



# Meeting Agenda

## Regular Meeting

Meeting No. 349  
**Wednesday, April 3, 2024 - 7:00 p.m.**  
**\*VIA HYBRID ACCESS\***

**David J. Chetcuti Community Room**  
**450 Poplar Ave | Millbrae, CA 94030**  
\*see attached venue map & parking

Public may also join the virtual webinar:  
<https://smcgov.zoom.us/j/93011857218>

Or Dial in:

US: +1(669)900-6833 Webinar ID: 930 1185 7218

This meeting of the San Francisco Airport Community Roundtable will be in person at the above-mentioned address. Members of the public will be able to participate in the meeting remotely via the Zoom platform or in person at 450 Poplar Avenue, Millbrae, CA 94030 or Pueblo Bonito Sunset Beach, Room 2194, Building 21, Domicilio Conocido S/N, Cabo San Lucas, Baja California Sur 23450 Mexico.

For information regarding how to participate in the meeting, either in person or remotely, please refer to instructions at the end of the agenda.

### **HYBRID PUBLIC PARTICIPATION:**

List of attendees (using zoom sign-in credentials) will be displayed periodically throughout the meeting.

### Public Comment

\*Written public comments can be emailed to [SFORoundtable@smcgov.org](mailto:SFORoundtable@smcgov.org) and should include specific agenda item to which you are commenting.

\*Spoken public comments will also be accepted during the meeting in-person or via Zoom on Items NOT on the Agenda and for each Regular Agenda Item and at the end of Presentations, at the option of the speaker.

\*\*Please see instructions for written and spoken comments at the end of this agenda.

### **ADA Requests**

Individuals who require special assistance or a disability-related modification or accommodation to participate in this meeting, or who have a disability and wish to request an alternative format for the agenda packet or other writings that may be distributed at the meeting, should contact staff as early as possible but no later than 10:00am the day before the meeting at [SFORoundtable@smcgov.org](mailto:SFORoundtable@smcgov.org) Notification in advance of the meeting will enable Staff to make reasonable arrangements to ensure accessibility to this meeting, the materials related to it, and your ability to comment.



**AGENDA**

**Call to Order / Roll Call / Declaration of a Quorum Present**  
Al Royse, Roundtable Chairperson

**Public Comment on Items NOT on the Agenda**  
Speakers are limited to two minutes. Roundtable members cannot discuss or take action on any matter raised under this item.

**Action to set Agenda and to Approve Consent Items**  
Al Royse, Roundtable Chairperson

**CONSENT AGENDA**

All items on the Consent Agenda are approved/accepted in one motion. A Roundtable Member can make a request, prior to action on the Consent Agenda, to transfer a Consent Agenda item to the Regular Agenda. Any items on the Regular Agenda may be transferred on the Consent Agenda in a similar manner. Public Comment is received prior to approval of the Consent Agenda.

- 1. Approval of Draft Minutes p. 9
  - a. December 6, 2023 Regular Meeting
  
- 2. Airport Director’s Reports p. 14
  - a. January 2024
  - b. February 2024
  
- 3. Fiscal Year to Date Budget vs. Actuals Update p. 28

**REGULAR AGENDA**

Public Comment received on Regular Agenda items prior to action.

- 4. **ACTION:** Approval of Chairperson Subcommittee Assignments p. 29
  - Al Royse, Roundtable Chairperson
  - Attachment: List of 2024 Subcommittee Members
  
  - a. Technical Working Group
  - b. Legislative
  - c. Ground-Based Noise
  - d. Work Program
  - e. Ad-Hoc Portable Noise Monitor Placement
  - f. Strategic Plan

**PRESENTATIONS**

Public Comment on Presentation items will be taken after the last item under presentations.

- 5. FAA Update  
FAA Staff

## Regular Meeting Agenda

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6. Airport Land Use Planning and Preparing for Advanced Air Mobility p. 30  
Matt Friedman, Mills H.S. BA, MRP, MAHL, DDiv (hon)  
Chief, Office of Aviation Planning, Caltrans Aeronautics  
*Attachment Investigating & Guiding Outcomes for Advanced Air Mobility (AAM)*
7. Review: Study comparing FAA AEDT modeling data vs. measured noise data p. 46  
Joe Czech, Principal Consultant, HMMH  
*Attachment: PowerPoint: Reviewing a Large-scale Validation Study of Aircraft Noise Modeling for Airport Arrivals*
8. Chairman's Update  
Al Royse
9. Airport Director Update  
Ivar Satero, Airport Director
- a. Aircraft Noise Office Update  
    Bert Ganoung, Aircraft Noise Office Manager
10. Subcommittee Updates
- a. Ground Based Noise Subcommittee March 11, 2024  
    Terry O'Connell, Ground Based Noise Subcommittee Chairperson  
    Link: [Subcommittee Agenda](#)

### **MEETING CLOSURE**

11. Member Communications / Announcements  
Roundtable Members and Staff

12. Adjourn  
Al Royse, Roundtable Chairperson

- Information Only** p. 59  
99.0 HMMH FAA IFP Information Gateway Review – January 2024  
99.1 HMMH FAA IFP Information Gateway Review – February 2024  
99.2 HMMH FAA Procedures Categorical Exclusion Declaration

### **\*\*Instructions for Public Comment during Meeting**

During the meeting, members of the public may address the Membership as follows:

#### **Written Comments:**

Written public comments may be emailed in advance of the meeting. Please read the following instructions carefully:

1. Your written comment should be emailed to [sforoundtable@smcgov.org](mailto:sforoundtable@smcgov.org)
2. Your email should include the specific agenda item on which you are commenting.
3. Members of the public are limited to one comment per agenda item.
4. The length of the emailed comment should be commensurate with two minutes customarily allowed for verbal comments, which is approximately 250-300 words.
5. If your emailed comment is received by 5:00 pm on the day before the meeting, it will be provided to the Roundtable and made publicly available on the agenda website under the specific item to which comment pertains. The Roundtable will make every effort to read emails received after that time but cannot

guarantee such emails will be read during the meeting, although such emails will still be included in the administrative record.

**Spoken Comments:**

**In-person Participation:**

1. If you wish to speak to the Membership, please fill out a speaker's slip located at the entrance. If you have anything you wish distributed to the Membership and included in the official record, please hand it to the Clerk who will distribute the information to the Membership and Staff.

**Via Teleconference (Zoom):**

1. The meeting may be accessed through Zoom online at <https://smcgov.zoom.us/j/93011857218> The webinar ID: 930 1185 7218. The meeting may also be accessed via telephone by dialing in +1-669-900-6833, entering webinar ID 930 1185 7218 then press #. Members of the public can also attend this meeting physically at the David J. Chetcuti Community Room, 450 Poplar Ave | Millbrae, CA 94030 or at Pueblo Bonito Sunset Beach, Room 2194, Building 21, Domicilio Conocido S/N, Cabo San Lucas, Baja California Sur 23450 Mexico. You may download the Zoom client or connect to the meeting using the internet browser. If you are using your browser, make sure you are using current, up-to-date browser: Chrome 30+, Firefox 27+, Microsoft Edge 12+, Safari 7+. Certain functionality may be disabled in older browsers including Internet Explorer.
2. You will be asked to enter an email address and name. We request that you identify yourself by name as this will be visible online and will be used to notify you that it is your turn to speak.
3. When the Chairperson calls for the item on which you wish you speak click on "raise-hand" icon. You will

**Additional Information**

For any questions or concerns regarding Zoom, including troubleshooting, privacy, or security settings, please contact Zoom directly.

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**Note:** Public records that relate to any item on the open session Agenda (Consent and Regular Agendas) for a Regular Airport/Community Roundtable Meeting are available for public inspection. Those records that are distributed less than 72 hours prior to a Regular Meeting are available for public inspection at the same time they are distributed to all Roundtable Members, or a majority of the Members of the Roundtable. The Roundtable has designated the San Mateo County Planning & Building Department, at 455 County Center, 2nd Floor Redwood City, California 94063, for the purpose of making those public records available for inspection. The documents are also available on the Roundtable website at: [www.sforoundtable.org](http://www.sforoundtable.org).

# Welcome

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The Airport/Community Roundtable is a voluntary committee that provides a public forum to address community noise issues related to aircraft operations at San Francisco International Airport. The Roundtable encourages orderly public participation and has established the following procedure to help you, if you wish to present comments to the committee at this meeting in-person or via Zoom.

- For written comments you may email your comments ahead of time to [sforoundtable@smcgov.org](mailto:sforoundtable@smcgov.org).
- To speak during the meeting in-person, submit a speaker slip to staff.
- To speak during the meeting via Zoom, you may use "raise-hand."
- The Roundtable Staff will call your name and allow you to speak. Full instructions in agenda below.

The Roundtable may receive several speaker requests on more than one Agenda item; therefore, each speaker is limited to two (2) minutes to present his/her comments on any Agenda item unless given more time by the Roundtable Chairperson. The Roundtable meetings are recorded. Video file of meeting will be posted to website once available. Please contact the Roundtable Coordinator for any request.

Roundtable Meetings are accessible to people with disabilities. Individuals who need special assistance or a disability-related modification or accommodation to participate in this meeting, or who have a disability and wish to request an alternative format for the Agenda, Meeting Packet, or other writings that may be distributed at the meeting, should contact the Roundtable Coordinator at least two (2) working days before the meeting at the phone or e-mail listed below. Notification in advance of the meeting will enable Roundtable staff to make reasonable arrangements to ensure accessibility to this meeting.



# About the SFO Airport Community Roundtable

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**The Airport/Community Roundtable was established in May 1981, by a Memorandum of Understanding (MOU), to address noise impacts related to aircraft operations at San Francisco International Airport (SFO).** The Airport is owned and operated by the City and County of San Francisco, but it is located entirely within San Mateo County.

This voluntary committee consists of 25 appointed and elected officials from the City and County of San Francisco, the County of San Mateo, and several cities in San Mateo County (see attached Membership Roster). It provides a forum for the public to address local elected officials, Airport management, FAA staff, and airline representatives, regarding aircraft noise issues.

The committee monitors a performance-based aircraft noise mitigation program, as implemented by Airport staff, interprets community concerns, and attempts to achieve additional noise mitigation through a cooperative sharing of authority brought forth by the airline industry, the FAA, Airport management, and local government officials. The Roundtable adopts an annual Work Program to address key issues.

In 2024, the Roundtable is scheduled to meet on the first Wednesday of the following months: February, April, June, August, October and December. Regular Meetings are held on the first Wednesday of the designated month at 7:00 p.m. at **the David Chetcuti Community Room at 450 Poplar Avenue, Millbrae, California unless otherwise noted. Meetings are also broadcast via Zoom to encourage public participation.** Special Meetings and workshops are held as needed. The members of the public are encouraged to attend the meetings and workshops to express their concerns and learn about airport/aircraft noise and operations.

## **FEDERAL PREEMPTION RE: AIRCRAFT FLIGHT PATTERNS**

The authority to regulate flight patterns of aircraft is vested exclusively in the Federal Aviation Administration (FAA). Federal law provides that:

“No state or political subdivision thereof and no interstate agency or other political agency of two or more states shall enact or enforce any law, rule, regulation, standard, or other provision having the force and effect of law, relating to rates, routes, or services of any air carrier having authority under subchapter IV of this chapter to provide air transportation.”

*(Source: 49 U.S.C. A. Section 1302(a)(1)).*



## SFO Roundtable Regular Meetings

David J. Chetcuti Community Room

450 Poplar Avenue, Millbrae

- PARKING:**
1. Library parking lot (Poplar Street) adjacent to the Chetcuti Room
  2. Parking lot on Library Avenue
  3. City Hall parking lot (some restrictions). Take outdoor stairs up to Chetcuti Room
  4. Nearby neighborhood on-street parking

**ENTRANCE:** Chetcuti building can typically be entered from glass door at front of building.

**ACCESSIBILITY:** Ramp from Library Parking Lot to Chetcuti Room.





# Member Roster

April 2024

**CITY AND COUNTY OF SAN FRANCISCO  
BOARD OF SUPERVISORS**  
Vacant

**CITY AND COUNTY OF SAN FRANCISCO  
MAYOR'S OFFICE**  
Alexandra Sweet, (Appointed)

**CITY AND COUNTY OF SAN FRANCISCO  
AIRPORT COMMISSION REPRESENTATIVE**  
Ivar Satero, Airport Director (Appointed)  
Alternate: Doug Yakel, Public Information Officer

**COUNTY OF SAN MATEO  
BOARD OF SUPERVISORS**  
Dave Pine

**CITY/COUNTY ASSOCIATION OF GOVERNMENTS  
AIRPORT LAND USE COMMITTEE (ALUC)**  
Carol Ford (Appointed)

**TOWN OF ATHERTON**  
Stacy Holland  
Alternate: Bill Widmer

**CITY OF BELMONT**  
Robin Pang-Maganaris  
Alternate: Davina Hurt

**CITY OF BRISBANE**  
Terry O'Connell  
Alternate: Madison Davis

**CITY OF BURLINGAME**  
Ricardo Ortiz  
Alternate: Peter Stevenson

**TOWN OF COLMA**  
Joanne del Rosario  
Alternate: John Goodwin

**CITY OF DALY CITY**  
Pamela DiGiovanni  
Alternate: Rod Daus-Magbual

**CITY OF EAST PALO ALTO**  
Martha Barragan  
Alternate: Antonio Lopez

**CITY OF FOSTER CITY**  
Sam Hindi

**CITY OF HALF MOON BAY**  
Joaquin Jimenez  
Alternate: Robert Brownstone

**TOWN OF HILLSBOROUGH**  
Alvin Royse  
Alternate: Christine Krolik

**CITY OF MENLO PARK**  
Drew Combs  
Alternate: Cecilia Taylor

**CITY OF MILLBRAE**  
Angelina Cahalan  
Alternate: Ann Schneider

**CITY OF PACIFICA**  
Christine Boles  
Alternate: Sue Vaterlaus

**TOWN OF PORTOLA VALLEY**  
Judith Hasko  
Alternate: Craig Hughes

**CITY OF REDWOOD CITY**  
Kaia Eakin  
Alternate: Chris Sturken

**CITY OF SAN BRUNO**  
Sandy Alvarez  
Alternate: Tom Hamilton

**CITY OF SAN CARLOS**  
Pranita Venkatesh  
Alternate: John Dugan

**CITY OF SAN MATEO**  
Rob Newsom  
Alternate: Lisa Diaz Nash

**CITY OF SOUTH SAN FRANCISCO**  
Mark Nagales  
Alternate: James Coleman

**TOWN OF WOODSIDE**  
Paul Goeld  
Alternate: Dick Brown

## ROUNDTABLE ADVISORY MEMBERS

**AIRLINES/FLIGHT OPERATIONS**  
Chief Pilot Lawrence Ellis, United Airlines

**FEDERAL AVIATION ADMINISTRATION**  
Rachel Girvin, Regional Administrator  
Faviola Garcia, Deputy Regional Administrator  
Carlette Young, Supervisory Senior Advisor  
Joseph Bert, Team Manager, Western Service Center

**ROUNDTABLE STAFF**  
Kathleen Wentworth, Roundtable Coordinator  
Diane Estipona, Roundtable Administrative Secretary  
Gene Reindel, Technical Consultant (HMMH)

**SFO AIRPORT NOISE OFFICE STAFF**  
Nupur Sinha, Director of Planning & Environmental Affairs  
Bert Ganoung, Aircraft Noise Office Manager



## **SFO Airport/Community Roundtable**

Meeting No. 347 Minutes

Wednesday, December 6, 2023

### **Call to Order / Roll Call / Declaration of a Quorum Present (00:08:40)**

Roundtable Chairperson, Sam Hindi, called the Regular Meeting of the SFO Airport/Community Roundtable to order, at 7:10 p.m., at the David J. Chetcuti Community Room, 450 Poplar Avenue, Millbrae, CA, and via Zoom. Roundtable Coordinator Kathleen Wentworth called the roll. A quorum (at least 13 Regular Members) was present as follows:

#### **REGULAR MEMBERS PRESENT**

Doug Yakel – City and County of San Francisco Airport Commission

Carol Ford – C/CAG Airport Land Use Committee (ALUC)

Terry O’Connell - City of Brisbane

John Goodwin -- Town of Colma

Pamela DiGiovanni – City of Daly City

Antonio Lopez -- City of East Palo Alto

Sam Hindi – City of Foster City

Ann Schneider – City of Millbrae

Christine Boles – City of Pacifica

Judith Hasko -- Town of Portola Valley

Pranita Venkatesh -- City of San Carlos

Mark Addiego – City of South San Francisco

Kaia Eakin -- City of Redwood City

Paul Goeld – Town of Woodside

#### **REGULAR MEMBERS ABSENT**

City and County of San Francisco Board of Supervisors

City and County of San Francisco Mayor’s Office

City and County of San Mateo Board of Supervisors

Town of Atherton

City of Belmont

City of Burlingame

Town of Colma

City of Half Moon Bay

Town of Hillsborough

City of Menlo Park

City of Redwood City

City of San Bruno

City of San Mateo

#### **ROUNDTABLE STAFF**

Kathleen Wentworth – Roundtable Coordinator

Angela Montes Cardenas – Roundtable Administrative Secretary

Eugene Reindel – Roundtable Technical Consultant, HMMH

Jason Stoddard – Airspace Analyst, HMMH

Lisa Aozasa – County of San Mateo, Deputy Community Development Director

**SAN FRANCISCO INTERNATIONAL AIRPORT STAFF**

Nupur Sinha, Director, Planning and Environmental Affairs

Doug Yakel, Chief Information Officer

Kevin Kone, Assistant Chief Financial Officer

Bert Ganoung, Noise Office Manager

Gerardo Fries, Special Projects Manager, Noise Insulation Program

Annalise Tang, Noise Abatement Specialist

David Ong, Aircraft Noise Systems Manager

Anthony Carpeneti, Noise Abatement Specialist

Paul Hannah, Chief Airspace and Flight Operations Engineer

**FAA STAFF**

Faviola Garcia, Deputy Regional Administrator

Moifair Chin

Chairman Hindi recognized that the meeting was taking place in the ancestral homeland of Ramaytush Ohlone.

**Public Comments for Items NOT on the Agenda (00:17:20)**

Chairman Hindi opened public comment.

Charlie Womback – a San Francisco resident, shared their appreciation for the improved air traffic and reduced aircraft noise. (00:18:00)

Mark Shull – a Peninsula resident, requested to extend speaking time to 3 minutes for regular agenda comments. (00:19:20)

Chairman Hindi closed public comment.

**Action to set Agenda and to Approve Consent Items 1-3 (00:20:15)**

Chairman Hindi opened and closed public comment for consent items, no comments were received.

Terry O’Connell **MOVED** to set the agenda and to approve consent items 1, 2 & 3. The motion was seconded by Pamela DiGiovanni and the motion **CARRIED**; vote passed. (00:22:35)

**4. ACTION: Adopt the Technical Working Group (TWG) recommendation to support the continued processing of the SFO Ground Based Augmentation System (GBAS) Group 2A Innovative Procedures to include: GLS CAT II 28R/ARCHI. GLS CAT II 28R/EDDYY, GLS CAT II 19L/UPEND, GLS SB 19L/COGGR, GLS DB1 28R/ DBAYY, and GLS OW2 28R/EDDYY. (00:23:12)**

Chairman Hindi reported that at the last Technical Working Group meeting on November 15, 2023, the TWG heard a presentation on this GBAS topic, had a discussion, and made the recommendation in Item #4 here before the Roundtable tonight.

Chairman Hindi opened the discussion for Roundtable Members. (00:23:17)

Mr. Hannah responded to Member Schneider's question regarding the possible effect of GBAS operations on noise from aircraft reverse thrust during landing. (00:23:58)

Chairman Hindi opened public comment for Item #4 (00:27:54)

Marie-Jo Fremont (00:29:14) – a Palo Alto resident, commented on the GBAS OW2 Procedure.

Mark Shull (00:34:47) – a Palo Alto resident, commented on the GBAS OW2 Procedure.

Darlene Yaplee (00:35:10) – a Palo Alto resident, commented on the GBAS OW2 Procedure.

Chairman Hindi closed public comments for Agenda Item #4. (00:37:52)

Chairman Hindi opened the discussion for Roundtable members. (00:38:01)

Mr. Hannah and Mr. Ganoung responded to Member O'Connell's comments regarding the possibility of conducting flight tests for the OW2 procedure. (00:38:10)

Mr. Ganoung responded to Member Schneider's comments regarding incorporating seasonal and other environmental factors in the GBAS testing. (00:55:25)

Pranita Venkatesh **MOVED** and Terry O'Connell **SECONDED** the motion to support the continued processing of the SFO Ground Based Augmentation System - GBAS Group 2A Innovative procedures. The motion was **CARRIED**, and the vote was passed. (00:57:50)

## 5. Chairman's Update (00:58:43)

Chairman Hindi announced that the County will be accepting forty applications for the new Roundtable Administrative Secretary and congratulated Lisa Aozasa, Roundtable Staff, for her retirement. Chairman Hindi thanked Maria Gonzales, Planning and Building Staff, for supporting the Roundtable and Technical Working Group subcommittee during the staffing changes. Chairman Hindi shared that the TRACON Tour held in October viewed the Air Traffic Controller operations and training rooms and participated in a briefing by the FAA. Chairman Hindi indicated the hope of soon receiving a status update from the FAA Western Pacific Region regarding the possible expansion of nighttime hours of operation for the NIITE/HUSSH departure procedure. Chairman Hindi applauded Eugene Reindel, Roundtable Technical Consultant, HMMH, who received the Randy Jones Award for Excellence at the recent American Association of Airport Executives.

## **6. Airport Director Update (01:04:00)**

Doug Yakel, Roundtable Alternate and SFO Chief Information Officer provided updates on SFO passenger traffic, new airline services, and an update for runway closure dates for the runway taxiway improvement project.

Kevin Kone, SFO Assistant Chief Financial Officer, presented their report on the FY 2020 & FY 2021 Economic Impact Study of San Francisco International Airport Mr. Kone responded to questions from Roundtable Members. (1:07:49)

Bert Ganoung shared updates from the SFO Noise Office which included website improvements, and GBAS information edits, and also said that the Noise Office has begun using L90 rather than Leq which provides lower ambient noise levels in most areas.

Bert Ganoung also thanked Glenn Morse, Director of Industry Affairs at United Airlines for his efforts which resulted in United being the first United States airline to begin the retrofit of Airbus aircraft with Airflow Deflectors. Chair Hindi also offered his acknowledgment and thanks to Mr. Morse and United Airlines for voluntarily initiating this important noise reduction retrofit of the Airbus aircraft.

Mr. Ganoung also reported on the SFO Noise Insulation Programs.

Member questions and answers ensued with Mr. Yakel, Mr. Ganoung, and Mr. Gerardo Fries, Special Projects Manager, Noise Insulation Program. (1:27:35)

## **7. Subcommittee Updates (01:44:38)**

### **a. Technical Working Group on November 15, 2023**

Chair Hindi reported that the TWG meeting held a review of the GBAS Innovative Group 2A procedures which were just reviewed tonight. The second item on the TWG agenda was to be a presentation by Bert Ganoung on Flight Procedures and the SFO Director's reports, but time did not permit. Mr. Ganoung will present at the next TWG meeting in January 2024.

Chairman Hindi opened and closed public comments for all Presentation items -- agenda items 5 through 7, no comments were received.

## **8. Member Communications/Announcements (01:46:55)**

Member Schneider suggested a review of new legislation introduced by the Congressional Quiet Skies Caucus for the February meeting.

## **9. Adjourn (01:47:41)**

Chairman Hindi adjourned the meeting in honor of Peter Grace of Brisbane and Supervisor Don Horsley.

**Regular Meeting Action Minutes / Meeting No. 347**

December 6, 2023

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*Roundtable action minutes are considered draft until approved by the Roundtable at a regular meeting. A video recording of this meeting is available on the Roundtable's website.*



# Airport Director's Report

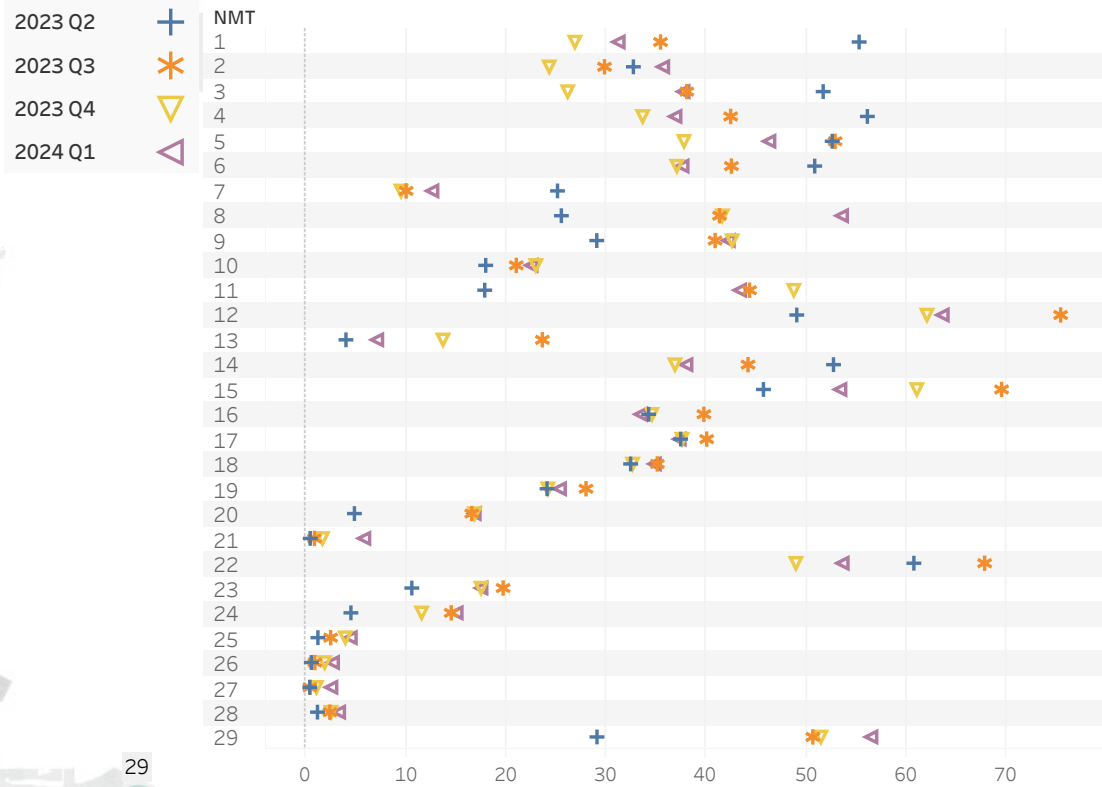
Presented at the April 3, 2024  
Airport/Community Roundtable Meeting

Aircraft Noise Office  
January 2024



San Francisco  
International  
Airport

## Nighttime N-Above 55 dBA Daily Average

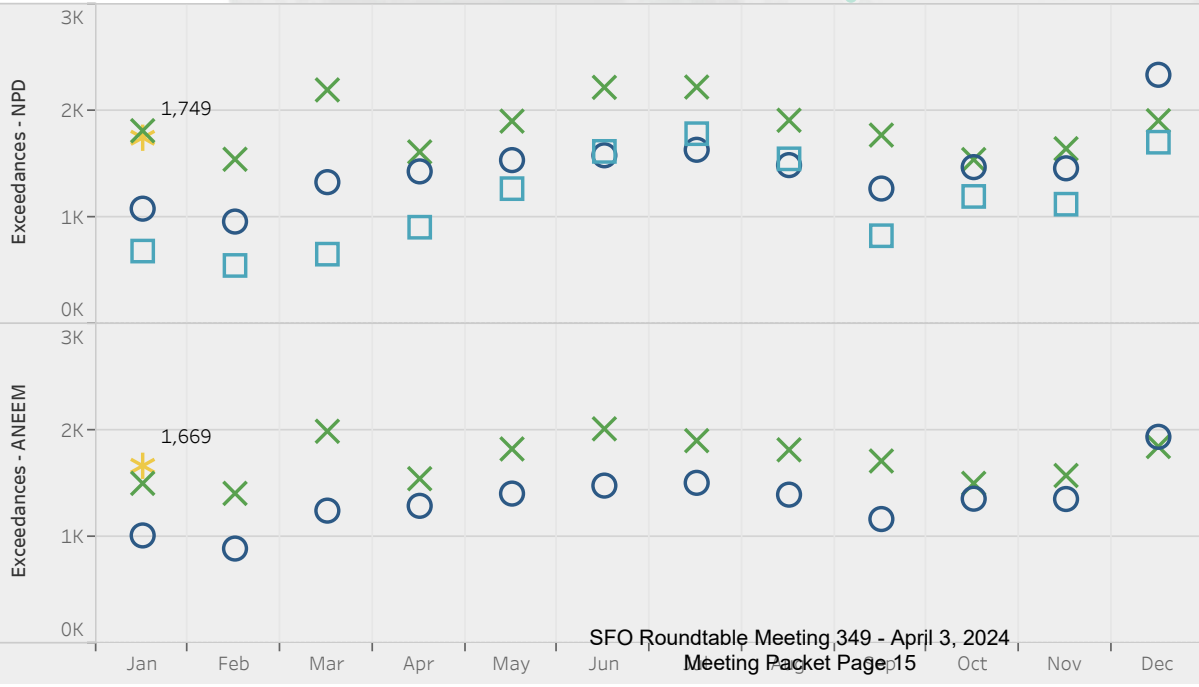


The chart above depicts the average daily N-Above 55dBA SFO aircraft noise events per NMT during nighttime hours (10pm-7am) compared to the previous 4 quarters. Values are derived from the ANEEM algorithm.



