutants and health risks.

34 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 2024.

35 International Civil Aviation Organization (ICAO), Miake-Lye, R., et al., Local Air Quality White Paper on Air Quality Aviation Impacts on Air Quality: State of the Science, 2016, pp. 75-81, www.icao.int/environmental-protection/Documents/ScientificUnderstanding/EnvReport2016-WhitePaper_LAQ.pdf, accessed September 9, 2024.

A variety of health risk documentation from California airports was reviewed due to their consistent approach to health risk analyses. San Francisco Bay Oakland International Airport (OAK), San José Mineta International Airport (SJC), San Diego International Airport (SAN), and Los Angeles International Airport (LAX) have each published EIRs that contain health risk studies. However, ESA did not find that these studies report the risks or pollutant concentrations of the airports' baseline conditions, but rather focused on incremental increases from their baseline years. The one exception is a Supplemental EIR published by OAK in 2003. However, this study is more than 20 years old, applies an outdated methodology for assessing risk, and may not be representative of potential impacts by SFO's existing activities.

The review of available documentation did not identify a study that could be readily used to approximate the ambient concentration contributions of SFO's existing activities. There are a variety of reasons why using such approximations could be problematic. Every airport is distinct in its operations, source locations, fleet composition, receptor distances/location, meteorology, and levels of activity. Notably, the predominate wind direction at SFO causes pollutants to disperse over the bay, in the opposite direction of sensitive receptors. Additionally, estimation of airport contributions using such studies produces results that are speculative.

2045 Future Baseline with RADP/Cumulative Conditions

Cumulative sources may 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 or operational-related emissions from nearby occurring or reasonably foreseeable projects will be included in the cumulative analysis only if emissions for these projects are known or have already been estimated (such as for California High-Speed Rail). This inventory will be limited by the availability of data for all potential cumulative projects. For reasonably foreseeable projects that do not have quantitative HRAs, the AQRM will qualitatively evaluate their cumulative health risk contribution.

Control Measures

If the criteria pollutant analysis or HRA shows that the RADP could result in a significant construction or operational impact as determined by EP, the AQRM will analyze controlled scenarios. The first round of modeling will identify control measures that could reduce criteria air pollutant and health risks. ESA will model two versions of construction and operations for the RADP: (1) an uncontrolled scenario and (2) a controlled scenario based on standard EP control measures. ESA will present the results of the uncontrolled scenario to EP staff before conducting the controlled scenario modeling and will consult with EP and SFO as needed to determine the specific control measures to include in the first round of modeling based on these results. Potential control measures are listed below. Based on the results of the first round of modeling for the controlled scenario, additional coordination with EP and SFO is anticipated to occur to revise and refine the control measures.

If implementation of the RADP could expose sensitive and worker receptors to substantial concentrations of DPM and $PM_{2.5}$, the use of U.S. EPA Tier 4 Final, Tier 4 Interim, or Tier 3 engines equipped with a CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS) would significantly reduce DPM and $PM_{2.5}$ exhaust emissions and therefore reduce the potential health impacts from implementation of the RADP on nearby receptors. ESA will consult with EP and SFO staff to determine whether these controls should be modeled for construction equipment.

Construction

Potential construction control measures include:

- **Control Measure AQ-1:** Off-road construction engine requirements.
  - 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 Tier 4 Final off-road emission standards.
  - Where access to alternative sources of power are available, portable diesel engines shall be prohibited.
  - Electric construction equipment shall be required when commercially available. This includes, but is not limited to, forklifts, tractors, sweepers / scrubbers, skid steer loaders, cranes, air compressors, concrete/industrial saws, generators, pumps, signal boards, standard light setup, and welding machines.
  - Diesel engines, whether for off-road or on-road equipment, shall not be left idling for more than two minutes, at any location, except as provided in exceptions to the applicable state regulations regarding idling for off-road and on-road equipment (e.g., traffic conditions, safe operating conditions). The Contractor shall post legible and visible signs in English, Spanish, and Chinese, in designated queuing areas and at the construction site to remind operators of the two-minute idling limit.
  - The Contractor shall instruct construction workers and equipment operators on the maintenance and tuning of construction equipment and require that such workers and operators properly maintain and tune equipment in accordance with manufacturer specifications.
- **Control Measure AQ-2:** All on-road construction trucks are required to have model year 2020 engines or newer. This includes all off-site and on-site haul trucks, water trucks, dump trucks, and concrete trucks.
- **Control Measure AQ-3:** On-road construction trucks must be zero emission vehicles (ZEVs) when commercially available.
- **Control Measure AQ-4:** All architectural coatings used during construction shall meet the standard of 10 grams VOC per liter.

