AGENDA

SANTA CLARA/SANTA CRUZ COUNTIES
AIRPORT/COMMUNITY ROUNDTABLE

Fifteenth Regular Meeting of the Roundtable

January 27, 2021
1:00 – 4:00 PM PST

This meeting will be conducted in accordance with State of California Executive Order N-29-20, dated March 17, 2020. All members of the Committee will participate by video conference, with no physical meeting location.

Members of the public wishing to observe the meeting live may do so at:
https://www.youtube.com/channel/UCtPEqHsvTSnRcJUCQxX2Ofw?view_as=subscriber
Youtube.com → SCSC Roundtable Channel

Members of the public wishing to comment on an item on the agenda may do so in the following ways:

1. Email comments to scscroundtable@gmail.com by 3:00 p.m. on January 26. Emails will be forwarded to the Committee. Emails received after 3:00 p.m. and prior to the Chair announcing that public comment is closed may be noted or may be read into the record by the Chair at the meeting (up to 3 minutes) at the discretion of the Chair. **IMPORTANT:** *Identify the Agenda Item number in the subject line of your email. All emails received will be entered into the record for the meeting.*

2. Provide oral public comments during the meeting by following the link to register in advance to access the meeting via Zoom Webinar: https://esassoc.zoom.us/j/85277551262

   a. You will be asked to enter an email address and a name. Your email address will not be disclosed to the public. After registering, you will receive an email with instructions on how to connect to the meeting. If you prefer not to provide an email, you may call in to the meeting (listed below) and view the live stream on the SCSC Roundtable YouTube Channel.

      Dial: US: +1 213 338 8477 or +1 669 219 2599 or +1 206 337 9723 or +1 346 248 7799 or +1 470 250 9358 or +1 646 518 9805 or 877 853 5247 (Toll Free) or 888 788 0099 (Toll Free) or 833 548 0276 (Toll Free) or 833 548 0282 (Toll Free)

      Webinar ID: 852 7755 1262

   b. When the Chair announces the item on which you wish to speak, click the “raise hand” feature in Zoom. Speakers will be notified shortly before they are called to speak.

   c. When called to speak, please limit your comments to the time allotted (up to 3 minutes, at the discretion of the Chair).

   d. For those individuals participating by phone, you may use the following controls as appropriate.

      Press *9 - Raise hand

      Press *6 - Toggle mute/unmute

1:00 PM	1. Welcome/Review of the Meeting Format – *Chris Sequeira, Roundtable Facilitator*	Information
	2. Call to Order and Identification of Members Present – *Chairperson Bernald*	Information
1:05 PM	3. Overview by ESA on FAA Publication – *Chris Sequeira, Roundtable Facilitator* Overview of FAA Aircraft Noise Policy and Research Efforts publication from the Federal Register release on 1/13/2021. Possible actions include direction from the full Roundtable to the committees on the possibility of follow-up activities related to the publication. Public Comment	Information/ Action
1:25 PM	4. Committee Reports a.) Legislative Committee – *Legislative Committee Chair Lisa Matichak* - Discussion and possible action in consideration of sending a letter/white paper to the FAA addressing the use of more effective noise metrics by the FAA, and direction from the full Roundtable to one or more of the Committees to investigate and report to the full Roundtable on matters of interest to the Roundtable. b.) Technical Working Group – *Technical Working Group Committee Chair Anita Enander* - Discussion and possible approval of sending a letter regarding GBAS to SFO based on the detailed input/comments received from the public. Emails from the public on GBAS have been forwarded to SFO for its reference. Public Comment	Information/ Action
2:35 PM	5. Ad Hoc Committee Report – *Chairperson Bernald* Update regarding the Ad Hoc Committee's exploration of the possibility of the Roundtable becoming independent from the Cities Association in Response to the Cities Association Executive Board request. Possible actions include direction from the full Roundtable to the Ad Hoc Committee on how to proceed in addressing the Roundtable's relationship with / potential independence from, the Cities Association. Public Comment	Information/ Action
3:05 PM	6. Election of the Chairperson and Vice Chairperson – *Chris Sequeira, Roundtable Facilitator* a.) Overview of nominees/candidates. Public Comment b.) Possible actions could include the election of a Chairperson and Vice Chairperson to a one-year term if suggested/approved by members. In addition, the newly elected Chairperson should appoint new or reconfirm an incumbent chairperson for the two subcommittees.	Action

3:25 PM	7.	Oral Communications/Public Comment - *Speakers are limited to a maximum of two minutes or less depending on the number of speakers. Roundtable members cannot discuss or take action on any matter raised under this agenda item.*	Information
3:40 PM	8.	Member Discussion - Newly Elected Chair's Report Public Comment	Information
4:00 PM	9.	Adjournment – *SCSC Roundtable Chairperson*	

Materials to be provided during the meeting:

- Presentation of the electronic agenda packet

In compliance with the Americans with Disabilities Act and the Brown Act, those requiring accommodation for this meeting should notify SCSC Roundtable Staff at least 24 hours prior to the meeting at scscroundtable@gmail.com; or at (408) 766-9534, or (916) 231-1166.

ESA 50 YEARS 1969-2019

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memorandum

date	January 11, 2021
to	Roundtable Members and Interested Parties
cc	
from	Chris Sequeira, Santa Clara/Santa Cruz Counties Airport/Community Roundtable Facilitator
subject	Review of the Federal Aviation Administration (FAA) Instrument Flight Procedures (IFP) Information Gateway

The FAA's Instrument Flight Procedures Information Gateway ("IFP Gateway") is a website used by the FAA to distribute aircraft instrument flight procedure details ("charts") to the general public.[1] The FAA also uses the IFP Gateway to share its IFP Production Plan, which includes details on IFPs under development or amendment along with development status and tentative publication dates. Environmental Science Associates (ESA) monitors the IFP Gateway for proposed changes to IFPs associated with Norman Y. Mineta San Jose International Airport (SJC), San Francisco International Airport (SFO), and Oakland International Airport (OAK). Changes to IFPs associated with these airports may affect communities in Santa Clara and Santa Cruz counties.

The FAA publishes IFPs on a 56-day publication cycle. The most recent publication date is December 31, 2020. The following information provides details on the IFP development process and IFPs under development or amendment.

Stages of IFP Development

Development of IFPs typically follows five stages, described below. Depending on the nature of the IFP development or amendment, not all of these stages may occur.

1.	**FPT (Flight Procedures Team):**	This team reviews potential IFPs for feasibility and coordinates IFP development with relevant FAA lines of business and staff offices.
2.	**DEV:**	Procedure development.
3.	**FC (Flight Check):**	The FAA performs a flight inspection of the procedure.
4.	**PIT (Production Integration Team):**	This team prepares procedure details to support publication.

[1] https://www.faa.gov/air_traffic/flight_info/aeronav/procedures/

5.	**CHARTING:**	Procedures are made available to the public, typically in graphical, text, and electronic formats.

IFP Development Status Indicators

The following terms are employed by the FAA to identify the status of the IFP during the development process.

At Flight Check	The procedure is with FAA staff responsible for flight inspection.
Awaiting Publication	The procedure has been developed and is awaiting an upcoming publication date.
Awaiting Cancellation	The procedure will be removed from FAA flight procedure databases on an upcoming publication date.
Complete	Procedure development has finished.
On Hold	Procedure development has been paused while awaiting further information.
Pending	Detailed development of the procedure will begin in the future.
Published	The procedure has been made publicly available.
Terminated	Development has terminated for the procedure.
Under Development	The procedure is being developed by the FAA.

Key Terms

The following acronyms are employed by the FAA to describe the IFP, including some of the navigational equipment necessary to accommodate the IFP.

AMDT	Amendment
CAT	Category
DME	Distance Measuring Equipment
DP	Departure Procedure
GPS	Global Positioning System
GLS	Ground-Based Augmentation System (GBAS) Landing System
IAP	Instrument Approach Procedure
ILS	Instrument Landing System
LOC	Localizer
LDA	Localizer Type Directional Aid
RNAV	Area Navigation
RNP	Required Navigation Performance
RWY	Runway
SA	Special Authorization
SID	Standard Instrument Departure
STAR	Standard Terminal Arrival Route
TBD	To Be Determined

Management of FAA IFP Production During the COVID-19 Pandemic

On April 16, 2020, the FAA issued a memorandum (distributed with the May 27, 2020 IFP Gateway memorandum) discussing changes to IFP production during the COVID-19 pandemic. FAA noted that IFP production has been impacted by precautions taken to protect the health and safety of FAA Flight Inspection aircrews[2] due to the pandemic. Among the work that may continue during the pandemic is completion of IFP procedure amendments that do not require flight inspection; periodic IFP reviews and inventory maintenance; compilation and utilization of a list of completed IFP work that can be flown by Flight Inspection aircrews if operations are warranted; and coordination with FAA Flight Inspection Operations on IFP requests associated with National Airspace System Safety/Efficiency. This includes IFP related requests such as returning navigational aids to service and providing support to Flight Inspection Operations by ensuring satisfaction of IFP requirements at Focus 40 airports. IFP requirements include satisfaction of instrument approach procedure prerequisites, collection of airport land survey data, collection of airport data, and satisfaction of an initial environmental review. Both OAK and SFO are Focus 40 airports. SJC is not a Focus 40 airport. The memorandum further states that no new or amended IFP will be validated by Flight Inspection without prior FAA approval.

IFP Status

The following tables provide status updates on IFP production for procedures serving OAK, SFO, and SJC. Information highlighted in turquoise has been updated since the October 23, 2020 SCSC Roundtable IFP Gateway Review.

Norman Y. Mineta San Jose International Airport				
IFP in Production Plan	**Type of IFP**	**Status**	**Scheduled Publication Date**	**Additional Notes (If Applicable)**
FAIRGROUDS VISUAL RWY 30 L/R, AMNDT 8	IAP	Under Development	6/17/2021	No further information available on the IFP Gateway at this time.
RNAV (RNP) Z RWY 30L, AMDT 3	IAP	Under Development	6/17/2021	No further information available on the IFP Gateway at this time. Amendment 3 replaces Amendment 2B which has not been published.
RNAV (RNP) Z RWY 30 R, AMDT 2	IAP	Under Development	6/17/2021	No further information available on the IFP Gateway at this time.
STAR BRIXX (RNAV) THREE SAN JOSE CA KSJC	IAP	Under Development	6/17/2021	No further information available on the IFP Gateway at this time.
STAR SILCN (RNAV) FIVE SAN JOSE CA KSJC	IAP	Under Development	6/17/2021	No further information available on the IFP Gateway at this time.
RNAV (RNP) Z RWY 12L, AMDT 2B	RNAV STAR	Under Development	4/22/2021	No further information available on the IFP Gateway at this time. This procedure has been removed from the IFP Gateway.
RNAV (RNP) Z RWY 12R, AMDT 3B	RNAV STAR	Under Development	4/22/2021	No further information available on the IFP Gateway at this time. This procedure has been removed from the IFP Gateway.

2 The FAA's Flight Inspection Operations Group is responsible for ensuring the safety of instrument flight procedures in the National Airspace System. Flight Inspection aircrews evaluate and validate ground and space-based navigational aids and conduct airborne inspection of all instrument flight procedures under both ideal and adverse weather conditions.

San Francisco International Airport				
IFP in Production Plan	**Type of IFP**	**Status**	**Scheduled Publication Date**	**Additional Notes (If Applicable)**
TIPP TOE VISUAL RWY 28L/R, AMDT 3	IAP	Pending	12/2/2021	The change is of interest to the SCSC Roundtable as the current procedure is a nighttime noise abatement procedure that overflies Los Altos and Palo Alto. Additional information is being pursued.
GLS OVERLAY RNAV (GPS) RWY 19L, AMDT 3	GLS IAP	Pending	10/7/2021	No further information available on the IFP Gateway at this time.
GLS OVERLAY RNAV (GPS) RWY 19R, AMDT 2	GLS IAP	Pending	10/7/2021	No further information available on the IFP Gateway at this time.
GLS OVERLAY RNAV (GPS) RWY 28L, AMDT 6	GLS IAP	Pending	10/7/2021	No further information available on the IFP Gateway at this time.
GLS OVERLAY RNAV (GPS) Z RWY 28R, AMDT 6	GLS IAP	Pending	10/7/2021	No further information available on the IFP Gateway at this time.
SID SAHEY THREE (RNAV) SAN FRANCISCO CA KSFO	RNAV SID	Pending	8/12/21	No further information available on the IFP Gateway at this time.
SID SSTIK FOUR (RNAV) SAN FRANCISCO CA KSFO	RNAV SID	Pending	8/12/21	No further information available on the IFP Gateway at this time.
SID WESLA FOUR (RNAV) SAN FRANCISCO CA KSFO	RNAV SID	Pending	8/12/21	No further information available on the IFP Gateway at this time.
POINT REYES THREE	STAR	Under Development	6/17/2021	No further information available on the IFP Gateway at this time.
STINS FOUR	STAR	Under Development	6/17/2021	No further information available on the IFP Gateway at this time.
ILS PRM RWY 28L (SIMULTANEOUS CLOSE PARALLEL), AMDT 3A	IAP	Awaiting Cancellation	2/25/2021	No further information available on the IFP Gateway at this time.
LDA PRM RWY 28R, AMDT 2B	IAP	Awaiting Cancellation	2/25/2021	No further information available on the IFP Gateway at this time.
LDA/DME RWY 28R, AMDT 2B	IAP	Awaiting Cancellation	2/25/2021	No further information available on the IFP Gateway at this time.
RNAV (GPS) PRM RWY 28L (CLOSE PARALLEL), AMDT 2	IAP	Awaiting Cancellation	2/25/2021	No further information available on the IFP Gateway at this time.
RNAV (GPS) PRM X RWY 28R, AMDT 1B	IAP	Awaiting Cancellation	2/25/2021	No further information available on the IFP Gateway at this time.

Oakland International Airport				
IFP in Production Plan	**Type of IFP**	**Status**	**Scheduled Publication Date**	**Additional Notes (If Applicable)**
QUAKE TWO	SID	Published	11/5/2020	This SID was published on 11/5/2020. No further information available on the IFP Gateway at this time.

Oakland International Airport				
IFP in Production Plan	**Type of IFP**	**Status**	**Scheduled Publication Date**	**Additional Notes (If Applicable)**
ILS OR LOC RWY 12, AMDT 9	IAP	Pending	10/7/2021	No further information available on the IFP Gateway at this time.
RNAV (GPS) Y RWY 12, AMDT 4	IAP	Pending	10/7/2021	No further information available on the IFP Gateway at this time.
AANET TWO	RNAV STAR	Pending	10/7/2021	No further information available on the IFP Gateway at this time.
WNDSR THREE	RNAV STAR	Pending	10/7/2021	No further information available on the IFP Gateway at this time.
SID CNDEL FOUR (RNAV) OAKLAND CA KOAK	RNAV SID	Pending	8/12/2021	No further information available on the IFP Gateway at this time.
SID KATFH TWO (RNAV) OAKLAND CA KOAK	RNAV SID	Pending	8/12/2021	No further information available on the IFP Gateway at this time.

SCSC Roundtable - Agenda Item 3

Overview of FAA Aircraft Noise Policy and Research Efforts

Santa Clara/Santa Cruz Counties
Airport/Community Roundtable

Overview of FAA Aircraft Noise Policy and Research Efforts

Chris Sequeira, ESA

January 27, 2021

FAA's Neighborhood Environmental Survey (NES)

esassoc.com

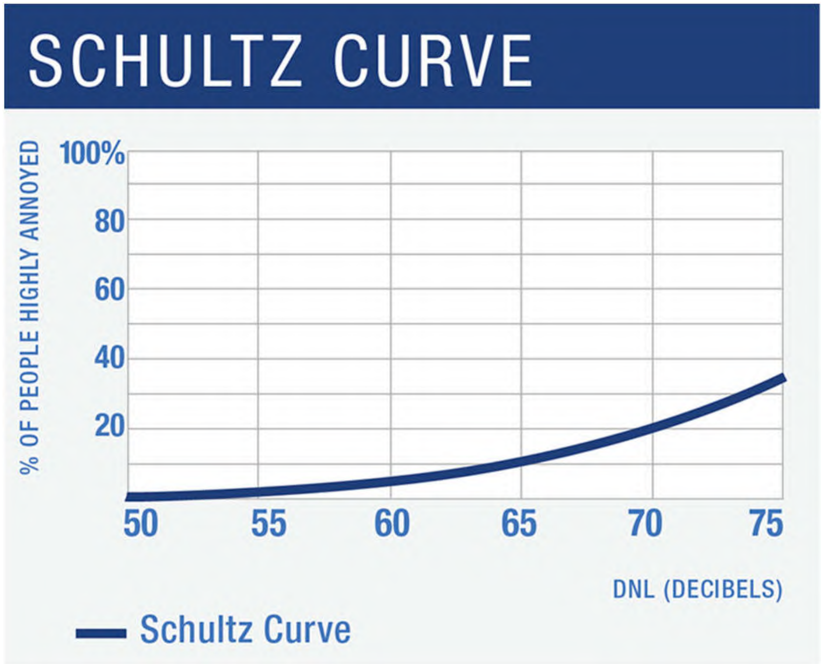
The FAA's Neighborhood Environmental Survey (NES)

