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

MEETING PACKET

Meeting No. 306

Wednesday, April 5, 2017 - 7:00 p.m.

David Chetcuti Community Room – Millbrae City Hall
450 Popular 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. Adoption of a Resolution in Recognition of Cliff Lentz
ACTION
Elizabeth Lewis, Roundtable Chairperson

3. 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 ITEMS

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.

4. Review of Roundtable Meeting Overviews
ACTION

REGULAR AGENDA

5. Review of Airport Director's Reports & New Report Format Update
ACTION
Bert Ganoung, Manager - Aircraft Noise Abatement Office

REGULAR AGENDA (continued)

6. Airport Director's Comments
INFORMATION
Ivar Satero, Director – San Francisco International Airport

7. Roundtable Technical Consultant Update
INFORMATION
Elizabeth Lewis, Roundtable Chairperson

1) Memorandum pg. 43

8. Roundtable Subcommittees
INFORMATION
James Castañeda, Roundtable Coordinator

1) Memorandum and Subcommittee Descriptions pg. 45

9. Status, Initiative Response Review Progress
INFORMATION
Elizabeth Lewis, Roundtable Chairperson

10. Post TRACON Field Trip recap
INFORMATION
Roundtable Members

OTHER MATTERS

11. Member Communications / Announcements
INFORMATION
Roundtable Members and Staff

12. Adjourn
ACTION
Elizabeth Lewis, Roundtable Chairperson

Correspondences
1) Woodside Noise Aircraft Noise Monitoring pg. 63

Airport Noise News
1) Airport Noise Report, March 24, 2017 pg. 91

Additional Resources
1) Glossary of Acoustic & Air Traffic Control Terms pg. 97

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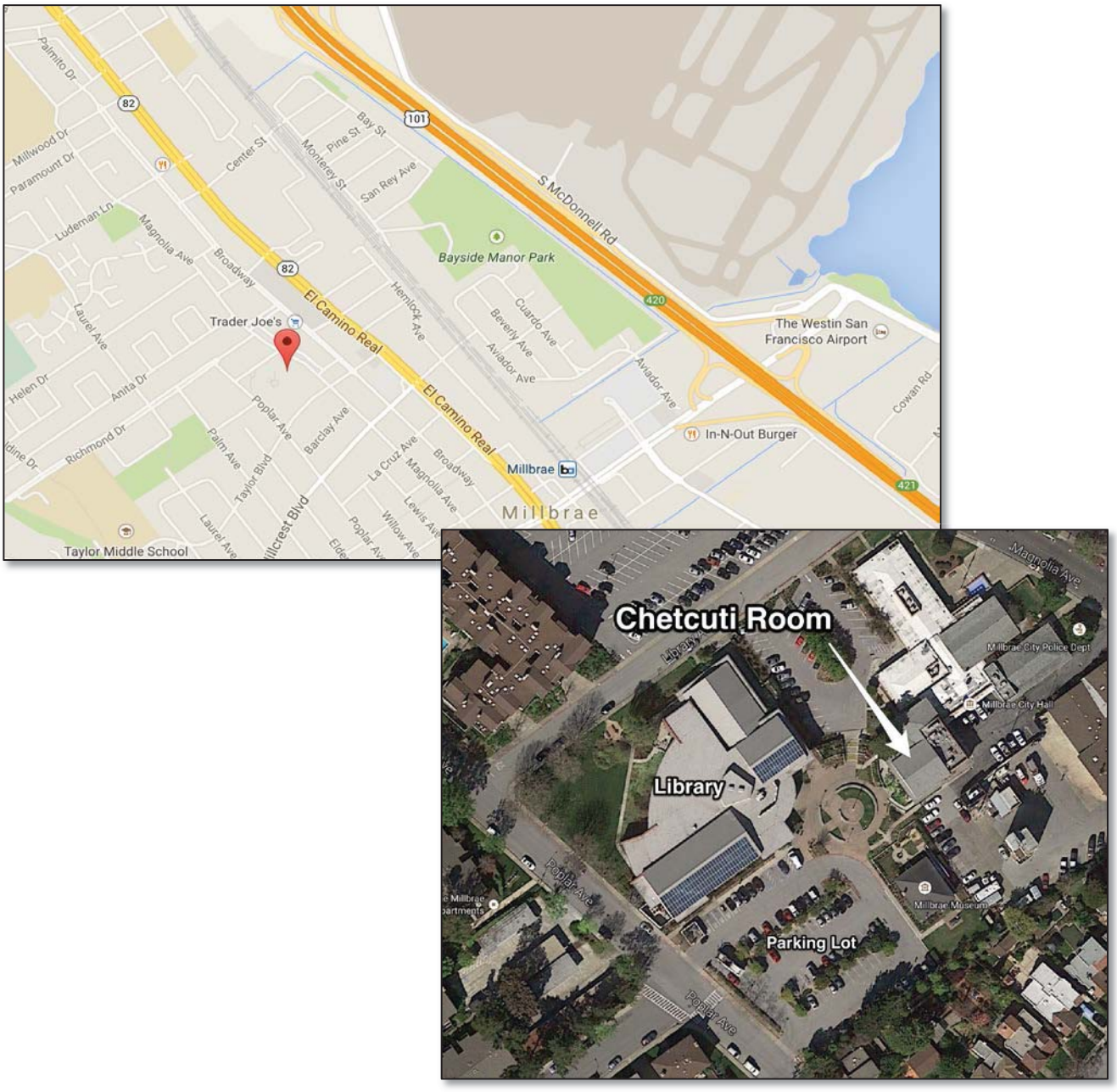
REGULAR MEETING LOCATION

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

Access through Millbrae Library parking lot on Poplar Avenue



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ABOUT THE AIRPORT/COMMUNITY ROUNDTABLE

OVERVIEW

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 2017, 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." (49 U.S.C. A. Section 1302(a)(1)).

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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, Agenda 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:
MARK ADDIEGO
Representative, City of South San Francisco
mark.addiego@ssf.net

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

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Airport/Community Roundtable

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MEMBERSHIP ROSTER APRIL 2017
REGULAR MEMBERS

CITY AND COUNTY OF SAN FRANCISCO
BOARD OF SUPERVISORS
Representative: Vacant
Alternate: Vacant

CITY AND COUNTY OF SAN FRANCISCO MAYOR'S OFFICE
David Takashima, (Appointed)
Alternate: Edwin Lee, Mayor

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 OF SAN MATEO COUNTY (C/CAG)
AIRPORT LAND USE COMMITTEE (ALUC)
Adam Kelly, ALUC Chairperson (Appointed)

TOWN OF ATHERTON
Elizabeth Lewis, Mayor/**Roundtable Chairperson**
Alternate: Bill Widmer, Council Member

CITY OF BELMONT
Douglas Kim, Council Member
Alternate: Eric Reed

CITY OF BRISBANE
Cliff Lentz, Council Member
Alternate: Lori Liu, Council Member

CITY OF BURLINGAME
Ricardo Ortiz, Council Member

MEMBERSHIP ROSTER APRIL 2017

CITY OF DALY CITY
Glenn Sylvester, Mayor

CITY OF FOSTER CITY
Sam Hindi, Council Member

CITY OF HALF MOON BAY
Harvey Rarback, Council Member

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

CITY OF MENLO PARK
Peter Ohtaki, Council Member

CITY OF MILLBRAE
Ann Schneider, Council Member

CITY OF PACIFICA
Sue Digre, Mayor

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

CITY OF REDWOOD CITY
Janet Borgens, Council Member
Alternate: Vacant

CITY OF SAN BRUNO
Ken Ibarra, Council Member
Alternate: Rico Medina, Council Member

CITY OF SAN CARLOS
Matt Grocott: Council Member
Alternate: Bob Grassilli, Council Member

CITY OF SAN MATEO
David Lim, Council Member
Alternate: Rick Bonilla, Council Member

CITY OF SOUTH SAN FRANCISCO
Mark Addiego, Council Member/**Roundtable Vice-Chairperson**
Alternate: Pradeep Gupta, Council Member

TOWN OF WOODSIDE
Deborah Gordon, Council Member
Alternate: Thomas Shanahan, Council Member

ROUNDTABLE ADVISORY MEMBERS

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

FEDERAL AVIATION ADMINISTRATION
Don Kirby, Northern California Terminal Radar Approach Control (NORCAL TRACON)
Tony DiBernardo, FAA District Manager – Sierra-Pacific District

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ROUNDTABLE STAFF

James A. Castañeda, AICP, Roundtable Coordinator

SAN FRANCISCO INTERNATIONAL AIRPORT NOISE ABATEMENT STAFF

Bert Ganoung, Noise Abatement Manager
David Ong, Noise Abatement Systems Manager
Ara Balian, Noise Abatement Specialist
John Hampel, Noise Abatement Specialist
Nastasja Gjorek, Noise Abatement Specialist
William Brown, Noise Abatement Specialist
Joyce Satow, Noise Abatement Office Administration Secretary

CONSENT AGENDA

Regular Meeting # 306
April 5, 2017

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SFO Airport/Community Roundtable
Meeting No. 303 Overview
Wednesday, November 2, 2016

1. Call to Order / Roll Call / Declaration of a Quorum Present

Roundtable Chairperson, Cliff Lentz, called the Regular Meeting of the SFO Airport / Community Roundtable to order, at approximately 7:09 p.m., in the David Chetcuti Community Room at the Millbrae City Hall. James A. Castañeda, AICP, Roundtable Coordinator, called the roll. A quorum (at least 12 Regular Members) was present as follows:

REGULAR MEMBERS PRESENT
Ivar Satero – City and County of San Francisco Airport Commission
David Takashima – City and County of San Francisco Mayor's Office
Adam Kelly – C/CAG Airport Land Use Committee (ALUC)
Elizabeth Lewis – Town of Atherton
Douglas Kim – City of Belmont
Cliff Lentz – City of Brisbane
Ricardo Ortiz – City of Burlingame
Sam Hindi – City of Foster City
Alvin Royse – Town of Hillsborough
Peter Ohtaki – City of Menlo Park
Ann Schneider – City of Millbrae
Sue Digre – City of Pacifica
Ann Wengert – Town of Portola Valley
Janet Borgens – City of Redwood City
Ken Ibarra – City of San Bruno
Mark Addiego – City of South San Francisco
Deborah Gordon – Town of Woodside

REGULAR MEMBERS ABSENT
City and County of San Francisco Board of Supervisors (Vacant)
County of San Mateo Board of Supervisors
City of Daly City
City of Half Moon Bay
City of San Carlos
City of San Mateo

ROUNDTABLE STAFF
James A. Castañeda, AICP – Roundtable Coordinator
Cindy Gibbs – Roundtable Technical Support (Consultant)

SAN FRANCISCO INTERNATIONAL AIRPORT STAFF
Bert Ganoung, Noise Abatement Manager
John Hampel, Noise Abatement Specialist
Nastasja Gjorek, Noise Abatement Specialist

2. Public Comments on Items Not on the Agenda

A total of 7 members of the public spoke to express concern over aircraft noise over their communities. The communities represented were Pacifica, Brisbane, Daly City and San Francisco. Daly City resident David Feldman requested that a noise monitor be deployed in the Southern Hill neighborhood of Daly City. Pacifica resident Ahna Dominski expressed that the current noise metrics are out of date and needs to be revised for the 21st century. San Francisco resident Kenji Okamoto indicated that noise has increased 10,000% in the Excelsior neighborhood, and expressed there should be additional transparency and direct access to FAA officials. Pacifica resident Max Burns expressed concerned of the noise impacts to children. Brisbane resident Tony Vereso indicated he was disappointed that the Roundtable meetings don't have the same live streaming capabilities as the Select Committee for South Bay Arrivals. San Francisco resident Katherine Gray expressed she wants to see an end point to the noise, and felt there was no end in sight. Pacifica resident Tony Dominski indicated that there should be a better way to measure aircraft noise, the need for clarity of short and long term solutions, and importance for an advisory board to the FAA.

CONSENT AGENDA

3. Review of Airport Director's Reports for July 2016, August 2016, and September 2016
4. Review of Roundtable Regular Meeting Overview for August 3, 2016

ACTION: Elizabeth Lewis **MOVED** approval of the Consent Agenda. The motion was seconded by Ann Schneider and **CARRIED**, unanimously.

Millbrae representative Ann Schneider expressed interest in starting a subcommittee to address the backblast effect from the airport. Roundtable Coordinator James Castañeda suggested that this suggestion be discuss as part of the Work Program Subcommittee in order to establish backblast as a work item for the Roundtable, and if necessary, develop an subcommittee/ad-hoc subcommittee for this effort. Airport Director Ivar Satero reported that an Auxiliary Power Unit (APU) use study was being conduct to examine noise from ground operations at SFO.

REGULAR AGENDA

5. Review of SFO FlyQuiet Report for Q3 2016

Bert Ganoung, Noise Abatement Manager, indicated the item would be postponed for a later meeting.

6. Airport Director's Comments

Airport Director Ivar Satero reported that the Noise Abatement Office has been receiving record number of complaints, but is also currently deploying additional noise monitors while continuing to respond to complaints and gather/analyze data. The results are currently being posted on the Noise Abatement Office's webpage at flyquietsfo.com.

DISCUSSION: Roundtable Chairperson Cliff Lentz asked if it's possible to get extra staff to help off load work from the Noise Abatement Office during this time of high noise reporting. Mr. Satero indicated that the airport has been exploring option and currently being investigated.

7. Roundtable Response to FAA Initiative Results to Address Noise Concerns

Roundtable Chairperson Cliff Lentz provided an introduction and overview of the response document, with the intent of having the Roundtable approve the document as to be sent to the Members of Congress in the coming weeks.

DISCUSSION: Roundtable members who also serve on the Select Committee for South Bay Arrivals (Select Committee) provided the current status of their response document. Vice-Chairperson Elizabeth Lewis indicated that both response should be addressed to the Members of Congress, who will then transmit the documents to the FAA. San Bruno representative Ken Ibarra expressed that the cover letter should be more powerful, and needs to communicate emotion to lend to the seriousness of the impacts experienced by residents. Roundtable Technical Consultant Cindy Gibbs responded that the next cover letter draft will incorporate additional language to that effect.

Ms. Gibbs provided an overview of the response documents and the various attachments that make up the entire document and its recommendations. Town of Woodside representative Deborah Gordon indicated concern about recommendations that implied possible noise shifting to open space areas should be reconsidered. Pacifica representative Sue Digre indicated that efficiency should not be listed in the top goals/objectives, as it dilutes other priorities. During Ms. Gibbs' overview and discussion of the recommendations related to the arrivals, Roundtable members made suggested edits to incorporate, specifically for the SERFR arrival. Millbrae representative Ann Schneider requested that language be added that discourage additional use of the RWY 1 departures at night for recommendations discussing the 050 heading departure as to reduce backblast impacts. Ms. Gibbs clarified that the recommendation was focused on aircraft already using RWY 1 for departure once airborne, not implying additional use.

Roundtable members continued to make suggested edits as Ms. Gibbs outlined the remainder of the recommendations discussed in the document. Brisbane resident Patrick Tanter expressed concerns with the recommendations specific to the SSTIK departure, and suggested that immediate relief be incorporated into the recommendation. Brisbane resident Jay Patel expressed disappointment with the SSTIK departure recommendation, as flying the procedures as charted does not work. Brisbane resident Danny Ames suggested more forceful language needs to be incorporated within the document. Palo Alto resident Jennifer Landersmann requested that the Roundtable acknowledge how the Roundtable's recommendations will shift noise to Palo Alto. Pacifica resident Ray Ramos suggested the cover letter should be revised to capture the health impacts to communities as a result of aircraft noise, and the Roundtable should also consider their own definition of "compatible land uses". Daly City resident David Feldman expressed that recommendation #32 regarding the CNDEL departure should be off the table.

ACTION: Janet Borgens **MOVED** approval of the Roundtable's response to the FAA Initiative with edits to incorporate as discussed. The motion was seconded by David Takashima and **CARRIED**, unanimously.

8. Discussion, Tasks and Appointment of Legislative Subcommittee

Roundtable Coordinated James Castañeda indicated he would be reaching to Roundtable members for volunteers to fill the standing subcommittees.

OTHER MATTERS

9. Airport Noise Briefing

No briefing was provided.

10. Member Communications / Announcements

No member communications or announcements were made.

12. Adjourn

The meeting was adjourned at 10:14 p.m.

Roundtable meeting overviews are considered draft until approved by the Roundtable at a regular meeting. An audio recording of this meeting is available on the Roundtable's website.

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SFO Airport/Community Roundtable
Meeting No. 304 Overview
Thursday, January 12, 2017

1. Call to Order / Roll Call / Declaration of a Quorum Present

Roundtable Chairperson, Cliff Lentz, called the Special Meeting of the SFO Airport / Community Roundtable to order, at approximately 7:06 p.m., in the Terminal 2 Partnering Room at the San Francisco International Airport. James A. Castañeda, AICP, Roundtable Coordinator, called the roll. A quorum (at least 12 Regular Members) was present as follows:

REGULAR MEMBERS PRESENT
Ivar Satero – City and County of San Francisco Airport Commission
David Takashima – City and County of San Francisco Mayor's Office
Dave Pine – County of San Mateo Board of Supervisors
Adam Kelly – C/CAG Airport Land Use Committee (ALUC)
Elizabeth Lewis – Town of Atherton
Cliff Lentz – City of Brisbane
Glenn Sylvester – City of Daly City
Sam Hindi – City of Foster City
Harvey Rarback – City of Half Moon Bay
Alvin Royse – Town of Hillsborough
Peter Ohtaki – City of Menlo Park
Ann Schneider – City of Millbrae
Sue Digre – City of Pacifica
Ann Wengert – Town of Portola Valley
Janet Borgens – City of Redwood City
Ken Ibarra – City of San Bruno
Mark Addiego – City of South San Francisco

REGULAR MEMBERS ABSENT
City and County of San Francisco Board of Supervisors (Vacant)
City of Belmont
City of Burlingame
City of San Carlos
City of San Mateo
Town of Woodside

ROUNDTABLE STAFF
James A. Castañeda, AICP – Roundtable Coordinator

SAN FRANCISCO INTERNATIONAL AIRPORT STAFF
Bert Ganoung, Noise Abatement Manager
David Ong, Noise Abatement Specialist

2. Roundtable's FAA Initiative Reponses, Recap

Roundtable Chairperson Cliff Lentz thanked everyone for attending and for their efforts in participating and contributing to the development of the Roundtable's response to the FAA Initiative. Vice-Chairperson Elizabeth Lewis also thanked members for taking the time to attend a special meeting and the expressed the importance of continuing the dialog. Palo Alto resident Mark Shultz raised the concern on why the Roundtable's engagement is limited the County

boundary, and SFO needs to step up to the FAA. Roundtable members inquired about the Roundtable's Technical Consultant, and Roundtable Coordinator James Castañeda indicated that the contract with BridgeNet International (consultant to the Roundtable since 2012) ended in December. A RFP is currently out to retain services from a new consultant.

3. Initiative Response Review Progress Update

Steve Karnes, Senior Technical Advisor at the FAA's Western Service Center, provided the current status of the FAA review process. The documents produced by the Roundtable and Select Committee on South Bay Arrivals (Select Committee) have gone through the FAA Administrator's office, however delays are anticipated with roles changing with the recent departure of former Western Service Center administrator Glenn Martin. Mr. Karnes did indicate that they're ready to move on whatever recommendations may be approved. Pacifica representative Sue Digre inquired on what the timeline was for immediate solutions. Thann McLeod of the Norcal TRACON facility, outlined a number of adjustments coming online in February as a result of local initiatives to address noises. Ms. McLeod indicated she'll be attending future meetings and engaging more with the Roundtable to provide updates and gather feedback to analyze at the TRACON facility for any solutions they may address.

Millbrae representative Ann Schneider asked if the HUSHH and NITTE procedures will increase departures on RWY 1. Ms. McLeod responded that there should be no change expected with runway assignments. Chairperson Lentz asked Kathleen Wentworth, legislative aide to Congresswoman Jackie Speirs, for an update from the Select Committee. Ms. Wentworth indicated that with the conclusion of the Select Committee's meeting in November to finalize their response to the FAA Initiative, they have met their obligation to the Members of Congress and now disbanded. It was indicated that as part of their document, it was recommended that an ad-hoc committee be formed to follow-up on the Select Committee's recommendations, but would be discussed in the future. Chairperson Lentz also asked for an update regarding Glenn Martin's role as FAA Western Service Center Administrator. Mr. Karnes responded that Dennis Roberts will be filling Mr. Martin's role as Administrator, and is expected to transition into that position in February.

Woodside resident Raymonde Guindon expressed concern regarding additional Asia-Pacific flights at night and possible seasonal flights becoming permanent. Pacifica resident Ray Ramos asked if the Select Committee's issues will now become Roundtable issues since they are disbanded. San Mateo County Board of Supervisor representative Dave Pine expanded on Ms. Wentworth response regarding the recommendation to establish a committee to continue the work of the Select Committee. He encourage those curious to review the Select Committee's recommendation that discusses the matter, but that there is strong interest to establish an organization.

4. Priority Items and Performance Metrics Discussion

Roundtable Chairperson Cliff Lentz asked Steve Karnes how he envisions the FAA Western Service Center will stay involved. Mr. Karnes indicated that the FAA is committed to the process and has and will continue to allocate resources as able to continue outreach in the matter. Thann McLeod reiterated Norcal TRACON's commitment to report and gather feedback from

the Roundtable. Roundtable members were pleased to hear that Ms. McLeod will be participating in meetings, and look forward to her future attendance.

5. Public Comment on Items NOT on the Agenda

Steve Karnes with FAA's Western Service Center announced an upcoming Class B airspace workshop occurring in the coming weeks, and information would be available online. Kathleen Wentworth, legislative aide to Congresswoman Jackie Speirs, asked if any impacts to what the Roundtable has been working on be anticipated with the Class B adjustments. Ms. McLeod responded that there would not be.

Brisbane resident Peter Grace provided a presentation on the current placement of noise monitors and correlation where complaints are made. Other comments were received from residents of Pacifica, Daly City, Brisbane, San Francisco, Palo Alto, and Oakland. Daly City resident David Feldman expressed concerns regarding the impacts from aircraft using the BODGA arrival to SFO. Brisbane resident Jay Patel indicated that metric standards need to be re-evaluated. Other concerns raised were advocating for immediately results and provide relief quicker. Questions regarding future video streaming of Roundtable meetings was also raised. Roundtable Coordinator James Castañeda indicated it'll be happening soon, as there's a number of logistical details to sort out.

6. Adjourn

The meeting was adjourned at 9:11 p.m.

SFO Airport/Community Roundtable
Meeting No. 305 Overview
Wednesday, February 1, 2017

1. Call to Order / Roll Call / Declaration of a Quorum Present

Roundtable Chairperson, Cliff Lentz, called the Regular Meeting of the SFO Airport / Community Roundtable to order, at approximately 7:10 p.m., in the David Chetcuti Community Room at the Millbrae City Hall. James A. Castañeda, AICP, Roundtable Coordinator, called the roll. A quorum (at least 12 Regular Members) was present as follows:

REGULAR MEMBERS PRESENT
Ivar Satero – City and County of San Francisco Airport Commission
David Takashima – City and County of San Francisco Mayor's Office
Elizabeth Lewis – Town of Atherton
Douglas Kim – City of Belmont
Cliff Lentz – City of Brisbane
Ricardo Ortiz – City of Burlingame
Glenn Sylvester – City of Daly City
Sam Hindi – City of Foster City
Peter Ohtaki – City of Menlo Park
Ann Schneider – City of Millbrae
Sue Digre – City of Pacifica
Ann Wengert – Town of Portola Valley
Janet Borgens – City of Redwood City
Ken Ibarra – City of San Bruno
Mark Addiego – City of South San Francisco

REGULAR MEMBERS ABSENT
City and County of San Francisco Board of Supervisors (Vacant)
County of San Mateo Board of Supervisors
C/CAG Airport Land Use Committee (ALUC)
City of Half Moon Bay
Town of Hillsborough
City of San Carlos
City of San Mateo
Town of Woodside

ROUNDTABLE STAFF
James A. Castañeda, AICP – Roundtable Coordinator

SAN FRANCISCO INTERNATIONAL AIRPORT STAFF
Bert Ganoung, Noise Abatement Manager
Dave Ong, Noise Abatement Specialist
John Hampel, Noise Abatement Specialist
Nastasja Gjorek, Noise Abatement Specialist

2. Election of Roundtable Chairperson for Calendar Year 2017

Before opening the floor for nominations, Chairperson Lentz acknowledged the hard work all the Roundtable members contributed in his time as Chair, specifically on the FAA Initiative response. He also thanked staff and the Nosie Abatement Office for their assistance to the Roundtable.

ACTION: Cliff Lentz **MOVED** to nominate Town of Atherton representative Elizabeth Lewis for the position of Chairperson of the Roundtable. Ann Wengert seconded the nomination. Hearing no additional nominations, a vote was taken and the acceptance of **Elizabeth Lewis** as Roundtable Chairperson was **CARRIED**, unanimously.

3. Election of Roundtable Vice-Chairperson for Calendar Year 2017

Chairperson Lewis opened the floor to nominations for Vice-Chairperson of the Roundtable.

ACTION: Chairperson Lewis **MOVED** to nominate City of South San Francisco representative Mark Addiego for the position of Vice-Chairperson of the Roundtable. Ann Schneider seconded the nomination. Hearing no additional nominations, a vote was taken and acceptance of **Mark Addiego** as Roundtable Vice-Chairperson was **CARRIED**, unanimously.

4. Approval of Resolution 17-01: Designating Roundtable Meeting Dates, Times and Place for Calendar Year 2016

ACTION: Janet Borgens **MOVED** the adoption of the resolution. The motion was seconded by Sue Digre and **CARRIED**, unanimously.

5. Public Comments on Items Not on the Agenda

A total of six members of the public spoke on items not on the agenda from the communities of Brisbane, Daly City and Pacifica. Topics raised included the expectation of aircraft navigation systems to fly the same path, community outreach to airlines, the use of Ground Based Augmented Systems (GBAS) navigation, re-evaluation of Palo Alto becoming a member of the Roundtable, activation of the Roundtable's Legislative subcommittee, and window insulation failure installed as part of the noise insulation program.

REGULAR AGENDA

7. Review of Airport Director's Report for October, November, and December 2016 & New Summary Format Introduction

Noise Abatement Specialist Nastasja Gjorek presented to the Roundtable an overview of the new Director Reports the Noise Abatement Office has been working on for the Roundtable. The

reports features improved graphical data on the noise complaints received. Samples of the report were included in the Roundtable packet and also passed out to members.

DISCUSSION: Members of the Roundtable provided general praise for the reports, as well as some feedback on what else could be included. Ms. Gjorek indicated it's a work in progress, and will continue to revise the reports to capture what the Roundtable will find useful to include. After questioning and receiving an explanation of the FlyQuiet program, Redwood City representative Janet Borgens commented that the problem is that the program has no teeth for enforcement. Belmont representative Douglas Kim encourage explanations for noise spikes or trends in the report that help provide context as to contributing events and/or factors. Brisbane representative Cliff Lentz asked if runway utilizes will continue to be included in the reports as it has in the past, in which Ms. Gjorek responded they would be.

8. Review of SFO FlyQuiet Report for Q4 2016

Bert Ganoung, Noise Abatement Manager, provided an overview of the Q4 2016 FlyQuiet report.

ACTION: Elizabeth Lewis **MOVED** the acceptance of the report. The motion was seconded by Cliff Lentz and **CARRIED**, unanimously.

9. Airport Director's Comments

Airport Director Ivar Satero reiterated the airport's role as a good citizen of the region with its ongoing supporting the Roundtable. He reported that additional permanent noise monitors are being installed, as well as keeping the temporary noise monitoring deployment effort flexible. In response to the member of the public that commented earlier regarding GBAS, Mr. Satero indicated the airport is investing utilizing GBAS at SFO. The airport is also investigating potential incentives in a revised fee structure as lease agreement with airlines come up.

10. Subcommittee Appointments

Roundtable Coordinator James Castañeda provided an overview of the various Roundtable standing subcommittees as listed in the bylaws, and goal of activating them in the coming months. Mr. Castañeda explained the importance of re-establishing the annual Work Program in order to provide structure and guidance for both the Roundtable and staff in moving forward this year, but also solidify some of the recommendations created out of the FAA Initiative response.

DISCUSSION: Roundtable members asked a few questions regarding the role of each subcommittee, as well as suggestions for additional ad-hoc subcommittees. Mr. Castañeda indicated his priority is establishing the Work Program subcommittee in order to develop a work plan in order to outline the goals and priorities that would lend themselves to determine where additional ad-hoc subcommittee's would be required to ensure resources and member's time are adequately allocated. Brisbane representative Cliff Lentz suggested that descriptions of the current standing subcommittees and the expectations of each be sent out to Roundtable

members. Mr. Castañeda indicated that will be done shortly, and ask Roundtable members to response as to which they may be interested in serving.

11. Discussion, Video Streaming of Roundtable Meetings

Roundtable Coordinator James Castañeda provided an update regarding the options for offering streaming video of future Roundtable meetings. Mr. Castañeda indicated services could start with the April meeting and cover the Roundtable's regular meeting that are held in its normal meeting location at the Checuti Community Room.

DISCUSSION: Members of the Roundtable agreed that it's time to start offering video as so many other council and community groups are doing.

12. FY 2016-2017 Budget

Roundtable Coordinated James Castañeda provided a detailed background and overview of the budget for current fiscal year of 2016-2017. Due to the efforts in developing the FAA Initiative response document, it wasn't possible to present the budget earlier as anticipated. Mr. Castañeda explained abnormalities in the expected funding from the prior fiscal year as a result of drawing down the surplus, but that expected funding from this fiscal year forward will remain the same from SFO.

DISCUSSION: Roundtable members asked for clarification regarding the funding from the airport during the prior fiscal years, and as well as the amount for coordination services doubling in the current fiscal year. Mr. Castañeda explained that as a result of an effort to reduce the surplus in the Roundtable trust, funding from the airport during the 2015-2016 fiscal year was not provided. The County postponed withdrawal of funds for coordination services in fiscal year 2015-2016 to the current fiscal year 2016-2017, so the amount is doubled simply to capture the prior fiscal year's reimbursement. Going forward, the amount will be stabilized as before.

ACTION: Janet Borgen **MOVED** the adoption of the bugdet. The motion was seconded by Mark Addiego and **CARRIED**, unanimously.

13. Status, Initiative Response Review Progress

Roundtable Chairperson Elizabeth Lewis indicated no update has been provided by the FAA regarding as response to the recommendations from the Roundtable and Select Committee on South Bay Arrivals. It's hoped that Roundtable may be able to receive a response before the next Roundtable meeting.

OTHER MATTERS

14. Member Communications / Announcements

Bert Ganoung, Noise Abatement Manager, announced the upcoming join tour of Norcal TRACON facility with the Oakland Noise Forum on March 7, 2017. Anyone interested should contact Mr. Ganoung in the coming weeks.

15. Adjourn

The meeting was adjourned at 9:45 p.m.

Roundtable meeting overviews are considered draft until approved by the Roundtable at a regular meeting. An audio recording of this meeting is available on the Roundtable's website.