Control measures that are included in the modeling are:

- **Control Measure AQ-1:** Off-road construction engine requirements.
  - 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 Tier 4 Final off-road emission standards.
  - Diesel engines, whether for off-road or on-road equipment, shall not be left idling for more than two minutes, at any location, except as provided in exceptions to the applicable state regulations regarding idling for off-road and on-road equipment (e.g., traffic conditions, safe operating conditions). The Contractor shall post legible and visible signs in English, Spanish, and Chinese, in designated queuing areas and at the construction site to remind operators of the two-minute idling limit.
- **Control Measure AQ-4:** All architectural coatings used during construction shall meet the standard of 10 grams VOC per liter.

Operation

Potential operational control measures include:

- **Control Measure AQ-1:** All diesel generators and fire pumps shall have engines that meet Tier 4 Final emission standards.
- **Control Measure AQ-2:** All vendor and delivery truck TRUs must be zero-emission. Require that all tenants and vendors convert their vehicle fleet(s) to ZEVs no later than 2040 or when commercially available. Prohibit trucks from idling for more than two minutes, and post "no idling" signs at all site entry points, at all loading locations, and throughout the project site.
- **Control Measure AQ-3**: Require that all tenants and vendors convert their vehicle fleet(s) to ZEVs no later than 2040 or when commercially available. Prohibit vendor and delivery trucks from idling for more than two minutes, and post "no idling" signs at all site entry points, at all loading locations, and throughout the project site.
- **Control Measure AQ-4:** All architectural coatings used in maintaining buildings during operations shall meet the standard of 10 grams VOC per liter.

The operational control measures that are included in the modeling are:

- **Control Measure AQ-1:** All diesel generators and fire pumps shall have engines that meet Tier 4 Final emission standards.
- **Control Measure AQ-2:** Prohibit trucks from idling for more than two minutes, and post "no idling" signs at all site entry points, at all loading locations, and throughout the project site. Additionally, limiting TRU idling to no more than 30 minutes at loading locations with posted signs.

G.2 Air Quality Results Memo

ESA

575 Market Street
Suite 3700
San Francisco, CA 94105
415.896.5900 phone
415.896.0332 fax

esassoc.com

memorandum

date	March 18, 2025
to	Josh Pollak, Senior Planner, San Francisco Planning Department Environmental Planning Division
cc	Audrey Park, Environmental Affairs Manager, SFO David Kim, Senior Environmental Planner, SFO Tania Sheyner, Principal Planner, San Francisco Planning Department Environmental Planning Division
from	Brian Schuster, ESA Sarah Patterson, ESA Eryn Brennan, ESA
subject	Final Air Quality Analysis Results Memorandum for the SFO Recommended Airport Development Plan (Case No. 2017-007468ENV)

Introduction

This Air Quality Results Memorandum (AQRM) presents the results of the air quality analysis conducted in support of environmental clearance under the California Environmental Quality Act (CEQA) for the San Francisco International Airport (SFO) Recommended Airport Development Plan (RADP; Case No. 2017-007468ENV). It presents the program-level and cumulative air quality impacts associated with RADP construction and operations. Specifically, this memorandum presents the modeling results for construction criteria pollutant and toxic air contaminant (TAC) emissions from representative RADP projects and operational criteria pollutant and TAC emissions for full buildout of the RADP. The overall approach to estimating air quality impacts from construction and operation of the RADP was discussed in the SFO RADP Air Quality Technical Memorandum and Greenhouse Gas Analysis Scope of Work (RADP AQ SOW) and the Air Quality Analysis Methods Memorandum for the SFO Recommended Airport Development Plan.

