SFO COMMUNITY ROUNDTABLE

Meeting Packet
Regular Meeting

Meeting No. 321
Wednesday, October 2, 2019 - 7:00 p.m.

David Chetcuti Community Room – Millbrae City Hall
450 Poplar Avenue – Millbrae, CA 94030

Note: To arrange an accommodation under the Americans with Disabilities Act to participate in this public meeting, please call (650) 363-1853 at least 2 days before the meeting date.

AGENDA

1. Call to Order / Roll Call / Declaration of a Quorum Present
ACTION
Elizabeth Lewis, Roundtable Chairperson / James A. Castaneda, AICP, Roundtable Coordinator

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

CONSENT AGENDA

All items on the Consent Agenda are approved/accepted in one motion. A Roundtable Representative 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.

3. Airport Director's Reports for July and August 2019, and 2Q 2019 FlyQuiet Report
ACTION

REGULAR AGENDA – GENERAL AIRPORT

4. SFO Updates
INFORMATION
Ivar Satero, Airport Director – San Francisco International Airport

5. FAA Work on Noise Initiatives
INFORMATION
To Be Announced

REGULAR AGENDA – GENERAL AIRPORT (continued)

6. Report from Technical Working Group September 26, 2019 meeting
INFORMATION
Justin Cook, Roundtable Technical Consultant (HMMH)

1. Questions to the FAA, August 22, 2019 pg. 33

REGULAR AGENDA – GROUND-BASED NOISE

7. Report from Ground-Based Noise Ad-Hoc Subcommittee September 16, 2019
INFORMATION
Ricardo Ortiz, City of Burlingame Representative

8. Discussion of Roundtable's Role Regarding SFO Noise Monitors
INFORMATION
Elizabeth Lewis, Roundtable Chairperson

9. Additional Matters Related to Ground-Based Noise Discussion
INFORMATION
Elizabeth Lewis, Roundtable Chairperson

REGULAR AGENDA – DEPARTURES

10. NIITE/HUSSH Procedure Status
INFORMATION
Elizabeth Lewis, Roundtable Chairperson

11. Additional Matters Related to Departures Discussion
INFORMATION
Elizabeth Lewis, Roundtable Chairperson

REGULAR AGENDA – ARRIVALS

12. PIRAT TWO Status
INFORMATION
Justin Cook, Roundtable Technical Consultant

13. Additional Matters Related to Arrivals Discussion
INFORMATION
Elizabeth Lewis, Roundtable Chairperson

OTHER MATTERS

14. Formal coordination with other Bay Area Roundtables status
INFORMATION/ACTION
Elizabeth Lewis, Roundtable Chairperson

OTHER MATTERS (continued)

15. Aviation Noise News and Updates
INFORMATION
Justin Cook, Roundtable Technical Consultant

16. Member Communications / Announcements
INFORMATION
Roundtable Members and Staff

17. Adjourn
ACTION
Elizabeth Lewis, Roundtable Chairperson

Correspondences / Additional Reports

SFO COMMUNITY ROUNDTABLE

Welcome

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.

- You must fill out a Speaker Slip and give it to the Roundtable Coordinator at the front of the room, as soon as possible, if you wish to speak on any Roundtable Agenda item at this meeting.
- To speak on more than one Agenda item, you must fill out a Speaker Slip for each item.
- The Roundtable Chairperson will call your name; please come forward to present your comments.

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. Copies of the audio file can be made available to the public upon request. 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 Notice, 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.

AIRPORT/COMMUNITY ROUNDTABLE OFFICERS & STAFF

Chairperson:

ELIZABETH LEWIS
Representative, Town of Atherton
elewis@ci.atherton.ca.us

Vice-Chairperson:

RICARDO ORTIZ
Representative, City of BURLINGAME
rortiz@burlingame.org

Roundtable Coordinator:

JAMES A. CASTAÑEDA, AICP
County of San Mateo
Planning & Building Department
jcastaneda@sforoundtable.org

SFO COMMUNITY ROUNDTABLE

About the Roundtable

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 22 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 2019, 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 Millbrae City Hall, 450 Poplar Avenue, Millbrae, California** unless noted. 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. For more information about the Roundtable, please contact Roundtable staff at (650) 363-1853.

POLICY STATEMENT

The Airport/Community Roundtable reaffirms and memorializes its longstanding policy regarding the "shifting" of aircraft-generated noise, related to aircraft operations at San Francisco International Airport, as follows:

> **"The Airport/Community Roundtable members, as a group, when considering and taking actions to mitigate noise, will not knowingly or deliberately support, encourage, or adopt actions, rules, regulations or policies, that result in the "shifting" of aircraft noise from one community to another, when related to aircraft operations at San Francisco International Airport."**
> *(Source: Roundtable Resolution No. 93-01)*

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:

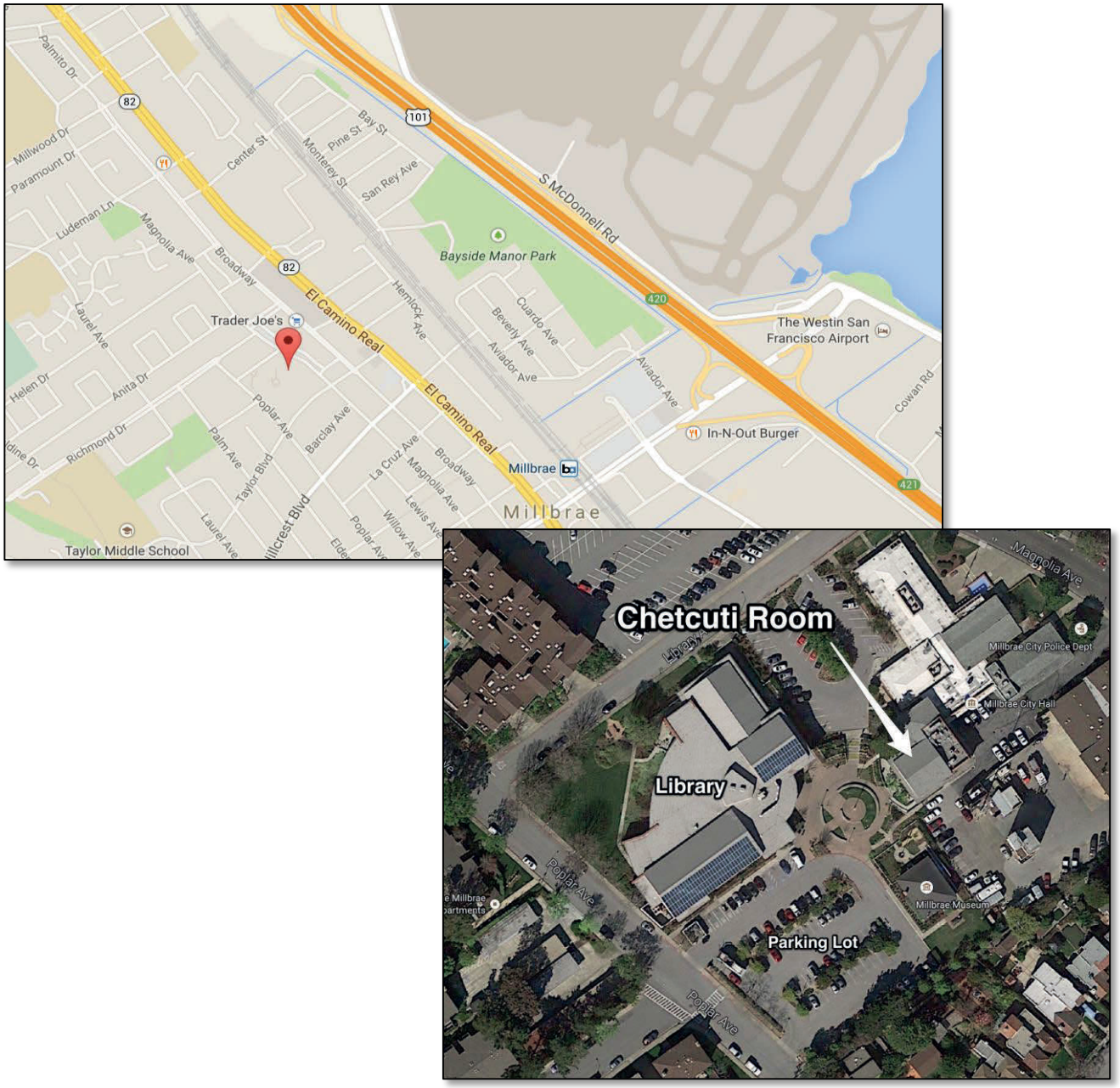
> "No state or political subdivision thereof and no interstate agency or other political agency of two or more states shall enact or enforce any law, rule, regulation, standard, or other provision having the force and effect of law, relating to rates, routes, or services of any air carrier having authority under subchapter IV of this chapter to provide air transportation."
> *(Source: 49 U.S.C. A. Section 1302(a)(1)).*

SFO COMMUNITY ROUNDTABLE

Meeting Location

David Chetcuti Community Room
450 Poplar Avenue - Millbrae, CA 94030

Access through Millbrae Library parking lot on Poplar Avenue



SFO COMMUNITY ROUNDTABLE

Member Roster

October 2019

CITY AND COUNTY OF SAN FRANCISCO BOARD OF SUPERVISORS
Ahsha Safaí, Supervisor

CITY AND COUNTY OF SAN FRANCISCO MAYOR'S OFFICE
Edward McCaffrey, (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, Supervisor
Alternate: Don Horsley, Supervisor

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

TOWN OF ATHERTON
Elizabeth Lewis, Council Member
Alternate: Bill Widmer, Mayor

CITY OF BELMONT
Julia Mates Council Member
Alternate: Douglas Kim, Council Member

CITY OF BRISBANE
Terry O'Connell, Council Member
Alternate: Madison Davis, Council Member

CITY OF BURLINGAME
Ricardo Ortiz, Council Member

CITY OF DALY CITY
Pamela DiGiovanni, Council Member

CITY OF FOSTER CITY
Sanjay Gehani, Council Member
Alternate: Sam Hindi, Mayor

CITY OF HALF MOON BAY
Adam Eisen, Council Member
Alternate: Harvey Rarback, Council Member

TOWN OF HILLSBOROUGH
Alvin Royse, Council Member
Alternate: Shawn Christianson, Council Member

CITY OF MENLO PARK
Ray Mueller, Mayor
Cecilia Taylor, Mayor Pro Tem

CITY OF MILLBRAE
Ann Schneider, Council Member
Alternate: Wayne Lee, Mayor

CITY OF PACIFICA
Mike O'Neill, Council Member
Alternate: Deirdre Martin, Council Member

TOWN OF PORTOLA VALLEY
Ann Wengert, Council Member
Alternate: Maryann Derwin, Council Member

CITY OF REDWOOD CITY
Giselle Hale, Council Member

CITY OF SAN BRUNO
Marty Medina, Council Member
Alternate: Rico Medina, Council Member

CITY OF SAN CARLOS
Adam Rak: Council Member
Alternate: Mark Olbert, Council Member

CITY OF SAN MATEO
Joe Goethals, Council Members
Alternate: Diane Papan, Council Member

CITY OF SOUTH SAN FRANCISCO
Mark Addiego, Council Member
Alternate: Mark Nagales, Council Member

TOWN OF WOODSIDE
Thomas Livermore, Council Member

ROUNDTABLE ADVISORY MEMBERS

AIRLINES/FLIGHT OPERATIONS
Captain James Abell, United Airlines
Glenn Morse, United Airlines

FEDERAL AVIATION ADMINISTRATION
Thann McLeod, NORCAL TRACON
Tony DiBernardo, FAA Sierra-Pacific District

ROUNDTABLE STAFF
James A. Castañeda, AICP, Roundtable Coordinator
Gene Reindel, Technical Consultant (HMMH)
Justin Cook, Technical Consultant (HMMH)
Adam Scholten, Technical Consultant (HMMH)

SAN FRANCISCO INTERNATIONAL AIRPORT NOISE ABATEMENT STAFF
Bert Ganoung, Noise Abatement Manager
David Ong, Noise Systems Manager
Nastasja von Conta, Senior Noise Abatement Specialist
Anthony Carpeneti, Noise Abatement Specialist
Anneliese Taing, Noise Abatement Specialist

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Airport Director's Report

Presented at the October 2, 2019
Airport Community Roundtable Meeting

Aircraft Noise Abatement Office
July 2019

SFO San Francisco International Airport

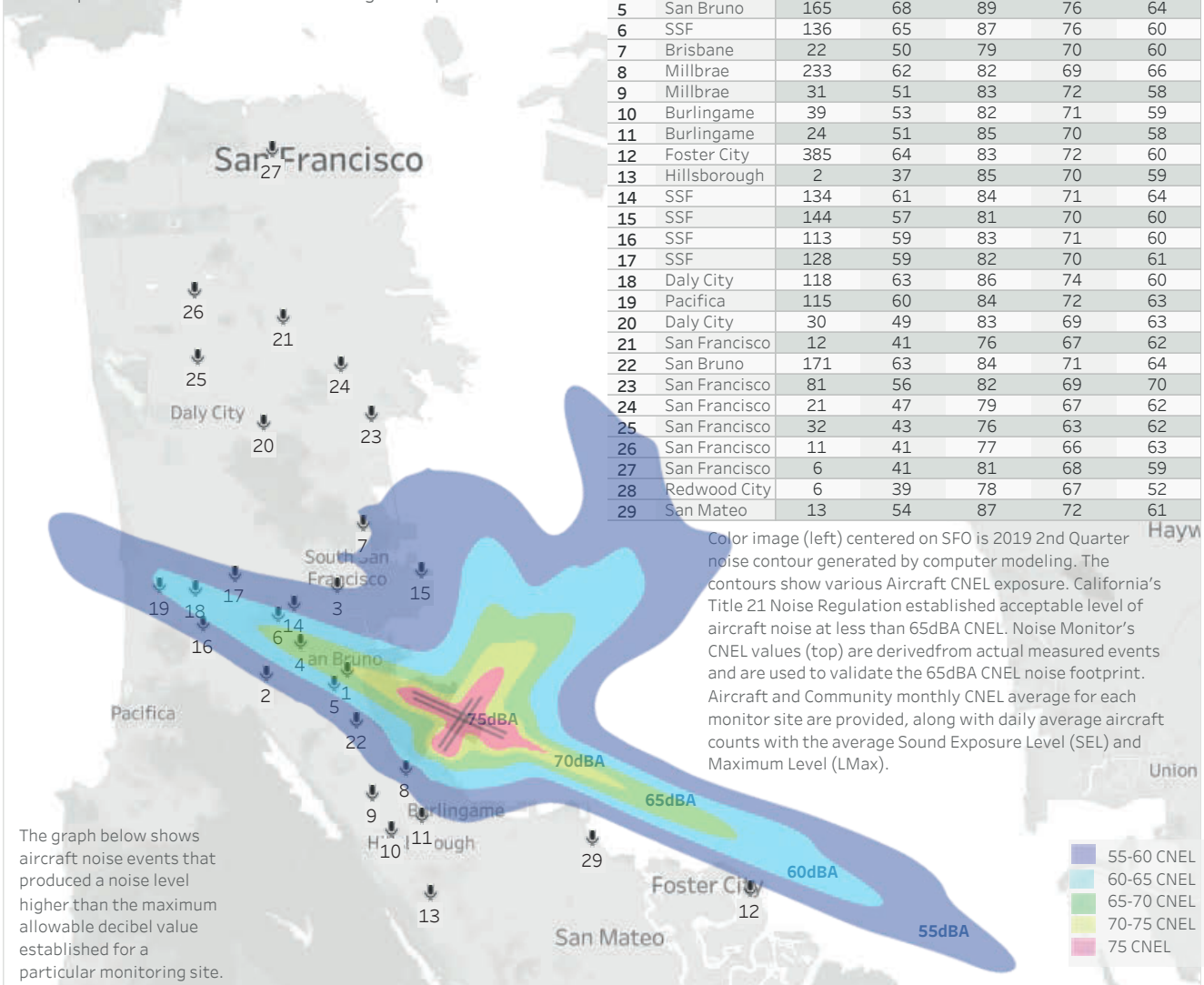
Aircraft Noise Levels

July 2019

The map shows 29 aircraft noise monitoring locations that keep track of noise levels in the communities around the airport. Image centered on SFO airport shows quartlerly aircraft noise levels (dBA) exposure. The green zone marks 65dBA Community Noise Exposure Level (CNEL). The CNEL metric is used to assess and regulate aircraft noise exposure in communities surrounding the airport.

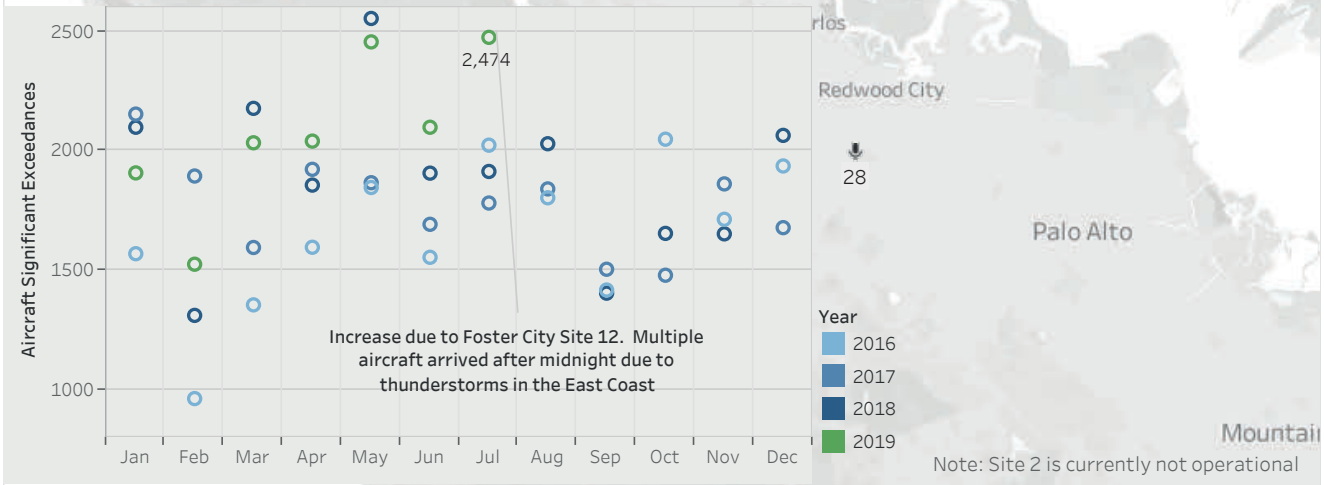
Site	City	Noise Events (AVG Day)	Aircraft CNEL (dBA)	Aircraft SEL (dBA)	Aircraft LMax (dBA)	Community CNEL (dBA)
1	San Bruno	227	74	93	78	68
3	SSF	76	54	80	69	65
4	SSF	151	69	90	78	61
5	San Bruno	165	68	89	76	64
6	SSF	136	65	87	76	60
7	Brisbane	22	50	79	70	60
8	Millbrae	233	62	82	69	66
9	Millbrae	31	51	83	72	58
10	Burlingame	39	53	82	71	59
11	Burlingame	24	51	85	70	58
12	Foster City	385	64	83	72	60
13	Hillsborough	2	37	85	70	59
14	SSF	134	61	84	71	64
15	SSF	144	57	81	70	60
16	SSF	113	59	83	71	60
17	SSF	128	59	82	70	61
18	Daly City	118	63	86	74	60
19	Pacifica	115	60	84	72	63
20	Daly City	30	49	83	69	63
21	San Francisco	12	41	76	67	62
22	San Bruno	171	63	84	71	64
23	San Francisco	81	56	82	69	70
24	San Francisco	21	47	79	67	62
25	San Francisco	32	43	76	63	62
26	San Francisco	11	41	77	66	63
27	San Francisco	6	41	81	68	59
28	Redwood City	6	39	78	67	52
29	San Mateo	13	54	87	72	61

Color image (left) centered on SFO is 2019 2nd Quarter noise contour generated by computer modeling. The contours show various Aircraft CNEL exposure. California's Title 21 Noise Regulation established acceptable level of aircraft noise at less than 65dBA CNEL. Noise Monitor's CNEL values (top) are derivedfrom actual measured events and are used to validate the 65dBA CNEL noise footprint. Aircraft and Community monthly CNEL average for each monitor site are provided, along with daily average aircraft counts with the average Sound Exposure Level (SEL) and Maximum Level (LMax).



The graph below shows aircraft noise events that produced a noise level higher than the maximum allowable decibel value established for a particular monitoring site.

Significant Exceedances



Note: Site 2 is currently not operational

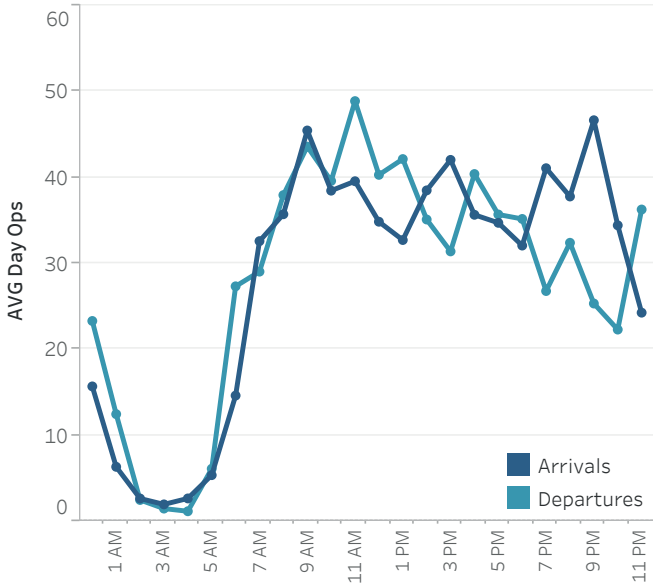
Operations

July 2019

Monthly Ops	AVG Daily Ops	12 Month AVG	YOY Growth
41,836	1,350	38,111	1.0%

Major Arrival and Departure Routes (West Flow)

July 2019 Average Day (Hourly)



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

West Flow
100%

Top Destinations

Los Angeles	Seattle
6%	6%

Down the Bay vs Peninsula

1.1 BDEGA East	29%
1.2 BDEGA West	71%

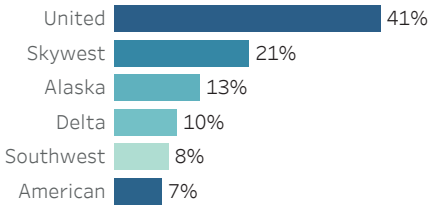
Arrival Route

1. BDEGA	29%
2. DYAMD	39%
3. SERFR	27%
4. OCEANIC	6%

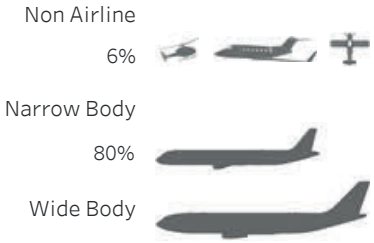
Departure Route

A. GAP	21%
B. SSTIK	26%
C. NIITE	8%
D. TRUKN RWY 01	41%
D. TRUKN RWY 28	3%

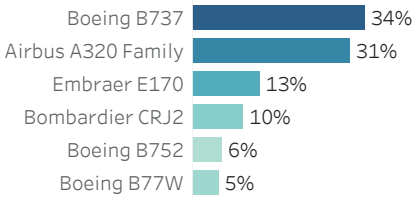
Airlines with the Most Operations



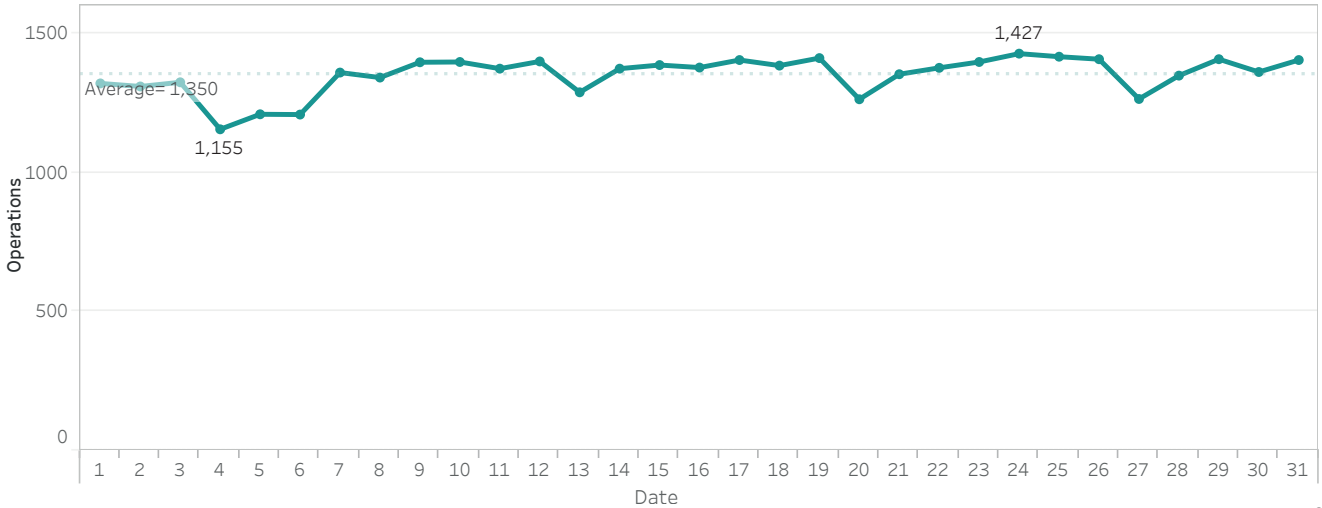
Non Airline / Narrow Body / Wide Body



Most Utilized Aircraft Types



Daily Aircraft Operations



Runway Usage and Nighttime Operations

Monthly Runway usage is shown for arrivals and departures, futher categorized by all hours and nightttime hours. Graph at the bottom of the page shows hourly nighttime operations for each day. Power Runup locations are depicted on the airport map with airlines nighttime power runup counts shown below. Percent [%] is rounded to the nearest whole number.