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REGULAR AGENDA

Regular Meeting # 306
April 5, 2017

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Airport Director's Report

Presented at the April 5, 2017
Airport Community Roundtable Meeting

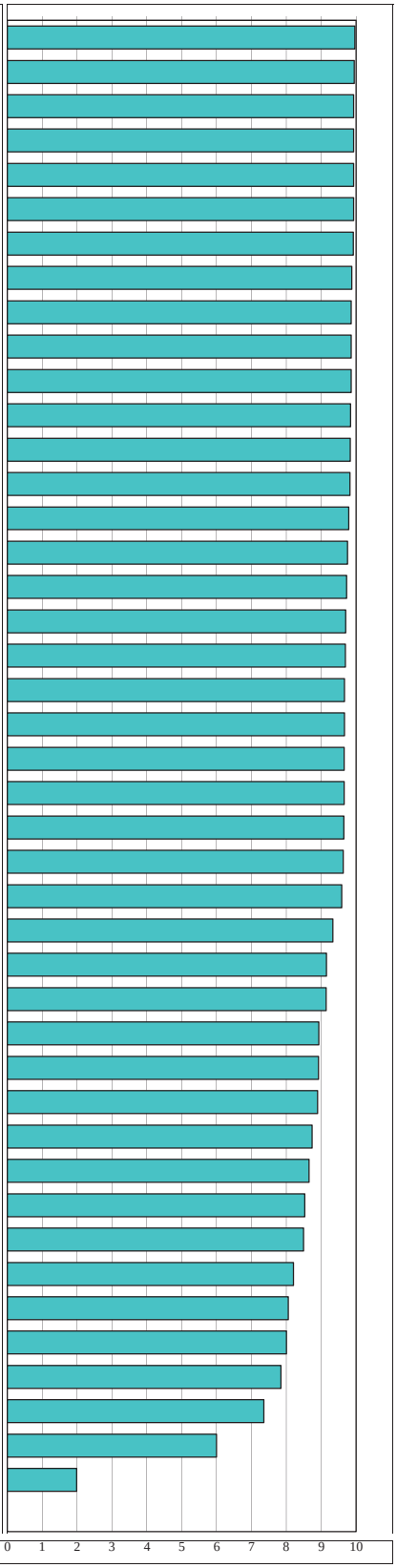
Aircraft Noise Abatement Office
January 2017

SFO San Francisco International Airport

Monthly Noise Exceedance Report
San Francisco International Airport -- Director's Report
Period: **January 2017**

Airline		Noise Exceedances: Total Noise Exceedances	Total Operations per Month	Exceedances per 1,000 Operations	Score
SkyWest	SKW	60	6,553	9	9.96
China Eastern	CES	1	84	12	9.95
China Southern	CSN	1	62	16	9.93
Scandinavian Airlines	SAS	1	62	16	9.93
Emirates	UAE	1	62	16	9.93
Japan Airlines	JAL	1	60	17	9.93
Turkish Airlines	THY	1	56	18	9.92
jetBlue	JBU	32	1,079	30	9.87
ANA	ANA	2	61	33	9.86
Virgin America	VRD	112	3,373	33	9.86
Compass	CPZ	26	781	33	9.86
Alaska	ASA	36	971	37	9.84
Southwest	SWA	95	2,510	38	9.84
British Airways	BAW	5	124	40	9.83
Air New Zealand	ANZ	3	61	49	9.79
American Airlines	AAL	124	2,161	57	9.75
Delta	DAL	82	1,312	63	9.73
Sun Country Airlines	SCX	5	73	68	9.70
Volaris	VOI	5	70	71	9.69
Frontier	FFT	22	282	78	9.66
United	UAL	720	9,185	78	9.66
Swiss	SWR	5	63	79	9.66
Air Canada	ACA	38	476	80	9.66
Hawaiian	HAL	10	124	81	9.65
FedEx	FDX	7	82	85	9.63
Lufthansa	DLH	11	114	96	9.58
Air China	CCA	13	84	155	9.33
Etihad	ETD	12	61	197	9.15
Aeromexico	AMX	39	196	199	9.14
Copa Airlines	CMP	31	125	248	8.93
Avianca	TAI	24	96	250	8.92
Atlas Air	GTI	23	90	256	8.90
China Airlines	CAL	31	106	292	8.74
Fiji Airways	FJI	5	16	313	8.65
Nippon Cargo Airlines	NCA	15	44	341	8.53
Singapore Airlines	SIA	43	123	350	8.49
EVA Air	EVA	55	132	417	8.20
Air India	AIC	23	51	451	8.05
Cathay Pacific	CPA	67	145	462	8.01
Philippines	PAL	40	80	500	7.84
Korean Air	KAL	73	119	613	7.35
Asiana Airlines	AAR	101	109	927	6.00
Kalitta Air	CKS	13	7	1,857	1.98
Qantas	QFA	139	60	2,317	0.00
TOTAL		**2,153**	**31,485**	**11,378**	

Noise Exceedance Quality Rating



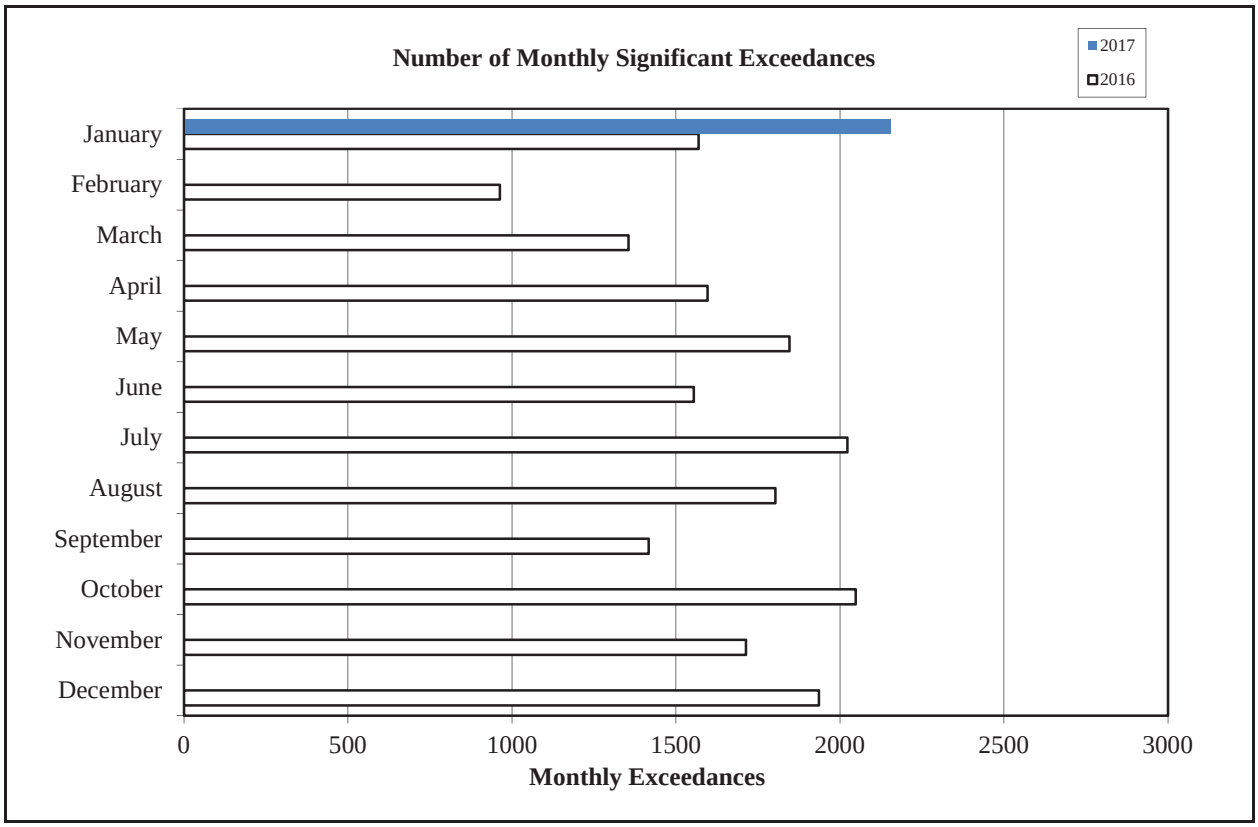
Source: SFO Noise Abatement Office

Historical Significant Exceedances Report
San Francisco International Airport -- Director's Report
Period: **January 2017**

San Francisco International Airport

Month	Number of Monthly Significant Exceedances 2013	2014	2015	2016	2017	Change from Last Year
January	1,428	1,184	1,204	1,569	2153	**584**
February	1,176	1,141	1,151	963		
March	1,671	1,345	1,384	1,355		
April	1,910*	1,362	1,475	1,596		
May	1,859*	1,515	1,718	1,846		
June	1,915	1,740	1,645	1,554		
July	1,647	1,619	1,763***	2,023		
August	1,638**	1,460	1,348	1,803		
September	1,352	1,111	994	1,417		
October	1,277	1,055	1,154	2,048		
November	1,262	1,245	1,133	1,713		
December	1,160	1,670	1,708	1,936		
Annual Total	18,295	16,447	16,677	19,823	2,153	
Year to Date Trend	**18,295**	**16,447**	**16,677**	**19,823**	**2,153**	**584**

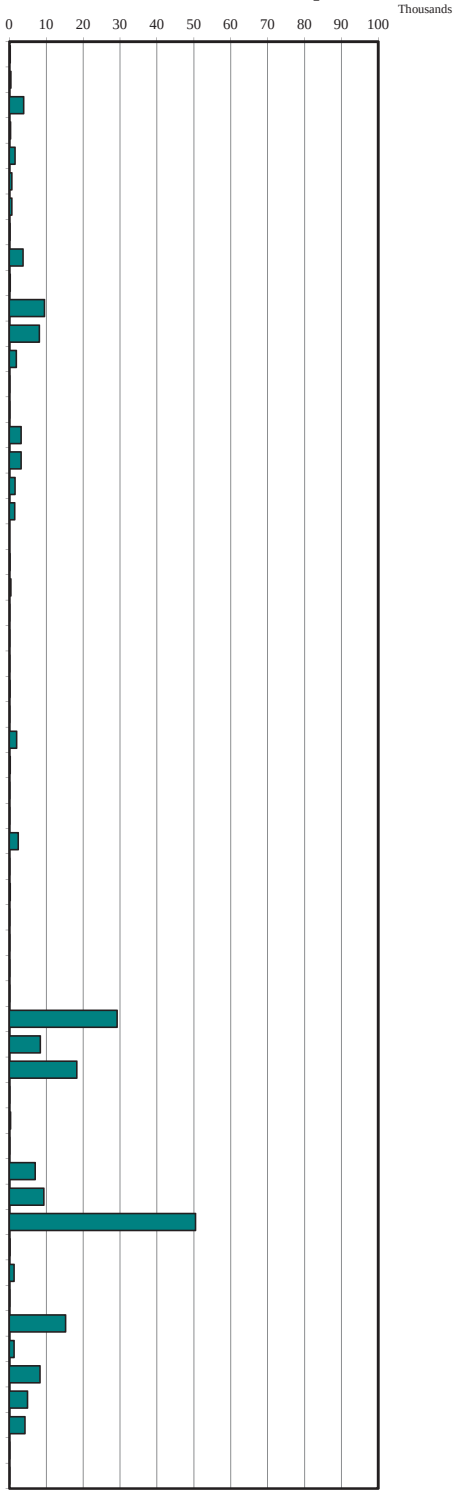
* Revised with correct amount of exceedance - 8/5/13
** No data available from Site 7, August 1-26
***No data available from Site 2 starting July 17



Monthly Calls by Community

Source: Airport Noise Monitoring System

Community	Total Complaints	Total Number of Complainants
Roundtable Communities		
Atherton	194	8
Belmont	357	8
Brisbane	3,858	49
Burlingame	322	49
Daly City	1,513	12
Foster City	669	14
Half Moon Bay	631	11
Hillsborough	125	20
Menlo Park	3,722	43
Millbrae	217	7
Pacifica	9,545	63
Portola Valley	8,131	55
Redwood City	1,846	23
San Bruno	11	7
San Carlos	52	6
San Francisco	3,145	52
San Mateo	3,199	37
South San Francisco	1,508	28
Woodside	1,434	23
Other Communities		
Alameda	98	4
Aptos	418	11
Belvedere-Tiburon	1	1
Ben Lomond	77	2
Berkeley	57	5
Boulder Creek	127	4
Brentwood	40	1
Capitola	1,945	17
Carmel Valley	213	1
Colma	24	1
Corte Madera	4	1
Cupertino	2,372	3
East Palo Alto	12	3
Felton	195	11
Fremont	10	1
Kensington	1	1
La Selva Beach	26	2
Lafayette	1	1
Los Altos	29,209	241
Los Altos Hills	8,405	39
Los Gatos	18,244	153
Moraga	5	2
Morgan Hill	336	2
Mount Hermon	1	1
Mountain View	7,023	64
Oakland	9,362	34
Palo Alto	50,447	298
Richmond	177	1
San Jose	1,227	2
San Leandro	15	1
Santa Cruz	15,198	116
Saratoga	1,228	18
Scotts Valley	8,312	83
Soquel	4,923	82
Sunnyvale	4,187	49
Union City	1	1
Watsonville	4	1
	204,404	**1,773**



"Our software vendor's address validation relies on USPS-provided ZIP code look up table and USPS-specified 'default city' values."

Monthly Noise Complainant Summary Map January 2017

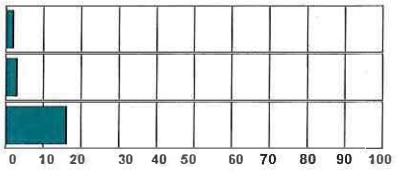
"Our software vendor's address validation relies on USPS-provided ZIP code look-up table and the USPS-specified 'default city' values"

Complainant Location

Monthly Nighttime Power Runups Report (85-06-AOB)
San Francisco International Airport -- Director's Report
Period : **January 2017**
Time of Day : From 10 pm through 7 am

San Francisco International Airport

Airline	Code	Number of Runups	Runups Per 1,000 Departures	Percentage of Runups
Virgin America	VRD	3	1.8	13%
UNITED	UAL	4	0.9	17%
American Airlines	AAL	17	15.8	71%
Total		24		



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 power settings tested range from idle to full power and may vary in duration.

Late Night Preferential Runway Use Report
San Francisco International Airport -- Director's Report
Period: January 2017
Time of Day: Late Night (1 am to 6 am)

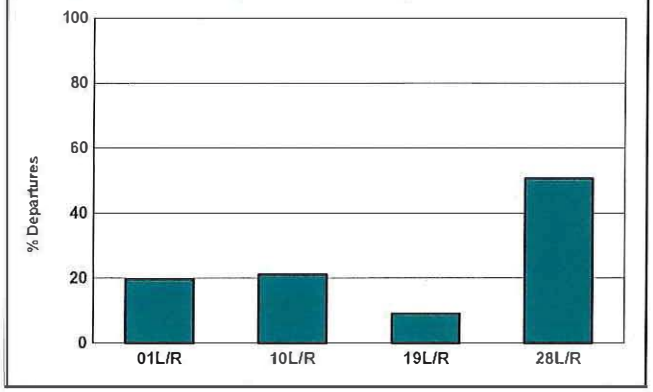
San Francisco International Airport

Runway Utilization (1 am to 6 am)

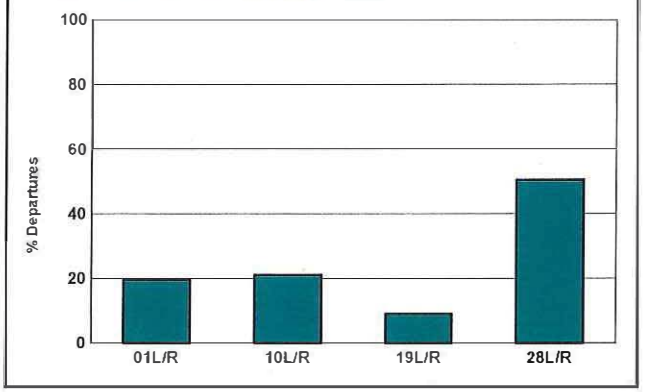
Monthly Jet Departures

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
01L/R	79	-	-	-	-	-	-	-	-	-	-	-	79
10L/R	85	-	-	-	-	-	-	-	-	-	-	-	85
19L/R	36	-	-	-	-	-	-	-	-	-	-	-	36
28L/R	204	-	-	-	-	-	-	-	-	-	-	-	204
Total	**404**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**404**
01L/R	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%
10L/R	21%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	21%
19L/R	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%
28L/R	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%

Current Month (1 am to 6 am)



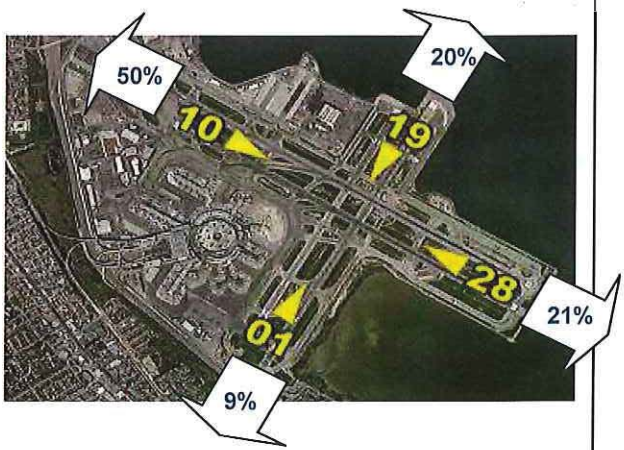
Year-to-Date (1am to 6 am)



Current Month (1 am to 6 am)

Numbers rounded to nearest whole percentages

Year-to-Date (1am to 6am)



Numbers rounded to nearest whole percentages

Air Carrier Runway Use Summary Report
San Francisco International Airport -- Director's Report
Period: January 2017
Time of Day : All Hours

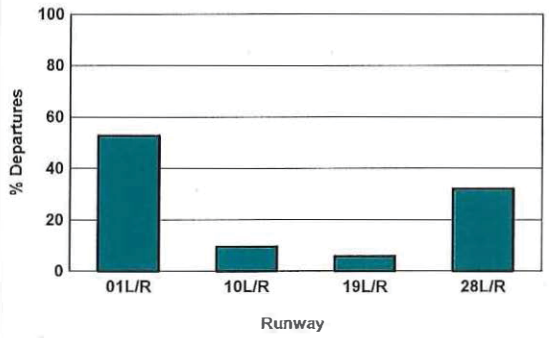
San Francisco International Airport

Runway Utilization (All Hours)

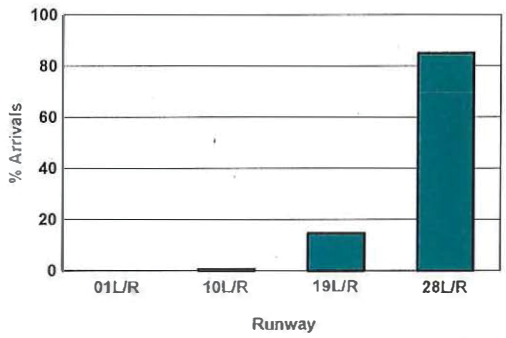
Source: Airport Noise Monitoring System

	Runway Utilization				Total
	01L/R	*10L/R*	*19L/R*	*28L/R*	
Total Monthly Operations					
Departures	8,090	1,463	887	4,918	15,358
Arrivals	0	82	2,251	13,167	15,500
Percentage Utilization					
Departures	52.7%	9.5%	5.8%	32.0%	100%
Arrivals	0.0%	0.5%	14.5%	84.9%	100%

Departures (All Hours)



Arrivals (All Hours)



Percentage Departure Utilization

Numbers rounded to nearest whole percentages

Percentage Arrival Utilization

Numbers rounded to nearest whole percentages

Airport Director's Report

Presented at the April 5, 2017
Airport Community Roundtable Meeting

Aircraft Noise Abatement Office
February 2017

SFO San Francisco International Airport

Monthly Noise Exceedance Report
San Francisco International Airport -- Director's Report
Period: **February 2017**

Airline		Noise Exceedances: *Total Noise Exceedances*	*Total Operations per Month*	*Exceedances per 1,000 Operations*	***Score***
SkyWest	SKW	36	4,651	8	***9.97***
China Southern	CSN	1	56	18	***9.92***
Compass	CPZ	17	742	23	***9.90***
WOW	WOW	1	38	26	***9.89***
British Airways	BAW	3	110	27	***9.88***
Lufthansa	DLH	3	106	28	***9.88***
Virgin America	VRD	102	2,964	34	***9.85***
Alaska	ASA	32	898	36	***9.85***
Southwest	SWA	83	2,181	38	***9.84***
Turkish Airlines	THY	2	46	43	***9.81***
JetBlue	JBU	46	947	49	***9.79***
Delta	DAL	72	1,188	61	***9.74***
American Airlines	AAL	120	1,930	62	***9.73***
United	UAL	612	8,651	71	***9.70***
Air Canada	ACA	39	481	81	***9.65***
Frontier	FFT	18	219	82	***9.65***
Air New Zealand	ANZ	5	56	89	***9.62***
Sun Country	SCX	6	67	90	***9.62***
Hawaiian	HAL	11	112	98	***9.58***
FedEx	FDX	9	86	105	***9.55***
Air China	CCA	13	74	176	***9.25***
Copa Airlines	CMP	23	112	205	***9.12***
Etihad	ETD	5	23	217	***9.07***
Aeromexico	AMX	36	156	231	***9.01***
Atlas Air	GTI	21	91	231	***9.01***
Philippines	PAL	13	56	232	***9.01***
Avianca	TAI	20	79	253	***8.92***
NCA	NCA	12	40	300	***8.72***
Air India	AIC	16	48	333	***8.58***
EVA Air	EVA	55	117	470	***7.99***
Singapore Airlines	SIA	57	112	509	***7.83***
China Airlines	CAL	49	92	533	***7.72***
Cathay Pacific	CPA	82	128	641	***7.26***
Korean Air	KAL	77	106	726	***6.90***
Asiana Airlines	AAR	94	96	979	***5.82***
Qantas	QFA	103	44	2,341	***0.00***
TOTAL		**1,894**	**26,903**	**9,446**	

Noise Exceedance Quality Rating

Source: SFO Noise Abatement Office

Historical Significant Exceedances Report
San Francisco International Airport -- Director's Report
Period: **February 2017**

San Francisco International Airport

Month	Number of Monthly Significant Exceedances 2013	2014	2015	2016	2017	Change from Last Year
January	1,428	1,184	1,204	1,569	2153	**584**
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March	1,671	1,345	1,384	1,355		
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October	1,277	1,055	1,154	2,048		
November	1,262	1,245	1,133	1,713		
December	1,160	1,670	1,708	1,936		
Annual Total	18,295	16,447	16,677	19,823	4,047	
Year to Date Trend	**18,295**	**16,447**	**16,677**	**19,823**	**4,047**	**1515**

* Revised with correct amount of exceedance - 8/5/13
** No data available from Site 7, August 1-26
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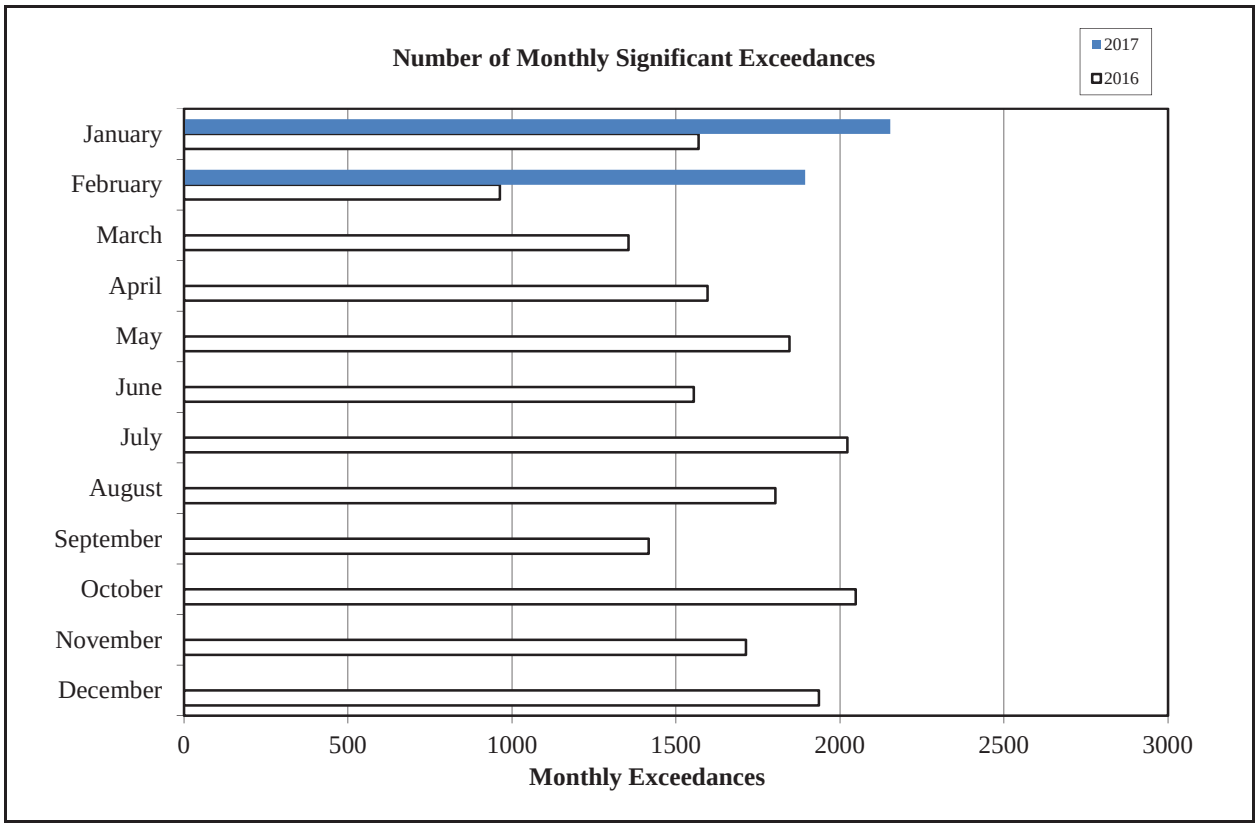
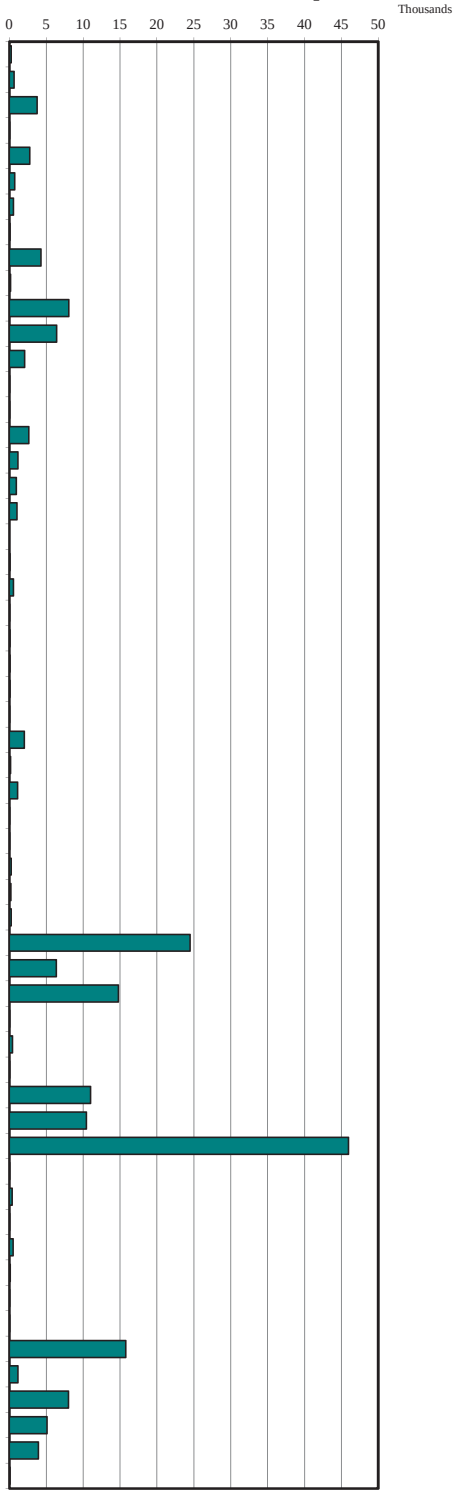


Monthly Calls by Community

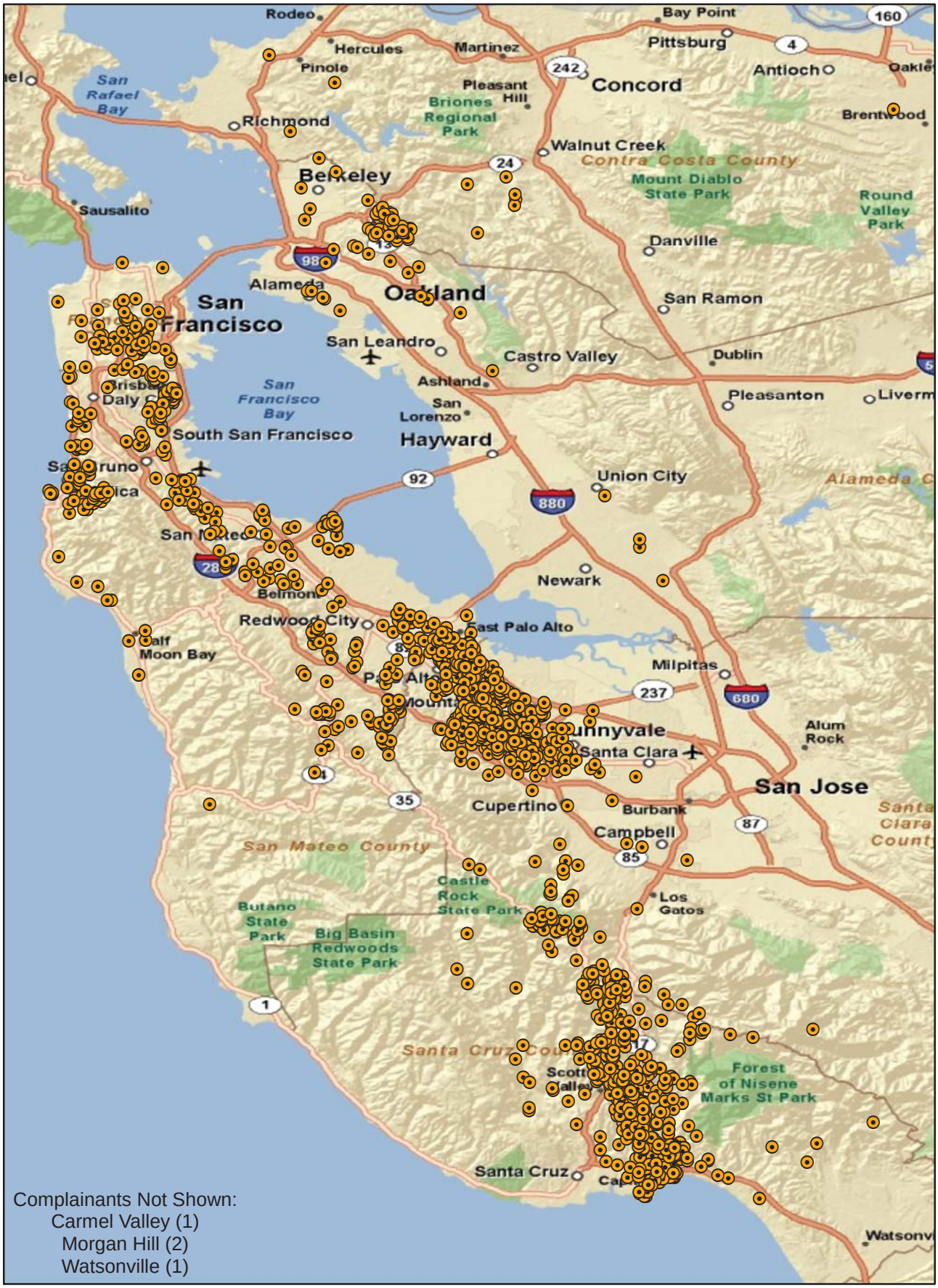
Source: Airport Noise Monitoring System

Community	Total Complaints	Total Number of Complainants
Roundtable Communities		
Atherton	262	6
Belmont	620	8
Brisbane	3,759	53
Burlingame	15	10
Daly City	2,772	15
Foster City	704	15
Half Moon Bay	551	10
Hillsborough	63	8
Menlo Park	4,288	45
Millbrae	139	10
Pacifica	8,060	63
Portola Valley	6,396	53
Redwood City	2,068	28
San Bruno	3	3
San Carlos	10	4
San Francisco	2,616	54
San Mateo	1,159	26
South San Francisco	919	24
Woodside	1,030	22
Other Communities		
Alameda	74	5
Aptos	538	11
Ben Lomond	16	2
Berkeley	73	5
Boulder Creek	61	4
Brentwood	74	1
Campbell	4	1
Capitola	2,017	20
Carmel Valley	157	1
Cupertino	1,113	4
East Palo Alto	18	4
El Cerrito	1	1
Felton	257	9
Fremont	182	3
Lafayette	248	4
Los Altos	24,472	237
Los Altos Hills	6,343	37
Los Gatos	14,770	143
Moraga	4	2
Morgan Hill	412	2
Mount Hermon	1	1
Mountain View	11,000	111
Oakland	10,455	69
Palo Alto	45,954	289
Piedmont	23	5
Richmond	358	1
San Gregorio	1	1
San Jose	521	2
San Leandro	129	1
San Pablo	1	1
Santa Clara	3	2
Santa Cruz	15,765	130
Saratoga	1,134	15
Scotts Valley	7,996	87
Soquel	5,105	91
Sunnyvale	3,928	42
Watsonville	86	3
	188,728	**1,804**



"Our software vendor's address validation relies on USPS-provided ZIP code look up table and USPS-specified 'default city' values."