The sections below describe:

- Construction criteria air pollutant emissions (Tables 1–4)
- Operational criteria air pollutant emissions (Tables 5–8)
- Construction and operational health risks (Tables 9–10)
- Existing plus project health risks (Tables 11–12)

Construction Criteria Air Pollutant Emissions

The following tables present average daily uncontrolled and controlled construction emissions by representative project and by overlap scenarios for the proposed plan. The four representative projects are: Central Hub (RADP Project #6), Consolidated Rental Car Center (CONRAC) Facility (RADP Project #9), the International Terminal Building (ITB) Main Hall Expansion (RADP Project #3), and the East Field Ground Support Equipment (GSE) Facility #2 (RADP Project #19). The tables presented below include:

- **Table 1:** Average daily uncontrolled construction emissions for the four representative projects by year.
- **Table 2:** Average daily uncontrolled construction emissions for each Overlap Scenario.
- **Table 3:** Average daily controlled construction emissions for the four representative projects by year.
- **Table 4:** Average daily controlled construction emissions for each Overlap Scenario.

TABLE 1
AVERAGE DAILY UNCONTROLLED CONSTRUCTION EMISSIONS BY REPRESENTATIVE PROJECT AND YEAR

Representative Project/Year[a]	Average Daily Emissions (pounds/day)			
	ROG	NO_X	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Large Project #1: Central Hub (RADP Project #6)				
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*
Large Project #2: CONRAC (RADP Project #9)				
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*
Medium Project: ITB Main Hall Expansion (RADP Project #3)				
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*
Small Project: East Field GSE #2 (RADP Project #19)				
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*

SOURCE: ESA, 2024.

ABBREVIATIONS: ROG = reactive organic gases; 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; 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 Draft EIR Chapter 2, Project Description, Table 2-5.

TABLE 2
AVERAGE DAILY UNCONTROLLED CONSTRUCTION EMISSIONS BY OVERLAP SCENARIO

Scenario/Project Size[a]	Average Daily Emissions (pounds/day)			
	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
Total	***3.1***	***9.4***	***0.3***	***0.3***
Medium Overlap				
Medium Project	16.4	8.5	0.2	0.2
Small Project	1.6	4.7	0.2	0.1
Total	***18.0***	***13.2***	***0.4***	***0.3***
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
Total	***61.2***	***78.3***	***1.5***	***1.4***

SOURCE: ESA, 2024.

ABBREVIATIONS: ROG = reactive organic gases; 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

NOTES: Due to rounding, numbers in columns may not add to totals.

a. Projects are defined in Table 1.

TABLE 3
AVERAGE DAILY CONTROLLED CONSTRUCTION EMISSIONS BY REPRESENTATIVE PROJECT AND YEAR

	Average Daily Emissions (pounds/day)			
Representative Project/Year[a,b]	**ROG**	**NO_X**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
Large Project #1: Central Hub (RADP Project #6)				
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*
Large Project #2: CONRAC (RADP Project #9)				
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*
Medium Project: ITB Main Hall Expansion (RADP Project #3)				
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*
Small Project: East Field GSE #2 (RADP Project #19)				
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*

SOURCE: ESA, 2024.

ABBREVIATIONS: ROG = reactive organic gases; 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; DEIR = draft environmental impact report

NOTES: Due to rounding, numbers in columns may not add to totals

a. Projects controls include Tier 4 Final Off-road Construction Equipment for engines greater than 25 horsepower (hp), ultra-low volatile organic compounds (VOC) architectural coatings, and a 2-minute idling limit for haul trucks.

b. Construction years presented in this table are based DEIR Project Description Table 2-5.

TABLE 4
AVERAGE DAILY CONTROLLED CONSTRUCTION EMISSIONS BY OVERLAP SCENARIO

	Average Daily Emissions (pounds/day)			
Scenario/Project Size[a]	**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
Total	***0.4***	***1.7***	***0.1***	***0.1***
Medium Overlap				
Medium Project	1.8	5.7	0.1	0.1
Small Project	0.2	0.9	<0.1	<0.1
Total	***2.0***	***6.6***	***0.1***	***0.1***
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
Total	***10.3***	***53.0***	***0.8***	***0.8***

SOURCE: ESA, 2024.