- January 13, 2021 - FAA released the findings of its long-awaited Neighborhood Environmental Survey (NES).
  - A multi-year research effort to quantify the relationships between aircraft noise exposure and community annoyance around commercial service airports in the U.S.
  - Conducted to improve the FAA's understanding of community annoyance with aircraft noise and to help determine if the FAA needs to update its 40-year-old aircraft noise policy.
- The survey included 10,000 people near 20 airports across the U.S. and was performed in 2015 and 2016.
- Communities were selected to be a representative sample of U.S. community response to aircraft noise. The FAA used various statistical methods to control for biases related to income and other factors.
- Link to NES: https://www.faa.gov/regulations_policies/policy_guidance/noise/survey/

preliminary data – subject to change

NES Background and Context

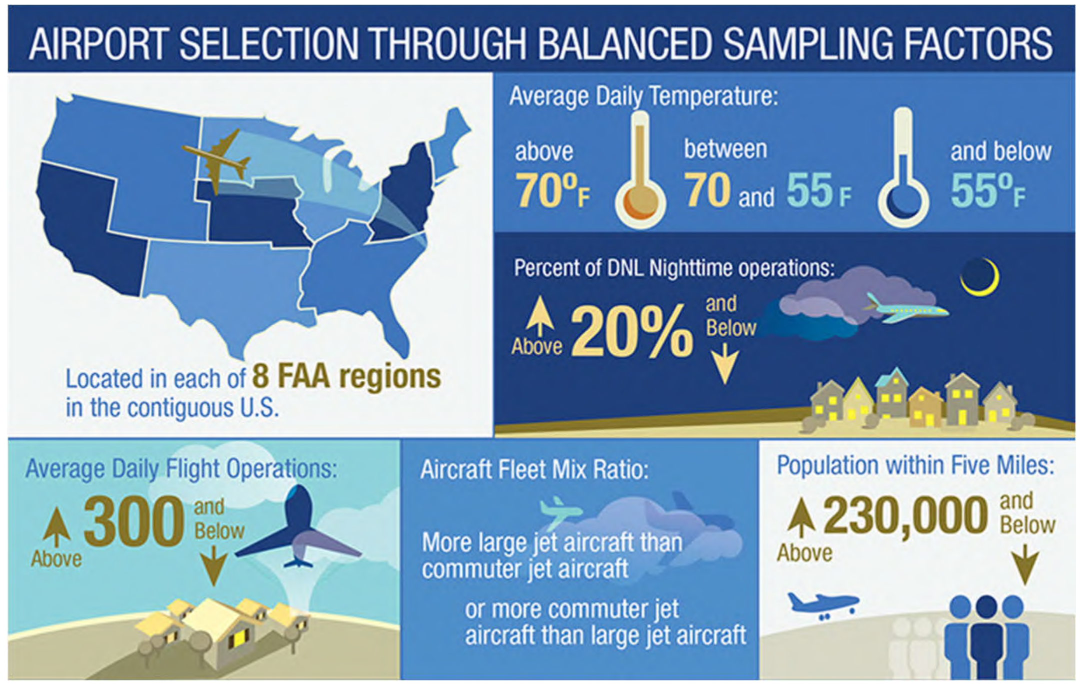
- FAA noise policy is based on a curve relating DNL to community annoyance, produced by T.J. Schultz in the 1970s
- The Schultz curve was last reviewed and validated in 1992 by a federal interagency working group
- The FAA NES was performed to “ensure that FAA's continued efforts to reduce the effects of aircraft noise exposure on communities is based upon accurate information”



preliminary data – subject to change

Survey Airport Communities

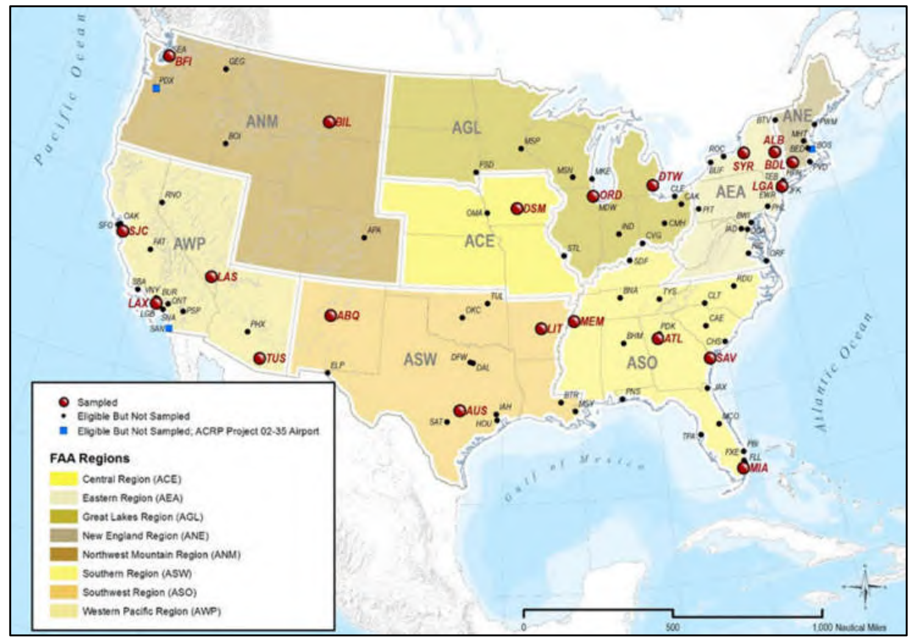
- Airport communities were selected for the survey using a variety of screening factors.
- Operators of selected airports were <u>not</u> notified of their airport's presence in the NES.



preliminary data – subject to change

Survey Airport Communities (cont.)

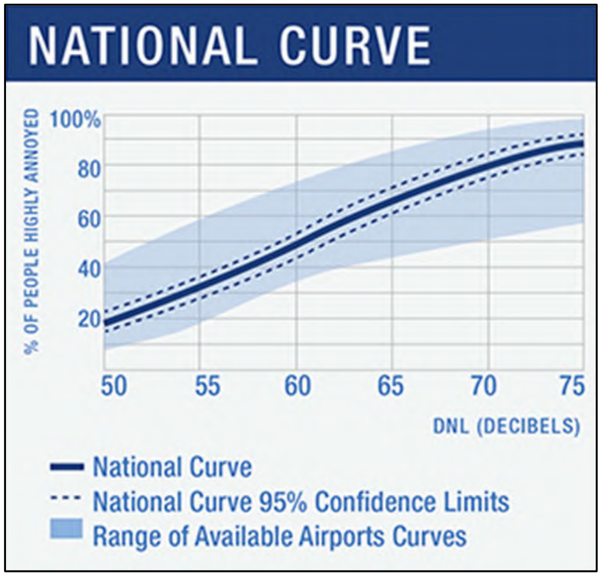
- Surveys were sent to community members by mail, with a $2 gift card as an incentive. Surveys asked about annoyance on a variety of environmental topics, one of which was aircraft noise.
- Respondents were also invited to participate in a follow-up phone survey, with a $10 gift card as an incentive.
- <u>Communities around SJC were surveyed for the NES.</u>



preliminary data – subject to change

Analysis of the Neighborhood Environmental Survey

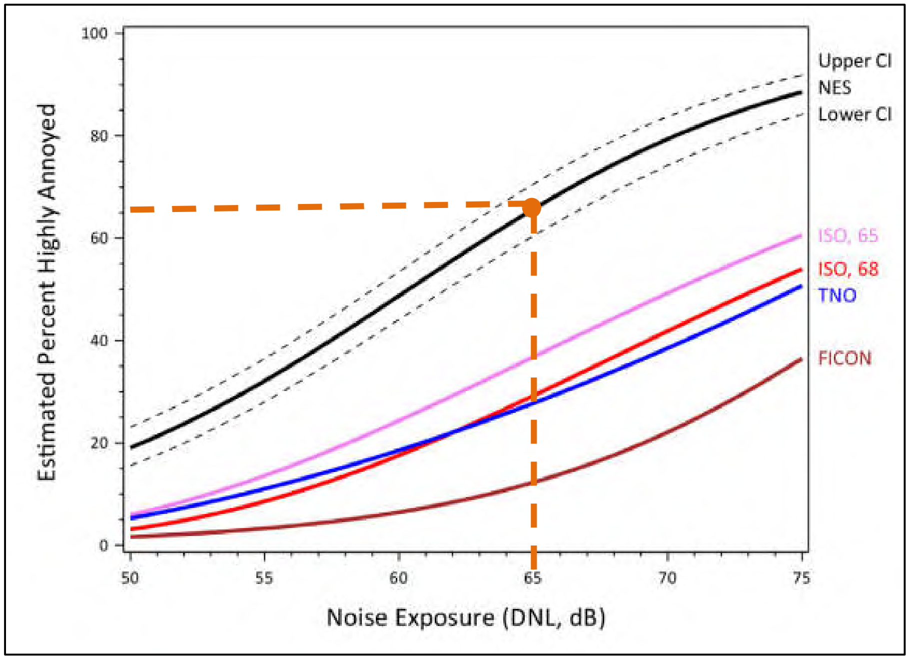
- The FAA used the NES results to produce a new national curve relating aircraft noise exposure to community annoyance
- NES results show more people are "highly annoyed" at a given noise exposure level compared to historical data
  - ~66% of respondents were highly annoyed at 65 DNL, compared with 12.3% in the Schultz curve
  - ~20% of respondents were highly annoyed at 50 DNL, compared with 1.7% in the Schultz curve



preliminary data – subject to change

Analysis of the Neighborhood Environmental Survey (cont.)

- The NES national curve shows more people highly annoyed by aircraft noise than multiple other curves produced to date, taking into account confidence intervals (CIs)
- In the image at right, the following curves are shown for comparison
  - Federal Interagency Committee on Aircraft Noise (FICON), 1992
  - Two International Standards Organization (ISO) curves
  - The Netherlands Organisation for Applied Scientific Research (TNO)



preliminary data – subject to change

Aviation Noise Policy Has Not Changed

- The NES national curve does not represent a new aviation noise policy. The existing noise metrics and thresholds in FAA Order 1050.1F and other noise regulations/policies still apply.
- The FAA has a long-standing history of noise research and is continuing to study noise impacts to health and welfare, noise abatement, and mitigation techniques.
- The FAA "will not make any determinations based on the findings of these research programs for the FAA's noise policies, including any potential revised use of the Day-Night Average Sound Level (DNL) noise metric, until it has carefully considered public and other stakeholder input along with any additional research needed to improve the understanding of the effects of aircraft noise exposure on communities."

preliminary data – subject to change

FAA is Requesting Feedback on Further Noise Research to Inform Future Noise Policy

FAA is requesting comments in three areas:

1. Effects of Aircraft Noise on Individuals and Communities;
2. Noise Modeling, Noise Metrics, and Environmental Data Visualization; and
3. Reduction, Abatement, and Mitigation of Aviation Noise

- FAA also requests input on the factors that may be contributing to the increase in annoyance shown in the survey results.
- Provide your comment to the FAA by March 15, 2021 at: http://www.regulations.gov/#!submitComment;D=FAA_FRDOC_0001-20316

Federal Register Notice: http://federalregister.gov/d/2021-00564

Full text: https://www.faa.gov/regulations_policies/policy_guidance/noise/survey/

Comments due: March 15, 2021 (ref. Docket Number FAA-2021-0037)

preliminary data – subject to change

ESA

SCSC Roundtable

Questions?

ESA

esassoc.com

SCSC Roundtable - Agenda Item 4a

Noise Metrics Position Paper

SCSC Roundtable

SCSC Roundtable's Position on the Federal Aviation Administration's (FAA) Aircraft Noise Metrics to Identify Noise Impacts from Proposed Flight Procedure Changes

Summary:

Based on feedback from the members of the SCSC Roundtable Legislative Committee, members of the public, and input from SCSC Roundtable consultant staff, this position paper has been drafted to address the issues surrounding the noise metrics used by the FAA in the environmental review process. Specifically, this position paper addresses the concerns that such noise metrics, and the way they are being used, are not effective in determining the impact to people on the ground. For example, tens of thousands of people make complaints about aircraft noise associated with air traffic changes where the FAA has concluded that there will be no impacts. Roundtables, like the SCSC Roundtable, are then formed to try to address the issue. Therefore, something is missing in this process, and the SCSC Roundtable is proposing recommendations to help address this issue.

Problem Statement:

The millions of aircraft noise complaints and public discord that has resulted from the FAA's implementation of the NorCal Metroplex and other Metroplex projects throughout the country has demonstrated that the FAA's existing tools, noise metrics, and thresholds of significance have not effectively or accurately assessed the actual impact of aircraft noise on residents and noise sensitive resources. As a result, the FAA, elected officials, airport/community roundtables, and affected members of the public spend countless hours addressing aircraft noise issues that could have been resolved in the procedure design and/or environmental analysis process.

Failure of the FAA's Existing Aircraft Noise Analysis Process:

The current FAA Orders that govern the FAA's environmental reviews under the National Environmental Policy Act (NEPA), do not include sufficiently specific language to direct the FAA to fully consider and disclose the impact of aircraft noise and overflights on residents and noise sensitive resources when it is making determinations about the appropriateness of flight procedure changes. In fact, the FAA has relied on NEPA's Categorical Exclusion (CatEx) process to approve flight procedure changes that have shifted and concentrated aircraft flight tracks over noise sensitive areas without disclosing the nature of the change in noise exposure and overflights or holding public meetings to solicit input on the proposed changes. As a result, thousands of residents who are impacted by the change express their concerns to their local, state, and federal elected representatives, local roundtables, and the FAA only to learn that the FAA's environmental process has been completed and there is no recourse for minimizing the new aircraft noise and overflight impacts.

To make matters worse, when the FAA has utilized the Environmental Assessment (EA) process under NEPA to disclose potential noise impacts due to changes in flight procedures over populated areas, there are no impacts to disclose because the FAA relies exclusively on the 65 dBA Day/Night Average Sound Level (DNL) as the impact threshold. Levels of 65-dBA DNL typically occur within a few miles of an airport's runways. As a result, flight procedure changes that occur miles from an airport will never trigger an exceedance of the 65-dBA DNL threshold. The SCSC Roundtable believes that there is a national urgency to correct this systemic flaw in the FAA's environmental process, which if corrected will benefit communities, the national air transportation system, aircraft operators, and the FAA.

The Solution:

The FAA should use a different noise metric(s) besides DNL to identify and mitigate potential aircraft noise exposure and overflight hotspots as experienced by people on the ground before flight procedure implementation.

For example, through the Aviation Environmental Design Tool (AEDT), the FAA has a suite of supplemental metrics to help identify where problems may occur. Once the problem areas are identified, the FAA can work with Air Traffic Organization (ATO) staff, industry partners, the local roundtable, and the public to explore methods of ameliorating those problems. In addition, to the benefit of developing an approach that minimizes aircraft noise exposure, this approach provides the FAA an opportunity to share its work with the public before procedure implementation.

In addition to supplemental noise metrics, the FAA should use tools such as its Terminal Area Route Generation Evaluation & Traffic Simulation (TARGETS) tool and non-noise metrics to assess potential change in aircraft noise and overflights experienced on the ground.

For example, the TARGETS tool or other appropriate tools should be used to analyze flight track density, changes in the number of overflights on a per person basis, changes in operations based on the availability of the flight procedure, and identify noise sensitive areas that will be newly overflown, and use similar non-noise metrics to determine the full breadth of the potential change in aircraft noise and overflights that people will experience on the ground.

Finally, after implementation of a procedure, the FAA should gather actual data to evaluate if the noise exposure from the procedure is at the predicted levels, determine if the aircraft operations levels are as predicted, calculate the actual overflights on a per-person basis, and make the necessary adjustments to ensure the aircraft noise exposure, operations levels, and flight track concentrations are within the predicted ranges.

Appropriate Balance:

The SCSC Roundtable agrees that safety of air travel is paramount. However, the SCSC Roundtable believes that the rules governing the FAA's environmental processes should be amended to ensure that "the impact of aircraft noise on people and noise sensitive resources" is given the same decision making weight as "the efficient use of the airspace for aircraft operators".

Recommendations:

The following conceptual language changes must be included in the appropriate FAA Reauthorization bill or similar FAA-related bills – until this language or similar language has been adopted for use by the FAA in fulfilling its obligations under NEPA.

- Utilizing supplemental noise metrics, the FAA must establish new analysis methods and noise/overflight standards to accurately assess the actual noise and overflight impacts of flight procedure changes to people on the ground. This includes the application of cumulative and single-event noise metrics to assess impacts on human annoyance, sleep, health, learning, public spaces, and natural quiet.
- The FAA must modify its existing flight procedure approval processes to include and utilize the new supplemental noise metrics and overflight density and intensity when approving any flight procedure modification.
- When the FAA is reviewing/approving any flight procedure, it must collect noise measurements at homes and noise sensitive uses (using new supplemental noise metrics). These noise measurements will include actual

pre-change conditions, actual post-change conditions, and a post-implementation review process to ensure the "after" condition is an improvement in aircraft noise exposure as measured at homes and noise sensitive uses than was defined in the approved flight procedure.

- If the post-implementation noise measurements are higher than those defined in the approved flight procedure's environmental documentation, the FAA is required to modify the flight procedures until the measured noise levels are at or lower than the approved levels.
- FAA's Orders and Desk Reference governing the FAA's environmental processes must be amended to ensure that "the impact of aircraft noise on people and noise sensitive resources" is given the same decision making weight as "the efficient use of the airspace for aircraft operators".

The intent of the proposed language changes above is to protect residents and noise sensitive resources as the FAA considers changing the flight procedures/path/frequency over them.

SCSC Roundtable All Correspondence

October 23, 2020 – January 22, 2021

October 26, 2020

From

Jennifer Landesmann

To

SCSC Roundtable

Message

10/28 meeting ITEM 4 Noise maps - Supplemental Metrics for public outreach

Dear Members of the SCSC,

Thank you for your September 22 letter to Administrator Dickson which lists as a top priority the issue of metrics.

As you are aware noise maps employing metrics to supplement DNL are possible to produce (and encouraged by FAA) for effective public outreach.

I am pleased to share the attached Recommendation to ensure that adequate information about aircraft noise and exposure is made available to the public with the list of the supplemental metrics that the FAA's AEDT 3C (noise mapping) tool currently supports. This recommendation was drafted by members of the Quiet Skies Conference made up of diverse grassroots groups affected by Nextgen.

As you pursue FAA follow up on airspace procedures affecting SCSC communities (PIRAT, BDEGA,and issues regarding CATEX and the IFP Gateway) I urge the SCSC to develop a similar recommendation about supplemental metrics or feel free to use this recommendation to please ensure that noise maps are soon made available for community discussions and public outreach about impending procedures or modifications.

I am especially concerned about how GBAS is being planned, with no updates given to the SCSC or requested by the SCSC. My understanding is that "overlays" are planned using CATEX, so procedures like PIRAT will be overlayed when nobody has ever seen a map with environmental information for these procedures.

It would take less time (and provide more meaningful information) to produce noise maps for the procedures the public is concerned about.