The map displays the N-Above counts at each NMT by N-Above Noise Level based on SFO aircraft noise events. Darker circles represent louder noise events and larger circles represent a larger number of noise events relative to the N-Above noise level. Values are derived from the ANEEM algorithm.

## Significant Exceedances



Significant Exceedances (right) displays a total count of SFO aircraft noise events that produced a noise level higher than the maximum allowable decibel value established for a particular monitoring site.

# Aircraft Noise Levels Details

NMT	City	ANOMS						ANEEM			
		Aircraft			Community			Aircraft			
		Noise Events (AVG Day)	CNEL (dBA)	SEL (dBA)	LMax (dBA)	CNEL (dBA)	Ambient Level (dBA)	Noise Events (AVG Day)	CNEL (dBA)	SEL (dBA)	LMax (dBA)
1	San Bruno	109	72	94	82	69	55	113	72	94	81
2	San Bruno	89	56	80	68	64	51	123	57	79	66
3	SSF	56	54	80	68	62	48	219	55	76	62
4	SSF	96	67	90	77	59	46	199	66	86	68
5	San Bruno	95	65	88	76	62	48	223	65	85	68
6	SSF	88	64	88	75	56	41	208	64	84	66
7	Brisbane	22	47	79	68	56	44	128	49	73	59
8	Millbrae	13	53	85	73	65	50	227	57	77	65
9	Millbrae	9	38	75	64	58	41	307	51	70	58
10	Burlingame	5	38	79	65	57	41	132	47	70	58
11	Burlingame	10	40	77	65	58	43	257	52	72	59
12	Foster City	320	62	82	71	57	41	420	62	81	68
13	Hillsborough	2	34	79	65	55	37	92	43	68	56
14	SSF	90	60	84	71	58	42	217	60	80	65
15	SSF	141	58	82	69	58	43	314	59	79	64
16	SSF	76	59	83	72	58	41	197	59	80	64
17	SSF	85	59	83	70	57	42	199	59	80	64
18	Daly City	79	63	87	76	58	44	180	63	84	66
19	Pacifica	70	60	85	74	58	43	110	60	83	68
20	Daly City	81	50	78	66	63	42	158	51	75	62
21	San Francisco	25	43	76	64	59	49	78	45	72	60
22	San Bruno	56	54	81	70	63	47	300	58	77	64
23	San Francisco	80	53	80	68	61	48	153	54	78	65
24	San Francisco	54	49	77	65	60	47	154	50	74	62
25	San Francisco	14	41	77	65	55	40	76	43	71	59
26	San Francisco	5	38	78	66	57	42	46	42	73	60
27	San Francisco	9	40	77	66	57	44	42	42	73	60
28	Redwood City	10	41	77	65	54	38	39	43	72	58
29	San Mateo	144	55	79	66	59	42	386	56	75	61

Noise Monitor's CNEL values (above) are derived from actual measured events and are used to validate the 65dBA CNEL noise footprint. Aircraft monthly CNELs from both ANOMS NPD and ANEEM algorithms for each monitor site are provided with daily average aircraft counts, the average Sound Exposure Level (SEL), and average Maximum Level (LMax). Noise levels from other noise sources in the community calculated by ANOMS is provided as Community CNEL. Ambient Level is represented by the LA90 noise value which is the noise level exceeded at the monitor for 90% of the time.

## SFO N-Above NPD

## SFO N-Above ANEEM

NMT	Min:Max							Min:Max						
	LMax	55 dBA	60 dBA	65 dBA	70 dBA	75 dBA	80 dBA	LMax	55 dBA	60 dBA	65 dBA	70 dBA	75 dBA	80 dBA
1	66:107	3,141	3,141	3,141	2,941	2,635	2,021	52:99	3,403	3,366	3,139	2,889	2,589	1,997
2	61:87	2,772	2,772	2,350	710	21	5	52:79	3,681	3,546	2,351	669	11	0
3	62:86	1,627	1,627	1,367	336	74	21	49:86	5,625	4,280	1,718	320	57	14
4	61:94	2,886	2,886	2,815	2,453	1,931	1,132	49:94	5,307	4,142	2,968	2,459	1,933	1,130
5	62:91	2,857	2,857	2,828	2,524	1,847	844	50:89	6,445	5,271	3,556	2,584	1,831	835
6	62:88	2,747	2,747	2,673	2,309	1,609	599	49:88	5,335	4,057	2,811	2,277	1,593	597
7	61:80	494	494	385	142	12	0	48:80	2,496	1,124	429	144	13	0
8	68:90	372	372	372	307	102	14	49:90	6,799	6,166	3,394	855	149	18
9	59:79	112	107	32	6	3	0	49:81	7,158	2,365	566	116	15	1
10	59:83	65	62	26	5	2	1	49:83	2,735	914	172	27	4	1
11	59:75	50	47	17	6	1	0	48:80	6,129	2,940	879	208	16	1
12	63:84	10,036	10,036	9,949	5,791	497	34	50:83	12,701	11,756	10,141	5,718	468	20
13	60:79	38	37	13	5	2	0	48:73	1,541	388	68	4	0	0
14	61:89	2,774	2,774	2,642	1,707	583	19	49:86	5,632	4,427	2,880	1,690	569	9
15	62:83	4,388	4,388	4,088	1,848	201	27	49:83	8,674	6,641	4,386	1,801	175	14
16	61:92	2,367	2,367	2,283	1,620	431	9	50:92	5,199	3,704	2,427	1,617	432	6
17	62:80	2,617	2,617	2,456	1,437	219	2	49:80	5,529	4,329	2,680	1,422	215	1
18	65:96	2,371	2,371	2,367	2,062	1,396	422	49:96	5,056	3,741	2,552	2,054	1,385	419
19	65:92	2,114	2,114	2,114	1,752	867	46	49:92	3,216	2,698	2,169	1,713	859	44
20	59:90	2,427	2,385	1,227	339	103	20	49:79	4,017	2,923	1,056	157	13	0
21	59:77	565	540	157	33	5	0	50:74	1,683	874	144	21	0	0
22	64:85	1,629	1,629	1,616	883	92	5	49:84	8,834	7,135	3,862	1,312	112	5
23	62:83	2,396	2,396	2,160	626	27	7	52:80	3,623	3,291	2,261	619	17	0
24	59:82	1,466	1,452	711	106	15	2	49:78	3,559	2,651	798	113	4	0
25	59:78	361	347	176	41	4	0	49:78	1,548	699	207	24	1	0
26	59:76	109	106	48	10	1	0	50:75	734	376	89	13	1	0
27	60:80	108	107	60	10	3	1	50:80	514	259	42	6	1	1
28	59:78	196	191	86	21	4	0	49:74	585	295	79	9	0	0
29	58:88	4,622	4,465	2,203	777	181	19	49:81	11,218	5,956	2,074	640	125	3

Noise Monitor N-Above values (above) are derived from actual measured events and assigned to aircraft overflights using both ANOMS NPD and ANEEM algorithms. N-Above represents the count of events where the peak noise (LMax) reached above the designated dBA value. Note the charts on this page represent only SFO aircraft-related noise events.

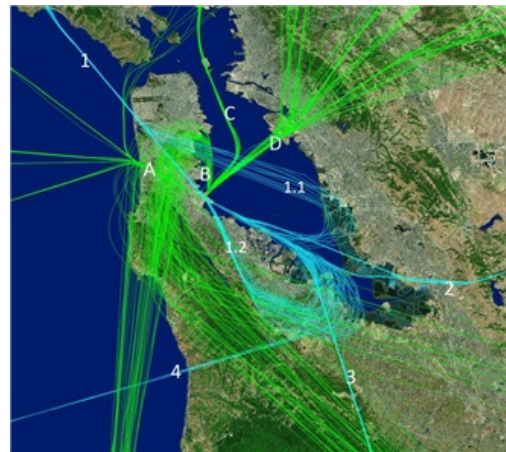


# Operations

January 2024

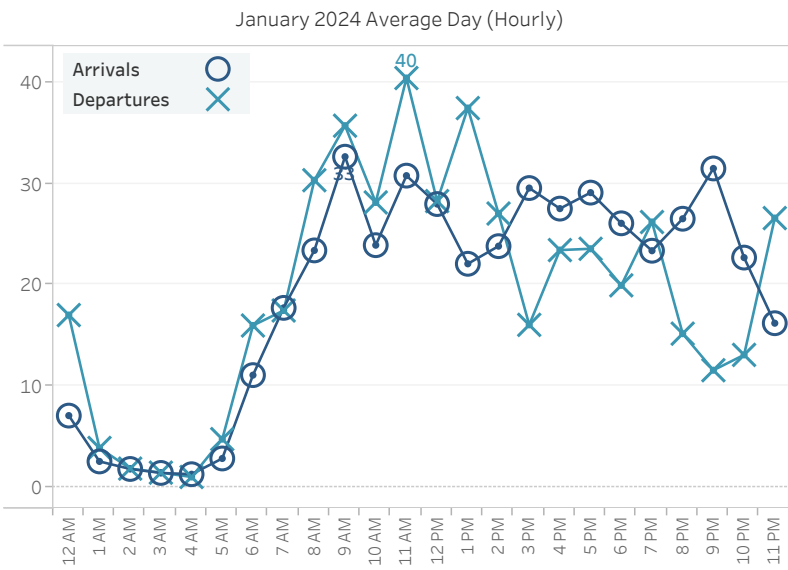
Monthly Ops	AVG Daily Ops	12 Month AVG	YOY Growth
28,741	927	31,685	1%

Major Arrival and Departure Routes (West Flow)



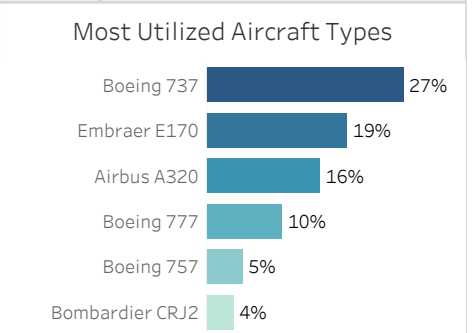
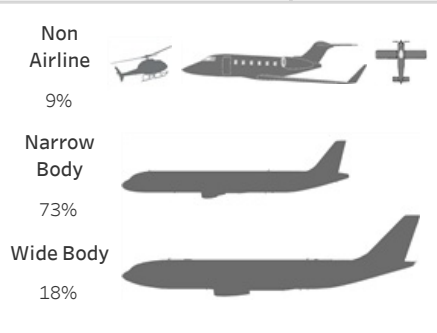
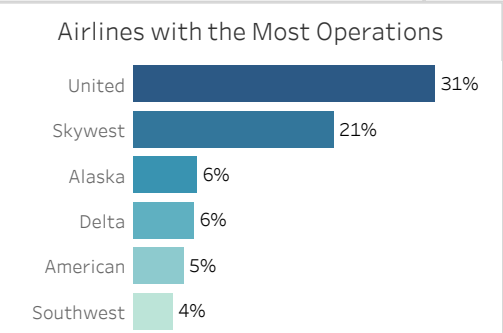
West Flow is depicted in the above image and is a predominate flow at SFO.

**West Flow**  
81%

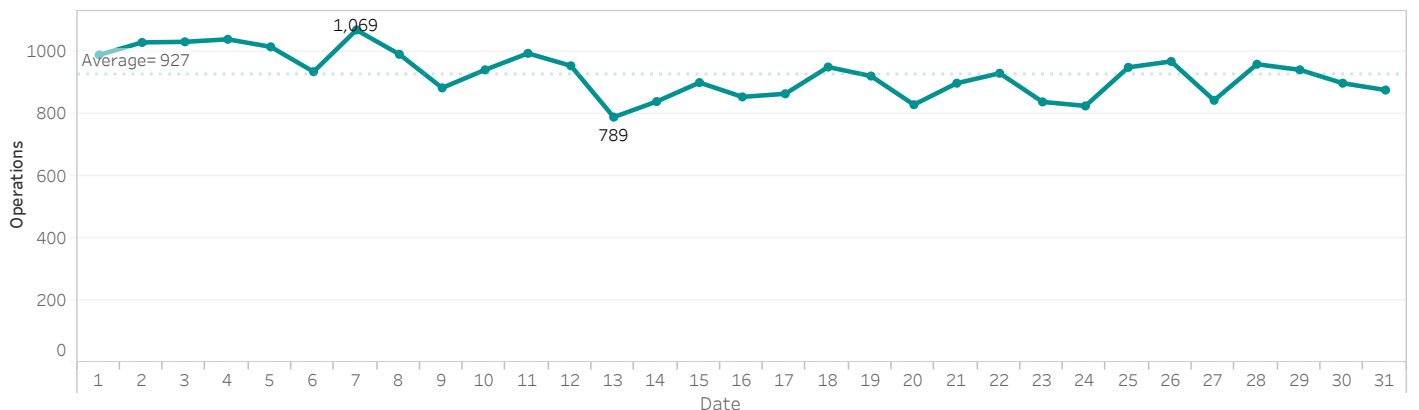


Arrival Route		Departure Route	
1. BDEGA	29%	A. GAP	22%
2. DYAMD	35%	B. SSTIK	33%
3. SERFR	28%	C. NIITE	7%
4. PIRAT	8%	D. TRUKN RWY 01	34%
		D. TRUKN RWY 28	4%

Top Destinations			Down the Bay vs Peninsula	
Los Angeles	Las Vegas	Seattle	1.1 Down the Bay Visual	28%
6%	3%	3%	1.2 BDEGA Arrival	72%



Daily Aircraft Operations



# Runway Usage and Nighttime Operations

Leftmost Runway Utilization table shows percent of runway usage for arrivals and departures by runway based on air carrier operations using jet, regional jet, and turboprop aircraft. Late Night Preferential Runway Use table depicts departure runway usage between 1am - 6am for jet aircraft for the whole month (top) and during nighttime hours only (bottom). Percentages [%] are rounded to the nearest whole number.

## Runway Utilization

	Arrivals	Departures
01 L/R		61% 8,029
10 L/R	0% 1	19% 2,467
19 L/R	19% 2,500	0% 1
28 L/R	81% 10,564	20% 2,578

## Late Night Preferential Runway Use (1 am - 6 am)

	Departures
10 L/R	13% 43
01 L/R	49% 161
28 L/R	38% 123

## Runway Utilization Arrivals

28L	28R
24%	76%
Night (10pm-7am)	
10%	90%

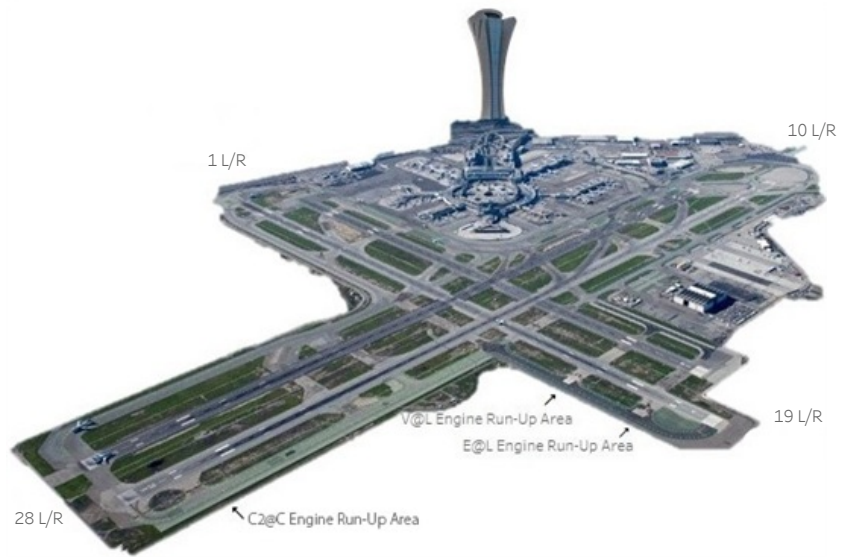
## Nighttime Power Run-Ups

10pm-7am

American Airlines 4  
United Airlines 9

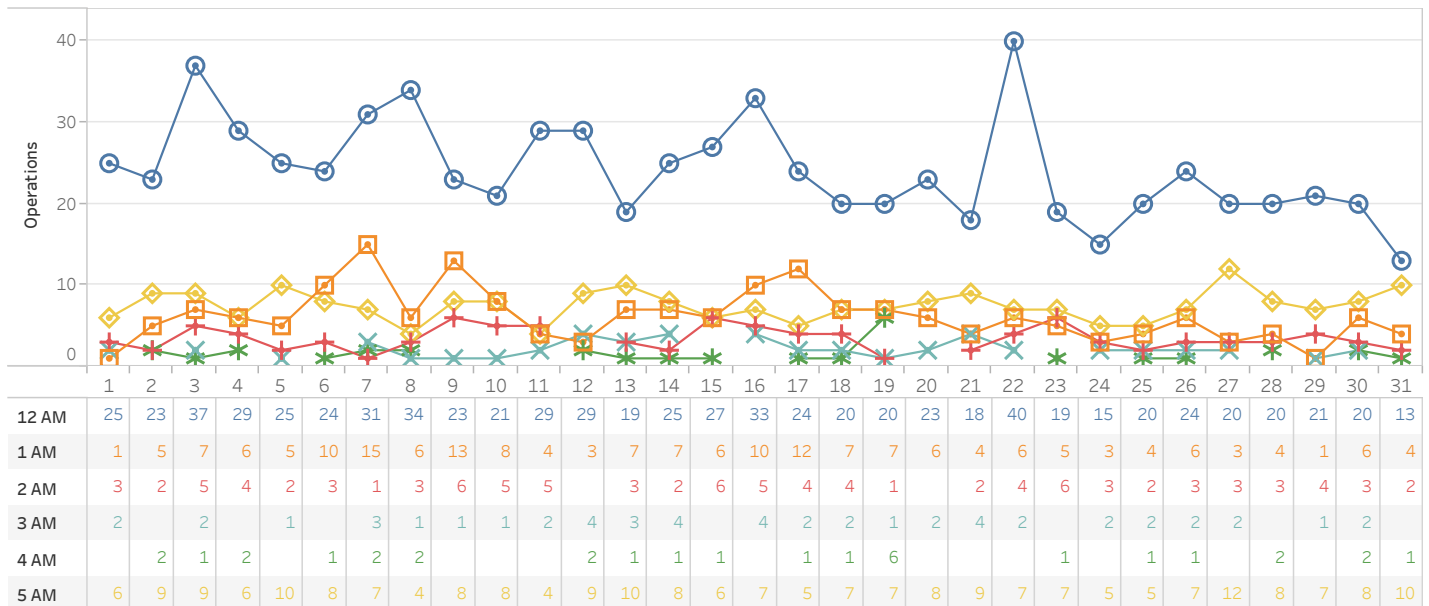
A power runup is a procedure used to test an aircraft engine after maintenance is completed. This is done to ensure safe operating standards prior to returning the aircraft to service. The Aircraft power settings range from idle to full power and may vary in duration.

Designated Power Runup locations are 19 L/R depicted on the airfield map (right) with airlines nighttime power runup counts shown above.



## Hourly Nighttime Operations

○ 12 AM    □ 1 AM    + 2 AM    × 3 AM    \* 4 AM    ◇ 5 AM



# Noise Reports

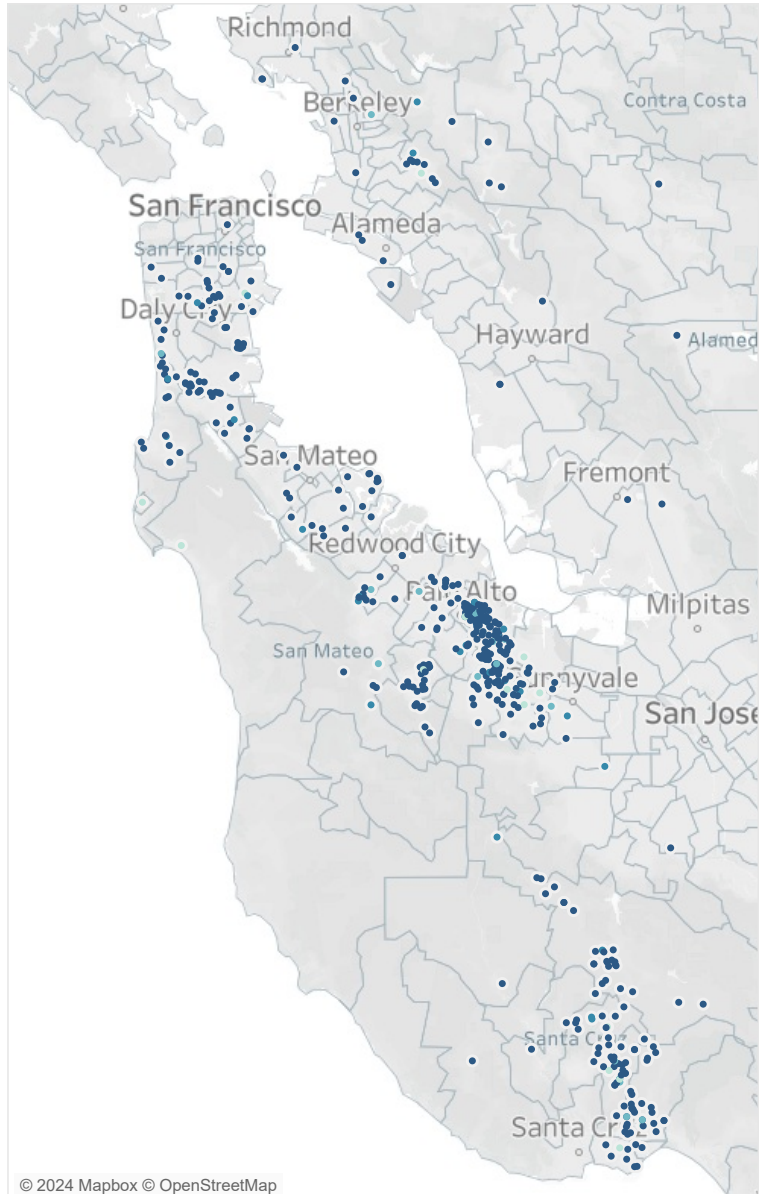
Reporters Annual AVG

## Noise Reporters Location Map

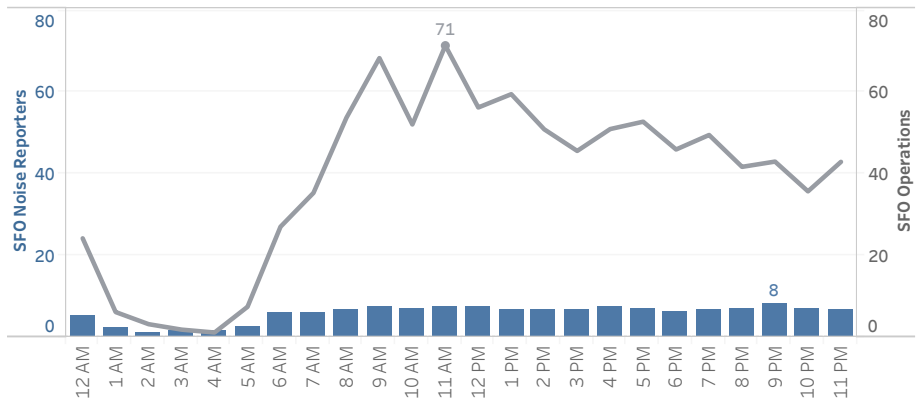
January 2024

	Noise Reporters / Noise Reports	
<b>Roundtable</b>		
Atherton	3	19
Belmont	3	55
Brisbane	10	135
Burlingame	1	2
Daly City	8	688
El Granada	1	1,052
Emerald Hills	7	1,205
Foster City	7	88
Hillsborough	2	30
Menlo Park	14	703
Millbrae	4	18
Montara	1	896
Pacifica	14	956
Portola Valley	28	12,715
Redwood City	7	506
San Bruno	4	489
San Francisco	26	2,315
San Mateo	7	307
South San Francisco	22	80
Woodside	6	1,546
<b>Other</b>		
Alameda	4	57
Berkeley	3	774
Boulder Creek	1	4
Capitola	1	28
Castro Valley	1	24
Cupertino	1	363
Danville	1	1
Felton	3	51
Fremont	2	135
Hayward	2	42
Kensington	1	1
Los Altos	46	4,962
Los Altos Hills	11	635
Los Gatos	29	2,814
Moraga	3	99
Mountain View	12	3,691
Oakland	10	2,693
Orinda	2	299
Palo Alto	103	13,270
Pleasanton	1	37
Richmond	3	180
Santa Cruz	38	7,019
Scotts Valley	21	2,828
Soquel	22	2,046
Stanford	2	611
Sunnyvale	3	989
Watsonville	1	48
<b>Grand Total</b>	<b>502</b>	<b>67,506</b>

521
Reports Annual AVG
82,058
New Reporters
36
New Reporters Top City
South San Francisco
Furthest Report
64 miles
Reports per SFO Operation
2
Top Aircraft Types
B737 E75L A320
Top Flight Numbers
KAL214 AMX664 UAL1272

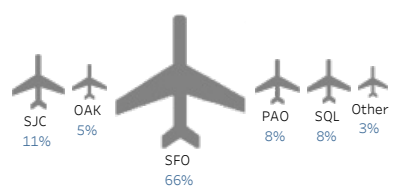


## Hourly Noise Reporters (Average Day in a Month)



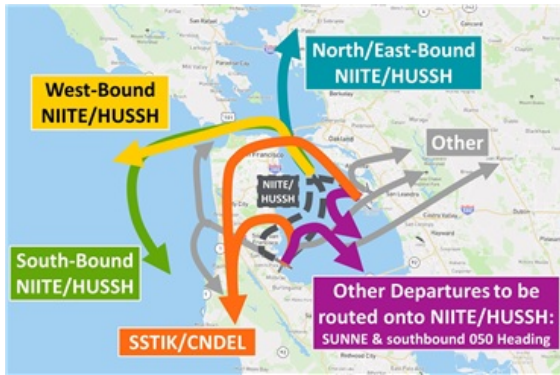
Notes:  
Address validation Relies on USPS-provided ZIP Code look up table and USPS-specified default city values.