Runway Utilization

	Arrivals	Departures
01 L/R		77% 15,151
10 L/R		0% 1
28 L/R	100% 19,555	23% 4,430

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

	Departures
10 L/R	0% 1
01 L/R	48% 324
28 L/R	52% 350

Runway Utilization

Arrivals

28L	28R
48%	52%

Night (10pm-7am)

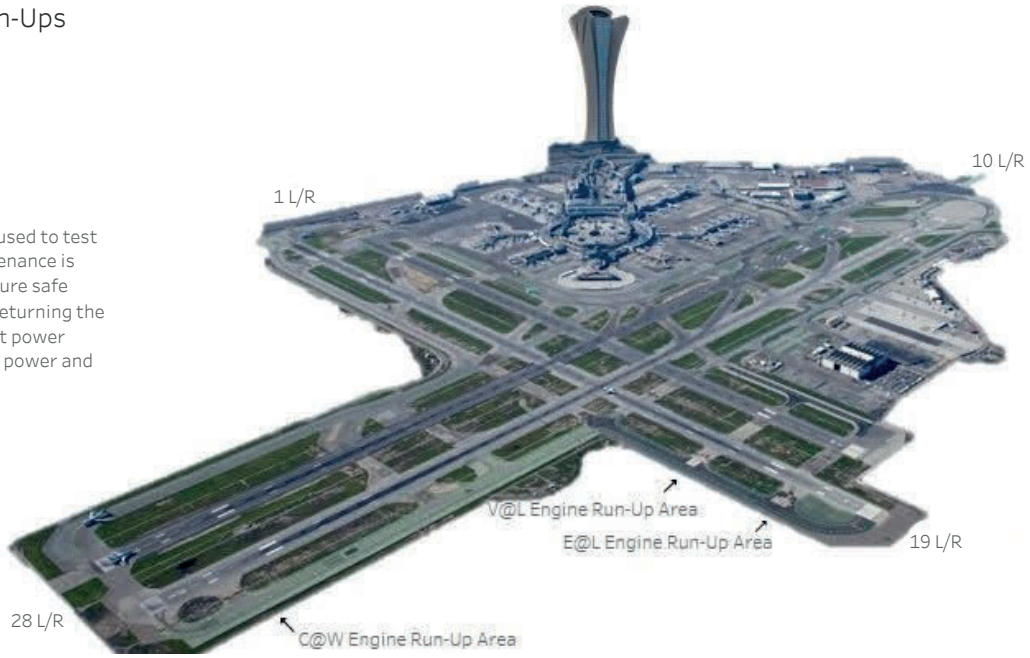
42%	58%

Nighttime Power Run-Ups

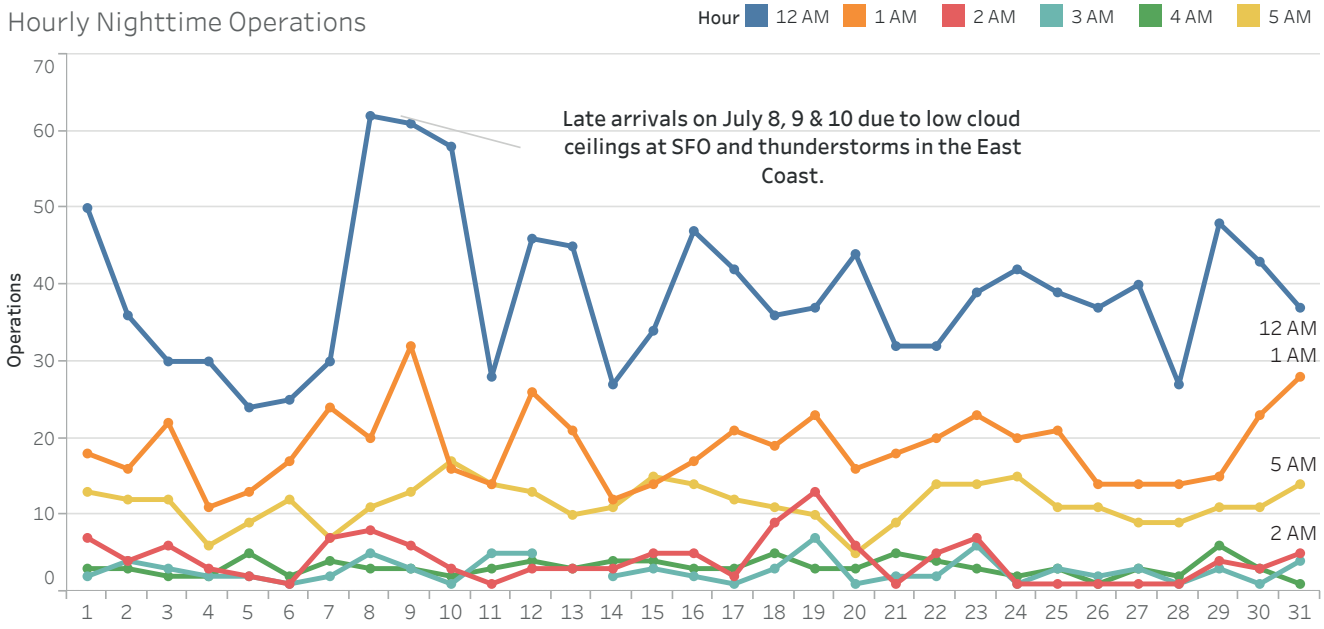
10pm-7am

Alaska Airlines	7
American Airlines	10
Delta Airlines	2
Southwest Airlines	1
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 settingsrange from idle to full power and may vary in duration.



Hourly Nighttime Operations



Noise Reports

July 2019

		Noise Reporters	Noise Reports
Roundtable	Atherton	6	1,601
	Belmont	3	328
	Brisbane	20	1,680
	Burlingame	13	210
	Daly City	6	994
	El Granada	1	974
	Foster City	18	853
	Hillsborough	7	90
	Menlo Park	23	1,610
	Millbrae	4	14
	Pacifica	29	3,133
	Portola Valley	33	7,251
	Redwood City	12	1,902
	San Bruno	9	565
	San Carlos	3	161
	San Francisco	37	4,598
	San Mateo	22	2,413
	South San Francisco	17	195
	Woodside	11	1,394
Other	Aptos	10	477
	Ben Lomond	5	36
	Berkeley	4	1,039
	Bonny Doon	2	57
	Boulder Creek	9	228
	Brookdale	1	6
	Capitola	18	2,452
	Carmel Valley	2	67
	Castro Valley	1	17
	Cupertino	1	693
	Danville	1	2
	East Palo Alto	1	1
	Emerald Hills	10	4,580
	Felton	13	932
	Fremont	1	180
	Hayward	1	46
	Lafayette	1	115
	Los Altos	117	18,144
	Los Altos Hills	26	10,240
	Los Gatos	121	20,549
	Montara	1	738
	Moraga	3	281
	Morgan Hill	2	299
	Moss Beach	1	2
	Mountain View	32	3,756
	Oakland	26	7,117
	Orinda	2	157
	Palo Alto	192	45,740
	Penngrove	1	6
	Richmond	4	3,271
	San Jose	1	4
	Santa Clara	1	10
	Santa Cruz	121	24,294
	Saratoga	4	336
	Scotts Valley	67	13,134
	Soquel	71	10,978
	Stanford	5	518
	Sunnyvale	5	348
	Union City	1	381
	Watsonville	1	174
Grand Total		**1,160**	**201,371**

Reporters Annual AVG

1,240

Reports Annual AVG

186,436

New Reporters

46

New Reporters Top City

Foster City

Furthest Report

88 Miles

Reports per SFO Operation

4

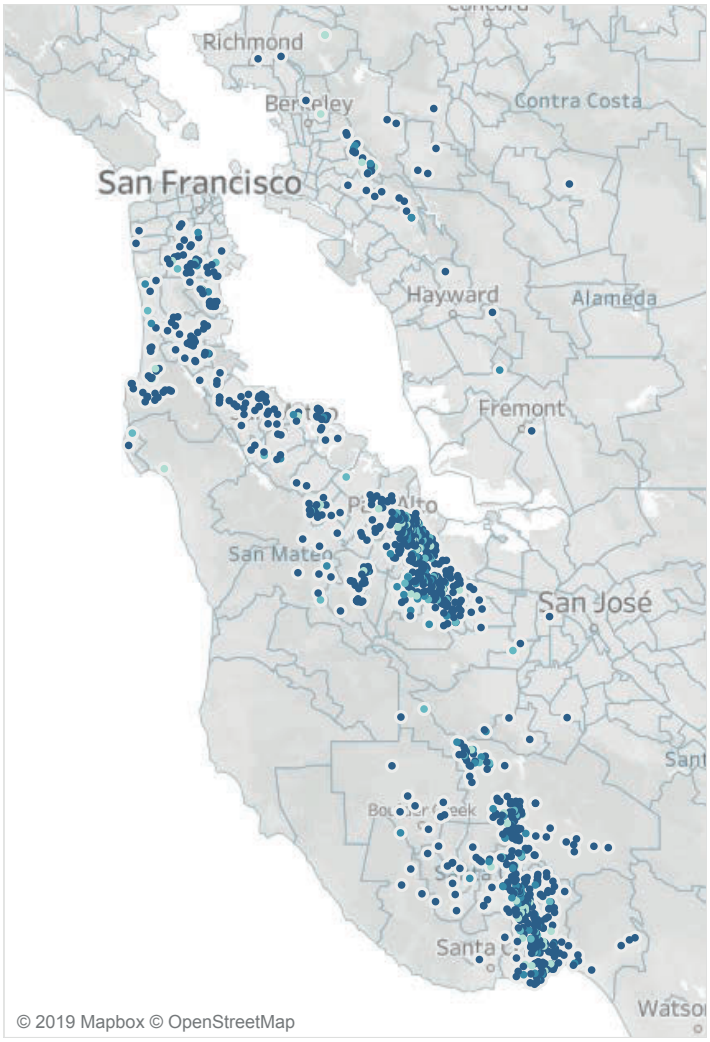
Top Aircraft Type

B737
A320
E75L

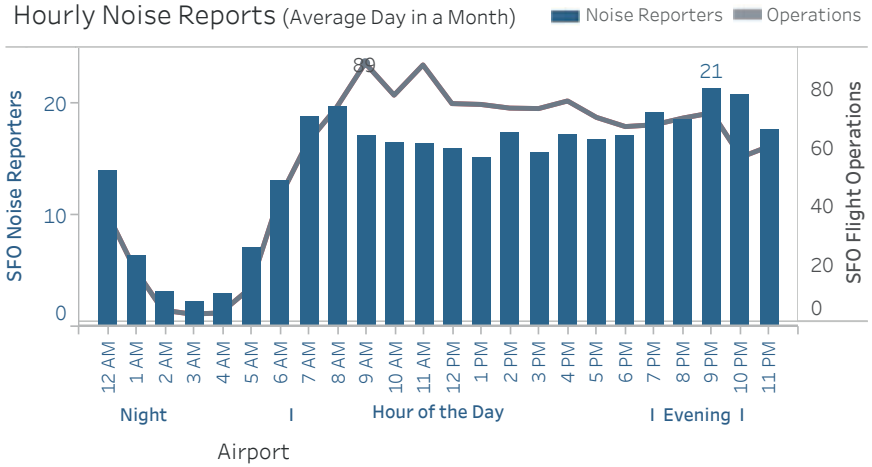
Top Flight Number

ASA1947
DAL1381
UAL2201

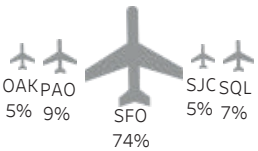
Noise Reporters Location Map



Hourly Noise Reports (Average Day in a Month)



Airport



100% of noise reports correlate to a flight origin/destination airport.

Source: SFO Intl Airport Noise Monitoring System

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

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Airport Director's Report

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Aircraft Noise Abatement Office
August 2019

SFO San Francisco International Airport

Aircraft Noise Levels

August 2019

The map shows 29 aircraft noise monitoring locations that keep track of noise levels in the communities around the airport. Image centered on SFO airport shows quartlerly aircraft noise levels (dBA) exposure. The green zone marks 65dBA Community Noise Exposure Level (CNEL). The CNEL metric is used to assess and regulate aircraft noise exposure in communities surrounding the airport.

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16	SSF	114	59	83	71	58
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19	Pacifica	107	60	84	73	56
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21	San Francisco	14	41	76	67	60
22	San Bruno	159	61	81	71	63
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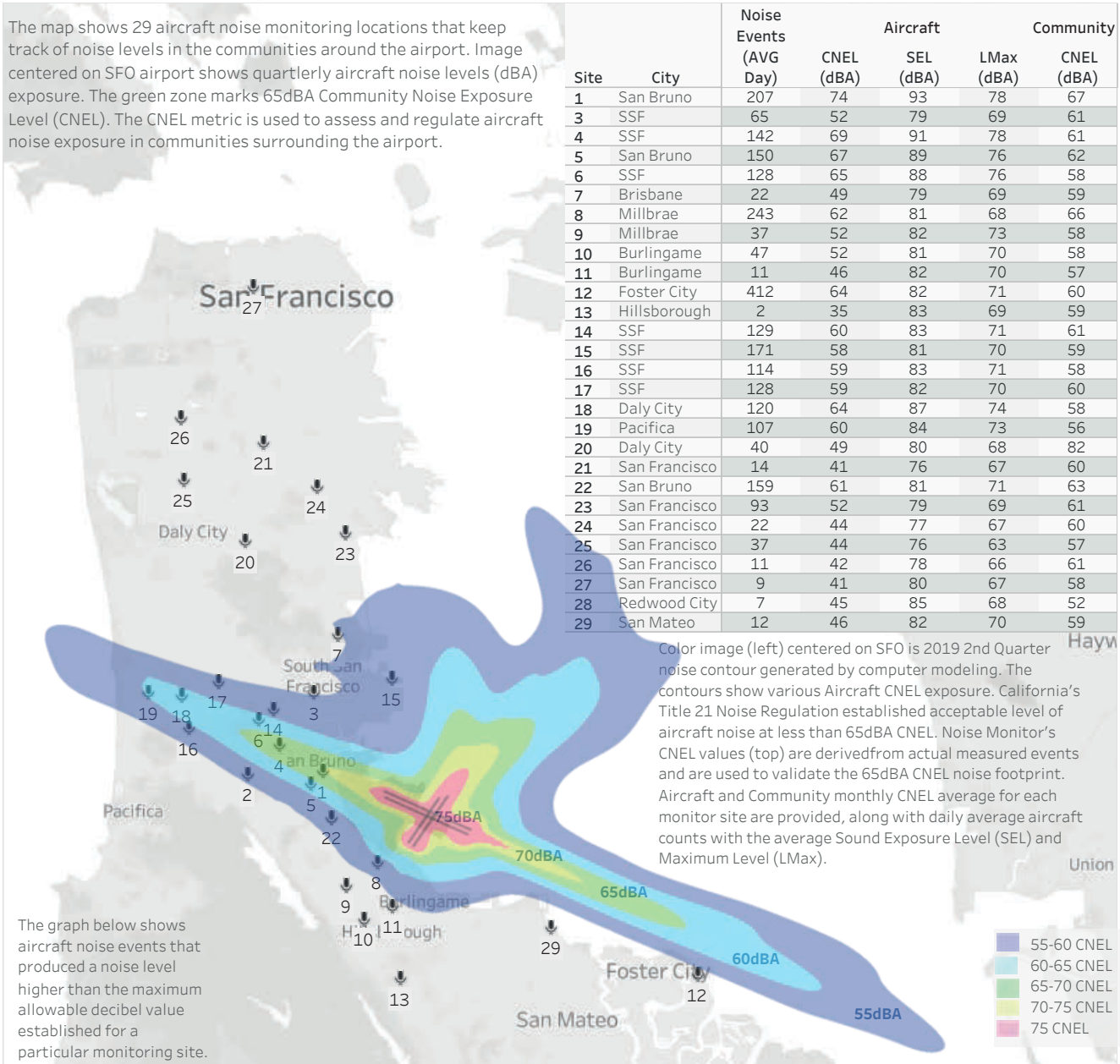

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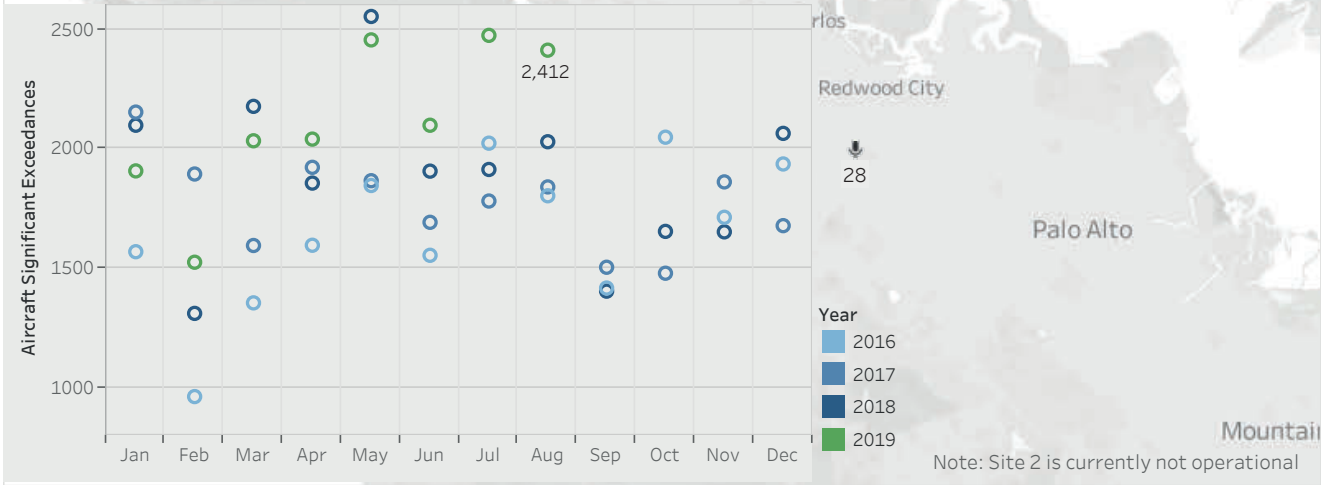
Significant Exceedances



Note: Site 2 is currently not operational

Operations

August 2019

Monthly Ops	AVG Daily Ops	12 Month AVG	YOY Growth
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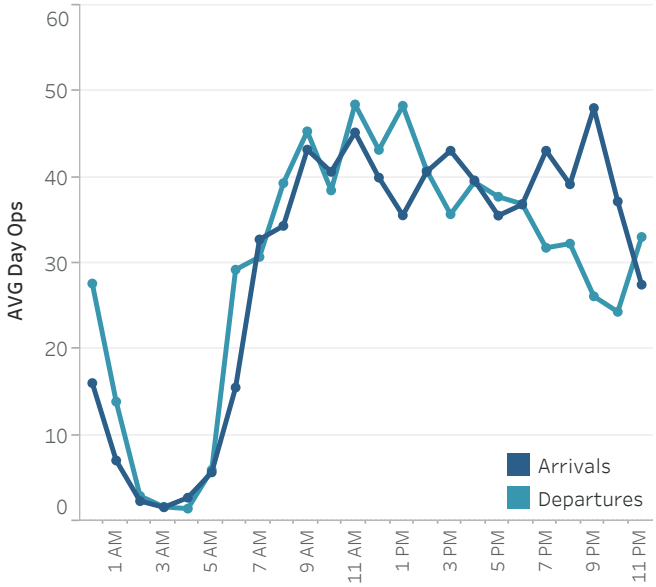
Major Arrival and Departure Routes (West Flow)

August 2019 Average Day (Hourly)



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

West Flow
100%

Top Destinations

Seattle	Los Angeles
7%	6%

Down the Bay vs Peninsula

1.1 BDEGA East	31%
1.2 BDEGA West	69%

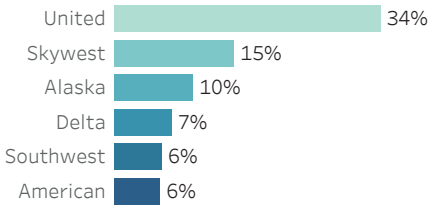
Arrival Route

1. BDEGA	29%
2. DYAMD	38%
3. SERFR	27%
4. OCEANIC	6%

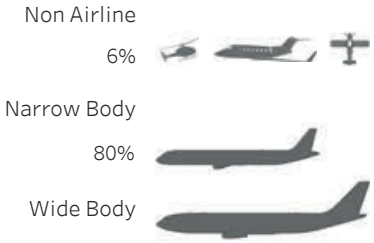
Departure Route

A. GAP	19%
B. SSTIK	28%
C. NIITE	10%
D. TRUKN RWY 01	42%
D. TRUKN RWY 28	1%

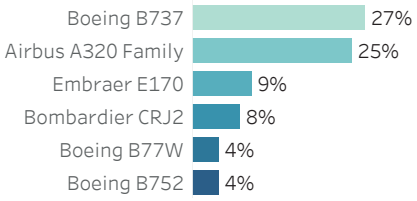
Airlines with the Most Operations



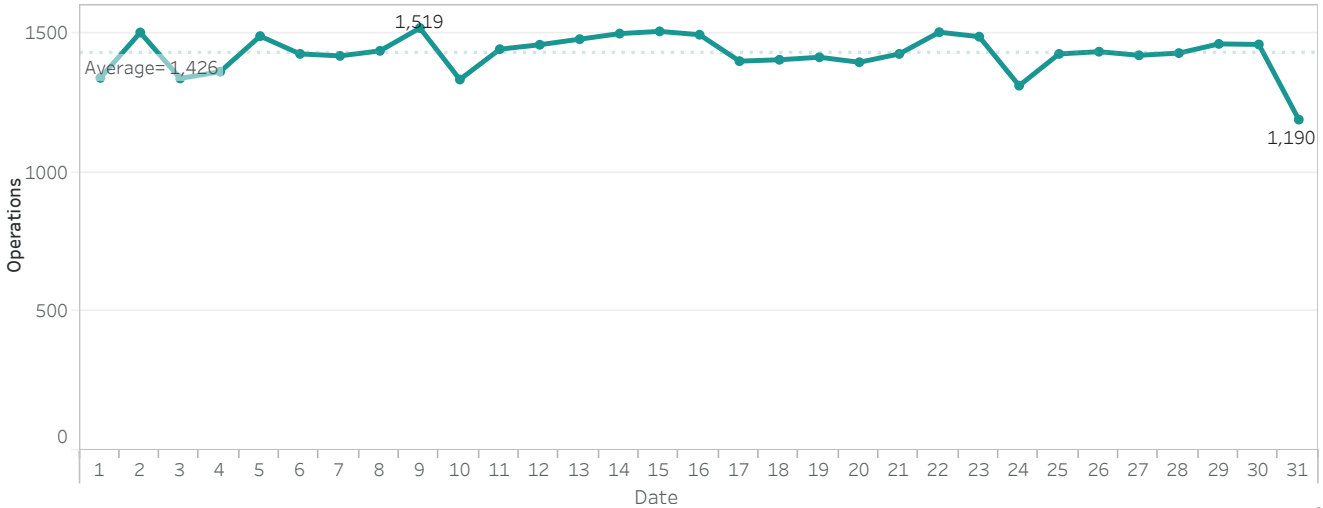
Non Airline / Narrow Body / Wide Body



Most Utilized Aircraft Types



Daily Aircraft Operations



Runway Usage and Nighttime Operations

Monthly Runway usage is shown for arrivals and departures, futher categorized by all hours and nightttime hours. Graph at the bottom of the page shows hourly nighttime operations for each day. Power Runup locations are depicted on the airport map with airlines nighttime power runup counts shown below. Percent [%] is rounded to the nearest whole number.