Thank you,

Jennifer

Attachment Name

20201026_Jennifer_Landesman_SCSCRoundtable_10-28 Meeting

Recommendation to ensure that adequate information about aircraft noise and exposure is made available to the public

Recommendation

We recommend, in addition to DNL (or CNEL) and population estimates which the FAA currently produces, that the FAA also produce two estimates of Nx -- N50 and N60 -- and TALC60 for each receiver location. Nx is the number of overflights that exceed x dbA during daytime hours or x-10 dBA during nighttime hours. TALC60 is the time in minutes per day during which aircraft noise exceeds 60 C-weighted decibels.

We also recommend that the FAA produce estimates for other metrics supported by the current version of the FAA's Aviation Environmental Design Tool[1] upon request by any of the currently or potentially affected communities. Attached are some of the other metrics supported by the FAA that communities could find appropriate to have.

Discussion:

When the FAA performs environmental assessments of proposed changes to navigation and operating procedures, they produce estimates of DNL (or CNEL, which is the required metric in California) for receiver locations where noise exposure is a potential issue (receiver locations are ¼ mile square grid cells and census block centroids). The noise estimates for census blocks are used in combination with census population estimates to estimate population exposure.

Vast community testimony and numerous studies have demonstrated that DNL alone does not adequately capture the impacts of aircraft noise as it is experienced by people who live near flight paths, and that additional metrics and estimates of population exposure are essential for informing the public and discussions of proposed changes aimed at reaching consensus. With nearly 50 expert references, FAA's own analysis[2] alternative metrics states in the introduction that "no single metric can cover all situations due to the dynamic acoustical and operational characteristics of aviation noise."

Nx and Tx metrics have a long history of support for describing aircraft noise, including by the FAA's first national ombudsman for aircraft noise:

> When TA and N-level contours are presented along with DNL contours, the public receives not only the average airport noise level, but the amount of time airplane noise

[1] https://aedt.faa.gov

[2] https://www.faa.gov/about/plans_reports/congress/media/Day-Night_Average_Sound_Levels_COMPLETED_report_w_letters.pdf

> exceeds the specified level and the number of times each day that noise exceeds the specified level. When these metrics are presented along with DNL, a complete picture of airport noise exposure in the community emerges, painted in clear terms. (William Albee, 2002)

We recommend TALC60 for two reasons: it clearly describes an important characteristic of noise, i.e., the duration of noise events that average noise metrics like DNL take into account but do not clearly describe; and dBC weighting represents the sound spectrum more completely than does dBA, capturing sound that is not only in the higher pitched sounds (A-weighted) but also lower-frequency components of jet engine noise that are especially problematic for people exposed to backblast noise from departing aircraft and communities which experience noise from both arrival and departure procedures.

Nx was recently identified as a "best metric" for analyzing noise impacts by MIT researchers working on the Massport study for Boston's Logan Airport and Project 23, "Analytical Approach for Quantifying Noise from Advanced Operational Procedures", which is sponsored by the FAA Center of Excellence for Alternative Jet Fuels and Environment.

AEDT supports the noise metrics listed in Table 2-5, as well as the capability to create user-defined noise metrics.

Table 2-5 Summary of AEDT Noise Metric Abbreviations and Definitions

Metric Type	AEDT Name	Standard Name	Definition/Full Name
A-Weighted Noise Metrics			
Exposure	SEL	L_{AE}	A-Weighted Sound Exposure Level
	DNL	L_{dn}	Day Night Average Sound Level
	CNEL	L_{den}	Community Noise Equivalent Level
	LAEQ	L_{AeqT}	Equivalent Sound Level
	LAEQD	L_{d}	Day-average noise level
	LAEQN	L_{n}	Night-average noise level
Maximum Level	LAMAX	L_{ASmx}	A-Weighted Maximum Sound Level
Time-Above	TALA	TA_{LA}	Time-Above A-Weighted Level
Time-Audible	TAUD	T_{Aau}	Time-Audible
	TAUDSC	T_{AudSC}	Time-Audible with Overlapping Events Method (Statistical Compression)
	TAUDP	T_{AudP}	Time-Audible Percent
	TAUDPSC	T_{AudPSC}	Time-Audible Percent with Overlapping Events Method (Statistical Compression)
C-Weighted Noise Metrics			
Exposure	CEXP	L_{CE}	C-Weighted Sound Exposure Level
	CDNL	L_{Cdn}	C-Weighted Day Night Average Sound Level
Maximum Level	LCMAX	L_{CSmx}	C-Weighted Maximum Sound Level
Time-Above	TALC	TA_{LC}	Time-Above C-Weighted Level
Tone-Corrected Perceived Noise Metrics			
Exposure	EPNL	L_{EPN}	Effective Perceived Noise Level
	NEF	L_{NEL}	Noise Exposure Forecast
	WECPNL	L_{WECPN}	Weighted Equivalent Continuous Perceived Noise Level
Maximum Level	PNLTM	L_{PNTSmx}	Tone-Corrected Maximum Perceived Noise Level
Time-Above	TAPNL	TA_{PNL}	Time-Above Perceived Noise Level
Number Above Noise Level Metric			
Number Above Noise Level	NANL	NANL	Number Above Noise Level

All of the metrics in Table 2-5 are computed using the following four base noise level metrics:

L_{AE}	A-weighted sound exposure level (SEL);
L_{ASmx}	A-weighted maximum sound level (LAMAX);
L_{EPN}	Effective perceived noise level (EPNL); and
L_{PNTSmx}	Tone-corrected maximum perceived noise level (PNLTM).

October 27, 2020

From
Steve Alverson
To
SCSC Roundtable
Message

FW: QSC and Congressional Letter re: airplane noise

Hi all:

My apologies for the delay in getting this to you, and you may already have it, but I'm sure you are aware of competing priorities in the current environment.

Attached hereto is a September 23, 2020 Congressional letter led by Rep. Karen Bass and Quiet Skies Caucus (QSC) Chair Eleanor Holmes Norton, signed by SCSC Roundtable congressional representatives Eshoo, Panetta and Khanna. This addresses concerns about the FAA's April 14, 2020 Report on findings relative to the FAA Reauthorization Act, including noise metric alternatives to Day Night Level (DNL). Despite all that is going on in our COVID reality, our members are continuing to push on those issues.

Note that this letter was issued the day before the QSC hearing with FAA Administrator Dickson on September 24, 2020. Unfortunately, the FAA asked that the QSC meeting be off the record, so I have no specific information coming from that meeting.

Please let me know if you have any questions or concerns. I'll be on the virtual Roundtable meeting on Wednesday.

Best, Tom

PS; CCing our CA-17 city reps and Rep. Eshoo and Panetta's District Directors

Tom Pyke

Attachment Name

20201027_Steve_Alverson_SCSCRoundtable_FW QSC

Congress of the United States
Washington, D.C. 20515

September 23, 2020

Steve Dickson, Administrator
U.S. Department of Transportation
Federal Aviation Administration
Office of the Administrator
800 Independence Avenue, S.W.
Washington, DC 20591

Dear Administrator Dickson:

As Members of the U.S. House of Representatives, we write to express deep concern regarding the Federal Aviation Administration's Report to Congress dated April 14, 2020, on its findings pursuant to Sections 188 and 173 of the FAA Reauthorization Act of 2018 (P.L. 115-254). After conducting a detailed review of the FAA's report, we find it wholly inadequate, failing to meet the mandate in the law.

As you know, Section 188 of the FAA Reauthorization Act of 2018 mandated the FAA to "evaluate alternative metrics to the current average day-night level standard, such as the use of actual noise sampling and other methods, to address community airplane noise concerns." Further, the law directed the FAA to provide Congress with a detailed report on its findings. On April 14, 2020, the FAA released the report, and in addition to reporting on Section 188, the FAA also used this report to address Section 173, which states: "Not later than 1 year after the date of enactment of this Act, the Administrator of the Federal Aviation Administration shall complete the ongoing evaluation of alternative metrics to the current Day Night Level (DNL) 65 standard." It is our assessment that this report entirely fails to seriously analyze and consider alternative metrics to the DNL 65 standard.

First and foremost, the report fails to evaluate well-respected and widely used alternatives, including: the Cumulative Noise Equivalency Level ("CNEL") metric, which California uses to evaluate aircraft and other noise exposures[1]; the ISO 1996-1:2016 ("Acoustics – Description measurement and assessment of environmental noise"), an international standard specifically adopted to identify community noise concerns in general, but airplane noise in particular[2]; and the European alternative to the DNL metric, known as the DENL, or the day-evening-night level metric. The latter noise metric disaggregates evening and night noise levels

[1] Lichman, Barbara. "FAA Sidesteps Congressional Mandate to Evaluate Alternative Noise Metrics." Aviation & Airport, 10 June 2020, www.aviationairportdevelopmentlaw.com/2020/06/articles/federal-aviation-administration-faa/faa-sidesteps-congressional-mandate-to-evaluate-alternative-noise-metrics/.
[2] Taber, Steven. "FAA's Report On Alternatives to the DNL Noise Metric Is Tone Deaf." LinkedIn, 4 May 2020, www.linkedin.com/pulse/faas-report-alternatives-dnl-noise-metric-tone-deaf-steven-taber.

to address the fact that communities experience noise events differently during the day, the evening and the nighttime sleeping hours. A credible evaluation of alternative noise metrics and the 65 DNL standard would have addressed the correlation between each metric and the known noise impact on communities in a NextGen environment, similar to a comparison done in an FAA-funded 2011 report on replacement metric research.[3] However, in lieu of providing a thorough evaluation, the report merely describes DNL and a number of alternative metrics, while offering an incomplete and at times inaccurate comparison of DNL to those alternatives.

Furthermore, there are glaring absences in the FAA's assessment that render it incomplete. For example, the report fails to analyze complaint data despite the fact that the FAA itself utilized complaint data as a lawful alternative metric in its 2013 federal court case against Helicopter Association International, Inc.[4] Failing to mention any role for complaint data would appear in contrast to FAA's Noise Complaint Initiative begun in the last 12 months, allowing direct reporting of noise events to FAA. The report also lacks the scientific nuance the agency demonstrated in 2019, when the FAA funded a research project at MIT to evaluate metrics and assess the impact of frequent overflights; that study concluded that the Number-Above (NA) metric provided an effective correlation to aircraft noise impacts on the public,[5] but is scarcely mentioned in this report. Even commonly used metrics are overlooked, such as the metrics for construction noise and the concept of sones. Construction noise metrics are regularly employed across the United States and capture greater noise nuance than the DNL standard. Sones represent the perception of loudness and help capture aviation noise annoyance. In our estimation, the FAA report merely stands by the agency's existing DNL metric and enumerates existing methodology with no regard to the value of improved and updated alternatives.

As a result, the FAA is effectively treating supplemental noise metrics as an asterisk to noise measurement rather than a comprehensive toolbox from which to address noise impacts. The FAA relegates supplementary metrics to an ancillary role by asserting that, "No single noise metric can cover all situations,"[6] and that while the "DNL metric is FAA's decision-making metric, other supplementary metrics can be used to support further disclosure and aid in the public understanding of community noise effects."[7] Nowhere in the report do we find clear guidance on how and when supplemental noise metrics could be used in flight procedure design decisions or to alleviate existing noise – even as the public health impact of noise continues to spread. U.S. standards to protect human health from airplane noise are not only glaringly ineffective, they also trail Western Europe's. In its 2018 Noise Guidelines for European

[3] Mestre, V., Schomer, P., Fidell, S., & Berry, B. (2011, June 14). Technical Support for Day/Night Average Sound Level (DNL) Replacement Metric Research. Retrieved September 16, 2020, from https://www.faa.gov/about/office_org/headquarters_offices/apl/research/science_integrated_modeling/noise_impacts/media/6-14-2011_FinalReport_MetricsMestre_etal_061411_part1.pdf

[4] Rogers, J. A. (2013, July 12). Helicopter Ass'n Int'l, Inc. v. Fed. Aviation Admin. Retrieved September 15, 2020, from https://www.casemine.com/judgement/us/5914f903add7b0493499f81d

[5] Yu, A. Y., & Hansman, R. (2019, May). Aircraft Noise Modeling of Dispersed Flight Tracks and Metrics for Assessing Impacts. Retrieved September 16, 2020, from file:///C:/Users/kkaiser/Downloads/ICAT-2019-07_Yu_Aircraft%20Noise.pdf

[6] Federal Aviation Administration. Report to Congress, FAA Reauthorization Act of 2018 (Pub. L. 115-254), Section 188 and Sec 173. 14 Apr. 2020, www.faa.gov/about/plans_reports/congress/media/Day-Night_Average_Sound_Levels_COMPLETED_report_w_letters.pdf

[7] Ibid.

countries, the World Health Organization recommended using a threshold of 45 dB or lower for day and evening aircraft noise[8] – that constitutes 20 dB less than the DNL metric employed by the FAA, which also does not disaggregate evening-levels from night. Far from trailing Western European nations, the U.S. should be demonstrating global leadership to mitigate the public health effects of aircraft noise.

When the FAA Reauthorization Act of 2018 was passed into law, Congress sought to address community airplane noise concerns by utilizing the scientific and research arms of the FAA to substantively evaluate alternative noise metrics with an eventual eye to having those metrics inform FAA decision-making. There is widespread consensus that the DNL metric remains an inadequate measure because it averages noise over a 24-hour period, thereby understating the impact of individual noise incidences. Thus, the congressional intent underpinning Sections 188 and 173 was to address the inadequacy of the DNL metric and nudge the FAA towards a more comprehensive measure. The report fails to understand that intent. Instead, we have received a delayed and highly insufficient report that does not address community impacts of noise.

Therefore, we, the undersigned Members of Congress, insist that the FAA return to the drawing board and meaningfully evaluate alternative metrics to the current DNL 65 average, not just dismiss or ignore them, and include the potential for the use of such metrics in the United States. Furthermore, we seek formal responses to the questions in the appended Citizens' Response Report, a *Technical Report to the FAA's April 2020 Report on Alternative Noise Metrics (Reauthorization Act of 2018, Sections 173 and 188)*. The concerned constituents who raised these eleven questions live in communities directly affected by increased noise from NextGen implementation. We request formal responses to each question.

Without a thorough and nuanced analysis of the DNL standard and better, more accurate metrics, progress on aircraft noise will remain elusive. It is therefore imperative that the FAA meet its congressional mandate and begin the report anew while also addressing our constituents' questions. We look forward to the agency's response, including its plans to follow through on our request.

Sincerely,

Karen Bass

Karen Bass
Member of Congress (CA-37)

Eleanor H. Norton

Eleanor Holmes Norton
Member of Congress (DC)

---

[8] World Health Organization, Regional Office for Europe. (2018). Environmental Noise Guidelines for the European Region. Retrieved September 16, 2020, from https://www.euro.who.int/__data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf

Stephen F. Lynch
Member of Congress (MA-08)

Thomas R. Suozzi
Member of Congress (NY-03)

/s/
Ed Case
Member of Congress (HI-01)

/s/
Anna G. Eschoo
Member of Congress (CA-18)

/s/
Ruben Gallego
Member of Congress (AZ-07)

/s/
Ro Khanna
Member of Congress (CA-17)

/s/
Alan Lowenthal
Member of Congress (CA-47)

Mike Quigley
Member of Congress (IL-05)

/s/
Donald S. Beyer Jr.
Member of Congress (VA-08)

/s/
Judy Chu
Member of Congress (CA-27)

/s/
Brian Fitzpatrick
Member of Congress (PA-01)

/s/
Pramila Jayapal
Member of Congress (WA-07)

/s/
Ted W. Lieu
Member of Congress (CA-33)

/s/
Joe Neguse
Member of Congress (CO-02)

/s/
Jimmy Panetta
Member of Congress (CA-20)

/s/
Scott H. Peters
Member of Congress (CA-52)

/s/
Jamie Raskin
Member of Congress (MD-08)

/s/
Kathleen M. Rice
Member of Congress (NY-04)

/s/
Harley Rouda
Member of Congress (CA-48)

/s/
C.A. Dutch Ruppersberger
Member of Congress (MD-02)

/s/
Adam B. Schiff
Member of Congress (CA-28)

/s/
David Scott
Member of Congress (GA-13)

/s/
Brad Sherman
Member of Congress (CA-30)

/s/
Adam Smith
Member of Congress (WA-09)

/s/
Jackie Speier
Member of Congress (CA-14)

/s/
Maxine Waters
Member of Congress (CA-43)

/s/
Frederica S. Wilson
Member of Congress (FL-24)

October 27, 2020

From

Michele Rodriguez

To

SCSC Roundtable

Message

New submission from Contact us

I'm the SFO Airport Community Roundtable Coordinator trying to touch base with you SCSC Coordinator, please contact at your convenience. Thank you

October 27, 2020

From

Jennifer Landesmann

To

SCSC Roundtable

Message

ITEM 3 10/28 Agenda: Instrument procedures Environmental Rules

Dear Members of the SCSC,

I look forward to hearing the Dispersion 101 presentation.

In explaining instrument procedures, I note that the presentation does not show the FAA NEPA rules that apply to instrument procedures. Every single instrument procedure should have had an environmental determination and where none is evident I believe you have a role to know why or why not.

There is poor documentation of how instrument procedures have come about locally. There is however record of “side agreements” that have happened on instrument procedures between airports and FAA Air Traffic Organization - entirely bypassing community input. One example is the side agreement about altitudes at MENLO waypoint and now SIDBY.

Also I see that there is material about why Nextgen procedures are important but this is an incomplete picture without seeing the costs to communities. The communities affected by the Florida Metroplex have been moving to ask FAA to substantiate all the purported benefits for Nextgen procedures and I suggest that this line of inquiry is critical.

Moreover, to name one benefit- increasing airport capacity goes back to environmental processes -increasing airport capacity demands the highest level of environmental review - an Environmental Impact Statement (EIS). With new CEQ rules this would no longer have to take longer than two years and it would be the fairest way to evaluate airspace matters affecting Bay Area residents.

Thank you,

Jennifer

October 28, 2020

From

Jennifer Landesmann

To

SCSC Roundtable

Message

ITEM 3 10/28 Agenda: Instrument procedures Environmental Rules

Dear Members of the SCSC,

As a further emphasis to my email that Instrument Procedures have environmental requirements, please note that Page 5 of the roundtable's IFP gateway report states

IFP requirements include satisfaction of instrument approach procedure prerequisites, collection of airport land survey data, collection of airport data, and satisfaction of an initial environmental review.