## Noise Reports by Airport

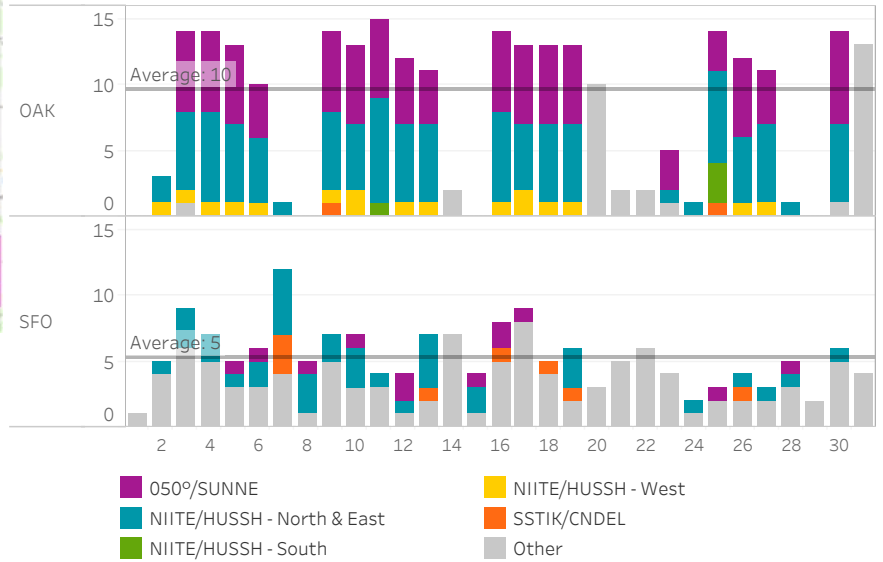


98% of noise reports correlate to a flight origin/destination airport.

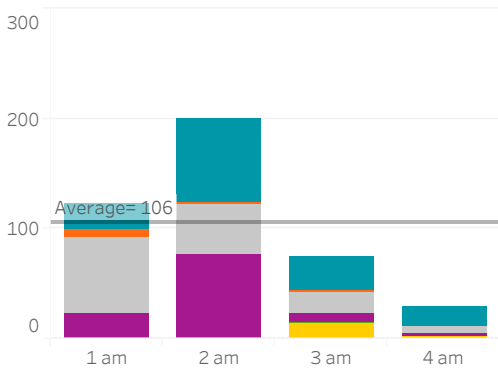
# NIITE to GOBBS 1 am to 5 am (January 2024)



Count of Departures per Night



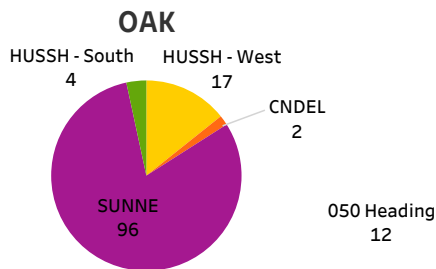
Average Total Departures per Hour



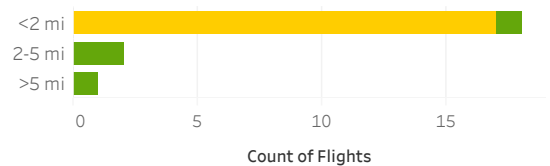
Departure Runway Usage

OAK		SFO				
12	30	01L	01R	10L	28L	28R
11%	89%	8%	24%	12%	13%	42%

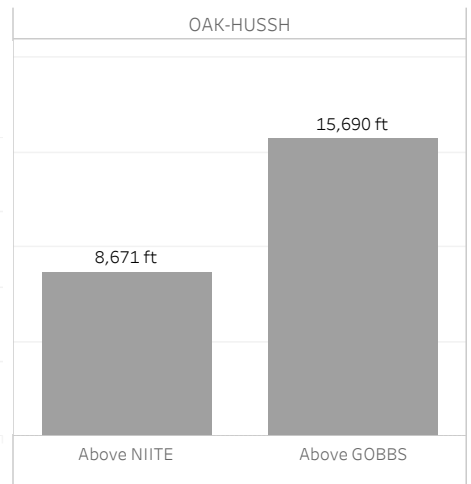
CNDEL and SSTIK Departures vs HUSSH and NIITE



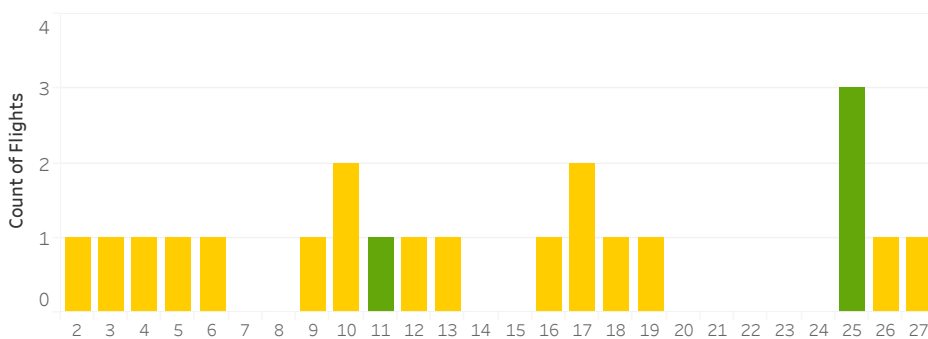
How Close are Aircraft Flying to GOBBS?



Average Altitude at NIITE and GOBBS



Count of Flights





# Airport Director's Report

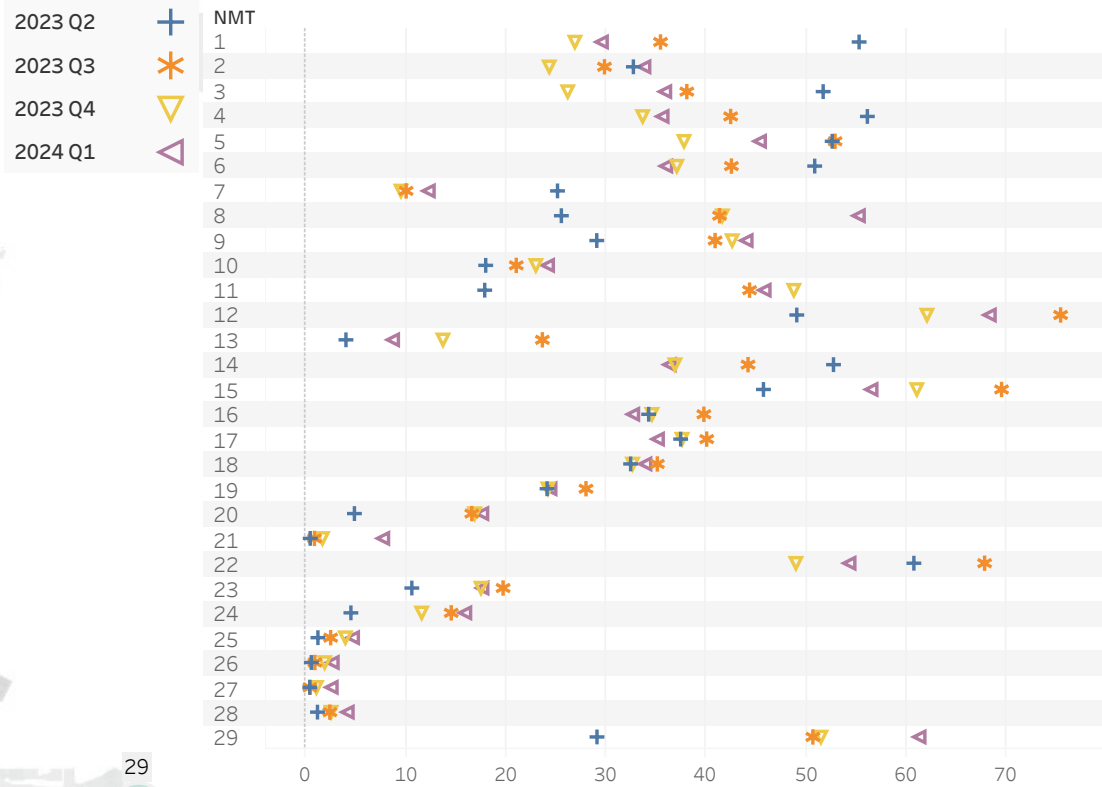
Presented at the April 3, 2024  
Airport/Community Roundtable Meeting

Aircraft Noise Office  
February 2024



San Francisco  
International  
Airport

## Nighttime N-Above 55 dBA Daily Average



The chart above depicts the average daily N-Above 55dBA SFO aircraft noise events per NMT during nighttime hours (10pm-7am) compared to the previous 4 quarters. Values are derived from the ANEEM algorithm.

N-Above dBA level

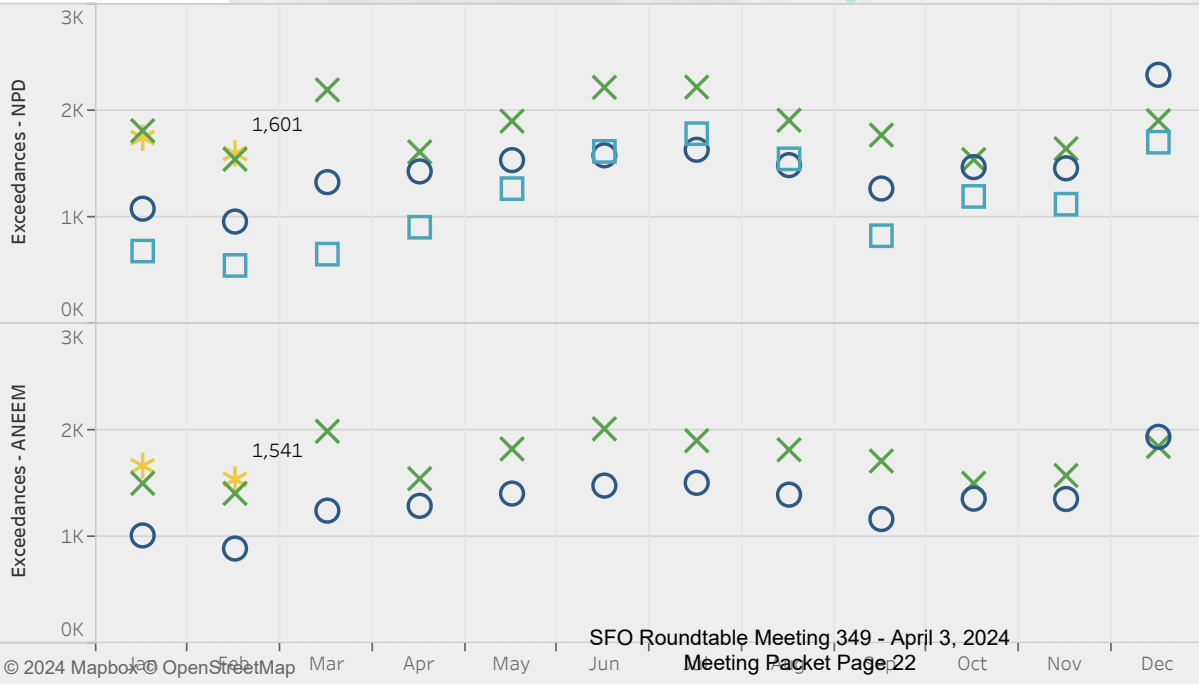
- 85 dBA
- 75 dBA
- 65 dBA
- 55 dBA

Count of Events

- 0
- 2,000
- 4,000
- 6,000
- 8,000
- ≥10,000

The map displays the N-Above counts at each NMT by N-Above Noise Level based on SFO aircraft noise events. Darker circles represent louder noise events and larger circles represent a larger number of noise events relative to the N-Above noise level. Values are derived from the ANEEM algorithm.

## Significant Exceedances



Significant Exceedances (right) displays a total count of SFO aircraft noise events that produced a noise level higher than the maximum allowable decibel value established for a particular monitoring site.

# Aircraft Noise Levels Details

NMT	City	ANOMS						ANEEM			
		Aircraft			Community			Aircraft			
		Noise Events (AVG Day)	CNEL (dBA)	SEL (dBA)	LMax (dBA)	CNEL (dBA)	Ambient Level (dBA)	Noise Events (AVG Day)	CNEL (dBA)	SEL (dBA)	LMax (dBA)
1	San Bruno	62	71	95	84	67	56	81	71	94	79
2	San Bruno	55	55	81	68	64	52	118	56	78	65
3	SSF	40	52	80	68	61	48	195	54	75	62
4	SSF	60	66	91	79	59	46	185	66	86	66
5	San Bruno	56	63	88	76	62	48	205	63	82	65
6	SSF	60	64	89	78	57	42	193	64	84	65
7	Brisbane	16	47	80	68	58	44	138	50	73	59
8	Millbrae	26	63	94	81	65	50	246	64	84	66
9	Millbrae	21	52	84	70	58	41	341	55	74	58
10	Burlingame	14	52	85	71	57	42	153	54	77	60
11	Burlingame	23	55	86	73	58	43	278	57	76	60
12	Foster City	376	62	81	70	58	41	452	62	80	69
13	Hillsborough	17	47	81	68	56	38	107	48	72	57
14	SSF	62	60	85	72	59	44	199	60	80	64
15	SSF	144	58	83	70	61	44	349	59	80	64
16	SSF	49	58	84	72	57	42	182	59	79	63
17	SSF	58	59	84	72	60	43	179	59	80	64
18	Daly City	53	63	89	78	59	44	170	63	84	65
19	Pacifica	50	60	86	75	59	44	101	60	83	67
20	Daly City	78	51	79	67	63	42	171	51	75	62
21	San Francisco	20	43	77	65	57	45	118	46	72	59
22	San Bruno	14	48	81	70	64	48	304	57	76	63
23	San Francisco	88	54	80	69	61	48	169	55	78	65
24	San Francisco	49	49	78	66	60	47	171	51	75	62
25	San Francisco	18	42	77	66	56	41	91	44	71	59
26	San Francisco	5	40	79	66	62	47	57	43	79	61
27	San Francisco	8	40	78	66	58	44	54	43	76	61
28	Redwood City	9	41	79	65	54	38	42	43	72	58
29	San Mateo	107	55	80	67	58	43	424	56	75	61

Noise Monitor's CNEL values (above) are derived from actual measured events and are used to validate the 65dBA CNEL noise footprint. Aircraft monthly CNELs from both ANOMS NPD and ANEEM algorithms for each monitor site are provided with daily average aircraft counts, the average Sound Exposure Level (SEL), and average Maximum Level (LMax). Noise levels from other noise sources in the community calculated by ANOMS is provided as Community CNEL. Ambient Level is represented by the LA90 noise value which is the noise level exceeded at the monitor for 90% of the time.

## SFO N-Above NPD

## SFO N-Above ANEEM

NMT	Min:Max							Min:Max						
	LMax	55 dBA	60 dBA	65 dBA	70 dBA	75 dBA	80 dBA	LMax	55 dBA	60 dBA	65 dBA	70 dBA	75 dBA	80 dBA
1	66:99	1,627	1,627	1,627	1,576	1,502	1,327	53:99	2,246	2,203	1,952	1,632	1,508	1,323
2	61:79	1,561	1,561	1,347	373	15	0	52:78	3,117	2,938	1,689	361	12	0
3	62:85	1,018	1,018	924	197	24	6	49:81	4,490	3,258	1,291	200	20	3
4	62:98	1,710	1,710	1,671	1,529	1,413	936	49:98	4,344	3,191	1,936	1,558	1,411	933
5	62:87	1,498	1,498	1,484	1,351	1,000	352	50:87	5,337	4,101	2,292	1,473	994	336
6	64:92	1,655	1,655	1,643	1,507	1,267	625	49:92	4,445	3,256	1,934	1,512	1,261	624
7	62:79	371	371	316	124	7	0	49:79	2,476	1,081	385	126	7	0
8	68:98	725	725	725	692	502	411	49:98	6,892	6,131	3,608	1,325	580	425
9	60:84	505	504	456	365	128	14	48:84	7,291	2,579	936	462	140	14
10	59:94	327	325	299	231	108	18	48:94	2,860	1,285	613	368	174	23
11	60:84	504	504	477	429	300	54	48:84	6,112	3,060	1,216	580	313	54
12	63:86	10,944	10,944	10,865	5,306	310	14	51:82	12,828	12,519	11,355	5,303	284	7
13	59:83	386	382	302	123	17	2	48:83	1,755	646	280	97	14	3
14	62:86	1,769	1,769	1,698	1,217	629	19	49:86	4,620	3,556	2,055	1,245	627	19
15	62:84	3,878	3,878	3,703	1,652	143	33	49:84	8,801	6,578	4,293	1,660	121	20
16	61:85	1,426	1,426	1,391	1,018	232	3	49:80	4,325	2,882	1,615	1,028	230	2
17	63:95	1,538	1,538	1,490	1,015	260	8	49:95	4,352	3,342	1,903	1,018	253	6
18	65:88	1,540	1,540	1,538	1,461	1,187	431	49:88	4,277	2,994	1,735	1,452	1,180	430
19	66:84	1,439	1,439	1,439	1,301	735	45	51:84	2,729	2,227	1,592	1,303	732	43
20	59:90	2,184	2,173	1,338	365	79	13	49:82	3,920	3,010	1,168	187	16	2
21	59:85	474	464	207	32	5	2	50:75	2,255	1,019	192	16	1	0
22	64:82	282	282	278	134	20	2	49:86	8,149	6,198	3,025	843	64	4
23	62:87	2,474	2,474	2,352	852	56	6	52:85	3,650	3,338	2,409	790	43	3
24	59:83	1,186	1,185	741	125	16	2	50:78	3,572	2,780	882	129	6	0
25	59:81	447	436	218	60	10	1	49:78	1,712	856	229	34	3	0
26	60:79	99	97	57	11	4	0	49:77	762	392	109	17	2	0
27	61:77	114	114	54	9	1	0	50:75	496	294	56	7	0	0
28	59:74	167	159	79	12	0	0	49:73	654	304	78	2	0	0
29	59:83	3,135	3,075	2,090	780	139	4	49:80	11,438	5,228	2,217	773	132	0

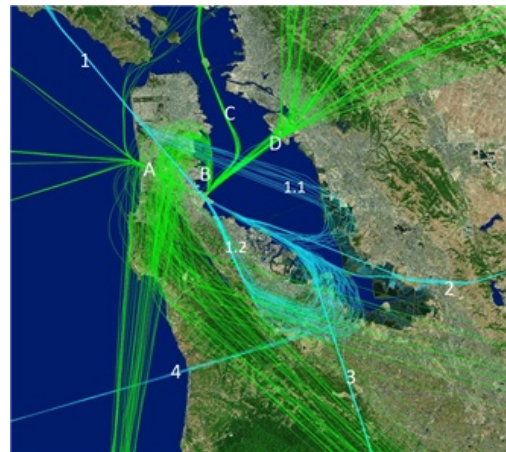
Noise Monitor N-Above values (above) are derived from actual measured events and assigned to aircraft overflights using both ANOMS NPD and ANEEM algorithms. N-Above represents the count of events where the peak noise (LMax) reached above the designated dBA value. Note the charts on this page represent only SFO aircraft-related noise events.

# Operations

February 2024

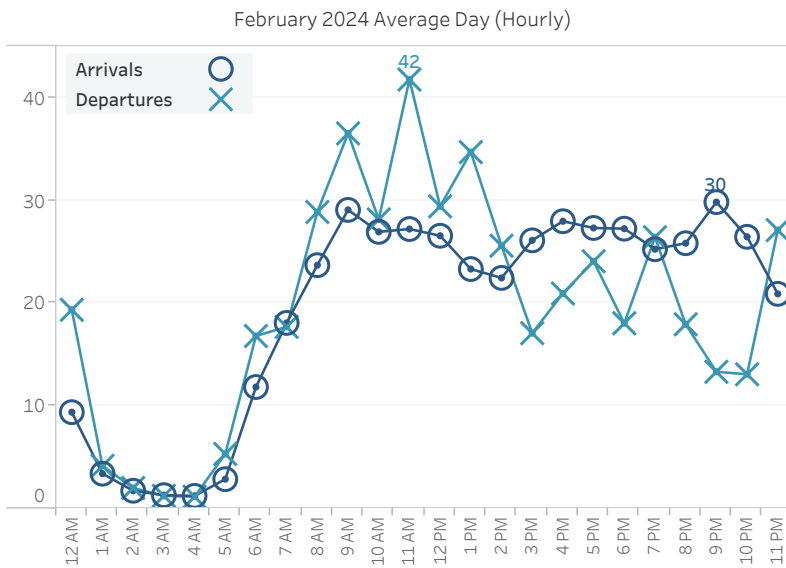
Monthly Ops	AVG Daily Ops	12 Month AVG	YOY Growth
27,117	935	31,713	1%

Major Arrival and Departure Routes (West Flow)



West Flow is depicted in the above image and is a predominate flow at SFO.

**West Flow**  
78%



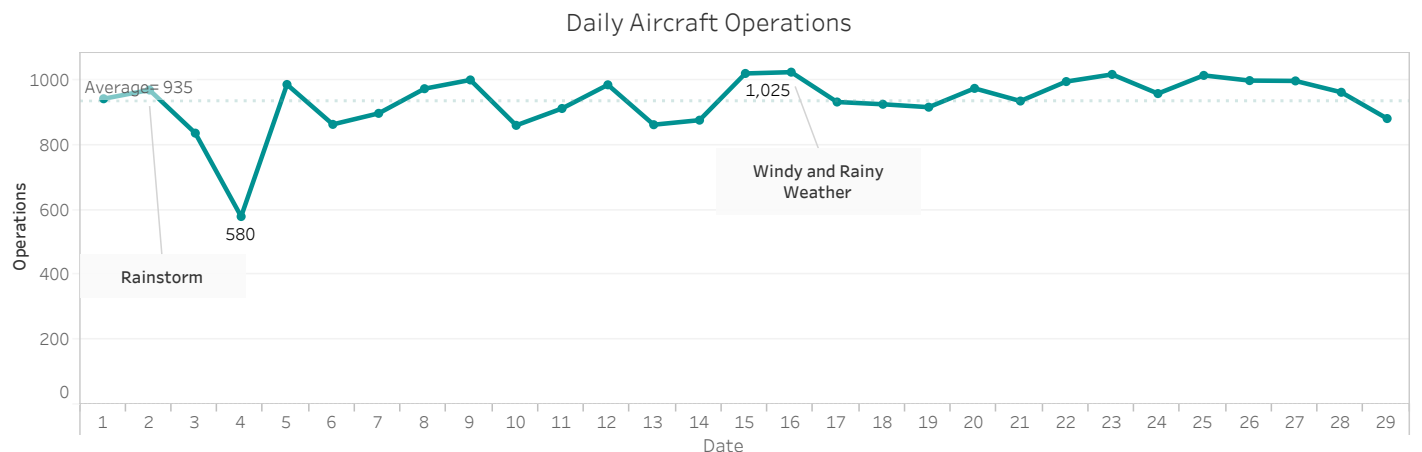
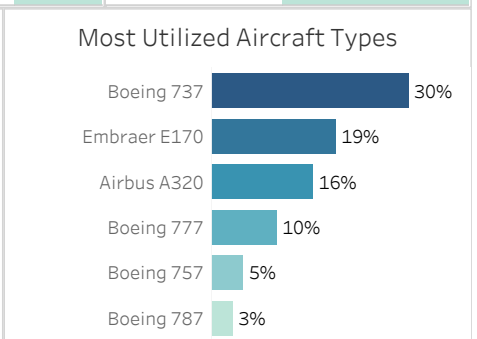
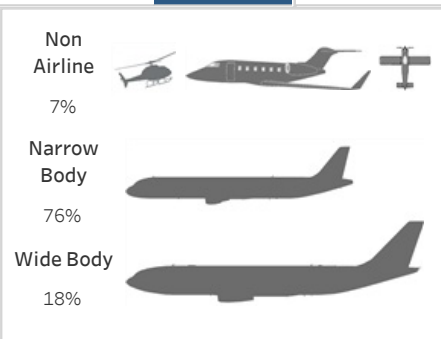
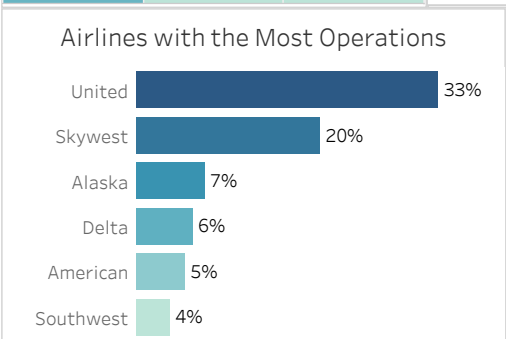
Top Destinations

Los Angeles	Las Vegas	Seattle
6%	4%	3%

Down the Bay vs Peninsula

Route	Percentage
1.1 Down the Bay Visual	13%
1.2 BDEGA Arrival	87%

Arrival Route	Percentage	Departure Route	Percentage
1. BDEGA	30%	A. GAP	13%
2. DYAMD	35%	B. SSTIK	38%
3. SERFR	27%	C. NIITE	9%
4. PIRAT	8%	D. TRUKN RWY 01	40%
		D. TRUKN RWY 28	0%





# Runway Usage and Nighttime Operations

Leftmost Runway Utilization table shows percent of runway usage for arrivals and departures by runway based on air carrier operations using jet, regional jet, and turboprop aircraft. Late Night Preferential Runway Use table depicts departure runway usage between 1am - 6am for jet aircraft for the whole month (top) and during nighttime hours only (bottom). Percentages [%] are rounded to the nearest whole number.

## Runway Utilization

	Arrivals	Departures
01 L/R		68% 8,593
10 L/R	1% 131	19% 2,367
19 L/R	21% 2,627	3% 431
28 L/R	78% 9,870	10% 1,299

## Late Night Preferential Runway Use (1 am - 6 am)

	Departures
10 L/R	20% 66
01 L/R	47% 159
28 L/R	26% 87
19 L/R	7% 23

## Runway Utilization Arrivals

28R	Night (10pm-7am) 28R
100%	100%

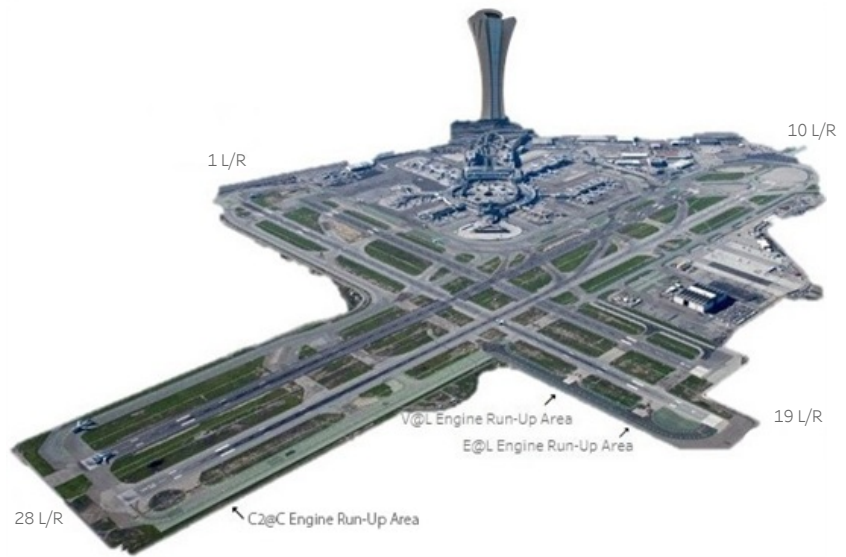
## Nighttime Power Run-Ups

10pm-7am

American Airlines 3  
United Airlines 8

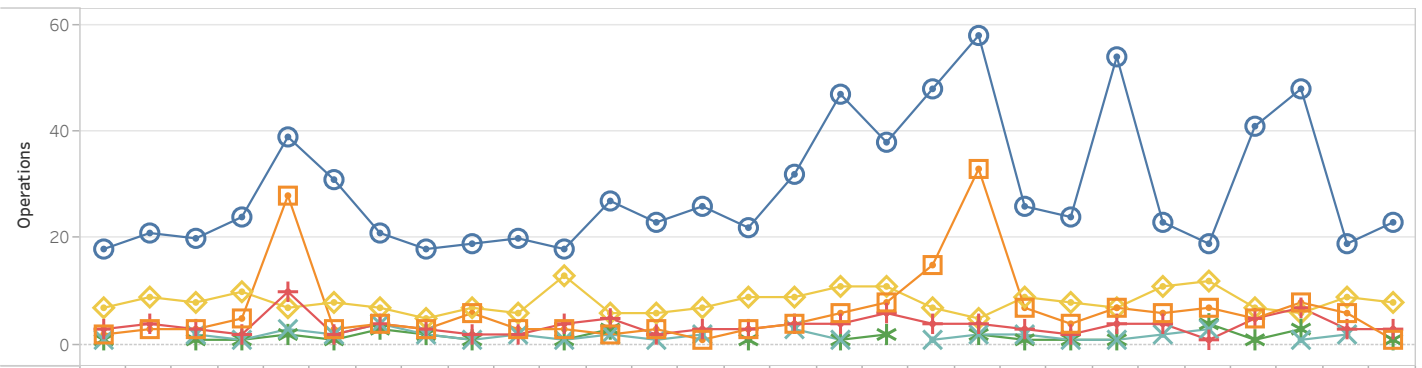
A power runup is a procedure used to test an aircraft engine after maintenance is completed. This is done to ensure safe operating standards prior to returning the aircraft to service. The Aircraft power settings range from idle to full power and may vary in duration.