ABBREVIATIONS: ROG = reactive organic gases; 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

NOTES: Due to rounding, numbers in columns may not add to totals

a. Projects are defined in Table 1. Project controls include Tier 4 Final Off-road Construction Equipment for engines greater than 25 horsepower (hp), ultra-low volatile organic compounds (VOC) architectural coatings, and a 2-miute idling limit restrictions for haul trucks.

Operational Criteria Air Pollutant Emissions

The following tables present average daily and annual uncontrolled and controlled operational emissions by source for the full buildout of the RADP. The tables presented below include:

- **Table 5:** Average daily uncontrolled full buildout operational emissions for the RADP by source, in pounds per day.
- **Table 6:** Average annual uncontrolled full buildout operational emissions for the RADP by source, in tons per year.
- **Table 7:** Average daily controlled full buildout operational emissions for the RADP by source, in pounds per day.
- **Table 8:** Average annual controlled full buildout operational emissions for the RADP by source, in tons per year.

TABLE 5
AVERAGE DAILY UNCONTROLLED FULL BUILDOUT RADP OPERATIONAL EMISSIONS

	Average Daily Emissions (pounds/day)			
Emissions Source	**ROG**	**NO_X**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
Delivery Truck On-Site Idling	2.9	3.2	<0.1	<0.1
Delivery Truck Off-Site Travel	1.9	5.8	3.4	0.07
Mobile	6.6	4.0	25.1	6.4
Area	68.1	0.7	0.1	0.1
Generators	0.3	0.9	<0.1	<0.1
Total	***79.7***	***14.7***	***28.7***	***7.3***

SOURCE: ESA, 2025.

ABBREVIATIONS: ROG = reactive organic gases; 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

NOTE: Due to rounding, numbers in columns may not add to totals.

TABLE 6
AVERAGE ANNUAL UNCONTROLLED FULL BUILDOUT RADP OPERATIONAL EMISSIONS

	Average Annual Emissions (tons/year)			
Emissions Source	**ROG**	**NO_X**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
Delivery Truck On-Site Idling	0.5	0.6	<0.1	<0.1
Delivery Truck Off-Site Travel	0.3	1.1	0.6	0.1
Mobile	1.2	0.7	4.6	1.2
Area	12.4	0.1	<0.1	<0.1
Generators	0.1	0.2	<0.1	<0.1
Total	***14.6***	***2.7***	***5.2***	***1.3***

SOURCE: ESA, 2025.

ABBREVIATIONS: ROG = reactive organic gases; 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

NOTE: Due to rounding, numbers in columns may not add to totals.

TABLE 7
AVERAGE DAILY CONTROLLED FULL BUILDOUT RADP OPERATIONAL EMISSIONS

	Average Daily Emissions (pounds/day)			
Emissions Source	**ROG**	**NO_X**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
Delivery Truck On-Site Idling	1.4	1.5	<0.1	<0.1
Delivery Truck Off-Site Travel	1.9	5.8	3.4	0.7
Mobile	6.6	4.0	25.1	6.4
Area	68.1	0.7	0.1	0.1
Generators	0.3	0.9	<0.1	<0.1
Total	***78.2***	***13.0***	***28.7***	***7.2***

SOURCE: ESA, 2025.

ABBREVIATIONS: ROG = reactive organic gases; 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

NOTES:

Due to rounding, numbers in columns may not add to totals.

Project controls include a 2-minute idling limit for delivery trucks and a 30-minute idling limit for TRUs.

TABLE 8
AVERAGE ANNUAL CONTROLLED FULL BUILDOUT RADP OPERATIONAL EMISSIONS

	Average Annual Emissions (tons/year)			
Emissions Source	**ROG**	**NO_X**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
Delivery Truck On-Site Idling	0.3	0.3	<0.1	<0.1
Delivery Truck Off-Site Travel	0.3	1.1	0.6	0.1
Mobile	1.2	0.7	4.6	1.2
Area	12.4	0.1	<0.1	<0.1
Generators	0.1	0.2	<0.1	<0.1
Total	***14.3***	***2.4***	***5.2***	***1.3***

SOURCE: ESA, 2025.