Monthly Noise Complainant Summary Map February 2017



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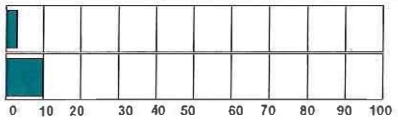
Complainant Location

Monthly Nighttime Power Runups Report (85-06-AOB)
San Francisco International Airport -- Director's Report
Period : **February 2017**
Time of Day : From 10 pm through 7 am

San Francisco International Airport

Airline	Code	Number of Runups	Runups Per 1,000 Departures	Percentage of Runups
UNITED	UAL	4	0.9	27%
American Airlines	AAL	11	11.4	73%
Total		15		



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Late Night Preferential Runway Use Report
San Francisco International Airport -- Director's Report
Period: February 2017
Time of Day: Late Night (1 am to 6 am)

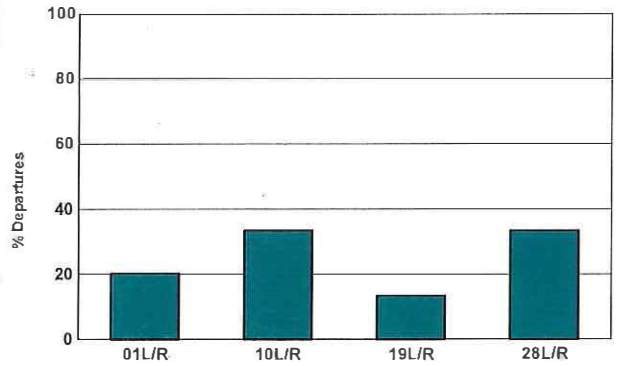
San Francisco International Airport

Runway Utilization (1 am to 6 am)

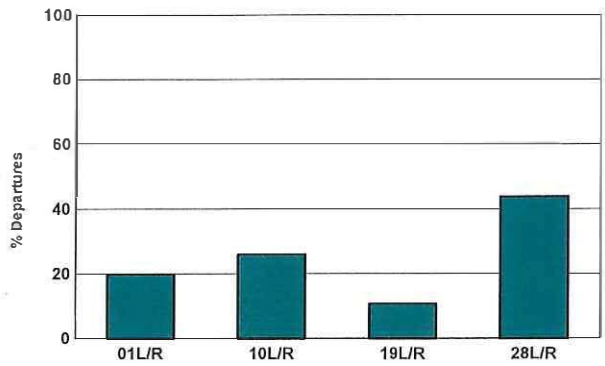
Monthly Jet Departures

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
01L/R	79	53	-	-	-	-	-	-	-	-	-	-	132
10L/R	85	88	-	-	-	-	-	-	-	-	-	-	173
19L/R	36	35	-	-	-	-	-	-	-	-	-	-	71
28L/R	204	88	-	-	-	-	-	-	-	-	-	-	292
Total	**404**	**264**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**668**
01L/R	20%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%
10L/R	21%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%
19L/R	9%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%
28L/R	50%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	44%

Current Month (1 am to 6 am)



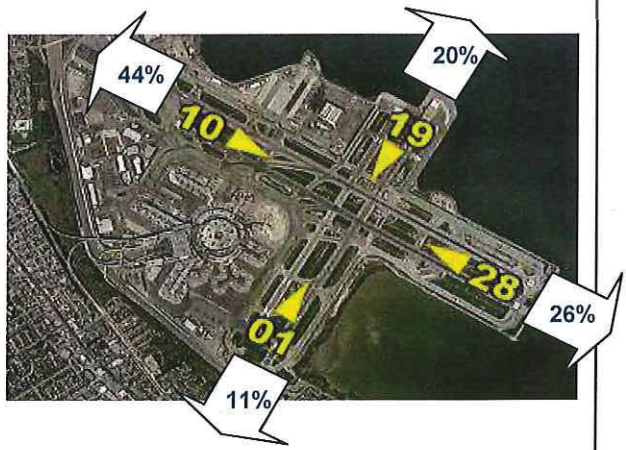
Year-to-Date (1am to 6 am)



Current Month (1 am to 6 am)

Numbers rounded to nearest whole percentages

Year-to-Date (1am to 6am)



Numbers rounded to nearest whole percentages

Air Carrier Runway Use Summary Report
San Francisco International Airport -- Director's Report
Period: February 2017
Time of Day : All Hours

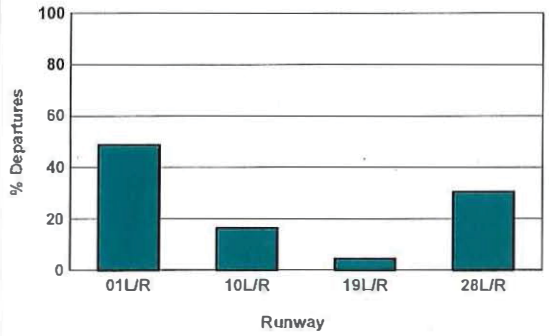
San Francisco International Airport

Runway Utilization (All Hours)

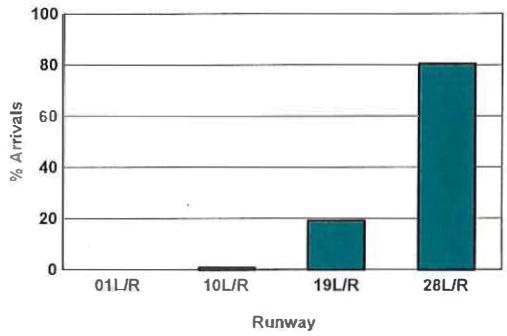
Source: Airport Noise Monitoring System

	Runway Utilization				Total
	01L/R	*10L/R*	*19L/R*	*28L/R*	
Total Monthly Operations					
Departures	6,751	2,267	609	4,224	13,851
Arrivals	0	102	2,640	11,175	13,917
Percentage Utilization					
Departures	48.7%	16.4%	4.4%	30.5%	100%
Arrivals	0.0%	0.7%	19.0%	80.3%	100%

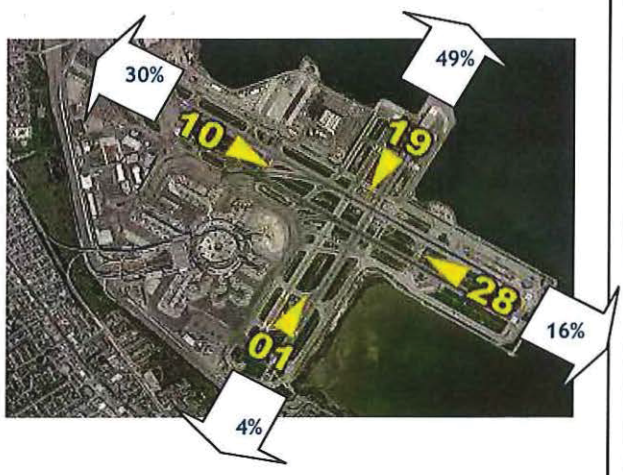
Departures (All Hours)



Arrivals (All Hours)



Percentage Departure Utilization



Numbers rounded to nearest whole percentages

Percentage Arrival Utilization

Numbers rounded to nearest whole percentages

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

March 28, 2017

TO: Roundtable members and Interested Persons

FROM: Elizabeth Lewis, Roundtable Chairperson

SUBJECT: Roundtable Technical Consultant Update

At the end of 2016, the Roundtable's contract with BridgeNet International, technical consultant since October 2012, had expired. A Request for Proposal (RFP) was circulated through the San Mateo County Planning and Building Department, and although the deadline for submissions was extended, only one response was received.

An ad-hoc subcommittee was formed that consisted of San Mateo County Board of Supervisor Dave Pine, Supervisor Pine's Administrative Aid Linda Wolin, Airport Planning Director John Bergener, Roundtable Coordinator James Castañeda, Roundtable Vice-Chairperson Mark Addiego, and myself. The ad-hoc subcommittee interviewed the candidate and after careful consideration and deliberation, it was decided that the applicant was not what the Roundtable needed at this time. It became apparent that the RFP needed to be revise to be more specific in the skill sets we were looking for in a Technical Consultant, especially given the *FAA Initiative* and expected response to the Roundtable's recommendations.

The revised RFP was sent out on March 23, 2017 and the deadline for receiving applications is April 17, 2017. Through this process, we have been assured by Airport Planning Director John Bergener that we can depend upon resources from SFO if needed for technical analysis until a new technical consultant is retained.

EL/jc

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San Francisco International
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March 28, 2017

TO: Roundtable members and Interested Persons

FROM: James A. Castañeda, AICP, Roundtable Coordinator

SUBJECT: Roundtable Standing Subcommittees

As announced at the February 1, 2017 Roundtable regular meeting, we're seeking volunteers and commitment to participate on the various standing subcommittees to commence assembling this spring. Attached is an overview of the relevant rules and procedures per the Roundtable's bylaws for subcommittees, as well as a description and expected structure and schedule of each of the standing subcommittees. Those interested should express interest to the Roundtable Chairperson or Coordinator.

JC

Attached:

1) Subcommittee Rules/Procedures, Description, Expected Structure and Schedule.

SFO Airport/Community Roundtable Standing Subcommittees

Below is a description of the standing subcommittees as adopted and listed in Article VII of the Roundtable's bylaws, as well as the relevant rules and procedures outlined in that same section.

Bylaw Subcommittee Procedures

- The number of members appointed to a subcommittee of the Roundtable shall consist of less than a quorum of its total membership (no more than 12).

- Standing Subcommittee or Ad Hoc Subcommittee membership and number of meetings shall be based on the following:

    a. The Chairperson, at his or her discretion, may appoint any Roundtable Representative or Alternate to serve on a Standing Subcommittee or on an Ad Hoc Subcommittee.

    b. The Roundtable Chairperson and Vice-Chairperson may serve on a Sub-committee or appoint a current member of the Roundtable to serve as the Subcommittee Chairperson. The Roundtable Chairperson shall serve or appoint a Chair of the Subcommittee, and the Subcommittee shall elect the Vice-Chair. When the Chair of the Subcommittee cannot attend a Subcommittee meeting, the Subcommittee Vice-Chair may serve as the Chair for that meeting.

    c. Each Subcommittee shall meet as many times as necessary to study the issues identified by the Roundtable as a whole and develop and submit final recommendations regarding such issues to the full Roundtable for review/action.

    d. After the date on which the Roundtable has heard and taken action on an Ad Hoc Subcommittee's final recommendation(s), the Ad Hoc Subcommittee shall cease to exist, unless the Roundtable determines that the Subcommittee must reconvene for the purposes described in this paragraph. In its action on the Ad Hoc Subcommittee recommendation(s), the Roundtable may direct the Subcommittee to reconvene, as necessary to review, refine, and/or revise all or a portion of its recommendation(s). If such action occurs, the Ad Hoc Subcommittee shall be charged with preparing and submitting a subsequent recommendation(s) to the full Roundtable for review/action. After the date on which the Roundtable has received the subsequent Ad Hoc Subcommittee recommendation(s), the Subcommittee shall cease to exist.

- The duties of a chairperson of a Roundtable Subcommittee may include, but are not limited to, presiding over Subcommittee meetings and submitting recommendations to the full Roundtable, regarding the topics/issues addressed by the Subcommittee.

STANDING SUBCOMMITTEES

Work Program Subcommittee

The role of the Work Program Subcommittee is to establish an annual work program that details where the Roundtable will focus its efforts during the coming fiscal year. The Work Program is guided by the Roundtable's Three-Year Strategic Plan, but it is also responsive to issues that are of interest to the community at the particular point in time. The Work Program Subcommittee also assists on development of the aforementioned Three-Year Strategic Plan.

Suggested structure and scheduled:

- 5-7 members
- Meets 2-3 times in the spring, as-needed the remainder of the year.

Operations and Efficiency Subcommittee

The role of the Operations and Efficiency Subcommittee is to review and study the Roundtable's operational aspects as it pertains to conducting meetings and business. The goal of the subcommittee is to help streamline the Roundtable's procedures and governing documents. This subcommittee shall investigate, review, analyze, and develop recommendations for any proposed changes to the bylaws requested by the Roundtable. Recommendations are presented to the Roundtable body for consideration.

Suggested structure and scheduled:

- 5-7 members
- Meet on as-needed basis.

Legislative Subcommittee

The mission of the Legislative Subcommittee is to review, research, analyze, and advise the Roundtable of any existing and/or pending legislative actions at the Federal level that impact the airspace and environs of the San Francisco International Airport as it pertains to noise impacting communities. This subcommittee shall, through local congressional offices, review, analyze and bring to the attention of the Roundtable legislative actions relevant to the issues of noise mitigation solutions for the region. The Legislative Subcommittee may develop recommendations actions for the Roundtable consideration and approval.

Suggested structure and scheduled:

- 5-7 members
- Meet on quarterly basis and/or as-needed basis.

Technical Working Groups (Departures and Arrivals)

The mission of the Technical Working Groups is to allow in-depth technical discussions and provide a forum for stakeholders to deal with specific issues outlined in the Roundtable's Work Plan, but it is also responsive to issues that are of interest to the community at the particular point in time. Initially, two technical working groups were established- "Departures Technical

Working Group", which focused on topics specific to northern San Mateo County communities related to departing flights, and the "Arrivals Technical Working Group", which focused on topics specific to impacts of arriving flights predominately over the communities of southern San Mateo County. The groups can meet together as a single technical working group (such as in the efforts to draft the 2016 *FAA Initiative* response document) at the discretion of the Chairperson.

Suggested structure and scheduled:

- 7-9 members
- Meet on quarterly basis and/or as-needed basis

SAN FRANCISCO INTERNATIONAL AIRPORT
CITY & COUNTY OF SAN FRANCISCO

MEMORANDUM

TO: JAMES CASTAÑEDA
FROM: BERT GANOUNG
AIRCRAFT NOISE ABATEMENT
SUBJECT: NEW AIRPORT DIRECTOR'S REPORT OFFERINGS FOR THE AIRPORT/COMMUNITY ROUNDTABLE
DATE: MARCH 23, 2017

Following the February Airport/Community Roundtable Meeting positive reception of the revised Director's Report pages we completed the revision of the Director's Report and have the January 2017 and February 2017 data to offer for comparison. have in this report going forward.

I previously submitted the pages that cover the noise complaint reporting and the operations at SFO during a monthly cycle. At this time, we are submitting for review and approval the Runway Usage and Nighttime Operations report as well as the Aircraft Noise Monitoring System pages. These two pages effectively gather up the Noise Exceedance, Historical Noise Exceedance, Nighttime Power Runups and the remaining Runway Use Report items and reduce the Airport Director's Report from seven to four pages in length while adding more details and pertinent items that were found to be relevant.

The one page of the Director's Report that was not carried forward as we understood it was not a priority was the Monthly Noise Exceedance Report by airline that appeared on the first page. Our reasoning is that this page is reported in the Quarterly Fly Quiet Program and the simple fact that we could not easily reconstruct this page without losing the message. All of these pages are created using a complex reporting software that allows us to provide more information visually than we were previously able to in clear and concise one-page summaries. We are asking for feedback, likes and dislikes before replacing pages one through seven with these four new pages should they be accepted by the Roundtable Membership.

Post Office Box 8097 San Francisco California 94128 Tel 650.821.5000 Fax 650.821-5005

Airport Director's Report

Presented at the April 5, 2017
Airport Community Roundtable Meeting

Aircraft Noise Abatement Office
January 2017

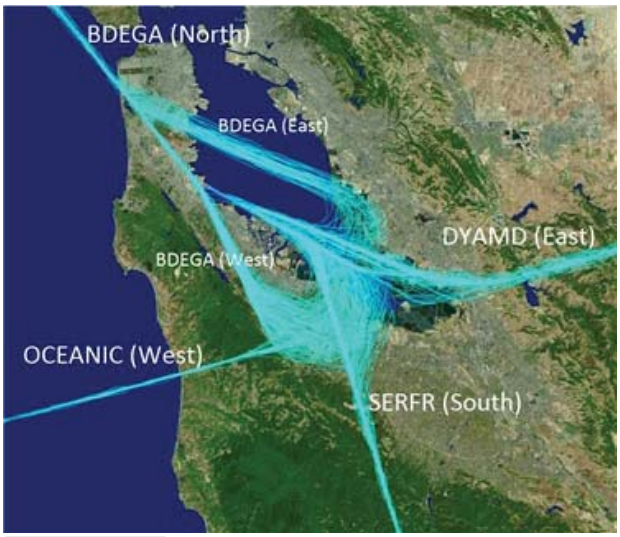
SFO San Francisco International Airport

Monthly Operations Summary

January 2017

34,139	1,101	37,592	2%
Monthly Operations	Average Daily Operations	12 Month AVG	YOY Growth

Major Arrival Routes (West Flow)



BDEGA	24%
DYAMD	39%
OCEANIC	7%
SERFR	30%

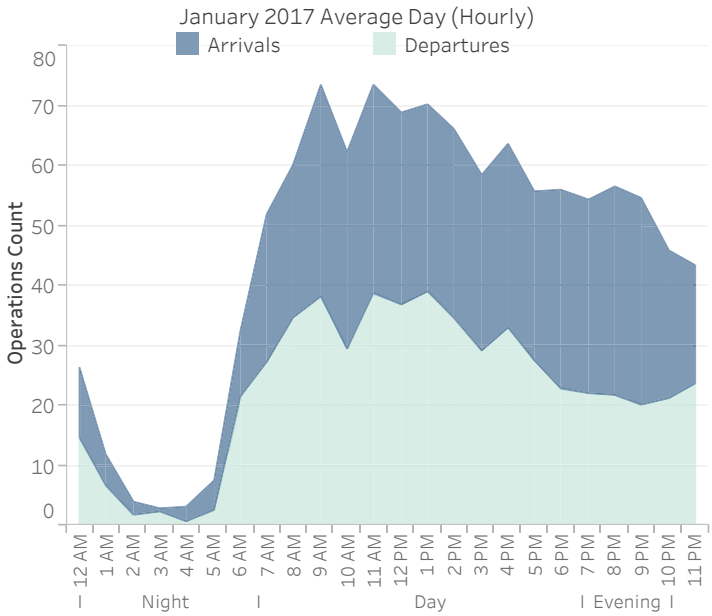
BDEGA East	27%
BDEGA West	73%

West Flow 85%

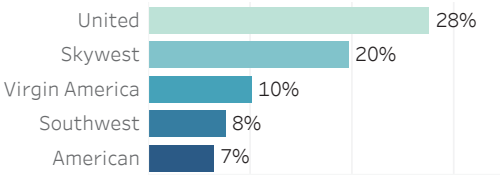
Top Destinations

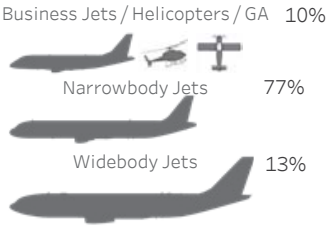
Los Angeles	Las Vegas	Seattle
10%	4%	4%

January 2017 Average Day (Hourly)

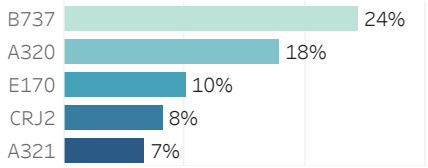


Airlines with the Most Operations

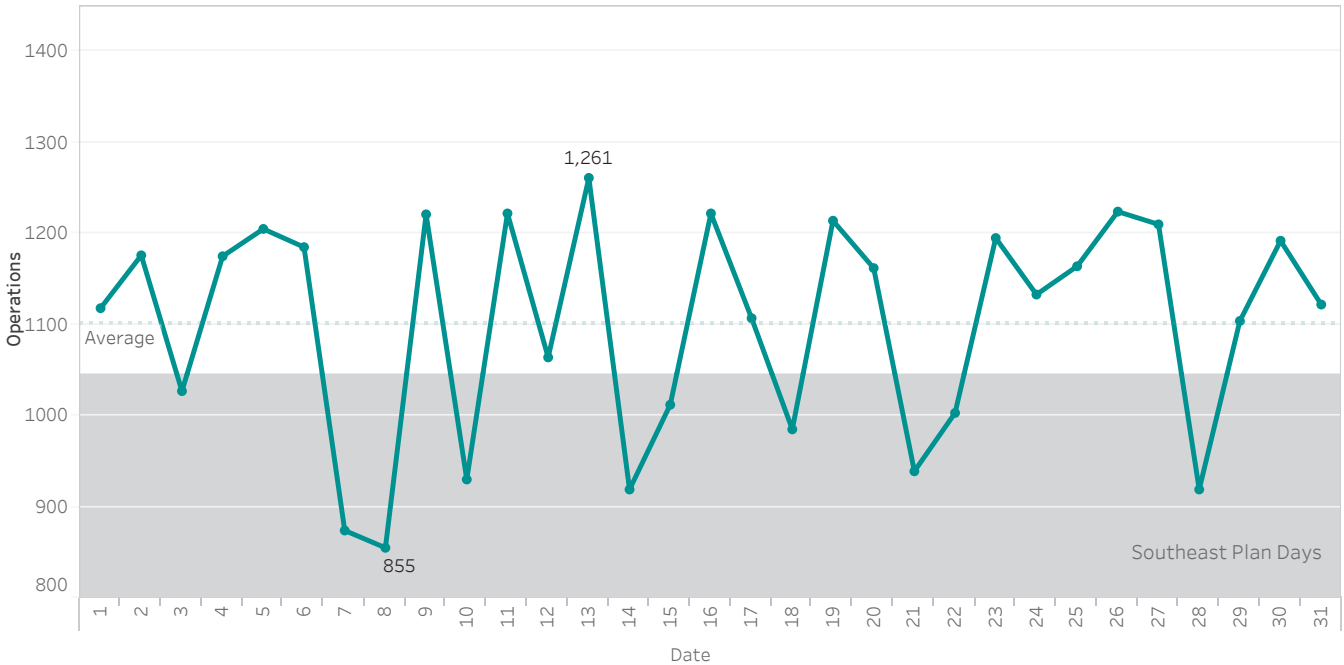




Most Utilized Aircraft Types

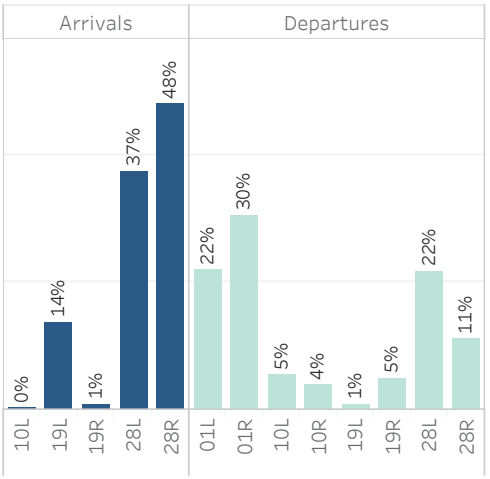


Daily Aircraft Operations



Runway Usage and Nighttime Operations

Monthly runway usage is shown for arrivals and departures, further categorized by all hours and nighttime 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 airline nighttime power runup counts shown below.

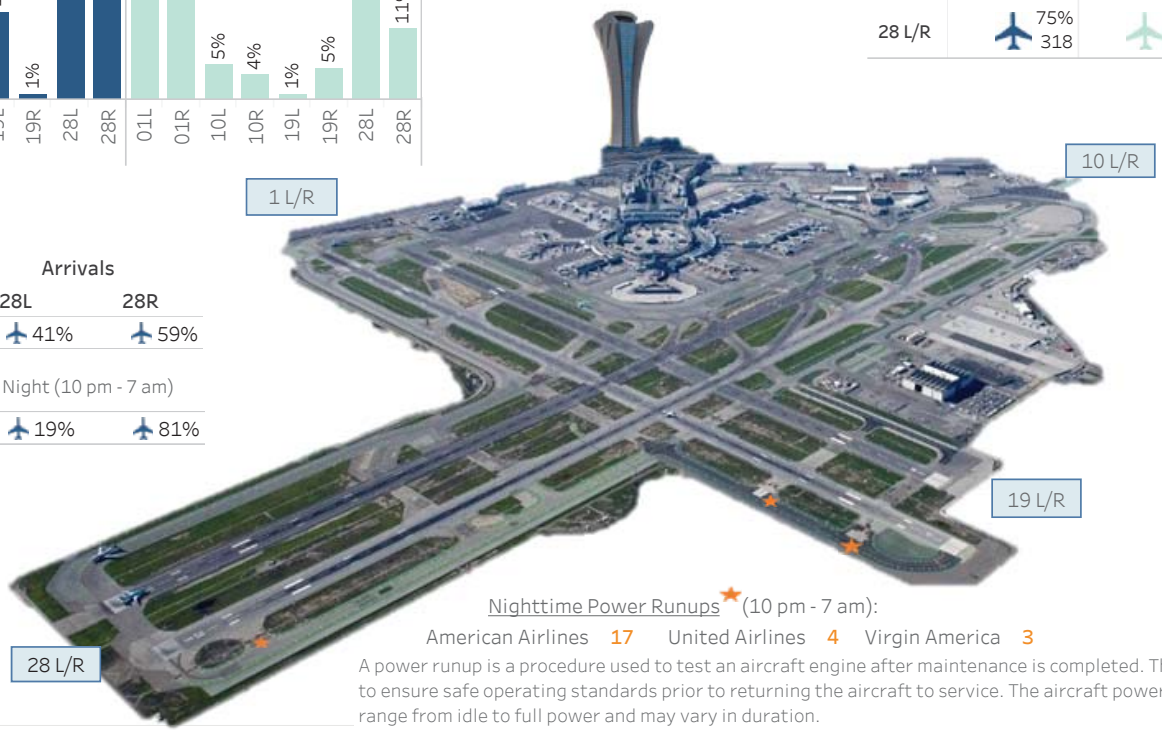


Runway Utilization (all hours)

	Arrivals	Departures
01 L/R		49%
10 L/R	1%	10%
19 L/R	15%	6%
28 L/R	84%	35%

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

	Arrivals	Departures
01 L/R		21% 79
10 L/R	0% 1	21% 81
19 L/R	25% 106	8% 31
28 L/R	75% 318	50% 194



Arrivals

28L	28R
41%	59%

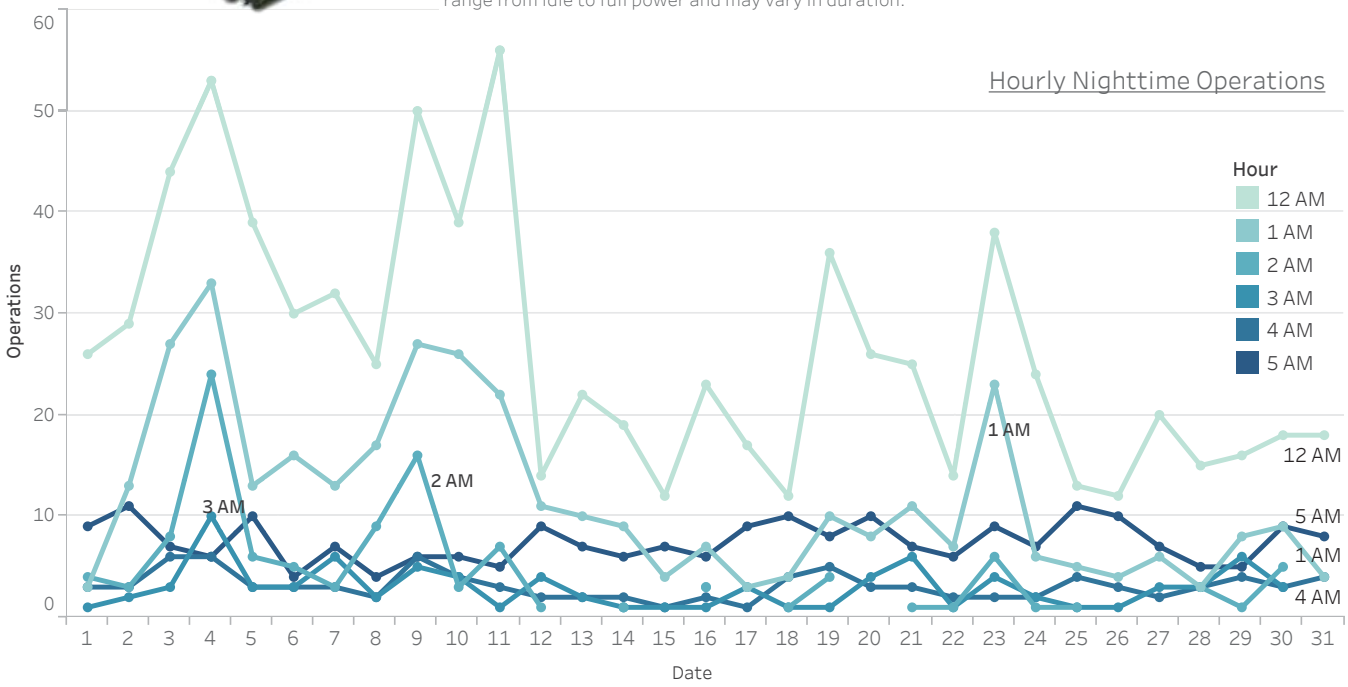
Night (10 pm - 7 am)