Designated Power Runup locations are 19 L/R depicted on the airfield map (right) with airlines nighttime power runup counts shown above.



## Hourly Nighttime Operations

○ 12 AM    □ 1 AM    + 2 AM    × 3 AM    \* 4 AM    ◇ 5 AM



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
12 AM	18	21	20	24	39	31	21	18	19	20	18	27	23	26	22	32	47	38	48	58	26	24	54	23	19	41	48	19	23
1 AM	2	3	3	5	28	3	4	3	6	3	3	2	3	1	3	4	6	8	15	33	7	4	7	6	7	5	8	6	1
2 AM	3	4	3	2	10	2	4	3	2	2	4	5	2	3	3	4	4	6	4	4	3	2	4	4	1	5	7	3	3
3 AM	1		2	1	3	2	4	2	1	2	1	2	1	2		3	1		1	2	2	1	1	2	3		1	2	
4 AM	1		1	1	2	1	3	2	1		1	3			1		1	2		2	1	1	1		4	1	3		1
5 AM	7	9	8	10	7	8	7	5	7	6	13	6	6	7	9	9	11	11	7	5	9	8	7	11	12	7	6	9	8

# Noise Reports

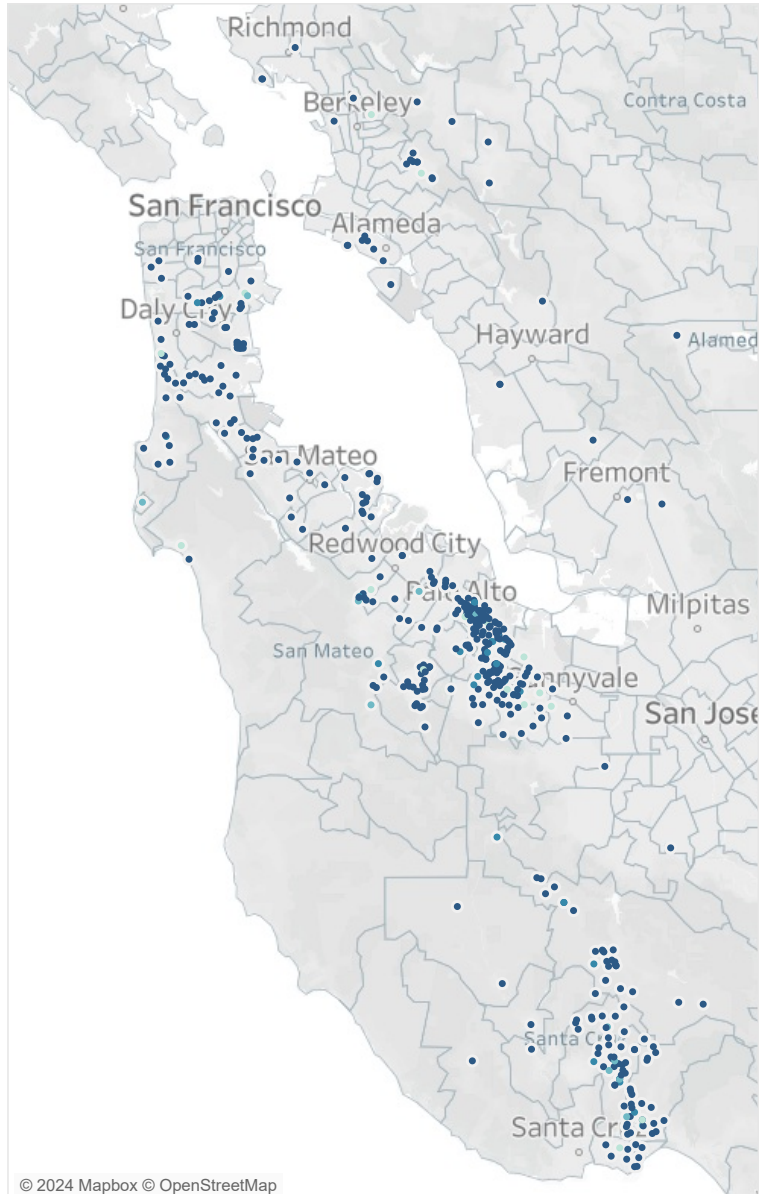
Reporters Annual AVG

## Noise Reporters Location Map

February 2024

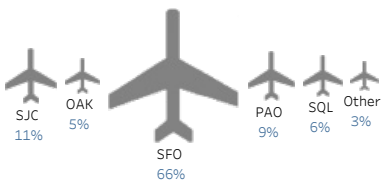
	Noise Reporters / Noise Reports	
Atherton	4	29
Belmont	1	23
Brisbane	13	79
Burlingame	4	4
Daly City	10	1,007
El Granada	1	981
Emerald Hills	6	1,467
Foster City	11	76
Half Moon Bay	1	1
Hillsborough	2	12
Menlo Park	12	819
Millbrae	6	21
Montara	1	733
Pacifica	12	587
Portola Valley	26	19,016
Redwood City	8	501
San Bruno	5	191
San Carlos	1	1
San Francisco	20	3,345
San Mateo	5	280
South San Francisco	9	44
Woodside	7	1,770
Alameda	8	176
Ben Lomond	1	4
Berkeley	3	1,231
Boulder Creek	2	4
Capitola	2	21
Castro Valley	1	117
Cupertino	1	242
Felton	2	80
Fremont	2	84
Hayward	2	24
Los Altos	48	4,420
Los Altos Hills	11	738
Los Gatos	27	2,548
Moraga	2	63
Mountain View	11	2,995
Oakland	9	2,736
Orinda	2	319
Palo Alto	103	13,358
Pleasanton	1	6
Richmond	3	159
San Jose	1	44
Santa Cruz	34	4,528
Scotts Valley	21	2,453
Soquel	20	2,345
Stanford	2	562
Sunnyvale	3	1,063
Union City	1	1
Watsonville	1	59
<b>Grand Total</b>	<b>489</b>	<b>71,367</b>

523
Reports Annual AVG
81,304
New Reporters
24
New Reporters Top City
South San Francisco
Furthest Report
64 Miles
Reports per SFO Operation
3
Top Aircraft Types
E75L B737 A320
Top Flight Numbers
KAL214 UAL2097 AMX664



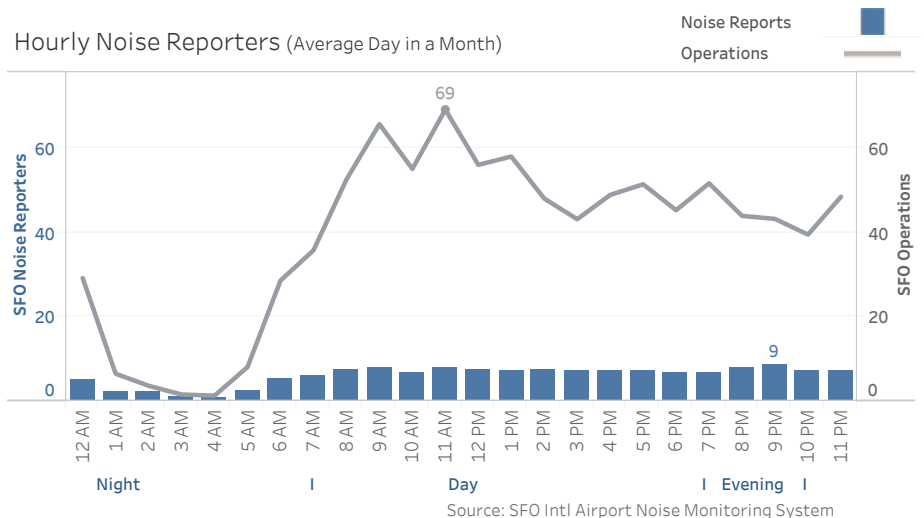
Notes:  
Address validation Relies on USPS-provided ZIP Code look up table and USPS-specified default city values.

## Noise Reports by Airport



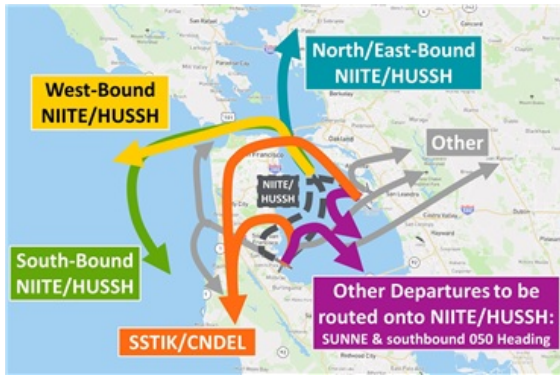
98% of noise reports correlate to a flight origin/destination airport.

## Hourly Noise Reporters (Average Day in a Month)

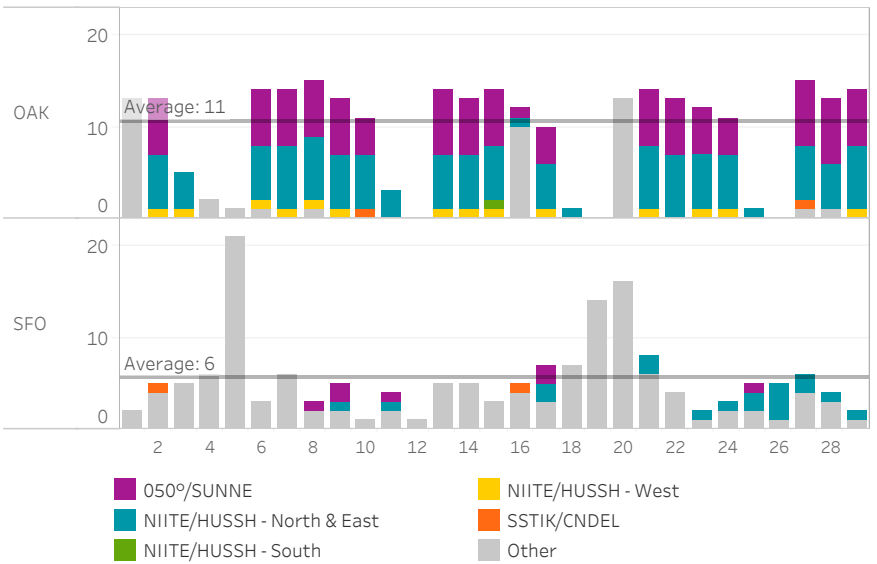


Source: SFO Intl Airport Noise Monitoring System

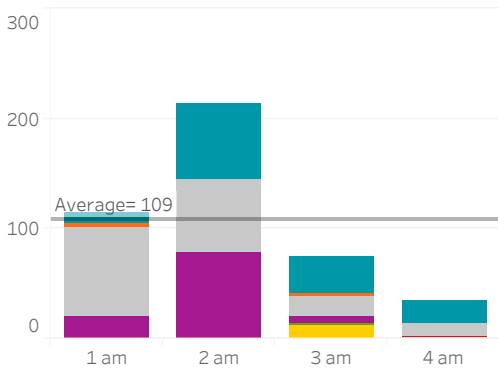
# NIITE to GOBBS 1 am to 5 am (February 2024)



Count of Departures per Night



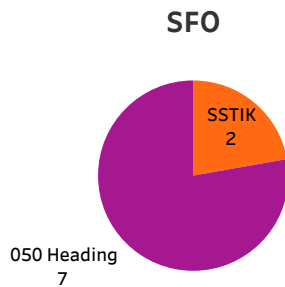
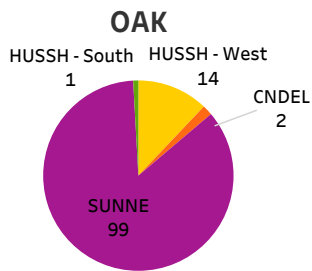
Average Total Departures per Hour



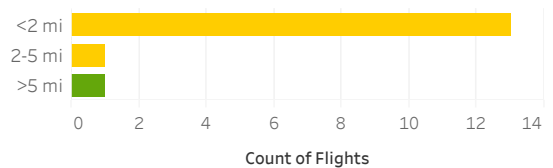
Departure Runway Usage

OAK		SFO					
12	30	01L	01R	10L	19L	19R	28R
14%	86%	4%	10%	32%	2%	8%	43%

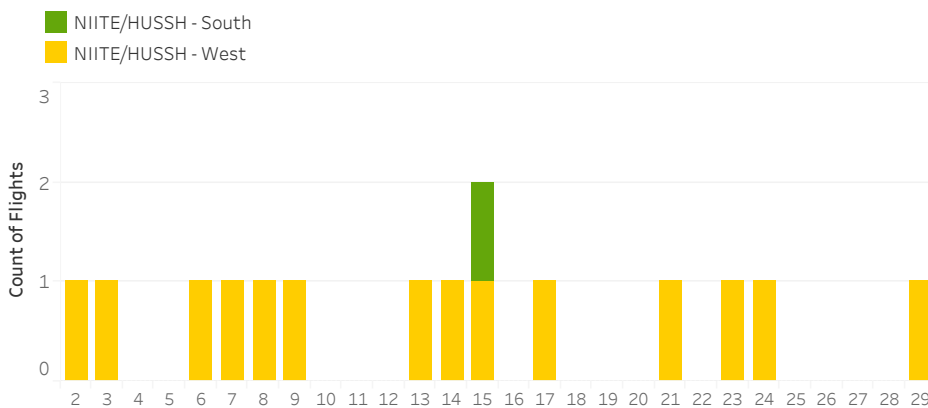
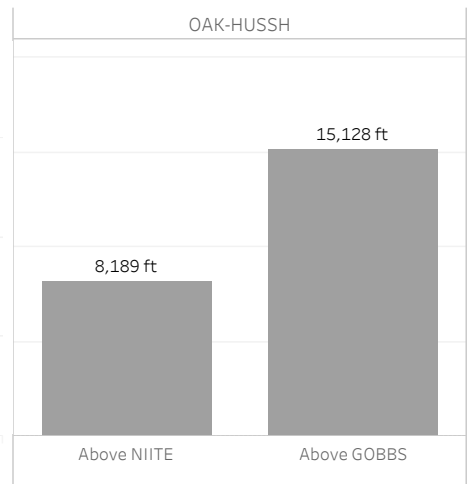
CNDEL and SSTIK Departures vs HUSSH and NIITE



How Close are Aircraft Flying to GOBBS?



Average Altitude at NIITE and GOBBS



SFO Roundtable: Budget vs. Actual as of March 26, 2024

As of 03/26/2024			
<b>A</b>	<b>SOURCES</b>	<b>2023-24</b>	<b>2023-24 as of 03/26/24</b>
	<b>Revenue</b>	<u>BUDGET</u>	<u>ACTUAL</u>
	San Francisco Airport Commission	\$ 220,000.00	\$ 110,000.00
	Roundtable Membership	\$ 43,500.00	\$ 34,500.00
	<i>In Kind Contributions*</i>		
		<b>\$ 263,500.00</b>	<b>\$ 144,500.00</b>
	<b>Other Sources</b>	<u>BUDGET</u>	
	Fund Balance Contribution	\$ 9,490	
	<b>SOURCES TOTAL</b>	<b>\$ 272,990</b>	
<b>B</b>	<b>EXPENSES</b>	<b>2023-24</b>	
	<b>Staffing &amp; Coordination</b>	<u>BUDGET</u>	<u>ACTUAL</u>
	County of San Mateo Coordination Services	\$ 155,000.00	\$ 81,179.28
	Roundtable Aviation Technical Consultant	\$ 90,000.00	\$ 39,280.40
		<b>\$ 245,000.00</b>	<b>\$ 120,459.68</b>
	<b>ADMINISTRATION / OPERATIONS</b>	<u>BUDGET</u>	<u>ACTUAL</u>
	Meeting Rooms * In-Kind		\$ -
	Postage / Printing	\$ 1,500.00	\$ -
	Website	\$ 1,800.00	\$ -
	Data Storage & Conference Services	\$ 990.00	\$ -
	Miscellaneous Office Expenses/Equipment	\$ 3,000.00	\$ 1,020.01
	Video Services	\$ 8,000.00	\$ 3,219.25
		<b>\$ 15,290.00</b>	<b>\$ 4,239.26</b>
	<b>PROJECTS, PROGRAMS, &amp; OTHER</b>	<u>BUDGET</u>	<u>ACTUAL</u>
	Noise Conferences Attendance, Coordinator	\$ 1,500.00	\$ -
	Noise Conferences Attendance, Members	\$ 3,000.00	\$ 150.00
	TRACON Field Trip(s)	\$ 950.00	\$ 1,372.98
	Airport Noise Report subscription	\$ 2,500.00	\$ 2,500.00
	N.O.I.S.E. Membership	\$ 4,300.00	\$ 4,300.00
	Fly Quiet Awards	\$ 450.00	\$ -
	Special Study	\$ -	\$ -
		<b>\$ 12,700.00</b>	<b>\$ 8,322.98</b>
	<b>EXPENSES TOTAL</b>	<b>\$ 272,990.00</b>	<b>\$ 133,021.92</b>
	<b>YEAR END BALANCE</b>	<u>PROPOSED</u>	
		\$ -	
<b>C</b>	<b>UNCOMMITTED FUNDS</b>	<b>2023-24</b>	
		<u>PROPOSED</u>	
	Fund Balance	\$ 411,863.00	
	Contingency Reserve	\$ 40,000.00	
	<b>UNCOMMITTED FUNDS TOTAL</b>	<b>\$ 451,863.00</b>	
	*Meeting venues in-kind contributions from Millbrae, Foster City, Hillsborough and the County of San Mateo.		

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**SFO Airport Community Roundtable – 2024 List of Subcommittee Members**

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<b>TECHNICAL WORKING GROUP</b>	<b>GROUND BASED NOISE</b>	<b>LEGISLATIVE</b>
<b>Sam Hindi, Chair</b> Kaia Eakin Judith Hasko Terry O’Connell Al Royse	<b>Terry O’Connell, Chair</b> Sandy Alvarez Angelina Cahalan Al Royse	<b>Al Royse, Chair</b> Angelina Cahalan Pam DiGiovanni Mark Nagales Rob Newsom Robin Pang-Maganaris
<b>WORK PROGRAM</b>	<b>STRATEGIC PLAN</b>	<b>Ad Hoc PORTABLE NOISE MONITORING PLACEMENT</b>
<b>Al Royse, Chair</b> Angelina Cahalan Kaia Eakin Sam Hindi Terry O’Connell	<b>Al Royse, Chair</b> Christine Boles Sam Hindi Terry O’Connell Carol Ford	<b>Terry O’Connell, Chair</b> Christine Boles Pam DiGiovanni

# **Investigating & Guiding Outcomes for Advanced Air Mobility (AAM)**

Matt Friedman, Caltrans

SFO Airport Community Roundtable

April 3, 2024

# SFO Airport Community Roundtable

Matt Friedman

Chief, Office of Aviation Planning

Caltrans Aeronautics Program

[matthew.friedman@dot.ca.gov](mailto:matthew.friedman@dot.ca.gov)

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CALTRANS, AERONAUTICS PROGRAM

SFO Roundtable Meeting 349 - April 3, 2024  
Meeting Packet Page 31



# Advanced Air Mobility (AAM)

*AAM is a new concept of air transportation using electric vertical takeoff and landing (eVTOL) aircraft to move people and cargo between places not currently or easily served by surface transportation or existing aviation modes. EVTOL aircraft may be powered by hybrid electric systems, batteries or potentially hydrogen fuel cells. (National Business Aviation Association)*



## Framing our Thoughts

- Three Points of Consideration
  - Convergence
  - Revolution
  - Policy/Ethics



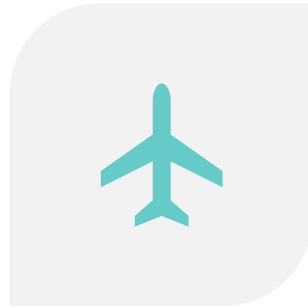
# AAM Aircrafts have arrived! (Photo by Joby Aviation)

# Terms & Acronyms



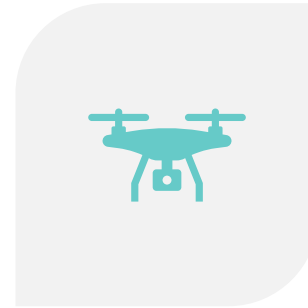
## **UAM**

URBAN AIR  
MOBILITY



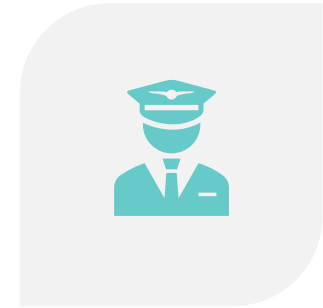
## **RAM**

REGIONAL AIR  
MOBILITY



## **UAS**

UNCREWED  
AIRCRAFT SYSTEM

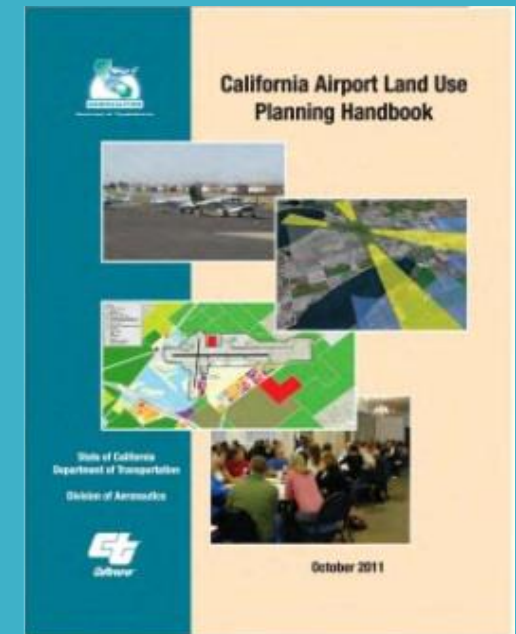
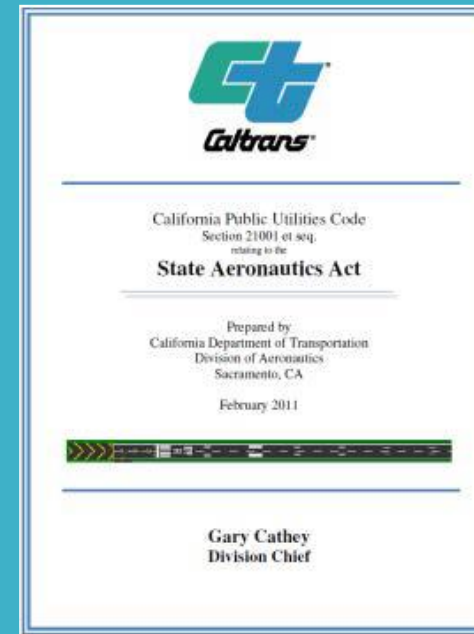


## **VERTIPORT**

TAKE AND LANDING  
LOCATION FOR  
EVTOLS

# Airport Land Use Planning

- Articulated via the Public Utilities Code(PUC)/ State Aeronautics Act (SAA)
- Guidance provided by the California Airport Land Use Planning Handbook (Handbook)
- <https://dot.ca.gov/programs/aeronautics/airport-land-use-planning>



# Airport Land Use Planning in CA

- Land use planning is conducted by Airport Land Use Commissions (ALUC) in designated Airport Influence Areas (AIA)
- ALUCs compose Airport Land Use Compatibility Plans (ALUCP)
- ALUCPs address safety, noise and overflight
- Primary guidance relates to land use compatibility and noise
- Land use is dictated by a series of safety zones based on historic crash data
  - Land use restrictions are created in zones with higher risk



# AAM in the Transportation System

- Getting it right this time and avoiding “infrastructure trauma” as experienced during the construction of the Interstate System
- Building a network of equitable facilities
  - Maximize existing uses, such as General Aviation Airports
    - Positive elements: Access to and from rural, disadvantaged or underserved communities, electrification
    - Negative elements: Increased noise, visual clutter, air quality degradation, surface congestion
- Building a system for AAM and incorporating it into a system plan
  - Where else do we place vertiports and integrate AAM into the transportation system?

# Adequacy of Existing Guidance

- Current standard is 65 dB
  - Section 4.1 of “Handbook”
- Does this meet needs?
  - New sound measurement technologies
  - New sound impact awareness
  - Equity issues, who is impacted?