ABBREVIATIONS: ROG = reactive organic gases; 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

NOTES:

Due to rounding, numbers in columns may not add to totals.

Project controls include a 2-minute idling limit for delivery trucks and a 30-minute idling limit for TRUs.

Health Risk Assessment

The following tables present the results of the health risk assessment for the RADP, including lifetime excess cancer risk (chances per million) due to diesel particulate matter (DPM) exposure and annual average particulate matter with an aerodynamic diameter equal to or less than 2.5 microns ($PM_{2.5}$) concentrations (micrograms per cubic meter = $\mu g/m^3$) associated with uncontrolled TAC emissions from construction and full buildout operations of the RADP. The tables presented below include:

- **Table 9:** Uncontrolled lifetime excess cancer risk and annual average $PM_{2.5}$ concentrations for construction plus operations and full buildout operations of the RADP.
- **Table 10:** Uncontrolled lifetime excess cancer risk and annual average $PM_{2.5}$ concentrations for construction plus operations of the RADP plus existing conditions from BAAQMD tools.
- **Table 11:** Uncontrolled lifetime excess cancer risk and annual average $PM_{2.5}$ concentrations for full buildout operations of the RADP plus existing conditions from BAAQMD tools.

TABLE 9
UNCONTROLLED LIFETIME EXCESS CANCER RISK AND ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS FROM COMBINED CONSTRUCTION AND OPERATIONS AND FULL BUILDOUT OPERATIONS

Scenario/ Receptor Type/ Phase	Uncontrolled			
	Lifetime Excess Cancer Risk (chances per million)		Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)	
	Receptor Location (UTM X, UTM Y)	Project Contribution	Receptor Location (UTM X, UTM Y)	Project Contribution[a]
Construction + Operations (CSTN + OPS)				
Resident (MEISR)	(553580, 4162660)		(553580, 4162660)	
Construction		2.2		0.01
Operations		<0.1		—
Total		***2.2***		***0.01***
Worker (MEIW)	(553940, 4163340)		(553940, 4163340)	
Construction		4.9		0.09
Operations		0.1		—
Total		***5.0***		***0.09***
Full Buildout Operations (FB OPS)				
Resident (MEISR)	(552480, 4165180)	0.7	(554880, 4161660)	0.02
Worker (MEIW)	(553060, 4165500)	1.9	(553060, 4165500)	0.19

SOURCE: ESA, 2025.

ABBREVIATIONS: UTM = Universal Transverse Mercator; UTM – X = eastward-measured distance; UTM – Y = northward-measured distance; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in aerodynamic diameter; $\mu g/m^3$ = micrograms per cubic meters; MEISR = maximum exposed individual sensitive receptor; MEIW = maximum exposed individual worker; CSTN = construction; OPS = operations; FB = full buildout

NOTES: Due to rounding, numbers in columns may not add to totals.

a. For the construction plus operations scenario, annual average $PM_{2.5}$ concentrations are from construction only because the analysis does not include an overlap with operations.

TABLE 10
UNCONTROLLED LIFETIME EXCESS CANCER RISK AND ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS FROM COMBINED CONSTRUCTION AND OPERATIONS PLUS EXISTING CONDITIONS

	Uncontrolled			
	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**
Construction + Operations (CSTN + OPS)				
Resident (MEISR)	(553580, 4162660)		(553580, 4162660)	
RADP		2.2		0.01
Mobile		22.6		0.69
Rail		44.2		0.06
Stationary		0.3		<0.01
Ambient[a]		—		7.8
Total Existing		***67.2***		***8.55***
Total RADP + Existing		***69.4***		***8.56***
Worker (MEIW)	(553940, 4163340)		(553940, 4163340)	
RADP		5.0		0.09
Mobile[b]		5.0		0.33
Rail[b]		1.6		0.01
Stationary[b]		7.5		0.16
Ambient[a]		—		7.8
Total Existing		***14.1***		***8.30***
Total RADP + Existing		***19.2***		***8.39***

SOURCES: ESA, 2025; 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; PurpleAir, 2023, www2.purpleair.com, accessed September 9, 2024; San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, July 2024, https://sfplanning.org/air-quality, accessed July 25, 2024.