19%	81%

Nighttime Power Runups (10 pm - 7 am):

American Airlines 17 United Airlines 4 Virgin America 3

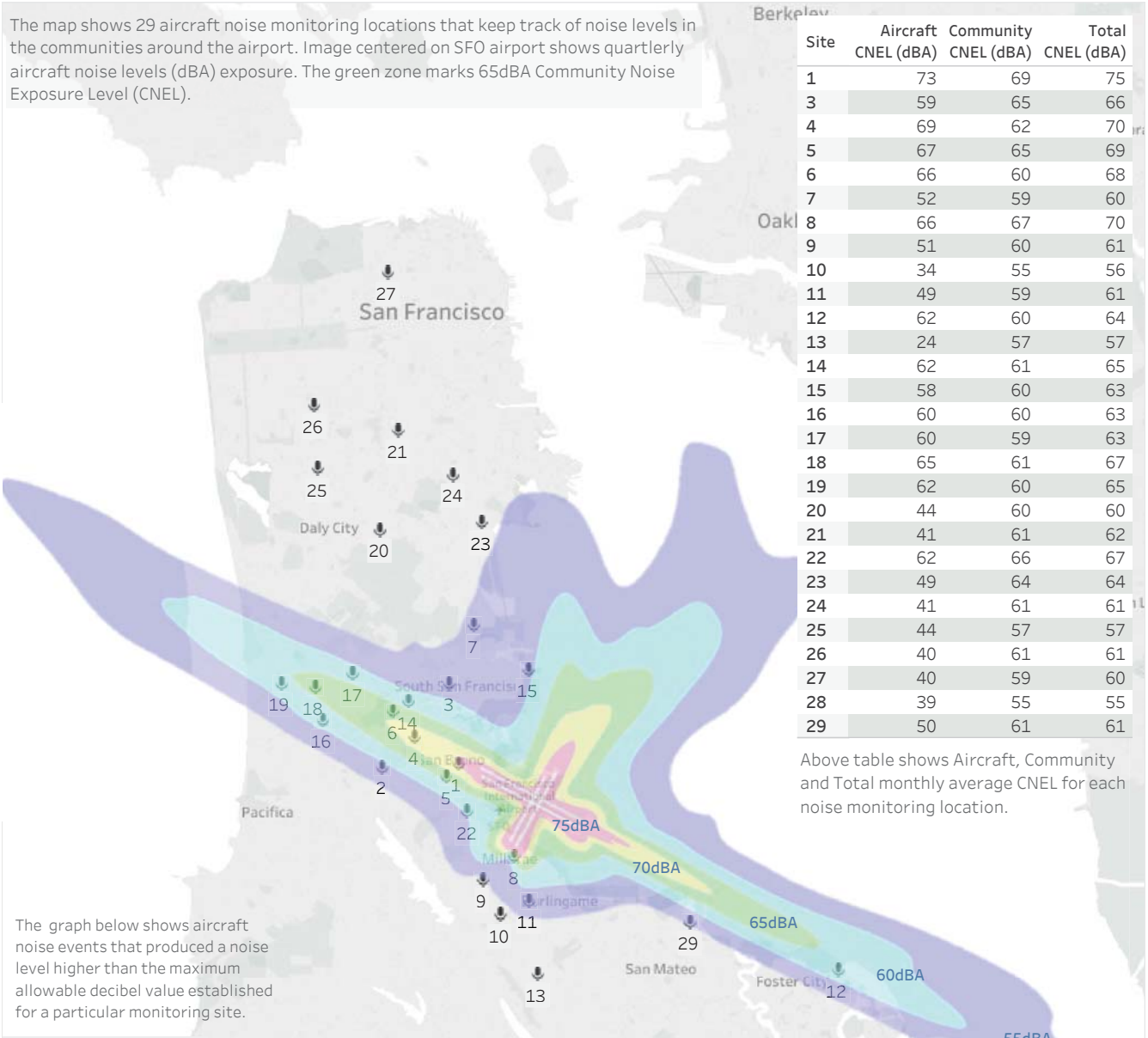
A power runup is a procedure used to test an aircraft engine after maintenance is completed. This is done to ensure safe operating standards prior to returning the aircraft to service. The aircraft power settings range from idle to full power and may vary in duration.



Aircraft Noise Monitoring System

January 2017

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).

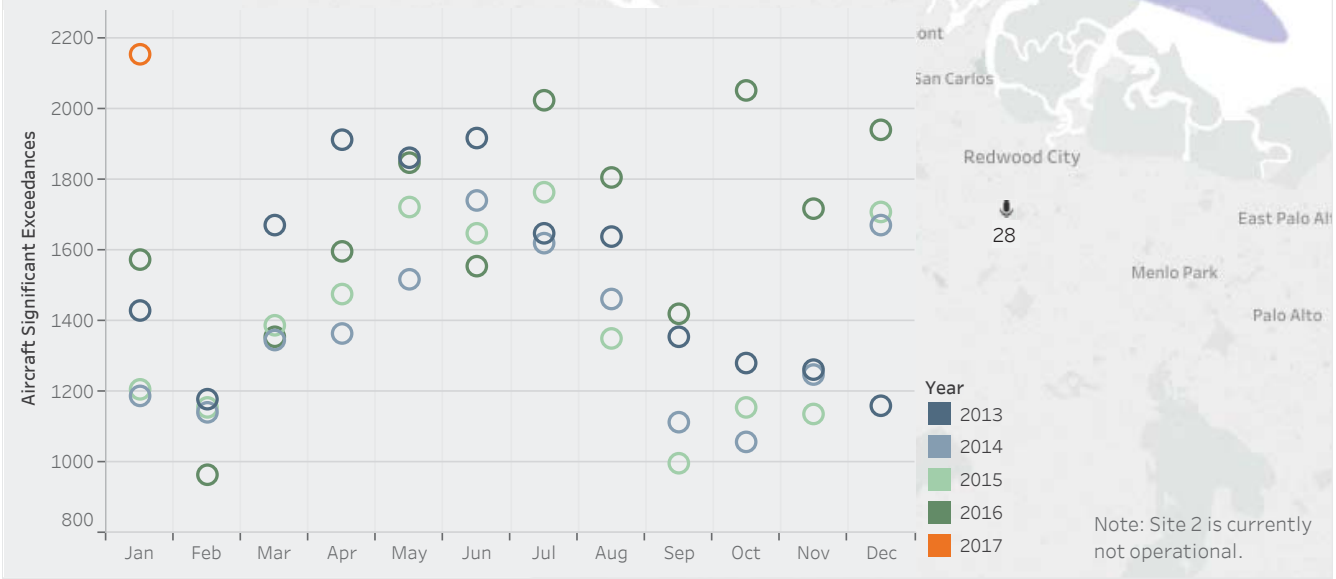


Site	Aircraft CNEL (dBA)	Community CNEL (dBA)	Total CNEL (dBA)
1	73	69	75
3	59	65	66
4	69	62	70
5	67	65	69
6	66	60	68
7	52	59	60
8	66	67	70
9	51	60	61
10	34	55	56
11	49	59	61
12	62	60	64
13	24	57	57
14	62	61	65
15	58	60	63
16	60	60	63
17	60	59	63
18	65	61	67
19	62	60	65
20	44	60	60
21	41	61	62
22	62	66	67
23	49	64	64
24	41	61	61
25	44	57	57
26	40	61	61
27	40	59	60
28	39	55	55
29	50	61	61

Above table shows Aircraft, Community and Total monthly average CNEL for each noise monitoring location.

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.

Noise Report Summary

January 2017

		Noise Reporters	Noise Reports
Roundtable Communities	Atherton	8	194
	Belmont	10	359
	Brisbane	49	3,858
	Burlingame	52	300
	Daly City	12	1,513
	Foster City	13	669
	Half Moon Bay	9	628
	Hillsborough	21	66
	Menlo Park	44	3,733
	Millbrae	5	215
	Pacifica	64	9,586
	Portola Valley	55	8,131
	Redwood City	27	2,766
	San Bruno	8	13
	San Carlos	6	52
	San Francisco	52	4,507
	San Mateo	38	1,756
	South San Francisco	27	1,504
	Woodside	23	1,434
Other Communities	Alameda	4	97
	Aptos	11	418
	Belvedere-Tiburon	1	1
	Ben Lomond	2	77
	Berkeley	5	55
	Boulder Creek	4	127
	Brentwood	1	40
	Capitola	18	1,946
	Carmel	1	213
	Colma	1	24
	Corte Madera	1	1
	Cupertino	3	2,372
	East Palo Alto	4	27
	Felton	12	199
	Fremont	1	10
	Kensington	1	1
	La Selva Beach	2	26
	Lafayette	1	1
	Los Altos	243	27,365
	Los Altos Hills	39	8,405
	Los Gatos	155	19,386
	Montara	2	5
	Moraga	2	4
	Morgan Hill	2	336
	Mount Hermon	1	1
	Mountain View	65	6,969
	Oakland	35	9,363
	Palo Alto	302	51,223
	Richmond	1	177
	San Jose	2	1,227
	San Leandro	1	15
	Santa Cruz	118	15,010
	Saratoga	18	1,228
	Scotts Valley	83	7,433
	Soquel	84	4,970
	Sunnyvale	54	4,380
	Union City	1	1
	Watsonville	1	4
Totals		1,805	204,421

2,037
Noise Reporters (12 month AVG)

291,373
Noise Reports (12 Month AVG)

150
New Reporters

Burlingame
New Reporters Top City

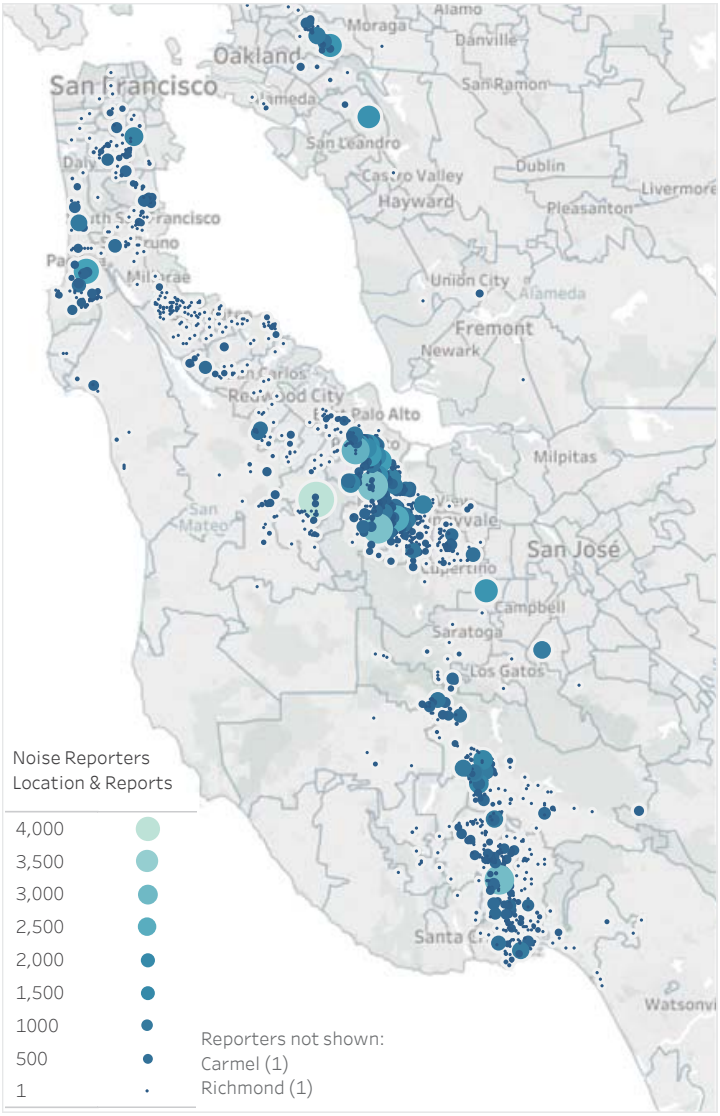
85 miles
Furthest Report

6
Reports/ SFO Operation

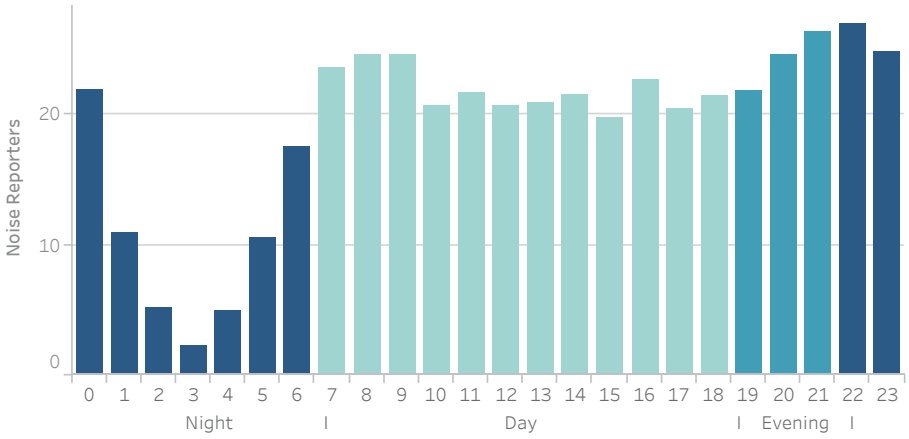
B737
A320
E170
Top Aircraft Type

KAL213*
CMP382*
JBU736
Top Flight Number
*Night

Noise Reporters Location Map



January 2017 Average day (SFO Reporters by Hour of the Day)



Our software vendor's address validation relies on USPS-provided ZIP code look up table and USPS-specified 'default' city values.

99% of noise reports correlate to a flight origin/destination airport:

OAK 4% | SFO 69% | SJC 14% | SQL 7%

Data Source: San Francisco International Airport Noise Monitoring System

Airport Director's Report

Presented at the April 5, 2017
Airport Community Roundtable Meeting

Aircraft Noise Abatement Office
February 2017

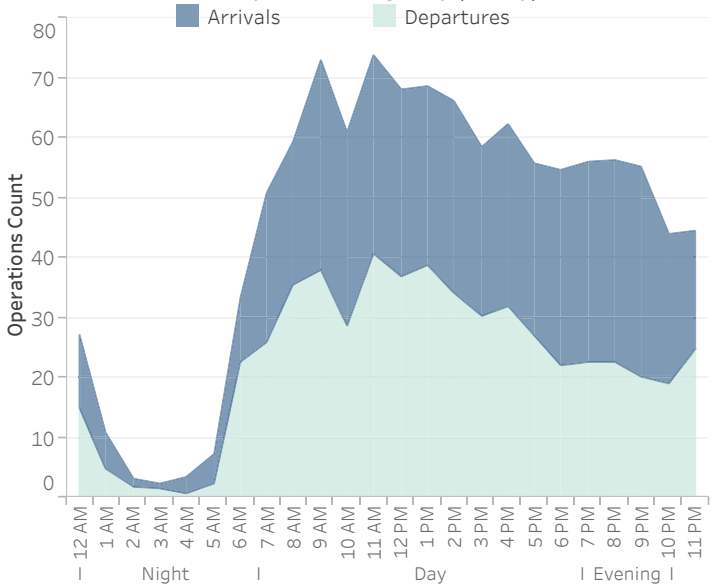
SFO San Francisco International Airport

Monthly Operations Summary

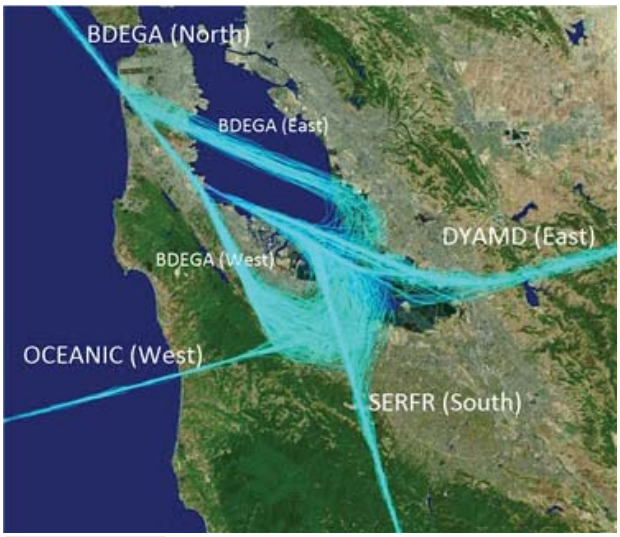
February 2017

30,559	1,091	37,441	3.6%
Monthly Operations	Average Daily Operations	12 Month AVG	YOY Growth

February 2017 Average Day (Hourly)



Major Arrival Routes (West Flow)



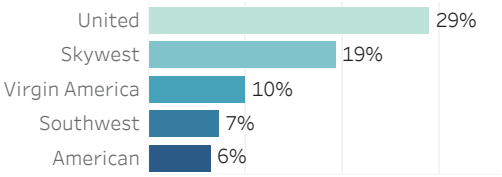
BDEGA	23%
DYAMD	39%
OCEANIC	6%
SERFR	31%

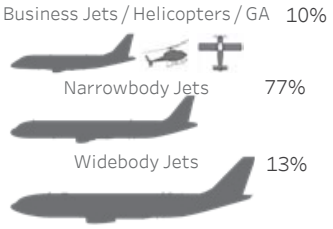
BDEGA East	28%
BDEGA West	72%

Top Destinations		
Los Angeles	Las Vegas	Seattle
10%	4%	4%

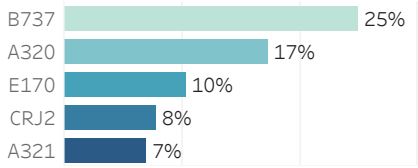
West Flow 80%

Airlines with the Most Operations

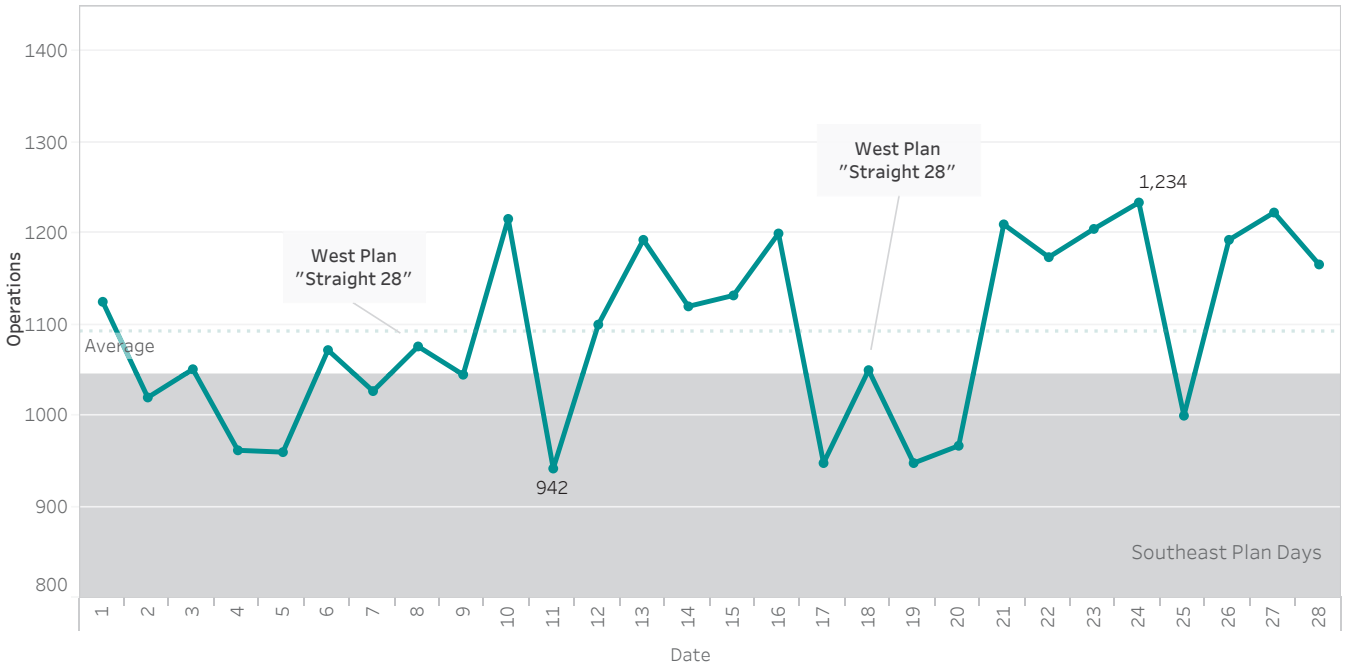




Most Utilized Aircraft Types

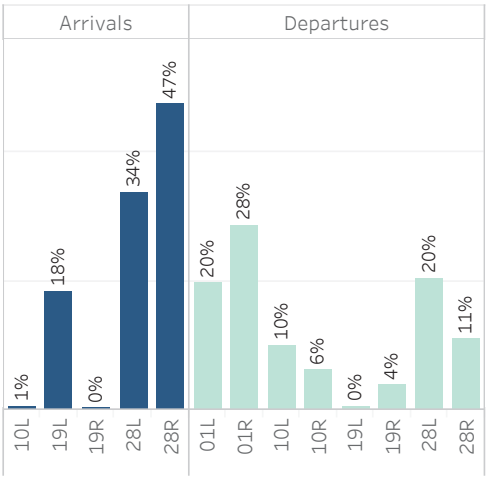


Daily Aircraft Operations



Runway Usage and Nighttime Operations

Monthly runway usage is shown for arrivals and departures, further categorized by all hours and nighttime 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 airline nighttime power runup counts shown below.

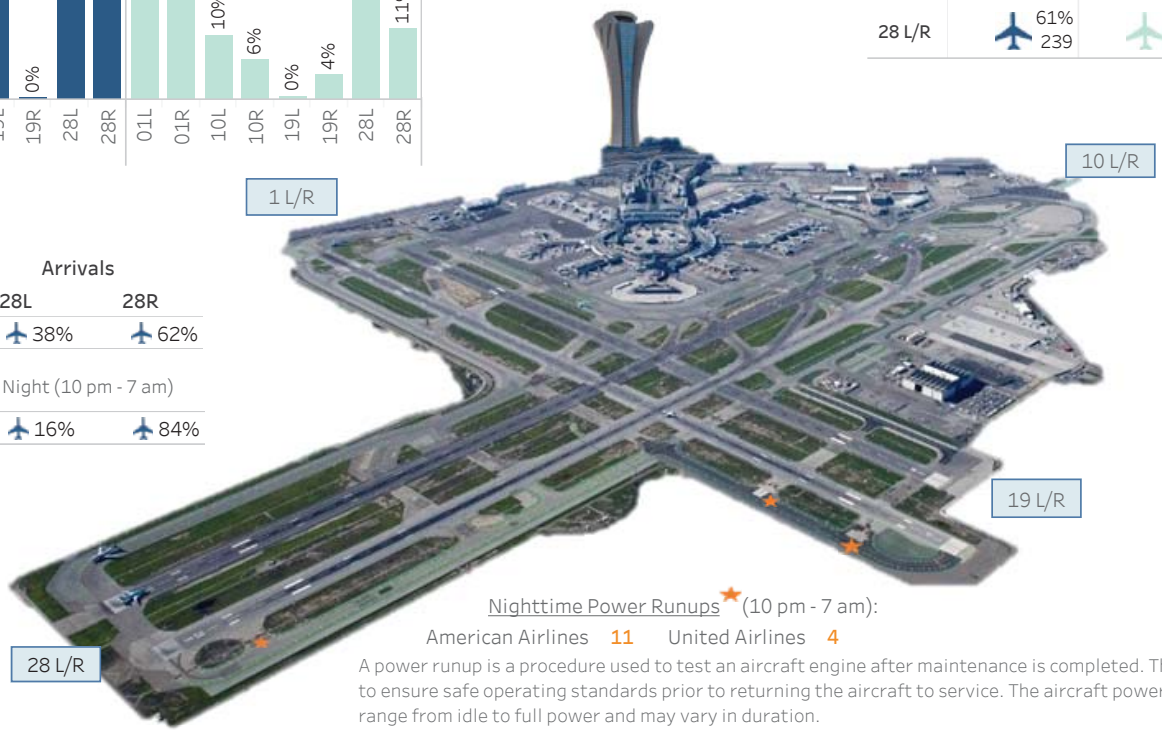


Runway Utilization (all hours)

	Arrivals	Departures
01 L/R		46%
10 L/R	1%	18%
19 L/R	20%	4%
28 L/R	79%	32%

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

	Arrivals	Departures
01 L/R		20% 47
10 L/R		32% 76
19 L/R	39% 156	12% 29
28 L/R	61% 239	35% 82



Arrivals

28L	28R
38%	62%

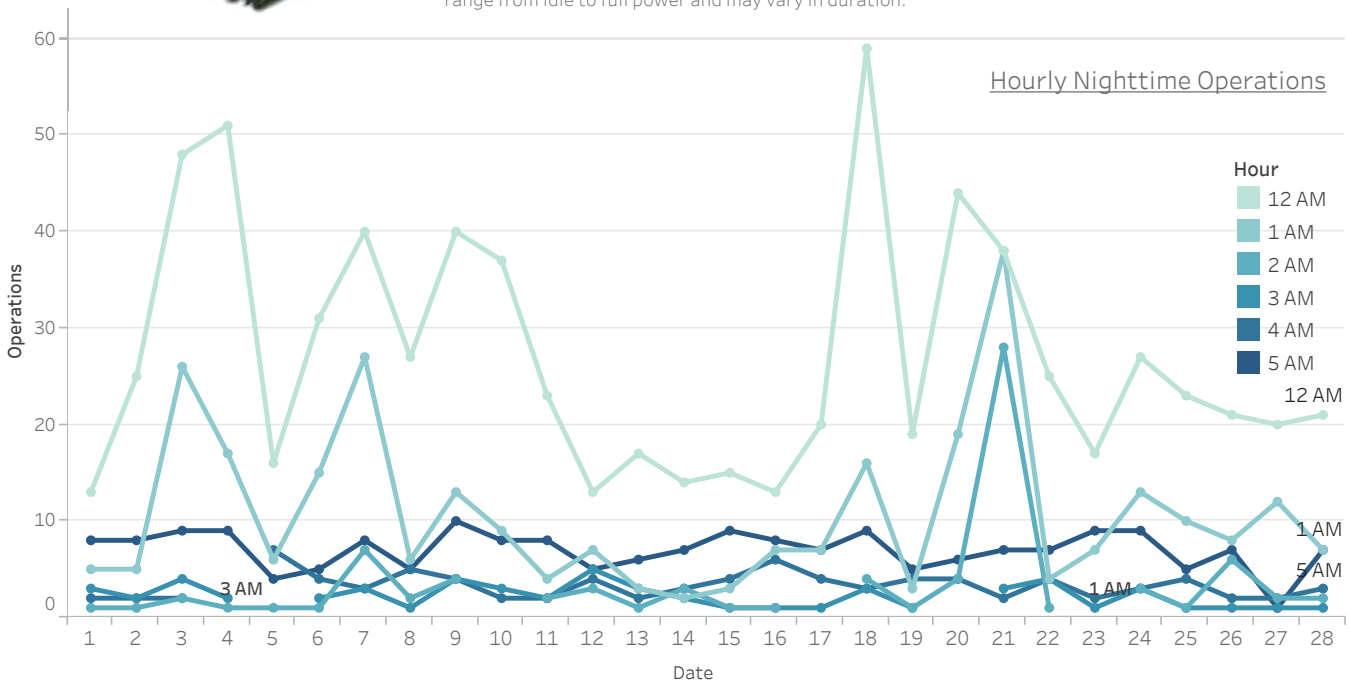
Night (10 pm - 7 am)

16%	84%

Nighttime Power Runups (10 pm - 7 am):

American Airlines 11 United Airlines 4

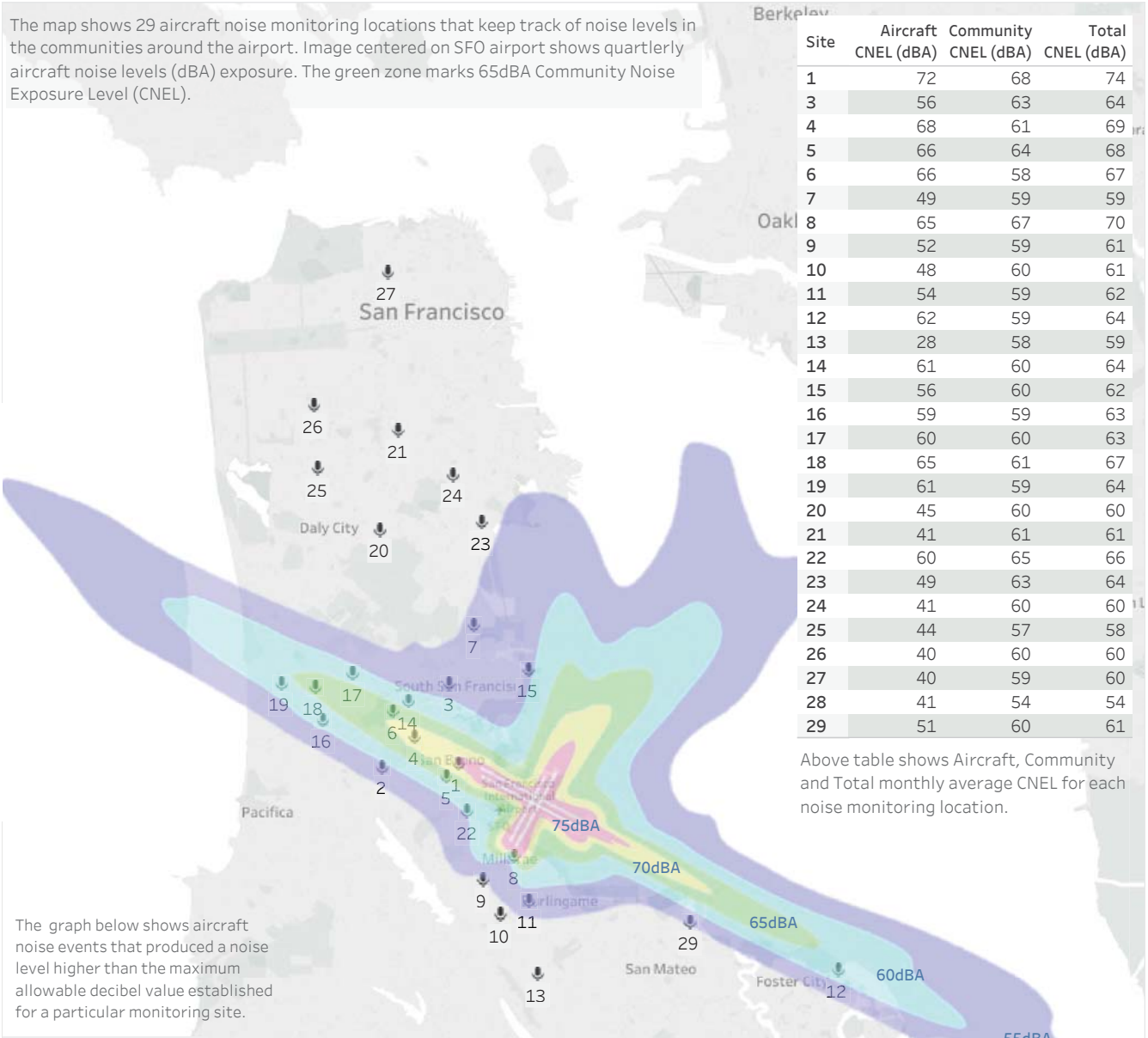
A power runup is a procedure used to test an aircraft engine after maintenance is completed. This is done to ensure safe operating standards prior to returning the aircraft to service. The aircraft power settings range from idle to full power and may vary in duration.