# Placement of Vertiports

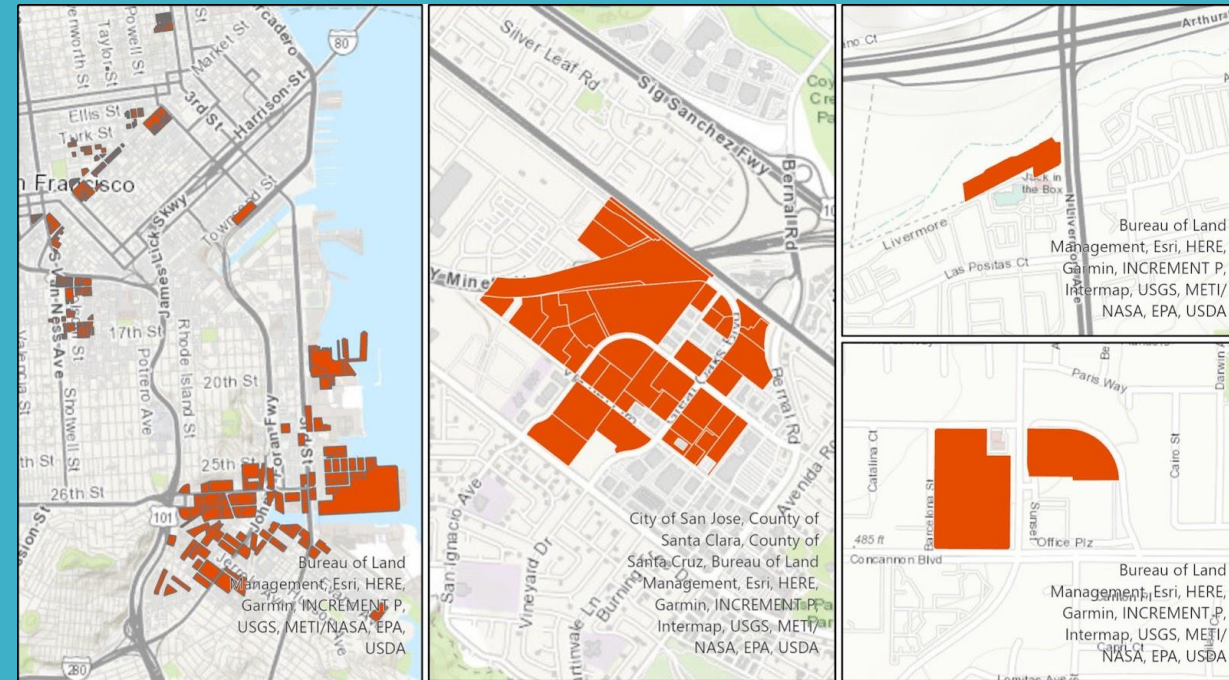
- Placement of vertiports is new territory for local land use authorities
- Land use issues have many additional and complex layers
- Importance of early consultation between stakeholders
- Caltrans sponsored research with SJSU & Mineta Transportation Institute to understand local considerations for vertiport site suitability in rural, suburban, and urban geographies related to safety, access, and equity using basic GIS tools





# SJSU Vertiport Case Study

- Three core areas of study for a land use analysis on vertiports: Safety, Access, Equity
  - \*Many parameters are not considered in this analysis
- Determine variables based on the areas of the local geography, develop a list of non-negotiable “high-priority” parameters
- Understand that suitability varies by community and preferences change
- Developing site suitability maps using a basic GIS analysis can begin fostering early conversation for considerations



	San Francisco	San Jose	Livermore
Total Parcels	234,693	459,282	51,836
Suitable Parcels	1,392	43	3

# Issues for Planners

## General Planning Issues

- System Planning
- Access
- **Equity**
- Light
- **Noise**

## Local Concerns

- Community Based Organizations
- Environmental Concerns
- Wildlife Interactions
- YIMBY & NIMBY

## Placement of Vertiports

## Technical Issues

- Zoning Code
- Use Permits
- Environmental Review

## Policy Issues

- FAA Airworthiness Certification
- Manufacturers & investors are eager for deployment

# Work is Underway

## FAA Guidance

[Engineering Brief 105 - Vertiport Design](#)

[AAM Implementation Plan](#)

## NASA

[AAM Community Integration Considerations Playbook](#)

[AAM Vertiport Considerations: A List and Overview](#)

## Non-Profit

[Community Air Mobility Initiative \(CAMI\) Resource Library](#)

[Urban Movement Labs – Integrating Advanced Air Mobility: A Primer for Cities](#)

## City Planning

[Los Angeles UAM Policy Framework Considerations](#)

[Miami-Dade Air Mobility Blueprint](#)

## Other States

[Ohio AAM Framework](#)

[Utah DOT Long-Range UAM Land-Use Planning for Vertiports](#)

## Research Publications

[UC Berkeley – UAM: History, Ecosystem, Market Potential, and Challenges](#)

[SJSU Mineta Transportation Institute - Land Use Analysis on Vertiports Based on a Case Study of the San Francisco Bay Area](#)

**THANK YOU**

Office of Aviation Planning | [Aeronautics@dot.ca.gov](mailto:Aeronautics@dot.ca.gov)

Matthew Friedman, Office Chief

[Matthew.friedman@dot.ca.gov](mailto:Matthew.friedman@dot.ca.gov)

[Aeronautics | Caltrans](#)

# Discussion - Q&A

- What about AAM sparks interest for your communities?
- What are your immediate local concerns and issues with AAM?

# HMMH's Summary & Review: *Large-Scale Validation Study of Aircraft Noise Modeling for Airport Arrivals*

Joseph Czech, Principal Consultant, HMMH

April 2024

- Thomas C. Rindfleisch, Alonso, Juan J., Jackson, Stanford University, and Donald C., Munguia, Brian C., NASA Jet Propulsion Laboratory, J. Acoust. Soc. Am., 155(3), March 2024



**A large-scale validation study of aircraft noise modeling for airport arrivals**

Thomas C. Rindfleisch,<sup>1,2</sup> Juan J. Alonso,<sup>1</sup> Donald C. Jackson,<sup>1</sup> Brian C. Munguia,<sup>1</sup> and Nicholas W. Bowman<sup>2</sup>

<sup>1</sup>Department of Aeronautics and Astronautics, Stanford University, Stanford, California 94305, USA

<sup>2</sup>Instrument Flight Software Group, NASA Jet Propulsion Laboratory, Pasadena, California 91011, USA

**ABSTRACT:**

In the U.S., the Federal Aviation Administration's Aviation Environmental Design Tool (AEDT) is approved to predict the impacts of aircraft noise and emissions. AEDT's critical role in regulatory compliance and evaluating the environmental impacts of aviation requires asking how accurate are its noise predictions. Previous studies suggest that AEDT's predictions lack desired accuracy. This paper reports on a large-scale study, using 200 000 flight trajectories paired with measured sound levels for arrivals to Runways 28L/28R at San Francisco International Airport, over 12 months. For each flight, two AEDT studies were run, one using the approved mode for regulatory filing and the other using an advanced non-regulatory mode with exact aircraft trajectories. AEDT's per aircraft noise predictions were compared with curated measured sound levels at two locations. On average, AEDT underestimated L<sub>Amax</sub> by -3.09 dB and SEL by -2.04 dB, combining the results from both AEDT noise-modeling modes. Discrepancies appear to result from limitations in the physical modeling of flight trajectories and noise generation, combined with input data uncertainties (aircraft weight, airspeed, thrust, and lift configuration) and atmospheric conditions.

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(Received 29 November 2023; revised 17 February 2024; accepted 23 February 2024; published online 11 March 2024)

[Editor: Anurag Agarwal]

Pages: 1928–1949

**1. INTRODUCTION**

As in many aviation metropolises, the deployment of the Federal Aviation Administration's (FAA's) Next Generation Air Transportation System (NextGen) in the San Francisco Bay area in March 2015, resulted in a ground swell of complaints due to changes to air traffic distribution and volume. These complaints have persisted and grown more insistent to the present day. The primary causes of these complaints have been:

- The sudden concentration of previously dispersed air traffic owing to the precision of NextGen navigation technologies such as the Global Positioning System (GPS),
- changes to established aircraft routes and procedures (by distances of up to five miles) that moved noise to communities that were unaccustomed to overflights, and
- the steady increase in overall air traffic volume.

There is an inevitable trade-off between the safety, economic, and environmental factors in the evolution of commercial aviation. These are routinely assessed and balanced using predictive models to estimate the parameters and consequences involved. In the U.S., the FAA Aviation Environmental Design Tool (AEDT) is the prescribed regulatory modeling system for estimating noise and air pollution levels that will result from traffic pattern designs and

changes. For aircraft noise predictions to provide useful information for both community impact assessments and the informed redesign of the airspace in making these trade-offs (Hauptvogel *et al.*, 2021), it is essential that predictions accurately model the level of noise produced by aircraft overflights, both near the airport, where the noise levels can be significant (>DNL 65 dB), and in areas farther away, where the noise levels are typically lower (~DNL 50 dB), and where complaints have increased significantly. There is growing evidence that AEDT has problems accurately predicting noise metrics.

The aims of this study are fourfold:

- (1) To collect a very large, statistically significant set of data, pairing aircraft flight profiles with carefully curated ground sound level measurements over time and identifying intrinsic limitations in the physical measurements.
- (2) To select aircraft study cohorts that control as much as possible many of the flight variables involved while examining AEDT behaviors for a broad, real-world fleet mix.
- (3) To tease out statistically significant measures of AEDT metric prediction accuracy and analysis anomalies, aircraft-type by aircraft-type, to reveal inherent computational strengths and weaknesses.
- (4) To provide recommendations for work needed to improve AEDT's noise prediction accuracy.

\*Email: [tcv@stanford.edu](mailto:tcv@stanford.edu)



0110102-0000-0000-0000-0000-0000

# Study

Analysis: Comparison of measured sound levels to modeled sound levels predicted with the Aviation Environmental Design Tool (AEDT), the FAA's model to assess fuel burn, emissions, and noise for aircraft arriving SFO Runways 28L and 28R

*Results: The measured single-event sound levels were approximately 1-4 dB higher, on average, than those predicted by AEDT.*

Note: HMMH did not participate in this study.



# Agenda

- Study's Bottom Line Up Front
- Study Details
- Responses and Observations to the Study

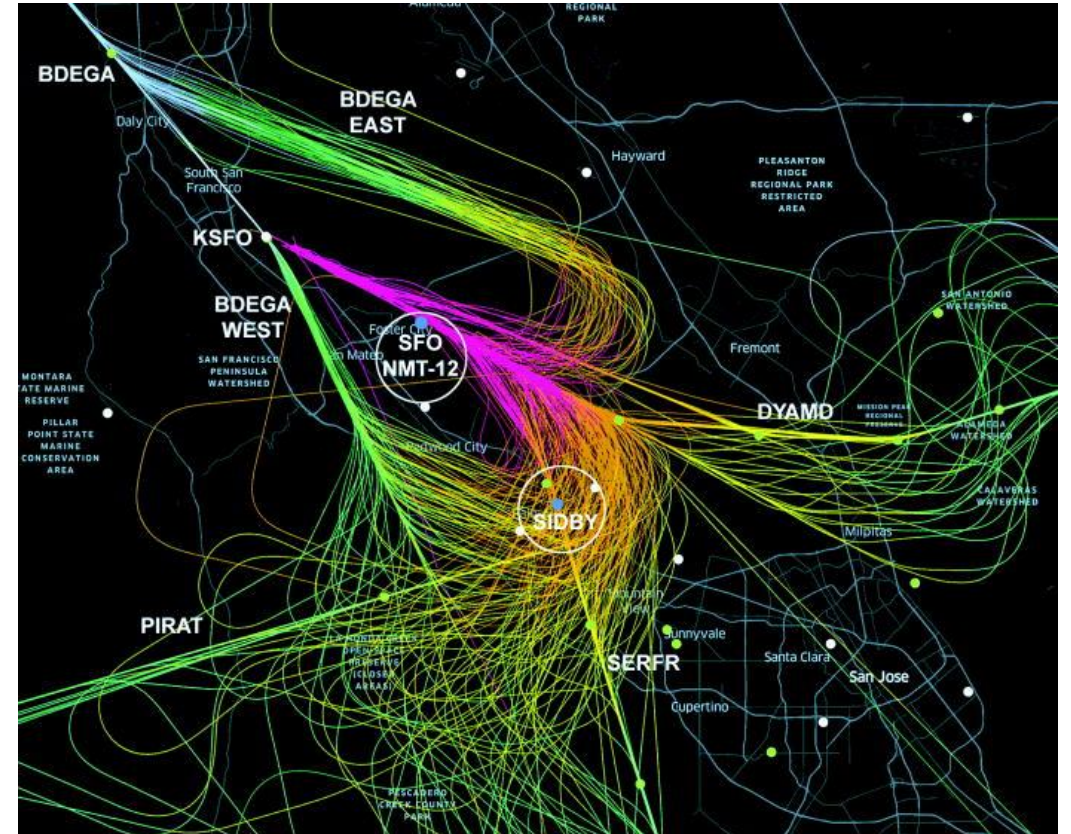


Figure 3, blue dots are SLM site



# Study's Bottom Line Up Front

---

- Regulatory Mode (Table VI, excluding SIDBY)

Over/Under	SEL (dB)	Lmax (dB)	Range of Uncertainties (dB)
Underpredicts vehicles	1.8 to 2.4 dB	3.5 to 3.6 dB	±2.3 to ±2.8

- Claim: *“AEDT has substantial prediction errors on approach trajectories and cannot be considered a reliable methodology for predicting valid aircraft noise impact.”*

# Study's Bottom Line Up Front (continued)

- Non-Regulatory Mode (Table VII)

Over/Under	SEL (dB)	Lmax (dB)	Range of Uncertainties (dB)
Underpredicts vehicles	1.6 to 2.7 dB	2.7 to 3.6 dB	±2.0 to ±3.4

- Claims:
  - (1) AEDT does not adequately account *“for increased noise levels with increased calibrated airspeed from auxiliary high-lift equipment and landing gear deployment”*
  - (2) accuracy is unknown for the AEDT Noise-Power-Distance (NPD) curves, and
  - (3) AEDT lacks knowledge of:
    - Aircraft’s weight and thrust when auxiliary lift equipment is deployed
    - Weather and atmospheric conditions at the time of the aircraft operation

# Study Details

- Arrivals to San Francisco International Airport (SFO) Runways 28L & 28R
- 12-month period; July 2021-June 2022
- ~175,000 usable pairs of AEDT predictions with (portable) Sound Level Meter (SLM) measurements
  - Two SLM sites
  - Two prediction modes
    - AEDT-R: “regulatory”, using Base of Aircraft Data (BADA) version 3
    - AEDT-AE: Non-regulatory, using BADA4

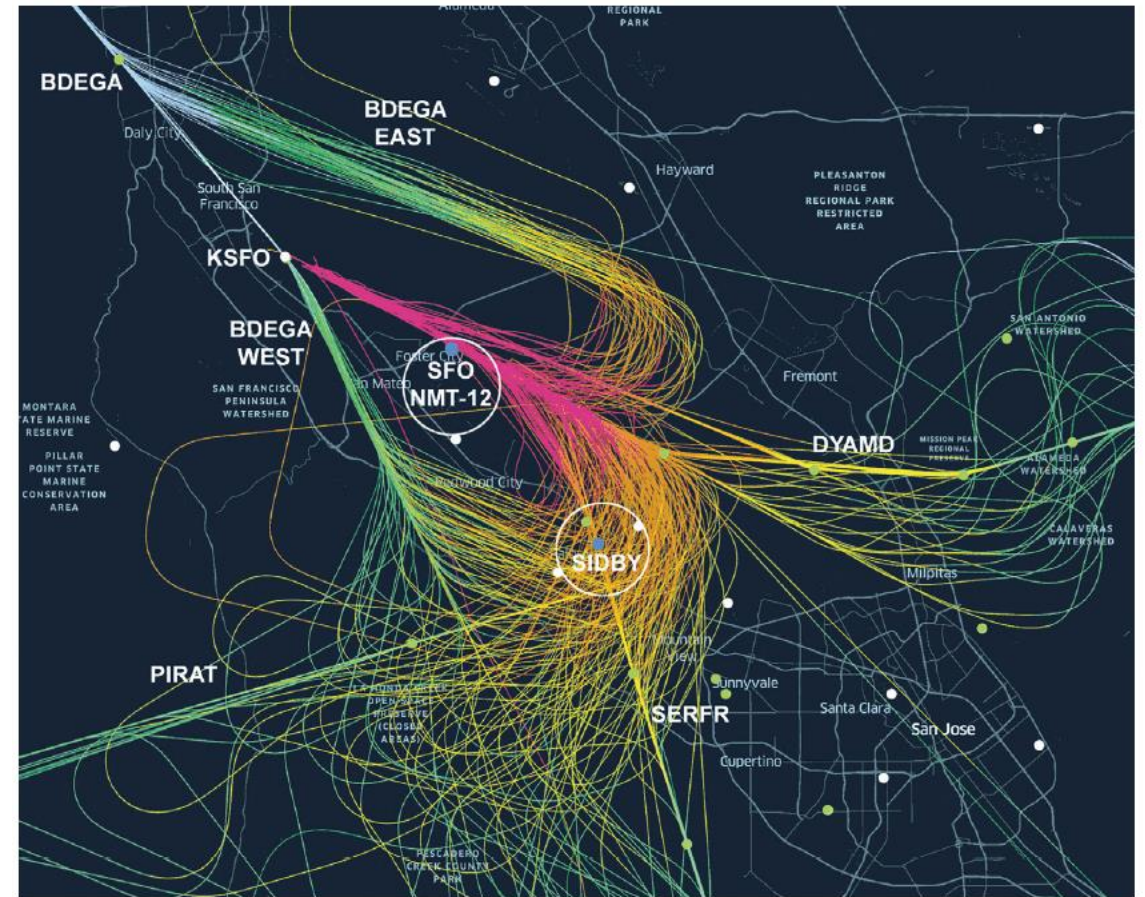
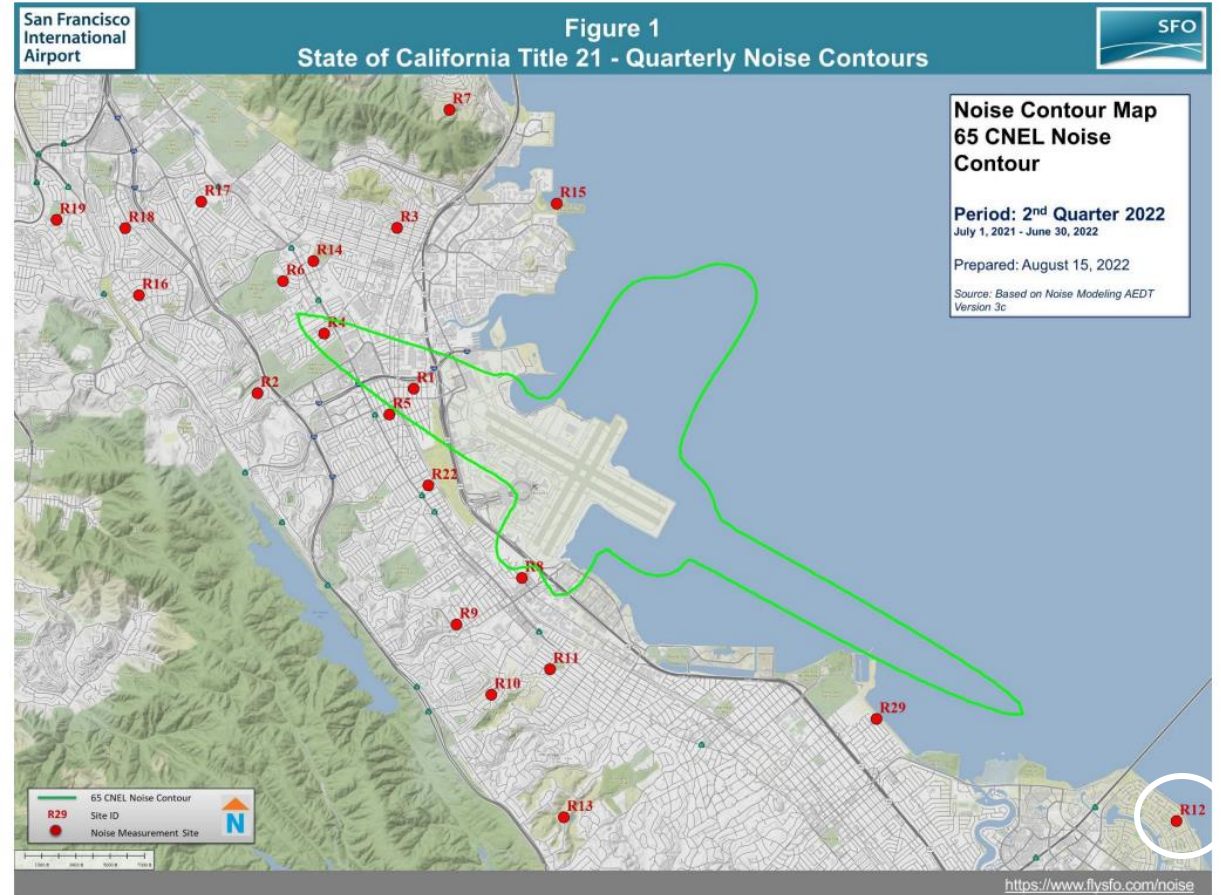


Figure 3, blue dots are SLM site

# Study Details: Cross Referencing Site 12

- Study used “SFO NMT-12”
- Shown in SFO Quarterly Reports as
  - “Site 12, Foster City”
  - For Period July 21 through June 2022:
    - Aircraft CNEL reported as 60.7 dB
- Site 12 is just over 6 miles from the end of Runway 28
  - Estimated arrival altitudes 1,700 ft to 1,800 ft MSL

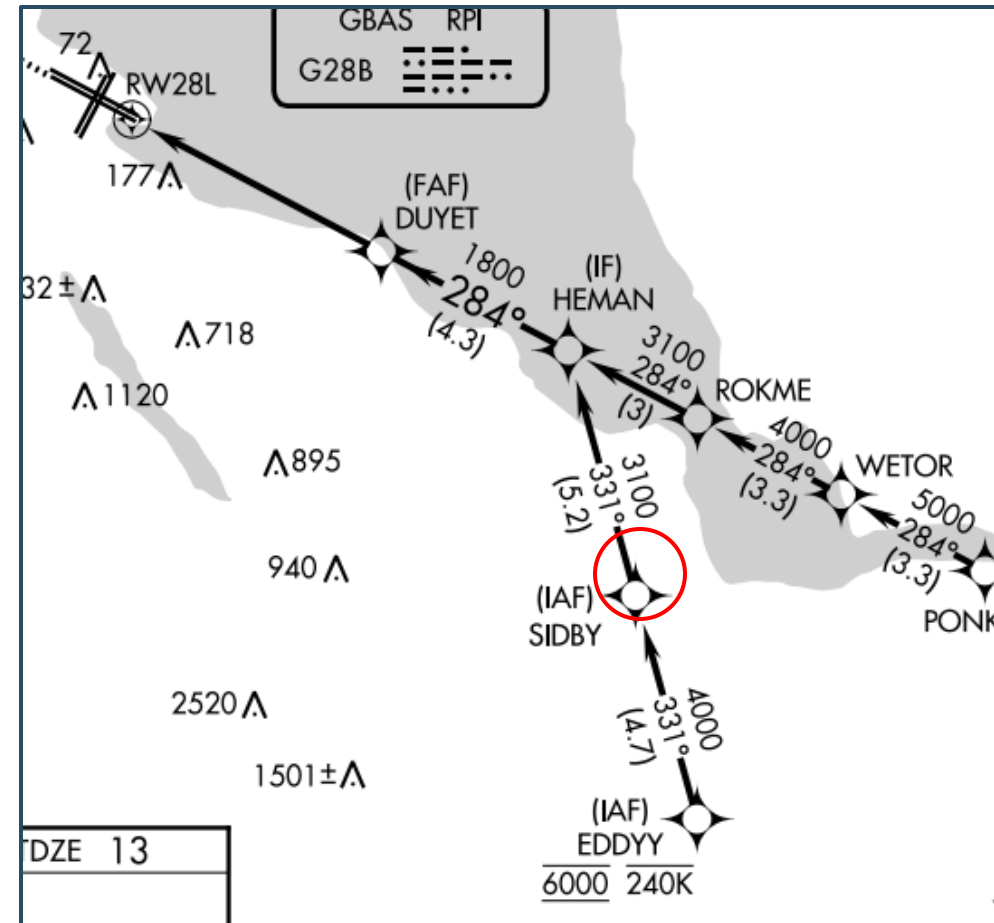


Source:

SFO Quarterly Noise Report for 2<sup>nd</sup> Quarter, 2022,  
August 15, 2022

# Study Details: Cross Referencing Site SIDBY

- Study used noise monitoring location near “SIDBY”
- SIDBY is about 17.5 miles (15.2 nautical miles) flight distance from the end of Runway 28
  - Palo Alto area - approximate



Source:  
[FAA Terminal Procedures for SFO, GLS RWY 28L,  
effective 21 MAR 2024 to 18 APR 2024](#)



# FAA Response

## “...too narrow...to draw broad conclusions...”

- FAA sponsored this research under Aviation Sustainability Center (ASCENT) Project 53
- FAA is further funding Project 53 to examine noise from departure operations
- FAA is funding other ASCENT analysis of operational noise at different airports to expand coverage

*“While we view Project’s 53 initial results as useful, they are too narrowly focused to draw broad conclusions regarding the overall accuracy of AEDT’s noise modeling capability and its ability to meet the requirements for which it was developed”*

Source: Airport Noise Report, Volume 36, Number 8, March 22, 2024

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### Airport Noise Report

Volume 36, Number 8 March 22, 2024

#### AEDT

##### JASA STUDY TOO NARROW TO DRAW BROAD CONCLUSIONS ON AEDT ACCURACY, FAA SAYS

ANR asked the FAA for comment on the findings of a major study reported March 11 in the *Journal of the Acoustical Society of America (JASA)* which concluded that FAA's Aviation Environmental Design Tool used in regulatory mode (AEDT-R) "is overly simplistic and gives far from accurate comparison with ground sound level monitor (SLM) measurements" (36 ANR 26).

Following are FAA's comments on the study, which was conducted by four researchers in Stanford University's Department of Aeronautics and Astronautics and one researcher at NASA's Jet Propulsion Laboratory in Pasadena, CA:

"The FAA sponsored this research under ASCENT Project 53, *Validation of Low-Exposure Noise Modeling by Open-Source Data Management and Visualization Systems Integrated with AEDT* (ASCENT - The Aviation Sustainability Center - <https://ascnt.aero/>).

"We sponsor research such as this to help the global community further improve the noise modeling accuracy of our environmental modeling tools beyond what is the current recognized standard (ICAO Doc 9911). The results of this research will be studied further to evaluate current noise modeling capabilities.

"However, as the authors note, this study is a comparison of modeling and measurements "...focused on SFO arrivals..." only. The FAA is further funding Project 53 to examine noise from departure operations as well. In addition, we are funding other ASCENT analyses of operational noise at different airports to expand national coverage.

"While we view Project 53's initial results as useful, they are too narrowly focused to draw broad conclusions regarding the overall accuracy of AEDT's noise modeling capability and its ability to meet the requirements for which it was developed."

#### Better Thrust Data Needed

ANR asked Vince Mestre, who has over 50 years of experience in airport noise control and acoustical engineering nationally and internationally, to weigh in on the AEDT study reported in JASA.

Mr. Mestre is the former Chairman of the Society of Automotive Engineers A-21 Subcommittee that develops best practice guidance documents for the measurement and modeling of noise and aviation emissions modeling. He also is a member of the Institute of Noise Control Engineers, the Society of Automotive Engineers, and the Acoustical Society of America. He is a licensed Mechanical Engineer and has published peer reviewed journal articles, including 13 JASA articles.

He provided the following "Additional Thoughts On the Discrepancies Between Measured and Modeled Noise Levels":

(Continued on p. 31)

#### In This Issue...

**AEDT ...** FAA says the findings of a major study critical of the accuracy of AEDT's modeling of aircraft arrival noise at SFO "are too narrowly focused to draw broad conclusions regarding the overall accuracy of AEDT's noise modeling capability." Acoustical expert Vince Mestre says better data on aircraft thrust is needed to improve AEDT; communities say FAA's current method of assessing aviation noise is seriously flawed - p. 30

**NASA ...** The agency seeks public comment on its plan to remotely test people's annoyance to noise from AAM/UAM vehicles to determine if there are significant differences in annoyance between low and high ambient noise environments and in different geographic areas - p. 32

**National Parks ...** FAA and NPS announce a proposed commercial air tour management voluntary agreement for the Lake Mead National Recreation area - p. 33

Airport Noise Report

# Mestre's Response

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- Authors neglect to mention two types of measurement uncertainty
  - Instrument (the Sound Level Meter, microphone, etc.)
    - International Standards Organization (ISO) Document 20906 cites measured SEL uncertainty of +0.8 dB, mitigating AEDT's underprediction of SEL
  - Contamination of non-aircraft sources occurring simultaneously with aircraft events
    - Mestre points to the CL600 discrepancy (compared to AEDT's correct prediction of 747-400) as indication of the presence of this uncertainty
- Authors neglect to recognize "Regulatory" mode does not necessarily model real-world altitude profiles

Source: Airport Noise Report, Volume 36, Number 8, March 22, 2024

# HMMH Observations

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- Large aircraft arrival data sample (full year/all seasons) at a single airport
- We concur with the stated possible reasons for the differences:
  - Noise Power Distance (NPD) curves
  - Assumed airspeed in AEDT
- Measurements occurred outside of the typical area of 65 dB CNEL/DNL
  - Reported differences may not exist closer in to the airport
- Measurement occurred in the area analyzed by the FAA for flight procedure changes
  - Such analyses typically use the altitude control codes (ACC) feature of AEDT to get the altitudes to better match to actual flights
  - We would recommend the modeling be redone using ACC feature



# HMMH Observations (continued)

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- Measurement differences from the CL600 skewed the average differences
  - Reported 7 dB SEL difference, lowest SEL of the reported aircraft, is an outlier and statistically should have been removed from the overall average difference
- Modeled aircraft may not have been chosen with FAA-approved substitutions
- Tabulated results include overestimations (measurements lower than modeled) but not mentioned
- Consulted FAA/Volpe but the report was not thoroughly peer reviewed prior to publishing

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Joe Czech, Principal Consultant

Contributions from:  
Dave Crandall, Rhea Hanrahan and Gene Reindel



## MEMORANDUM

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**To:** SFO Community Roundtable Members and Interested Parties

**From:** Jason R. Stoddard, Senior Airspace Analyst  
Eugene M. Reindel, Vice President

**Date:** February 7, 2024

**Subject:** Federal Aviation Administration (FAA) Instrument Flight Procedures (IFP)  
Information Gateway Review

**Reference:** HMMH Project Number 312310

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At the request of the Roundtable, Harris Miller Miller & Hanson Inc. (HMMH) is monitoring and reviewing updates to procedures published onto the FAA's IFP Information Gateway in the regions of San Francisco International Airport (SFO), Metropolitan Oakland International Airport (OAK), and Norman Y. Mineta San Jose International Airport (SJC).