Runway Utilization

	Arrivals	Departures
01 L/R		82% 17,194
10 L/R		0% 3
28 L/R	100% 20,994	18% 3,823

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

	Departures
10 L/R	0% 2
01 L/R	55% 407
28 L/R	44% 327

Runway Utilization

Arrivals	
28L	28R
46%	54%

Night (10pm-7am)

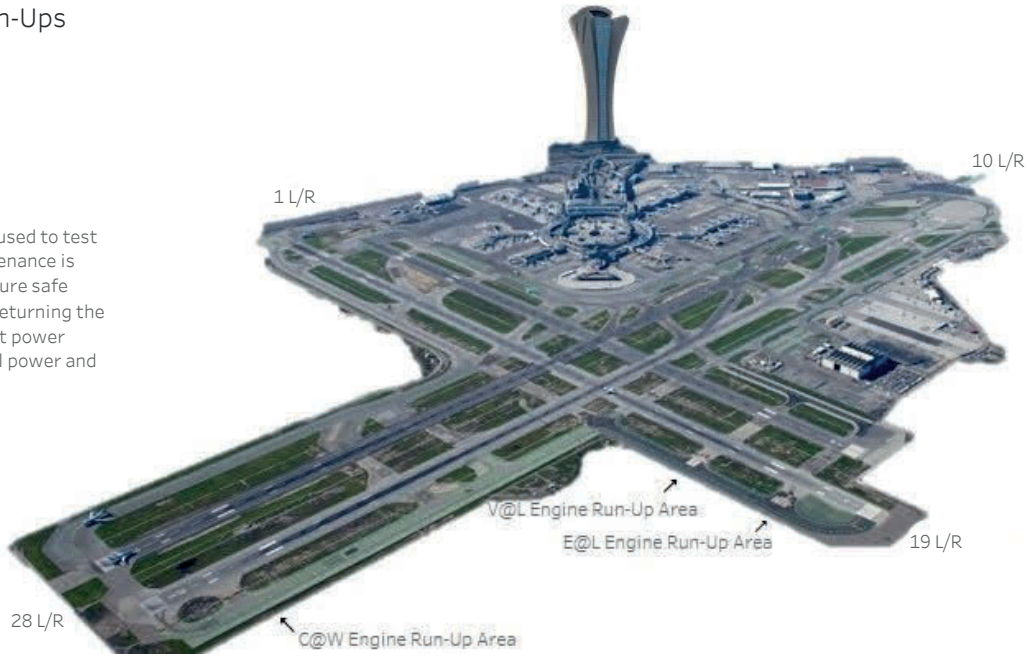
39%	61%

Nighttime Power Run-Ups

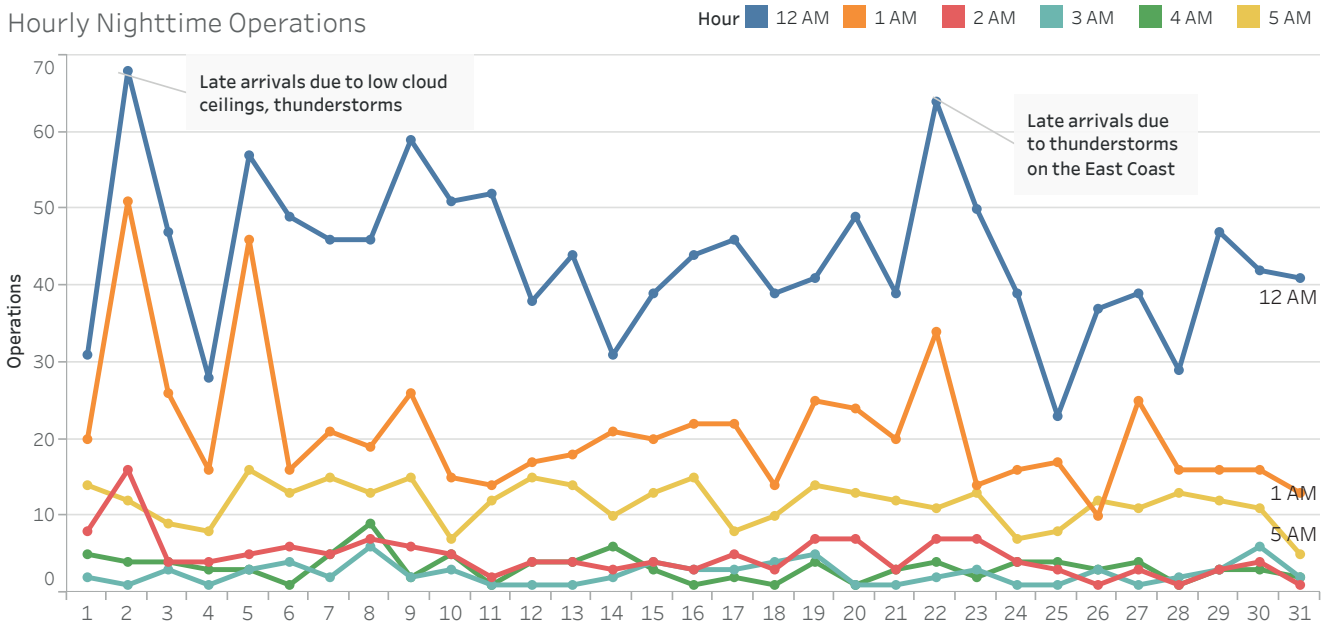
10pm-7am

Alaska Airlines	12
American Airlines	15
United Airlines	18

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.



Hourly Nighttime Operations



Noise Reports

August 2019

		Noise Reporters	Noise Reports
Roundtable	Atherton	6	948
	Belmont	4	315
	Brisbane	22	3,225
	Burlingame	12	278
	Daly City	8	1,164
	El Granada	1	628
	Foster City	16	824
	Half Moon Bay	3	4
	Hillsborough	9	139
	Menlo Park	25	1,877
	Millbrae	2	13
	Pacifica	29	2,551
	Portola Valley	31	7,482
	Redwood City	12	1,745
	San Bruno	11	592
	San Carlos	2	113
	San Francisco	41	6,103
	San Mateo	24	1,079
	South San Francisco	11	362
	Woodside	10	1,636
Other	Aptos	8	411
	Ben Lomond	5	48
	Berkeley	4	1,178
	Bonny Doon	2	38
	Boulder Creek	10	248
	Brookdale	1	1
	Capitola	19	2,645
	Carmel Valley	2	52
	Castro Valley	1	6
	Concord	1	1
	Cupertino	2	650
	Danville	1	1
	East Palo Alto	2	70
	Emerald Hills	7	6,806
	Felton	12	907
	Fremont	1	218
	La Selva Beach	1	2
	Lafayette	1	186
	Los Altos	125	20,188
	Los Altos Hills	27	10,778
	Los Gatos	117	16,570
	Montara	1	304
	Moraga	4	254
	Morgan Hill	2	166
	Moss Beach	1	12
	Mountain View	38	5,011
	Oakland	31	9,063
	Orinda	2	27
	Palo Alto	210	45,928
	Penngrove	1	6
	Piedmont	1	1
	Richmond	3	3,075
	San Jose	1	3
	Santa Clara	1	32
	Santa Cruz	117	19,601
	Saratoga	4	387
	Scotts Valley	66	13,121
	Soquel	66	11,333
	Stanford	4	627
	Sunnyvale	8	448
	Union City	1	339
	Watsonville	1	96
Grand Total		**1,191**	**201,916**

Reporters Annual AVG

1,218

Reports Annual AVG

186,233

New Reporters

39

New Reporters Top City

San Mateo

Furthest Report

88 Miles

Reports per SFO Operation

5

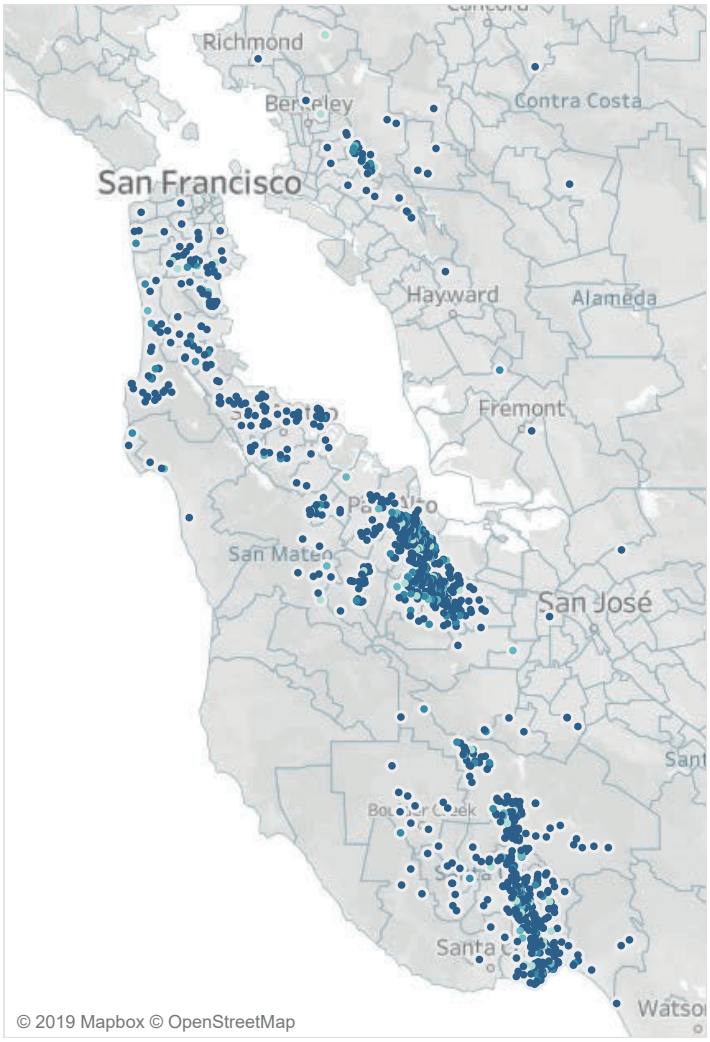
Top Aircraft Type

B737
A320
A319

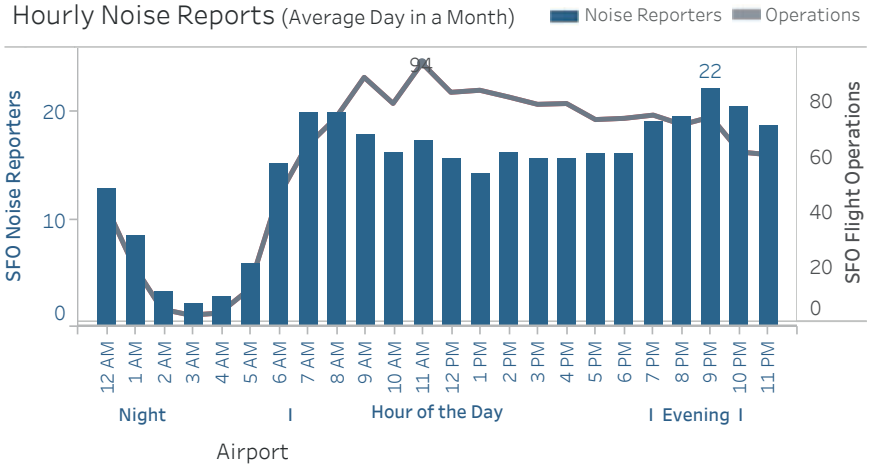
Top Flight Number

AAL1769
JBU1136
ASA1947

Noise Reporters Location Map



Hourly Noise Reports (Average Day in a Month)



Airport

100% of noise reports correlate to a flight origin/destination airport.

Source: SFO Intl Airport Noise Monitoring System

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

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Fly Quiet Report

Presented at the October 2, 2019
Airport Community Roundtable Meeting

Aircraft Noise Abatement Office
Second Quarter 2019

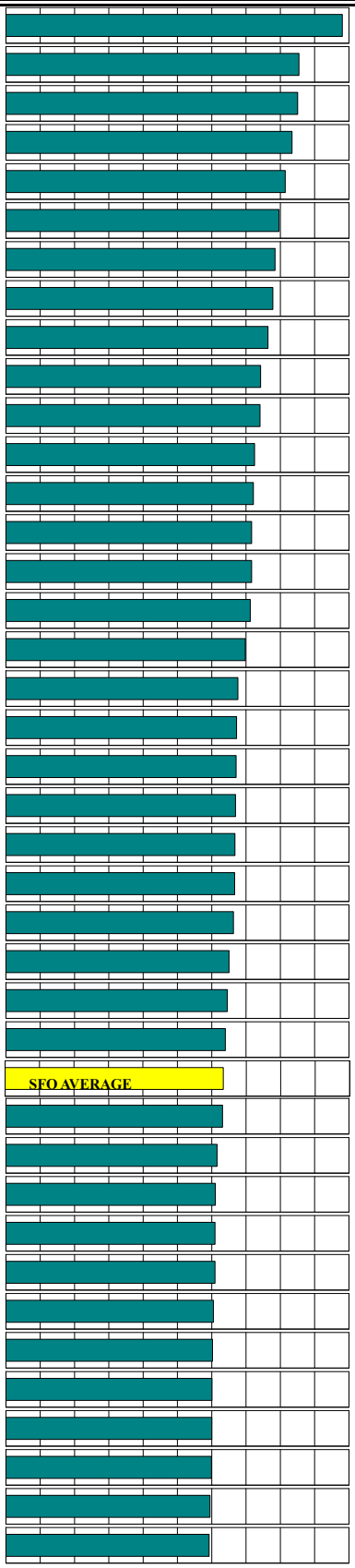
SFO San Francisco International Airport

Airline Fly Quiet Summary Report - 2nd Quarter 2019

April 1 to June 30, 2019

Airline		Fleet Noise Quality	Noise Exceedance	Nighttime Runway Use	Departures Shoreline	Departures Gap	Arrivals Foster City	Final Score
virgin atlantic	VIR	9.50	10.00	-	-	9.92	-	9.81
JAPAN AIRLINES	JAL	7.16	9.96	-	-	8.51	-	8.54
ANA	ANA	7.15	10.00	-	-	8.37	-	8.51
Emirates	UAE	10.00	10.00	-	-	5.03	-	8.34
Scandinavian Airlines	SAS	8.07	10.00	-	-	6.36	-	8.14
AIRFRANCE	AFR	7.99	9.93	-	-	5.97	-	7.96
אל על	ELY	9.50	7.92	-	-	8.96	5.00	7.85
WESTJET	WJA	5.82	9.86	-	9.47	8.75	5.00	7.78
SWISS	SWR	7.15	9.83	-	-	5.94	-	7.64
HONGKONG AIRLINES 香港航空	CRK	9.50	10.00	-	-	2.77	-	7.42
BRITISH AIRWAYS	BAW	6.70	9.87	-	-	5.66	-	7.41
Jazz	JZA	10.00	9.95	-	8.38	2.92	5.00	7.25
SkyWest AIRLINES	SKW	10.00	9.92	2.75	9.54	6.07	5.03	7.22
Aer Lingus	EIN	4.05	10.00	-	-	7.44	-	7.16
中國東方航空 CHINA EASTERN	CES	6.21	10.00	-	-	5.28	-	7.16
Frenchbee	FBU	9.50	9.76	0.67	8.75	9.06	5.00	7.12
DELTA	DAL	6.34	9.69	3.68	7.82	7.63	6.71	6.98
AIRITALY	ISS	4.05	10.00	-	8.00	5.00	-	6.76
UNITED	UAL	6.04	9.61	2.94	8.29	7.43	6.02	6.72
FedEx.	FDX	3.84	8.88	-	9.44	5.97	5.42	6.71
TURKISH AIRLINES	THY	7.15	10.00	-	-	2.93	-	6.69
Southwest	SWA	5.82	9.62	3.16	9.72	5.31	6.42	6.68
Compass Airlines	CPZ	5.82	9.72	3.11	9.66	6.70	5.00	6.67
FRONTIER AIRLINES	FFT	4.84	9.71	4.11	9.06	4.46	7.61	6.63
norwegian	NRS	9.50	10.00	-	0.56	5.97	-	6.51
Thomas Cook Airlines	TCX	4.05	9.62	-	10.00	2.14	-	6.45
XL airways	XLF	4.05	8.74	-	-	-	-	6.40
								6.33 SFO AVERAGE
Lufthansa	DLH	9.09	9.81	0.00	-	7.67	5.00	6.32
interjet	AIJ	4.85	9.24	3.06	-	8.64	5.00	6.16
jetBlue	JBU	4.75	9.60	4.51	6.99	4.39	6.39	6.10
Alaska	ASA	5.16	9.63	3.33	8.75	4.21	5.49	6.10
HAWAIIAN AIRLINES	HAL	4.05	8.42	-	-	6.91	5.00	6.10
sun country airlines	SCX	5.83	9.35	4.81	7.92	3.17	5.21	6.05
AIR NEW ZEALAND	ANZ	7.05	5.53	-	-	5.49	-	6.02
American Airlines	AAL	5.04	9.62	3.15	8.47	2.91	6.84	6.01
AIR CANADA	ACA	5.77	9.65	3.33	7.41	4.43	5.40	6.00
AEROMEXICO	AMX	5.82	8.47	2.50	10.00	3.71	5.45	5.99
FINNAIR	FIN	4.05	10.00	-	3.75	6.00	-	5.95
ICELANDAIR	ICE	4.52	10.00	-	4.38	4.79	-	5.92

Airline Fly Quiet Rating

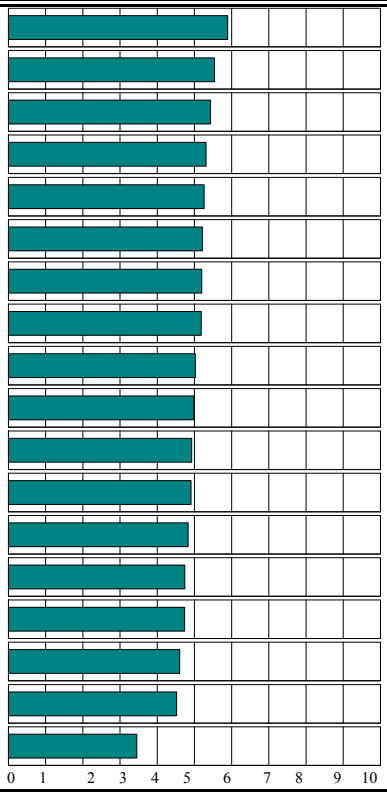


Airline Fly Quiet Summary Report - 2nd Quarter 2019

April 1 to June 30, 2019

Airline		Fleet Noise Quality	Noise Exceedance	Nighttime Runway Use	Departures Shoreline	Departures Gap	Arrivals Foster City	Final Score
KLM Royal Dutch Airlines	KLM	4.66	9.81	-	2.22	6.88	-	5.89
Avianca	TAI	4.85	8.70	2.45	-	6.86	4.84	5.54
KALITTA AIR	CKS	3.83	7.57	0.00	7.50	8.84	4.88	5.44
AIR CHINA	CCA	9.15	8.61	0.45	0.00	8.36	-	5.31
FIJI AIRWAYS	FJI	4.05	5.67	-	-	6.06	-	5.26
CATHAY PACIFIC	CPA	7.63	7.36	0.19	-	5.90	5.00	5.22
SINGAPORE AIRLINES	SIA	8.53	7.44	0.11	-	4.90	5.00	5.19
IBERIA	IBE	4.05	10.00	-	-	1.51	-	5.19
ASIANA AIRLINES	AAR	7.40	6.03	0.00	-	6.68	5.00	5.02
KOREAN AIR	KAL	8.00	5.97	0.12	-	5.84	5.00	4.99
中国南方航空 CHINA SOUTHERN AIRLINES	CSN	7.15	7.04	0.00	-	5.45	5.00	4.93
CHINA AIRLINES	CAL	5.52	7.25	0.00	-	6.78	5.00	4.91
AIR INDIA	AIC	7.15	6.93	3.16	0.33	6.42	5.00	4.83
EVA AIR	EVA	7.15	6.29	0.12	-	5.14	5.00	4.74
CopaAirlines	CMP	5.82	8.15	0.51	5.71	2.95	5.27	4.74
QANTAS	QFA	5.79	0.00	-	-	8.02	-	4.60
Philippines	PAL	7.51	6.36	0.00	-	3.74	5.00	4.52
ATLAS AIR	GTI	3.53	3.63	0.00	-	5.10	5.00	3.45
SFO Average		**6.45**	**8.68**	**1.80**	**7.00**	**5.87**	**5.35**	**6.33**

Airline Fly Quiet Rating

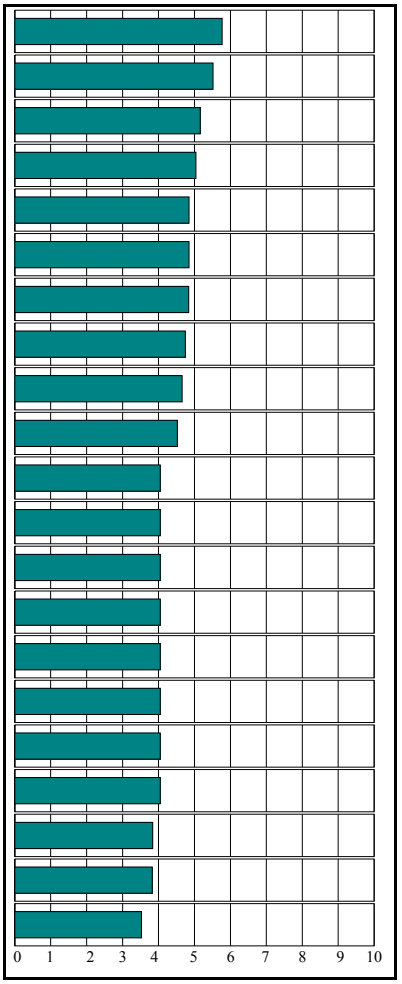


Fleet Noise Quality - 2nd Quarter 2019

April 1 to June 30, 2019

Airline		Nationwide Fleet Noise Quality Rating	San Francisco Average Daily Jet Operations	San Francisco Score	Fleet Noise Quality Rating
Emirates	UAE	7.10	1	10.00	
SkyWest	SKW	8.50	51	10.00	
JZA	JZA	8.90	5	10.00	
Hong Kong Airlines	CRK	7.90	1	9.50	
El Al	ELY	8.20	0	9.50	
Frenchbee	FBU	6.50	1	9.50	
norwegian	NRS	7.40	1	9.50	
virgin atlantic	VIR	5.70	2	9.50	
Air China	CCA	7.10	1	9.15	
Lufthansa	DLH	7.00	2	9.09	
Singapore Airlines	SIA	7.20	2	8.53	
Scandinavian Airlines	SAS	4.60	1	8.07	
Korean Air	KAL	6.80	3	8.00	
Air France	AFR	7.00	2	7.99	
Cathay Pacific	CPA	7.40	3	7.63	
Philippines	PAL	6.50	2	7.51	
Asiana Airlines	AAR	6.50	2	7.40	
Japan Airlines	JAL	7.90	1	7.16	
ANA	ANA	7.70	1	7.15	
China Southern Airlines	CSN	7.20	1	7.15	
SWISS	SWR	5.40	1	7.15	
Turkish Airlines	THY	5.50	1	7.15	
Air India	AIC	7.10	1	7.15	
EVA Air	EVA	7.10	3	7.15	
Air New Zealand	ANZ	7.90	1	7.05	
British Airways	BAW	7.50	2	6.70	
				6.45	SFO AVERAGE
DELTA	DAL	5.70	42	6.34	
China Eastern	CES	5.00	1	6.21	
UNITED	UAL	5.70	197	6.04	
sun country airlines	SCX	5.20	2	5.83	
AeroMexico	AMX	6.60	3	5.82	
CopaAirlines	CMP	5.50	2	5.82	
Compass Airlines	CPZ	5.50	0	5.82	
WestJet	WJA	5.50	2	5.82	
Southwest	SWA	5.30	38	5.82	
QANTAS	QFA	6.20	1	5.79	