Aircraft Noise Monitoring System

February 2017

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).

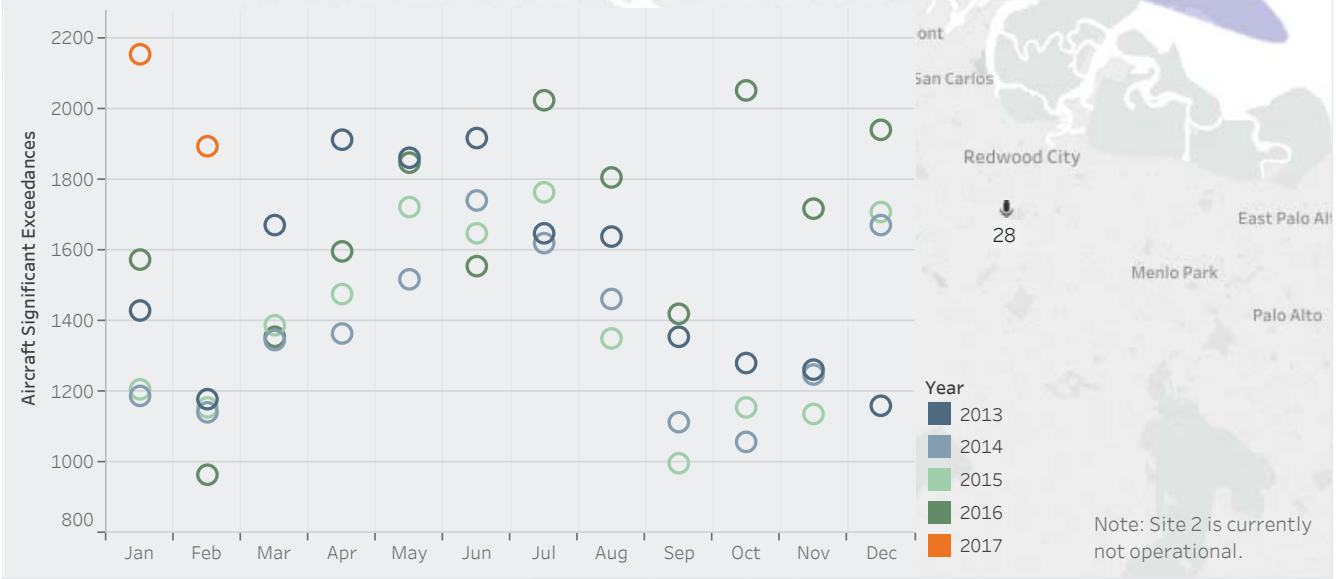


Site	Aircraft CNEL (dBA)	Community CNEL (dBA)	Total CNEL (dBA)
1	72	68	74
3	56	63	64
4	68	61	69
5	66	64	68
6	66	58	67
7	49	59	59
8	65	67	70
9	52	59	61
10	48	60	61
11	54	59	62
12	62	59	64
13	28	58	59
14	61	60	64
15	56	60	62
16	59	59	63
17	60	60	63
18	65	61	67
19	61	59	64
20	45	60	60
21	41	61	61
22	60	65	66
23	49	63	64
24	41	60	60
25	44	57	58
26	40	60	60
27	40	59	60
28	41	54	54
29	51	60	61

Above table shows Aircraft, Community and Total monthly average CNEL for each noise monitoring location.

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.

Noise Report Summary

February 2017

		Noise Reporters	Noise Reports
Roundtable Communities	Atherton	6	262
	Belmont	8	620
	Brisbane	53	3,759
	Burlingame	10	15
	Daly City	15	2,772
	Foster City	15	704
	Half Moon Bay	9	550
	Hillsborough	8	63
	Menlo Park	44	4,287
	Millbrae	10	139
	Pacifica	63	8,060
	Portola Valley	53	6,396
	Redwood City	28	2,068
	San Bruno	3	3
	San Carlos	4	10
	San Francisco	54	2,616
	San Mateo	26	1,159
	South San Francisco	24	919
	Woodside	22	1,030
Other Communities	Alameda	5	74
	Aptos	11	538
	Ben Lomond	2	16
	Berkeley	5	73
	Boulder Creek	4	61
	Brentwood	1	74
	Campbell	1	4
	Capitola	20	2,017
	Carmel	1	157
	Cupertino	4	1,113
	East Palo Alto	4	18
	El Cerrito	1	1
	Felton	9	257
	Fremont	3	182
	Lafayette	4	248
	Los Altos	237	24,472
	Los Altos Hills	37	6,343
	Los Gatos	143	14,770
	Montara	1	1
	Moraga	2	4
	Morgan Hill	2	412
	Mount Hermon	1	1
	Mountain View	111	11,000
	Oakland	69	10,455
	Palo Alto	289	45,954
	Piedmont	5	23
	Richmond	1	358
	San Gregorio	1	1
	San Jose	2	521
	San Leandro	1	129
	San Pablo	1	1
	Santa Clara	2	3
	Santa Cruz	131	15,765
	Saratoga	15	1,134
	Scotts Valley	87	7,996
	Soquel	91	5,105
	Sunnyvale	42	3,928
	Watsonville	3	86
Totals		1,804	188,727

2,047
Noise Reporters
(12 month AVG)

285,029
Noise Reports
(12 Month AVG)

173
New
Reporters

Mountain View
New Reporters
Top City

85 miles
Furthest Report

4
Reports/ SFO
Operation

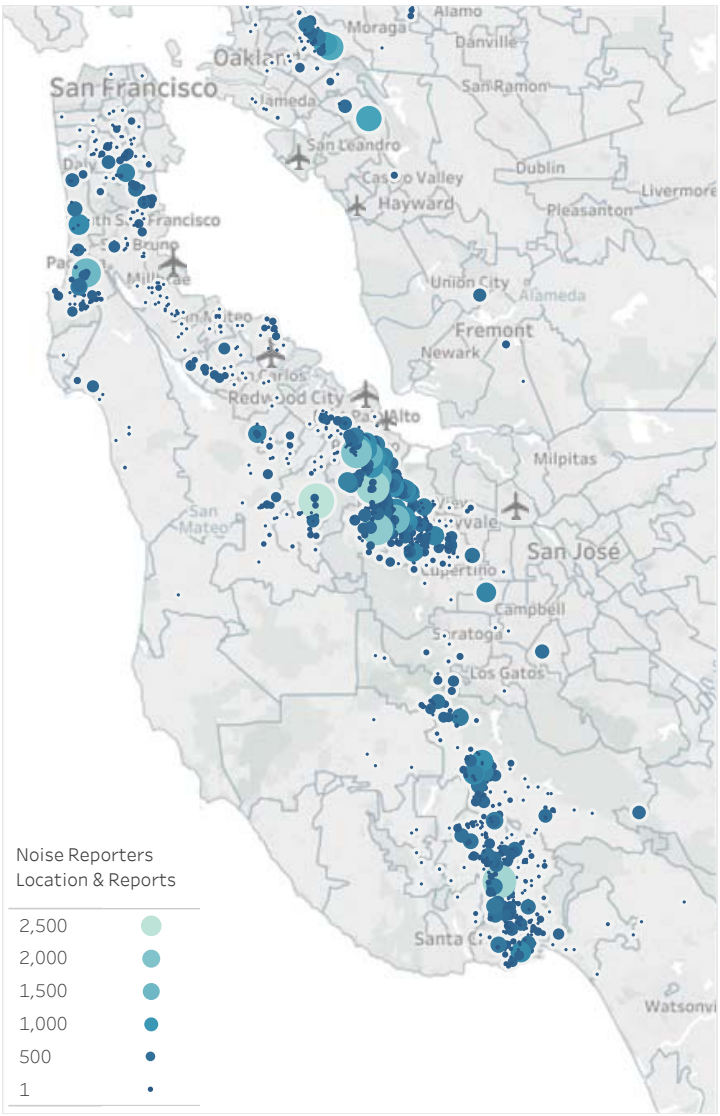
B737
A320
E170
Top Aircraft Type

KAL213*
CMP382*
JBU736
Top Flight
Number
*Night

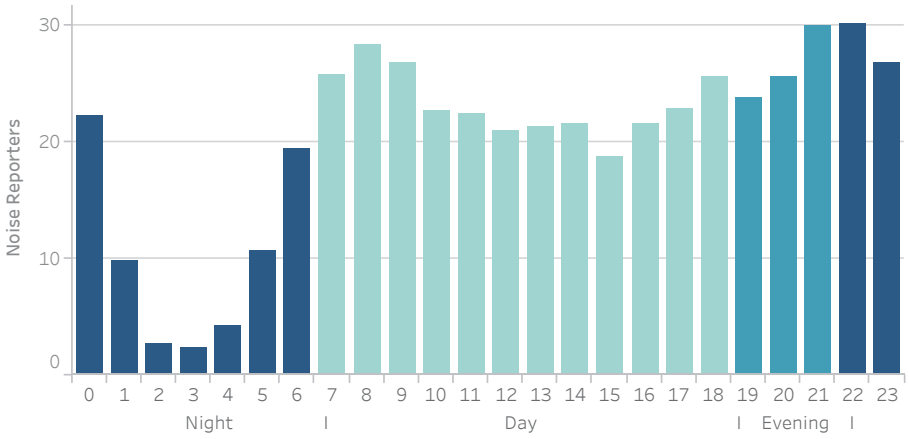
90% of noise reports correlate to a flight origin/destination airport:

PAO 6%
SFO 65%
SJC 17%
SQL 8%

Noise Reporters Location Map



February 2017 Average day (SFO Reporters by Hour of the Day)



Our software vendor's address validation relies on USPS-provided ZIP code look up table and USPS-specified 'default' city values.

Source: San Francisco International Airport Noise Monitoring System

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CORRESPONDENCES

Regular Meeting # 306
April 5, 2017

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Quarterly Aircraft Noise Monitoring Results for Woodside VOR

Dave Ong (AIR) <Dave.Ong@flysfo.com>

Fri 3/24/2017 12:21 PM

To: dcgordon@me.com <dcgordon@me.com>;

Cc: James A Castañeda <jcastaneda@sforoundtable.org>; Bert Ganoung (AIR) <Bert.Ganoung@flysfo.com>;

2 attachments (4 MB)

Woodside Aircraft Noise Monitoring FINAL.pdf; Supplement Aircraft Noise Terminology Metric.pdf;

Dear Honorable Deborah Gordon,

The Noise Abatement Office staff at San Francisco International Airport performs quarterly noise monitor in the Town of Woodside, specifically at the Federal Aviation Administration airway facility to help us better understand, quantify, and manage aircraft noise in the community. In the past we share this information with the Airport Community Roundtable (ACR), the Woodside representative Mr. David Burow and interested community members. As the current ACR representative for Woodside, I am pleased to share the recently published quarterly noise monitoring report covering 4Q2014 to 4Q2016, along with a supplement which explains aircraft noise terminology for reference. At your discretion we will continue to perform this monitoring. The next monitoring period is schedule for the first half of May 2017.

Should you have any questions regarding this report please do not hesitate to call me or Bert Ganoung, Aircarft Noise Abatement Manager at the telephone number below.

Thank you,

David Ong

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

Woodside
Aircraft Noise Monitoring

Prepared by San Francisco International Airport
Aircraft Noise Abatement Office
Technical Report #022017-969

February 2017

Table of Contents

Executive Summary

The San Francisco International Airport (SFO) Aircraft Noise Abatement Office conducted aircraft noise monitoring in Woodside to determine the noise level within the community from aircraft operations at SFO. The monitoring location is at an airway facility that provides a fixed ground navigational aid that commercial and general aviation pilots use to guide the aircraft. The monitoring was made possible with the assistance of the Federal Aviation Administration (FAA). The overall average daily noise level from all aircraft was 43dBA CNEL. The Community daily noise level was 52dBA CNEL. Noise from all aircraft over this location increased the total average daily noise level by 1dBA. SFO aircraft represent 69% of all aircraft noise events over Woodside community.

Community and SFO Operations

Oceanic Arrivals destined to SFO and OAK typically flyover Woodside community with flight traffic crossing over a fixed ground radio beacon known as a VHF Omni Directional Radio Range (VOR). The Woodside VOR is located 1 mile west of Highway 84 off of Skyline Boulevard. Aircraft track to the Woodside VOR navigational aid which guide airplanes through the National Airspace System (NAS). VOR stations are gradually being decommissioned by the FAA as they incorporate more satellite based navigation procedures in the NAS.

Advances in Global Navigation Satellite System allows newer aircraft equipped with latest guidance and navigation technologies to fly Oceanic Tailored Arrivals (OTA). This arrival procedure allows an aircraft to fly a continuous decent from cruise altitude to touching down on the runway. Versus a conventional arrival procedure which requires an aircraft to descend, fly at a leveled altitude, then descend again in a stair-step fashion which can lead to increased use of the engine throttle over noise-sensitive areas. The OTA procedure is typically used during early morning hours when there is less traffic. OTA allows aircraft arriving from the west, over the Pacific Ocean fly a constant rate of decent, and track the Woodside VOR to the runway. This procedure is quiet, produces less emission as less fuel is burned and increases air traffic efficiency.

In high traffic conditions or inclement weather days, Woodside community may experience more air traffic due to aircraft vectoring (FAA Air Traffic Controller instructs the pilot to fly specific headings), also known as delay vectoring. 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 aircraft (and aircraft of different size), maximizing use of available airspace, achieving an expeditious flow of aircraft, avoiding areas of known hazardous weather or known severe turbulence, and maneuvering an aircraft into a suitable position for a visual approach.

During the monitoring period there were no significant weather impacts or other disruptions of the air traffic that would alter the flight paths. SFO operated on a West Flow Plan (Appendix 2) the entire monitoring period. Non aircraft noise sources include a back-up generator for the close-by FAA facility, leaf blower and occasional vehicular traffic. The ambient levels in Woodside are approximately 40 decibels in the day and about 35 decibels at night.

Equipment

Woodside aircraft noise monitoring is conducted at the FAA Airway Facility every quarter, for a 14-day measurement period. The measurement period is performed during the same weeks during each quarter. This provides for a sufficient data sample to evaluate the overall noise climate similar to a permanent noise monitor site installation.

The equipment used to measure the sound level was an Environmental Monitor Unit 2200 noise monitor and Type 41DM-2 microphone manufactured by Bruel & Kjaer. The measurements consisted of monitoring the A-weighted decibels (dBA) in accordance with procedures and equipment which comply with International Electrotechnical Commission, and measurement standards established by the American National Standards Institute for Type I instrumentation. The microphone was calibrated prior to the start of the measurement. The monitor was housed in a weatherproof case and powered by a standard exterior electrical wall outlet. The microphone was mounted on a tripod at a height of 7 feet (see Figure 1). The sound levels at the site were continuously monitored, stored on the onboard memory and transferred to a removable memory stick for decoding. The decoded noise data was then processed in the Airport Noise and Operations Management System (ANOMS) for identification, noise to flight track matching and Community Noise Equivalent Level (CNEL) noise metric calculations.

Aircraft Noise Analysis

Noise measurements were taken at the Woodside VOR. This report evaluates 4th Quarter 2014 - 3rd Quarter 2016 (see Appendix 1 for all measurement days). 1st Quarter 2015 monitoring was not conducted because the facility was unavailable. Quarterly monitoring period consists of at least 14 full 24 hour days. The noise monitor measures noise at the pre-defined sound level threshold of 52dBA (day) and 50dBA (night). Due to this not every aircraft passing over Woodside VOR creates a noise event. During the monitoring periods a total of 17,630 noise events were recorded. There were 7,580 aircraft noise events of which 4,815 (64%) were correlated to SFO operations (SFO Events) and 2,765 (36%) correlated to other Bay Area airports (Non-SFO Events). The average aircraft generated Maximum Noise Level (Lmax) was 62dBA, the average Sound Exposure Level (SEL) was 72dBA, and the average aircraft noise event duration was 24 seconds. The event counts (SFO Events, Non SFO Events and Community) in Table 1 are presented as Quarterly daily averages.

Table 1 - Noise Event Averages by Yearly Quarter

Years	Quarter	SFO Events[1]	SEL (dBA)[2]	Lmax(dBA)[3]	Non- SFO Event	SEL (dBA)	Lmax (dBA)	Community	SEL (dBA)	Lmax (dBA)
2014	Qtr4	29	71	61	15	73	63	35	74	59
2015	Qtr2	53	70	59	23	72	64	164	75	59
	Qtr3	29	70	60	20	74	67	14	76	66
	Qtr4	30	71	61	23	73	64	67	74	63
2016	Qtr1	33	71	62	21	72	62	108	76	63
	Qtr2	43	71	61	23	72	63	48	75	62
	Qtr3	30	70	59	18	72	64	32	70	59
Total	**AVG**	**36**	**71**	**60**	**21**	**73**	**64**	**67**	**75**	**61**

[1] SFO Events are: Single SFO Aircraft, Multiple SFO Aircraft, Simultaneous SFO and Non-SFO Aircraft, and Simultaneous Community and SFO Aircraft.
[2] 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.
[3] Lmax - The maximum noise level is a measurement of the peak level of a noise event.

Table 2 – SEL Comparison of Quarterly Averages

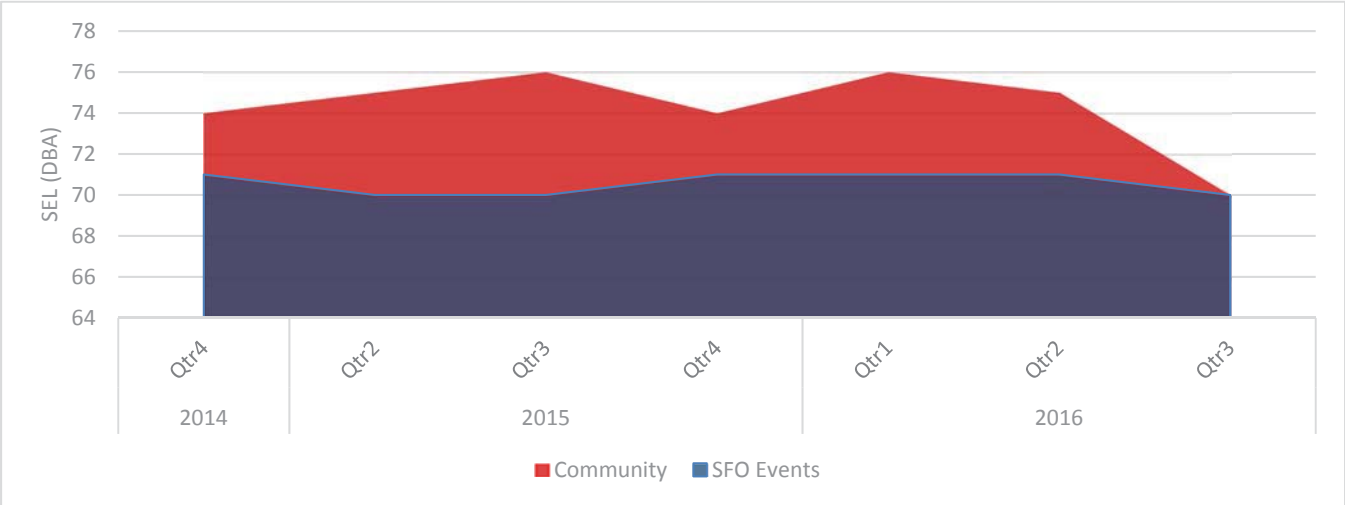


Table 2 shows a graphic comparison between the SEL of SFO Events and SEL of Community Events. For example, 2015 Qtr2 (quarter with the most amount of SFO Events), SFO aircraft events were on average 5dBA quieter than the Community Events. While SFO Events were quieter the ratio between the average amount of SFO Events and Community Events varies (See Table 1). SFO Events (53) occurred less than three times than the community events (164).

Table 3 – SFO Events by Hour of the Day

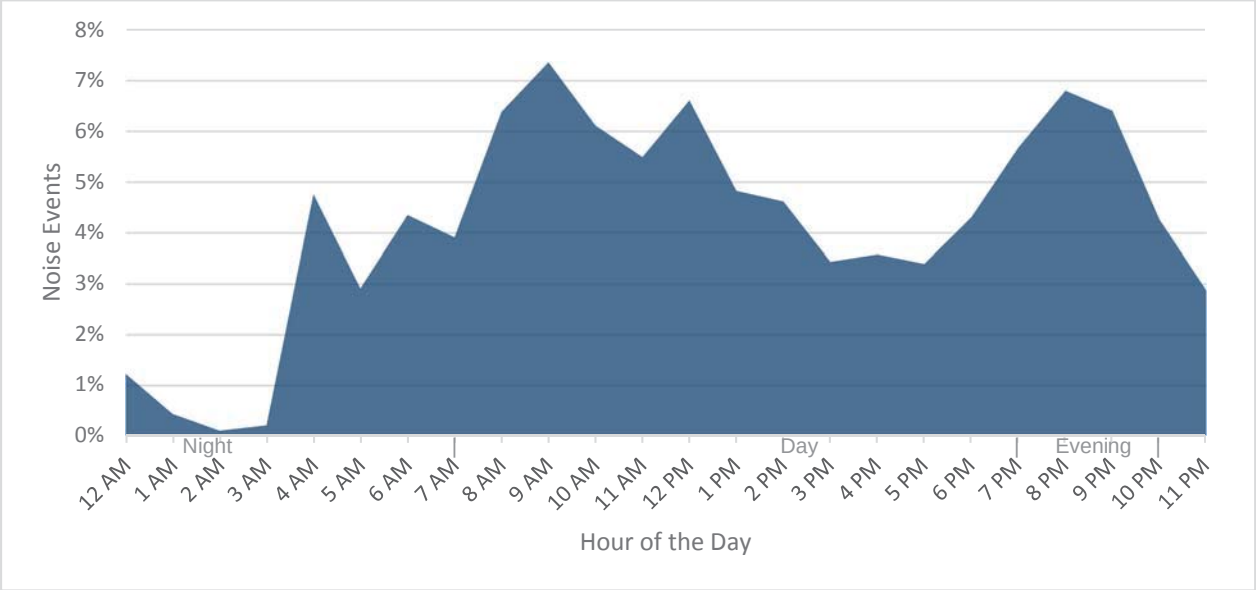


Table 4 – SFO Events by Daytime, Evening and Nighttime hours

SFO Aircraft Noise Data (Single Noise Events)			Lowest (dBA)	Highest (dBA)	Average (dBA)
Day (7:00 am-7:00 p.m.)	2890 events **60 %**	LMax	50	79	58
		SEL	58	86	68
		Duration	8 sec	120 sec	26 sec
Evening 7:00 pm-10:00 p.m.)	908 events **19 %**	LMax	50	72	58
		SEL	58	81	68
		Duration	8 sec	102 sec	25 sec
Night (10:00 pm-7:00 a.m.)	1017 events **21 %**	LMax	50	72	56
		SEL	58	81	67
		Duration	8 sec	101 sec	25 sec

Table 5 – SFO Nighttime Noise Events 10:00 PM – 7:00 AM

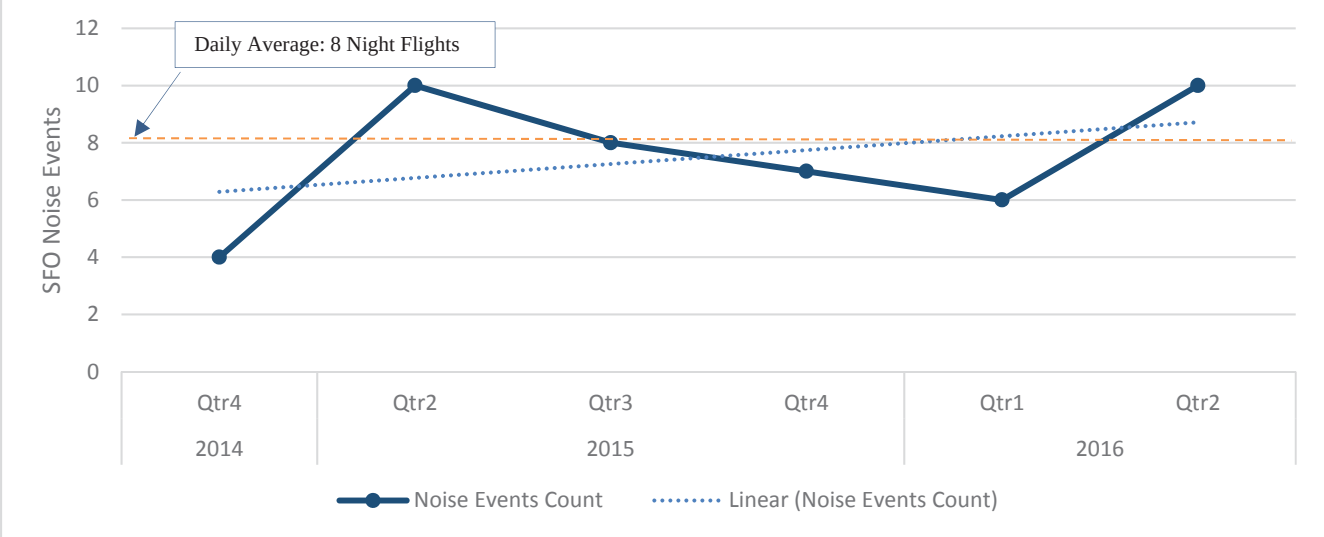


Table 6 shows quarterly CNEL values for Aircraft, Community and the Total CNEL. Air traffic is seasonal so it is important to compare the same yearly quarters. The highest Aircraft CNEL of 44dBA was measured in 2Q 2015 and 2016. An increase of flight operations was observed during these quarters. Aircraft CNEL values have been consistent throughout the 2 year monitoring period. Yearly quarters with Community CNEL higher than 49dBA are due to the sound of FAA back-up generator, rain, wind or crickets. Woodside aircraft noise monitoring threshold for noise events is set at a monitor minimum level of 50dB. In view of the fact that the monitoring location in Woodside is located in a quiet suburban community with ambient noise in the 40s, consequently any aircraft noise above this threshold may become a nuisance for the residents.

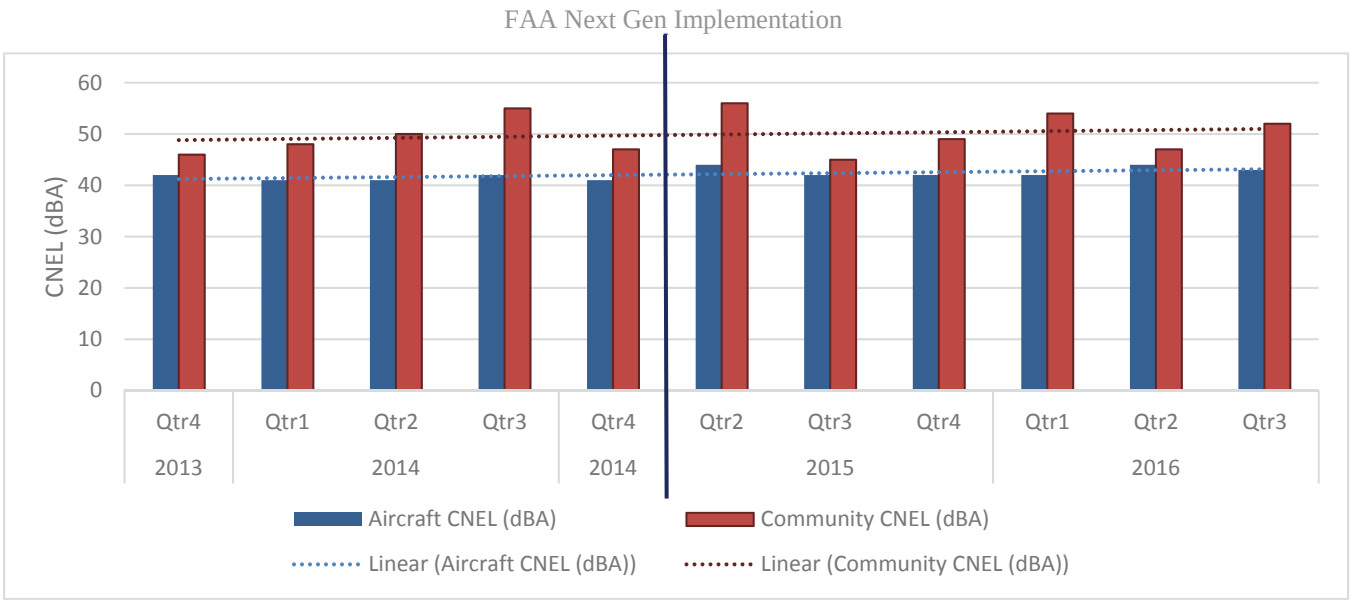
Table 6 - Quarterly CNEL

Yearly Quarters	Aircraft CNEL (dBA)	Community CNEL (dBA)	Total CNEL (dBA)
2014			
Qtr4	41	49	49
2015			
Qtr1	-	-	-
Qtr2	44	56	56
Qtr3	42	45	47
Qtr4	42	49	50
2016			
Qtr1	42	54	54
Qtr2	44	47	49
Qtr3	43	52	52
Qtr4	-	-	-
AVG	43	52	53

Northern California Metroplex (Next Gen)

On March 5, 2015 Federal Aviation Administration implemented airspace modifications in the Northern California Metroplex. These changes are part of a historic airspace modernization from a ground based to satellite based navigation. Major arrival and departure flight routes are still present, the majority of the newly introduced procedures are direct overlays of the old ones, nevertheless there were some changes. In general, routes have increased concentration, there is less dispersion, and there were some lateral/vertical changes to the routes. Aircraft are now able to fly more precise flight paths with satellite based navigation. Table 7 shows Pre Next Gen (before March 5, 2015) Aircraft CNEL at 41dBA, while Post Next Gen CNEL is 43dBA.