Categorical exclusions are not defensible for the IFP's affecting people and the environment - especially not for all you represent, where all the procedures affecting MidPen have zero prior environmental documents and the one set of documents available (the 2014 EA) has been found to be completely inadequate because the 2014 EA did not correctly consider where the planes would fly, how many, or at which altitudes.

Also, I remind that Nextgen is NOT ""exempted from normal environmental review impacts."" as SJC misinformed the public per the exhibit I shared in my July 28 email to you. SJC demonstrated total unawareness that an EA was used for some procedures implemented in 2014 but all new instrument procedures and amendments enjoy rights to normal environmental reviews

Every new instrument procedure and amendment should rightfully and authentically consider the public. Giving procedures the name Nextgen does not make them automatically environmentally reviewed. We actually need reviews.

As you learn more about IFPs I ask that you please focus on the environmental determinations for instrument procedures affecting people or which could potentially affect Sta Clara and Sta Cruz people and the environment.

Thank you,

Jennifer

October 28, 2020

From

Faviola Garcia

To

SCSC Roundtable

Message

FW: FAA response to Ms. Bernald SCSC letter date 08.11.20
Dear Representative Eshoo, and members of the SCSC Roundtable,

Good morning, I realize our staff emailed the letter to mlbernald@saratoga.ca.us, but wanted to make sure you receive this in your SCSC email account.

Thank you,

Favi-

Faviola Garcia

Supervisory Senior Advisor

Federal Aviation Administration

Office of the Regional Administrator"

Attachment Name

20201028_Faviola_Garcia_SCSCRoundtable_FW FAA Response

U.S. Department of Transportation
Federal Aviation Administration

Western-Pacific Region
Office of the Regional Administrator

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

October 28, 2020

Ms. Mary-Lynne Bernald
Chairperson
Santa Clara/Santa Cruz Counties Airport/Community Roundtable
PO Box 3144
Los Altos, CA 94024

Dear Ms. Bernald:

Subject: Request for a Comprehensive Presentation on the FAA's Development of the Big Sur Overlay Including a Detailed Schedule, and a List of the FAA's Next Steps Through the Project's Completion

Thank you for your letter dated August 11, 2020, in which you requested a production schedule and presentation by the Federal Aviation Administration (FAA) at the Santa Clara/Santa Cruz Counties Airport/Community Roundtable meeting on October 28, 2020.

Representative Eshoo's office, with the support of other members, asked the FAA to defer the briefing until next year due to the impact of the fires in Santa Cruz County and to wait until such time that all constituents have the opportunity to participate. The FAA will attend the meeting on October 28, 2020, and although we are delaying our presentation as requested, please be assured that internal agency work continues for this procedure request. We look forward to presenting the material at a future roundtable meeting.

If you have any questions or if we can be of further assistance, please contact my office at (424) 405-7000.

Sincerely,

Raquel Girvin
Regional Administrator

November 2, 2020

From
Evan Wasserman
To
SCSC Roundtable
Message

Info for SCSC RT members – GBAS

Dear SCSC Roundtable Members,

As a follow-up to the prior email regarding a GBAS presentation, additional info is available on the SFO Community Roundtable website with a video recording from the November 19, 2020 meeting, and agenda materials. The GBAS presentation starts at approximately the 00:9:10 mark of the video timestamp and continues until about 01:33:30. Again, we urge all members to please review the materials/recording of the presentation for reference.

In addition, as noted previously the SFO Community Roundtable will be holding their regular meeting today via Zoom starting at 7:00 p.m. PST.

Regards,

Evan Wasserman

November 3, 2020

From
Steve Alverson
To
Michele Rodriguez
Message

Inquire to the SCSC Roundtable

Michele,

Thanks for your October 27, 2020 email to the SCSC Roundtable regarding touching base with our Roundtable Coordinator. The SCSC Roundtable does not have a Roundtable Coordinator. ESA serves as the consultant and facilitator of the SCSC Roundtable. Our contract is managed by Andi Jordan of the Cities Association of Santa Clara County. So, depending on your question either Andi or I may be able to help you.

I tried calling the phone number you provided, but the recording said your voicemail was not set up.

Feel free to respond to this email and the appropriate person can give you a call back. Thanks!

Regards,

Steve

November 5, 2020

From

Mike McClintok

To

SCSC Roundtable

Message

Fwd: November 18, OAK--Community Engagement Meeting For Proposed New Terminal Development

Public Engagement Meeting for the Proposed Terminal Development Project at Oakland International Airport (OAK)

November 6, 2020

From

Steve Alverson

To

SCSC Roundtable

Message

My Retirement

Dear Roundtable Members and Alternates,

I hope this email finds you all doing well and staying healthy during this challenging time.

I am writing to let you know that I am retiring from ESA on December 31, 2020. My last day “in the office” will be Friday, December 18, 2020.

Due to several ongoing high-profile projects that I have been involved with, ESA has asked and I have agreed to continue to support ESA as an independent contractor after January 1, 2021. Therefore, if the SCSC Roundtable needs my support, I will be available to do so through ESA’s existing contract with the Cities Association.

In order to have some semblance of a retirement, I plan to reduce my work schedule to Tuesday through Thursday. As a result of my reduced work hours, I expect that Back-up Facilitator Chris Sequeira, Evan Wasserman, Chris Jones, Phoebe Weiman, and other ESA staff will increase their support of the Roundtable to ensure that it continues to operate smoothly and makes progress on its Work Plan tasks. I have spoken to Chair Bernald and Andi Jordan about these plans.

After leaving ESA on Friday, December 18th, I will be off through Friday, January 8, 2021.

I look forward to continuing to support the Roundtable moving forward.

Have a great weekend!

Regards,

Steve

November 19, 2020

From
Jennifer Landesmann
To
SCSC Roundtable
Message

GBAS Follow up New submission from Contact us

Hi Chairman Ortiz,

Below please find the follow up on my public comments for this morning's GBAS:

1. Necessary Impacts Information for Public Outreach

As many noted today, it is imperative to have noise baselines with time above and other metrics for the public to understand any of the GBAS discussions. Please find attached the list of metrics that the GBAS team can output at the push of a button with the software Aviation Environmental Design Tool AEDT that our tax dollars have funded precisely for these purposes.

A. Impact information must first be made available on the ""overlays"" and what was submitted to FAA for them to make the premature environmental determination.

B. It is insufficient to use ""single flight"" information - there should be an analysis with sample PEAK traffic days and ideally other data sets to reflect true experience on the ground.

C. My specific suggestions today are to use TALC60 and Number Above metrics - attached please find a Recommendation with Discussion on Supplemental Metrics on this topic that you are welcome to use.

1. SFO/GBAS' interest in input from residents of the Bay Area -lacking actual public engagement:

Per my records, the SFO Roundtable and the SCSC roundtables nor member cities do ANY public outreach. Threfore, all the presentations on GBAS have so far been seen by a limited audience. And will remain as such as long as the public is not notified.

The public has been left completely out of the loop on the ""Overlays"" information because - on the one hand SFO advertises that the public will be involved before FAA development of procedures yet the overlays are already under FAA production with a ""hard date"" publication of October 7, 2021. And already deemed a CATEX (!)when there is so much incomplete information including the EA for the BSR overlay? The added confusion of ""innovative"" procedures which are for a 5 year plan creates the appearance that the public is being engaged but that is misleading.

I suggest that Congressional Reps be contacted for the congressional offices to notify all the hundreds and thousands of Bay Area residents who have asked for Congressional help on aircraft noise. When reaching out to the public, noise contours and maps with more metrics must be made available for meaningful engagement.

Thank you,

Jennifer

Attachment Name
20201119_Jennifer_Landesman_SCSCRoundtable_GBAS follow up

AEDT supports the noise metrics listed in Table 2-5, as well as the capability to create user-defined noise metrics.

Table 2-5 Summary of AEDT Noise Metric Abbreviations and Definitions

Metric Type	AEDT Name	Standard Name	Definition/Full Name
A-Weighted Noise Metrics			
Exposure	SEL	L_{AE}	A-Weighted Sound Exposure Level
	DNL	L_{dn}	Day Night Average Sound Level
	CNEL	L_{den}	Community Noise Equivalent Level
	LAEQ	L_{AeqT}	Equivalent Sound Level
	LAEQD	L_{d}	Day-average noise level
	LAEQN	L_{n}	Night-average noise level
Maximum Level	LAMAX	L_{ASmx}	A-Weighted Maximum Sound Level
Time-Above	TALA	TA_{LA}	Time-Above A-Weighted Level
Time-Audible	TAUD	T_{Aau}	Time-Audible
	TAUDSC	T_{AudSC}	Time-Audible with Overlapping Events Method (Statistical Compression)
	TAUDP	T_{AudP}	Time-Audible Percent
	TAUDPSC	T_{AudPSC}	Time-Audible Percent with Overlapping Events Method (Statistical Compression)
C-Weighted Noise Metrics			
Exposure	CEXP	L_{CE}	C-Weighted Sound Exposure Level
	CDNL	L_{Cdn}	C-Weighted Day Night Average Sound Level
Maximum Level	LCMAX	L_{CSmx}	C-Weighted Maximum Sound Level
Time-Above	TALC	TA_{LC}	Time-Above C-Weighted Level
Tone-Corrected Perceived Noise Metrics			
Exposure	EPNL	L_{EPN}	Effective Perceived Noise Level
	NEF	L_{NEL}	Noise Exposure Forecast
	WECPNL	L_{WECPN}	Weighted Equivalent Continuous Perceived Noise Level
Maximum Level	PNLTM	L_{PNTSmx}	Tone-Corrected Maximum Perceived Noise Level
Time-Above	TAPNL	TA_{PNL}	Time-Above Perceived Noise Level
Number Above Noise Level Metric			
Number Above Noise Level	NANL	NANL	Number Above Noise Level

All of the metrics in Table 2-5 are computed using the following four base noise level metrics:

- L_{AE} A-weighted sound exposure level (SEL);
- L_{ASmx} A-weighted maximum sound level (LAMAX);
- L_{EPN} Effective perceived noise level (EPNL); and
- L_{PNTSmx} Tone-corrected maximum perceived noise level (PNLTM).

November 20, 2020

From
Evan Wasserman
To
SCSC Roundtable
Message

SCSC Roundtable - Correspondence/Reference Materials Posted

Dear SCSC Roundtable Members, and Interested Parties,

At the request of the SCSC Roundtable Chair, and based on requests made by member approval at the 10/28/2020 Roundtable meeting, we have posted three documents on the Roundtable website for reference as listed below. Therefore, this email is to provide Roundtable Members, and interested parties notification about accessing these materials.

The following items have been posted:

Correspondence: 2020-11-24 Letter from SCSC Roundtable to FAA Regarding BDEGA
Correspondence: 2020-11-24 Letter from SCSC Roundtable to FAA Regarding PIRAT
SCSC Roundtable – Responses to Questions Asked at October 28, 2020 Meeting

Regards, and have a Happy and Healthy Thanksgiving!

Evan Wasserman

November 24, 2020

From

Chris Sequeira

To

Raquel Girvin

Message

SCSC Roundtable - Letters to the FAA - Questions on PIRAT and BDEGA

Dear Regional Administrator Girvin,

At the direction of the Santa Clara/Santa Cruz Airport/Community Roundtable (SCSC Roundtable) Chairperson, Mary-Lynne Bernald, I am forwarding to you the Roundtable's follow-up questions regarding the FAA's BDEGA and PIRAT procedures. As the SCSC Roundtable's conduit into the FAA, Chairperson Bernald would appreciate your forwarding this letter to the appropriate leadership and departments within the FAA for their review, action, and response. The Roundtable looks forward to receiving a response from the FAA through you in the near future, prior to or at the next SCSC Roundtable meeting on January 27, 2021.

Please let me know once you have received the letters, and if you have any questions. We wish you a good Thanksgiving!

Best wishes,

Chris Sequeira (he/him)"Facilitator, SCSC Roundtable

Attachment Name

20201124_Chris_Sequeira_Raquel_Girvin_SCSCRoundtable letters to the FAA

20201124_Chris_Sequeira_Raquel_Girvin_SCSCRoundtable letters to the FAA2

SANTA CLARA/SANTA CRUZ COUNTIES
AIRPORT/COMMUNITY ROUNDTABLE
PO Box 3144
Los Altos, CA 94024

11/24/2020

Ms. Raquel Girvin
Regional Administrator, AWP-1
FAA Western-Pacific Region
777 South Aviation Boulevard, Suite 150
El Segundo, CA 90245

Subject: BDEGA Arrivals - FAA Questions

Dear Administrator Girvin,

As the FAA is aware, SFO BDEGA arrivals have a substantial negative impact on many Peninsula residents because BDEGA is a high-volume procedure (roughly 25% of SFO arrivals) and planes fly over the Peninsula the majority of the time (typically 70% or more) using the BDEGA-west leg[1] instead of the BDEGA-east leg[2] down over the Bay.

Both the SFO Roundtable and Select Committee made multiple recommendations to the FAA regarding increasing the use of the BDEGA-east leg, including returning to historical usage where BDEGA-east was used at least 50% of the time:

- See Appendix for data analyses (recent and historical).
- See the November 2016 SFO Roundtable recommendations (in particular pages 7-9 of the pdf document) and the November 2016 Select Committee recommendations (in particular section 2.2 on page 10 of report).

Through past FAA updates and comments at Roundtable meetings, the FAA indicated that BDEGA-east usage was constrained by DYAMD arrival volume and that the FAA would reinforce the use of BDEGA-east with Air Traffic Control staff.

If the FAA took specific actions to increase the percentage use of BDEGA-east, the SCSC Roundtable has not seen substantial progress since these recommendations were made. We were hoping, however, that the sharp downturn in SFO operations caused by the COVID-19 pandemic would allow the FAA to

[1] The SCSC Roundtable acknowledges that the FAA uses the term “BDEGA Arrival” instead of the BDEGA-west leg, which has been retained here for historical context.
[2] The SCSC Roundtable acknowledges that the FAA uses the term “downwind visual for the BDEGA Arrival” instead of the BDEGA-east leg over the Bay, which has been retained here for historical context.

substantially increase the use of BDEGA-east, therefore, reducing the impact on the residential communities of the Peninsula.

The SCSC Roundtable saw some improvement in May and June 2020, which we appreciate very much. Using BDEGA-east 40% of the time is great progress over the typical 28 or 30% usage of the last few years. However, the percentage split for BDEGA-east still falls short of historical values achieved when air traffic was much higher than now. For instance, BDEGA-east was used 57% of the time in May 2005 when traffic was almost three times as high. One would expect that the FAA would be able to achieve similar splits or exceed them when the volume of SFO operations is roughly one-third of what it was then. See the BDEGA-east analysis provided in the Appendix.

Given the limited improvement observed on the percentage use of BDEGA-east, the SCSC Roundtable therefore requests that the FAA address the following BDEGA questions:

1. What is preventing Air Traffic Control from using the BDEGA-east leg more during this period of drastically reduced air traffic volume at SFO?
    - Please list all reasons with supporting data.
        - In particular, please specify whether NIITE/HUSSH departures or OAK departures to FFOIL with transition to YYUNG conflict with BDEGA-east arrivals.
    - Please provide specific reasons why BDEGA-east was used only 40% of the time in May 2020, but 57% of the time in May 2005 when traffic volume was about three times higher.
    - Identify what can be done to encourage ATC staff to use BDEGA-east much more during this very low traffic period.

2. Is the BDEGA-east leg down the Bay considered an integral part of the BDEGA arrivals procedure?
    - If not, please explain why not and what needs to happen to change that.

3. Is the FAA willing to consider changes to enable the use of BDEGA-east at least 50% of the time?
    - Please suggest all possible changes that would increase usage of BDEGA-east.
        - Changes may include but are not limited to increasing in-trail spacing on DYAMD, creating a curved arrival Required Navigation Procedure over the Bay, coordinating SFO or OAK departures to allow BDEGA-east arrivals if conflicts exist, and making BDEGA-east the default leg for SFO arrivals from the north during night time (10 PM to 7 AM).
    - For each possible change, specify if the FAA is willing or not to evaluate the change.
        - If the FAA is willing, describe the process to initiate the change.
        - If the FAA is not willing, please share explanations.