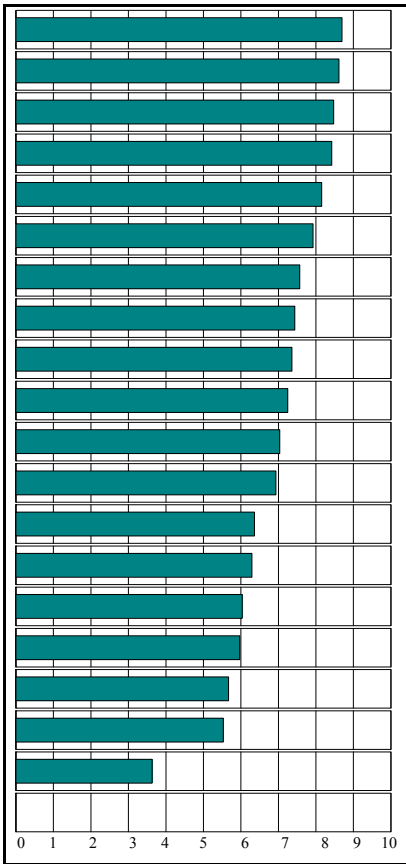
Airline		Nationwide Fleet Noise Quality Rating	San Francisco Average Daily Jet Operations	San Francisco Score	Fleet Noise Quality Rating
AIR CANADA	ACA	6.30	8	5.77	
CHINA AIRLINES	CAL	6.30	2	5.52	
Alaska	ASA	5.20	64	5.16	
American Airlines	AAL	5.60	37	5.04	
Avianca	TAI	6.00	2	4.85	
interjet	AIJ	5.00	1	4.85	
FRONTIER AIRLINES	FFT	5.10	4	4.84	
jetBlue	JBU	5.80	15	4.75	
KLM Royal Dutch Airlines	KLM	6.70	2	4.66	
ICELANDAIR	ICE	6.30	1	4.52	
Aer Lingus	EIN	4.90	1	4.05	
FINNAIR	FIN	4.80	0	4.05	
FIJI AIRWAYS	FJI	4.20	0	4.05	
HAWAIIAN AIRLINES	HAL	6.00	2	4.05	
IBERIA	IBE	4.90	1	4.05	
AIRITALY	ISS	3.80	1	4.05	
Thomas Cook Airlines	TCX	3.80	0	4.05	
XL airways	XLF	3.80	0	4.05	
FedEx	FDX	5.20	1	3.84	
KALITTA AIR	CKS	5.80	1	3.83	
ATLAS AIR	GTI	5.80	1	3.53	
AVERAGE		**6.16**	**9**	**6.45**	



Airline		Noise Exceedances				Noise Exceedance Quality Rating
		Total Noise Exceedances	*Total Quarterly Operations*	*Exceedances per 1000 Operations*	***Score***	
ANA	ANA	0	182	0	***10.00***	
中國東方航空 CHINA EASTERN	CES	0	260	0	***10.00***	
HONGKONG AIRLINES 香港航空	CRK	0	104	0	***10.00***	
Aer Lingus	EIN	0	168	0	***10.00***	
FINNAIR	FIN	0	88	0	***10.00***	
IBERIA	IBE	0	116	0	***10.00***	
ICELANDAIR	ICE	0	102	0	***10.00***	
AIRITALY	ISS	0	94	0	***10.00***	
norwegian	NRS	0	129	0	***10.00***	
Scandinavian Airlines	SAS	0	161	0	***10.00***	
TURKISH AIRLINES	THY	0	178	0	***10.00***	
Emirates	UAE	0	182	0	***10.00***	
virgin atlantic	VIR	0	331	0	***10.00***	
JAPAN AIRLINES	JAL	1	184	5	***9.96***	
Jazz	JZA	6	840	7	***9.95***	
AIRFRANCE	AFR	3	318	9	***9.93***	
SkyWest AIRLINES	SKW	201	20,075	10	***9.92***	
BRITISH AIRWAYS	BAW	6	360	17	***9.87***	
WESTJET	WJA	8	437	18	***9.86***	
SWISS	SWR	4	178	22	***9.83***	
Lufthansa	DLH	9	364	25	***9.81***	
KLM Royal Dutch Airlines	KLM	7	283	25	***9.81***	
Horizon Air	QXE	44	1,422	31	***9.77***	
Frenchbee	FBU	5	156	32	***9.76***	
Compass Airlines	CPZ	50	1,334	37	***9.72***	
FRONTIER AIRLINES	FFT	27	695	39	***9.71***	
DELTA	DAL	317	7,653	41	***9.69***	
AIR CANADA	ACA	70	1,495	47	***9.65***	
Alaska	ASA	563	11,613	48	***9.63***	
Thomas Cook Airlines	TCX	2	40	50	***9.62***	
Southwest	SWA	355	6,972	51	***9.62***	
American Airlines	AAL	339	6,654	51	***9.62***	
UNITED	UAL	1,832	35,837	51	***9.61***	
jetBlue	JBU	142	2,652	54	***9.60***	
suncountry airlines	SCX	37	431	86	***9.35***	
interjet	AIJ	26	258	101	***9.24***	
FedEx	FDX	38	256	148	***8.88***	
XL airways	XLF	1	6	167	***8.74***	
					8.70	SFO AVERAGE

Airline		Noise Exceedances: *Total Noise Exceedances*	*Total Quarterly Operations*	*Exceedances per 1000 Operations*	***Score***
Avianca	TAI	63	365	173	***8.70***
AIR CHINA	CCA	47	256	184	***8.61***
AEROMEXICO	AMX	119	589	202	***8.47***
HAWAIIAN AIRLINES	HAL	76	364	209	***8.42***
CopaAirlines	CMP	80	327	245	***8.15***
אל על	ELY	11	40	275	***7.92***
KALITTA AIR	CKS	86	267	322	***7.57***
SINGAPORE AIRLINES	SIA	150	442	339	***7.44***
CATHAY PACIFIC	CPA	188	538	349	***7.36***
CHINA AIRLINES	CAL	118	324	364	***7.25***
中国南方航空 CHINA SOUTHERN AIRLINES	CSN	73	186	392	***7.04***
AIR INDIA	AIC	95	234	406	***6.93***
Philippines	PAL	161	334	482	***6.36***
EVA AIR	EVA	240	489	491	***6.29***
ASIANA AIRLINES	AAR	146	278	525	***6.03***
KOREAN AIR	KAL	282	528	534	***5.97***
FIJI AIRWAYS	FJI	47	82	573	***5.67***
AIR NEW ZEALAND	ANZ	77	130	592	***5.53***
ATLAS AIR	GTI	108	128	844	***3.63***
QANTAS	QFA	347	262	1324	***0.00***

Noise Exceedance Quality Rating

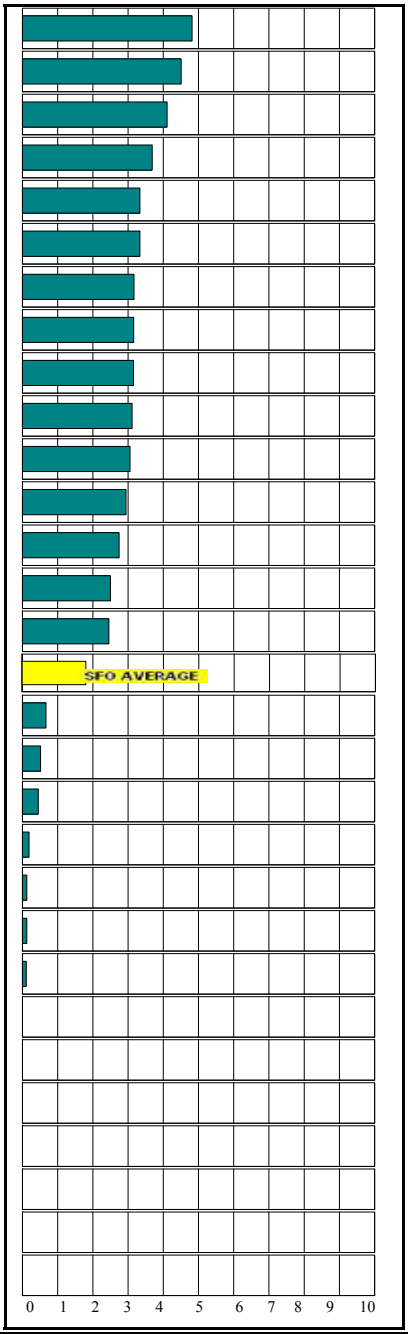


TOTAL	**6,607**	**108,771**		
SFO AVERAGE			**172**	**8.70**

Nighttime Preferential Runway Use - 2nd Quarter 2019

April 1 to June 30, 2019

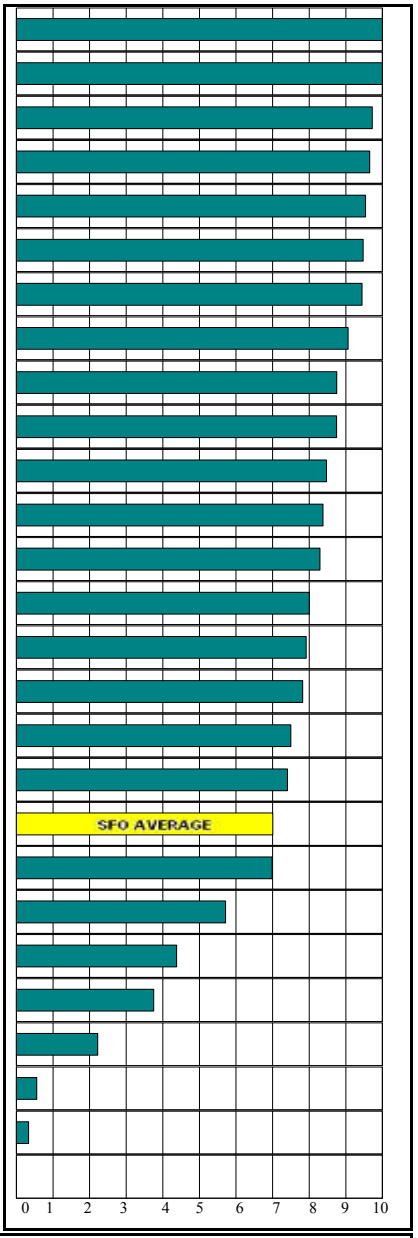
Airline		Nighttime Departures (1:00 am to 6:00 am)						Nighttime Runway Use Rating
		Total	*10L/R*	*28L/R Shoreline*	*01L/R*	*28L/R Straight*	***Score***	
SUN COUNTRY AIRLINES	SCX	**9**	11%	22%	67%	0%	***4.81***	
JETBLUE	JBU	**17**	6%	35%	47%	12%	***4.51***	
FRONTIER AIRLINES	FFT	**73**	1%	23%	73%	3%	***4.11***	
DELTA	DAL	**38**	0%	13%	84%	3%	***3.68***	
AIR CANADA	ACA	**2**	0%	0%	100%	0%	***3.33***	
ALASKA	ASA	**9**	0%	0%	100%	0%	***3.33***	
SOUTHWEST	SWA	**198**	0%	0%	95%	5%	***3.16***	
AIR INDIA	AIC	**38**	5%	39%	0%	55%	***3.16***	
AMERICAN AIRLINES	AAL	**93**	0%	22%	52%	27%	***3.15***	
COMPASS AIRLINES	CPZ	**30**	0%	0%	93%	7%	***3.11***	
INTERJET	AIJ	**12**	8%	0%	67%	25%	***3.06***	
UNITED	UAL	**281**	1%	10%	66%	23%	***2.94***	
SKYWEST AIRLINES	SKW	**17**	0%	6%	71%	24%	***2.75***	
AEROMEXICO	AMX	**16**	0%	6%	63%	31%	***2.50***	
AVIANCA	TAI	**91**	1%	0%	70%	29%	***2.45***	
							1.80	SFO AVERAGE
FRENCHBEE	FBU	**10**	0%	10%	0%	90%	***0.67***	
COPA AIRLINES	CMP	**91**	0%	8%	0%	92%	***0.51***	
AIR CHINA	CCA	**37**	3%	3%	0%	95%	***0.45***	
CATHAY PACIFIC	CPA	**108**	2%	0%	0%	98%	***0.19***	
EVA AIR	EVA	**164**	1%	0%	0%	99%	***0.12***	
KOREAN AIR	KAL	**83**	1%	0%	0%	99%	***0.12***	
SINGAPORE AIRLINES	SIA	**92**	1%	0%	0%	99%	***0.11***	
ASIANA AIRLINES	AAR	**27**	0%	0%	0%	100%	***0.00***	
CHINA AIRLINES	CAL	**96**	0%	0%	0%	100%	***0.00***	
KALITTA AIR	CKS	**2**	0%	0%	0%	100%	***0.00***	
CHINA SOUTHERN AIRLINES	CSN	**4**	0%	0%	0%	100%	***0.00***	
Lufthansa	DLH	**1**	0%	0%	0%	100%	***0.00***	
ATLAS AIR	GTI	**25**	0%	0%	0%	100%	***0.00***	
Philippines	PAL	**7**	0%	0%	0%	100%	***0.00***	
TOTAL		**1,671**						
SFO AVERAGE			**1%**	**7%**	**36%**	**56%**	**1.80**	



Shoreline Departure Rating - 2nd Quarter 2019

April 1 to June 30,2019

Airline		Shoreline Departures					Shoreline Departure Rating
		Total	Successful	Marginal	Poor	Score	
AEROMEXICO	AMX	1	100%	0%	0%	10.00	
Thomas Cook Airlines	TCX	2	100%	0%	0%	10.00	
Southwest	SWA	54	94%	6%	0%	9.72	
Compass Airlines	CPZ	29	93%	7%	0%	9.66	
SkyWest	SKW	195	91%	8%	1%	9.54	
WESTJET	WJA	19	89%	11%	0%	9.47	
FedEx	FDX	9	89%	11%	0%	9.44	
FRONTIER AIRLINES	FFT	32	81%	19%	0%	9.06	
Alaska	ASA	261	77%	22%	2%	8.75	
Frenchbee	FBU	4	75%	25%	0%	8.75	
American Airlines	AAL	193	71%	27%	2%	8.47	
Jazz	JZA	37	70%	27%	3%	8.38	
UNITED	UAL	518	71%	24%	5%	8.29	
AIRITALY	ISS	5	80%	0%	20%	8.00	
sun country airlines	SCX	12	67%	25%	8%	7.92	
DELTA	DAL	234	64%	29%	7%	7.82	
KALITTA AIR	CKS	8	50%	50%	0%	7.50	
AIR CANADA	ACA	54	61%	26%	13%	7.41	
						7.00	SFO AVERAGE
jetBlue	JBU	88	40%	60%	0%	6.99	
CopaAirlines	CMP	7	29%	57%	14%	5.71	
ICELANDAIR	ICE	8	13%	63%	25%	4.38	
FINNAIR	FIN	4	0%	75%	25%	3.75	
KLM Royal Dutch Airlines	KLM	18	0%	44%	56%	2.22	
norwegian	NRS	9	0%	11%	89%	0.56	
AIR INDIA	AIC	15	0%	7%	93%	0.33	
AIR CHINA	CCA	1	0%	0%	100%	0.00	
TOTAL		**1,817**					
SFO AVERAGE			**58%**	**24%**	**18%**	**7.00**	



Gap Departure Climb Rating - 2nd Quarter 2019

April 1 to June 30, 2019

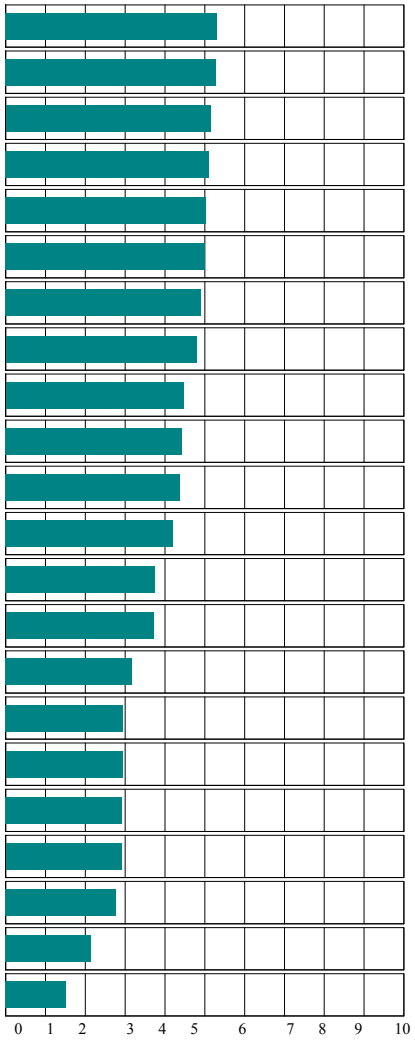
Airline		Gap Departures		Gap Departure Quality Rating
		Total	Score	
virgin atlantic	VIR	60	9.92	
Frenchbee	FBU	72	9.06	
אל על	ELY	18	8.96	
KALITTA AIR	CKS	73	8.84	
WESTJET	WJA	1	8.75	
interjet	AIJ	11	8.64	
JAPAN AIRLINES	JAL	83	8.51	
ANA	ANA	89	8.37	
AIR CHINA	CCA	124	8.36	
QANTAS	QFA	127	8.02	
Lufthansa	DLH	177	7.67	
DELTA	DAL	233	7.63	
Aer Lingus	EIN	88	7.44	
UNITED	UAL	4356	7.43	
HAWAIIAN AIRLINES	HAL	19	6.91	
KLM Royal Dutch Airlines	KLM	12	6.88	
Avianca	TAI	33	6.86	
CHINA AIRLINES	CAL	159	6.78	
Compass Airlines	CPZ	58	6.70	
ASIANA AIRLINES	AAR	138	6.68	
Horizon Air	QXE	75	6.60	
AIR INDIA	AIC	97	6.42	
Scandinavian Airlines	SAS	79	6.36	
SkyWest	SKW	893	6.07	
FIJI AIRWAYS	FJI	40	6.06	
FINNAIR	FIN	20	6.00	
FedEx	FDX	18	5.97	
AIRFRANCE	AFR	147	5.97	
norwegian	NRS	22	5.97	
SWISS	SWR	88	5.94	
CATHAY PACIFIC	CPA	265	5.90	
			5.87	SFO AVERAGE
KOREAN AIR	KAL	260	5.84	
BRITISH AIRWAYS	BAW	158	5.66	
AIR NEW ZEALAND	ANZ	64	5.49	
中国南方航空 CHINA SOUTHERN AIRLINES	CSN	92	5.45	

Gap Departure Climb Rating - 2nd Quarter 2019

April 1 to June 30, 2019

Airline		Gap Departures Total	Gap Departures Score
Southwest	SWA	326	5.31
中國東方航空 CHINA EASTERN	CES	127	5.28
EVA AIR	EVA	240	5.14
ATLAS AIR	GTI	61	5.10
Emirates	UAE	89	5.03
AIRITALY	ISS	7	5.00
SINGAPORE AIRLINES	SIA	217	4.90
ICELANDAIR	ICE	6	4.79
FRONTIER AIRLINES	FFT	7	4.46
AIR CANADA	ACA	42	4.43
jetBlue	JBU	49	4.39
Alaska	ASA	598	4.21
Philippines	PAL	164	3.74
AEROMEXICO	AMX	34	3.71
suncountry airlines	SCX	30	3.17
CopaAirlines	CMP	157	2.95
TURKISH AIRLINES	THY	87	2.93
Jazz	JZA	6	2.92
American Airlines	AAL	536	2.91
HONGKONG AIRLINES 香港航空	CRK	51	2.77
Thomas Cook Airlines	TCX	7	2.14
IBERIA	IBE	58	1.51

Gap Departure Quality Rating

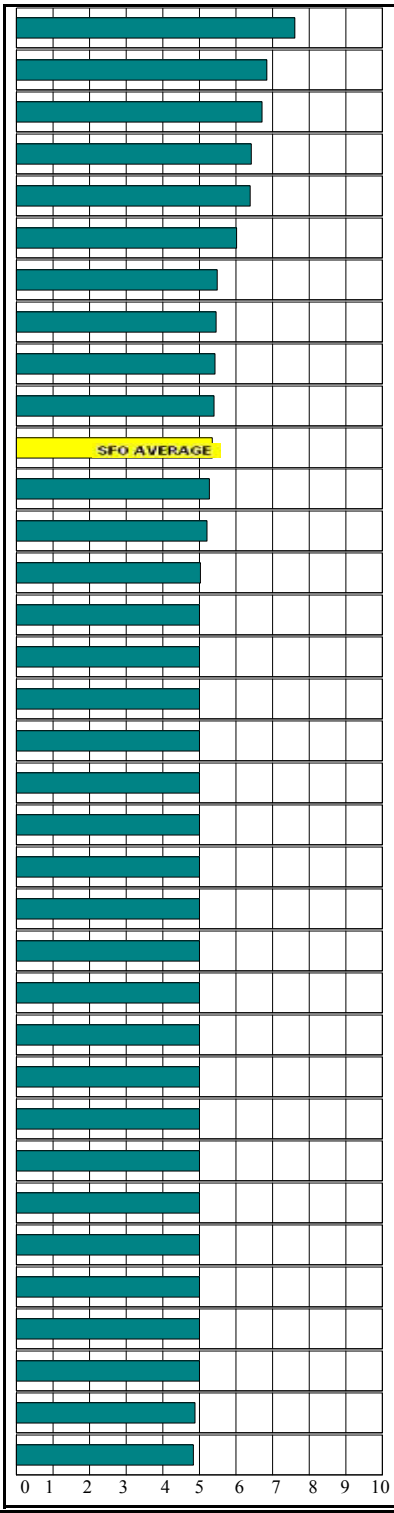


TOTAL	**11148**	
SFO Average		**5.87**

Foster City Arrival Rating - 2nd Quarter 2019

April 1 to June 30,2019

Airline		Foster City Arrivals					Foster City Arrival Rating
		Total	*Successful*	*Marginal*	*Poor*	*Score*	
FRONTIER AIRLINES	FFT	**92**	52%	48%	0%	*7.61*	
American Airlines	AAL	**434**	37%	62%	0%	*6.84*	
DELTA	DAL	**362**	35%	64%	1%	*6.71*	
Southwest	SWA	**399**	29%	70%	1%	*6.42*	
jetBlue	JBU	**274**	28%	72%	0%	*6.39*	
UNITED	UAL	**1,560**	22%	77%	1%	*6.02*	
Alaska	ASA	**513**	11%	87%	2%	*5.49*	
AEROMEXICO	AMX	**11**	9%	91%	0%	*5.45*	
FedEx	FDX	**59**	8%	92%	0%	*5.42*	
AIR CANADA	ACA	**25**	8%	92%	0%	*5.40*	
						5.35	SFO AVERAGE
CopaAirlines	CMP	**91**	5%	95%	0%	*5.27*	
suncountry airlines	SCX	**24**	4%	96%	0%	*5.21*	
SkyWest	SKW	**175**	6%	88%	6%	*5.03*	
ASIANA AIRLINES	AAR	**27**	0%	100%	0%	*5.00*	
AIR INDIA	AIC	**1**	0%	100%	0%	*5.00*	
interjet	AIJ	**10**	0%	100%	0%	*5.00*	
CHINA AIRLINES	CAL	**5**	0%	100%	0%	*5.00*	
CATHAY PACIFIC	CPA	**6**	0%	100%	0%	*5.00*	
Compass Airlines	CPZ	**55**	2%	96%	2%	*5.00*	
中国南方航空 CHINA SOUTHERN AIRLINES	CSN	**1**	0%	100%	0%	*5.00*	
Lufthansa	DLH	**1**	0%	100%	0%	*5.00*	
אל על	ELY	**17**	0%	100%	0%	*5.00*	
EVA AIR	EVA	**2**	0%	100%	0%	*5.00*	
Frenchbee	FBU	**3**	0%	100%	0%	*5.00*	
ATLAS AIR	GTI	**28**	0%	100%	0%	*5.00*	
HAWAIIAN AIRLINES	HAL	**2**	0%	100%	0%	*5.00*	
Jazz	JZA	**6**	0%	100%	0%	*5.00*	
KOREAN AIR	KAL	**81**	0%	100%	0%	*5.00*	
Philippines	PAL	**1**	0%	100%	0%	*5.00*	
Horizon Air	QXE	**37**	0%	100%	0%	*5.00*	
SINGAPORE AIRLINES	SIA	**1**	0%	100%	0%	*5.00*	
WESTJET	WJA	**1**	0%	100%	0%	*5.00*	
KALITTA AIR	CKS	**42**	2%	93%	5%	*4.88*	
Avianca	TAI	**91**	0%	97%	3%	*4.84*	
TOTAL		**4,437**					
SFO AVERAGE			**8%**	**92%**	**1%**	**5.35**	