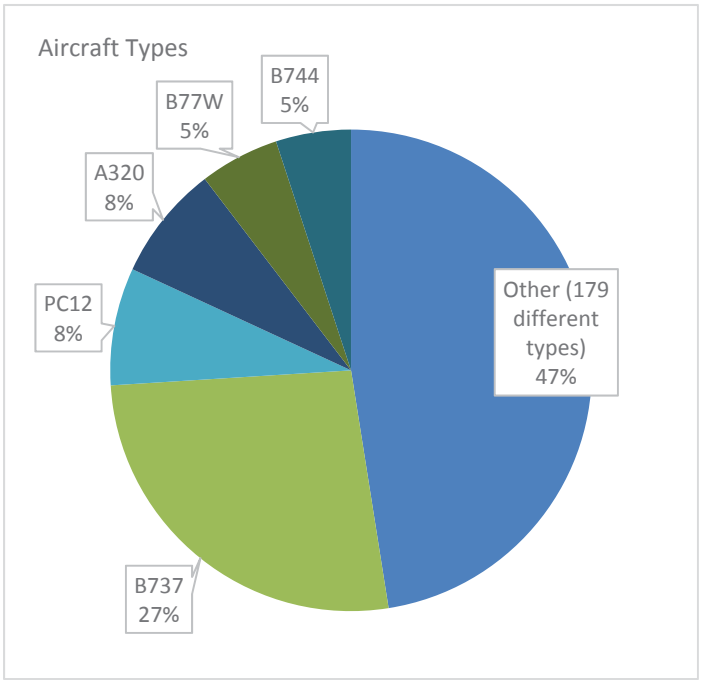
Table 7 – Pre and Post Next Gen CNELs

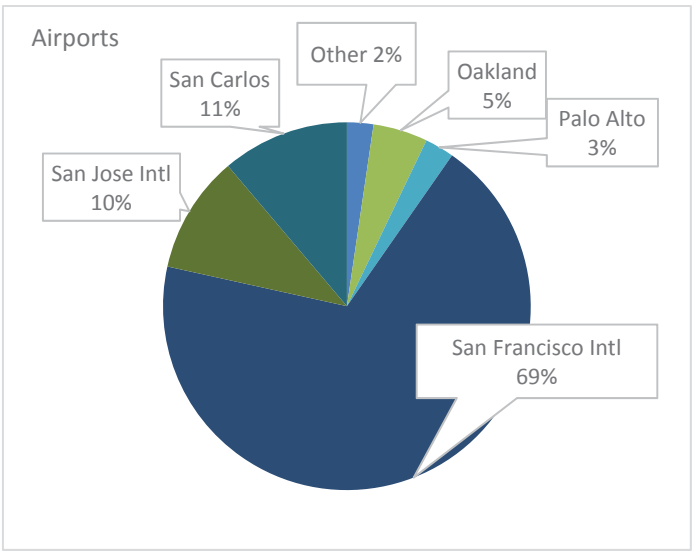


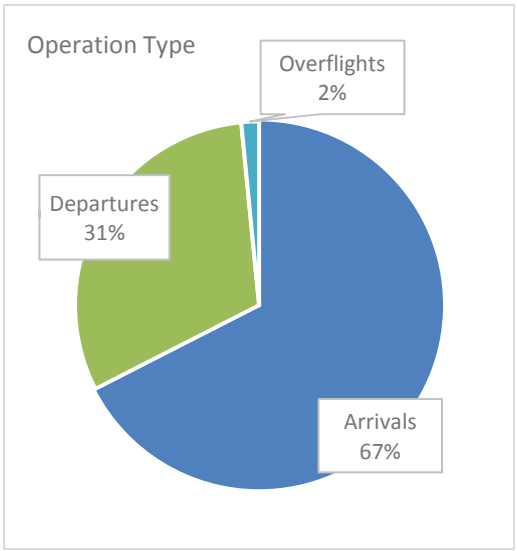
Aircraft Operations

Aircraft operations that created a noise event were studied based on the aircraft type, destination/origin airport, and operation type. SFO air traffic represented 69% of all correlated aircraft noise events, followed by San Carlos (11%) and San Jose International Airport (10%). Moreover, 80% of SFO traffic were arrivals and 20% were departures. 184 different aircraft types were tracked; five most frequent aircraft types account for 53% of all traffic (Appendix 3- Aircraft Type Reference Sheet). Out of those five, four operate at SFO and one is a business aircraft (Pilatus - PC12) that does not fly to SFO.

Table 8 – All Aircraft Operations

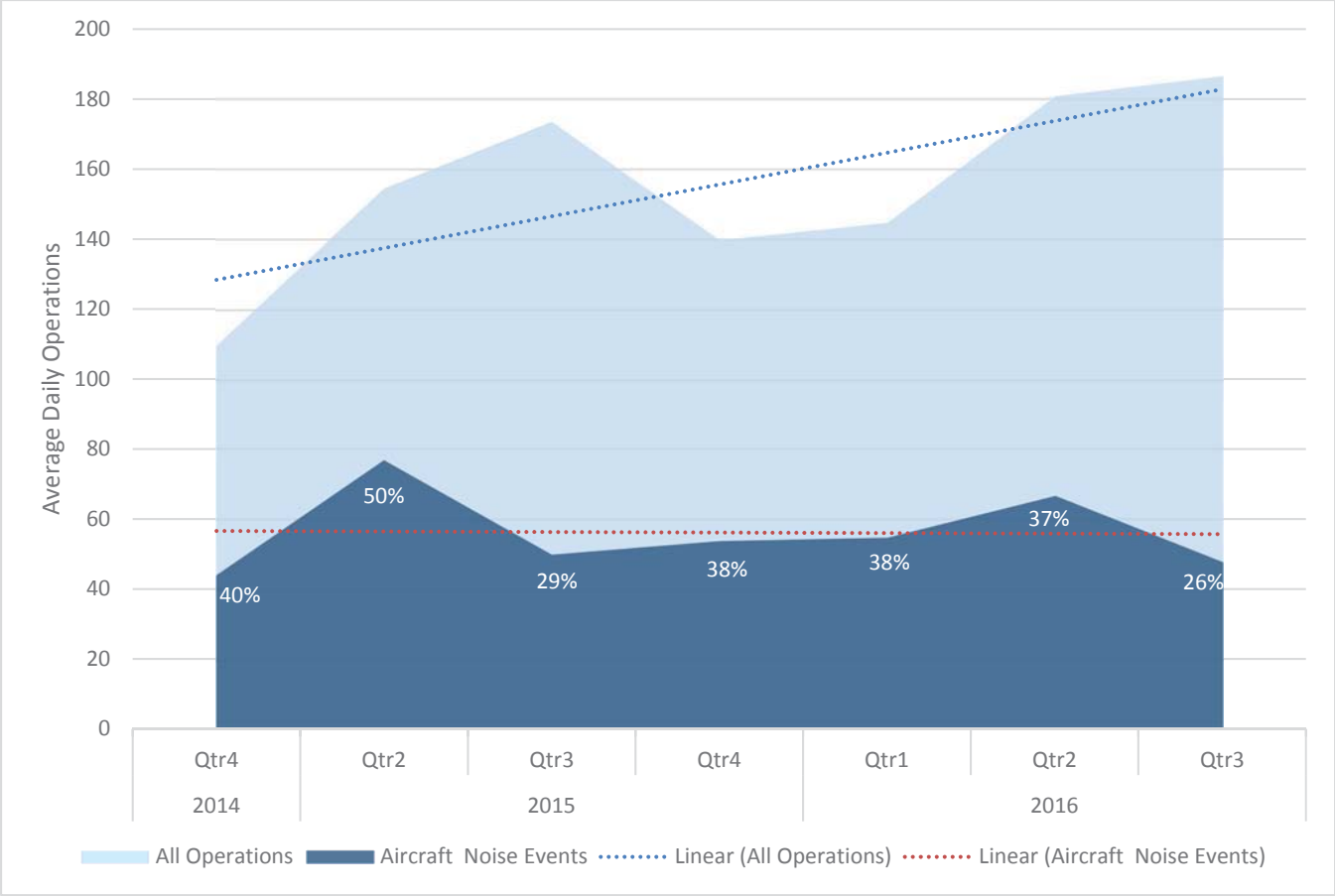






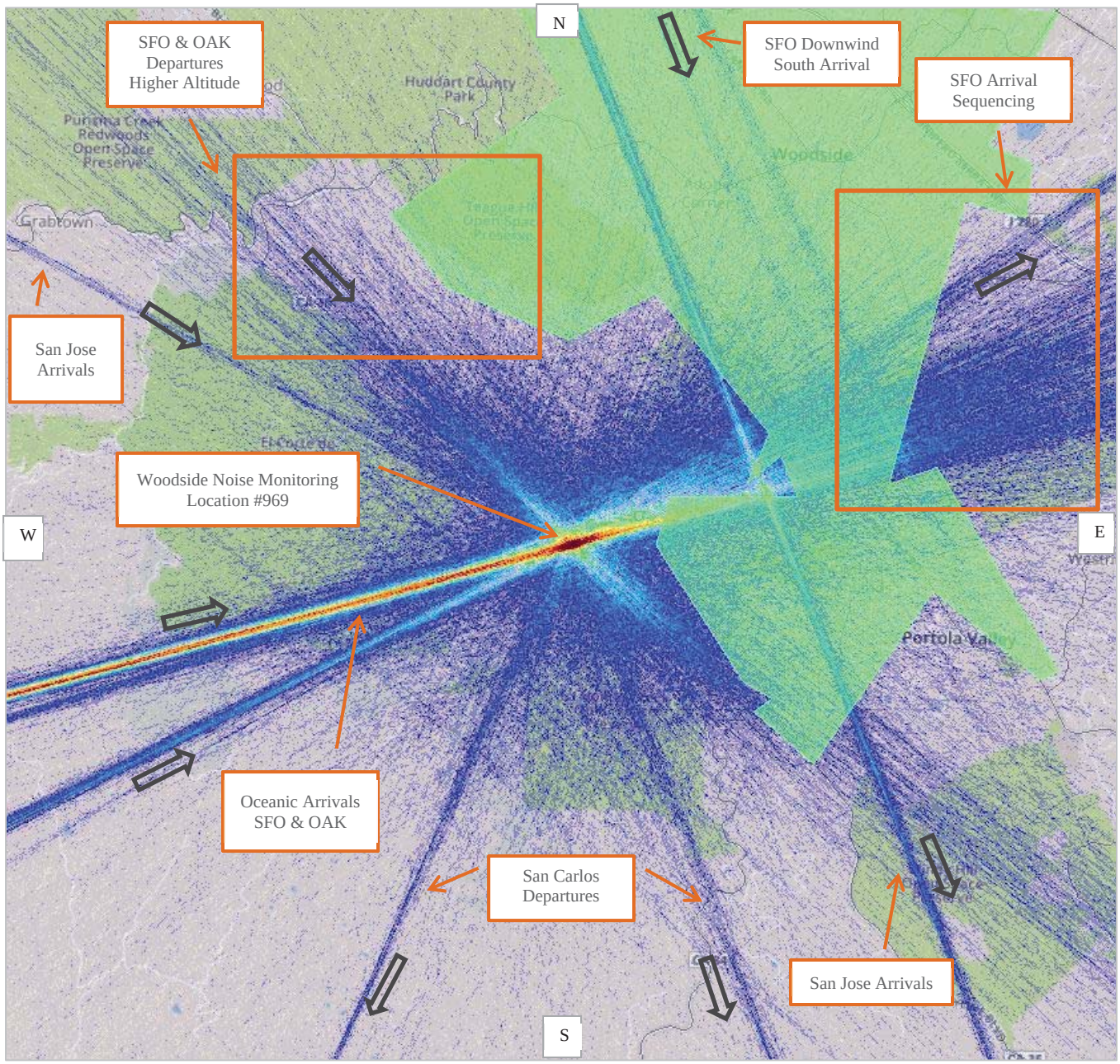
All aircraft which flew within a cylindrical airspace of 2 miles in radius and 15,000 feet in height, known as Point of Closest Approach (PCA); centered on the measurement location were evaluated for this measurement period. A daily average of 152 flights penetrated this airspace. An average of 36% of flights exceeded the threshold used to detect aircraft noise and registered events on the noise monitor. Appendix 3 lists these aircraft by type.

Table 9 - Average Daily Operations for each Quarter vs. Aircraft Noise Events (%)



Track Density

Below photo shows the track density of all flights that created a noise event during the monitoring periods. A track density plot is a grid, displayed over the map, and colored according to the number of flights that have passed through each grid point. It shows the density of flights using the same route. The noise monitor is located at the Woodside VOR, so it is anticipated to have the highest concentration (dark red) in the immediate vicinity of the VOR.



Air Traffic Direction ⟹

Aircraft Noise Reporters

Analysis of noise reports includes all Woodside noise reporters and reports from September 2014 to December 2016, not just during the noise monitoring periods. The number of noise reporters has un upward trend, more noticeable the number of reports has increased significantly. Nighttime reports between 10:00 p.m. and 7:00 a.m. account for 14% of all submitted noise reports. Table 11 depicts percentage of aircraft noise events and noise reports by hour of the day. During the evening hours there is a noticeable spike of noise reports disproportionate with aircraft noise events. All things considered, it seems reasonable to assume that the evening hours are most disturbing to noise reporters due to low ambient noise levels.

Table 10 - Noise Reporters

Yearly Quarters	Noise Reporters[1]	Noise Reports
2014		
Qtr4	1	10
2015		
Qtr1	6	32
Qtr2	3	75
Qtr3	6	154
Qtr4	4	3451
2016		
Qtr1	17	4453
Qtr2	39	8695
Qtr3	6	7368
Qtr4	29	7395

[1]Unique noise reporters for each quarter.

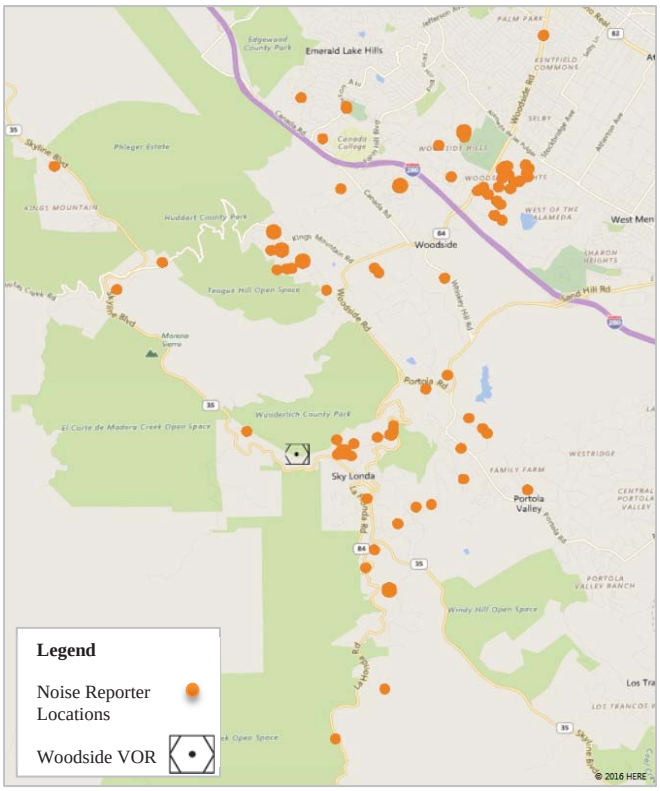
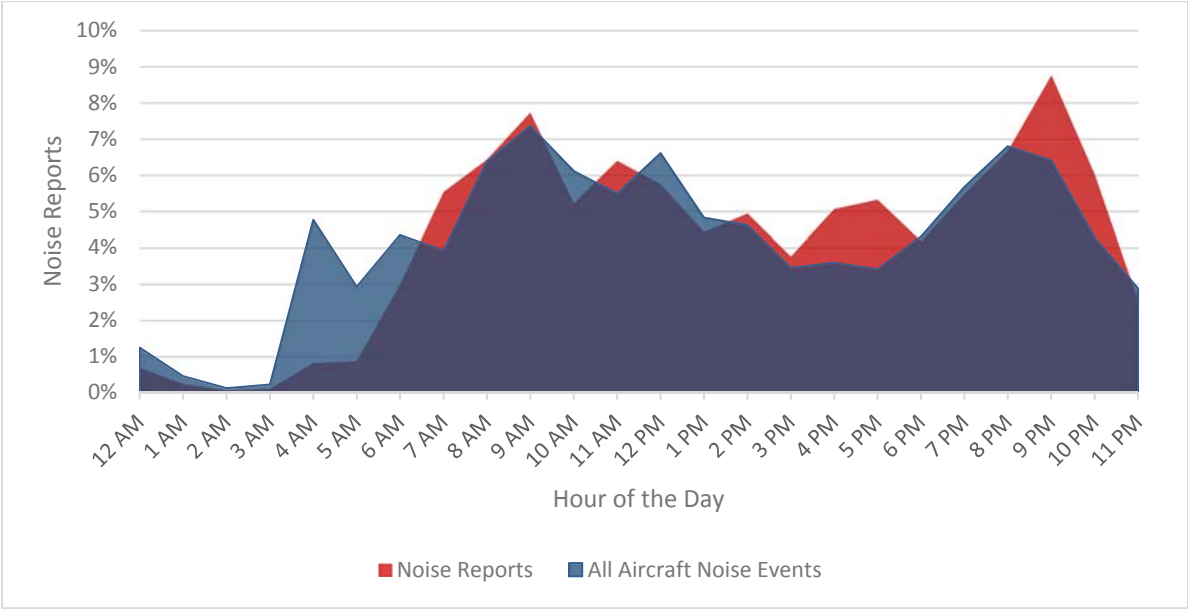


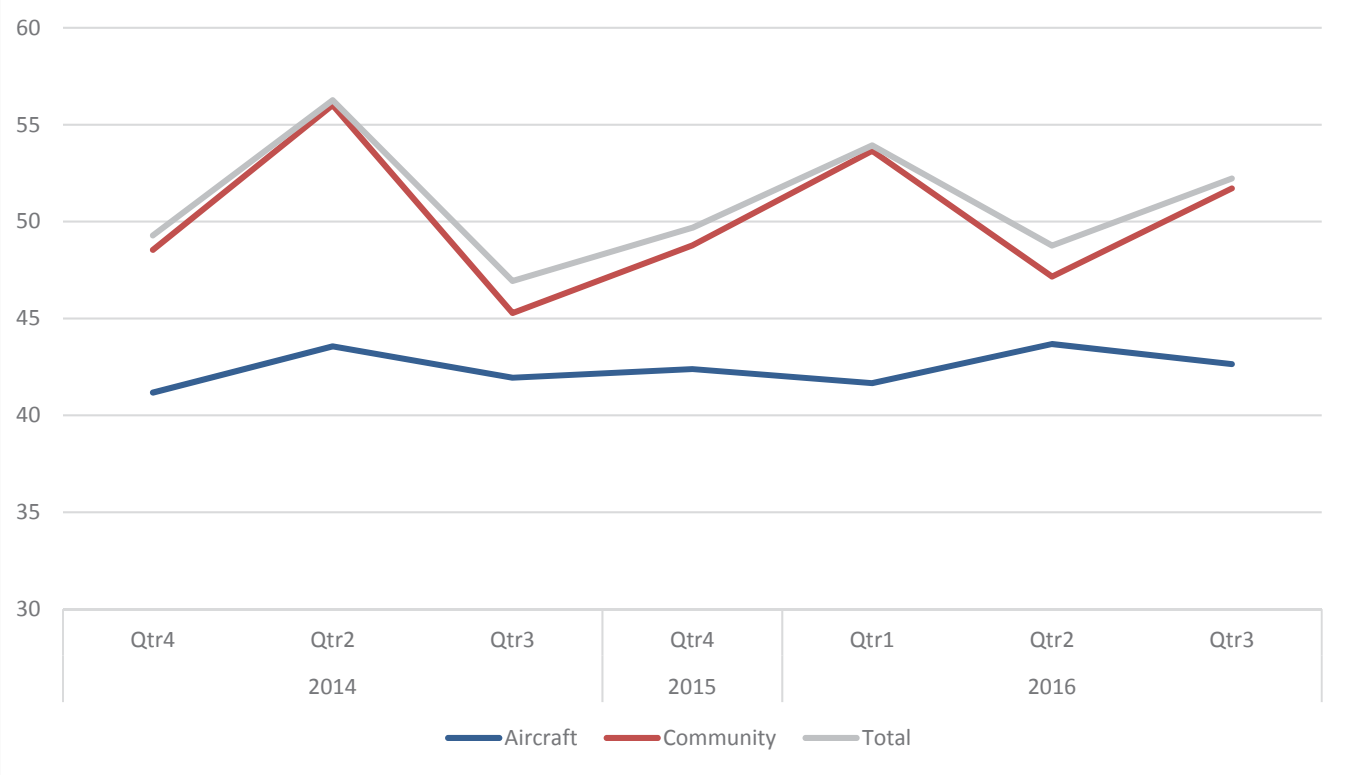
Table 11 – Noise Reports and Aircraft Noise Events by Hour of the Day



Conclusion

Aircraft noise levels were measured at the Woodside VOR, approximately 16 miles away from SFO. Flights above Woodside typically consist of arrivals to Bay Area airports. In high traffic conditions or inclement weather days Woodside community experiences more air traffic due to aircraft vectoring. More than half of the flights are associated with SFO operations.
The computed level for the average **Aircraft CNEL** was 43dBA, the average **Community CNEL** was 52dBA. Overall aircraft noise measurements contribute 1dBA additional noise to the **Total** cumulative average noise level of 53dBA CNEL.

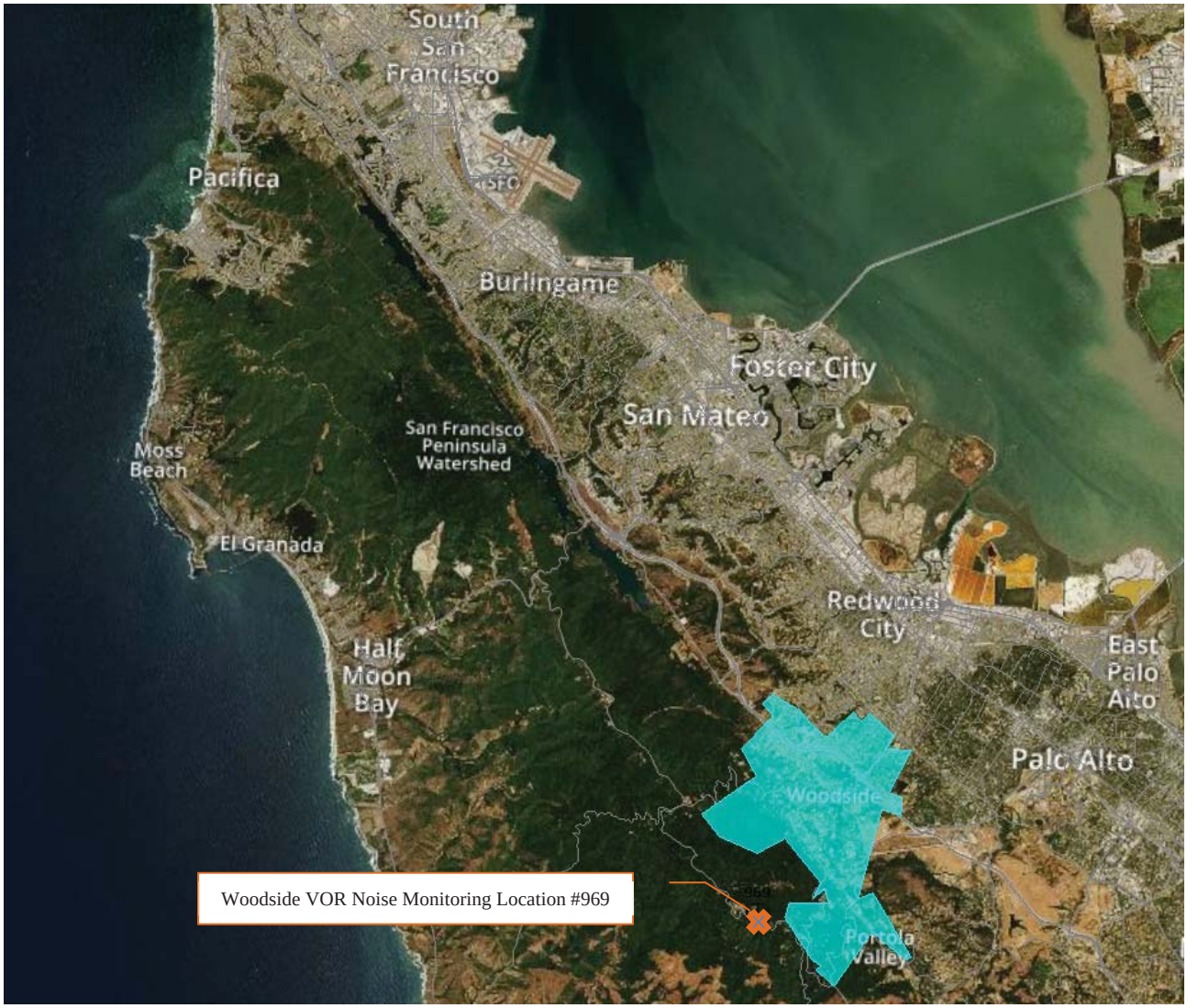
Table 12 – CNEL



The California Code of Federal Regulations, Title 21, Division 2.5, Chapter 6, paragraph 5012 states, "The standard for the acceptable level of aircraft noise for persons living in the vicinity of airports is hereby established to be a community noise equivalent level of 65 decibels." Since the average Aircraft CNEL was measured at 43dBA at the Woodside VOR, this residential area has an acceptable level of aircraft noise as defined by state law. The extent of the 65dBA CNEL noise impact contour at SFO is shown on page 18. This noise contour was generated using Federal Aviation Administration's Integrated Noise Model (version 7.0d). The Federal Aviation Administration accepted this map as part of the Noise Exposure Map update under Federal Aviation Regulations Part 150 on January 29, 2016. The results of the field monitoring validate the extent of the 65dBA CNEL noise impact boundary confirming Aircraft CNEL is less than 65dBA CNEL for this location.

Figure 1 – **Microphone mounted on tripod and Monitor at the Woodside VOR.**

Figure 2 - **Monitoring Location #969 and Woodside (blue zone)**



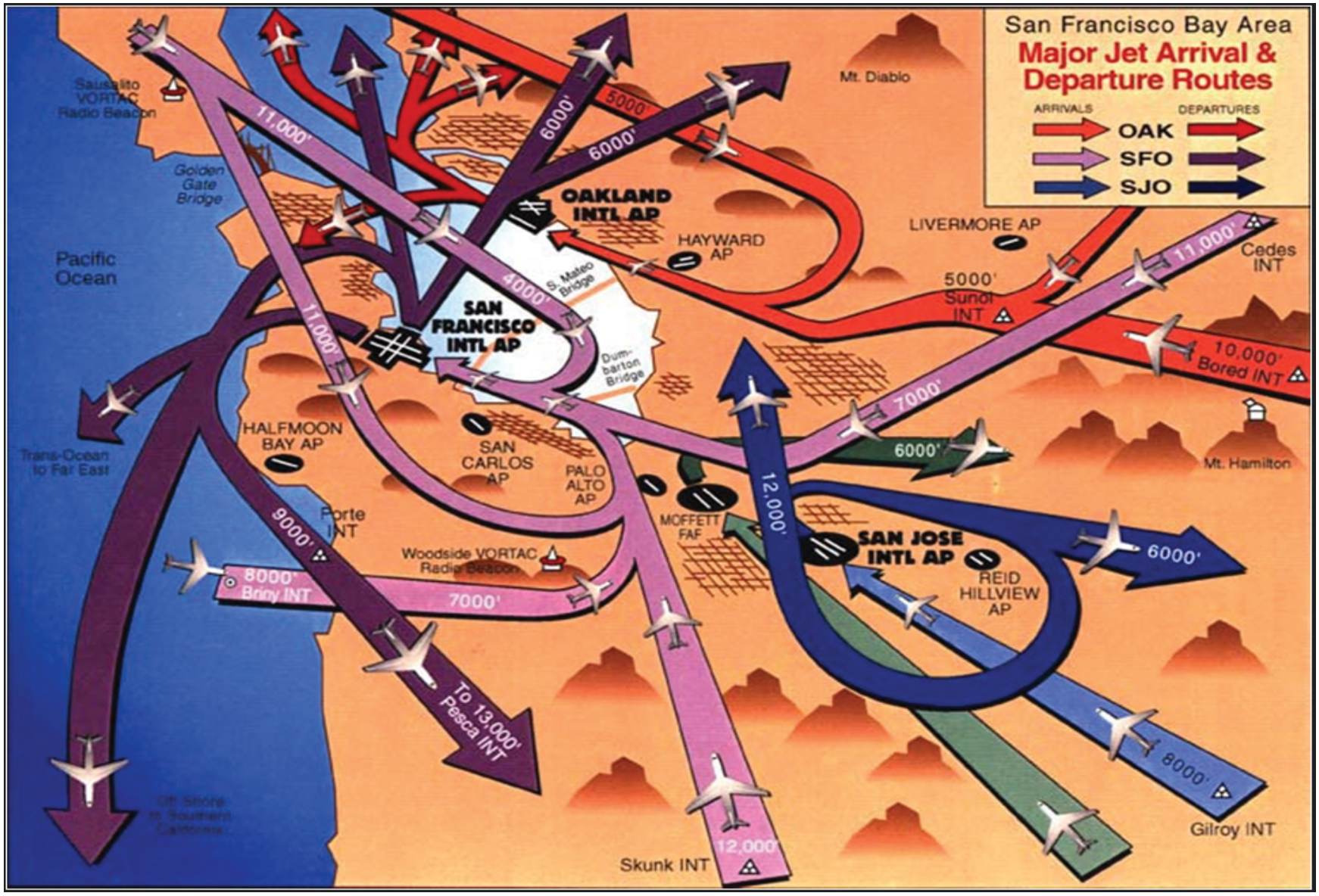
Appendix 1 – Noise Measurement Days

Quarter	Date	Number of monitoring days
4thQ 2014	11/05 - 11/20	16
1stQ 2015*	-	-
2ndQ 2015	5/08 - 6/03	27
3rdQ 2015	7/30 - 8/16	18
4thQ 2015	11/05 - 11/29	25
1stQ 2016	2/18 - 3/07	19
2ndQ 2016	5/05 - 5/17	13
3rdQ 2016	8/04 - 8/18	15
4thQ 2016**	-	-
133 noise monitoring days over 2 year period		

*No Access
**Equipment Power Outage

Appendix 2 – San Francisco Bay Area Major Jet Arrival and Departure Routes

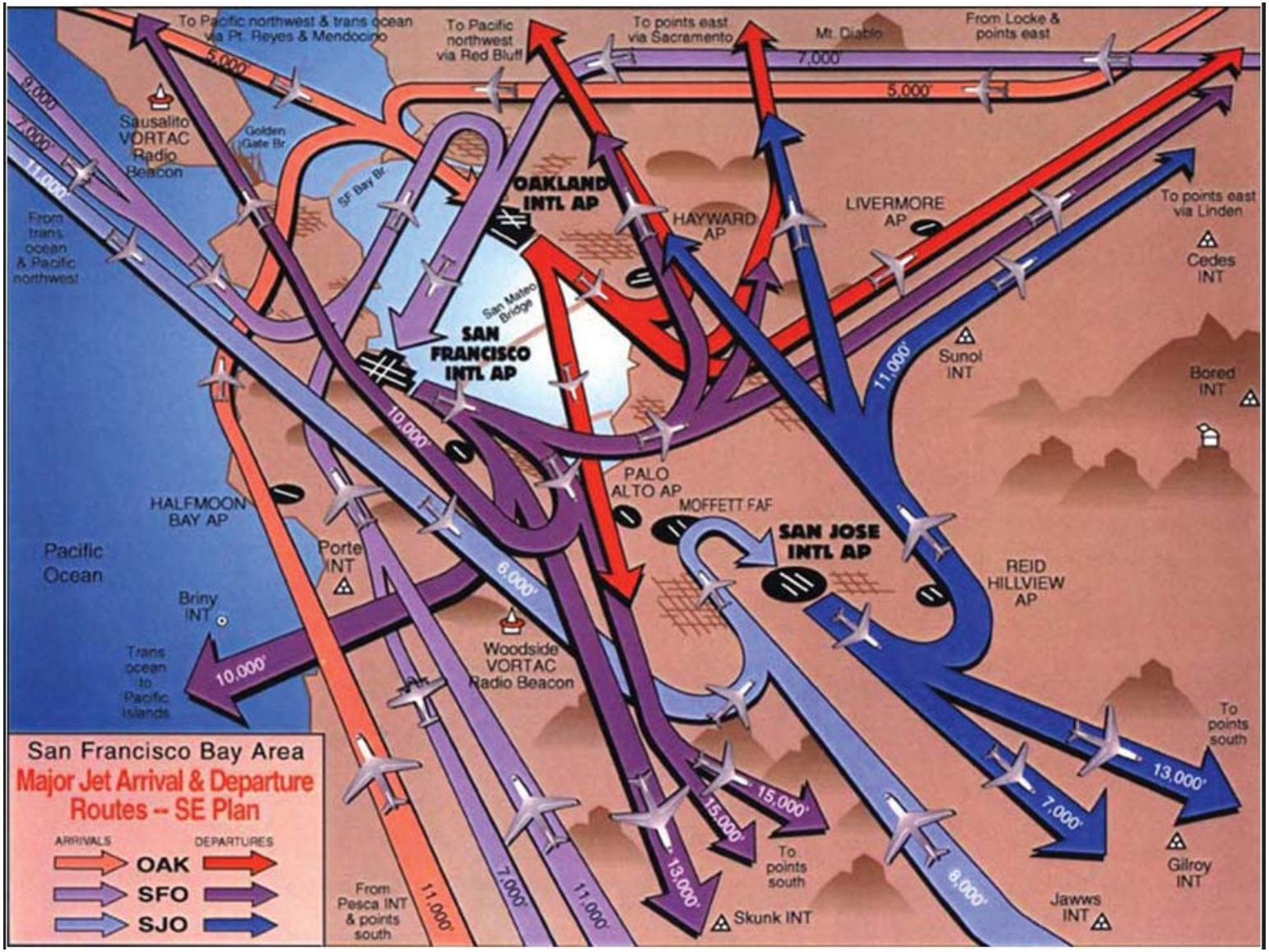
West Flow Plan



Note: Image not to scale and not all flights paths are shown.