Most Sincerely,

MaryLynne Bernald

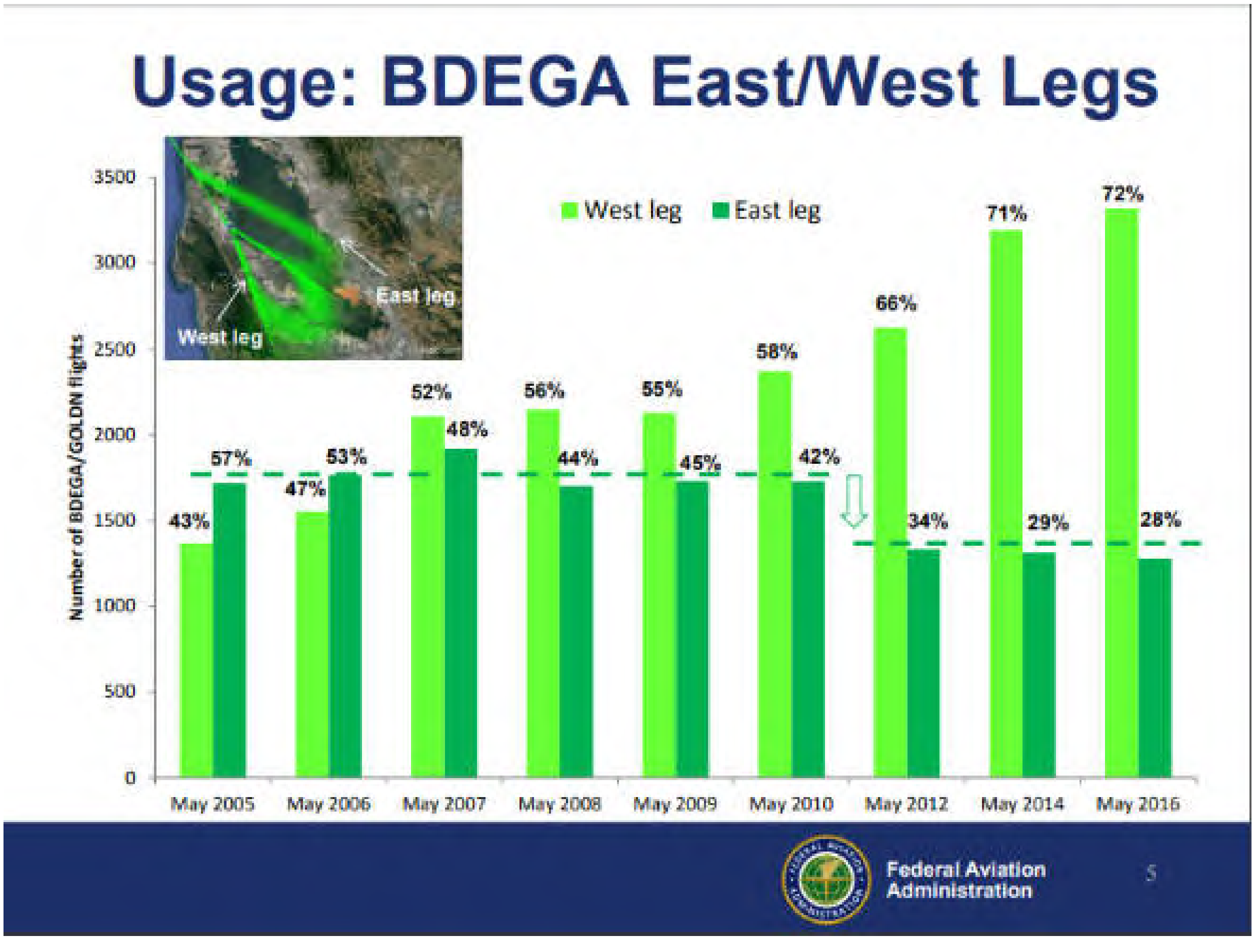
Mary-Lynne Bernald
Chairperson, SCSC Roundtable

APPENDIX

BDEGA usage analysis
Sources: FAA data presented at the 09/29/2016 Select Committee meeting (see figure below), 2020 data provided by the SFO Noise Abatement Office (see table below), and SFO Airport Director Reports.

- All BDEGA arrivals:
  - Current BDEGA arrivals are much lower than before: all BDEGA arrivals in May 2020 (~ 1150) were about 37% of all BDEGA arrivals in May 2005 (~ 3100).
  - The decrease in all BDEGA arrivals is consistent with the decrease in all SFO arrivals for the same months:
    - May 2020 SFO total arrivals (~ 4,400) were about 35% of the May 2005 SFO total arrivals (~ 12,500).
- BDEGA-east arrivals:
  - Between 2005 and 2016, the percentage use of BDEGA-east declined steadily:
    - Between May 2005 and May 2016, the percentage use of BDEGA-east was cut in half: 57% usage in May 2005 versus 28% usage in May 2016.
  - Since 2014, the percentage use of BDEGA-east has remained below 30% except for May and June 2020 when usage rose to 39.7% and 37.4%, respectively.
  - BDEGA-east was used 57% of the time in May 2005 versus 40% of the time in May 2020 even though there were almost 3 times as many BDEGA arrivals in May 2005 than in May 2020 as described above.
- Key observations:
  - Recent percentages of BDEGA-east usage remain low when compared to historical percentages given that current SFO traffic is much lower than historical values due to COVID-19.
  - The FAA was able to use BDEGA-east 57% of the time in May 2005 when SFO traffic was roughly three times higher than in May 2020.
  - In comparison, BDEGA-east was used only 40% of the time in May 2020 when traffic was about one third of what it was in May 2005.

FAA presentation at 09/29/2016 Select Committee meeting



BDEGA-east & BDEGA-west arrivals into SFO from January through June 2020

2020	SFO Total Operations*	SFO Arrivals (assumption: 1/2 of total operations)	BDEGA Arrivals		BDEGA East Arrivals		BDEGA West Arrivals	
			Number*	% SFO Arrivals	Number*	% split	Number*	% split
January	36,473	18,237	4,781	26.2%	1,300	27.2%	3,481	72.8%
February	33,991	16,996	4,636	27.3%	1,443	31.1%	3,193	68.9%
March	29,674	14,837	3,935	26.5%	1,028	26.1%	2,907	73.9%
April	7,576	3,788	906	23.9%	257	28.4%	649	71.6%
May	8,726	4,363	1,162	26.6%	461	39.7%	701	60.3%
June	11,275	5,638	1,491	26.4%	558	37.4%	933	62.6%
Totals:	127,715	63,858	16,911	26.5%	5,047	29.8%	11,864	70.2%

*Data source: SFO Airport Noise Abatement Office

Notes:

1. BDEGA is a major SFO arrival route, typically representing about 26.5% of SFO arrivals in the first 6 months of 2020.
2. In the first 3 months of 2020, the % split between BDEGA East and BDEGA West was aligned with the typical split observed for the last few years: BDEGA East was used between 26% and 31% of the time.
3. SFO Arrivals in April 2020 were only 20.7% of the January 2020 arrivals. Despite this sharp decrease in traffic, BDEGA East was used only 28.4% of the time in April 2020.
4. In May and June 2020, SFO arrivals started to increase again and the percentage usage of BDEGA East increased substantially to 39.7% and 37.4%, respectively.

SANTA CLARA/SANTA CRUZ COUNTIES
AIRPORT/COMMUNITY ROUNDTABLE
PO Box 3144
Los Altos, CA 94024

11/24/2020

Ms. Raquel Girvin
Regional Administrator, AWP-1
FAA Western-Pacific Region
777 South Aviation Boulevard, Suite 150
El Segundo, CA 90245

Subject: Response to FAA PIRAT letter dated May 27, 2020

Dear Administrator Girvin,

Thank you for your letter dated May 27, 2020, which included your responses to the four requests regarding PIRAT and related changes from July 2018 through February 2019.

We are responding to your latest May 27 letter on PIRAT. Our new questions that we would like the FAA to address related to previous FAA presentations and responses on PIRAT (including the FAA's PIRAT presentation to the SCSC RT February 26, 2020 meeting) are listed in Attachment 2 to this letter.

On behalf of the SCSC Roundtable, thank you for your attention to these requests. We look forward to receiving your written response by the January 27, 2021 SCSC Roundtable meeting.

Sincerely,

MaryLynne Bernald

Mary-Lynne Bernald

Chairperson, SCSC Roundtable

cc: SFO Community Roundtable – Chairperson Ricardo Ortiz

ATTACHMENT

- Comments and Additional Questions on PIRAT Procedure

Attachment 1

COMMENTS AND ADDITIONAL QUESTIONS ON PIRAT PROCEDURE

This section includes follow-up questions for the FAA in regards to the May 27, 2020[1] FAA response to the SCSC Roundtable and previous FAA presentations and responses on PIRAT (including the FAA's PIRAT presentation to the SCSC RT February 26, 2020[2] meeting).

Notes:

- The FAA implemented the RNAV PIRAT ONE procedure first, but quickly replaced it with PIRAT TWO when the FAA discovered that PIRAT ONE did not specify the 15,000 ft altitude at waypoint PIRAT (far away over the Pacific Ocean) -- the critical missing data created conflicts between PIRAT ONE arrivals and some departures.
- The only difference between PIRAT TWO and PIRAT ONE is the 15,000 ft altitude requirement at waypoint PIRAT. This difference does not affect any community. Therefore, for simplicity purposes, we decided to use the word **"PIRAT" in this document to refer to the RNAV Oceanic arrivals procedure that replaced Tailored Arrivals and non-Tailored Arrivals to SFO and OAK**.
- For everyone's benefit, we have summarized below the sequence of events on PIRAT:
    - The FAA issued a CATEGORICAL EXCLUSION DECLARATION/RECORD OF DECISION for several procedures, including the PIRAT STAR on July 17, 2018, date of the last signature by the Western Service Area Director.
    - The CATEX/ROD stated that "*The PIRAT STAR will be an Optimized Profile Descent (OPD) STAR, requiring aircraft to cross a new waypoint ARGGG at 8,000 feet MSL or approximately 5,820 feet AGL. The waypoint ARGGG will replace the WOODSIDE VOR (OSI), and is located approximately 100 feet west of OSI along the existing track. The PIRAT STAR does not connect to IAPs* [Instrument Approach Procedure]*. At ARGGG, ATC will vector aircraft to final approach course for KSFO and/or KOAK.*"
        - The last sentence about vectoring is critical. Per the CATEX document, pilots should have expected to receive vectoring instructions from ATC at ARGGG. The published PIRAT procedure chart, however, does not specify "Expect Vectors at ARGGG". Instead, the chart specifies an on track heading of 060, which leads to SIDBY (see insert with red underline for emphasis):

          LANDING KOAK/KSFO: From PIRAT on track 060° to cross BRINY at or below 12000 and at 250K, then on track 060° to cross ARGGG at 8000 and at 230K, then on track 060°. Expect RADAR vectors to assigned instrument approach.
    - At the request of the SFO Roundtable, the FAA presented PIRAT on February 6, 2019[3] and stated then that PIRAT:
        - was a request of the Select Committee.[4]

[1] https://storage.googleapis.com/proudcity/scscroundtable/uploads/2020/06/FAA-response-to-Mary-Lynne-Bernald-SCSC-letter-dated-03.06.20_.pdf

[2] https://storage.googleapis.com/proudcity/scscroundtable/uploads/2020/02/1_Final_SCSC_Roundtable_Agenda-Packet_Full_02-26-20_Meeting_v4_2020022

[3] https://sforoundtable.org/meeting317/

[4] https://storage.googleapis.com/proudcity/scscroundtable/uploads/2019/07/SelectCommitteeReportNovem.pdf

  - was an OPD and therefore would be quieter as airplanes will glide down to the airport.
  - would end at ARGGG with planes being vectored after that because of congestion due to two other SFO arrival routes (BDEGA-west and SERFR). The FAA did not explain how vectored planes would glide down to the airport, but added that the FAA did not control how pilots fly their aircraft (e.g., when pilots deploy flaps and slats to slow planes down or use engine power to maintain or increase speed).
  - would not increase traffic.
  - would be used by OAK on an exception basis.
  - was an overlay of the TA arrivals and therefore nothing would change.
  - NOTE: The FAA did not mention any safety or efficiency concerns in the presentation.
- The Feb 22, 2019 letter from FAA Regional Administrator Raquel Girvin[5] to then Palo Alto Mayor Eric Filseth reiterated that planes would be vectored after ARGGG and follow the same ground tracks as before (no mention of a change in the heading from MENLO to SIDBY and the addition of a charted heading to SIDBY):

  > arrives at the Woodside VOR (OSI). The PIRAT STAR would end at the ARGGG waypoint, located approximately 100 feet west of OSI along the existing track. Currently, aircraft cross the OSI at 6,000 feet mean sea level (MSL). However, aircraft would cross the ARGGG waypoint at 8,000 feet MSL on the PIRAT STAR. After ARGGG, aircraft would be vectored to final and into the arrival sequence. We anticipate SFO and OAK oceanic arrivals will follow the same ground track as they do today, including being vectored after the OSI. Due to the dynamic nature of air traffic control, there may be

- We learned subsequently that PIRAT was not a Select Committee recommendation, planes did not glide to the airport, the volume increased substantially, and that PIRAT was not a strict overlay given the **new** and **charted heading** (“on track 060”) that automatically directed planes to SIDBY instead of being vectored to the MENLO waypoint as before. Using a new heading **changes ground tracks**: from Woodside, going to MENLO is a 040 heading, going to SIDBY is a 060 heading. Adding a charted heading **automatically concentrates planes** into a narrow corridor over the communities beyond ARGGG.

[5] https://www.cityofpaloalto.org/civicax/filebank/documents/71896

Questions for the FAA

The SCSC Roundtable would like the FAA to address the following three topics and respond to the questions listed under each topic:

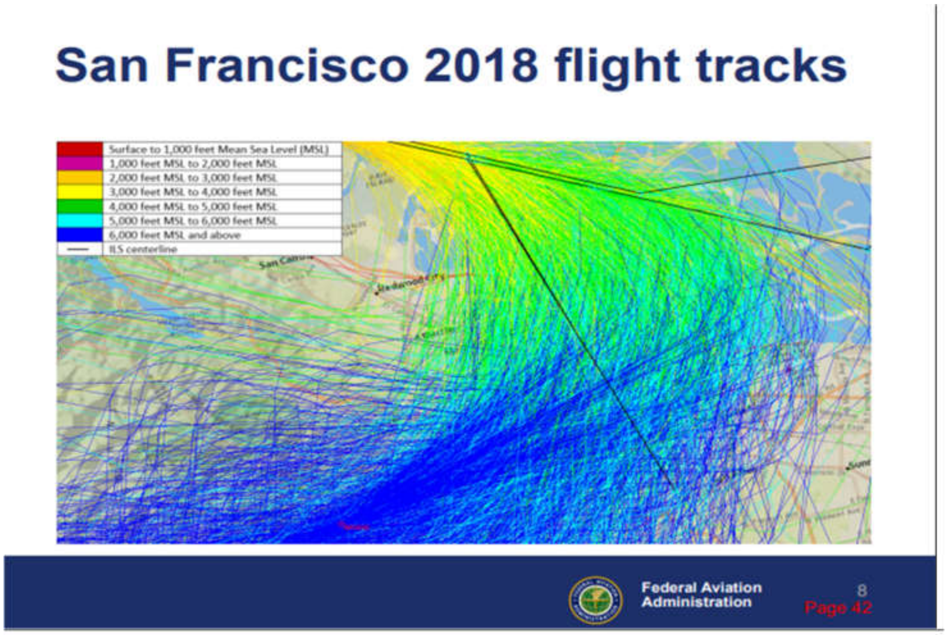
1. **Environmental Review:**
   a. As requested previously in our letter of March 6, 2020[6], can the FAA provide documentation that shows that the airport proprietor supported PIRAT?
      i. Please specify the dates, participants, and notes/emails of any FAA discussions with SFO regarding the PIRAT RNAV procedure that was published on Feb 28, 2019.
   b. Was the issue of shifting noise considered in the PIRAT IER for the ground track prior to ARGGG as well as after ARGGG?
      i. If so, please provide documentation.
      ii. If not, please explain why it was not considered.
   c. Can the FAA clarify the legitimacy of the July 17, 2018 PIRAT CATEX/ROD given that the description of the vectoring after ARGGG in the CATEX document is substantially different from the charted heading of 060 that is specified in the published PIRAT procedure chart?
   d. Can the FAA clarify what process exists, if any, to audit the content of an environmental review (CATEX or otherwise) when there is material evidence that assumptions or statements were either subjective, incorrect, or inconsistent, that methods used were invalid, or that the FAA did not seek answers to critical questions?
      i. If so, please describe the audit process and possible outcomes.

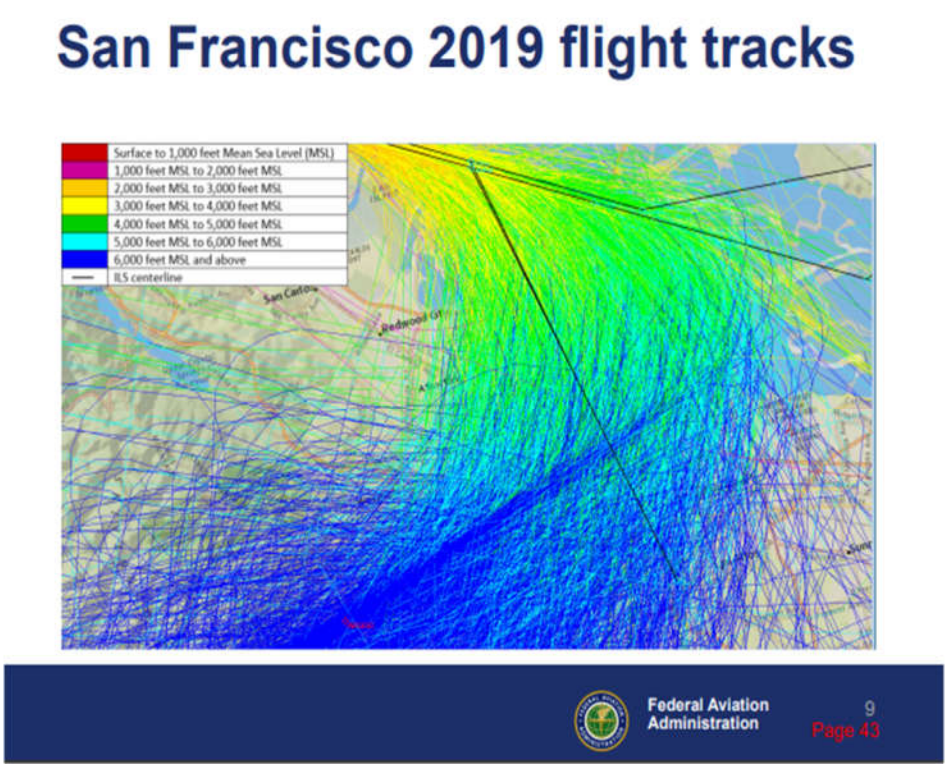
2. **Community concerns:**
   a. Why did the FAA disregard community concerns that were raised by residents and several cities in the fall of 2018, after the IER was concluded, but months before PIRAT ONE went live on Feb 28, 2019?
   b. Why did the FAA continue to disregard the lack of community support for the new procedure when it modified PIRAT ONE to create PIRAT TWO, which went live in April 2019? By then, the FAA was fully aware that the community was very concerned about PIRAT and was not supportive of the procedure as implemented.

3. **Root cause of the increase in Oceanic arrivals after PIRAT was implemented:**
   a. Can the FAA substantiate with a data analysis its statement that the 35.5% increase in the PIRAT procedure operations is solely due to an increase in market demand and has nothing to do with converting a private Tailored Arrival to SFO and other Oceanic Arrivals to SFO and OAK into a public RNAV/OPD that can now be used in the optimization algorithms used by airlines in requesting a flight plan and programmed in the Flight Management Systems?
      i. A comparison of the same 4-month period in 2018 and 2019 indicate that Oceanic arrivals at both SFO and OAK increased by 35.5% while overall arrivals at both airports increased by less than 2% (1.7% for SFO, 1% for OAK).

[6] Ibid.