SFO COMMUNITY ROUNDTABLE

San Francisco International
Airport/Community Roundtable

455 County Center, 2nd Floor
Redwood City, CA 94063
T (650) 363-1853
F (650) 363-4849
www.sforoundtable.org

August 22, 2019

TO: Roundtable Representatives, Alternatives, and Interested Persons

FROM: James A. Castañeda, AICP, Roundtable Coordinator

SUBJECT: Questions for the FAA at the September 26, 2019 SFO Airport/Community Roundtable Technical Working Group Meeting

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BACKGROUND/INTRODUCTION:

The FAA reports in their latest July FAA INITIATIVE PROCESS UPDATE REPORT the following:

Create an OAK departure procedure that flies down the Bay during nighttime hours

- References: RT B 24 Part 2 (Pg 28), B 33 (Pg. 30), C 050° ST 2 (Pg. 40), C Nighttime ST 4 part 2 (Pg. 44), C CNDEL COL 1 in part (Pg. 50), D 1.a.ii. Resp 3 part 2 (Pg 56), D 1.b.ii. Resp 4 part 2 (Pg. 59)
- **Status:** On March 9, 2018, this proposed action was entered into the IFP Gateway. This Request has received initial feasibility and Regional Airspace and Procedures Team approval. The FAA anticipates a publication date sometime in Spring 2020.

The SFO Airport/Community Roundtable (Roundtable) has previously recommended increased use of two long-standing TRACON SOP nighttime noise abatement vectoring procedures for southbound departures -- SFO 050° Down the Bay and the OAK (~135°) Down the Bay.

The Roundtable has not requested a published procedure for either the SFO 050° Down the Bay or the OAK (~135° heading) Down the Bay.

QUESTIONS FOR THE FAA

1. Please provide a **graphic format such as a Google satellite map** showing the Bay Area, SFO and OAK airports and including the following:

   a. Map showing the current typical path for an SFO southbound departure vectored on a 050° heading.

   b. Map showing the current typical path for an OAK southbound departure vectored on a heading Down the Bay.

c. Map showing the current NIITE and HUSSH nighttime noise abatement procedures.

d. Map showing the current NIITE and HUSSH nighttime noise abatement procedures along with the proposed Southbound transition.

e. Map showing the JO7100.41 planned *OAK departure procedure that flies Down the Bay.*

f. Map combining the three paths in a,b,e : current vector 050°, current vector OAK Down the Bay, and proposed procedure *OAK Down the Bay*

g. Map combining NIITE/HUSSH South with the planned *OAK departure procedure that flies Down the Bay.*

h. Map showing planned *OAK departure procedure that flies Down the Bay* along with inbound paths for SFO ILS and visuals to 28L/R, OAK ILS and visuals to Runway 30.

2. With regard to the PBN Implementation Process (Order JO7100.41) for the *OAK departure procedure that flies Down the Bay*

    i. At what step in the PBN Implementation Process (Order JO 7100.41) is this procedure?

    ii. Who is the proponent?

    iii. Who is the lead industry representative?

    iv. Who has provided public input on this proposed procedure?

    v. What steps have been completed? What steps are remaining before implementation?

    vi. When will there be opportunity for public input?

3. Please explain the inter-relationship of the flight paths of the proposed NIITE and HUSSH Southbound procedure with the proposed *OAK departure procedure that flies Down the Bay.*

    a. Will the proposed NIITE/HUSSH southbound procedures be legal and safe to fly simultaneously with the *OAK departure procedure that flies Down the Bay?*

    b. Will there be operational conflicts between the *OAK departure procedure that flies Down the Bay and the NIITE/HUSSH South* which might cause delays for the NIITE/HUSSH Southbound departures?

    c. Will the *OAK departure procedure that flies Down the Bay remain operational after the NIITE/HUSSH South transition is implemented? If so, how will flight priorities and conflicts be determined?*

4. Is this proposed *OAK departure procedure that flies Down the Bay being developed in isolation?*

    a. Is there also a SFO 050° Down the Bay Procedure being developed? If so, please provide all details.

    b. If there is not also a companion SFO 050° Down the Bay Procedure being planned, why not?

    c. Please provide Google maps showing each -- the SFO 050° and the OAK Down the Bay vectored **actual flight tracks** with altitudes for July 2019 or the most recent month.

5. The SFO RT has previously been told that ODO operations are severely restricted in the SF Bay Airspace. How will the *OAK departure procedure that flies Down the Bay* deal with safety separation requirements from incoming OAK and SFO traffic and SFO Runway 1 Departures (including NIITE, HUSSH, SSTIK, CNDEL and any other Runway 1 southbound departure?

6. If the *OAK departure procedure that flies Down the Bay* is implemented, will it interfere with support from the FAA, Airports and industry for implementation of the NIITE/HUSSH Southbound Transition?

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Dave Ong (AIR)

From: Dave Ong (AIR)
Sent: Monday, September 23, 2019 4:01 PM
To: annwengert@yahoo.com; jdennis@portolavalley.net
Cc: Sue Chaput; Audrey Park (AIR); Bert Ganoung (AIR); James A Castañeda; Anneliese Taing (AIR); Anthony Carpeneti (AIR); Nastasja von Conta (AIR)
Subject: 3Q 2019 Aircraft Noise Monitoring Results for Portola Valley
Attachments: 3Q 2019 Portola Valley Noise Monitoring Report.pdf

Dear Honorable Ann Wengert,

Please find attached the aircraft noise monitoring results for 3Q 2019 noise measurements collected in the Town of Portola Valley. Past reports are also available online at link, located under the Quarterly Portable Noise Monitoring section, then Portola Valley. The next measurement period will be from November 8 to 22. If you have any questions or like to discuss the information please don't hesitate to call our office at (650) 821-5100.

Thank you,

David Ong
Noise Systems Manager | Planning, Design & Construction
San Francisco International Airport | P.O. Box 8097 | San Francisco, CA 94128
Tel 650-821-5100 | flysfo.com

Facebook | Twitter | YouTube | Instagram | LinkedIn

SAN FRANCISCO INTERNATIONAL AIRPORT
CITY & COUNTY OF SAN FRANCISCO

MEMORANDUM

TO: **PORTOLA VALLEY COMMUNITY**

FROM: **SAN FRANCISCO INTERNATIONAL AIRPORT AIRCRAFT NOISE ABATEMENT OFFICE**

SUBJECT: **2Q 2019 PORTOLA VALLEY NOISE MONITORING REPORT**

DATE: **JULY 8, 2019**

The San Francisco International Airport (SFO) Aircraft Noise Abatement Office (ANAO) conducts aircraft noise monitoring in the Town of Portola Valley to determine noise levels within the community from aircraft operations at SFO. Noise monitoring occurs every quarter for a 14-day data collection period. This quarter's measurement period was from May 3, 2019 to May 21, 2019. We were only able to get data between May 4, 2019 and May 11, 2019 because of problems with our portable batteries. The monitoring was made possible with the assistance of a Portola Valley resident.

The overall average daily noise level from all aircraft was 43dBA CNEL. The Community daily noise level was 47dBA CNEL. Noise from all aircraft over this location increased the total average daily noise level by 1.6dBA. Non-aircraft noise sources included residential noise and wind. The total noise level was 48 dBA CNEL.

The Town of Portola Valley is a quiet suburban community with ambient noise levels of 42dBA. On an average day, Portola Valley had 173 overflights out of which 63 exceeded the noise monitor thresholds and recorded a noise event. The threshold was 55dBA. Aircraft destined to SFO typically overfly Portola Valley during high traffic conditions or inclement weather days with aircraft vectoring. Also known as delay vectoring, is when a FAA (Federal Aviation Administration) Air Traffic Controller instructs the pilot to fly specific headings. The headings are not the most direct path to the runways. Reasons why aircraft may be vectored include: adjusting the arrival sequence in order to maintain safe separation between all aircraft, maximizing use of available airspace, achieving an expeditious flow of aircraft traffic, avoiding areas of known hazardous weather or known severe turbulence, and maneuvering an aircraft into a suitable position to accommodate a visual approach and landing.

As flights to SFO cross over the peninsula, they are typically between 5,000 and 7,000 feet, and represent about 82 percent of all aircraft noise events over Portola Valley. The remaining aircraft noise events are low-flying general aviation traffic using San Carlos and Palo Alto Airport.

An average sound exposure level (SEL) for a single noise event for all aircraft were recorded at 69dBA and maximum noise levels (LMax) at 59dBA. On average, there were four nighttime noise events from SFO aircraft. During the noise-monitoring period, SFO ANAO received noise reports from 21 individuals in Portola Valley primarily during the daytime hours. In view of the fact that the monitoring location in Portola Valley is located in a quiet suburb with ambient noise in the low 40dB range, any aircraft noise above this threshold may become a nuisance for the residents.

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dBA- stands for A-weighted decibel. Decibel unit measures the loudness of a sound and is computed as the signal to noise ratio. A-weighting is used to adjust for frequency range of human hearing. An increase of ten decibels is perceived by human ear as a doubling of noise.
SEL - Sound Exposure Level of a noise event is measured over time between the initial and final points when the noise level exceeds a predetermined threshold and its energy is compressed into one second.
LMax - The maximum noise level is a measurement of the peak level of a noise event.
CNEL- This metric is used to assess and regulate aircraft noise exposure in communities surrounding the airport. California Title 21 Noise Regulations established acceptable level of aircraft noise of 65dBA CNEL.

Post Office Box 8097 San Francisco California 94128 Tel 650.821.5100 Fax 650.821.5112

Short Term Noise Monitoring Report - Site 978

Portola Valley 2Q 2019

May 4 - May 11

Battery failure caused the monitor to only record 8 days of data

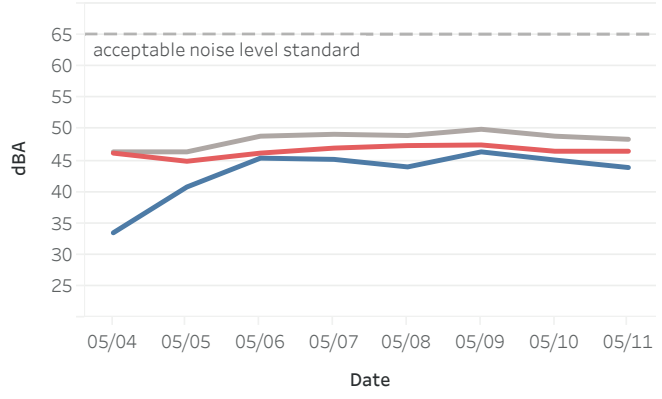
Aircraft CNEL: 43dBA
Community CNEL: 47dBA
Total CNEL: 48dBA
Aircraft SEL: 69dBA
Aircraft LMax: 59dBA
Ambient Noise: 42dBA
Noise Monitor Treshold: 55dBA
SFO Aircraft Noise Events: 56 per day
SFO Operations Flow: West Flow
Cause of Aircraft Overflights: SFO aircraft arrivals, delayed vectoring and small general aviation aircraft transitioning the area

Daily Noise Event Averages

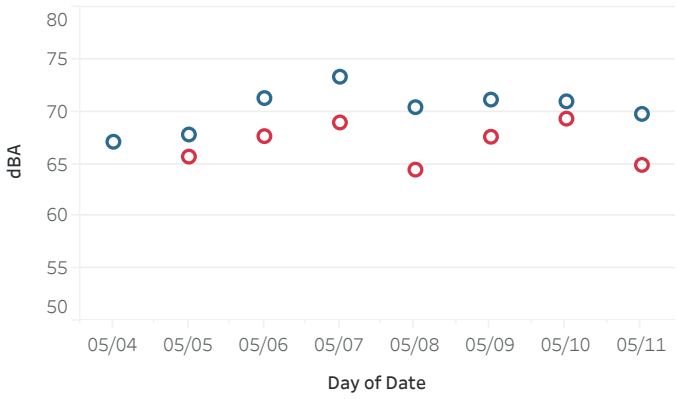
	Date	SFO Noise Events	SFO Avg. SEL (dBA)	SFO Avg. LMax (dB)	Non-SFO Noise Events	Non-SFO Avg. SEL (dBA)	Non-SFO Avg. LMax (dB)	Community Noise Events	Community Avg. SEL (dBA)	Community Avg. LMax (dB)
May	4	3	67	57	17	69	59			
	5	20	68	58	24	72	61	1	66	57
	6	78	71	60	11	69	57	10	68	56
	7	57	73	59	12	73	60	2	69	57
	8	79	70	59	17	69	58	7	64	55
	9	102	71	59	12	71	60	11	68	59
	10	70	71	59	24	71	60	4	69	59
	11	41	70	58	25	71	59	7	65	57
Daily Average		**56**	**70**	**59**	**18**	**71**	**59**	**6**	**67**	**57**

SFO Events are: Single SFO Aircraft, Multiple SFO Aircraft, Simultaneous SFO and Non-SFO Aircraft, and Simultaneous Community and SFO Aircraft.
SEL - Sound Exposure Level of a noise event is measured over time between the initial and final points when the noise level exceeds a predetermined threshold and its energy is compressed into one second.
Lmax - The maximum noise level is a measurement of the peak level of a noise event.
CNEL- This metric is used to assess and regulate aircraft noise exposure in communities surrounding the airport. California Title 21 Noise Regulations established acceptable level of aircraft noise of 65dBA CNEL.

Community Noise Exposure Level (CNEL)



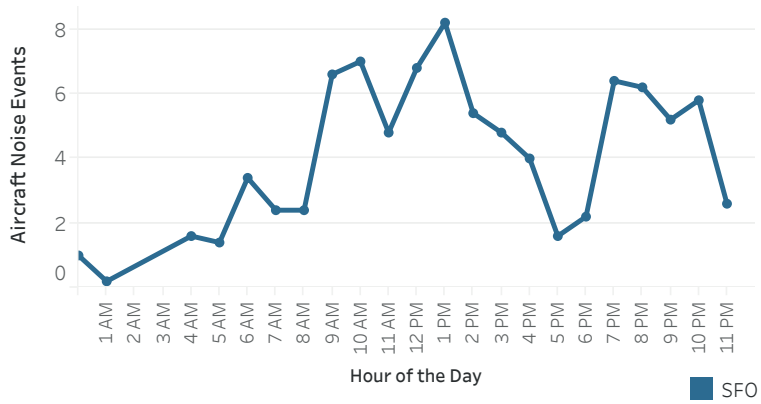
Sound Exposure Level (SEL) Comparison



SFO Aircraft Noise Events by Day (7am-7pm), Evening (7pm-10pm) and Night (10pm-7am)

	Noise Events	SFO Noise Events (%)	Avg. SEL (dBA)	Min. SEL (dBA)	Max. SEL (dBA)	Avg. LMax (dB)	Min. LMax (dBA)	Max. LMax (dBA)	Avg. Duration (sec)	Min. Duration (sec)	Max. Duration (sec)
Day	281	64%	72	60	87	59	54	78	27	8	60
Evening	89	20%	71	61	78	59	54	68	27	8	60
Night	72	16%	70	62	78	59	55	66	28	9	49

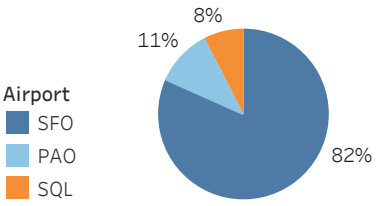
SFO Noise Events by Hour of the Day



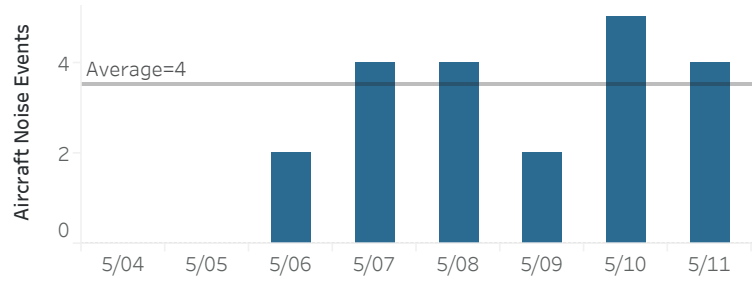
SFO Arrivals Altitude

≤3000ft	4,000ft	5,000ft	6,000ft	>7,000ft
1%	15%	44%	29%	11%

Only aircraft that registered a noise event on the monitor are considered.



SFO Nighttime (Midnight-6am)



May 4 and 5 did not have any nighttime aircraft noise events.

Operation Type	Arrivals	Departures
	83%	17%

Aircraft Type

Boeing 737 -700,800,900	21%
Airbus A319, A320, & A321	16%
Boeing B77W	9%
Other 48 Aircraft Types	35%

Noise Reporters

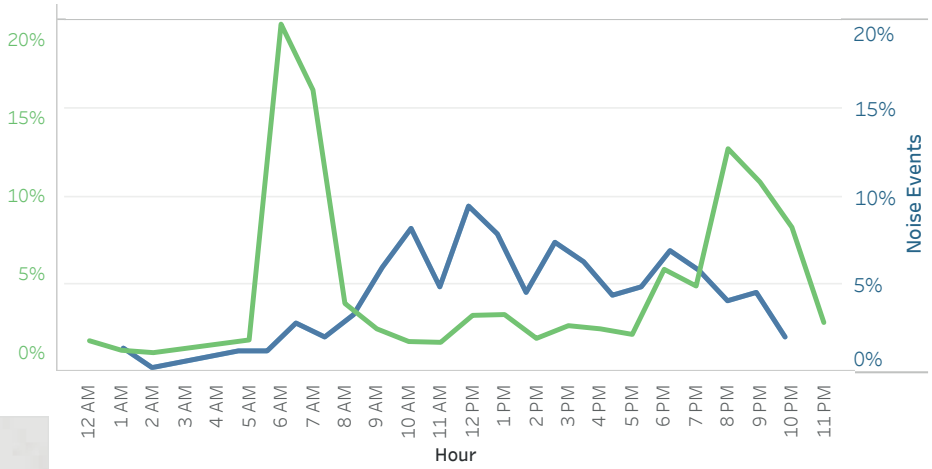
		Noise Reporters	Noise Reports
May	4	6	106
	5	10	283
	6	15	306
	7	14	204
	8	17	291
	9	17	376
	10	16	128
	11	15	283
Total		21*	1,977

*Individual Reporters

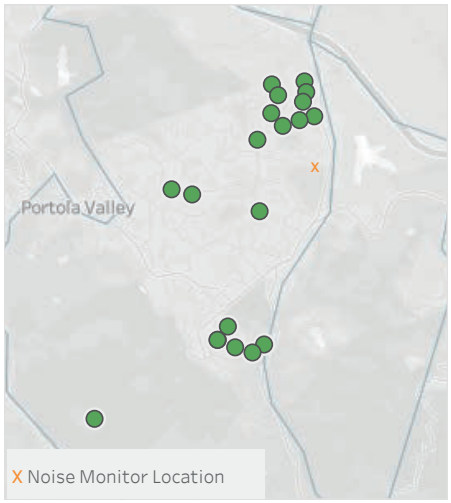
36%

of overflights registered a noise event.
(173 avg daily overflights of which 63 created a noise event)

Noise Reports vs Aircraft Noise Events



Noise Reporters Location



Noise Monitor on Location

Dave Ong (AIR)

From: Dave Ong (AIR)
Sent: Monday, September 23, 2019 4:23 PM
To: Terry O'Connell; Holstine, Clay
Cc: Audrey Park (AIR); Bert Ganoung (AIR); James A Castañeda; Anneliese Taing (AIR); Anthony Carpeneti (AIR); Nastasja von Conta (AIR)
Subject: 3Q 2019 Aircraft Noise Monitoring Results for Brisbane
Attachments: 3Q 2019 Brisbane Noise Montioring Report.pdf

Dear Honorable Terry O'Connell,

Please find attached aircraft noise monitoring results for Third Quarter 2019, for noise measurements collected in the City of Brisbane at two locations (Mission Blue Community Center and at the end of Trinity Road). Past reports are also available online at link in the Quarterly Portable Noise Monitoring section, then Brisbane. The next measurement period will be from October 11 to 25. If you have any questions or like to discuss the information provided, please don't hesitate to call our office at (650) 821-5100.

Thank you,

David Ong
Noise Systems Manager | Planning, Design & Construction
San Francisco International Airport | P.O. Box 8097 | San Francisco, CA 94128
Tel 650-821-5100 | flysfo.com

Facebook | Twitter | YouTube | Instagram | LinkedIn

MEMORANDUM

TO: BRISBANE COMMUNITY

FROM: SAN FRANCISCO INTERNATIONAL AIRPORT AIRCRAFT NOISE ABATEMENT OFFICE

SUBJECT: 3Q 2019 BRISBANE NOISE MONITORING REPORT

DATE: SEPTEMBER 18, 2019

The San Francisco International Airport (SFO) Aircraft Noise Abatement Office (ANAO) conducts aircraft noise monitoring in the City of Brisbane, California to determine noise levels within the community from aircraft operations at SFO. Noise monitoring occurs every quarter for a 14-day data collection period. This quarter's measurement period was from July 13, 2019, to July 28, 2019. The monitoring is made possible with the assistance of the City Manager, resulting in two temporary sites in Brisbane. The first site was located at the Mission Blue Center (Site 966) and the second site was located above the Brisbane Community Pool (Site 1001) at the end of Trinity Road. Due to problems with our portable batteries at site 1001, we were unable to process any data between July 25, 2019 and July 28, 2019.