After analyzing the documents posted, HMMH determines proposed changes and the reason for the changes. The FAA IFP Information Gateway published seven updates for SFO, one update for OAK, and three update for SJC. There are currently two open comment periods. The next publication is expected on February 22, 2024.

### Important Terms and Items:

- FAA Stage Definitions
  1. FPT: Procedures are coordinated with Air Traffic, Tech Ops and Airports for feasibility, preparation, and priority (FPO)
  2. DEV: Development of the procedures
  3. FC: FAA Flight Inspection of the developed procedures
  4. PIT: Production Integration Team (TS)
  5. CHARTING: Procedures at Arnav Products Charting for publication (NACO)
  
- FAA Status Definitions
  1. At Flight Check: At Flight Inspection for procedure validation
  2. Awaiting Publication: At Arnav Products Charting for publication
  3. Complete: Procedure development action finished
  4. On Hold: Procedure waiting data/information to allow it to proceed/continue to next stage
  5. Pending: Procedure development work on-going
  6. Published: Procedure charted and published
  7. Under Development: Procedure is being worked on by the FAA
  8. Terminated: Procedure/project terminated
  
- Glossary
  - RNAV: Area Navigation
  - ATC: Air Traffic Control
  - IAP: Instrument Approach procedure
  - STAR: Standard Terminal Arrival Route
  - SID: Standard Instrument Departure
  - GPS: Global Positioning System
  - ILS: Instrument Landing System
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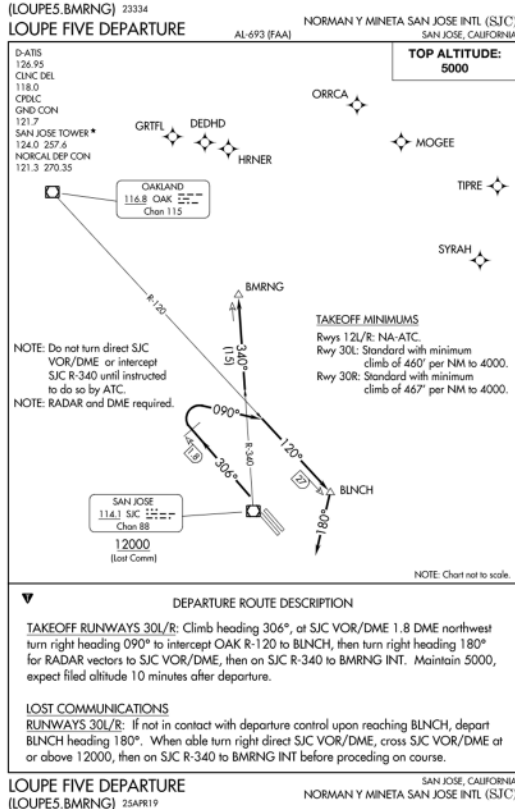
### Updates:

- SFO NIITE FOUR (RNAV) SID
  - Status remains Under Development
  - Publication Date changed to July 11, 2024
- SFO PIRAT THREE (RNAV) SID
  - Status remains Under Development
  - Publication Date changed to July 11, 2024
- SFO RNAV (GPS) RWY 10L, AMDT 3
  - Status changed to Under Development
  - Publication Date changed to July 11, 2024
- SFO SEGUL ONE (RNAV) SID
  - Status remains as Under Development
  - Publication Date changed to July 11, 2024
- SFO STAR ALWAYS THREE (RNAV)
  - Status remains as Under Development
  - Publication Date changed to July 11, 2024
- SFO STAR STLER FOUR (RNAV)
  - Status remains as Under Development
  - Publication Date changed to July 11, 2024
- SFO STAR WWAVS TWO (RNAV)
  - Status remains as Under Development
  - Publication Date changed to July 11, 2024
- SJC STAR BRIXX FOUR (RNAV)
  - Status changed to Awaiting Publication
  - Scheduled Publication Date of March 21, 2024
- SJC SID LOUPE FIVE (RNAV)
  - Status changed to Awaiting Cancellation
  - Scheduled Cancellation Date of May 16, 2024
- SJC SID LOUPE ONE (RNAV)
  - Status changed to At Flight Check
  - Scheduled Publication Date of May 16, 2024
- OAK SID OAKLAND SIX
  - Status changed to Published
  - Scheduled Publication Date of January 25, 2024

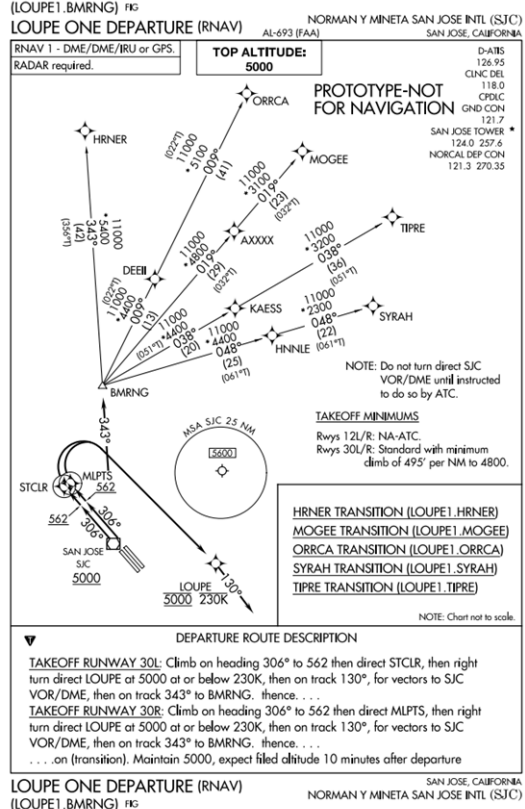
### Open Comment Periods:

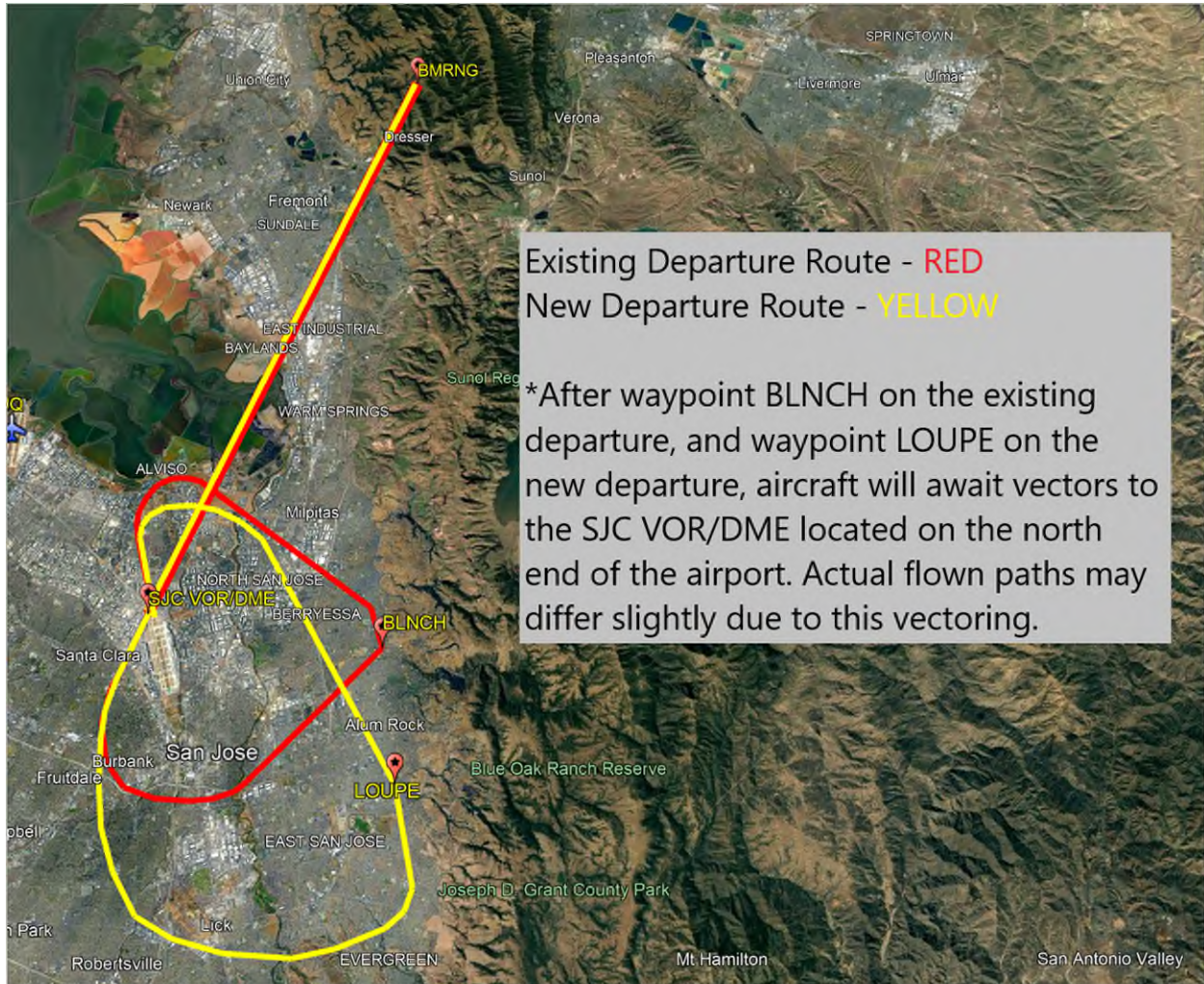
- SJC SID LOUPE ONE (RNAV) & SJC SID LOUPE FIVE
  - Comment period ends February 13 and 14, 2024 respectively
  - The following changes are expected:
    - Planned cancellation of existing SID LOUPE FIVE and replacing it with SID LOUPE ONE (RNAV)
    - Graphical depictions of the existing SID (LOUPE FIVE) and new SID (LOUPE ONE (RNAV)) are located on the following pages
  - Concerns can be submitted via [https://www.faa.gov/air traffic/flight info/aeronav/aero data/Aeronautical Inquiries/?event=email.con tact&details=General%20Comments](https://www.faa.gov/air%20traffic/flight%20info/aeronav/aero%20data/Aeronautical%20Inquiries/?event=email.contact&details=General%20Comments)

**Existing SID**



**Proposed SID**





- On the existing departure (depicted in red) aircraft are instructed to take off from RWY 30 and fly runway heading until reaching 1.8 nautical miles (NM) from the SJC VOR/DME. The SJC VOR/DME is located just northwest of RWY 30L at SJC. After reaching 1.8NM from the SJC VOR/DME, aircraft turn right heading 090 to intercept a course to waypoint BLNCH. Once aircraft reach BLNCH, they will turn right heading 180, and await vectors from ATC to fly towards the SJC VOR/DME. Once the aircraft reaches the SJC VOR/DME, they will proceed to waypoint BMRNG and then complete the remainder of the departure.
- On the new departure, aircraft will fly runway heading until reaching a waypoint that is approximately 1.9NM off the departure end of the runway. After reaching this waypoint, aircraft are instructed to turn right directly towards waypoint LOUPE. After passing waypoint LOUPE, aircraft will fly heading 130 and await vectors from ATC towards the SJC VOR/DME. Once the aircraft reach the SJC VOR/DME, they will proceed to waypoint BMRNG and then complete the remainder of the departure.

**Next Publication:** We do not expect any updates in the February 22, 2024 publication.



## MEMORANDUM

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**To:** SFO Community Roundtable Members and Interested Parties

**From:** Jason R. Stoddard, Senior Airspace Analyst  
Eugene M. Reindel, Vice President

**Date:** March 21, 2024

**Subject:** Federal Aviation Administration (FAA) Instrument Flight Procedures (IFP)  
Information Gateway Review

**Reference:** HMMH Project Number 312310

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At the request of the Roundtable, Harris Miller Miller & Hanson Inc. (HMMH) is monitoring and reviewing updates to procedures published onto the FAA's IFP Information Gateway in the regions of San Francisco International Airport (SFO), Metropolitan Oakland International Airport (OAK), and Norman Y. Mineta San Jose International Airport (SJC).

After analyzing the documents posted, HMMH determines proposed changes and the reason for the changes. The FAA IFP Information Gateway published eight updates for SFO, one update for OAK, and one update for SJC. There are currently eight recently closed comment periods. The next publication is expected on March 21, 2024.

### Important Terms and Items:

- FAA Stage Definitions
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  2. DEV: Development of the procedures
  3. FC: FAA Flight Inspection of the developed procedures
  4. PIT: Production Integration Team (TS)
  5. CHARTING: Procedures at Arnav Products Charting for publication (NACO)
  
- FAA Status Definitions
  1. At Flight Check: At Flight Inspection for procedure validation
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**Updates:**

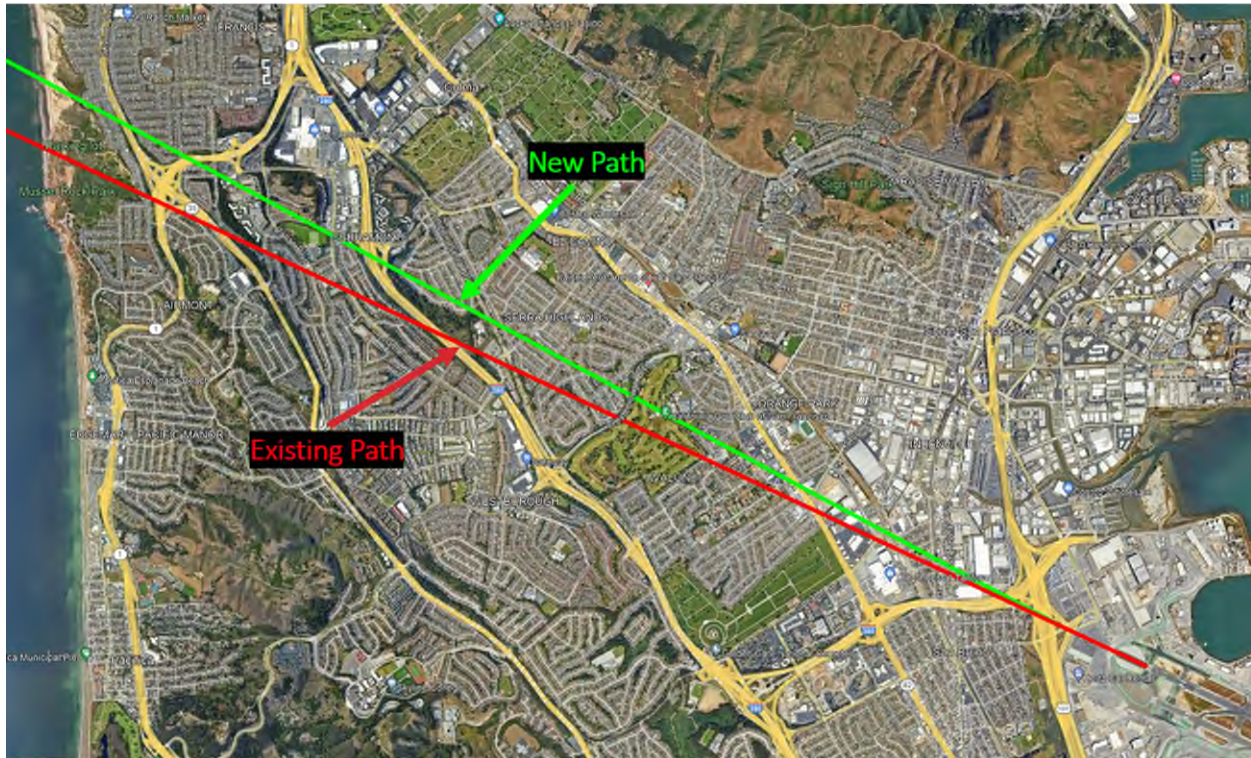
- SFO NIITE FOUR (RNAV) SID
    - Status changed to At Flight Check
    - Publication Date changed to July 11, 2024
  - SFO PIRAT THREE (RNAV) STAR
    - Status changed to At Flight Check
    - Publication Date changed to July 11, 2024
  - SFO RNAV (GPS) RWY 10L, AMDT 3
    - Status changed to At Flight Check
    - Publication Date changed to July 11, 2024
  - SFO SEGUL ONE (RNAV) SID
    - Status changed to At Flight Check
    - Publication Date changed to July 11, 2024
  - SFO STAR ALWAYS THREE (RNAV)
    - Status changed to At Flight Check
    - Publication Date changed to July 11, 2024
  - SFO STAR STLER FOUR (RNAV)
    - Status changed to At Flight Check
    - Publication Date changed to July 11, 2024
  - SFO STAR WWAVS TWO (RNAV)
    - Status changed to At Flight Check
    - Publication Date changed to July 11, 2024
  - SFO SID OFFSHORE TWO
    - Status changed to Awaiting Cancellation
    - Cancellation Date changed to July 11, 2024
  - SJC SID LOUPE ONE (RNAV)
    - Status changed to Awaiting Publication
    - Scheduled Publication Date of May 16, 2024
  - OAK SID OAKLAND SIX
    - Status changed to Published
    - Scheduled Publication Date of January 25, 2024
- **Next Publication:** We are not anticipating any updates in the March 21, 2024 publication.

**Recently Closed Comment Periods:**

- SFO NIITE FOUR (RNAV) SID
  - Comment period ended March 13, 2024
  - The following changes are expected:
    - This is an abbreviated amendment with only administrative changes expected
- SFO PIRAT THREE (RNAV) STAR
  - Comment period ended March 13, 2024
  - The following changes are expected:
    - Administrative remarks were updated to meet current FAA standards
    - Altitude restrictions were changed at various points along the STAR, however all changes were above 8,000 ft. and should be transparent to local communities
- SFO RNAV (GPS) RWY 10L
  - Comment period ended March 13, 2024
  - The following changes are expected:
    - Final approach course shifted north to accommodate a final approach course offset of 3 degrees.
    - Updated Flight Path can be seen in image below:



### Proposed Amendments to RNAV (GPS) RWY 10L



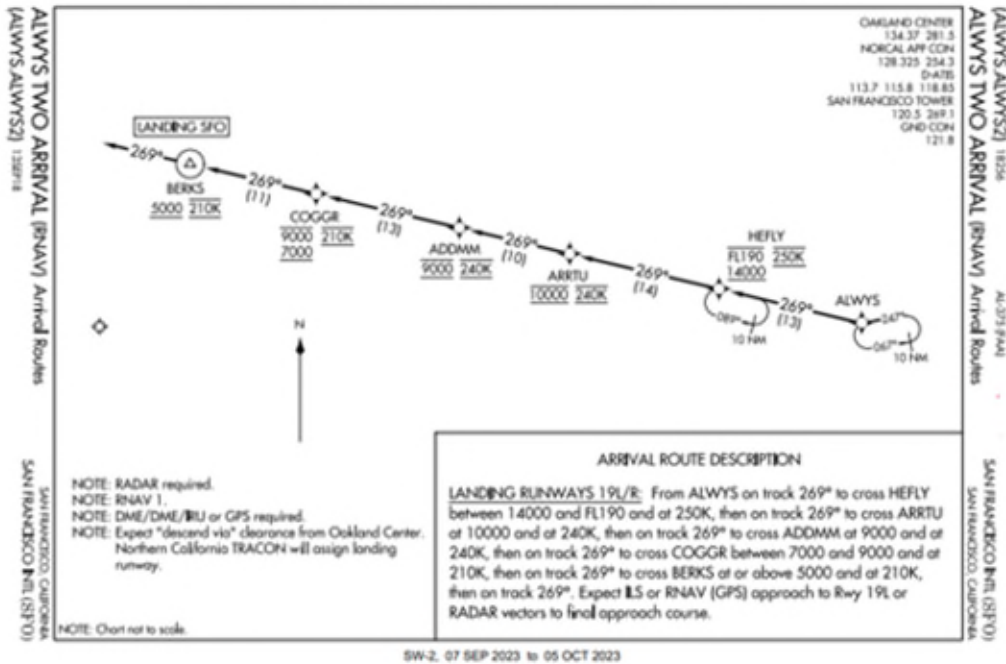
- SFO SID SEGUL ONE (RNAV)
  - Comment period ended March 13, 2024  
New SID departing from Runways 28L/R and 1L/R:
    - Flight Path and proposed Departure Procedure Chart can be seen in image below:

**Proposed SEGUL ONE DEPARTURE (RNAV) Compared to Canceled OFFSHORE TWO DEPARTURE**

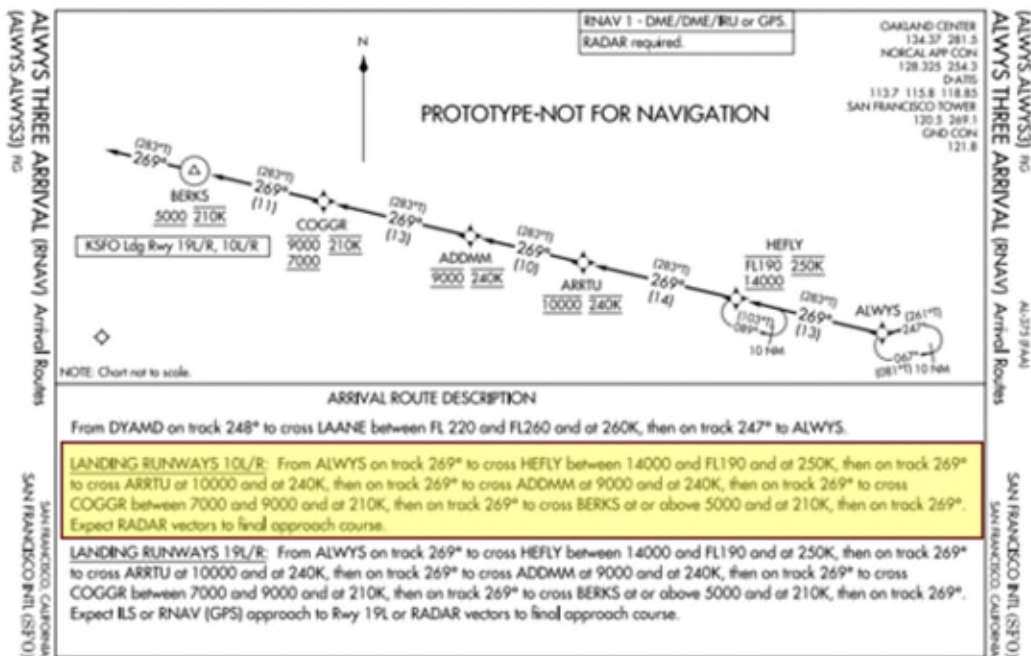


- SFO STAR ALWAYS THREE (RNAV)
  - Comment period ended March 13, 2024  
The following changes can be expected:
    - Minor administrative remarks were changed that will not impact flight paths or altitudes.
    - Arrival now available for landing on runways 19L/R and 10L/R, whereas previously the arrival was only available for landing on runway 19L/R.

### EXISTING ALWAYS TWO (RNAV) PROCEDURE



### PROPOSED ALWAYS THREE (RNAV) PROCEDURE



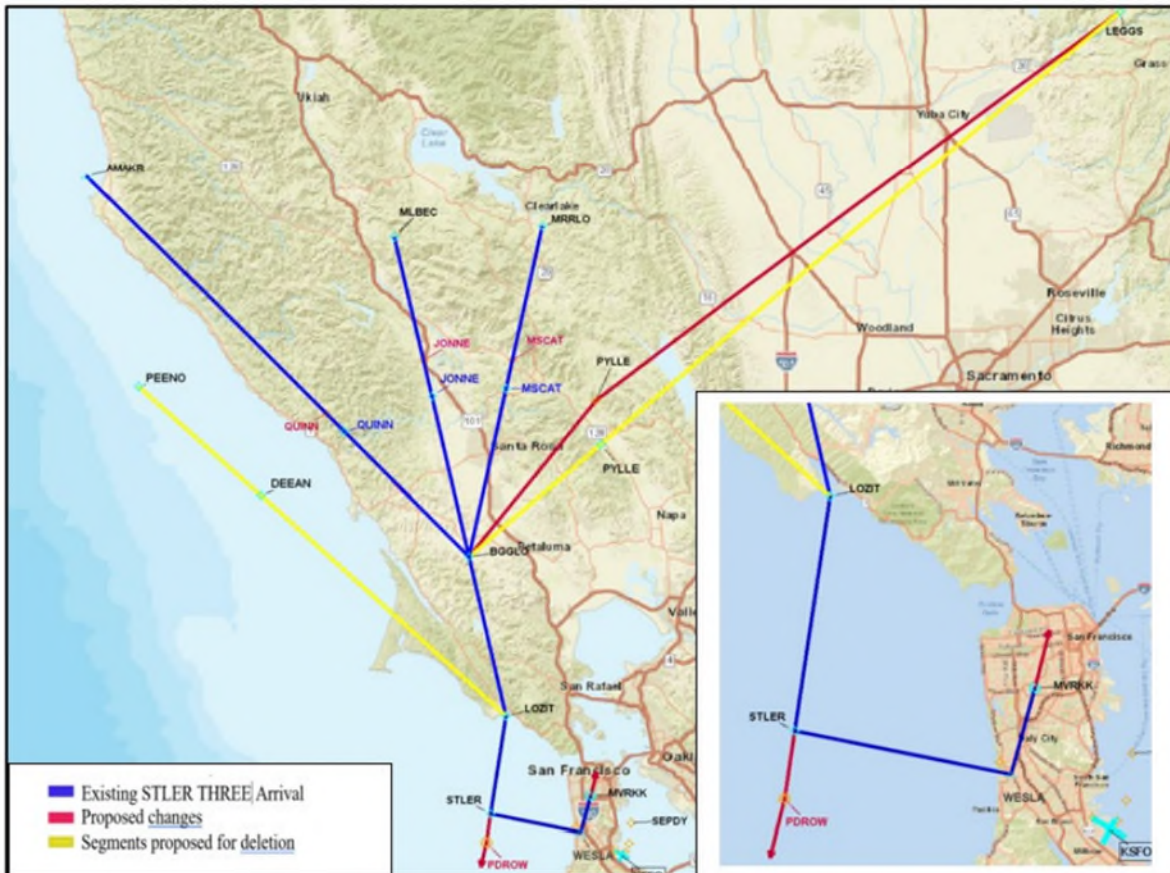
- SFO STAR BDEGA FOUR (RNAV)
  - Comment period ended March 13, 2024The following changes can be expected:
  - All changes to STAR route and altitudes only affect route segments and waypoints above 10,000 ft. MSL. No change expected to impact surrounding communities.
  - STAR restricted to arrivals for only 1R and 28L/R.

### Proposed Amendments for BDEGA FOUR ARRIVAL (RNAV)



- SFO STAR STLER FOUR (RNAV)
  - Comment period ended March 13, 2024
  - The following changes can be expected:
    - Added RWY 10 L/R transition to the procedure. From STLER WP aircraft would track 175° to cross PDROW WP At 7,000 ft MSL, then on track 180°. Expect radar vectors to final approach course.

### Proposed Amendments for STLER FOUR ARRIVAL (RNAV)



- SFO STAR WWAVS TWO (RNAV)
  - Comment period ended March 13, 2024
  - The following changes can be expected:
    - Added RWY 10 L/R transition to the procedure. From WPOUT WP aircraft would track 305° to cross PLLAR WP At 6,000 ft MSL and AT 210 KIAS, then track 310°. Expect radar vectors to final approach course.
    - Graphical depiction of changes can be seen on following page.