As shown in the FAA slides below (pages 42 and 43 of the Feb 26, 2020 Santa Clara Santa Cruz Roundtable meeting packet[7]) the FAA "shifted noise" because PIRAT substantially increased aircraft concentration after the end of the STAR: in 2018, there were three concentrated SFO Oceanic arrivals tracks while in 2019, there is only one single concentrated track.





Traffic data changes July 2016 vs. July 2014

Arrival routes	# of aircraft July 2014	# of aircraft July 2016	Delta (Jul16 – Jul14) # of aircraft	Delta (Jul16 – Jul14) %
OCEANIC	1139	867	- 272	-23.9%
NORTHERN (GOLDN/BDEGA)	4400	4929	+529	+12.0%
SOUTHERN (BSR/SERFR)	4752	5576	+824	+17.3%
EASTERN (MOD/DYAMD)	7728	7300	-428	-5.5%
TOTAL SFO	18019	18672	+653	+3.6%

- **SERFR**: 824 more planes/month → ~27 more planes/day; ~10,000 planes/year
- BDEGA: 529 more planes/month → ~18 more planes/day; ~6,000 more planes/year
- OCEANIC: 272 fewer planes/month →~9 fewer planes/day; ~3,000 fewer planes/year

- **SFO:** 653 more planes/month: ~22 more planes/day; **~8,000 more planes/year**
- **DYAMD**: 428 fewer planes/month: ~14 fewer planes/day; **~5,000 fewer planes/year**

Sources: FAA data shared at the November 3, 2016 Select Committee meeting. SFO Airport Director Reports

SFO and OAK operations data for the same 4-month period in 2018 and 2019:

- **Increase in Oceanic Arrivals: 1,435 flights for both OAK and SFO** (source: FAA data)
- Increase in SFO operations: 1.7% or 2,794 flights (source: SFO Airport Director Reports)
- **Increase in SFO arrivals: 1,397 flights** (assuming an even split between arrivals and departures)
- Increase in OAK operations: 1% or 851 flights (source: OAK Airport statistics)
- **Increase in OAK arrivals: 426 flights** (assuming an even split between arrivals and departures)
- **Combined increase in SFO and OAK arrivals: 1,823 flights**

November 24, 2020

From
Faviola Garcia
To
Chris Sequeira
Message

SCSC Roundtable - Letters to the FAA - Questions on PIRAT and BDEGA

Hi Chris,

I am writing to acknowledge receipt of your email with two letters attached. I also wanted to take this opportunity to wish everyone on this email a happy and safe holiday season.

We will respond to the letters accordingly.

Thank you,

Favi-

Faviola Garcia

November 30, 2020

From
Evan Wasserman
To
SCSC Roundtable
Message

Info for SCSC RT members - GBAS

Dear SCSC Roundtable Members,

The following information is being provided for your reference regarding GBAS.

At the request of SCSC Roundtable Chairperson Bernald, the link below is to the GBAS presentation given at the TWG of the SFO Roundtable on October 7, 2020. The video of the GBAS presentation can be found at this link starting approximately at video timestamp 1:10:50. We urge all members to please review the recording of the presentation.

Further, additional information on GBAS (or any of the other matters on their agenda) can be heard during the full SFO Roundtable meeting to be held this coming Wednesday, December 2nd, beginning at 7:00 p.m. PST. For all interested parties, the agenda can also be found at this link for reference. (https://sforoundtable.org/12-2-2020-roundtable-regular-meeting/)

Regards,

Evan Wasserman

December 1, 2020

From
Susan Lawless
To
SCSC Roundtable
Message

New submission from Contact us

I am finding the unrelenting airplane noise to and from the san Jose airport unacceptable. They not only fly directly ovet my house but sometimes extremely low as to cause shaking. It has gotten worse since the pandemic when logic would say there should be less activity.

December 8, 2020

From
Angela Montes
To
SCSC Roundtable
Message

SFO Roundtable Strategic Plan & Work Plan

Roundtable Partners,

On December 2, 2020 the San Francisco International Airport Community Roundtable approved a four-year Strategic Plan, and a one year Work Plan thru June 2021 for your Board consideration. If there are opportunities for collaboration to reduce the noise impacts from the San Francisco International Airport operations, or airlines, please let us know. We are available to answer questions on Strategic Plan or Work Plan items.

Thank you for your hard work, and continued partnership.

-SFO Airport/Community Roundtable

Angela Montes Cardenas

Attachment Name
20201208_Angela_Montes_SCSCRoundtable_SFO Roundtable Strategic Plan
20201208_Angela_Montes_SCSCRoundtable_SFO Roundtable Work Plan

ROUNDTABLE STRATEGIC PLAN

July 1, 2020 – December 31, 2024

Adopted by the Roundtable on December 2, 2020

ORGANIZATION OF THIS STRATEGIC PLAN

This Strategic Plan is organized as follows:

- Introduction
- Background/History
- Opportunistic Strategy
- Guiding Principles
- Mission Statement
- Goals, and Action Items
- Strategic Plan Amendment Process
- Appendices: Roundtable Bylaws and Memorandum of Understanding

INTRODUCTION

As a part of its ongoing mission to serve the residents living in the Roundtable communities (County of San Mateo and the City and County of San Francisco) affected by noise from aircraft operating to and from San Francisco International Airport (SFO), the Roundtable embarked on a strategic planning process in early 2010 with a goal of developing a Strategic Plan that would guide the Roundtable actions over the next three years. The Roundtable appointed a Strategic Planning Subcommittee to carry out the strategic planning process and to bring a recommended Strategic Plan back to the full Roundtable for its consideration and adoption. In 2010, the Roundtable adopted its first Strategic Plan to better serve its Members and establish long-term goals and vision. The plan was updated in 2020.

This 2020-2024 Strategic Plan represents the work product of the Subcommittee and was approved by the full Roundtable at its December 2, 2020 Regular Roundtable meeting. This Strategic Plan will guide the Roundtable’s actions for the next three years.

Recognizing that the Roundtable needs to respond to changing conditions over time, there are provisions within the Strategic Plan that allow for its ongoing revision. In fact, the Strategic Plan update process will begin a year in advance of the expiration of the Plan or sooner if needed. Until that time, the Roundtable will rely on the guidance provided by the Strategic Plan to develop its annual Work Program, prioritize its activities, and guide its efforts to work with SFO, the Federal Aviation Administration, and the airlines to respond to community concerns and to minimize the impact of aircraft noise on Roundtable member communities.

BACKGROUND/HISTORY

The Airport/Community Roundtable was established in 1981 as a voluntary committee of elected officials to address community noise impacts from aircraft operations at SFO. The Roundtable monitors a performance-based noise mitigation program implemented by airport staff, interprets community concerns and attempts to achieve noise mitigation through a cooperative sharing of authority among the aviation industry, the Federal Aviation Administration (FAA), SFO management and local government.

The authority to control aircraft in flight and on the ground is vested exclusively in the FAA. The FAA, however, cannot control the number of flights or the time of day aircraft operate. Federal law preempts any local government agency from implementing any action that is intended to control the routes of aircraft in flight. Neither the Roundtable, local elected officials nor airport management can control the routes of aircraft in flight or on the ground.

GUIDING PRINCIPLES

The following guiding principles define the manner in which the Roundtable will conduct business over the next three-year period:

1. The Roundtable is the preeminent forum for addressing and resolving community concerns related to noise from aircraft operating to and from San Francisco International Airport.

2. The Roundtable fosters and enhances cooperation between the San Francisco International Airport, noise-impacted communities, the federal government, and the airlines with the purpose of developing, evaluating, and implementing reasonable and feasible policies, procedures, and mitigation actions that will further reduce aircraft noise exposure in neighborhoods and communities in San Francisco and San Mateo Counties.

3. The 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.

MISSION STATEMENT

The San Francisco International Airport Community Roundtable is a forum of elected officials from San Mateo, and San Francisco Counties assembled to address community noise impacts due to operations at San Francisco International Airport by advocating for legislation, policies, and programs that result in a quiet, healthy community, and by serving as the liaison and resource for community members, local governments, the Federal Aviation Administration (FAA), San Francisco International Airport, and airline operators.

GOALS, AND ACTION ITEMS

The following goals are not listed in priority order:

Goal 1: Review and Comment on Aircraft Procedures: Focus on all aircraft procedures including arrival, departure, and ground based procedures.

Action item: The Roundtable will focus, advocate, and respond on procedural changes that limit the noise impacts on our communities.

Goal 2: Address Airport Operation Noise: Abate noise impacts to surrounding communities from airport and airline operations.

Action item: The Roundtable will identify noise impacts and provide recommendations to SFO Airport Noise Abatement Office for outreach to airlines and FAA as well as to the Airport Director to address in the Airport Development and Noise Action Plans.

Goal 3: Lobby for Aircraft Noise Reduction. Lobby for aircraft noise reduction by sponsoring legislation and research.

Action item: Actively monitor, review, and oppose or support legislation, research, and/or aircraft noise reduction programs to achieve measurable noise reduction in our communities.

Goal 4: Airline Award Program: The Roundtable will partner with SFO to modify the *Fly Quiet Program* to obtain compliance and measurable improvement year over year.

Action item: The Roundtable will report to its community's *Fly Quiet Program* compliance and measurable improvement in compliance year over year.

Goal 5: Address Community Concerns*:* Focusing on San Mateo, and San Francisco Counties continue to actively respond to community concerns regarding aircraft and airport noise issues.

Action item: Provide the forum for communities to voice their concerns and give their input. Educate community members about FAA, SFO International Airport, Airlines, and SFO Roundtable roles and responsibilities and authority.

Goal 6: Improve Roundtable Effectiveness*:* Increase Roundtable effectiveness with inward focused Member education, support and mentorship.

Action item: The Roundtable will make an ongoing effort at strengthening our membership, by developing a mentorship program, creating a new member packet, and translating technical jargon.

STRATEGIC PLAN AMENDMENT PROCESS

This Strategic Plan is a long-term plan that is intended to guide the Roundtable over a three-year period. Among other things, the Strategic Plan shall be used to guide the development of the Roundtable's annual Work Program. The Work Program can be tailored to respond to short-term needs, while remaining responsive to the Roundtable's long-term goals.

There may be circumstances, however, during which conditions change to a point that require an update of the Strategic Plan. In those instances, the Strategic Planning Subcommittee shall be convened to discuss the required changes to Strategic Plan and, when appropriate, shall make recommendations to the full Roundtable regarding the required updates to the Strategic Plan. If the full Roundtable adopts the Subcommittee's recommendations, the Strategic Plan will be amended to incorporate those recommendations.

The foregoing notwithstanding, the Strategic Plan shall be updated no less than every three years. The strategic planning process shall commence no less than one year prior to the expiration plan. The Strategic Planning Subcommittee shall be convened to conduct the strategic planning process and present a recommended Strategic Plan to the full Roundtable for consideration and adoption.

ROUNDTABLE ANNUAL WORK PLAN

July 1, 2020 through June 30, 2021

Adopted by the Membership on December 2, 2020

Organization of the Work Program

The Work Program is organized as follows: Strategic Plan goal and action, and work plan task to be accomplished this fiscal year 2020-2021.

Introduction

The Work Program is part of the Roundtable's overall approach to planning efforts; it is guided by the Roundtable's Strategic Plan. The Strategic Plan has a three-year planning horizon and the Work Program has a one-year planning horizon. The Work Program items are distilled from the overall Strategic Plan goals; each of the Work Program items are associated with a Strategic Plan goal.

While the Work Program is a one-year document, many items will be rolled over through multiple planning cycles. This is due to the longer-term nature of some items, including standing updates and future technologies. These longer-term items remain on the Work Program in order for the Roundtable to maintain their understanding of the issue. The Roundtable appointed a Work Program Subcommittee to carry out the work program planning process and to bring a recommended Work Program back to the full Roundtable for its consideration and adoption.

The following are the approved Strategic Plan (2020-2024) Goals, and Action Items, along with the Work Plan tasks to be accomplished during the fiscal year 2020-2021:

Goal 1: Review and Comment on Aircraft Procedures: Focus on all aircraft procedures including arrival, departure, and ground based procedures.

<u>Action item</u>: The Roundtable will focus, advocate, and respond on procedural changes that limit the noise impacts on our communities.

<u>Work Plan Item(s):</u>

- The Roundtable Technical Working Group will evaluate the FAA NIITE and HUSSH Departures modified proposal for nighttime noise abatement regarding location, level of flight paths, night time hours, and environmental review process. The Roundtable Technical Working Group will recommend next steps to the full Roundtable, as appropriate.

- Working with the technical consultant, the Roundtable will evaluate options for nighttime arrivals on Runways 28R and 28L.

- Working with the technical consultant, the Roundtable will evaluate options for Redirect Southern Arrivals (SERFR) and PIRAT STAR Airspace arrival procedures.

Goal 2: Address Airport Operation Noise: Abate noise impacts to surrounding communities from airport and airline operations.

<u>Action item</u>: The Roundtable will identify noise impacts and provide recommendations to SFO Airport Noise Abatement Office for outreach to airlines and FAA as well as to the Airport Director to address in the Airport Development and Noise Action Plans.

<u>Work Plan Item(s):</u>

-Review and provide feedback on the SFO Strategic Plan, Development Plan, and Noise Action Plan. Include Environmental Justice in the feedback.

-The Roundtable Technical Working Group will actively work with SFO on Ground Based Augmentation System to provide feedback on the GLS (global navigation satellite landing) approach, the associated noise evaluation, and the Community Flight Procedure Package (CFPP) and plan for community evaluation of innovative GLS approaches.

-The Roundtable Ground Based Noise Subcommittee will complete the Ground Based Noise Study and make a recommendation to the Membership on next steps.

Plan Goal 3: Lobby for Aircraft Noise Reduction. Lobby for aircraft noise reduction by sponsoring legislation and research.

<u>Action item</u>: Actively monitor, review, and oppose or support legislation, research, and/or aircraft noise reduction programs to achieve measurable noise reduction in our communities.

<u>Work Plan Task(s)</u>:

- Receive regular reports from N.O.I.S.E., a national organization to insure a sound controlled environment, regarding federal legislation and action.

- Actively monitor activities from the congressional Quiet Skies Caucus.

- Lobby/advocate as needed.

- Work with Congressional delegation to help develop and pass noise-related legislation.

Goal 4: Airline Award Program: The Roundtable will partner with SFO to modify the *Fly Quiet Program* to obtain compliance and measurable improvement year over year.

<u>Action item</u>: The Roundtable will report to its community's *Fly Quiet Program* compliance and measurable improvement in compliance year over year.

<u>Work Plan Task(s):</u>

- Receive Noise Office presentation on new plan, provide feedback, and recommend needed revisions.

Goal 5: Address Community Concerns*:* Focusing on San Mateo, and San Francisco Counties continue to actively respond to community concerns regarding aircraft and airport noise issues.

<u>Action item</u>: Provide the forum for communities to voice their concerns and give their input. Educate community members about FAA, SFO International Airport, Airlines, and SFORT roles and responsibilities and authority.

<u>Work Plan Task(s):</u>

- Revamp the Roundtable website to include accessible meeting information, useful documents, and archived history so that it can be used as an education tool for the community. The website can also be used to communicate

Roundtable successes.

- Conduct an Annual Report of Accomplishments and celebrate the Roundtable 40th Anniversary.

- Analyze noise monitor methodology and make recommendations at the local, state, and federal levels.

Goal 6: Improve Roundtable Effectiveness*:* Increase Roundtable effectiveness with inward focused Member education, support and mentorship.

Action item: The Roundtable will make an ongoing effort at strengthening our membership, by developing a mentorship program, creating a new member packet, and translating technical jargon.

Work Plan Task(s):

- Conduct Noise 101 training.

- Create a member packet for onboarding and supporting new members including mentorship.

December 10, 2020

From
Evan Wasserman
To
SCSC Roundtable
Message

SCSC Roundtable - DOT NEPA NPRM

Good afternoon Chairperson Bernald,

For future reference and notification to SCSC Roundtable members and interested parties we have posted an informational item on the SCSC Roundtable website in the “News” section regarding a Notice of Proposed Rule Making (NPRM) from the US Department of Transportation titled Procedures for Considering Environmental Impacts.

For now, this information is just being reported as a current event for reference to the SCSC Roundtable, and we suggest that it may be more efficient to wait for full discussion/presentation to the SCSC Roundtable (if they are interested) until after January when changes may come, and as more detail/guidance comes forward from the FAA, when the DOT Rule becomes final.

Therefore, before pursuing any action it may be useful to observe whether Congress and the incoming Biden Administration do anything to the final CEQ regulations. As the DOT is tasked with harmonizing its environmental review processes with the already-final CEQ regulations, it is expected that any public comment would have limited ability to affect the scope of the DOT final rule. In our review of the NPRM, there does not appear to be many changes that would likely affect the SCSC Roundtable mission. That being said, the public comment period closes 12/23/2020, and if the full Roundtable or Committees would like to consider this topic further we would be happy to provide summary/guidance.

DOT NEPA NPRM

The US Department of Transportation posted a Proposed Rule in the November 23 Federal Register titled Procedures for Considering Environmental Impacts. According to the notice, “This proposal would update the DOT NEPA procedures in response to the Council on Environmental Quality's (CEQ's) final rule updating its NEPA procedures and also incorporate provisions of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU); Moving Ahead for Progress in the 21st Century Act (MAP-21); and the Fixing America's Surface Transportation (FAST) Act related to the Department's environmental review process. This proposed rule would modernize the Department's procedures and promote collaboration and efficiency in the implementation of NEPA. Finally, this proposal would also update the list of the Department's categorical exclusions consistent with the CEQ's regulations implementing NEPA.”

Regards,

Evan Wasserman

December 10, 2020

From
Darlene Yaplee
To
TWG
Message

TWG Meeting 12/15/2020 - GBAS questions for SFO to address

TWG Committee,

Thank you for putting GBAS on the agenda of the next TWG meeting on Dec 15, 2020.

After attending the SFO GBAS presentations at the SFO RT (Oct 7) and SFO RT TWG (Nov 19), we created a list of GBAS questions to be addressed by SFO for all of us to understand what changes will occur and what impacts these changes will have. We organized our GBAS questions in 7 sections. See below.

We would like these questions submitted by the SCSC RT TWG to SFO.

We appreciate your consideration of our input.