Brisbane is located approximately 4 miles from the SFO Airport, and aircraft noise events sources include primarily SFO departures utilizing the SSTIK and OFFSHORE departure procedures. During the monitoring period, there were no changes to departure procedures. Aircraft departing SFO from Runways 01L/R for destinations to the west, south, and southeast typically overfly Brisbane. Occasionally when the winds on the airfield are stronger from the west, the TRUKN or NIITE departures will be utilized for destinations to the northeast and east. Departing aircraft from Runways 28L/R will initiate a right turn once the aircraft reaches the minimum altitude of 520 feet, consequently, this may have some aircraft fly over Brisbane. SFO aircraft arrivals from the north (BDEGA) on a typical day (West Plan) overfly Brisbane at 10,000 feet or higher. The ambient levels within Brisbane during the monitoring period were as follows: Site 966 - 48dBA and Site 1001 - 57dBA. Non-aircraft noise sources included construction and maintenance activity and weather-related conditions such as wind.

The overall average daily noise level from all Aircraft at both sites were 50dBA. The Community and Total CNEL values, along with other noise metrics are shown in the summary section of the data report. Noise from all aircraft increased the total average daily noise level by 1.6dBA at site 966 and 0.8dBA at site 1001. In comparison, the human ear can detect a 3dB sound change, and a 6dB increase may result in higher annoyance levels due to a doubling of the sound energy.

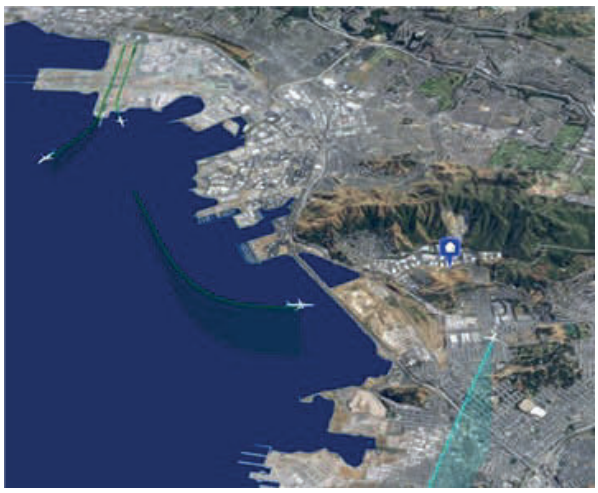
During the noise-monitoring period, SFO ANAO received noise reports from 18 individuals in Brisbane. The majority of aircraft noise events at both sites occurred between 6 am and 9 pm. Since the monitoring locations in Brisbane are in an urban area with ambient noise in the 50dBA range, any aircraft noise above this threshold may become a nuisance for the residents as evident in the Sound Exposure Level comparison table. Additionally, the frequency of flights due to the proximity of the Airport may increase annoyance levels.

dBA- stands for A-weighted decibel. Decibel unit measures the loudness of a sound and is computed as the signal to noise ratio. A-weighting is used to adjust for the frequency range of human hearing. The human ear perceives an increase of ten decibels as a doubling of noise.
CNEL- This metric is used to assess and regulate aircraft noise exposure in communities surrounding the airport. California Title 21 Noise Regulations established an acceptable level of aircraft noise of 65dBA CNEL.
West Plan – Standard operations at the Bay Area International Airports. Aircraft arrive to the west at all three airports. At San Jose and Oakland Airports, aircraft depart to the west. While at San Francisco Airport, aircraft depart either to the north or to the west depending on wind conditions on the airfield.
TRUKN and NIITE – RNAV departure procedures off Runways 28L/R at SFO, has aircraft climb heading of 284° to 520 feet then right turn to initial fix. These procedures replaced the legacy departures procedures SHORELINE and QUIET, respectively.

City of Brisbane - Site 966
Short Term Noise Monitoring Report

Mission Blue Center 3Q 2019

July 13 - July 28



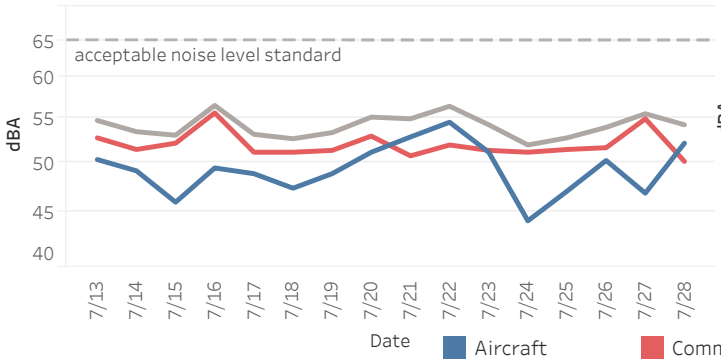
Aircraft CNEL: 50dBA
Community CNEL: 52dBA
Total CNEL: 54dBA
Aircraft SEL: 74dBA
Aircraft LMax: 65dBA
Ambient Noise: 48dBA
Noise Monitor Treshold: 57dBA
SFO Aircraft Noise Events: 82 per day
SFO Operations Flow: West Flow all days and West Flow-Straight 28 on July 15, July 16 and July 19
Cause of Aircraft Overflights : SFO SSTIK Departures from Runway 01L/R making a left turn over Brisbane and departures making a right turn from Runways 28L/R performing the TRUKN / NIITE Departure

Daily Noise Event Averages

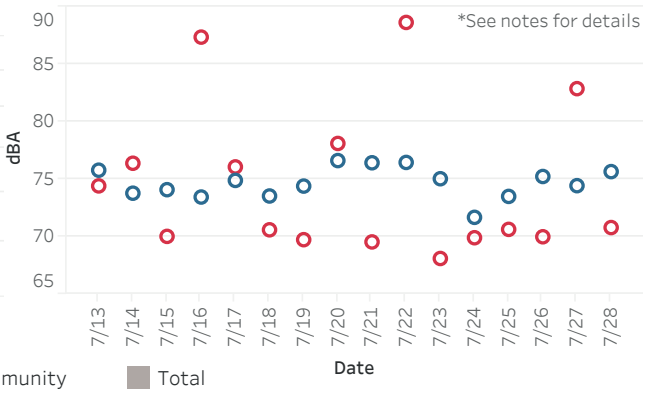
Date	SFO			Non-SFO			Community		
	Noise Events	Avg. SEL (dBA)	Avg. LMax (dB)	Noise Events	Avg. SEL (dBA)	Avg. LMax (dB)	Noise Events	Avg. SEL (dBA)	Avg. LMax (dB)
Jul 13	99	76	64	15	69	60	11	74	65
14	98	74	63	11	70	61	30	76	63
15	55	74	63	10	69	59	4	70	61
16	58	73	63	7	70	61	36	87	66
17	94	75	64	5	70	61	4	76	66
18	79	74	63	9	68	60	3	71	62
19	61	74	63	6	69	59	9	70	62
20	96	77	65	24	71	61	85	78	65
21	113	76	64	28	71	61	2	70	62
22	123	76	64	13	72	61	11	89	70
23	102	75	63	9	70	60	5	68	62
24	40	72	61	1	70	60	5	70	64
25	61	74	63	3	74	63	6	71	64
26	85	75	64	4	68	59	9	70	62
27	56	74	63	5	72	63	9	83	66
28	94	76	64	22	70	60	4	71	63
Daily AVG	**82**	**75**	**64**	**11**	**70**	**61**	**15**	**75**	**65**

SFO Events are: Single SFO Aircraft, Multiple SFO Aircraft, Simultaneous SFO and Non-SFO Aircraft, and Simultaneous Community and SFO Aircraft.
SEL - Sound Exposure Level of a noise event is measured over time between the initial and final points when the noise level exceeds a predetermined threshold and its energy is compressed into one second.
Lmax - The maximum noise level is a measurement of the peak level of a noise event.
CNEL- This metric is used to assess and regulate aircraft noise exposure in communities surrounding the airport. California Title 21 Noise Regulations established acceptable level of aircraft noise of 65dBA CNEL.

Community Noise Exposure Level (CNEL)



Sound Exposure Level (SEL) Comparison

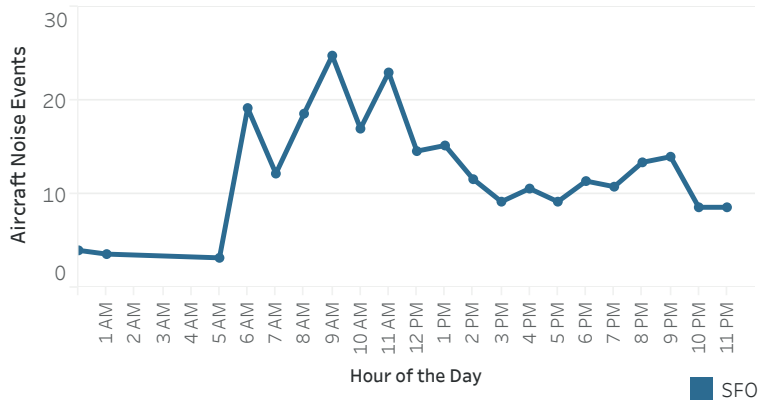


*Notes: 7/16: Loud noises from a truck between 9:39 am and 9:46 am. Leafblower in use from 12:29 through 12:45 pm. 7/22: Leafblower in use from 10:00 am through 11:19 am. Loud cars driving by at 1:23 pm, 3:18 pm and 6:36 pm. 7/27: What seem to be fireworks for 13 seconds at 11:41 pm.

SFO Aircraft Noise Events by Day (7am-7pm), Evening (7pm-10pm) and Night (10pm-7am)

	Noise Events	SFO Noise Events (%)	Avg. SEL (dBA)	Min. SEL (dBA)	Max. SEL (dBA)	Avg. LMax (dB)	Min. LMax (dBA)	Max. LMax (dBA)	Avg. Duration (sec)	Min. Duration (sec)	Max. Duration (sec)
Day	887	68%	75	62	87	64	56	78	21	5	62
Evening	191	15%	75	62	81	64	57	73	21	5	55
Night	236	18%	76	63	85	64	57	74	22	5	46

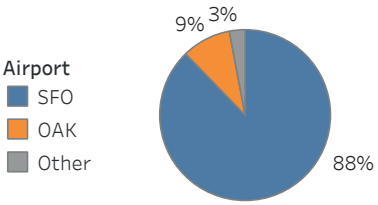
SFO Noise Events by Hour of the Day



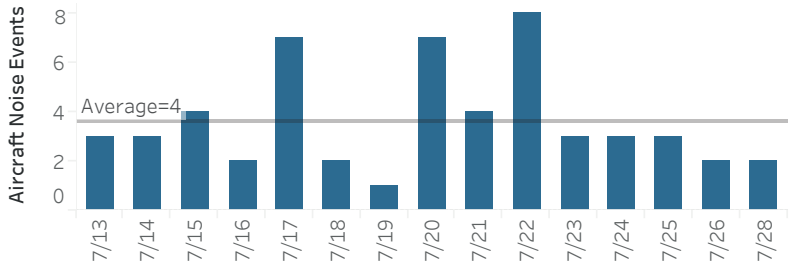
Only aircraft that registered a noise event on the monitor are considered.

SFO Departures Altitude

≤3500ft	3500ft	4000ft	4500ft	≥5000ft
19%	30%	21%	15%	14%



SFO Nighttime (Midnight-6am)



Days not shown did not have any aircraft noise events

	Arrivals	Departures
Operation Type	1%	99%

Aircraft Type

Boeing 737 -700,800,900	42%
Airbus A319, A320, & A321	36%
Embraer E170	12%
Other 41 Aircraft Types	9%

Noise Reporters

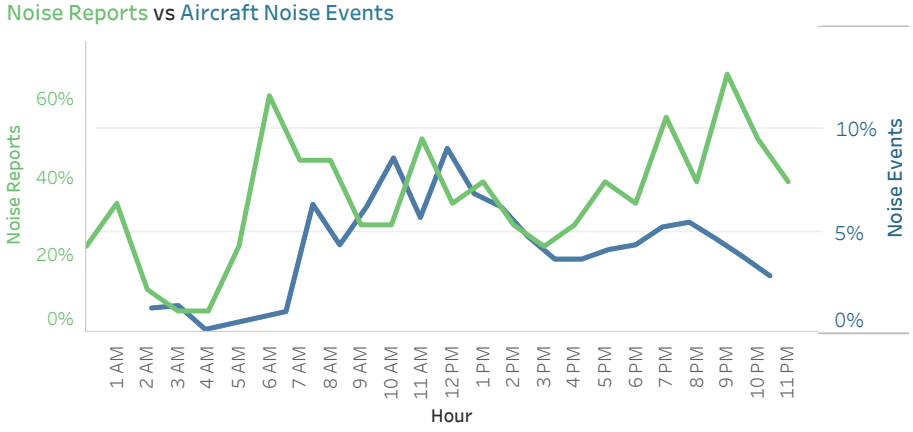
		Noise Reporters	Noise Reports
Jul	13	10	59
	14	9	66
	15	6	54
	16	5	30
	17	11	71
	18	7	69
	19	11	78
	20	9	92
	21	11	79
	22	10	91
	23	5	61
	24	3	21
	25	4	37
	26	6	49
	27	6	45
	28	8	85
Total		18*	987

*Individual Reporters

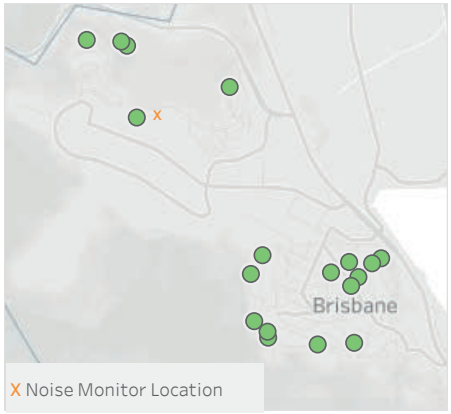
21%

of overflights registered a noise event.
(492 avg daily overflights of which 82 created a noise event)

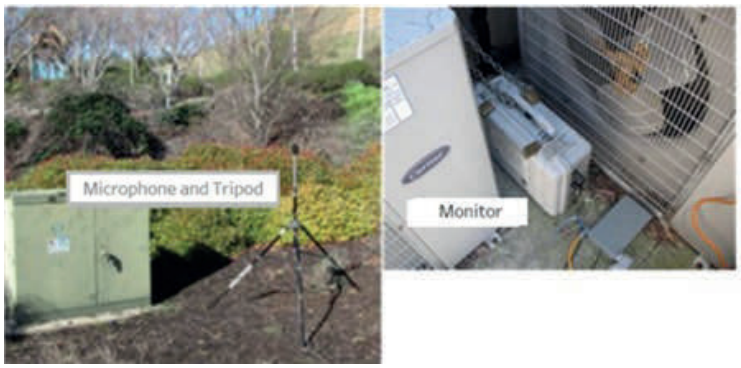
Noise Reports vs Aircraft Noise Events



Noise Reporters Location



Noise Monitor on Location

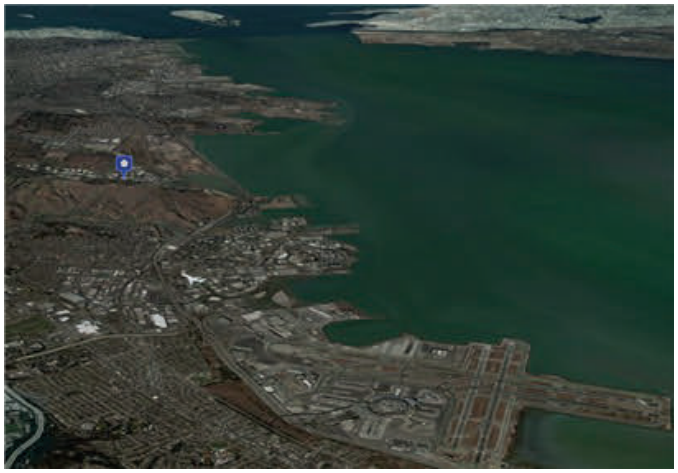


City of Brisbane - Site 1001
Short Term Noise Monitoring Report

Trinity Road 3Q 2019

July 13 - July 24

Aircraft CNEL: 50dBA
Community CNEL:62dBA
Total CNEL: 62dBA
Aircraft SEL: 49dBA
Aircraft LMax: 58dBA
Ambient Noise: 57BA
Noise Monitor Treshold: 57dBA
SFO Aircraft Noise Events: 65 per day
SFO Operations Flow: West Flow all days and West Flow-Straight 28 on July 15, July 16 and July 19
Cause of Aircraft Overflights : SFO SSTIK Departures from Runway 01L/R making the left turn over Brisbane, departures making a right turn from Runways 28L/R performing the TRUKN / NIITE Departure and BDEGA arrivals from the north entering the right traffic pattern for Runway 28R



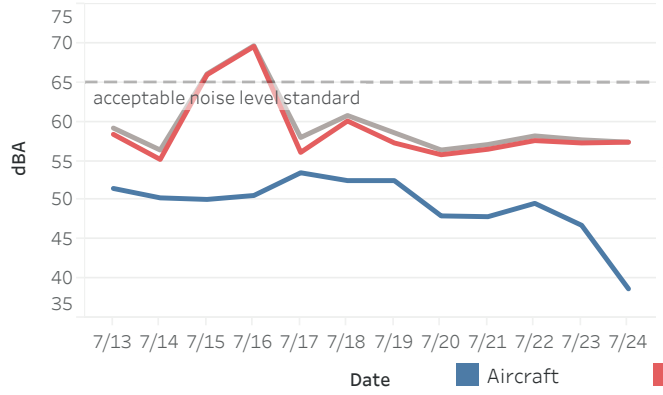
Daily Noise Event Averages

Date		SFO			Non-SFO			Community		
		Noise Events	Avg. SEL (dBA)	Avg. LMax (dB)	Noise Events	Avg. SEL (dBA)	Avg. LMax (dB)	Noise Events	Avg. SEL (dBA)	Avg. LMax (dB)
Jul	13	103	76	64	22	70	60	38	79	63
	14	94	76	64	14	69	61	38 +	69	62
	15	87	75	63	14	72	60	670 +	85	71
	16	55	76	64	18	70	60	609 +	88	76
	17	99	77	64	15	71	61	23	68	61
	18	163	75	64	38	71	61	486	80	66
	19	80	78	65	10	69	59	48	77	65
	20	25	79	69	2	73	68	7	76	69
	21	23	79	69				2	88	78
	22	28	78	68	1	80	70			
	23	16	79	70				3	84	77
	24	2	78	70				1	74	72
Daily Average		65	77	64	15	72	61	175	79	71

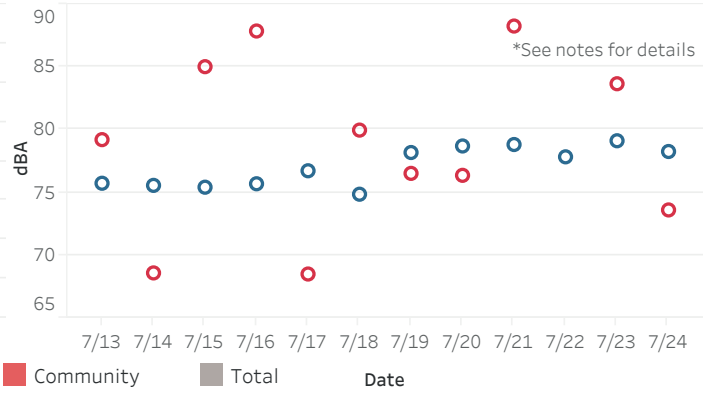
+ wind

SFO Events are: Single SFO Aircraft, Multiple SFO Aircraft, Simultaneous SFO and Non-SFO Aircraft, and Simultaneous Community and SFO Aircraft.
SEL - Sound Exposure Level of a noise event is measured over time between the initial and final points when the noise level exceeds a predetermined threshold and its energy is compressed into one second.
Lmax - The maximum noise level is a measurement of the peak level of a noise event.
CNEL- This metric is used to assess and regulate aircraft noise exposure in communities surrounding the airport. California Title 21 Noise Regulations established acceptable level of aircraft noise of 65dBA CNEL.

Community Noise Exposure Level (CNEL)



Sound Exposure Level (SEL) Comparison

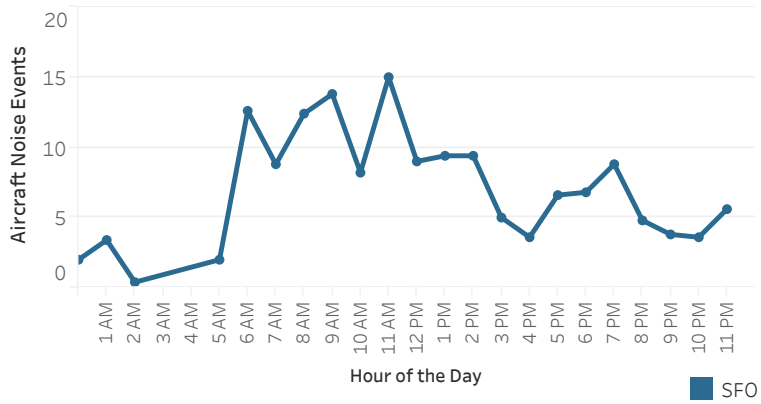


*Notes: 7/14 Birds cawing sounds and wind noises. 7/15 Wind noise for most of the afternoon. 7/16 Wind noise for most of the afternoon. 7/17 vehicles driving by and sirens. 7/18 Two trucks backing up and one loud vehicle. 7/21 Loud vehicle and loud motorcycle. 7/22 No community events. 7/23 Two trucks backing up and one loud vehicle. 7/24 Truck and horn from a car.

SFO Aircraft Noise Events by Day (7am-7pm), Evening (7pm-10pm) and Night (10pm-7am)

	Noise Events	SFO Noise Events (%)	Avg. SEL (dBA)	Min. SEL (dBA)	Max. SEL (dBA)	Avg. LMax (dB)	Min. LMax (dBA)	Max. LMax (dBA)	Avg. Duration (sec)	Min. Duration (sec)	Max. Duration (sec)
Day	540	70%	76	63	92	64	57	84	21	2	60
Evening	87	11%	76	63	84	65	57	75	20	5	44
Night	146	19%	77	63	84	65	57	74	23	5	59

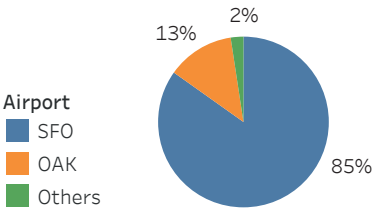
SFO Noise Events by Hour of the Day



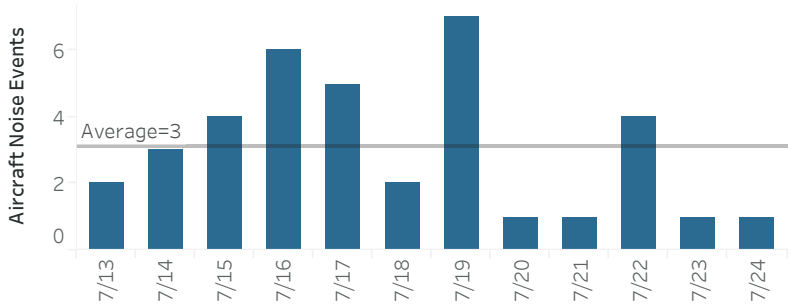
SFO Departures Altitude

≤3000ft	3000ft	3500ft	4000ft	≥4500ft
14%	21%	27%	16%	22%

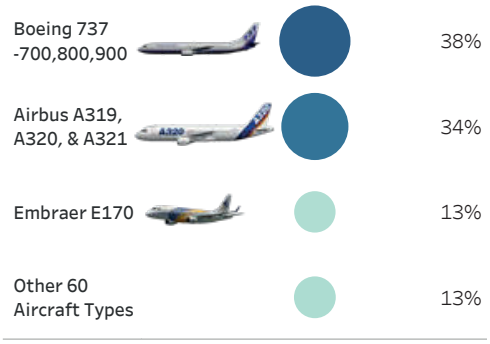
Only aircraft that registered a noise event on the monitor are considered.