San Francisco Bay Area Major Jet Arrival and Departure Routes

Southeast Flow Plan



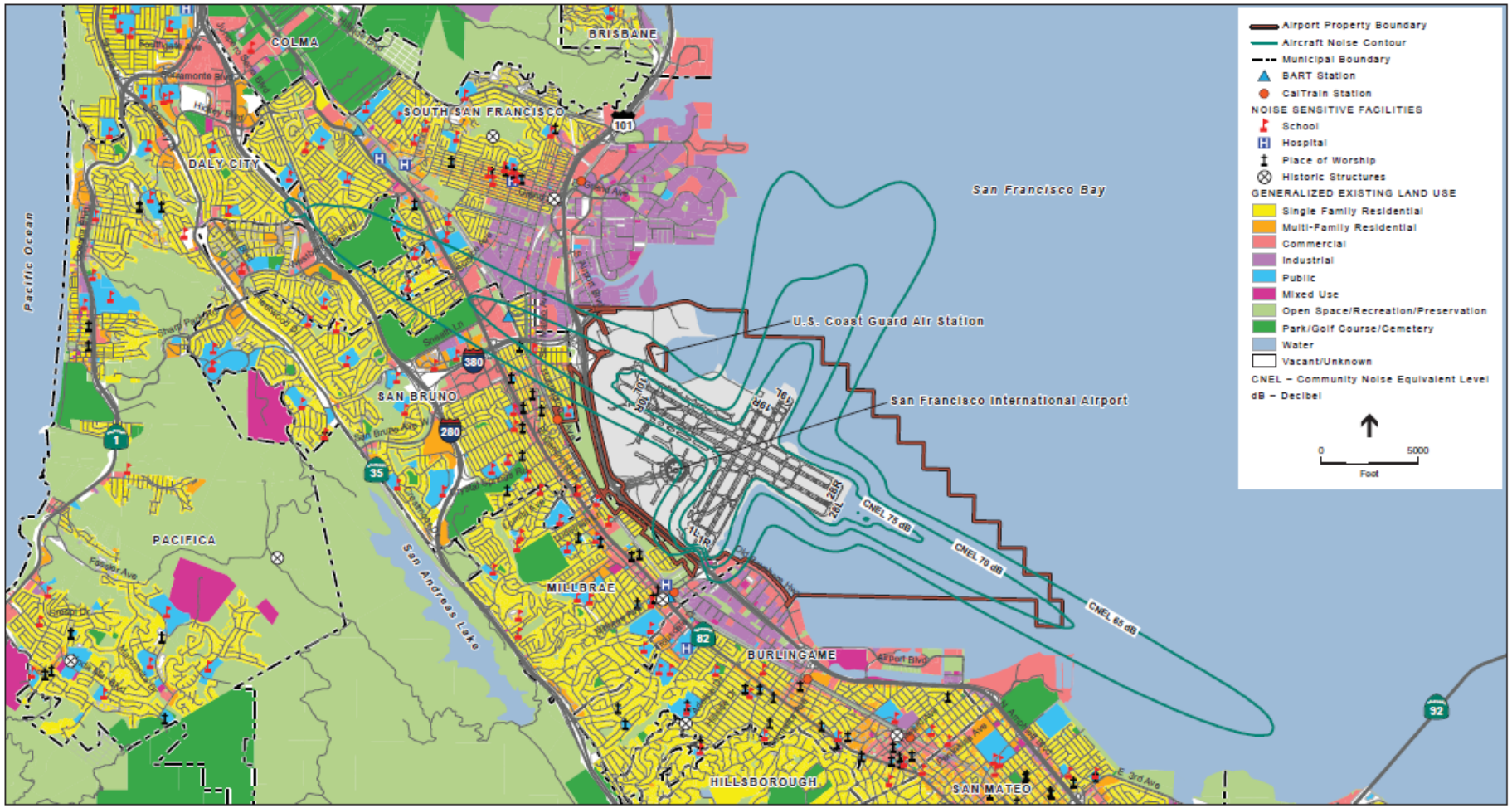
Note: Image not to scale and not all flight paths are shown.

Appendix 3 – Aircraft Type Reference Sheet

Aircraft Code	Description
	Wide Body Jet
A306	Airbus A300-600F
A332	Airbus A330-200
A333	Airbus A330-300
A343	Airbus A340-300
A346	Airbus A340-600
A388	Airbus A380-800
B744	Boeing 747-400
B747	Boeing 747
B748	Boeing 747-8
B762	Boeing 767-200
B763	Boeing 767-300
B764	Boeing 767-400
B772	Boeing 777-200
B773	Boeing 777-300
B77L	Boeing 777-200LR
B77W	Boeing 777-300ER
B788	Boeing 787-8
B789	Boeing 787-9
MD11	McDonnell Douglas MD-11
DC10	Douglas DC-10
	Narrow Body Jet
A319	Airbus A319
A320	Airbus A320
A321	Airbus A321
B712	Boeing 717-200
B722	Boeing 727-200
B733	Boeing 737-300
B734	Boeing 737-400
B735	Boeing 737-500
B737	Boeing 737-700
B738	Boeing 737-800
B739	Boeing 737-900
B752	Boeing 757-200
B753	Boeing 757-300
CRJ2	Bombardier CRJ200
CRJ7	Bombardier CRJ700
CRJ9	Canadair/Bombardier CRJ-900
DC3	Douglas DC-3
DH8D	DeHavilland Dash 8-Q400
E120	Embraer E120
E170	Embraer EMB 170
E175	Embraer ERJ-175
E190	Embraer ERJ-190
E45X	Embraer E145XR
E75L	Embraer E175
E75S	Embraer E175
MD83	McDonnell Douglas MD-83
	Military
C130	Lockheed C-130
C30J	Lockheed Martin C-130
E6	Boeing E-6B Mercury
OV10	North American/ Rockwell OV-10 Bronco
P3	Lockheed P-3 Orion
T38	Northrop T-38 Talon
V22	Bell-Boeing V-22 Osprey
	Helicopter
B206	Bell 206
EC20	Eurocopter EC120 Colibri
H60	Sikorsky H-60
HELO	Helicopter
R44	Robinson R-44
	General Aviation Aircraft
AA5	Grumman AA-5 Tiger
AC11	Rockwell Commander 112
AC50	Aero Commander 500
AEST	Piper Aerostar
AS65	Aerospatiale AS-365 Dauphin
B36T	Beechcraft Bonanza
BE24	Beechcraft Musketeer
BE30	Beechcraft Super King Air 300
BE33	Beechcraft Debonair
BE36	Beechcraft 36 Bonanza
BE55	Beechcraft 55 Baron
BE58	Beechcraft Baron
BE76	Beechcraft 76 Duchess
BE77	Beechcraft Skipper
BE95	Beechcraft Travel Air
BE9L	Beechcraft 90 King Air
C152	Cessna C152
C162	Cessna C162
C172	Cessna 172 Skyhawk
C177	Cessna Cardinal
C180	Cessna C180
C182	Cessna C182 Skylane
C195	Cessna C195
C206	Cessna 206 Super Skylane
C210	Cessna C210
C240	Cessna C240
C310	Cessna C310
C320	Cessna C320
C337	Cessna C337
C340	Cessna 340
C353	Cessna C353
C414	Cessna C414
C425	Cessna C425
C441	Cessna C441 Conquest
C550	Cessna C550/Citation II
C56X	Cessna 560XL/Citation Excel
C650	Cessna 650/Citation III
C72R	Cessna Cutlass RG
C82R	Cessna Turbo Skylane RG
CH7A	Champion Tri-Traveler
COL4	Cessna 400/TTx
DA40	Diamond DA-40
DA42	Diamond DA-42
EVSS	Evektor SportStar
EXPR	Wheeler Express
F33A	Beechcraft F33 Bonanza
KODI	Quest Kodiak
LANC	Lancair
LEG2	Lancair Legacy
LNC4	Lancair 4
LNCE	Lancair ES
M20	Mooney M-20
M20P	Mooney M-20
M20T	Mooney M-20 Turbo
P180	Piaggio P-180 Avanti
P28A	Piper 28A Cherokee
P28B	Piper PA-28B Cherokee
P28R	P-28B
P46T	Piper PA-46 Meridian
PA18	Piper Pa-18 Super Cub
PA23	Piper PA-23 Apache
PA24	Piper PA-24 Comanche
PA27	Piper PA-27 Aztec
PA28	PA-28
PA31	Piper PA-31 Navajo
PA32	Piper PA-32 Cherokee Six
PA34	Piper PA-34 Seneca
PA38	Piper PA-38 Tomahawk
PA46	Piper Malibu/Mirage
PAY1	Piper Cheyenne
RV6	Vans RV-6
RV7	Van's Aircraft RV-7
RV8	Vans RV-8
S22T	Cirrus S
SR20	Cirrus SR-20
SR22	Cirrus SR-22
T182	Cessna 182
T210	Cessna 210
XL2	Liberty XL-2
	Business Aircraft
B350	Beechcraft 350 Super King Air
B350	Beechcraft King Air 350
BE20	Beechcraft 200 King Air
BE40	Beechcraft 400 Beechjet
C208	Cessna 208 Caravan
C25A	Cessna Citation CJ2
C25B	Cessna Citation CJ3
C25C	Cessna Citation CJ4
C510	Cessna 510 Citation Mustang
C525	Cessna 525 Citation CJ1
C560	Cessna 560 Citation V
C56X	Cessna 560XL Citation Excel
C650	Cessna Citation III
C680	Cessna 680 Citation Sovereign
C750	Cessna 750 Citation X
CL30	Bombardier Challenger 300
CL35	Bombardier Challenger 350
CL60	Bombardier Challenger 600
E50P	Embraer Phenom 100
E55P	Embraer EMB-500 Phenom 300
F2TH	Dassault Falcon 2000
F900	Dassault Falcon 900 (tri-jet)
FA7X	Dassault Falcon 7X
G150	Gulfstream 150
G280	Gulfstream G280
GALX	Dassault Falcon 900EX
GL5T	Bombardier Global Express
GLEX	Bombardier Global Express (twin-jet)
GLF3	Gulfstream III
GLF4	Gulfstream 4
GLF5	Gulfstream 5
GLF6	Gulfstream 6
H25B	Raytheon/Hawker 800
H25C	Hawker 800/850
HA4T	Hawker Beechcraft 4000
LJ30	Learjet 35
LJ31	Learjet 31
LJ35	Learjet 35
LJ45	Learjet 45
LJ55	Learjet 55
LJ60	Learjet 60
MU2	Mistubishi MU-2
PAY2	Piper Cheyenne ii
PC12	Pilatus PC-12 Eagle
SW3	Swearingen Merlin III
TBM7	Socata TBM 700
TBM8	Socata TBM 800

Wide Body Jet (wide enough for two passenger aisles); **Narrow Body Jet** (wide enough for one passenger aisles); **Business Aircraft** (transportation for small groups of people); **General Aviation Aircraft** (Generally small, propeller-driven aircraft); **Helicopters** (Aircraft operated by rotor blades); **Military** (U.S Military Aircraft).

Appendix 4 – 2014 Noise Exposure Map



SOURCE: ESRI, 2014; San Mateo County Planning and Building Department, 2014; ESA Airports, 2014

SFO FAR Part 150 Noise Exposure Map Report . 120932

Exhibit 5-1
2014 Noise Exposure Map – San Francisco International Airport

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Aircraft Noise Terminology & Metric

Supplement

San Francisco International Airport Noise Abatement Office
P.O. Box 8097 San Francisco, CA 94128
(650) 821-5100

2014

Aircraft Noise Terminology & Metric

To assist in understanding the noise measurement results and the metric used in evaluating airport noise, this supplement provides a brief introduction to various acoustic terminologies used to express sound level. The terms discussed are the decibel (dB), A-weighted decibel (dBA), Maximum Noise Level (Lmax), Sound Exposure Level (SEL) and time-weighted, cumulative metric known as Community Noise Equivalent Level (CNEL).

The **decibel (dB)** is the unit used to represent the change in sound pressure as a direct measurement of changes in amplitudes on array of frequencies. Decibels measure a scale from the threshold of human hearing – 0 dB, towards the threshold of pain about 120-140 dB. Because decibels are such a small measure, they are computed logarithmically and cannot be added arithmetically. An increase of 10 dB is perceived by our ears as a doubling of noise. Most sounds we experience in our day-to-day lives vary between 30 dB and 100 dB. Figure 1 depicts decibel levels of common sounds.

A-weighted decibel (dBA) is sound pressure levels filtered with an "A" weighted filter de-emphasizing level changes that occur at lower frequencies (those below 500 Hertz) and also at very high frequencies above 10,0000 Hertz where people generally do not hear as well. The normal frequency range of hearing for most people is from a low of 500 Hertz to a high of 10,000 Hertz. This filter closely matches our ears' sensitivity to sound. As a result, an aircraft noise event with a higher A-weighted sound level is perceived to be louder than an aircraft noise event with a lower A-weighted sound level. This correlation with our perception of loudness is the reason that A-weighted sound levels are used to evaluate environmental noise sources.

The sound level heard during an arrival or departure of an aircraft varies as a function of the distance from the aircraft to the person hearing the noise and as a function of the direction of the aircraft noise source. As the aircraft approaches the person, the sound level increases and as the aircraft moves away from the person, the sound level decreases. The effect of noise exposure during such an event can be described in terms of either the Maximum Sound Level or the Sound Exposure Level of an individual aircraft noise event.

The **Maximum Sound Level (Lmax)** represents the highest instantaneous noise level heard during a single aircraft overflight. However, it provides no information on the duration (length) of the noise exposure. Thus, two events with the exact Lmax may produce completely different total exposures. While some people will be annoyed by events having shorter duration, majority of people are more likely to be highly annoyed with longer events continuing for extended period of time. To account for differing durations of an event, Sound Exposure Level is used to quantify total noise exposure for a single aircraft overflight.

The **Sound Exposure Level (SEL)** is the total sound energy above an established threshold for a single event considering both intensity and length of the event all compressed into 1 second. The SEL of any noise event is the entire event's total energy expressed in a reference period time as though it had occurred within one second. A noise event having a Lmax of 80 dbA and lasting 1 second would have a SEL of 80 dBA. But if that event lasted 2 seconds long, the SEL would be 83 dBA. Two events with the same intensity but different durations can be differentiated with the longer duration event having a higher SEL. For locations relatively close to an airport, the SEL for most aircraft departures will usually be about 10 decibels higher than the corresponding Lmax. For example, an aircraft departure producing a maximum sound level of 70 dB at a particular location would be expected to produce an SEL value of about 80 dB at the same location. SEL gives us a common basis for comparing noise events that matches our instinctive impression – the higher the SEL, the more annoying it is likely to be. Figure 2 is a graphic representation of a typical aircraft noise event along with these terminologies.

In the example below, the SEL is calculated for an aircraft noise event that has a duration of 5 seconds and a Lmax of 65 dBA. This noise event is numerically equivalent to a SEL of 69.6 dBA.

Sound Exposure Level Formula:

$$SEL = 10 * \log_{10}\left(\sum_{i=1}^{n} 10^{L_i/10}\right)$$

Where SEL = sound exposure level
L_i = sound level for a given one second time period
n = number of seconds during the measurement period

SEL calculation example:

The rows below list the 1 second decibel levels and the corresponding energy levels of the 5 seconds duration aircraft noise event. The energy levels are summed together in order to calculate the SEL value of the aircraft noise event.

Seconds	Sound Level	Energy
1	60 dB	1000000.0
2	63 dB	1995262.3
3	65 dB (LMax)	3162277.7
4	63 dB	1995262.3
5	60 dB	1000000.0
	Total Energy	9152802.3
	Aircraft Noise Event's SEL	**69.6 dB**

The **Community Noise Equivalent Level (CNEL)** metric is used to assess and regulate aircraft noise exposure in communities surrounding airports located in California. Federal Government approved and defined in the California Airport Noise Standards, this cumulative metric represents the average daytime noise level during a 24-hour day and adjusted to an equivalent level to account for increased sensitivity to aircraft noise during evening and nighttime periods relative to the daytime. CNEL applies a 4.77 dBA weighting to all aircraft events occurring during the 3 evening hours from 7:00 p.m. to 9:59:59 p.m. and a 10 dBA weighting to all aircraft events during the 9 nighttime hours from 10:00 p.m. to 6:59:59 a.m.

Aircraft CNEL is then derived using the SELs from all aircraft events for the 24 hour day. The Total CNEL will include all aircraft events as well as other noise events generated in the community during the corresponding time period. Typically, Total CNEL in our environment ranges from a low of 40-45 dBA in very quiet locations to 80-85 dBA immediately adjacent to an active noise source – busy traffic route or active airport. Figure 3 shows representative values of CNEL in typically different environments. Aircraft CNEL greater than 65 dBA CNEL within a residential property line is incompatible to airport operations. CNEL is calculated using the following formula:

$$CNEL = 10 * \log_{10}\left(\left[\sum_{i=1}^{n} 10^{SEL_i/10} + \sum_{i=n+1}^{m} 10^{(SEL_i+4.8)/10} + \sum_{i=m+1}^{r} 10^{(SEL_i+10)/10}\right]\right) - 49.4$$

Day Evening Night

CNEL calculation example showing 10 aircraft noise events in a 24 hour period:

Time of Day	Hour	SEL (dB)	Weighting (dB)	Weighted SEL (dB)	Energy
Night	Midnight	86.1	10	96.1	4073802778.0
Night	1:00 a.m.		10		
Night	2:00 a.m.		10		
Night	3:00 a.m.		10		
Night	4:00 a.m.		10		
Night	5:00 a.m.	90.0	10	100.0	10000000000.0
Night	6:00 a.m.	86.1	10	96.1	4073802778.0
Day	7:00 a.m.		0		
Day	8:00 a.m.	93.6	0	93.6	2290867652.8
Day	9:00 a.m.		0		
Day	10:00 a.m.	82.6	0	82.6	181970085.9
Day	11:00 a.m.		0		
Day	Noon	90.3	0	90.3	1071519305.2
Day	1:00 p.m.		0		
Day	2:00 p.m.		0		
Day	3:00 p.m.		0		
Day	4:00 p.m.		0		
Day	5:00 p.m.	94.8	0	94.8	3019951720.4
Day	6:00 p.m.		0		
Evening	7:00 p.m.		4.77		
Evening	8:00 p.m.		4.77		
Evening	9:00 p.m.	86.1	4.77	90.9	1221799660.2
Night	10:00 p.m.	85.2	10	95.2	3311311214.8
Night	11:00 p.m.	89.5	10	99.5	8912509381.3
				Total Energy	38157534576.7
				Aircraft CNEL	**56.4 dB**

Figure 1 – Common Sound Levels

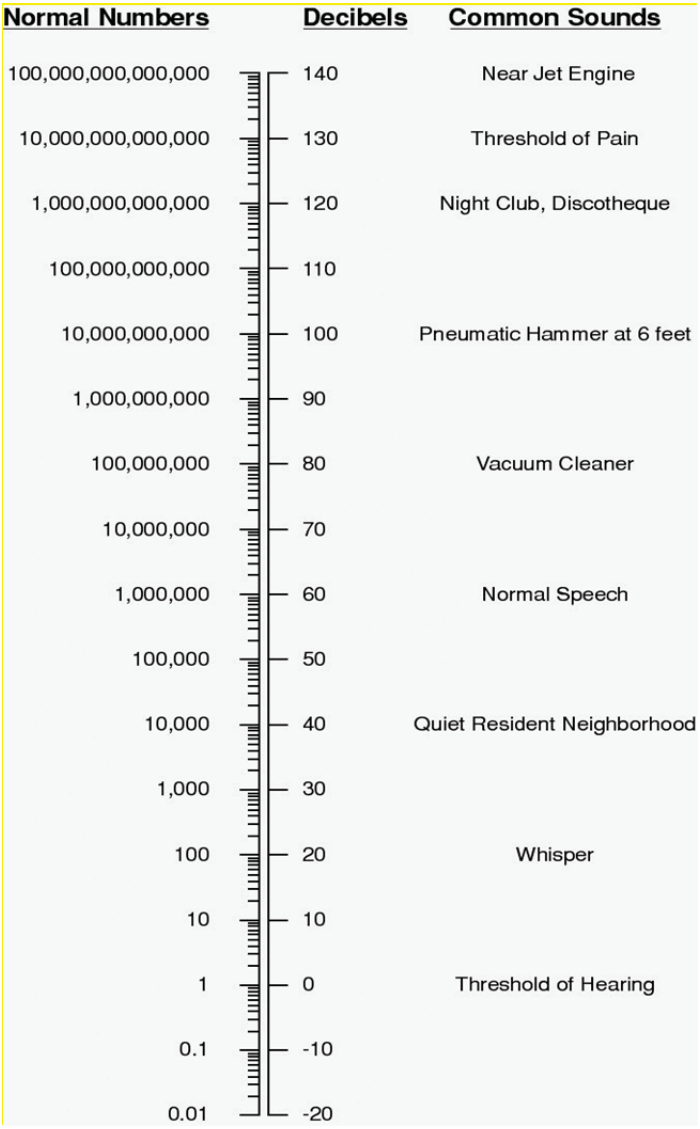


Figure 2 – Typical Aircraft Noise Event

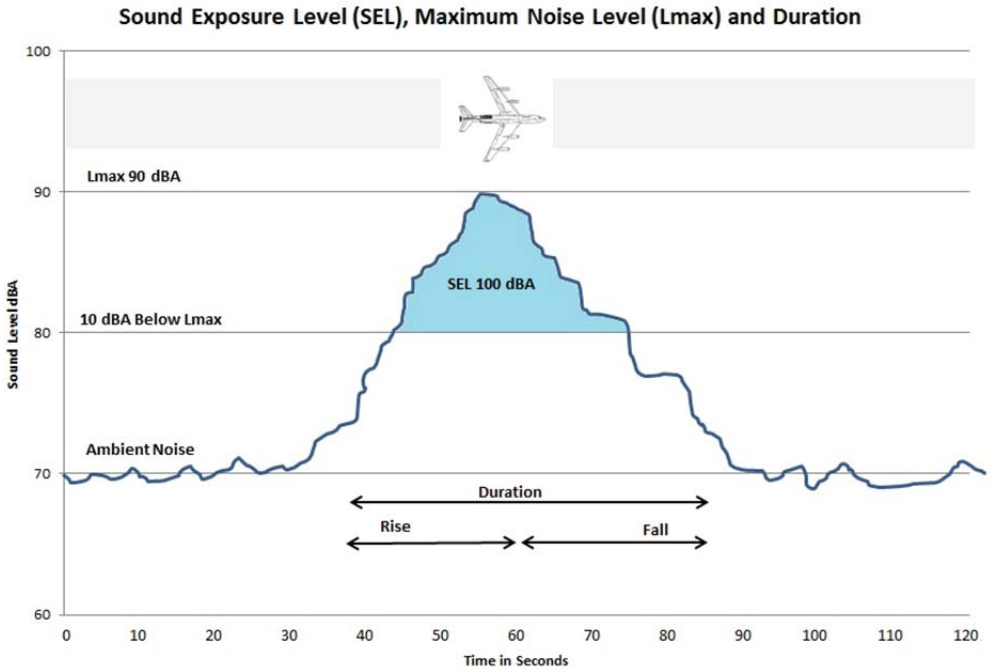
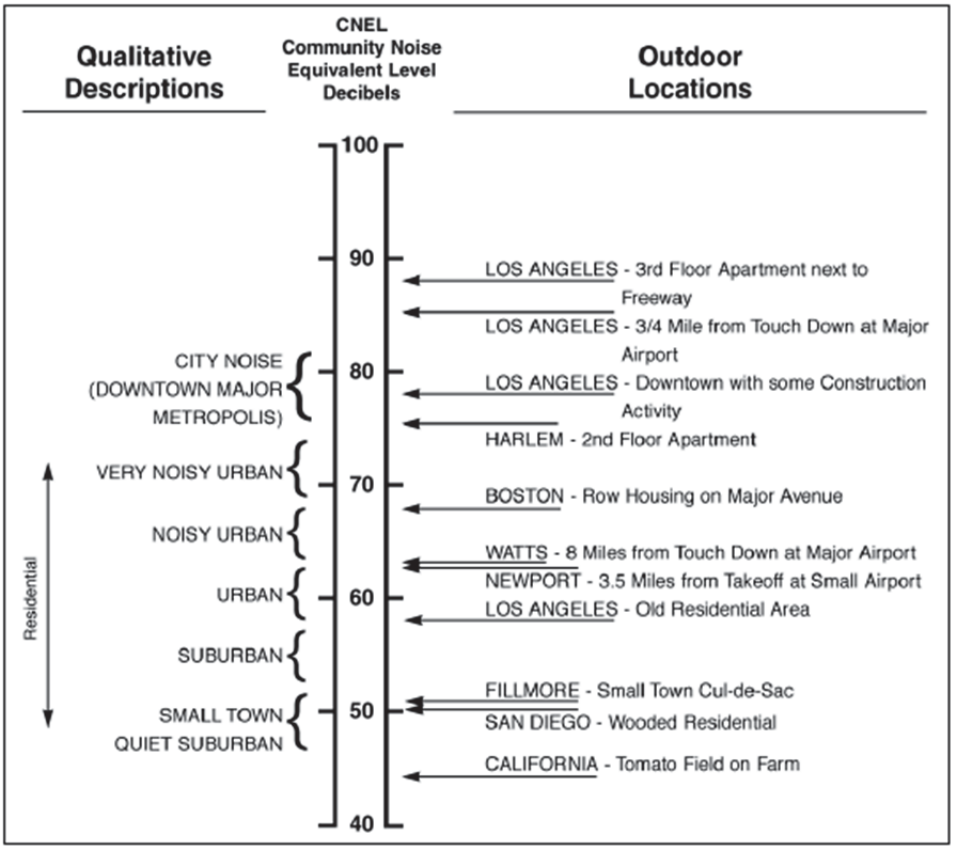


Figure 3 – Representative Cumulative Sound Levels



AIRPORT NOISE NEWS

Regular Meeting # 306
April 5, 2017

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Airport Noise Report

A weekly update on litigation, regulations, and technological developments

Volume 29, Number 9 March 24, 2017

NASA

PRESIDENT SIGNS BILL AUTHORIZING $640 M. FOR NASA'S FY 2017 AERONAUTICS PROGRAM

On March 21, President Trump signed into law legislation authorizing $640 million for NASA's Aeronautics program in FY 2017 and $19.5 billion for the agency overall.

The National Aeronautics and Space Administration Transition Authorization Act of 2017 (S. 442) requires the agency to develop, within one year, research roadmaps in the areas of hypersonic aircraft, supersonic aircraft, and rotorcraft.

In February 2016, NASA awarded a $20 million contract to Lockheed Martin for the preliminary design of a low-boom supersonic demonstrator aircraft (28 ANR 30). The low-boom SST demonstrator is the first in a series of 'X-planes' in NASA's New Aviation Horizons (NAH) Initiative, introduced in former President Obama's Fiscal Year 2017 budget request for NASA (28 ANR 17).

Supersonic aircraft are able to fly faster than the speed of sound (771 miles per hour) or Mach 1. Hypersonic aircraft fly at Mach 5 – 8: five to eight times the speed of sound (3,836 mph – 6,138 mph). NASA's NAH Initiative does not include

(Continued on p. 35)

Phoenix Sky Harbor

FAA RNAV IMPLEMENTATION COMES UNDER TOUGH SCRUTINY BY APPEALS COURT JUDGE

The legal arguments the Department of Justice mounted to justify the process FAA used to implement controversial RNAV departure procedures at Phoenix Sky Harbor International Airport in 2014 came under tough scrutiny in a withering examination by Judge Judith W. Rogers of the U.S. Court of Appeals for the District of Columbia Circuit.