Darlene and Marie-Jo

GBAS Overlay Approaches: we have been told that there is no change in altitudes, waypoints, etc. However, we have not seen detailed specifications to understand that there will not be any additional noise impacts.

What does “overlay” mean exactly?

Where is it an exact copy of the current ILS approaches, and where and how is it different? Are there any changes to today’s arrival and approach procedures, which will be required or have been requested as part of the Overlay update, that are not strictly a one-for-one translation of RNAV and ILS into RNP to GLS?

What specific changes are involved in implementing a GBAS mirroring of the current ILS?

Does the 28L overlay require planes to approach the legacy localizer intercept point exactly as before at 3100 feet, 200 knots and flying upward or level? Or are these noise creating artifacts of the ILS and the Localizer smoothed out in the GBAS overlay to some extent?

How do the charted Tipp Toe and FMS Bridge RNAV/Visuals change with the RNP to GLS overlay? (The typical ATC instructions coming off “descend via SERFR” are “Over EDDYY, join the Tipp Toe visual approach, course only” or once past EDDYY, “Join the Tipp Toe Visual, Expect 28 L.”)

Does the overlay make any attempt to address the current and known SERFR speed brake problem at EDDYY? Has this issue been discussed?

How much will RNP reduce lateral separation over mid-Peninsula cities, and how narrow will the path be?

If the answer is “there will be no reduction”, please explain why this will not happen.

What are the exact RNP specifications of the RNP segment over mid-Peninsula cities?

Will the overlay approaches allow SFO to land more planes per hour?

If so, please explain the expected potential increase in the context of pre-Covid usage rates.

If not, please explain why this will not happen in the future.

What changes in noise impacts do you anticipate with the GBAS Overlay approaches?

Will SFO measure noise before and after GBAS overlay approaches are implemented in October 2021?

If so, what is SFO’s noise monitoring plan (when, where, for how long)?

If there is no plan, please explain why not.

Current FAA constraints for 28L and 28R innovative approaches over mid-Peninsula cities: We understand that the SFO GBAS team is limited in their designs to optimize the approaches for noise abatement purposes because of constraints imposed by the FAA.

Please list all the GBAS-specific constraints currently imposed by the FAA that affect the optimal altitudes, speeds, descent angles, etc. that could reduce noise substantially.

What are the specific constraints at EDDYY and why?

Please explain in particular why the EDDYY altitude or location can't be changed given that such changes have occurred for SERFR3/SERFR4 and may occur in the future.

Why is the area around EDDYY, which is the termination of the SERFR4 STAR and the beginning of the RNP segment, so noisy (i.e., showing purple area)?

Has the GBAS team discussed the descent angle of SERFR? In their meeting notes, the BSR Overlay Full Working Group noted that the descent angle was overly steep.

In particular, what would the noise impact be if SERFR arrivals were less steep and crossed EDDYY at a higher altitude?

What would be the optimal altitude, speed, and location for the end of a new SERFR STAR that would most reduce noise over mid-Peninsula cities if the arrival were fully designed from the runway back?

Noise calculations for proposed innovative approaches:

For mid-Peninsula residential areas and extending 1 mile into the Bay, please show on a grid the expected impact differences before and after the proposed innovative approaches:

Display data for different metrics: LAMAX, SEL, N-Above (start at 45 dB and use 5 dB increments up to 70 dB), T-Above (start at 45 dB and use 5 dB increments up to 70 dB).

Is it possible to report data using C-weighting and A-weighting?

Explain the reasons behind potential noise increases and possible remedies.

We want to understand in particular the effect of shallower or steeper descent angles .

Explain whether the noise calculations take into account speed brakes and aircraft configuration.

If yes, please pinpoint on the grid the assumed locations where speed brakes and changes in aircraft configuration and thrust levels would occur.

If no, how do you plan to estimate the noise impacts accurately?

Additional details on proposed innovative approaches for 28L and 28R: we would like the detailed specifications for 28L and 28R to understand the potential noise reduction. For each 28L and 28R innovative approach, please specify:

Speeds and altitudes at waypoints, distance between waypoints, and descent angles in each segment.

Expected aircraft configuration (e.g. flap schedules) and anticipated levels of thrust at waypoints (per representative aircraft and BADA4 modeling).

How do horizontal and vertical separations for Closely Spaced Parallel Operations affect the descent angle on 28L?

Will horizontal or vertical separation for 28L and 28R approaches change (or could change in the future) given that SFO is introducing new vertical separation for Closely Spaced Parallel Operations (e.g., .308 procedures) for the 19L and 19R approaches?

If yes, please describe the changes. If no, please explain why not.

Industry and FAA whitepapers describe similar GBAS-enabled vertical separation (potentially including displaced thresholds) to reduce the horizontal distance between sequentially arriving aircraft. Furthermore, SFO's presentation suggests that GBAS will not replicate the current 28R lateral offset.

Please describe how vertical separation in Closely Spaced Parallel Operations will affect or constrain descent angles for 28L going forward.

How do you plan to estimate the cumulative impact of GBAS innovative approaches given the mix of aircraft types and the potentially different noise profiles of each aircraft type?

Will you model the noise impact of different aircraft types?

Will you run estimated impacts based on pre-Covid usage rates?

When and how will you share the data?

Innovative “BDEGA-east down the Bay” approach:

Will more planes be able to use this approach? Why?

Will planes using this approach always use just 28R or can they be assigned or request 28L as well?

DYAMD arrivals are sometimes vectored to 28L near FAITH, which is near the south end of the Bay. Could this become a standard procedure to increase use of a BDEGA RNP to GLS?

Design questions on other potential innovative approaches for 28L and 28R:

In principle, could GBAS innovative approaches follow different ground tracks (e.g, a short final or curved approach) given that planes no longer need to connect to the old ILS system? Why or why not?

What barriers stand in the way of low power and clean/low drag aircraft configuration through all descent segments?

How could these barriers be removed?

How would migrating to low power/low drag arrival profiles affect altitudes, speeds, separation, etc.?

Additional technical clarifications on the Glide Path Angle (GPA) for innovative approaches: How are the GPAs in the GBAS presentation measured? Are they measured in straight lines from the runway out (as it is for ILS), or are they constants relative to the curvature of the earth (more likely for a GPS-based system)?

If the angles are measured differently, how are the two normalized for comparison? (A 3 degree GPS derived angle is actually a lower altitude than a 2.85 ILS angle at Palo Alto’s distance from the airport.)

December 13, 2020

From

Robert Holbrook

To

Legislative Committee

Message

Input for the Leg Committee: Noise Metrics; Environmental Impacts

I do not find my correspondence to the Leg Committee (below and attached) sent September 11th included in the packet that was noticed by Friday night’s email. If this was an error, please correct it.

Attachment Name

20201213_Robert_Holbrook_Legislative_Committee_Input for the leg comm1

20201213_Robert_Holbrook_Legislative_Committee_Input for the leg comm2

20201213_Robert_Holbrook_Legislative_Committee_Input for the leg comm3

Robert Holbrook
September 11, 2020

Proposal for an FAA Center of Excellence for Public Health and Welfare

Congress might want to consider asking the FAA to establish a Center of Excellence dedicated exclusively to the FAA's statutory duty "To relieve and protect the public health and welfare from aircraft noise and sonic boom…" (49 USC 44715). This might be called the Center of Excellence for Public Health and Welfare.

Independent of this, Congress might want to consider asking the FAA to provide them with an annual report detailing where the FAA stands with regard to this duty. The FAA might be asked to include in the report an update on progress the FAA has made toward improving public health and welfare during the past year as well as identify initiatives in progress.

Congress mandated the establishment of FAA Air Transportation Centers of Excellence in the Omnibus Budget Reconciliation Act of 1990 and several Centers of Excellence ('CoE') now exist, some as fully self-funded entities. Unlike the other Centers of Excellence, a center of Excellence dedicated to the Public Health and Welfare would not necessarily serve the interests of industry and pilots and so the expectation that it is to become self-funding or require matching contributions should be waived.

Previously, A Center of Excellence of Aircraft Noise and Aviation Emissions Mitigation existed, but it was disbanded and replaced by the Center of Excellence for Alternative Jet Fuels and Environment. In light of the widespread concerns raised by the residential public in the wake of NextGen, it might be good to revisit this decision.

The FAA states, "The mission of the FAA's COE program is to help develop the nation's technology base while educating the next generation of aviation professionals…." If a CoE for Public Health and Welfare were to be established, this mission statement would need to be broadened to reflect the interests of residents as stakeholders in the nation's air transportation system.

Whether such an office is established as a CoE or elsewhere within the FAA, there would be value in having a central coordinating and administrative role within the FAA with regard to the following:

- Technical matters pertaining to Aircraft Noise and Emissions Mitigation
    - Initiating and coordinating research into the health effects of aircraft;
    - Initiating and coordinating research into the noise impacts of aircraft;
    - Definition of an expanded set of measures and mitigations that can be used to mitigate the negative effects of aircraft; and
    - Definition of thresholds of significance that can be used to enable or require these new mitigating measures to be taken and initiating and coordinating any research required to support these determinations.

- Full incorporation of residents affected by aircraft as stakeholders in the nation's air transportation system
    - Serving as a focal point for residential advocacy within the FAA - the office could be tasked with ensuring effective execution of the ombudsman role established by Congress;
    - More effective community engagement in the evolution of the nation's airspace.
    - Better definition of the process to involve communities impacted by aircraft noise and emissions in the rollout - before the fact, while change is still possible - of FAA procedures and standards; and
    - Preparation of any reports requested by Congress on progress toward Public Health and Welfare.
    - In the future, such an office might be asked to undertake a periodic survey of the various roundtables around the country for feedback and suggestions. This might be akin to a Customer Satisfaction Survey, which many corporations use to drive progress.

Requiring an annual report on the progress of the FAA toward relieving and protecting public health and welfare from aircraft noise and sonic boom would help ensure that the FAA understands the continuing interest of Congress in the FAA's execution of this duty – and this interest would be further driven home should a subcommittee or the Quiet Skies Caucus choose to follow up with the Administrator to discuss the report.

Robert Holbrook
September 11, 2020

Standards of Significance and Mitigations for Aircraft Noise

The following contains my thoughts stated in the form of Roundtable findings and resolutions that have not yet been considered or adopted.

Mindful of the FAA's duty "To relieve and protect the public health and welfare from aircraft noise and sonic boom…" 49 USC 44715, the Roundtable finds that the increase in airplane noise since the introduction of NextGen has negatively impacted the public welfare of residents in our jurisdiction and that these negative impacts are not limited to the area immediately surrounding the airports, but extend across the metroplex.

The Roundtable observes that the DNL 65 standard, as applied, does nothing for people residing more than a few miles from an airport. The Roundtable calls upon the FAA to take measures to mitigate the significant negative impacts of airplane noise on the public welfare of residents throughout our jurisdiction and residents outside our jurisdiction who have been negatively affected by airports within our jurisdiction.

The Roundtable believes that the current DNL 65 standard of 'significance' cannot by itself fulfill the FAA's duty "to protect the public health and welfare" to the satisfaction of the Roundtable. The Roundtable therefore believes that the FAA is likely to require new metrics and standards of significance. Noting that a threshold of significance can have no more effect than the measures to be taken when that significance threshold is reached, and that the existing measures and mitigations have proven to be inadequate under NextGen, the Roundtable believes that a broader basket of measures and mitigations is required.

The Roundtable suggests that this broader basket could include the use of less-preferred operational practices with regard to efficiency and that this is not inconsistent with the FAA's charter.

- This might include routing airplanes over longer paths to avoid populated areas.
- This might include increasing the staffing of ATC controllers when unused tower capacity is available, to allow for more communication between ATC and pilots.
- This might include encouraging airplanes to fly slower, but quieter.
- This might include invoking procedures that optimize efficiency at the expense of noise only when the operational conditions actually demand that efficiency – and using less impactful procedures when operational conditions permit, for example, during off-peak periods.

The Roundtable suggests that Congress might want to consider asking the FAA to define significance standards pertaining to the safety of operational procedures. This would allow for the possibility of an <u>acceptable compromise to safety</u>, which might no longer exist under current law per section 329 of the FAA Reauthorization Act of 2018. Whereas aircraft manufacturers are permitted to (and, in fact, must) make cost-benefit tradeoffs to safety when making engineering design decisions, residents are now

Robert Holbrook
September 11, 2020

A Few More Thoughts About Noise Metrics

DNL and Reverse Flow

The DNL standard suffers from a major problem. It is calculated as the annual average of 365 DNL values each of which is calculated over 24h. Consider the implications of this with regard to normal flow traffic and reverse flow of traffic. A location with no reverse flow could have twice as many airplanes overhead during normal flow conditions as a location with a 50/50 split of normal flow to reverse flow. More alarming, the DNL standard would permit an area where reverse flow occurs one in eight days to have seven times as many airplanes as the normal flow area during those hours. Alternately, it would permit each noise event to be ~8dB louder. This could be an issue with South Flow traffic into SJC, where residents can experience months of heavy south flow traffic – and where arrivals are expected to be louder than at present with new aircraft like the Boeing 737-8Max. The fundamental problem is that people are annoyed – annoyed enough to take action – in periods much shorter than a year, and these concerns should not be washed out by an overly broad metric.

Number of noise events

I don't believe that annoyance can be effectively characterized without understanding the number of noise events during the measurement period. It has been suggested that a simple enhancement to the DNL metric would be to report the number of events assumed per day (but see above), This would allow us to distinguish a DNL 63/n20 experience from a DNL 63/n350 experience.

It is Important to Tie out FAA Models with Real World Data

In 2001, the Wyle Acoustics Group indicated to the SFO Noise Abatement Office that meteorological effects are the major factor affecting sound propagation over long distances. Temperature inversions ad downwind propagation increase low-frequency noise levels. (Sharp, Gurovich, & Albee, Wyle Acoustics Group, for Noise Abatement Office, SFO, 2001)

It is important to model noise with real-world conditions, not an average or typical condition. The noise made flying into a 4 knot headwind and flying away from a 4 knot tailwind will not equal the noise made by two flights flying through still air.

To help verify FAA predictions, it would be helpful if the FAA were to provide a breakdown for its DNL assessments. Getting technical for a moment, if the FAA were to bin the projected noise events over a year into 4h buckets starting at 7am and then report the number of buckets in a year expected to exceed 65 DNL, 62 DNL, 59 DNL, etc., we would have a much better sense for the profile of noise the FAA expects – and whether that is likely to tie out with our expectations. Note that this would flag the normal/reverse flow effect I noted above.

Tone

Studies suggest that tone can be an important factor in annoyance. The shriek of the airbus whine affects us differently than the rumble of engines or the deployment of flaps and slats. In 1973, the EPA wrote "One difficulty in the use of the A-…weighted sound level is that psychoacoustic judgment data indicate that effects of tonal components are sometimes not adequately accounted for by a simple sound level." (p.4, Impact Characterization of Noise Including Implications of Identifying and Achieving Levels of Cumulative Noise Exposure ; EPA Aircraft/Airport Noise Study 27 July 1973, http://nepis.epa.gov/Exe/ZyPDF.cgi/9101DPQN.PDF?Dockey=9101DPQN.PDF)

"The psychologist John G. Neuhoff found that for the rising level our hearing is more sensitive than for the declining level. For the same sound level difference the change of loudness from quiet to loud is stronger than from loud to quiet." (John G. Neuhoff, "An adaptive bias in the perception of looming auditory motion", 2001,Ecological Psychology 13 (2) pp. 87 - 110 and John G. Neuhoff, "Perceptual Bias for Rising Tones", 1998, Nature, Volume 395, 10 September http://www.sengpielaudio.com/TableOfSoundPressureLevels.htm)

Noise Level

In 1973, the EPA wrote, "An outdoor Ldn of approximately 60 dB or less is required in order that no more than 23% of the population exposed to noise would be individually highly annoyed…. It therefore appears reasonable to propose an Ldn of 55 to 60 dB as the long range goal for maximum permissible average sound level with respect to health and welfare. (Note that this level is not considered optimum, merely the upper limit of permissibility. No endorsement is intended of degradation of existing areas having a lower noise level.)" (p.43, Impact Characterization of Noise Including Implications of Identifying and Achieving Levels of Cumulative Noise Exposure ; EPA Aircraft/Airport Noise Study 27 July 1973, http://nepis.epa.gov/Exe/ZyPDF.cgi/9101DPQN.PDF?Dockey=9101DPQN.PDF)

Low-frequency noise

Low-frequency sound travels further and better penetrates walls and windows than higher frequency sound. A Low Frequency Noise Study by the Partnership for AiR Transportation Noise & Emissions Reduction (FAA/NASA/Transport Canada, Hodgdon, Atchley, Bernhard, April 2007) cited work by researchers Tokita and Namura showing that the delta between being able to detect low frequency noise and being highly annoyed by it narrowed for low frequencies all the way down to 31.5 Hz. The Tokita & Nakamura annoyance thresholds were validated as predictors of annoyance due to low-frequency aircraft noise. They were found to relate favorably to the subjective annoyance assessments. Linear regression analysis showed that the C-weighted sound exposure level LCE was the best single-metric predictor of subjective annoyance response, explaining over 90% of the variability of the data set. LCE correlated better with the subjective data than metrics specifically designed to quantify low-frequency noise impact.

In 2001, the Wyle Acoustics Group indicated to the SFO Noise Abatement Office that C-weighting is preferred over A-weighting to describe backblast noise. (Sharp, Gurovich, & Albee, Wyle Acoustics Group, for Noise Abatement Office, SFO, 2001)

A-Weighting discounts the sound energy measured at 125Hz by 15.9 dB relative to A- weighting. At 64 Hz, the discount is 25.4dB.

expected to endure any cost when safety is raised as an issue, no matter how insignificant the tradeoff or how abstract the argument. More rigorous analysis is required.

The Roundtable further suggests that, based on the above, this broader basket could also include less-preferred operational practices with regard to safety that are nevertheless acceptably safe.

- This might include increasing the amount of communication between ATC and pilots to the level that was considered safe in the decades pre-NextGen when circumstances permit. Among other things, this might enable pilots and ATC to reintroduce dispersion into routes that NextGen concentrated into rails.