SFO Nighttime (Midnight-6am)



Aircraft Type



Noise Reporters

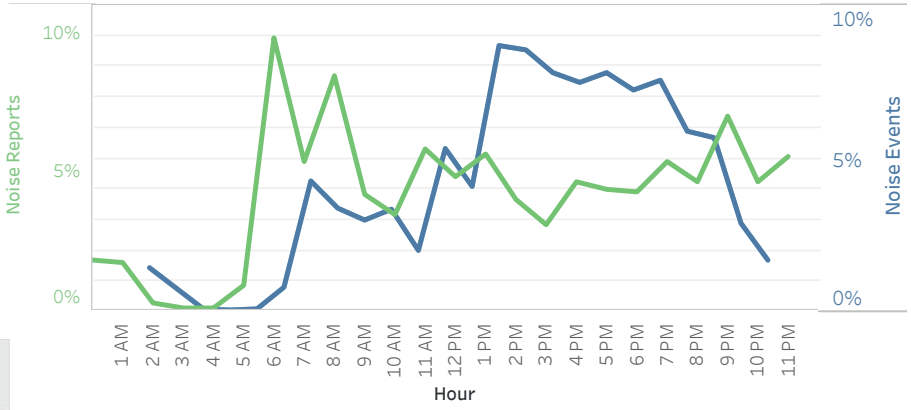
		Noise Reporters	Noise Reports
July	13	10	59
	14	9	66
	15	6	54
	16		
	17		
	18	7	69
	19	11	78
	20	9	92
	21	11	79
	22	10	91
	23	5	61
	24	3	21
Total		17*	670

*Individual Reporters

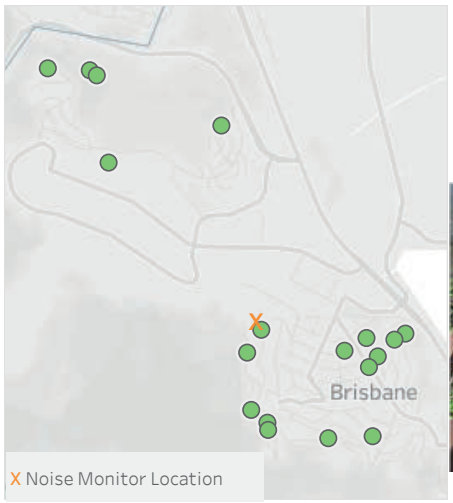
13%

of overflights registered a noise event. (473 avg daily overflights of which 65 created a noise event)

Noise Reports vs Aircraft Noise Events



Noise Reporters Location



Noise Monitor on Location

Dave Ong (AIR)

From: Dave Ong (AIR)
Sent: Monday, September 23, 2019 4:09 PM
To: t.livermore@woodsidetown.org
Cc: Audrey Park (AIR); Bert Ganoung (AIR); James A Castañeda; Anneliese Taing (AIR); Anthony Carpeneti (AIR); Nastasja von Conta (AIR)
Subject: 3Q 2019 Aircraft Noise Monitoring Results for Woodside VOR
Attachments: 3Q 2019 Woodside Noise Monitoring Report.pdf

Dear Honorable Thomas Livermore,

Please find attached the aircraft noise monitoring results for third quarter 2019, for noise measurements collected in the Town of Woodside. Past reports are also available online at link, located under the Quarterly Portable Noise Monitoring section, then Woodside. The next measurement period will be from November 8 to 22. If you have any questions or like to discuss the information please don't hesitate to call our office at (650) 821-5100.

Thank you,

David Ong
Noise Systems Manager | Planning, Design & Construction
San Francisco International Airport | P.O. Box 8097 | San Francisco, CA 94128
Tel 650-821-5100 | flysfo.com

Facebook | Twitter | YouTube | Instagram | LinkedIn

SAN FRANCISCO INTERNATIONAL AIRPORT
CITY & COUNTY OF SAN FRANCISCO

MEMORANDUM

TO: WOODSIDE COMMUNITY

FROM: SAN FRANCISCO INTERNATIONAL AIRPORT AIRCRAFT NOISE ABATEMENT OFFICE

SUBJECT: 3Q 2019 WOODSIDE NOISE MONITORING REPORT

DATE: SEPTEMBER 19, 2019

The San Francisco International Airport (SFO) Aircraft Noise Abatement Office (ANAO) conducts aircraft noise monitoring in the Town of Woodside to determine noise levels within the community from aircraft operations at SFO. The monitoring occurs every quarter for a 14-day data collection period. This quarter's measurement period was from August 16, 2019 to August 29, 2019. The monitoring is made possible with the assistance of the Federal Aviation Administration (FAA) San Jose Technical Operations team. They continue to provide support and participate in our efforts to collect noise data by allowing us access to their facility to monitor aircraft noise.

The overall average daily noise level from all aircraft was 45dBA CNEL. The Community daily noise level average was 52dBA CNEL. Other non-aircraft noise sources included wind and wildlife. Noise from all aircraft over this location increased the total average daily noise level by 1.2dBA.

The Town of Woodside is a quiet suburban community with ambient noise levels of 44dBA. On an average day of this study, Woodside had 97 overflights out of which 31 exceeded the noise monitor threshold and recorded a noise event. The threshold was 50dBA. Aircraft destined to SFO typically overfly Woodside during high traffic conditions or inclement weather days with aircraft vectoring. Also known as delay vectoring, it is when an FAA Air Traffic Controller instructs the pilot to fly specific headings. These headings are not the most direct path to the runways. Reasons for aircraft vectoring may include adjusting the arrival sequence in order to maintain safe separation between all aircraft, maximizing use of available airspace, achieving an expeditious flow of aircraft traffic, avoiding areas of known hazardous weather or known severe turbulence, and maneuvering an aircraft into a suitable position to accommodate a visual approach and landing.

As flights to SFO cross over the peninsula, they represent about 66 percent of all aircraft noise events over Woodside and are typically above 6,000 feet. The remaining aircraft noise events were attributed to general aviation traffic using San Carlos Airport, airline traffic using San Jose International Airport and traffic from other airports in the area.

An average sound exposure level (SEL) for a single noise event for all aircraft were recorded at 69dBA and maximum noise levels (LMax) at 54dBA. On average, there were five nighttime noise events from SFO aircraft. During the noise-monitoring period, SFO ANAO received noise reports from 9 individuals primarily during the 9 a.m. hour. The Town of Woodside is a quiet suburban community with ambient noise in the quiet 40-45dB range; any aircraft noise level above the background may become a nuisance for the residents.

---

dBA- stands for A-weighted decibel. Decibel unit measures the loudness of a sound and is computed as the signal to noise ratio. A-weighting is used to adjust for a frequency range of human hearing. An increase of ten decibels is perceived by the human ear as a doubling of noise.
SEL - Sound Exposure Level of a noise event is measured over time between the initial and final points when the noise level exceeds a predetermined threshold, and its energy is compressed into one second.
LMax - The maximum noise level is a measurement of the peak level of a noise event.
CNEL- This metric is used to assess and regulate aircraft noise exposure in communities surrounding the airport. California Title 21 Noise Regulations established the acceptable level of aircraft noise of 65dBA CNEL.

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Short Term Noise Monitoring Report - Site 969

Woodside 3Q 2019

August 16 - August 29

Aircraft CNEL: 45dBA
Community CNEL: 52dBA
Total CNEL: 53dBA
SEL: 69dBA
LMax: 54dBA
Ambient Noise: 44dBA
Noise Monitor Treshold: 50dBA
SFO Aircraft Noise Events: 56 per day
SFO Operations Flow: West Flow
Cause of Aircraft Overflights: SFO Oceanic Arrival Route, San Jose Arrivals, delayed vectoring, SFO Departures and general aviation-small aircraft

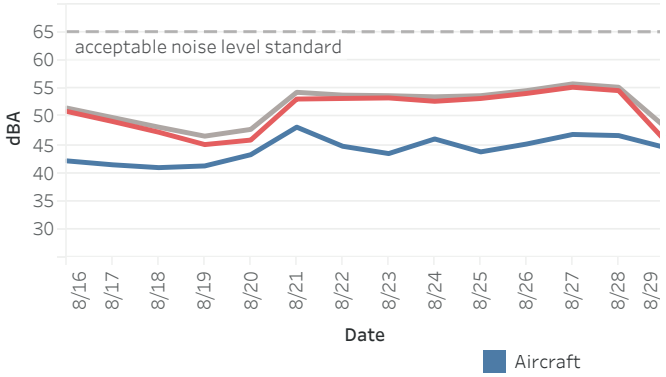
Daily Noise Event Averages

	Date	SFO Noise Events	SFO Avg. SEL (dBA)	SFO Avg. LMax (dB)	Non-SFO Noise Events	Non-SFO Avg. SEL (dBA)	Non-SFO Avg. LMax (dB)	Community Noise Events	Community Avg. SEL (dBA)	Community Avg. LMax (dB)
August	16	54	68	55	18	72	59	1	61	51
	17	54	69	57	31	73	58	8	62	52
	18	34	70	57	21	70	58	16	63	52
	19	42	68	56	26	71	59	27	64	53
	20	36	71	59	25	72	61	2	69	58
	21	117*	71	57	45	71	58	213**	67	54
	22	36	69	56	35	71	58	77	72	53
	23	42	69	57	17	72	60	60	67	51
	24	53	71	58	43	72	58	99	66	51
	25	51	71	57	29	72	58	54	68	51
	26	60	68	54	31	71	57	254***	68	51
	27	71	70	55	43	69	55	397***	68	51
	28	91	69	56	43	68	55	259***	68	52
	29	47	71	59	25	72	59	1	62	55
	Daily AVG	56	70	57	31	71	58	105	66	52

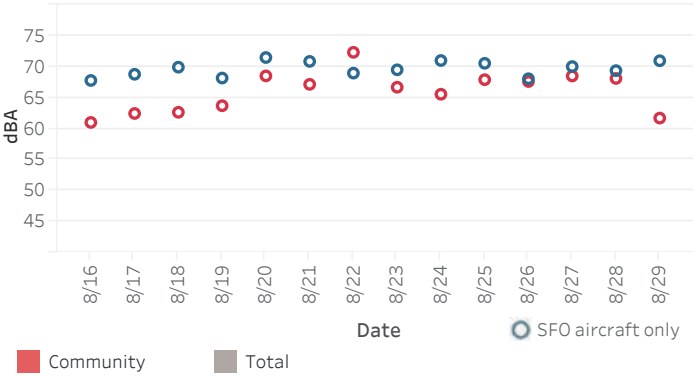
* Delayed vectors due to weather-related Ground Delay Program (low visibility and East Coast thunderstorms)
** Crickets, Wind
*** Crickets

SFO Events are: Single SFO Aircraft, Multiple SFO Aircraft, Simultaneous SFO and Non-SFO Aircraft, and Simultaneous Community and SFO Aircraft.
SEL - Sound Exposure Level of a noise event is measured over time between the initial and final points when the noise level exceeds a predetermined threshold and its energy is compressed into one second.
Lmax - The maximum noise level is a measurement of the peak level of a noise event.
CNEL- This metric is used to assess and regulate aircraft noise exposure in communities surrounding the airport. California Title 21 Noise Regulations established acceptable level of aircraft noise of 65dBA CNEL.

Community Noise Equivalent Level (CNEL)



Sound Exposure Level (SEL) Comparison

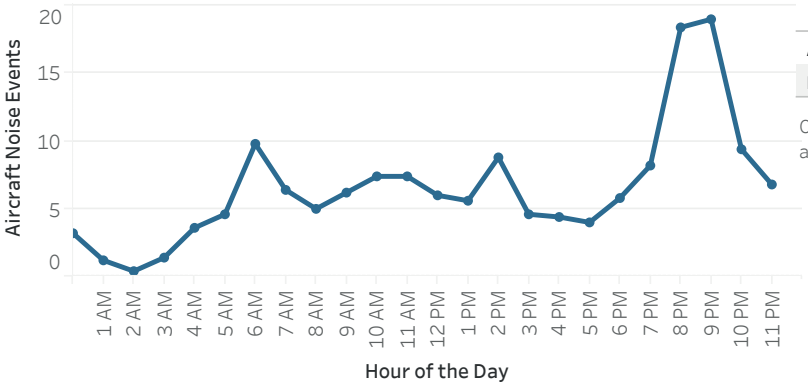


Aircraft Community Total

SFO Aircraft Noise Events by Day (7am-7pm), Evening (7pm-10pm) and Night (10pm-7am)

	Noise Events	SFO Noise Events (%)	Avg. SEL (dBA)	Min. SEL (dBA)	Max. SEL (dBA)	Avg. LMax (dB)	Min. LMax (dBA)	Max. LMax (dBA)	Avg. Duration (sec)	Min. Duration (sec)	Max. Duration (sec)
Day	358	45%	70	57	81	57	50	74	25	3	60
Evening	228	29%	70	60	82	56	51	74	41	10	60
Night	202	26%	69	59	80	56	50	70	31	8	60

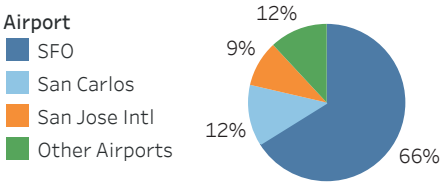
SFO Noise Events by Hour of the Day



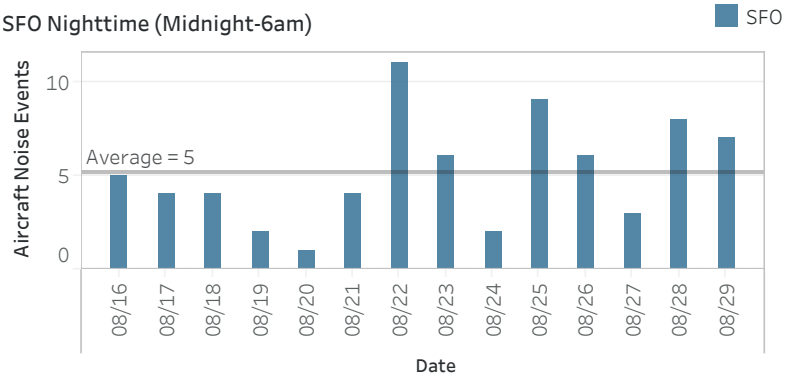
SFO Aircraft Altitude

	<6000ft	≥6000ft	≥7000ft	≥8,000ft	≥9,000ft
Arrivals	20%	29%	40%	10%	
Departures	22%	1%			77%

Only aircraft that registered a noise event on the monitor are considered.



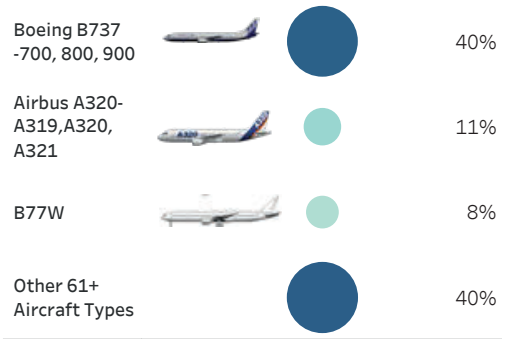
SFO Nighttime (Midnight-6am)



Operation Type

Arrivals	Departures
69%	31%

Aircraft Type



Noise Reporters

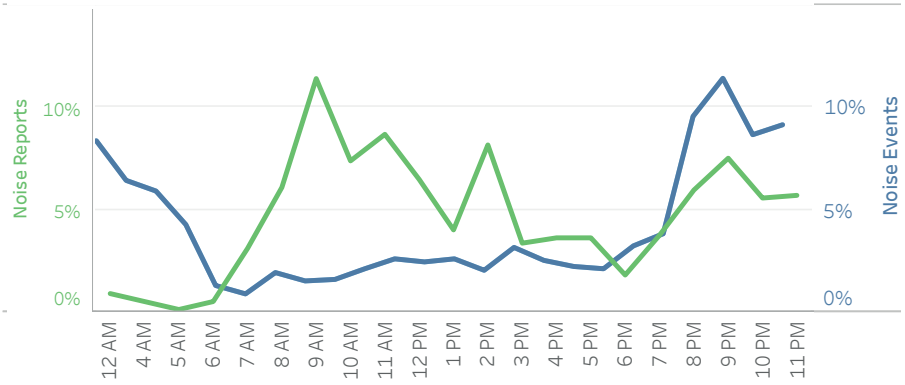
	Noise Reporters	Noise Reports
August 16	4	47
17	4	60
18	5	45
19	3	31
20	4	47
21	6	69
22	6	50
23	3	28
24	4	63
25	4	71
26	2	48
27	3	35
28	5	83
29	5	82
Total	9 *	759

* Individual Reporters

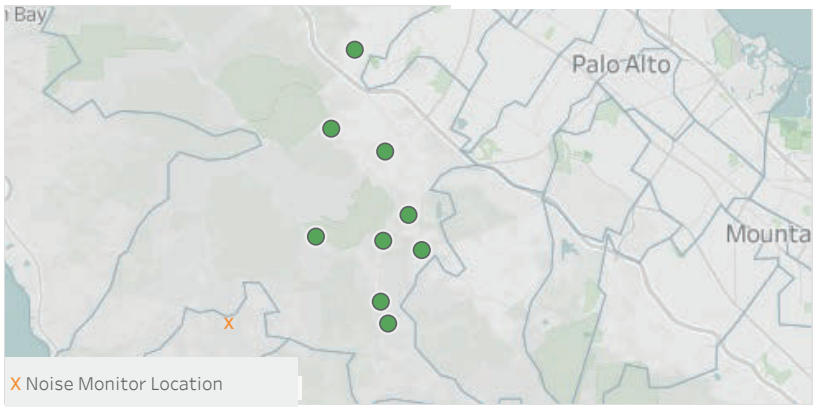
32%

of overflights registered a noise event.
(97 avg daily overflights of which 31 created a noise event)

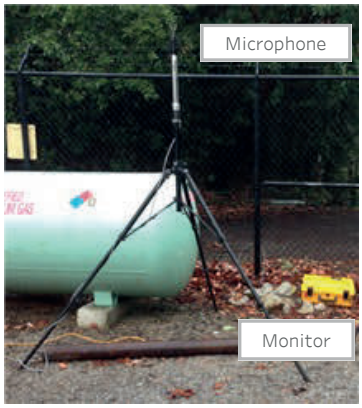
Noise Reports vs Noise Events



Noise Reporters Location



Noise Monitor on Location



Dave Ong (AIR)

From: Dave Ong (AIR)
Sent: Monday, September 23, 2019 4:57 PM
To: 'Joe Baylock'
Cc: Audrey Park (AIR); 'Ricardo Ortiz'; 'James A Castañeda'; Bert Ganoung (AIR); Anneliese Taing (AIR); Anthony Carpeneti (AIR); Nastasja von Conta (AIR)
Subject: RE: Short Term Aircraft Noise Monitoring Report for Burlingame
Attachments: 1004 Burlingame Noise Monitoring Report Revision 2 FINAL.pdf

Dear Mr. Joe Baylock,

We discovered some errors in the noise monitoring report provided on September 16. Please accept my apology for this oversight. The errors are:

1. The decibels used in the table for "Daily Noise Event Averages in C-Weighted Decibels (dBC)" on page 3 were incorrect and now contains C-weighted decibels.
2. The line graph titled, "LEQ-A and LEQ-C Equivalent Sound Pressure Levels" on page 3 were incorrectly associated between the two weighted levels (crossed). It is now depicting the correct line for LEQ-A and LEQ-C.
3. To provide clarification for what low-frequency noise metric and C-weighting is, the 3rd paragraph on the memorandum page was rewritten.

If you have any questions regarding these changes please call me at the number below.

Thank you,

David Ong
Noise Systems Manager | Planning, Design & Construction
San Francisco International Airport | P.O. Box 8097 | San Francisco, CA 94128
Tel 650-821-5100 | flysfo.com

Facebook | Twitter | YouTube | Instagram | LinkedIn

From: Dave Ong (AIR)
Sent: Monday, September 16, 2019 4:43 PM
To: Joe Baylock <joeb650@gmail.com>
Cc: NIIRO, NICHOLAS (CAT) <Nicholas.Niiro@sfcityatty.org>; Audrey Park (AIR) <audrey.park@flysfo.com>; Ricardo Ortiz <rortiz@burlingame.org>; James A Castañeda <jcastaneda@sforoundtable.org>; Bert Ganoung (AIR) <bert.ganoung@flysfo.com>; Anthony Carpeneti (AIR) <Anthony.Carpeneti@flysfo.com>; Anneliese Taing (AIR) <anneliese.taing@flysfo.com>; Nastasja von Conta (AIR) <nastasja.vonconta@flysfo.com>
Subject: Short Term Aircraft Noise Monitoring Report for Burlingame

Dear Mr. Joe Baylock:

Thank you for allowing San Francisco International Airport (SFO) Noise Abatement Office the opportunity to collect aircraft noise measurements at your residence. Please find attached the Short Term Aircraft Noise Monitoring report. This document contains the results of the monitoring performed from Saturday, July 20, 2019 to Monday, August 5, 2019. Also attached is an Aircraft Noise Terminology & Metric Supplement to help explain some of the terms used in the report.

I have also copied Airport Roundtable Member Ricardo Ortiz to share the results with.

SFO will strive to improve aircraft noise abatement procedures to further reduce aircraft noise in your community and are continually developing initiatives to mitigate the impacts of aircraft noise by working with the Airport Community Roundtable, the Federal Aviation Administration, and the airlines operating here at SFO.

Please feel free to call Bert Ganoung or me at (650) 821-5100 if you have any questions or would like to discuss this information.

Sincerely,

David Ong
Noise Systems Manager | Planning, Design & Construction
San Francisco International Airport | P.O. Box 8097 | San Francisco, CA 94128
Tel 650-821-5100 | flysfo.com

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MEMORANDUM

TO: BURLINGAME COMMUNITY

FROM: SAN FRANCISCO INTERNATIONAL AIRPORT AIRCRAFT NOISE ABATEMENT OFFICE

SUBJECT: BURLINGAME SHORT-TERM NOISE MONITORING REPORT

DATE: SEPTEMBER 23, 2019

The San Francisco International Airport (SFO) Aircraft Noise Abatement Office (ANAO) conducted aircraft noise monitoring in Burlingame to determine the noise levels within the community from aircraft operations at SFO. This measurement period was from July 20, 2019 to August 5, 2019. The monitoring was made possible with the assistance of a Burlingame resident. The overall average daily noise level from all aircraft was 52dBA CNEL. The Community daily noise level average was 53dBA CNEL. Noise from all aircraft over this location increased the total average daily noise level by 1.6dBA. There were two thresholds used during this measurement period. 57dBA was used between 7:00 am and 10:00 pm, while 52dBA was used between 10:01 pm and 6:59 am.

The monitoring site at the Burlingame Park Neighborhood is relatively quiet with ambient noise levels of 48dBA, considering that most of the neighborhood is in an urban community setting. On an average day, there were 229 overflights, out of which 65 exceeded the noise monitor threshold and recorded a noise event. These events included departing aircraft engine start, ground idling, take-off thrust and initial climb thrust. Runways 01-Left and 01-Right departing aircraft accounted for the vast majority of the noise events recorded by the monitor. The majority of flights departing SFO use overwater procedures that reduces the noise in residential communities from direct overflights when wind speed and wind direction allow for a safe take-off. Arriving aircraft caused noise upon landing by applying reverse thrust and when they flew over the monitor on the BDEGA West arrival path.

A low-frequency aircraft noise study conducted at SFO by Wyle Laboratories in 2001 suggests that C-weighting is preferred over A-weighting to describe aircraft back-blast noise in areas behind the take-off runways such as this Burlingame community. While not a required metric, the ANAO has included C-weighted metric in its analytics on Page 3 of the Monitoring Data Report to help with the understanding of low-frequency noise metrics and how it differs from high-frequency noise metrics.

During the noise-monitoring period, SFO ANAO received 79 noise reports from seven individuals all across Burlingame. Of these reports, approximately 95% are for SFO and the remaining 5% were for other airports. Of the reports submitted, 16% (13) were in the daytime hours (7am-7pm), 25% (20) for the evening hours (7pm-10pm), and 58% (46) for the nighttime hours (10pm-7am). There were 367 (21%) SFO Aircraft noise events in the daytime, 287 (17%) in the evening hours and 1,085 (62%) during the nighttime period. The majority of SFO Aircraft noise events occurred between 12:00 am and 2:00 am, 5:00 am and 8:00 am and 5:00 pm through 11:59 pm. On average, there were 26 nighttime noise events during the duration of the monitoring session.