ABBREVIATIONS: UTM = Universal Transverse Mercator; UTM – X = eastward-measured distance; UTM – Y = northward-measured distance; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in aerodynamic diameter; $\mu g/m^3$ = micrograms per cubic meters; TBD = to be determined based on additional analysis; MEISR = maximum exposed individual sensitive receptor; MEIW = maximum exposed individual worker; CSTN = construction; OPS = operations; FB = full buildout

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. Cancer risk from mobile, rail, and stationary for the Worker receptor were scaled from BAAQMD screening tools to represent worker exposure parameters because the exposure parameters incorporated into the tool are for residential risk.

TABLE 11
UNCONTROLLED LIFETIME EXCESS CANCER RISK AND ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS FROM FULL BUILDOUT OPERATIONS PLUS EXISTING CONDITIONS

	Uncontrolled			
	Lifetime Excess Cancer Risk (chances per million)		Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)	
Scenario/ Receptor Type/ Phase	**Receptor Location[a] (UTM X, UTM Y)**	**Project Contribution/Existing**	**Receptor Location[a] (UTM X, UTM Y)**	**Project Contribution/Existing**
Full Buildout Operations (FB OPS)				
Resident (MEISR)	(552480, 4165180)		(554880, 4161660)	
RADP		0.7		0.02
Mobile		14.5		1.31
Rail		13.6		0.02
Stationary		16.2		0.05
Ambient[a]		—		7.8
Total Existing		***44.2***		***9.18***
Total RADP + Existing		***44.9***		***9.20***
Worker (MEIW)	(553060, 4165500)		(553060, 4165500)	
RADP		1.9		0.19
Mobile[b]		4.1		0.37
Rail[b]		0.5		<0.01
Stationary[b]		4.3		8.66
Ambient[a]		—		7.8
Total Existing		***8.9***		***16.82***
Total RADP + Existing		***10.8***		***17.01***

SOURCES: ESA, 2025; 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; PurpleAir, 2023, www2.purpleair.com, accessed September 9, 2024; San Francisco Planning Department, *Air Quality and Greenhouse Gas Analysis Guidelines*, July 2024, https://sfplanning.org/air-quality, accessed July 25, 2024.

ABBREVIATIONS: UTM = Universal Transverse Mercator; UTM – X = eastward-measured distance; UTM – Y = northward-measured distance; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in aerodynamic diameter; $\mu g/m^3$ = micrograms per cubic meters; TBD = to be determined based on additional analysis; MEISR = maximum exposed individual sensitive receptor; MEIW = maximum exposed individual worker; CSTN = construction; OPS = operations; FB = full buildout

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. Cancer risk from mobile, rail, and stationary for the Worker receptor were scaled from BAAQMD screening tools to represent worker exposure parameters because the exposure parameters incorporated into the tool are for residential risk.

Cumulative Health Risk

This section presents information regarding potential cumulative health risks in combination with the existing plus project health risks, from Table 10 and Table 11, at the project MEISR and MEIW. Below is a list of cumulative projects considered when determining if any are located within 1,000 feet of the project's MEISR or MEIW, which is the zone of influence directed by the BAAQMD for cumulative assessments.[1] However, because of the lack of available emissions data for the cumulative projects, cumulative health risks were not evaluated quantitatively. **Table 12** lists the cumulative projects and provides a brief description, the expected risk sources associated with each project, and the project distances from the proposed project's MEISR and MEIW.