Judge Rogers presided over a three-judge panel that held an oral argument on March 17 on lawsuits filed by the City of Phoenix and Story Preservation Association, Inc. challenging FAA's approval of RNAV departure procedures that moved flight paths away from rural and sparsely-populated areas and over neighborhoods of Phoenix never exposed to aircraft noise, including the city's refurbished historic district.

The public outrage that ensued sparked the litigation filed by city officials who had not been directly informed by FAA of the pending flight path changes and were suddenly caught in a political whirlwind.

Arizona congressional representatives and the state's two senators stepped in trying to find ways to reduce the aircraft noise impact, with Sen. John McCain (R)

(Continued on p. 37)

In This Issue…

NASA, from p. 34

development of a hypersonic X-plane demonstrator.

S. 442 authorizes funding only for FY 2017, which began on Oct. 1, 2016, and is almost half over. NASA had been funded under a Continuing Resolution that continued its FY 2016 funding level.

Title VI of the legislation addresses NASA's Aeronautics Program and specifies what the research roadmaps for hypersonic, supersonic, and rotorcraft must include.

Hypersonic Aircraft: NASA must develop the research roadmap for hypersonic aircraft "in consultation with the heads of other relevant Federal agencies."

The objective of the research roadmap "is to explore hypersonic science and technology using air-breathing propulsion concepts, through a mix of theoretical work, basic and applied research, and development of flight research demonstration vehicles." The roadmap must recommend "appropriate Federal agency contributions, coordination efforts, and technology milestones."

Supersonic Aircraft: The goal of the research roadmap for supersonic aircraft "is to develop and demonstrate, in a relevant environment, airframe and propulsion technologies to minimize the environmental impact, including noise, of supersonic overland flight in an efficient and economical manner."

The roadmap must include;

• The baseline research as embodied by the Administration's existing research on supersonic flight;

• A list of specific technological, environmental, and other challenges that must be overcome to minimize the environmental impact, including noise, of supersonic over- land flight;

• A research plan to address the challenges listed, including a project timeline for accomplishing relevant research goals;

• A plan for coordination with stakeholders, including relevant government agencies and industry; and

• A plan for how the Administration will ensure that sonic boom research is coordinated as appropriate with relevant Federal agencies.

Rotorcraft: The goal of the research roadmap for rotorcraft "and other runway-independent air vehicles" is to develop and demonstrate improved safety, noise, and environmental impact in a relevant environment.

The roadmap must include "specific goals for the research, a timeline for implementation, metrics for success, and guidelines for collaboration and coordination with industry and other Federal agencies."

Presidents Trump's FY 2018 budget request seeks only $624 million for NASA's Aeronautics Program (29 ANR 30) but Congress could increase that amount.

San Carlos Airport

COUNTY TO CONSIDER LIMITS ON NOISY AIRCRAFT OPERATIONS

San Mateo County, CA, is considering imposing a nighttime curfew and other restrictions on operations by "noisy" aircraft at general aviation San Carlos Airport.

A draft airport ordinance announced on March 3 appears to be aimed at limiting flights by Surf Air, a start-up airline that began operations at San Carlos Airport in June 2013 under a new business model where passengers pay a monthly fee for unlimited flights to other cities mainly in California.

Surf Air's all-you-can-fly-for-a-flat-fee model has been very successful, with its operations at San Carlos increasing from three departures and arrivals per day initially to about 15 or more operations per day, on average, now.

However, community complaints about the carrier, which is not directly identified in the draft ordinance, have increased along with its operations.

San Mateo's draft airport ordinance would impose a nighttime curfew from 9 p.m. to 6 a.m. on "noisy" aircraft, which are defined as those with maximum certificated noise level of 74.5 dBA or greater that are not rated by FAA as Stage 2, 3, or 4 aircraft.

The draft ordinance also would restrict operations by "noisy" aircraft to no more than one landing and one takeoff during the curfew's shoulder hours in the morning (6 a.m. – 9 a.m.) and evening (6 p.m. to 9 p.m.)

The draft ordinance would catch 66 "noisy" aircraft types, including the Pilatus PC-12s flown by Surf Air.

Board Will Consider Restrictions in July

The San Mateo County Board of Supervisors will likely consider the draft airport ordinance in July.

To gather a better sense of how its proposed airport noise restrictions might impact the community and airport users, the County will hold focus group sessions and a town hall meeting over the next 60 days and will solicit comments from key stakeholders, such as the San Carlos pilots and business associations, neighboring cities and the public.

Over the past year, the County of San Mateo said it has been analyzing the negative impacts to surrounding communities from aircraft operations at San Carlos Airport.

The analysis has included evaluating noise management programs and policies at similar general aviation airports, reviewing changes to flight paths over the last five years, a community survey and meetings, and implementing better technology to track noise complaints.

Last year, the County in collaboration with the FAA and its local congressional delegation, launched a six-month pilot study of the Bayside Visual Approach, an alternate arrival flight path into the airport for Surf Air flights.

During that time, overflights by Surf Air were reduced by approximately 60 percent for those areas under the existing GPS arrival flight path. As a result, approximately 140,000

residents regionally benefitted, the County estimated.

The pilot program ended in January and the FAA is now expediting a study of the pilot test results.

The County has requested that the FAA adopt the Bayside Visual Approach at San Carlos Airport for all flight arrivals, which, it said, could result in an even more dramatic shift in overflights and noise levels.

But with no clear answer on when the FAA will make its decision, County leaders said they are eager to provide affected residents with more immediate relief.

"We're sensitive to residents' concerns about noise and also don't want to hinder our pilots more than necessary. We value both as vital contributors to our community and are working to strike the right balance," said Assistant County Manager Mike Callagy.

More information about the proposed ordinance, including a list of affected aircraft, FAQs and a copy of the letter sent to stakeholders is available at publicworks.smcgov.org.

Comments on the proposed ordinance should be sent to SQLFlightRestrictions@smcgov.org

Denver Int'l

S. BOULDER RESIDENTS PROPOSE TWEAK TO DEPARTURE PATH

A group of South Boulder, CO, residents wants FAA to "tweak" an RNAV departure path out of Denver International Airport implemented in 2013 that concentrated aircraft noise over their community and several others population centers in Boulder County.

"Our community seeks immediate relief from the unwelcomed surge of DIA airport noise over South Boulder, noticeably beginning as an irritation in 2015 and presently at an intolerable level of impact," South Boulder resident Pamela Barsam Brown, asserted in a statement to ANR.

"While an Environmental Assessment [of the RNAV departure] was executed, the FAA did so without notifying officials elected to represent the City of Boulder. These revisions were undertaken despite the fact our environment was to be predictably and substantially altered," she said.

"In fact, concentrated routes over South Boulder, Louisville, Nederland, and the Indian Peaks Wilderness has conservatively increased noise impact by a factor of three. There are in excess of 70 overflights per day some occurring at two to three minute intervals. The FAA persists in live-testing the maximum level of airport noise citizens are willing to tolerate – and we have certainly met ours in spades."

On March 9, the South Boulder residents presented their solution for reducing the increased noise impact over their community caused by the so-called westbound 'FOOOT' flight path out of DIA to a group of local and state elected officials.

They proposed that the FOOOT flight path be shifted roughly six miles to the south, over an unpopulated area, and closer to where it was located prior to 2013.

Such a change would cut about three to five air miles off of each departure on the FOOOT track, depending on which runway was used, the group estimated.

"For an estimated range of 40-80 flights per day on this route, that could save up to 400 air miles per day, or about 12,000 air miles per month, and translates into considerable fuel and time savings for the airlines," the group stressed in its presentation at the meeting.

The change also would bring the FAA into compliance with the National Park Service Natural Sounds policy by moving aircraft away from the Indian Peaks Wilderness area thereby preserving its soundscape, the South Boulder residents argued.

Attending the March 9 meeting were aides to Colorado Senators Michael Bennet (D) and Cory Gardner (R), Colorado Congressman Jared Polis (D), and the state senator and assemblywoman representing the Boulder area, as well as Boulder Mayor Suzanne Jones and Boulder Councilwoman Lisa Morzel.

Barsam Brown said the elected officials and their representatives attending the meeting were supportive of the South Boulder group's proposed tweak to the RNAV departure.

FAA confirmed that an environmental review was conducted for the RNAV procedure when it was put in place but was not certain if Boulder officials were notified prior to implementation.

Barsam Brown said Boulder officials were not notified and no notice was placed in the local newspaper.

FAA said the community outreach process on Performance-based Navigation Procedures that is in place now is much more robust than it was in 2012.

The issue of how FAA notifies local officials that it plans to implement PBN procedures was the focus of an oral argument held by a three-judge panel of the D.C. Court of Appeals in two lawsuits filed by the City of Phoenix and a neighborhood group (see story on p. 34).

Noise Mapping

BTS ISSUES FIRST NATIONAL TRANSPORTATION NOISE MAP

On March 21, the U.S. Department of Transportation's Bureau of Transportation Statistics' (BTS) releases its first National Transportation Noise Map, which will track trends in aviation and highway noise in the United States at the national, state, and county level.

The map is at https://www.rita.dot.gov/bts/press_releases/bts015_17

It shows that more than 97 percent of the U.S. population has the potential to be exposed to noise from aviation and Interstate highways at levels below 50 decibels "or roughly comparable to the noise level of a humming refrigerator,"

BTS said.

"A much smaller segment of the U.S. resident population has the potential to be exposed to higher levels of aviation and Interstate highway noise. Less than one-tenth of a percent of the population could potentially experience noise levels of 80 decibels or more, equivalent to the noise level of a garbage disposal," BTS said in a press release announcing its new noise map.

The purpose of the noise map, BTS explained, "is to facilitate the tracking of trends in transportation-related noise, by mode, and collectively for multiple transportation modes. The data allow viewing the national picture of potential exposure to aviation and highway noise. The data also allow viewing of the potential exposure at the state or county level."

The layers of the BTS National Transportation Noise Map will be updated on an annual basis and future versions are expected to include additional transportation noise sources, such as rail and maritime.

The BTS map contains aircraft and road noise inventory data provided as web map services (WMS) for use with Geographic Information Systems (GIS), computer programs that can store, analyze, and present spatial or geographic data.

"The geospatial data provides a basis for understanding what-if scenarios and helping policy makers to prioritize noise-related transportation investments," BTS said.

The noise mapping initiative used data sources from the FAA and Federal Highway Administration (FHWA) to create a comprehensive map of noise levels. The FAA's Aviation Environmental Design Tool was used to model the average number of daily flight operations from airports across the country, excluding airports with exclusively military operations.

Phoenix, from p. 34

finally able to include a provision in a defense bill requiring the FAA to review the controversial NextGen flight paths out of Sky Harbor, which were granted a categorical exclusion from environmental review by FAA, and to take steps to mitigate the negative effects these changes have had on communities (29 ANR 1).

Judge Rogers asked most of the questions posed by the panel in the oral argument and focused on three issues:

• Why didn't the City of Phoenix file its petition seeking review of FAA's decision to implement the new flight paths within the 60-day window required under law and did reasonable grounds exist for the city to wait beyond that point to file?

• What recourse do parties affected by FAA flight path changes have to get the agency to reconsider them other than to take the agency to court and why does FAA not have processes and procedures spelling out what parties should do?

• How did FAA interpret its obligation under the National Historic Preservation Act "to consult with a representative of local government" prior to implementing the RNAV procedures? Why did FAA notify the airport's noise officer about the flight path changes and not city officials with policy-making authority?

Judge Rogers said FAA's strategy of giving the RNAV departure procedures a categorical exclusion under the National Environmental Policy Act seems designed to avoid the more extensive public notification and consultation required in environmental assessments and environmental impact statements.

When to File Petition

DOJ attorney Lane McFadden asserted that the FAA's final order approving the RNAV procedures was issued on Sept. 14, 2014, the day the FAA issued a map in the *Federal Register* showing the new departure routes and began implementing them.

The City of Phoenix failed to file its litigation within the 60-day window following that date and therefore lost its opportunity to litigate the issue, McFadden told the court. To DOJ the issue is cut and dry.

But John Putnam of Kaplan Kirsch & Rockwell, which represents the City of Phoenix, disagreed, arguing that the 60-day clock for seeking court review did not begin ticking until June 2015 when the FAA finally made clear in a letter to the City that it would not make changes to the flight paths the city had proposed and would not consult with the Phoenix historic preservation officer on the impact of the flight path changes.

Judge Rogers appeared sympathetic to Putnam's argument. She noted that in a January 2015 letter, FAA Administrator Michael Huerta told city officials that FAA would consider the noise impact of the new flight paths and the city would be part of the FAA's post-implementation analysis that would be conducted.

Phoenix officials "were lulled into believing" that FAA was taking their concerns seriously and would substantively address them, Judge Rogers told McFadden. The city officials had meetings with the FAA and corresponded with the agency and FAA "lulled then into not running to court." But when it became clear to the city that FAA would not do anything, they did go to court.

Aren't FAA's actions sufficient to stop the 60-day period until FAA said it would not change the flight paths? Judge Rogers asked.

Putnam agreed, arguing that the "reasonable grounds exception" to having to take FAA to court within 60 days should apply in this case because the City had to wait until FAA "consummated its decision-making process" on the flight paths and that did not occur until June 2015.

McFadden asserted that such reasoning would push the reasonable grounds exception beyond prior court limits.

How Does Public Get FAA to Reconsider

Judge Rogers was very concerned about how parties affected by FAA flight path changes get the agency to reconsider them.

She said a "black hole" exists in FAA processes and procedures making it unclear what an affected party has to do to get FAA to reconsider final decisions.

"I'm concerned about a federal agency making decisions that affect people's lives without having a process for agency review," she said, noting that the City of Phoenix had to get Congress to pass a statute to get FAA to reconsider its flight path changes.

DOJ's McFadden told Judge Rogers those affected by FAA flight path changes need to file lawsuits to protect themselves.

"So maybe FAA ought to let entities know that," Judge Rogers shot back.

Who Must FAA Notify

Judge Rogers also focused her questioning on why FAA chose to notify the noise officer in the Phoenix Aviation Department about its pending flight path changes and not city officials with policy-making authority.

FAA had an obligation [under the National Historic Preservation Act] to consult with the city and you interpret that as with a low level employee," Judge Rogers told DOJ's McFadden. The regulatory language says FAA has an obligation to consult with a representative of local government but the agency notified someone who has no authority to speak on behalf of the City of Phoenix, she said.

McFadden responded that FAA assumed that the airport noise officer would send the information on the RNAV implementation higher up the chain of command.

"So, FAA interprets NHPA to say it can consult with a non-policy person and is not obligated to notify policy making officials?" Judge Rogers asked.

"All indications were that there would be no adverse impact," McFadden said.

"If you live in our region [D.C.], you would know that noise from aircraft is a serious public issue, so what may be a 5 dB increase on a chart may not be viewed in the same way by residents in the area," Judge Rogers told the DOJ attorney.

Attorneys always stress that it is not possible to determine how a court will rule in a case from the questions asked at an oral argument. And, while Judge Rogers seemed sympathetic to the arguments being made by Phoenix, Judge David Sentelle noted several times during the oral argument that parties are required to file petitions seeking review of FAA final actions within 60 days.

A recording of the oral argument, about one hour and 15 minutes in length, is posted at the court's website at:

https://www.cadc.uscourts.gov/recordings/recordings.nsf

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San Francisco International Airport

Aircraft Noise Abatement Office

Glossary of common Acoustic and Air Traffic Control terms

A

ADS-B - **Automatic Dependent Surveillance – Broadcast** – ADS-B uses ground based antennas and in-aircraft displays to alert pilots to the position of other aircraft relative to their flight path. ADS-B is a key element of NextGen.

Air Carrier - A commercial airline with published schedules operating at least five round trips per week.

Air Taxi – An aircraft certificated for commercial service available for hire on demand.

ALP - Airport Layout Plan – The official, FAA approved map of an airport's facilities.

ALS – Approach Lighting System - Radiating light beams guiding pilots to the extended centerline of the runway on final approach and landing.

Ambient Noise Level – The existing background noise level characteristic of an environment.

Approach Lights – High intensity lights located along the approach path at the end of an instrument runway. Approach lights aid the pilot as he transitions from instrument flight conditions to visual conditions at the end of an instrument approach.

APU - Auxiliary Power Unit – A self-contained generator in an aircraft that produces power for ground operations of the electrical and ventilation systems and for starting the engines.

Arrival – The act of landing at an airport.

Arrival Procedure - A series of directions on a published approach plate or from air traffic control personnel, using fixes and procedures, to guide an aircraft from the en route environment to an airport for landing.

Arrival Stream – A flow of aircraft that are following similar arrival procedures.

ARTCC – Air Route Traffic Control Center - A facility providing air traffic control to aircraft on an IFR flight plan within controlled airspace and principally during the enroute phase of flight.

ATC - Air Traffic Control - The control of aircraft traffic, in the vicinity of airports from control towers, and in the airways between airports from control centers.

ATCT – Air Traffic Control Tower - A central operations tower in the terminal air traffic control system with an associated IFR room if radar equipped, using air/ground communications and/or radar, visual signaling and other devices to provide safe, expeditious movement of air traffic.

Avionics – Airborne navigation, communications, and data display equipment required for operation under specific air traffic control procedures.

Altitude MSL –Aircraft altitude measured in feet above mean sea level.

B

Backblast - Low frequency noise and high velocity air generated by jet engines on takeoff.

Base Leg – A flight path at right angles to the landing runway. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.

C

Center – See ARTCC.

CNEL – Community Noise Equivalent Level - A noise metric required by the California Airport Noise Standards for use by airport proprietors to measure aircraft noise levels. CNEL includes an additional weighting for each event occurring during the evening (7;00 PM – 9:59 PM) and nighttime (10 pm – 6:59 am) periods to account for increased sensitivity to noise during these periods. Evening events are treated as though there were three and nighttime events are treated as thought there were ten. This results in a 4.77 and 10 decibel penalty

penalty for operations occurring in the evening and nighttime periods, respectively.

CNEL Contour - The "map" of noise exposure around an airport as expressed using the CNEL metric. A CNEL contour is computed using the FAA-approved Integrated Noise Model (INM), which calculates the aircraft noise exposure near an airport.

Commuter Airline – Operator of small aircraft (maximum size of 30 seats) performing scheduled (maximum size of 30 seats) performing service between two or more points.

D

Decibel (dB) - In sound, decibels measure a scale from the threshold of human hearing, 0 dB, upward towards the threshold of pain, about 120-140 dB. Because decibels are such a small measure, they are computed logarithmically and cannot be added arithmetically. An increase of ten dB is perceived by human ears as a doubling of noise.

dBA - A-weighted decibels adjust sound pressure towards the frequency range of human hearing.

dBC - C-weighted decibels adjust sound pressure towards the low frequency end of the spectrum. Although less consistent with human hearing than A- weighting, dBC can be used to consider the impacts of certain low frequency operations.

Decision Height – The height at which a decision must be made during an instrument approach either to continue the approach or to execute a missed approach.

Departure – The act of an aircraft taking off from an airport.

Departure Procedure – A published IFR departure procedure describing specific criteria for climb, routing, and communications for a specific runway at an airport.

Displaced Threshold - A threshold that is located at a point on the runway other than the physical beginning. Aircraft can begin departure roll before the threshold, but cannot land before it.

DME - Distance Measuring Equipment - Equipment (airborne and ground) used to measure, in nautical miles, a slant range distance of an aircraft from the DME navigational aid.

DNL - Day/Night Average Sound Level - The daily average noise metric in which that noise occurring between 10:00 p.m. and 7:00 a.m. is penalized by 10 dB. DNL is often expressed as the annual-average noise level.

DNL Contour - The "map" of noise exposure around an airport as expressed using the DNL metric. A DNL contour is computed using the FAA-approved Integrated Noise Model (INM), which calculates the aircraft noise exposure near an airport.

Downwind Leg – A flight path parallel to the landing runway in the direction opposite the landing direction.

Duration - The length of time in seconds that a noise event lasts. Duration is usually measured in time above a specific noise threshold.

E

En route – The portion of a flight between departure and arrival terminal areas.

Exceedance— Whenever an aircraft overflight produces a noise level higher than the maximum decibel value established for a particular monitoring site, the noise threshold is surpassed and a noise exceedance occurs. An exceedance may take place during approach, takeoff, or possibly during departure ground roll before lifting off.

F

FAA - The Federal Aviation Administration is the agency responsible for aircraft safety, movement and controls. FAA also administers grants for noise mitigation projects and approves certain aviation studies including FAR Part 150 studies, Environmental Assessments, Environmental studies, Environmental Assessments, Environ Impact Statements, and Airport Layout Plans.

FAR – Federal Aviation Regulations are the rules and regulations, which govern the operation of aircraft, airways, and airmen.

FAR Part 36 – A Federal Aviation Regulation defining maximum noise emissions for aircraft.

FAR Part 91 – A Federal Aviation Regulation governing the phase out of Stage 1 and 2 aircraft as defined under FAR Part 36.

FAR Part 150 – A Federal Aviation Regulation governing noise and land use compatibility studies and programs.

FAR Part 161 – A Federal Aviation Regulation governing aircraft noise and access restrictions.

Fix – A geographical position determined by visual references to the surface, by reference to one or more Navaids, or by other navigational methods.

Fleet Mix – The mix or differing aircraft types operated at a particular airport or by an airline.

Flight Plan – Specific information related to the intended flight of an aircraft. A flight plan is filed with a Flight Service Station or Air Traffic Control facility.

FMS – Flight Management System - a specialized computer system in an aircraft that automates a number of in-flight tasks, which reduces flight crew workload and improves the precision of the procedures being flown.

G

GA - General Aviation – Civil aviation excluding air carriers, commercial operators and military aircraft.

GAP Departure – An aircraft departure via Runways 28 at San Francisco International Airport to the west over San Bruno, South San Francisco, Daly City, and Pacifica.

Glide Slope – Generally a 3-degree angle of approach to a runway established by means of airborne instruments during instrument approaches, or visual ground aids for the visual portion of an instrument approach and landing.

GPS - Global Positioning System – A satellite based radio positioning, navigation, and time-transfer system.

GPU - Ground Power Unit – A source of power, generally from the terminals, for aircraft to use while their engines are off to power the electrical and ventilation systems on the aircraft.

Ground Effect – The excess attenuation attributed to absorption or reflection of noise by manmade or natural features on the ground surface.

Ground Track – is the path an aircraft would follow on the ground if its airborne flight path were plotted on the ground the terrain.

H

High Speed Exit Taxiway – A taxiway designed and provided with lighting or marking to define the path of aircraft traveling at high speed from the runway center to a point on the center of the taxiway.

I

IDP - Instrument Departure Procedure - An aeronautical chart designed to expedite clearance delivery and to facilitate transition between takeoff and en route operations. IDPs were formerly known as SIDs or Standard Instrument Departure Procedures.

IFR - Instrument Flight Rules -Rules and regulations established by the FAA to govern flight under conditions in which flight by visual reference is not safe.

ILS - Instrument Landing System – A precision instrument approach system which normally consists of a localizer, glide slope, outer marker, middle marker, and approach lights.

IMC – Instrument Meteorological Conditions - Weather conditions expressed in terms of visibility, distance from clouds, and cloud ceilings during which all aircraft are required to operate using instrument flight rules.

Instrument Approach – A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

J

K

Knots – A measure of speed used in aerial navigation. One knot is equal to one nautical mile per hour (100 knots = 115 miles per hour).

L

Load Factor – The percentage of seats occupied in an aircraft.

Lmax – The peak noise level reached by a single aircraft event.

Localizer – A navigational aid that consists of a directional pattern of radio waves modulated by two signals which, when receding with equal intensity, are displayed by compatible airborne equipment as an “on-course” indication, and when received in unequal intensity are displayed as an “off-course” indication.

LDA – Localizer Type Directional Aid – A facility of comparable utility and accuracy to a localizer, but not part of a complete ILS and not aligned with the runway.

M

Middle Marker - A beacon that defines a point along the glide slope of an ILS, normally located at or near the point of decision height.

Missed Approach Procedure – A procedure used to redirect a landing aircraft back around to attempt another landing. This may be due to visual contact not established at authorized minimums or instructions from air traffic control, or for other reasons.

N

NAS – National Airspace System - The common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information, manpower and material.

Nautical Mile – A measure of distance used in air and sea navigation. One nautical mile is equal to the length of one minute of latitude along the earth's equator. The nautical mile was officially set as 6076.115 feet. (100 nautical miles = 115 statute miles)

Navaid – Navigational Aid.

NCT – Northern California TRACON – The air traffic control facility that guides aircraft into and out of San Francisco Bay Area airspace.

NDB – Non-Directional Beacon - Signal that can be read by pilots of aircraft with direction finding equipment. Used to determine bearing and can "home" in or track to or from the desired point.

NEM – Noise Exposure Map – A FAR Part 150 requirement prepared by airports to depict noise contours. NEMs also take into account potential land use changes around airports.

NextGen – The Next Generation of the national air transportation system. NextGen represents the movement from ground-based navigation aids to satellite-based navigation.

NMS – See RMS

Noise Contour – See CNEL and DNL Contour.

Non-Precision Approach Procedure – A standard instrument approach procedure in which no electronic glide slope is provided.

O

Offset ILS – Offset Parallel Runways – Staggered runways having centerlines that are parallel.

Operation – A take-off, departure or overflight of an aircraft. Every flight requires at least two operations, a take-off and landing.

Outer Marker – An ILS navigation facility in the terminal area navigation system located four to seven miles from the runways edge on the extended centerline indicating the beginning of final approach.

Overflight – Aircraft whose flights originate or terminate outside the metropolitan area that transit the airspace without landing.

P

PASSUR System – Passive Surveillance Receiver - A system capable of collecting and plotting radar tracks of individual aircraft in flight by passively receiving transponder signals.

PAPI – Precision Approach Path Indicator - An airport lighting facility in the terminal area used under VFR conditions. It is a single row of two to four lights, radiating high intensity red or white beams to indicate whether the pilot is above or below the required runway approach path.

PBN –Performance Based Navigation - Area navigation based on performance requirements for aircraft operating along an IFR route, on an instrument approach procedure or in a designated airspace.

Preferential Runways - The most desirable runways from a noise abatement perspective to be assigned whenever safety, weather, and operational efficiency permits.

Precision Approach Procedure – A standard instrument approach procedure in which an electronic glide slope is provided, such as an ILS. GPS precision approaches may be provided in the future.

PRM – Precision Runway Monitoring – A system of high-resolution monitors for air traffic controllers to use in landing aircraft on parallel runways separated by less than 4,300'.

Q

R

Radar Vectoring – Navigational guidance where air traffic controller issues a compass heading to a pilot.

Reliever Airport – An airport for general aviation and other aircraft that would otherwise use a larger and busier air carrier airport.

RMS – Remote Monitoring Site - A microphone placed in a community and recorded at San Francisco International Airport's Noise Monitoring Center. A network of 29 RMS's generate data used in preparation of the airport's Noise Exposure Map.

RNAV – Area Navigation - A method of IFR navigation that allows an aircraft to choose any course within a network of navigation beacons, rather than navigating directly to and from the beacons. This can conserve flight distance, reduce congestion, and allow flights into airports without beacons.

RNP – Required Navigation Performance - A type of performance-based navigation (PBN) that allows an aircraft to fly a specific path between two 3- dimensionally defined points in space. RNAV and RNP systems are fundamentally similar. The key difference between them is the requirement for on- board performance monitoring and alerting. A navigation specification that includes a requirement for on-board navigation performance monitoring and alerting is referred to as an RNP specification. One not having such a requirement is referred to as an RNAV specification.

Run-up – A procedure used to test aircraft engines after maintenance to ensure safe operation prior to returning the aircraft to service. The power settings tested range from idle to full power and may vary in duration.

Run-up Locations - Specified areas on the airfield where scheduled run-ups may occur. These locations are sited, so as to produce minimum noise impact in surrounding neighborhoods.

Runway – A long strip of land or water used by aircraft to land on or to take off from.

S

Sequencing Process – Procedure in which air traffic is merged into a single flow, and/or in which adequate separation is maintained between aircraft.

Shoreline Departure – Departure via Runways 28 that utilizes a right turn toward San Francisco Bay as soon as feasible. The Shoreline Departure is considered a noise abatement departure procedure.

SENEL – Single Event Noise Exposure Level - The noise exposure level of a single aircraft event measured over the time between the initial and final points when the noise level exceeds a predetermined threshold. It is important to distinguish single event noise levels from cumulative noise levels such as CNEL. Single event noise level numbers are generally higher than CNEL numbers, because CNEL represents an average noise level over a period of time, usually a year.

Single Event – Noise generated by a single aircraft overflight.

SOIA – Simultaneous Offset Instrument Approach Is an approach system permitting simultaneous Instrument Landing System approaches to airports having staggered but parallel runways. SOIA combines Offset ILS and regular ILS definitions.

STAR – Standard Terminal Arrival Route is a published IFR arrival procedure describing specific criteria for descent, routing, and communications for a specific runway at an airport.

T

Taxiway – A paved strip that connects runways and terminals providing the ability to move aircraft so they will not interfere with takeoffs or landings.

Terminal Airspace - The air space that is controlled by a TRACON.

Terminal Area – A general term used to describe airspace in which approach control service or airport traffic control service is provided.

Threshold – Specified boundary.

TRACON -Terminal Radar Approach Control – is an FAA air traffic control service to aircraft arriving and departing or transiting airspace controlled by the facility. TRACONs control IFR and participating VFR flights. TRACONs control the airspace from Center down to the ATCT.

U

V

Vector – A heading issued to a pilot to provide navigational guidance by radar. Vectors are assigned verbally by FAA air traffic controllers.

VFR – Visual Flight Rules are rules governing procedures for conducting flight under visual meteorological conditions, or weather conditions with a ceiling of 1,000 feet above ground level and visibility of three miles or greater. It is the pilot's responsibility to maintain visual separation, not the air traffic controller's, under VFR.

Visual Approach – Wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic facility and having an air traffic control authorization, may proceed to destination airport under VFR.

VASI – Visual Approach Slope Indicator - An airport lighting facility in the terminal area navigation system used primarily under VFR conditions. It provides vertical visual guidance to aircraft during approach and landing, by radiating a pattern of high intensity red and white focused light beams, which indicate to the pilot that he/she is above, on, or below the glide path.

VMC – Visual Meteorological Conditions - weather conditions equal to or greater than those specified for aircraft operations under Visual Flight Rules (VFR).

VOR - Very High Frequency Omni-directional Range – A ground based electronic navigation aid transmitting navigation signals for 360 degrees oriented from magnetic north. VOR is the historic basis for navigation in the national airspace system.

W

X

Y

Z

how to reach us

SFO Aircraft Noise Abatement Office mailing address is:
P.O. Box 8097, San Francisco, CA 94128

Phone:	**650.821.5100**
Fax:	**650.821.5112**
Noise Complaint Line:	**650.821.4736**
Toll Free Noise Complaint Line:	**877.206.8290**
Noise Complaint E-mail:	**sfo.noise@flysfo.com**
Airport Web Page:	**www.flysfo.com**
Noise Abatement Web Page:	**http://www.flysfo.com/community-environment/noise-abatement**
Roundtable Web Page:	**www.sforoundtable.org**