The resident provided some dates and times he found particularly disturbing. These disturbances are listed on the next page. Possible source(s) of the noise are also provided by ANAO.

CNEL- This metric is used to assess and regulate aircraft noise exposure in communities surrounding the airport. California Title 21 Noise Regulations established acceptable level of aircraft noise of 65dBA CNEL.
dBA- stands for A-weighted decibel. Decibel unit measures the loudness of a sound and is computed as the signal to noise ratio. A-weighting is used to adjust for frequency range of human hearing. An increase of ten decibels is perceived by human ear as a doubling of noise.
dBC-stands for C-weighted decibel.
Day, Evening, Night-Day is considered the time between 7 a.m.-7p.m., Evening between 7 p.m. – 10:00 p.m., and Night between 10 p.m. – 7 a.m.
Reverse Thrust – Aircraft engine thrust is directed forward rather than backward to help reduce speed for stopping.

Post Office Box 8097 San Francisco, California 94128 Tel 650.821.5100 Fax 650.821.6777

July 22, 2019
12:09 am: A United Airlines' Airbus A320, Flight UAL1471 to Austin, TX started its takeoff roll first at 12:09:13 am on runway 1L. LMax is 56.8 dB, SEL is 66.5 dB and the event was 16 seconds long.

11:02 pm: A Qantas Airways' Boeing 747-400, Flight QFA074 to Sydney, Australia, started its takeoff roll on runway 28L at 11:01:35 pm. The LMax was 68.7 dB, the SEL was 76.2 dB and the event was 42 seconds long.

July 23, 2019
7:00 pm: While the monitor did not pick up any noise at 7:00 pm, there was a departure at this time. A United Airlines' Boeing 787-8 Dreamliner, Flight UAL2731 to Chicago O'Hare started its takeoff roll at 6:59:40 pm.

8:29 pm: A Southwest Airlines' Boeing 737-800, Flight SWA2583 to Phoenix started its takeoff roll on runway 1L. The monitor heard the aircraft twice. The first event LMax was 61.6 dB, the SEL was 69.4 dB and the event was nine seconds long. The second event LMax was 58.1 dB, the SEL was 65.9 dB and the event was seven seconds long.

10:15 pm: A Frontier Airlines' Airbus A321, Flight FFT2438 to Cleveland started its takeoff roll on runway 1R. The LMax was 68.0 dB, the SEL was 79.0 dB and the event was 40 seconds long.

July 27, 2019
11:40 pm: A United Airlines' Boeing 787-9 Dreamliner, Flight UAL1 to Singapore started its takeoff roll on Runway 28L at 11:39 pm. The LMax was 56.9 dB, the SEL was 64.7 dB and the event was 11 seconds long.

11:41 pm: A United Airlines' Airbus A319, Flight UAL1164 to Toronto started its takeoff roll on Runway 1R at 11:40 pm. The LMax was 58.8 dB, the SEL was 70.9 dB and the event was 30 seconds long.

11:43 pm: A United Airlines' Airbus A319, Flight UAL864 to Atlanta started its takeoff roll on Runway 1R at 11:42 pm. The LMax was 58.6 dB, the SEL was 70.2 dB and the event was 31 seconds long.

11:50 pm: An American Airlines' Airbus A321, Flight AAL2902 to Charlotte started its takeoff roll on Runway 1R at 11:50 pm. The LMax was 65.1 dB, the SEL was 77.1 dB and the event was 40 seconds long.

11:58 pm: A United Airlines' Boeing 737-800, Flight UAL384 to Philadelphia started its takeoff roll on Runway 1R at 11:57 pm. The LMax was 62.6 dB, the SEL was 74.8 dB and the event was 40 seconds long.

July 29, 2019
1:23 am: A United Airlines' Boeing 777-200, Flight UAL1639 to Houston. It started its takeoff roll, using runway 1R, at 1:23:20 am. The LMax was 53.5 dB, the SEL was 60.2 dB and the event was seven seconds long.

July 30, 2019
1:34 am: While the monitor did not pick up any noise at 1:34 am, there was a departure at this time. A Singapore Airlines' Boeing 777-300ER, Flight SIA001 to Hong Kong that departed on runway 28L at 1:35:39 am.

August 3, 2019
12:35 am: A Delta Airlines' Boeing 757-200, Flight DAL806 to Minneapolis. It started its takeoff roll on runway 1R at 12:35:39 am. The LMax was 59.9 dB, the SEL was 70.4 dB and the event was 27 seconds long.

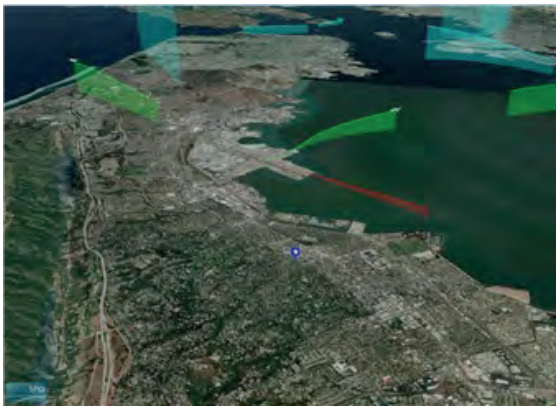
6:57 am: An American Airlines' Airbus A321, Flight AAL234 to New York JFK started its takeoff roll on Runway 1R at 6:55:40 am. The LMax was 63.5 dB, the SEL was 72.5 dB and the event was 47 seconds long.

11:38 pm: A Qantas Airways' Boeing 747-400, Flight QFA074 to Sydney, Australia, started its takeoff roll on Runway 28L at 11:41:09 pm. The LMax was 65.5 dB, the SEL was 77.4 dB and the event was 60 seconds long.

Short Term Noise Monitoring Report - Site 1004

Burlingame 2019

July 20 - August 5



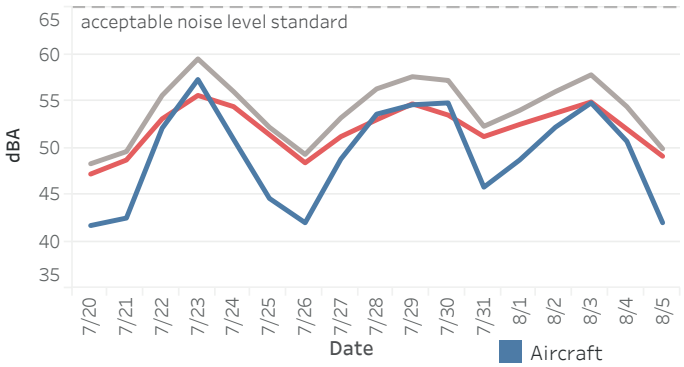
Aircraft CNEL: 52dBA
Community CNEL: 53dBA
Total CNEL: 55dBA
SEL: 72dBA
LMax: 59dBA
Ambient Noise: 48dBA
Noise Monitor Treshold: 57dBA from 7 am to 10 pm. 52dBA from 10:01 pm to 6:59 am.
SFO Aircraft Noise Events: 102 per day
SFO Operations Flow: West Flow
Cause of Aircraft Noise: SFO arrivals on the BDEGA coming down the peninsula, aircraft doing missed approaches and turning left before the airport, SFO helicopter arrivals from the south bay, OAK departures to southern California, General Aviation and Ground Noise.

Daily Noise Event Averages

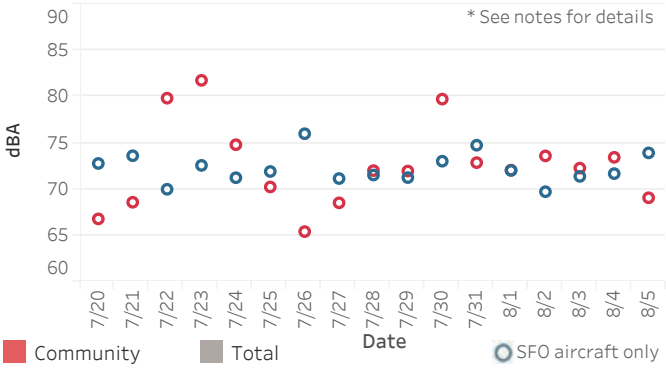
	Date	SFO Noise Events	SFO Avg. SEL (dBA)	SFO Avg. LMax (dB)	Non-SFO Noise Events	Non-SFO Avg. SEL (dBA)	Non-SFO Avg. LMax (dB)	Community Noise Events	Community Avg. SEL (dBA)	Community Avg. LMax (dB)
July	20	11	73	59	5	77	63	14	67	58
	21	23	74	60	7	73	64	12	69	62
	22	83	70	58	11	77	65	91	80	63
	23	210	73	60	5	73	59	156	82	62
	24	142	71	59	6	75	64	83	75	61
	25	49	72	59	8	74	63	21	70	61
	26	10	76	62	3	75	65	5	65	57
	27	79	71	59	4	72	63	7	69	60
	28	179	72	59	10	71	61	26	72	59
	29	223	71	60	6	70	60	111	72	59
	30	12	73	59	8	72	60	169	80	63
	31	27	75	60	13	80	67	56	73	63
August	1	139	72	59	5	75	61	45	72	61
	2	145	70	58	6	68	58	82	74	61
	3	243	71	59	10	74	63	162	72	62
	4	147	72	60	6	71	61	24	73	61
	5	17	74	61	7	76	65	27	69	61
Daily Average		**102**	**72**	**59**	**7**	**74**	**63**	**64**	**73**	**62**

SFO Events are: Single SFO Aircraft, Multiple SFO Aircraft, Simultaneous SFO and Non-SFO Aircraft, and Simultaneous Community and SFO Aircraft.
SEL - Sound Exposure Level of a noise event is measured over time between the initial and final points when the noise level exceeds a predetermined threshold and its energy is compressed into one second.
Lmax - The maximum noise level is a measurement of the peak level of a noise event.
CNEL- This metric is used to assess and regulate aircraft noise exposure in communities surrounding the airport. California Title 21 Noise Regulations established acceptable level of aircraft noise of 65dBA CNEL.

Community Noise Equivalent Level (CNEL)



Sound Exposure Level (SEL) Comparison

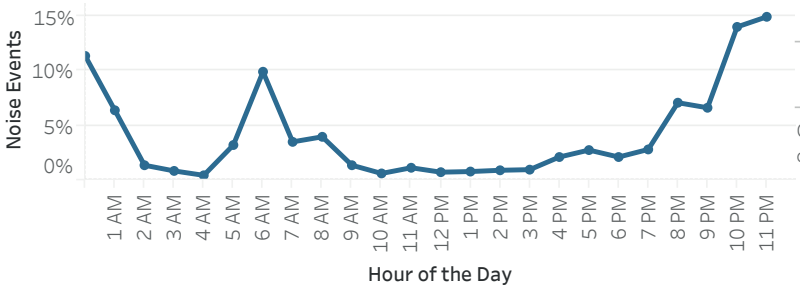


*Notes: 7/22: Yard work with a leafblower from 12:00 pm to 1:30 pm and again from 4:30 pm to 5:30 pm. 7/23: Yard work with a leafblower from 9:25 am to 11:30 am, from 11:50 am to 12:25 pm and again from 2:45 pm to 3:05 pm. 7/30: Music being played from 12:00 am through 12:46 am and from 7:45 pm to 8:00 pm, Yardwork with a leafblower from 9:05 am to 10:45 am and from 11:10 am to 1:15 pm.

SFO Aircraft Noise Events by Day (7am-7pm), Evening (7pm-10pm) and Night (10pm-7am)

	Noise Events	SFO Noise Events (%)	Avg. SEL (dBA)	Min. SEL (dBA)	Max. SEL (dBA)	Avg. LMax (dB)	Min. LMax (dBA)	Max. LMax (dBA)	Avg. Duration (sec)	Min. Duration (sec)	Max. Duration (sec)
Day	367	21%	74	62	86	62	57	78	17	5	47
Evening	287	17%	73	64	82	62	57	75	17	5	56
Night	1,085	62%	70	52	80	58	52	71	21	1	60

SFO Noise Events by Hour of the Day

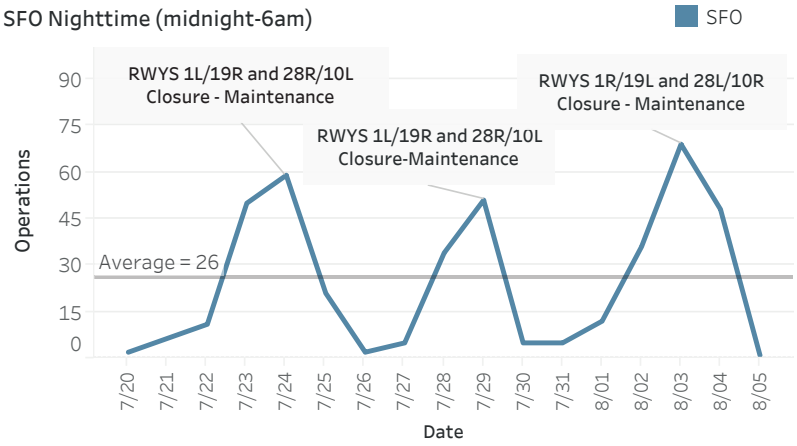


SFO Runway Usage - Arrivals and Departures

	01L	01R	28L	28R	HELI
Arrivals			13%	9%	2%
Departures	13%	39%	17%	4%	3%

Only aircraft that registered a noise event on the monitor are considered.

SFO Nighttime (midnight-6am)



Operation Type

Arrivals	Departures
25%	75%

Airport
- SFO
- Other

Aircraft Type

Boeing B737 -700, 800, 900	34%
Other 60 Aircraft Types	25%
Airbus A319, A320&A321	24%
Boeing B777 -200, 300	9%
Boeing 757 -200, -300	8%

Noise Reporters

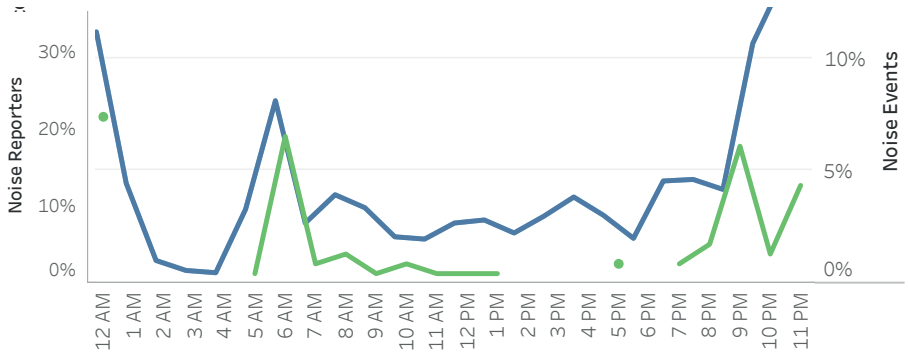
		Noise Reporters	Noise Reports
July	20	0	0
	21	2	2
	22	2	17
	23	4	25
	24	1	1
	25	1	3
	26	0	0
	27	0	0
	28	1	1
	29	3	6
	30	0	0
	31	0	0
August	1	2	6
	2	3	6
	3	2	5
	4	3	6
	5	1	1
Total		7*	79

*Individual Reporters

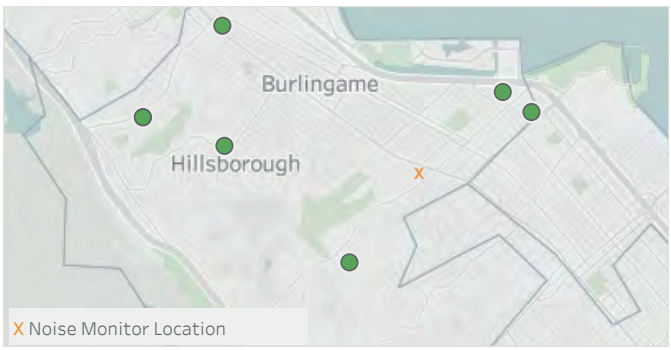
28%

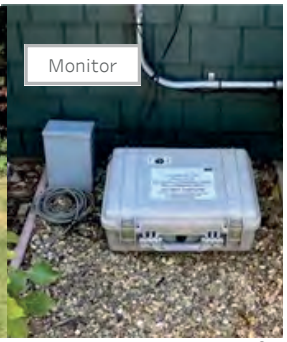
of flights registered a noise event.
(229 avg daily flights of which 65 created a noise event)

Noise Reporters vs Noise Events



Noise Reporters Location





Low Frequency Noise Levels

Low frequency aircraft noise study conducted at SFO in 2001 suggests that C-weighting is preferred over A-weighting to describe aircraft back-blast noise. The standard to measure aircraft overflight noise is typically done using A-weighting which better conforms to the response of the human ear. This frequency range are in the mid to high frequencies between 500 Hertz (Hz) and 6,000 Hz. C-weighting sound levels are deep tones in the low frequency range from the 16 Hz to 256 Hz. In the event of low frequency noise (airplane taking off, engine run-up) the duration and spectral content of the event is quite different from that of an aircraft overflight.

For this measurement the average aircraft, generated Maximum Noise Level (LCmax) was 73dBC compared to 59dBA. The average Sound Exposure Level (LCE) was 83dBC compared to 72dbA.

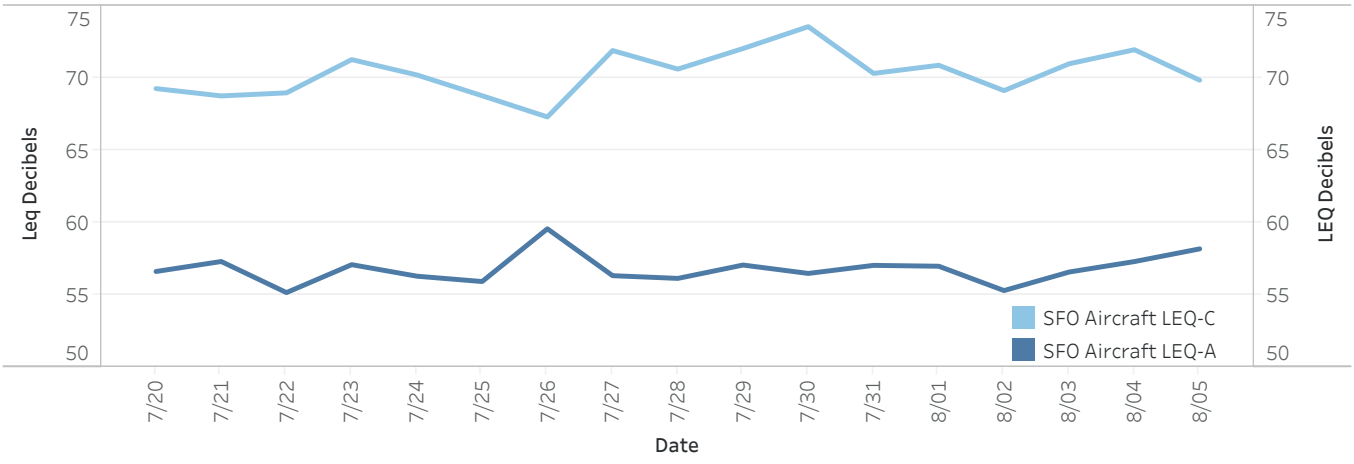
In general, the C-weighted levels will be greater than the A-weighted level behind the departing aircraft. Low frequency back-blast noise levels decrease by about 6 decibels per doubling of distance. The reduction of noise from air and ground absorption is small (Wyle, 2001).

C-Weighted Decibels (dBC)

		SFO			Non-SFO			Community		
		Noise Events	LCE	LC Max	Noise Events	LCE	LC Max	Noise Events	LCE	LC Max
July	20	11	82	72	5	80	72	14	68	61
	21	23	80	71	7	82	73	12	69	63
	22	83	81	71	11	84	74	91	82	70
	23	210	84	74	5	78	69	156	83	72
	24	142	82	73	6	85	76	83	78	68
	25	49	81	71	8	80	71	21	78	70
	26	10	79	70	3	85	76	5	68	61
	27	79	83	74	4	84	75	7	77	70
	28	179	83	73	10	81	72	26	77	67
	29	223	84	75	6	80	73	111	79	69
	30	12	85	76	8	81	70	169	81	70
	31	27	82	73	13	87	76	56	74	67
August	1	139	82	73	5	81	71	45	80	72
	2	145	80	72	6	78	70	82	80	70
	3	243	83	74	10	83	73	162	77	69
	4	147	83	75	6	82	73	24	82	73
	5	17	82	72	7	85	77	27	72	64
Average		**102**	**83**	**73**	**7**	**82**	**73**	**64**	**79**	**69**

SFO Events are: Single SFO Aircraft, Multiple SFO Aircraft, Simultaneous SFO and Non-SFO Aircraft, and Simultaneous Community and SFO Aircraft.
LCE - Sound Exposure Level of a noise event is measured over time between the initial and final points when the noise level exceeds a predetermined threshold and its energy is compressed into one second.
LCmax - The maximum noise level is a measurement of the peak level of a noise event.

LEQ-A and LEQ-C Equivalent Sound Pressure Levels



LEQ - Equivalent Continuous Sound Level

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August 20, 2019

TO: Roundtable Members and Interested Parties

FROM: Bryan Lynch, Consultant
Justin W. Cook – INCE, LEED GA, Principal Consultant
Roundtable Technical Consultant - HMMH

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

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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 updates on August 16. All eight (8) changes were identified to be of low importance. The next publication is expected on September 12, 2019.

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 AeroNav Products Charting for publication (NACO)
- FAA Status Definitions
    1. At Flight Check: At Flight Inspection for procedure validation
    2. Awaiting Publication: At AeroNav 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

  - IAP: Instrument Approach procedure
  - STAR: Standard Terminal Arrival Route
  - SID: Standard Instrument Departure
  - GPS: Global Positioning System
  - ILS: Instrument Landing System
  - LOC: Localizer

Low Importance:

- August 16, 2019
  - STAR EL NIDO FIVE at SJC status change to Published
    - Status is “Canceled”
  - STAR ROBIE FIVE at SJC status change to Published
    - Status is “Published”
  - SID SUNOL ONE at SJC status change to Published
    - Status is “Published”
    - Departure route description changed from a climb to altitude for RWY 12L/12R of 4,000 feet MSL to 4,500 feet MSL.
    - RWY 12L/R takeoff minima amended from “Standard with a minimum climb of 290 feet per NM to 4,000 feet MSL” to “Standard with a minimum climb of 330 feet per NM to 4,500 feet MSL” to account for new obstacle to air traffic.
  - STAR CAPITOL THREE at SJC status change to Published
    - Status is “Canceled”
  - SID SAN JOSE THREE at SJC status change to Published
    - Status is “Published”
    - RWY 30L/R takeoff minima amended from “Standard with a minimum climb of 460 feet per NM to 4,000” to “Standard with a minimum climb of 480 feet per NM to 4,000” to account for new obstacle to air traffic.
    - Minimum Obstacle Clearing Altitude between waypoint MOONY and AVE VOR/DME amended from 7,400 feet MSL to 7,500 feet MSL to account for new obstacle to air traffic.
    - Minimum Obstacle Clearing Altitude between waypoint MOONY and PXN VORTAC amended from 5,900 feet MSL to 6,100 feet MSL to account for new obstacle to air traffic.
  - STAR MODESTO NINE at SFO status change to Published
    - Status is “Published”
  - SID SKYLINE ONE at OAK status change to Published
    - Status is “Published”
  - STAR PANOCHE SIX at OAK status change to Published
    - Status is “Published”
  - SID OAKLAND FOUR at OAK status change to Published
    - Status is “Published”

High Importance:

- None

Open Comment Periods:

- STAR SERFR FOUR at SFO comment period ends: August 22, 2019
    - Email concerns can be sent here: https://www.faa.gov/air_traffic/flight_info/aeronav/procedures/application/?event=procedure.results&tab=coordination&nasrId=SJC#searchResultsTop

Next Publication:

We do not expect to see any Instrument Flight Procedure updates for OAK, SFO or SJC on the September 12, 2019 publication.