TABLE 12
CUMULATIVE PROJECTS

Location	Project Name and Description	Potential Source of Health Risk	Distance from MEISR (feet)	Distance from MEIW (feet)
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 on the West of Bayshore property: 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.	Construction DPM and $PM_{2.5}$	• CSTN + OPS: 1,000 to 5,000 (multiple locations on Airport property) • FB OPS Cancer Risk: 1,000 to 5,000 (multiple locations on Airport property) • FB OPS $PM_{2.5}$: 6,500 to 10,000+ (multiple locations on Airport property)	• CSTN + OPS: 2,500 to 5,500 (multiple locations on Airport property) • FB OPS: 2,500 to 9,000 (multiple locations on Airport property)
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).	Construction DPM and $PM_{2.5}$; operational emergency generator DPM and $PM_{2.5}$	• CSTN + OPS: 5,000 • FB OPS Cancer Risk: 4,500 • FB OPS $PM_{2.5}$: 10,000+	• CSTN + OPS: 3,600 • FB OPS: 4,900
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.	Construction DPM and $PM_{2.5}$; operational emergency generator DPM and $PM_{2.5}$	• CSTN + OPS: 5,000 • FB OPS Cancer Risk: 4,800 • FB OPS $PM_{2.5}$: 10,000	• CSTN + OPS: 3,600 • FB OPS: 4,900

[1] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, 2022, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed September 9, 2024.

Location	Project Name and Description	Potential Source of Health Risk	Distance from MEISR (feet)	Distance from MEIW (feet)
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.	Construction DPM and $PM_{2.5}$	• CSTN + OPS: 3,300 to 10,000+ (multiple locations on Airport property) • FB OPS Cancer Risk: 2,000 to 10,000+ (multiple locations on Airport property) • FB OPS $PM_{2.5}$: 1,600 to 10,000+ (multiple locations on Airport property)	• CSTN + OPS: 4,200 to 9,800 (multiple locations on Airport property) • FB OPS: 1,200 to 10,000+ (multiple locations on Airport property)
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.	Construction DPM and $PM_{2.5}$	• CSTN + OPS: 1,000 to 10,000+ (multiple locations on Airport property) • FB OPS Cancer Risk: 1,000 to 10,000+ (multiple locations on Airport property) • FB OPS $PM_{2.5}$: 1,600 to 10,000+ (multiple locations on Airport property)	• CSTN + OPS: 4,200 to 9,800 (multiple locations on Airport property) • FB OPS: 1,200 to 10,000+ (multiple locations on Airport property)
On SFO Property	Underground Pipeline and Pump Station Upgrades – Improvements to underground industrial waste, sewer, and drainage pipelines and pump stations across Airport property.	Construction DPM and $PM_{2.5}$	• CSTN + OPS: 1,000 to 10,000+ (multiple locations on Airport property) • FB OPS Cancer Risk: 1,000 to 10,000+ (multiple locations on Airport property) • FB OPS $PM_{2.5}$: 1,600 to 10,000+ (multiple locations on Airport property)	• CSTN + OPS: 4,200 to 9,800 (multiple locations on Airport property) • FB OPS: 1,200 to 10,000+ (multiple locations on Airport property)
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.	Construction DPM and $PM_{2.5}$	• CSTN + OPS: 10,000+ • FB OPS Cancer Risk: 6,200 • FB OPS $PM_{2.5}$: 10,000+	• CSTN + OPS: 8,000 • FB OPS: 3,800