### Proposed Amendments for WWAVS TWO ARRIVAL (RNAV)



**U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
CATEGORICAL EXCLUSION DECLARATION**

**SEGUL ONE DEPARTURE (RNAV) (New)  
ALWYS THREE ARRIVAL (RNAV) (Amend)  
BDEGA FOUR ARRIVAL (RNAV) (Amend)  
STLER FOUR ARRIVAL (RNAV) (Amend)  
WVAVS TWO ARRIVAL (RNAV) (Amend)  
PIRAT THREE ARRIVAL (RNAV) (Amend)  
RNAV (GPS) RWY 10L (Amend)  
OFFSHORE TWO DEPARTURE (Cancel)**

**San Francisco International Airport (KSFO)  
San Francisco, California**

**Description of Proposed Action**

The Federal Aviation Administration (FAA) is proposing to implement one new departure procedure, amend five arrival procedures, amend one approach procedure, and cancel one departure procedure at San Francisco International Airport (KSFO), San Francisco, California. The proposed procedures are as follows:

- SEGUL ONE DEPARTURE (Area Navigation [RNAV]) – New
- ALWYS THREE ARRIVAL (RNAV) – Amend
- BDEGA FOUR ARRIVAL (RNAV) – Amend
- STLER FOUR ARRIVAL (RNAV) – Amend
- WVAVS TWO ARRIVAL (RNAV) – Amend
- PIRAT THREE ARRIVAL (RNAV) – Amend
- RNAV (Global Positioning System [GPS]) Runway (RWY) 10 Left (L) – Amend
- OFFSHORE TWO DEPARTURE – Cancel

Amendments to the ALWYS TWO ARRIVAL (RNAV), BDEGA THREE ARRIVAL (RNAV), STLER THREE ARRIVAL (RNAV), WVAVS ONE ARRIVAL (RNAV), and PIRAT TWO ARRIVAL (RNAV) would update design criteria, add RWY 10 L/Right (R) transitions, and deconflict aircraft from Bay Area departures. Canceling the conventional OFFSHORE TWO departure procedure (a turbojet-only procedure) and replacing it with the SEGUL ONE DEPARTURE (RNAV) (also a turbojet-only procedure) will enable aircraft flight crews to enter the procedure into the aircraft's flight management system, thereby reducing the potential for error.

Proposed Action amendments to the ALWYS TWO ARRIVAL (RNAV), BDEGA THREE ARRIVAL (RNAV), STLER THREE ARRIVAL (RNAV), and PIRAT TWO ARRIVAL (RNAV) either occur well above altitudes necessary for environmental consideration, or over

water. Therefore, when considering study areas, only the proposed RNAV (GPS) RWY 10L, WWAVS TWO ARRIVAL (RNAV), and SEGUL ONE DEPARTURE (RNAV) procedures required further analysis with study areas.

Annual aircraft operational statistics at KSFO were obtained from the Performance Data Analysis and Reporting System (PDARS) database for a period of December 6, 2022–December 5, 2023, and are presented in **Tables 1 and 2**.

**Table 1. PDARS Operational Statistics at KSFO Fleet Mix**

<b>Category</b>	<b>Annual Aircraft Operations 12/6/2022–12/5/2023</b>	<b>Percentage</b>	<b>Average Per Day</b>
Jet Heavy	62,237	16.67	170.51
Jet Large	292,201	78.29	800.55
Jet Small	15,177	4.07	41.58
Turboprop	2,740	0.73	7.51
Piston Props	104	0.03	0.28
Helicopter	733	0.20	2.01
Unknown	25	0.01	0.07
<b>Total</b>	<b>373,217</b>	<b>100.00</b>	<b>1,022.51</b>

**Table 2. PDARS Operational Statistics at KSFO Runway Use**

<b>Runway</b>	<b>Arrivals</b>	<b>Departures</b>	<b>Totals</b>
RWY 10L	247	4,803	5050
RWY 10R	218	3,140	3,358
RWY 28L	64,853	56,785	121,638
RWY 28R	113,161	13,968	127,129
RWY 1L	0	39,136	39,136
RWY 1R	3	66,431	66,434
RWY 19L	8,034	104	8,138
RWY 19R	436	823	1,259
Unknown	314	761	1,075
<b>Totals</b>	<b>187,266</b>	<b>185,951</b>	<b>373,217</b>



**Table 3. Description of Proposed Action**

Proposed Procedure	Proposed Changes
<p>SEGUL ONE DEPARTURE (RNAV) (New)</p>	<p>Would replace the OFFSHORE TWO DEPARTURE.</p> <ul style="list-style-type: none"> <li>• SEPDY waypoint (WP) would move approximately (~)0.64 nautical miles (NM) east from its current location.</li> <li>• WAMMY WP would be added ~19.69 NM southwest of SEPDY WP and ~13.65 NM southwest of SENZY WP.</li> <li>• MCKEY WP would be replaced with YYUNG WP located ~2.10 NM northeast of MCKEY WP.</li> </ul> <p>Runway transition to common WP—SEGUL WP—would be:</p> <ul style="list-style-type: none"> <li>• From RWY 1 L/R: Climb on heading 014° to 513 ft MSL, then climbing left turn direct SEPDY WP, then left turn direct WAMMY WP, then track 154° to cross SEGUL WP at or above (AOA) 16,000 feet (ft) mean sea level (MSL) (over water).</li> <li>• From RWY 28 L/R: Climb on heading 284° to 513 ft MSL, then climbing left turn direct SENZY WP, then left turn direct WAMMY WP, then track 154° to cross SEGUL WP AOA 16,000 ft MSL (over water).</li> </ul> <p>En route transition from SEGUL WP to YYUNG WP would be:</p> <ul style="list-style-type: none"> <li>• From SEGUL WP track 154° to cross CYPRS WP AOA flight level (FL) 220 (over water).<sup>1</sup> Minimum en route altitude (MEA) of 16,000 ft MSL would be established between SEGUL WP and CYPRS WP. Minimum obstruction clearance altitude (MOCA) would be 2,200 ft MSL.</li> <li>• From CYPRS WP track 115° to cross YYUNG WP. MEA would be FL220, MOCA would be 4,600 ft MSL.</li> </ul>
<p>ALWYS THREE ARRIVAL (RNAV) (Amend)</p>	<ul style="list-style-type: none"> <li>• MEA from RUSME WP to DYAMD WP would decrease from FL220 to FL200.</li> <li>• MOCA of 15,300 ft MSL would be established between INYOE WP and DYAMD WP.</li> <li>• MOCA of 15,300 ft MSL would be established between RUSME WP and DYAMD WP.</li> <li>• MEAs and MOCAs between DYAMD WP and ALWYS WP would be removed.</li> <li>• Would add RWY 10 L/R transition to the procedure.</li> </ul>

<sup>1</sup> In aviation, a flight level (FL) is an aircraft's altitude at standard air pressure and therefore is not necessarily the same as the aircraft's actual altitude, either above sea level or above ground level. Aircraft altitudes AOA 18,000 ft will be referenced in FL.

Proposed Procedure	Proposed Changes
<p style="text-align: center;">BDEGA FOUR ARRIVAL (RNAV) (Amend)</p>	<ul style="list-style-type: none"> <li>• PEENO transition—PEENO WP to LOZIT WP—would be removed.</li> <li>• PYLLE WP would move approximately (~)5.35 nautical miles (NM) north of its current location. Course heading from LEGGS WP to PYLLE WP would change from 216° to 219°. Course heading from PYLLE WP to BGGLO WP would change from 216° to 205°.</li> <li>• QUINN WP would move ~2.98 NM northwest of its current location and along the existing flight path.</li> <li>• JONNE WP would move ~4.12 NM north-northwest of its current location and along the existing flight path.</li> <li>• MSCAT WP would move ~3.50 NM north-northeast of its current location and along the existing flight path.</li> <li>• RWY 1R and RWY 28 L/R identifiers would be added to the published procedure description.</li> </ul> <p>Altitudes would remain the same except:</p> <ul style="list-style-type: none"> <li>• MOCA between AMAKR WP and QUINN WP would increase from 4,600 ft MSL to 4,700 ft MSL.</li> <li>• Crossing restriction at LOZIT WP would change from at or below (AOB) 16,000 ft MSL to between 14,000 ft MSL and 16,000 ft MSL, inclusive.</li> <li>• MEA between LEGGS WP and PYLLE WP would increase from 11,000 ft MSL to 15,000 ft MSL.</li> <li>• MEA between MLBEC WP and JONNE WP would increase from 11,000 ft MSL to 15,000 MSL.</li> <li>• MOCA between JONNE WP and BGGLO WP would increase from 3,800 ft MSL to 4,300 ft MSL.</li> <li>• MOCA between MSCAT WP to BGGLO WP would increase from 4,500 ft MSL to 5,400 ft MSL.</li> </ul> <p>Speed restrictions would remain the same except:</p> <ul style="list-style-type: none"> <li>• Speed restriction of At 280 knots indicated airspeed (KIAS) would be established at MLBEC WP.</li> <li>• Speed restriction of At 280 KIAS would be established at MRRLO WP.</li> </ul>
<p style="text-align: center;">STLER FOUR ARRIVAL (RNAV) (Amend)</p>	<p>Flight paths and WP locations would remain the same except:</p> <ul style="list-style-type: none"> <li>• PEENO transition—PEENO WP to LOZIT WP—would be removed.</li> <li>• QUINN WP would move ~2.98 NM northwest of its current location and along the existing flight path.</li> <li>• PYLLE WP would move ~5.35 NM north of its current location. Course heading from LEGGS WP to PYLLE WP would change from 216° to 219°. Course heading from</li> </ul>

Proposed Procedure	Proposed Changes
	<p>PYLLE WP to BGGLO WP would change from 216° to 205°.</p> <ul style="list-style-type: none"> <li>• JONNE WP would move ~4.12 NM north-northwest of its current location and along the existing flight path.</li> <li>• MSCAT WP would move ~3.50 NM north-northeast of its current location and along the existing flight path.</li> <li>• PDROW WP would be added ~3.5 NM south of STLER WP.</li> <li>• Would add a RWY 10 L/R transition to the procedure. From STLER WP aircraft would track 175° to cross PDROW WP At 7,000 ft MSL, then on track 180°. Expect radar vectors to final approach course.</li> </ul> <p>Altitudes would remain the same except:</p> <ul style="list-style-type: none"> <li>• MOCA between AMAKR WP and QUINN WP would increase from 4,600 ft MSL to 4,700 ft MSL.</li> <li>• MOCA of 4,400 ft MSL would be added between QUINN WP and BGGLO WP.</li> <li>• Minimum crossing restriction at BGGLO WP would increase from block altitude 15,000 ft MSL to FL190 inclusive to block altitudes 16,000 MSL to FL190 inclusive.<sup>2</sup> Maximum crossing restriction would remain the same.</li> <li>• MOCA of 4,100 ft MSL would be added between BGGLO WP and LOZIT WP.</li> <li>• MOCA of 5,600 ft MSL would be added between LEGGS WP and PYLLE WP.</li> <li>• MEA between LEGGS WP and PYLLE WP would increase from 11,000 ft MSL to 15,000 ft MSL.</li> <li>• MOCA of 4,400 ft MSL would be added between PYLLE WP and BGGLO WP.</li> <li>• MOCA of 4,100 ft MSL would be added between BGGLO WP and LOZIT WP.</li> <li>• MEA between MLBEC WP and JONNE WP would increase from 11,000 ft MSL to 15,000 ft MSL.</li> <li>• MOCA of 5,700 ft MSL would be added between MLBEC WP and JONNE WP.</li> <li>• MOCA of 6,600 ft MSL would be added between MRRLO WP and MSCAT WP.</li> </ul>

<sup>2</sup> In aviation, a flight level (FL) is an aircraft's altitude at standard air pressure and therefore is not necessarily the same as the aircraft's actual altitude, either mean sea level or above ground level. Aircraft altitudes AOA 18,000 ft will be referenced in FL.

Proposed Procedure	Proposed Changes
<p style="text-align: center;">WVAVS TWO ARRIVAL (RNAV) (Amend)</p>	<ul style="list-style-type: none"> <li>• PLLAR WP would be added ~30.75 NM northwest of WPOUT WP.</li> <li>• Transition to RWY 10 L/R would be added: From WPOUT WP aircraft would track 305° to cross PLLAR WP At 6,000 ft MSL and AT 210 KIAS, then track 310°. Expect radar vectors to final approach course.</li> <li>• THEEZ WP would move ~0.10 NM southeast of its current location and along the existing flight path.</li> <li>• Speed restriction at THEEZ WP would decrease from 240 KIAS to 230 KIAS.</li> <li>• Would add a crossing restriction of At 6,000 ft MSL at MVRKK WP.</li> <li>• All MEAs would be removed from the procedure.</li> </ul>
<p style="text-align: center;">PIRAT THREE ARRIVAL (RNAV) (Amend)</p>	<p>Altitudes would remain the same except:</p> <ul style="list-style-type: none"> <li>• MOCA of 2,200 ft MSL would be added between SUPER WP and PIRAT WP.</li> <li>• MEA between SUPER WP and PASIF WP would decrease from 15,000 ft MSL to 10,000 ft MSL.</li> <li>• Crossing restriction at PASIF WP would decrease from AOB FL195 to AOB 14,000 ft MSL.</li> <li>• Crossing restriction at PIRAT WP would decrease from AOB 15,000 ft MSL to At 10,000 ft MSL.</li> <li>• MOCA of 2,200 ft MSL would be added between HUNTS WP and PASIF WP.</li> <li>• MEA between HUNTS WP and PASIF WP would decrease from 15,000 ft MSL to 10,000 ft MSL.</li> <li>• MOCA of 2,200 ft MSL would be added between PAINT WP and SUPER WP.</li> <li>• MOCA of 2,200 ft MSL would be added between WUSES WP and SUPER WP.</li> <li>• Crossing and speed restrictions at BRINY WP would be removed.</li> </ul>
<p style="text-align: center;">RNAV (GPS) RWY 10L (Amend)</p>	<p>Flight paths, WP locations, and altitudes would remain the same, with some changes:</p> <ul style="list-style-type: none"> <li>• Crossing restriction at STINS WP would be AOA 3,700 ft MSL.</li> <li>• NORMM WP would be removed from the procedure and replaced with ILUDY WP located ~0.62 NM north-northeast of NORMM WP. Course heading from STINS WP to ILUDY WP would be 114°.</li> <li>• Crossing restriction at ILUDY WP would be AOA 3,500 ft MSL (over water).</li> </ul>

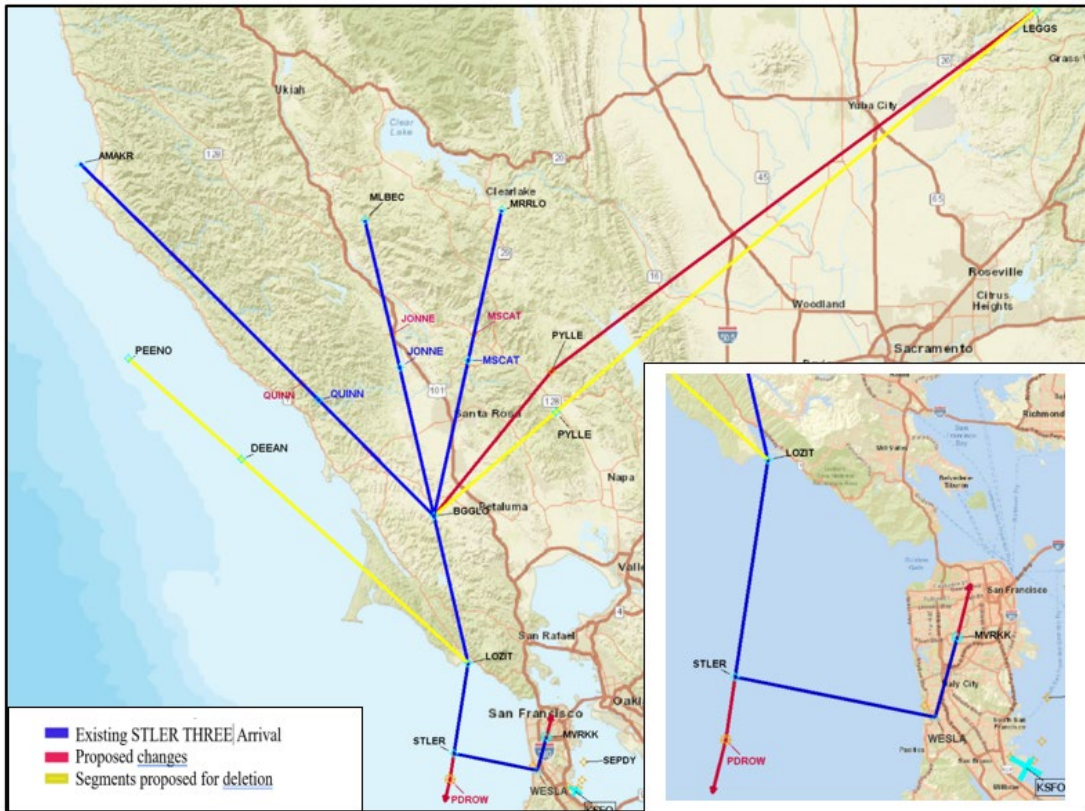
Proposed Procedure	Proposed Changes
	<ul style="list-style-type: none"> <li>• XATTU WP would move ~0.26 NM north-northeast from current location. Course heading from ILUDY WP to XATTU WP would be 107°.</li> <li>• Crossing restriction at XATTU WP would be AOA 1,800 ft MSL (~1,216 ft AGL).</li> <li>• Final approach course heading from XATTU WP would be change from 104° to 107°.</li> </ul> <p>Missed approach procedure would change to: Climb to 3,000 ft MSL direct DUMBA WP and hold.</p>
<p>OFFSHORE TWO DEPARTURE (Cancel)</p>	<p>Procedure would be cancelled.<sup>3</sup></p>

**Figure 1. Proposed Amended BDEGA FOUR ARRIVAL**



<sup>3</sup> Cancellation of a routes is a publication action and would remove the route from publication. No environmental impacts are anticipated with the implementation of the cancellation. There would be no increase in operations nor a change in aircraft fleet mix with the implementation of the cancellation.

**Figure 2. Proposed Amended STLER FOUR ARRIVAL**



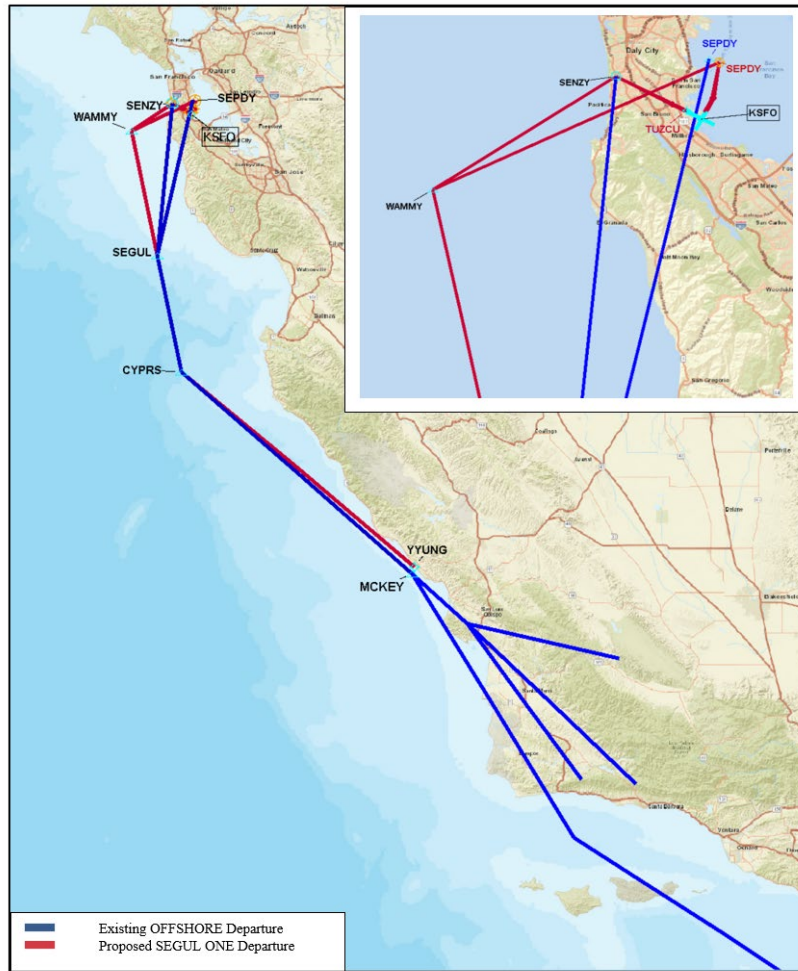
**Figure 3. Proposed Amended WWAVS TWO ARRIVAL (RNAV)**



Figure 4. Proposed Amended RNAV (GPS) RWY 10L



**Figure 5. Proposed SEGUL ONE DEPARTURE (RNAV) Compared to Canceled OFFSHORE TWO DEPARTURE**



The Proposed Action is an air traffic action and does not involve land acquisition, any physical ground disturbance, construction, excavation or development activities, or discharges to water bodies. The following environmental impact categories were assessed and were considered either to not be present or to have negligible or nonexistent effects from the Proposed Action and, in accordance with Council on Environmental Quality (CEQ) regulations, did not warrant further analysis:

- Biological Resources (including Fish, Wildlife, and Plants)
- Climate
- Coastal Resources
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Architectural and Archeological Resources (except Historical and Cultural Resources)



- Land Use
- Natural Resources and Energy Supply
- Socioeconomic Impacts and Children’s Environmental Health and Safety Risks (except Environmental Justice)
- Visual Resources (except Visual Impacts)
- Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

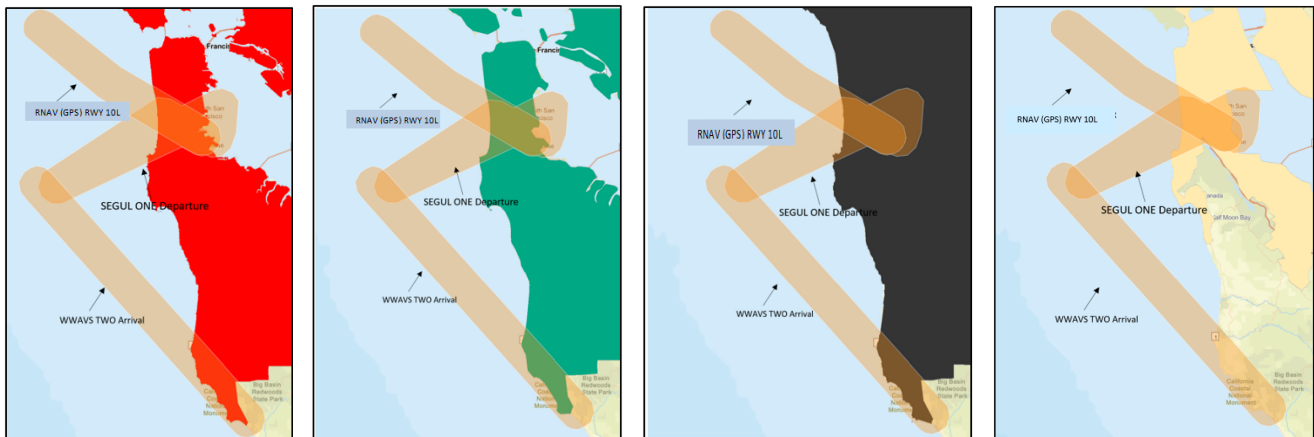
A project study area of approximately one nautical mile on either side centerline of the proposed procedure track was established for the Proposed Action. For the Proposed Action, the FAA assessed the following environmental impact categories, which, if they result in a significant impact, would preclude use of a categorical exclusion to satisfy National Environmental Policy Act (NEPA) requirements:

- Air Quality
- Biological Resources (Bird and Bat Species)
- Department of Transportation Act, Section 4(f)
- Historical and Cultural Resources (except Architectural and Archaeological Resources)
- Environmental Justice (except Socioeconomic Impacts and Children’s Environmental Health and Safety)
- Noise and Noise-Compatible Land Use
- Visual Impacts (except Light Emissions)
- Cumulative Impacts

**Air Quality**

The NEPAassist tool identified that the proposed SEGUL ONE DEPARTURE (RNAV), RNAV (GPS) RWY 10L, and WWAWS TWO ARRIVAL (RNAV) procedures are located within the following nonattainment and/or maintenance areas within the project study area: nonattainment area for Ozone (O<sub>3</sub>) 8-hour (2008 Standard) (red), nonattainment for O<sub>3</sub> (2015 Standard) (green), nonattainment for Particulate Matter 2.5 microns (PM<sub>2.5</sub>) 24-hour (2006 Standard) (black), and maintenance area for carbon monoxide (CO) (1971 Standard) (tan).

**Figure 6. Nonattainment and Maintenance Areas within the Project Study Areas**



Additionally, the Proposed Action would not change project-related aircraft emissions below 3,000 feet AGL. The Proposed Action is not intended to change the number of aircraft operations and fleet mix. The Proposed Action is presumed to conform to the State Implementation Plan (SIP). The Proposed Action is a type of action that promotes the safe, orderly, and expeditious flow of aircraft traffic, including airport, approach, departure, and enroute air traffic control (ATC) procedures. Therefore, these changes are presumed to conform as emissions from these types of actions are below the applicable *de minimis* levels (40 CFR 93.153[c][2][xxii]). The EPA regulations identify certain actions that would not exceed these thresholds, including ATC activities and adoption of approach, departure, and enroute ATC procedures for aircraft operations above the mixing height specified in the applicable SIP (or 3,000 feet AGL) in places without an established mixing height. FAA Order 1050.1F provides that further analysis for NEPA purposes is normally not required where emissions do not exceed the EPA’s *de minimis* thresholds.

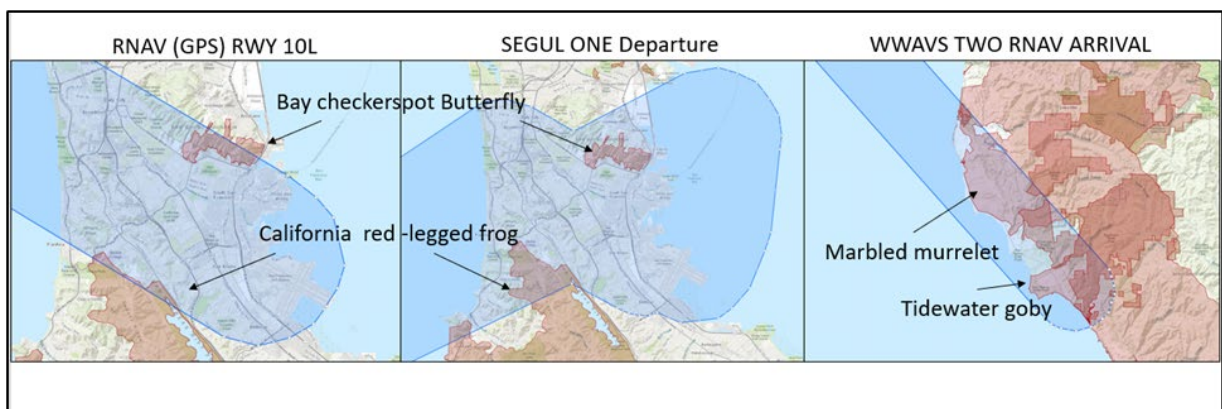
Implementation of this Proposed Action is not expected to affect air quality and is presumed to conform as Category 14, “Air Traffic Control Activities and Adopting Approach, Departure and Enroute Procedures for Air Operations,” as identified in the General Conformity Rule, 72 Fed. Reg. 41565–41580 (July 30, 2007).

**Biological Resources (Avian and Bat Species)**

The United States Fish and Wildlife Service’s (USFWS) Information for Planning and Consultation (IPaC) database was reviewed to identify critical habitat located within the project study areas for the amended RNAV (GPS) RWY 10L and WWAVS TWO ARRIVAL (RNAV) and the new SEGUL ONE DEPARTURE (RNAV) procedures.

Critical habitat areas for the Bay checkerspot Butterfly (*Euphydryas editha bayensis*), California red-legged frog (*Rana draytonii*), Tidewater goby (*Eucyclogobius newberryi*), and Marbled Murrelet (*Brachyramphus marmoratus*) have each been identified in the project study area for the Proposed Action. See **Figure 7**.

**Figure 7. Critical Habitat within the Proposed Action Study Areas**



The IPaC database identified 52 migratory bird species that could potentially be located within the project study area. The project study area falls within the Pacific Flyway. Every year, migratory birds travel some or all of this distance in spring and fall, following food sources, heading to breeding grounds, or traveling to overwintering sites. The Proposed Action is an air traffic action only. Based on the analysis of existing flight track data obtained from the PDARS, aircraft are currently overflying this area of the Western Pacific Flyway. See **Figure 11**.

The greatest potential for impacts to wildlife species would result from wildlife strikes on avian and/or bat species at altitudes below 3,000 feet AGL. Changes to flight paths under the Proposed Action would primarily occur above 3,000 feet AGL. The Proposed Action is not intended to increase the number of aircraft operations or change the aircraft fleet mix. Therefore, the Proposed Action is not anticipated to result in an impact to biological resources.

**Department of Transportation Act, Section 4(f)**

The NEPAassist tool identified the following Section 4(f) resources within the project study area:

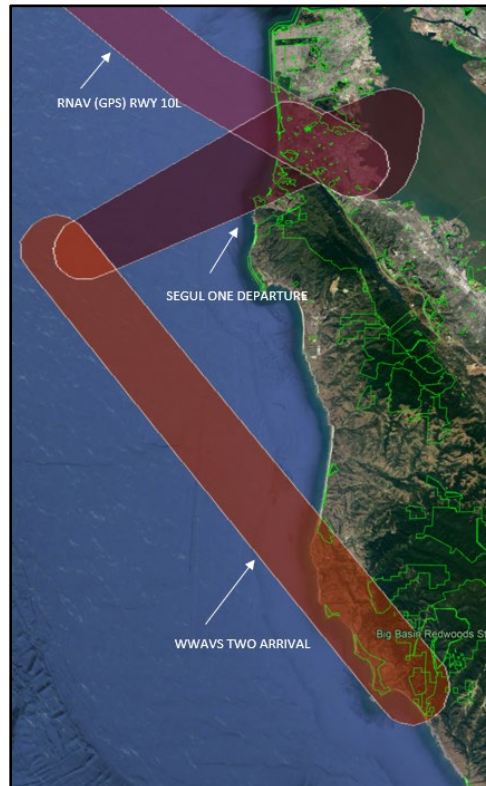
**Table 4. List of 4(f) Resources within the Project Study Area**

<b>Name of 4(f) Resource</b>	<b>Governing Authority</b>
Fort Funston	National Park Service
Thornton State Beach	California State Beach
Palisades Park	San Mateo County
Mussel Rock Park	National Park Service
Pacifica Esplanade Beach	City of Pacifica
Pacifica Municipal Pier	City of Pacifica
Rockaway Beach	City of Pacifica
Point San Pedro	National Park Service
Bacquiano Trail/ Sweeney Ridge	National Park Service
Pacifica State Beach (Linda Mar)/ San Pedro Beach	National Park Service
Mori Point	National Park Service
Pacifica Land Trust	National Park Service
Crestmoor Canyon	City of San Bruno
Ano Nuevo State Marine Reserve	State of California
Butano State Park	State of California
Bean Hollow State Beach	State of California

Pescadero State Beach	State of California
California Coastal National Monument*	Bureau of Land Management

\*Not shown in Fig. 8

**Figure 8. Section 4(f) Resources within the Project Study Area in Google Earth**



The Proposed Action would not involve land acquisition, construction, or other physical ground disturbance. The FAA considered that certain protected resources may be potentially sensitive to the effects of overflights that introduce a visual or audible element. The number of aircraft operations and the aircraft fleet mix are not expected to change as a result of the implementation of the Proposed Action. Additionally, civilian jet aircraft are currently overflying the area and would continue to overfly the area. See **Figure 11**. Furthermore, a noise screening of potential noise impacts was completed for this Proposed Action using the TARGETS Environmental Plug-in tool and the TARGETS Aviation Environmental Design Tool (AEDT) plug-in. Proposed procedures in the study area passed the noise analysis. Therefore, no noise impacts are anticipated with the implementation of the Proposed Action.

No new areas would be overflown, and the areas overflown are predominantly over water; aircraft would continue to overfly the area as they would with the No Action Alternative. Thus, the FAA determined that there would be no potential to introduce either new visual elements or

reportable or significant audible elements that could constitute a constructive use of protected resources.

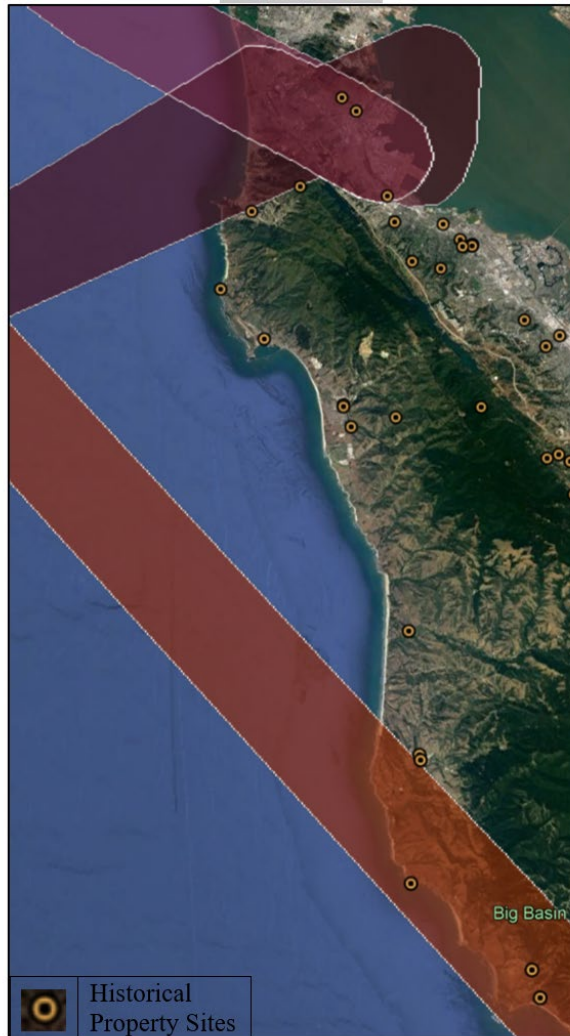
**Historical, Architectural, Archaeological, and Cultural Resources**

A search of the National Register of Historic Places (NRHP), accessed through the NPS Google Earth plug-in are summarized in **Table 5** and depicted in **Figure 9**.

**Table 5. List of Historic Properties in the Study Area**

<b>Procedure</b>	<b>Historic Property</b>	<b>NPS Number</b>	<b>Significance</b>
WWAVS TWO ARRIVAL (RNAV)	Dickerman Barn	82002259	Agriculture/Architecture
	Green Oaks Ranch House	76000526	Agriculture/Industry
	Pigeon Point Lighthouse	77000337	Architecture; Commerce; Engineering; Military; Politics/Government; Transportation
RNP (GPS) RWY 10L & SEGUL ONE DEPARTURE (RNAV)	Southern Pacific Depot	78000770	Transportation/Architecture
	Martin Building	97000043	Community Planning and Development
	South San Francisco Hillside Sign	96000761	Social History; Other

**Figure 9. Historical Sites near the Proposed Procedure Using Google Earth**



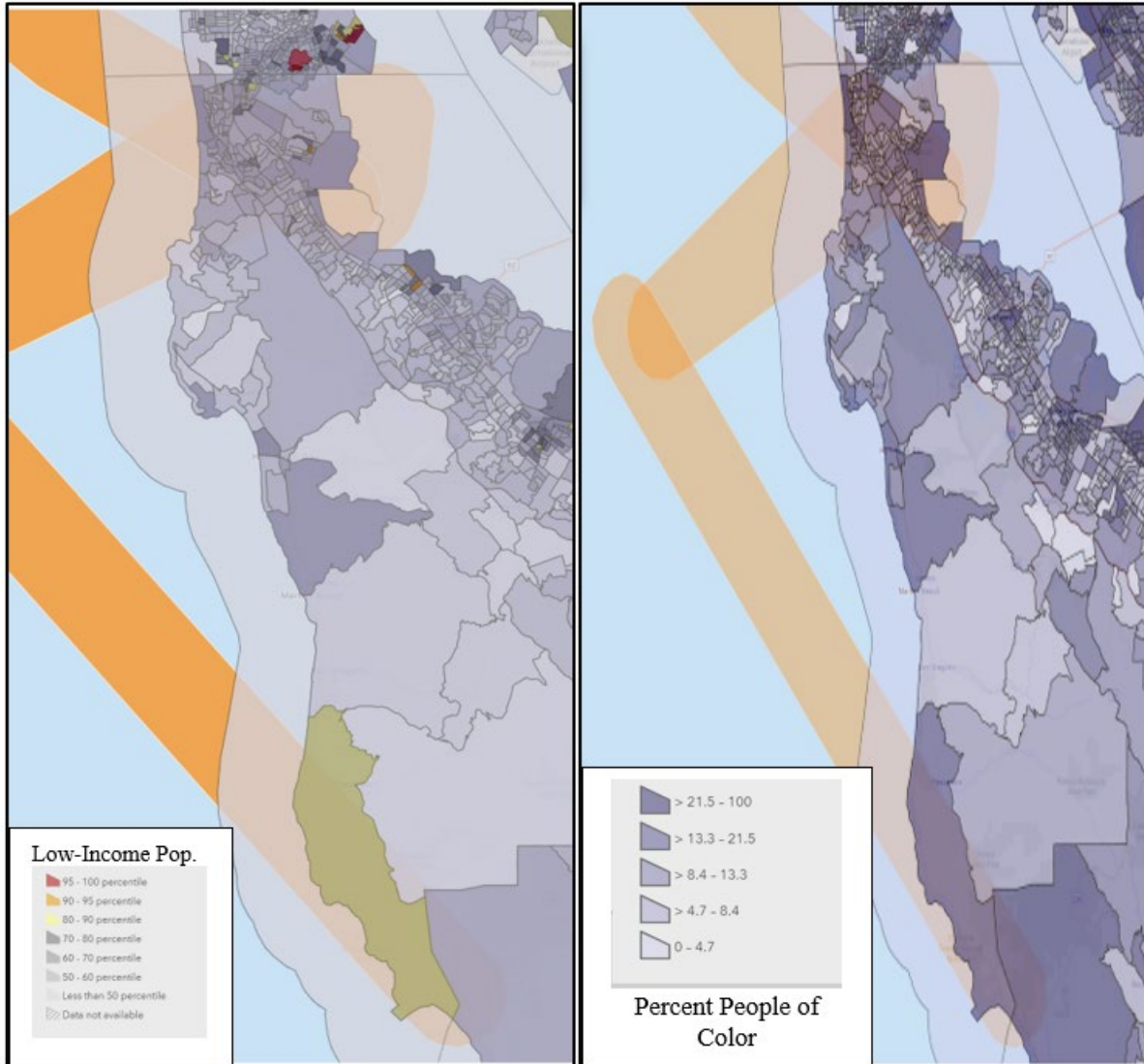
The identified historic resources are currently overflowed, and the results of the noise analysis indicate that no significant or reportable noise impacts are expected near these resources as a result of the implementation of the Proposed Action. Furthermore, there would be no land acquisition, construction activities, or other physical ground disturbance with the implementation of the Proposed Action. Therefore, the FAA has concluded that an impact to known listed historical properties is not anticipated.

**Environmental Justice (Subcategory under the General Heading of Socioeconomic Impacts)**

An environmental justice analysis considers the potential for impact on minority and low-income populations of the Proposed Action compared to the No Action Alternative. Considering whether the Proposed Action raises environmental justice concerns, the FAA considers whether a Proposed Action may have disproportionately high and adverse human health or environmental effects on minority and low-income populations. This analysis draws on the findings of the other impact analyses, particularly noise, land use, and air quality. If these factors exist, there is not

necessarily a significant impact; rather, the FAA must evaluate these factors in light of the context and intensity to determine if there are significant impacts.

**Figure 10. Low-Income and People of Color Percentiles in the Study Area**



While the concentration of low-income households and percentage of people of color in the study areas may be somewhat elevated, the study area was previously overflowed by aircraft. See **Figure 11**. Implementation of the Proposed Action would not adversely affect air quality or land use within the vicinity of the Proposed Action. Furthermore, a noise screening of potential noise impacts was not completed for this Proposed Action because the proposed amendments are de minimis in nature and would not appreciably change where aircraft are currently flying. No new areas would be overflowed, and the areas overflowed are predominantly unpopulated; aircraft would continue to overfly the area as they would with the No Action Alternative. Furthermore, a change in the number of aircraft operations—including those occurring between 10 p.m. and 7

a.m.—and a change to the aircraft fleet mix are not part of the purpose and need of the Proposed Action.

Based on the available information, there would be no disproportionate impacts on minority or low-income populations due to the Proposed Action when compared to the No Action Alternative. Therefore, an impact related to environmental justice is not anticipated.

### **Noise and Noise-Compatible Land Use**

Historical radar track data for KSFO was obtained from PDARS. Dates were randomly selected within a recent 60-day period (December 6, 2022 through December 5, 2023). The random dates are assumed to represent average runway usage, flight paths, and day/night traffic ratios by capturing a range of temperature and wind conditions. See **Figure 11**.

A noise screening/analysis was completed to assess the potential impacts from a change in aircraft noise exposure resulting from the Proposed Action. The noise screening/analysis was conducted in the Terminal Area Route Generation, Evaluation, and Traffic Simulation (TARGETS) Environmental Plug-in tool and the Aviation Environmental Design Tool (AEDT).

#### **RNAV (GPS) RWY 10L**

For screening of the amended RNAV (GPS) RWY 10L approach procedure, the Operations Test (OPS Test) was used in accordance with MITRE's Center for Advanced Aviation System Development's *Guidance for Noise Screening of Air Traffic Actions* (December 2012). The OPS Test is a tool to help determine if further noise screening is required based on the number of operations on the RNAV (GPS) RWY 10L. An increase in operations and a change in fleet mix is not part of the purpose and need. RNAV (GPS) RWY 10L passed the OPS Test and no further noise analysis was required for the procedure.

#### **WVAVS TWO ARRIVAL (RNAV)**

For screening of the WVAVS TWO ARRIVAL (RNAV), the Traffic Test (TRAF Test) was used in accordance with MITRE's Center for Advanced Aviation System Development's *Guidance for Noise Screening of Air Traffic Actions* (December 2012). The TRAF Test is a tool to help determine if the number of operations on a particular route or procedure is high enough to generate noise levels that exceed noise screening thresholds based on the fleet mix. ATC anticipates the new segment of the WVAVS TWO ARRIVAL (RNAV) from WPOUT WP to PLLAR WP would be used by ~5% of aircraft landing to RWY 10L/R. An increase in operations and a change in fleet mix is not part of the purpose and need. The WVAVS TWO ARRIVAL (RNAV) passed the TRAF Test and no further noise analysis was required for this procedure.

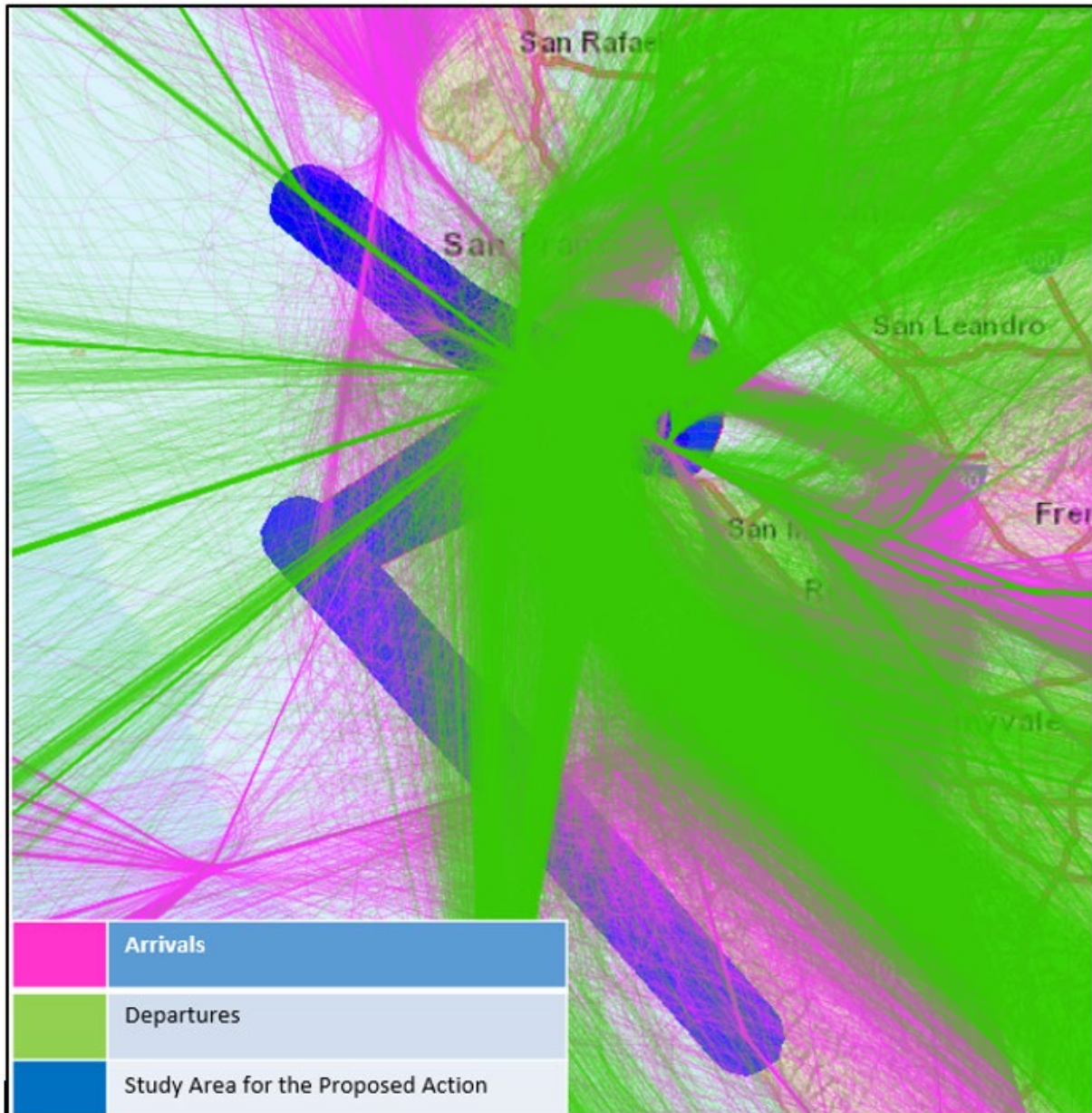
#### **SEGUL ONE DEPARTURE (RNAV)**

Noise analysis was completed to assess potential impacts resulting from proposed air traffic actions at KSFO using the TARGETS Environmental Plug-in tool and the AEDT. Historical radar track data was used to create a baseline scenario. After the baseline scenario was built, aircraft operations were reassigned to the proposed procedures, which provides the alternative scenario. Once the baseline and alternative scenarios were built, the TARGETS Environmental Plug-in Tool was used to generate noise outputs for both scenarios using AEDT. The scenarios



were then compared to determine the potential for significant noise impacts. In the case of KSFO, there were **no reportable and no significant** impacts resulting from the proposed action.

**Figure 11. Historical Flight Tracks in TARGETS with Proposed Procedures**



*\*Tracks at 90% Transparency*

## **Cumulative Impacts**

Consideration of cumulative impacts applies to the impacts resulting from the implementation of the Proposed Action combined with other actions. A cumulative impact is defined as an impact on the environment, which results from the incremental impact of the action when added to other, recent and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions.

Analyzing cumulative impacts is considered within geographic (spatial) and time (temporal) boundaries. Reasonably foreseeable future actions refer to projects that would likely be completed within the next five years and do not include those actions that are highly speculative or indefinite. The types of projects considered under the cumulative impact analysis were primarily limited to airfield projects, specifically projects that directly affect or involve runways and modifications to parallel taxiways (TWY) (e.g., lengthening and/or widening). These types of projects may affect aircraft flight operations.

A comprehensive search identified the KSFO Draft Airport Development Plan (DADP) (2016).<sup>4</sup> The DADP provides a road map for efficiently meeting aviation demand through the reasonably foreseeable future while preserving the flexibility necessary to respond to changing airport needs and industry conditions. The KSFO DADP established a phasing plan broken down into Ongoing Development Projects (2011-2016), Near-Term Development Projects (2016-2021), and Long-Term Development Projects (2022 forward).

The following RWY/TWY projects were identified in the near-term development projects (2016-2021):

- TWY F2 would provide a second runway-entrance TWY to RWY 28L.
- TWY S3 fillet was added to TWY S (to be renamed TWY S3) at the end of RWY 10R.
- TWY C East would shift TWY C to a separation distance of 550 feet from the RWY 28R centerline along the eastern 6,850 feet of the RWY. Relocate the existing stormwater pump station 1B to the northwest. Rename TWY W to TWY C2.
- TWY C3 would realign TWY C1 perpendicular to RWY 10L/28R and rename it to TWY C3.
- TWY R North would realign TWY R perpendicular to the RWY between RWY 10L/28R and TWY C.
- TWY R South would upgrade TWY R between RWYs 10L/28R and 10R/28L to accommodate larger aircraft and close TWY U between TWY C and RWY 10R/28L.
- TWY F1 would realign TWY F1 at a separation of 800 feet from TWY F and rename it TWY W.
- TWYs T and D would realign TWY T to a similar angle as TWY Q and separate TWYs D and T at the RWY 10R/28L crossing point.
- TWYs E and J would reconfigure TWY E as an acute-angled exit TWY and realign and shift TWY J farther from RWY 1L/19R.
- TWY F West would shift TWY F farther from RWY 10R/28L between TWYs B and L.

<sup>4</sup> KSFO ADP (2016), <https://www.flysfo.com/about-sfo/sfo-tomorrow/draft-final-airport-development-plan>, accessed January 25, 2024.

- TWY F East would shift TWY F farther from RWY 10R/28L between TWYs L and N.
- TWY N would realign TWY N at its intersection with TWY F.
- Helipad would provide a dedicated helipad northwest of Building 1050.
- TWYs H and M would realign TWYs H and M to the southwest; rename to TWYs M1 and M2, respectively, to conform to FAA naming convention.

The following RWY/TWY projects were identified in the long-term development projects (2022 forward):<sup>5</sup>

- TWY B realignment would shift TWY B 22 feet to the northwest to meet FAA design standards.
- TWY A realignment would shift TWY A 15 feet to the northwest to meet FAA design standards.

A review of historical FAA Airport Improvement Program (AIP) grants indicated that KSFO has received the following grants for RWY/TWY modifications/improvements within the last five years.<sup>6</sup> The Airport Improvement Program (AIP) grant funding indicates that the total amount of grants for infrastructure projects at KSFO in 2023 was \$15,207,247 for taxiway rehabilitation. Between 2019 and 2022, KSFO was awarded \$52,299,930 in AIP entitlements or discretionary funding to reconstruct runways, rehabilitate taxiways and runways.

The Terminal Area Forecast (TAF) report projects that total aircraft operations at KSFO are expected to increase by 36.19% between 2023 and 2028.<sup>7</sup>

**Table 6** summarizes proposals for amendments to flight procedures that have been recently published, are under development, or are pending.

**Table 6. Proposals for Amendments to KSFO Flight Procedures**

Procedure Name	Scheduled Pub. Date	Status
GLS RWY 19R, AMDT 1	11/30/2023	Published
GLS RWY 19L, AMDT 1	11/30/2023	Published
ILS OR LOC RWY 19L, AMDT 23	11/30/2023	Published
RNAV (GPS) RWY 19L, AMDT 4	11/30/2023	Published
RNAV (GPS) Y RWY 19R, AMDT 4	11/30/2023	Published
RNAV (GPS) Z RWY 19R, ORIG	11/30/2023	Published

<sup>5</sup> KSFO ADP (2016), [https://www.flysfo.com/sites/default/files/default/about/Chapter\\_6\\_Recommended\\_ADP\\_Draft\\_Final.pdf](https://www.flysfo.com/sites/default/files/default/about/Chapter_6_Recommended_ADP_Draft_Final.pdf), accessed January 28, 2024.

<sup>6</sup> FAA AIP Histories, [https://www.faa.gov/airports/aip/grant\\_histories](https://www.faa.gov/airports/aip/grant_histories), accessed January 28, 2024.

<sup>7</sup> Federal Aviation Administration (taf.faa.gov), accessed on January 28, 2024.

NIITE FOUR (RNAV) SID	7/11/2024	Under Development
RNAV (GPS) X RWY 28R, AMDT 1B	7/11/2024	Awaiting Cancellation
GLS RWY 10L, ORIG	2/20/2025	Pending
GLS RWY 10R, ORIG	2/20/2025	Pending
GLS T RWY 28R, ORIG	2/20/2025	Pending
GLS W RWY 28R, ORIG	2/20/2025	Pending
GLS X RWY 28R, ORIG	2/20/2025	Pending
GLS Y RWY 28L, ORIG	2/20/2025	Pending
GLS Y RWY 28R, ORIG	2/20/2025	Pending
GLS Z RWY 28L, ORIG	2/20/2025	Pending
GLS Z RWY 28R, ORIG	2/20/2025	Pending

The Proposed Action has independent utility and is unrelated to the projects above. There would be no anticipated change in aircraft operations or change to aircraft fleet mix in connection with the Proposed Action. The Proposed Action would have no long-term impacts on air traffic operations; therefore, cumulative impacts are not anticipated when compared to the No Action Alternative.

**Extraordinary Circumstances**

In accordance with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Paragraph 5-2, Extraordinary Circumstances, the FAA has reviewed the Proposed Action for factors and circumstances in which a normally categorically-excluded action may have a significant environmental impact requiring further analysis. The FAA has determined that no extraordinary circumstances exist that warrant additional environmental review.

**Declaration of Exclusion**

The FAA has reviewed the above referenced proposed action and it has been determined, by the undersigned, to be categorically excluded from further environmental documentation according to FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. The implementation of this action will not result in any extraordinary circumstances in accordance with FAA Order 1050.1F.

**Basis for this Determination**

The IFP Environmental Pre-Screening Filter was used to document the analysis, which was reviewed by the Western Service Center. This review was conducted in accordance with policies and procedures in Department of Transportation Order 5610.1C, *Procedures for Considering*

*Environmental Impacts*, and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*.

The applicable categorical exclusion is:

***5-6.5.i. Establishment of new or revised air traffic control procedures conducted at 3,000 feet or more above ground level (AGL); procedures conducted below 3,000 feet AGL that do not cause traffic to be routinely routed over noise sensitive areas; modifications to currently approved procedures conducted below 3,000 feet AGL that do not significantly increase noise over noise sensitive areas; and increases in minimum altitudes and landing minima. For modifications to air traffic procedures at or above 3,000 feet AGL, the Noise Screening Tool (NST) or other FAA-approved environmental screening methodology should be applied.***

**Recommended by**

**Facility Manager Review/Concurrence**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: Michael Galvan  
Air Traffic Manager  
Oakland Air Route Traffic Control Center

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: Francine Malabo  
Air Traffic Manager  
Northern California Terminal Radar Approach Control

**Concurrence by**

**Western Service Area Environmental Protection Specialist**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: Suzanne Nelson-Pittle  
Environmental Protection Specialist, Operations Support Group  
Western Service Center

**Approval by**

**Western Service Area Director or Designee Approval**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: B. G. Chew  
Group Manager, Operations Support Group  
Western Service Center