Location	Project Name and Description	Potential Source of Health Risk	Distance from MEISR (feet)	Distance from MEIW (feet)
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.	Construction DPM and $PM_{2.5}$	• CSTN + OPS: 1,000 to 10,000+ (multiple locations on Airport property) • FB OPS Cancer Risk: 1,000 to 10,000+ (multiple locations on Airport property) • FB OPS $PM_{2.5}$: 1,600 to 10,000+ (multiple locations on Airport property)	• CSTN + OPS: 4,200 to 9,800 (multiple locations on Airport property) • FB OPS: 1,200 to 10,000+ (multiple locations on Airport property)
On SFO Property	Plot 10F Demolition and Paving and Cargo Building 662 (Case No. 2022-003521ENV) – This project will demolish Building 660 (Airport Post Office) 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.	Construction DPM and $PM_{2.5}$	• CSTN + OPS: 5,000 • FB OPS Cancer Risk: 5,000 • FB OPS $PM_{2.5}$: 10,000	• CSTN + OPS: 3,600 • FB OPS: 4,900
On SFO Property	Boarding Area C Renovation (Case No. 2007.1149E) – This project would entail a complete renovation of Boarding Area C.	Construction DPM and $PM_{2.5}$	• CSTN + OPS: 3,000 • FB OPS Cancer Risk: 9,000 • FB OPS $PM_{2.5}$: 5,300	• CSTN + OPS: 1,400 • FB OPS: 8,700
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 DPM and $PM_{2.5}$; operational emergency generator DPM and $PM_{2.5}$	• CSTN + OPS: 5,000 • FB OPS Cancer Risk: 10,000+ • FB OPS $PM_{2.5}$: 700	• CSTN + OPS: 5,100 • FB OPS: 10,000+
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.	Construction DPM and $PM_{2.5}$; operational emergency generator DPM and $PM_{2.5}$	• CSTN + OPS: 10,000+ • FB OPS Cancer Risk: 3,400 • FB OPS $PM_{2.5}$: 10,000+	• CSTN + OPS: 10,000+ • FB OPS: 5,500
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.	Construction DPM and $PM_{2.5}$; operational emergency generator and warehouse trucking sources DPM and $PM_{2.5}$	• CSTN + OPS: 10,000+ • FB OPS Cancer Risk: 1,200 • FB OPS $PM_{2.5}$: 10,000+	• CSTN + OPS: 9,300 • FB OPS: 3,300
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.	Construction DPM and $PM_{2.5}$	• CSTN + OPS: 1,200 • FB OPS Cancer Risk: 9,200 • FB OPS $PM_{2.5}$: 3,000	• CSTN + OPS: 3,600 • FB OPS: 9,900

Location	Project Name and Description	Potential Source of Health Risk	Distance from MEISR (feet)	Distance from MEIW (feet)
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.	Construction DPM and $PM_{2.5}$; operational emergency generator and delivery truck sources DPM and $PM_{2.5}$	• CSTN + OPS: 5,000 • FB OPS Cancer Risk: 10,000+ • FB OPS $PM_{2.5}$: 2,000	• CSTN + OPS: 6,600 • FB OPS: 10,000+
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 DPM and $PM_{2.5}$; operational emergency generator and delivery truck sources DPM and $PM_{2.5}$	• CSTN + OPS: 10,000+ • FB OPS Cancer Risk: 3,700 • FB OPS $PM_{2.5}$: 10,000+	• CSTN + OPS: 10,000+ • FB OPS: 4,700
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 development and amenities within six buildings, ranging from two to six-stories, along with two parking garages and additional surface parking.	Construction DPM and $PM_{2.5}$; operational emergency generator and delivery truck sources DPM and $PM_{2.5}$	• CSTN + OPS: 10,000+ • FB OPS Cancer Risk: 3,700 • FB OPS $PM_{2.5}$: 10,000+	• CSTN + OPS: 10,000+ • FB OPS: 4,700
South San Francisco	A-1 Self Storage – Development of a new public storage facility consisting of three buildings on a 5.4-acre site.	Construction DPM and $PM_{2.5}$; operational moving truck sources DPM and $PM_{2.5}$	• CSTN + OPS: 10,000+ • FB OPS Cancer Risk: 8,700 • FB OPS $PM_{2.5}$: 10,000+	• CSTN + OPS: 10,000+ • FB OPS: 7,300
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.	Construction DPM and $PM_{2.5}$	• CSTN + OPS: 7,700 • FB OPS Cancer Risk: 10,000+ • FB OPS $PM_{2.5}$: 2,900	• CSTN + OPS: 7,900 • FB OPS: 10,000+

SOURCES: City of South San Francisco Development and Construction Map, 2023; City of San Bruno Major Development Projects, 2023; City of Millbrae Active Development Projects, 2023; City of Burlingame Residential and Commercial Applications Overview, 2023; and SFO Five-Year Capital Plan, 2019.

ABBREVIATIONS: CSTN + OPS = Construction plus operations; FB OPS = full buildout operations; DPM = diesel particulate matter; 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

INTENTIONALLY BLANK