The Roundtable suggests that the FAA consider defining significance criteria associated with this broader basket of measures and mitigations. The significance criteria might apply to specific measures and mitigations (as the DNL 65 criteria does to soundproofing homes) or to baskets of mitigations. Importantly, the significance criteria would convey the authority and, where appropriate, the obligation to use them.

The following illustrates a possible application of the above suggestion:

Significance Level 1 – The negative effects to public health and welfare require the FAA to consider and, if possible, use less preferred procedures and operations at a modest cost to efficiency or a less than 'significant' compromise to safety. *This might apply to the changes made to PIRAT.*

Significance Level 2 – The negative effects to public health and welfare require the FAA to consider, and if possible, use less preferred procedures and operations at a significant cost (to be defined) to efficiency and to consider all procedures that provide 'acceptable' levels of safety. *This might apply to the changes made to South Flow to SJC.*

Significance Level 3 - The negative effects to public health and welfare require the FAA to remediate or mitigate the effects even at substantial cost (to be defined). *This might apply to BSR/SERFR.*

Significance level 4 – At this level, the negative effects to public health and welfare are so severe as to not allow operations under normal circumstances.

Note that each of these levels of significance could be accompanied by multiple independent tests.

December 14, 2020

From

SCSC Roundtable

To

Robert Holbrook

Message

Input for the Leg Committee: Noise Metrics; Environmental Impacts

Good morning Mr. Holbrook,

Thank you for bringing this to our attention. You are correct, these emails should have been included along with the other emails from the September 11th timeframe, and were inadvertently left out of this packet by mistake. We have updated the packet to include all of the correct correspondence files (your email and attachments can be found on pages 31 through 37). We will be sending notification to Roundtable members and interested parties regarding this correction.

We would like to note that while the emails were mistakenly left out of this packet, they had previously been included in the October 27th, 2020 regular SCSC Roundtable meeting agenda packet and were reviewed by Legislative Committee members at that time. Further, these documents had also been forwarded to Legislative Committee members more recently for their review while developing their talking points/papers. Once again we appreciate you bringing this to our attention, and we appreciate your understanding.

Regards,

SCSC Roundtable Staff

December 15, 2020

From
Jennifer Landesmann
To
TWG
Message

Today's meeting on GBAS and environmental review items

Hello SCSC members,

Following are my comments for the public records of your 12/15/20 Agenda,

for Agenda Item 4 - to please consider them as part of the SCSC's input to SFO's GBAS project, and
for Agenda Item 5 - the long standing and unresolved problem with the IFP Gateway and SCSC's associated Memos.

Agenda Item 4

1) ""Review of SFO project to implement GBAS/GLS arrival procedures..""
Project Ownership: Please confirm and document a comprehensive project ownership description for GBAS that does not fail to disclose that GBAS is ultimately a Nextgen project irrespective of SFO buying/installing the Honeywell system. SFO GLS procedures have been documented as part of FAA's Nextgen Priorities - a national infrastructure program. What assurance or documentation will back up what SFO has been saying that it can choose to not use GBAS if it causes harm to communities? That is - once ""harm"" has been defined. Will the FAA sign off to commit suspending use of GLS procedures if they cause harm, once harm has been defined? How does the GBAS project square with the follow up on the FAA Initiative that engaged the Select Committee on South Bay Arrivals? So far is highly controversial with FAA distorting what communities proposed and instead using the process to get premium spots on the IFP Gateway to benefit operators as happened with PIRAT.
Project Description: It's time to come clean about ""safety and efficiency"" and the deception of using ""tech"" to say that airspace procedural changes are meant to reduce noise, see San Mateo Daily Journal, new Tech may quiet SFO noise. Nextgen first compromises safety because of reduced aircraft separation; ""tech"" then helps reduce the risks with enhanced navigational info (it does not solve safety issues) and ""efficiency"" increases airport capacity which qualifies projects for a higher level environmental look and review, or EIS. The yet unaddressed deception began when Nextgen was pitched to Congress as a project with environmental benefits - purposely crafted itself as ""good"" to hide realistic estimates and not have any consideration of necessary mitigations for significant costs to communities. This needs to be cleaned up. Including that it was not appreciated when Air Canada had a near crash at SFO a couple of years ago and the chatter was that it was because of changes to address noise.
Public and Stakeholder Outreach: The phrase in roundtable communications - emails to ""roundtable members and interested parties"" needs to be addressed because you may be misrepresenting that either you are the public or that you are engaging the public. The impacted public and stakeholders are people who may not know or don't know that they should have an interest until they are contacted, and given adequate information in the form of estimated impacts from GBAS or any procedural modifications or changes. I have not seen any actual public engagement or outreach activities with GBAS. Who is responsible for public and stakeholder outreach?
In addition to DNL: SCSC stakeholders who are far away from SFO but have been suffering Nextgen impacts will have very different needs than what SFO or FAA are used to, in terms of noise metrics and thresholds. The 65 dnl threshold is too insensitive or overly permissive and the DNL metric is not enough. To have impact estimates for GBAS that reflect the true experience on the ground (and to avert the noise problems from previously flawed SFO/FAA estimates) - please request that impact estimates are done with supplemental metrics and as suggested in this practical Recommendation to ensure that adequate information about aircraft noise and exposure is made available to the public
The term ""identical"" to describe overlays: Overlays is a legalistic term to trick you and the public to let the FAA prematurely declare a Catex and abuse NEPA and public trust. FAA and SFO should first substantiate the previous environmental assessments and basis that should exist (for said ""overlays"") and upon which a Catex was calculated - if there are none, then higher level reviews are called for. Either way, so much has changed and expected to change with Nextgen that a Catex is wholly inappropriate.
About the term ""Augmentation:"" I urge you to watch the recent 20/20 investigation on Boeing's Maneuvering Characteristics Augmentation System MCAS which illustrates the anatomy of how Boeing claimed that there was ""nothing to look at"" with MCAS in order to sell planes without additional pilot training - to save money and time for airlines - which as you know cannot turn a profit on their own. What a Boeing employee boasted as ""jedi mind tricking"" - is what has been going on with GBAS and Nextgen - regrettably using the affected

communities themselves into bypassing rightful NEPA processes with horribly managed projects that appear to mitigate noise but only push to quiet the public. The resulting harm may not be as sudden as the deaths of hundreds of innocent people as with the doomed MAX flights but if you count the lost life years due to health impacts from aviation noise and emissions - these are real costs, and for thousands of families.

2) ""Develop a list of concerns (with examples where possible) regarding the FAA Environmental Review Process.. ""
This item looks like a separate concern from GBAS when it should be the first order priority to understand FAA NEPA processes before engaging in any airport procedure discussions.
No matter what SFO says or does about GBAS, the ultimate environmental responsibility is FAA and we know how vulnerable that makes all citizens but especially those already suffering Nextgen problems. Worst, SFO/FAA appear to be using the unresolved cracks or craters in the system to doubly take advantage of how in the dark the public is kept. It was similar in 2014 when SFO insisted that ""nothing has changed. An 8-13 db change in 45-50 DNL is not nothing.
The FAA has described in at least two presentations to you that you can state the level of environmental review and public engagement for projects. Why do you still not ask for higher level reviews from the FAA? Are the airports pressuring you to not ask for higher level environmental reviews as they threatened to not support the SCSC if you support dispersion? There is also the ""shared responsibility"" communications in responses to Congress. I don't see how shared responsibility can happen in the absence of transparency, facts and noise and emissions impact analysis.
Agenda Item 5
Oral Communications for items not on the Agenda

For a year and almost every meeting I have been imploring attention to your IFP Gateway Memos https://scscroundtable.org/ifp-gateway-memos/ which would lead one to believe that the SCSC is actually looking at the procedures when in fact there is no environmental information on the IFP Gateway and the FAA even has a Disclaimer on the IFP Gateway.

It was especially alarming that at the last meeting, a member of the public randomly asked you to explore an item on the IFP Gateway and the response was along the lines of Steve will call the FAA. Do you notice how arbitrary that is? That the public is given no way to deal with procedure development, practically gagged, there is no environmental information for anything, and yet a random request from one person gets a phone call to the FAA?

It was a gut punch to hear SFO say that the FAA issued CATEX in 2018! for the GLS procedures that have been on the SCSC Memo with ""No further information on the IFP Gateway at this time.""

WHEN will you connect the dots between the IFP Gateway and rightful NEPA processes?

Thank you,

Jennifer

December 15, 2020

From

SCSC Roundtable

To

TWG

Message

Today's meeting on GBAS and environmental review items

SCSC Roundtable TWG members,

For your review/reference is a comment from a member of the public for today's TWG meeting.

Regards,

SCSC Roundtable Staff

December 17, 2020

From

Marie-Jo Fremont

To

Legislative Committee

Message

Follow up on Noise Metrics discussion at 12/16/2020 Legislative Committee meeting

Steve,

Here is my follow up on yesterday's Legislative Committee meeting including the problem with using the term "supplemental" metrics.

First, my understanding of Lisa's comment to "Change DNL" and have it "pop out" is that we need to change the standard for significant impact. The usage of "supplemental" metrics is incompatible with this intent.

The term ""supplemental"" metrics is used by the FAA for communication purposes to help the public understand impacts, while the term ""alternative"" metrics is used for defining impact and in environmental review decisions.
· See section 1.7 on page 14 of DOT/FAA Report called ""Technical Support for Day/Night Average Sound Level (DNL) Replacement Metric Research"" published on June 14, 2011 (see screenshot of extract below).

In my and Darlene's comments yesterday, we urge the Legislative Committee to consider three critical things that will be required to change the 65 dB DNL standard for significant impact:

1. Other metrics that may be used in the future for determining significant impact should *not* be labeled as "supplemental".

o It is important to be aware of the FAA terminology to prevent potential misunderstandings.

o Instead use ""alternative metrics"" or "metrics" or "non-DNL metrics".

o Note that:

§ AEDT tool does not distinguish metrics as supplemental or alternative; it only has a list of metrics.

§ Both Sections 173 and 188 of the 2018 FAA reauthorization bill use the term ""alternative"", not ""supplemental"".

2. Today the DNL metric with a threshold of 65 dB defines the standard for significant impact. A change in that standard will require establishing not only the metrics to be used but also their associated thresholds.

3. To build on Glenn's comment, all impacts experienced by "people on the ground" must be assessed, not just the subset that the FAA currently evaluates.

o Impact must be assessed for communities that live between the end of a procedure and the runway. Assessments should not stop at the end of a STAR procedure.

o Impact must also be defined as the aggregate impact of:

§ Multiple procedures from multiple commercial airports over a community, not just one procedure from one airport as done today, and

§ Multiple changes over time over a community. Because the FAA is allowed to reset the noise baseline after every change, the incremental impact of each individual change on our communities always falls below the standard to be considered significant. We are like frogs in the pot with the temperature increasing slowly.

Thank you again for your contributions to the Roundtable. I wish you the best for this next stage in your life.

mjf

image.png

December 17, 2020

From
Marie-Jo Fremont
To
Legislative Committee
Message

Follow up on Noise Metrics discussion at 12/16/2020 Legislative Committee meeting

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Thank you again for your contributions to the Roundtable. I wish you the best for this next stage in your life.

December 18, 2020

From

Evan Wasserman

To

SCSC Roundtable

Message

SCSC Roundtable - GBAS Information - Soliciting comments and questions

Dear SCSC Roundtable Members and Interested Parties,

On behalf of SCSC Roundtable Chairperson Bernald, and as discussed at the SCSC Roundtable Technical Working Group (TWG) meeting on 12/15/2020, the following information is being provided as a notification to SCSC Roundtable members, and members of the public regarding the use of the Ground Based Augmentation System (GBAS) procedure at the San Francisco International Airport (SFO).

This material on GBAS may be of interest to member jurisdictions of the SCSC Roundtable for future consideration as additional information becomes available. Please submit any comments or questions to the SCSC Roundtable regarding clarification from SFO on GBAS. The SCSC Roundtable will then submit to SFO. Please provide your comments and questions to the scscroundtable@gmail.com email address by Wednesday 12/23 for review and incorporation into a consolidated list of questions to be sent to SFO.

The following information is being provided for your reference regarding GBAS.

The link below is to the GBAS presentation given at the TWG of the SFO Roundtable on October 7, 2020. The video of the GBAS presentation can be found at this link starting approximately at video timestamp 1:10:50. For your information we suggest all members and interested parties to please review the recording of the presentation.

Additional info is available on the SFO Community Roundtable website with a video recording from the November 19, 2020 meeting, and agenda materials. The GBAS presentation starts at approximately the 00:9:10 mark of the video timestamp and continues until about 01:33:30. Again, we suggest all members and interested parties to please review the materials/recording of these presentations for reference.

Thank you,

December 19, 2020

From
Glenn Hendricks
To
Evan Wasserman
Message

RE: SCSC Roundtable - GBAS Information - Soliciting comments and questions

Evan,

Thanks for sharing.

I have a couple of questions.

1) Who paided for GBAS at SFO? It says the FAA didn't pay, but who is paying?
2) on Slide 7, it should a side view of the GBAS Approach. It shows three phases of approach. a) Final b) Intermediate c) Initial,
Would it be possible for someone to make a side view like this for South Flow at SJC? I think it would be useful to know which phase of approach happens over which City during South Flow at SJC.
Ex: I assume that anything over Santa Clara is Final Approach. Mountain View and parts of Sunnyvale might be Intermediate Approach. Cupertino and before is Initial Approach or none of the above.
3) What is the Community Issue with GBAS at SFO?
4) Does anyone know many aircraft that use SFO have GBAS capability?

Glenn Hendricks
Sunnyvale Council Member, Seat #2"

December 20, 2020

From
Marie-Jo Fremont
To
TWG
Message

GBAS Follow-up input after 12/15/2020 TWG meeting

TWG Committee,

We appreciate you giving us time to provide input on GBAS after the TWG meeting.

We organized our follow-up input in 2 sections:

Clarifications on some comments made at the TWG meeting

Additional GBAS questions to submit to SFO:

We already submitted GBAS questions on 12/10/2020 to the TWG (see previous email below or attached pdf) and would like these additional questions to be submitted as well.

Clarifications on some comments made at the 12/15/2020 TWG meeting:

Moving back the end of a STAR procedure:

Our request is to move back the end of a STAR procedure (further away from the airport), not move the procedures around or change the ground tracks.

In the case of SERFR, moving back “EDDYY” could help SFO address the speed brakes problem that occurs at EDDYY because they could optimize the descent (speed brakes and “flying dirty” result in noise). In addition, moving back “EDDYY” could increase altitudes, which could potentially help procedures like BRIXX that go under SERFR and other procedures like PIRAT and BDEGA-west that are vectored over mid-Peninsula communities.

Speed brakes: Someone commented that it is not possible to address speed brakes. We learned previously from SFO staff that airlines can run simulations to see where speed brakes occur in a descent. Speed brakes and dirty configurations are the root causes of the noise over our communities and must be addressed to reduce noise. We included speedbrakes in our previous GBAS questions. Bert Ganoung of SFO is a resource to get information on simulations.

SFO plan to measure before & after any GBAS implementation, including the GBAS Overlay: although mentioned in our previous questions, we want to emphasize that the SFO plan to measure noise before & after is a requirement. It should not be optional. We request the SCSC RT TWG to agendize at future meetings an SFO review of the before-and-after noise measurement plan of any GBAS implementation.

Modeling of impact: We included requests and questions on modeling noise calculations in our previous submission. We want to emphasize, however, that additional modeling of impact is critical. Reporting the maximum sound level for one single noise event for one aircraft type is not sufficient to understand the potential impacts of a SERFR GBAS innovative approach. We have added a question regarding modeling to the additional questions listed in the next section.

Additional questions to submit to SFO (in addition to our 12/10/2020 questions)

GBAS Overlay CATEX: Request a copy of the CATEX document from SFO

SFO Motivations behind GBAS: Ask SFO to describe in writing their rationale and specific objectives for each implementation: the GBAS Overlay and GBAS Innovative approaches.

Public Outreach: Request SFO to share their plan specifics:

Who do they believe is responsible for doing public outreach?

What role do they expect the SCSC RT to play?

When will public outreach events occur and end, given the proposed schedule to submit innovative approaches in March?

Will SFO adjust their submission schedule on innovative approaches if necessary? For example, what if SFO is unable to respond to (and discuss?) GBAS submitted questions by the end of February?

Modeling of Impact: Ask SFO what additional modeling and noise analyses they are planning to do for innovative approaches, what metrics they will use beyond Lmax, and how they plan to report expected impacts. Share that we would like to see Lmax and other metrics like N-Above reported to help residents understand how many planes above a certain noise level would overfly their residences.

NOTE to TWG: Reporting impacts on a grid, as suggested in our previous submission, is also important to display impact changes on the ground.

Finally, as mentioned in Darlene Yaplee’s comments at the 12/15/20 TWG meeting, please ask ESA to share their perspective on GBAS implementations at the January TWG meeting, specifically:

What are the critical differences between the GBAS Overlay and the GBAS innovative approaches?

What potential impacts (positive or negative) could both the GBAS Overlay and the proposed 28L/28R innovative approaches have on RT Cities?

What potential benefits could a SERFR innovative approach have on RT Cities if the FAA agreed to work with SFO on a GBAS innovative approach that would start further away than waypoint EDDYY and use the same groundtrack? In other words, what if SERFR did not end at EDDYY at 6,000 ft, but south of EDDYY at higher altitudes? Would this help Cities under the SERFR path? Would it allow BRIXX arrivals to SJC to fly higher?

We appreciate your time and efforts on this important topic. Please feel free to contact us if you have any questions.

Gratefully,

Marie-Jo and Darlene

Attachment Name

20201220_Marie-Jo_Fremont_TWG_GBAS follow up

Gmail **Marie-Jo Fremont**

TWG Meeting 12/15/2020 - GBAS questions for SFO to address

Darlene Yaplee Thu, Dec 10, 2020 at 3:33 PM
To: SCSC Roundtable

TWG Committee,

Thank you for putting GBAS on the agenda of the next TWG meeting on Dec 15, 2020.

After attending the SFO GBAS presentations at the SFO RT (Oct 7) and SFO RT TWG (Nov 19), we created a list of GBAS questions to be addressed by SFO for all of us to understand **what changes will occur and what impacts these changes will have**. We organized our GBAS questions in 7 sections. See below.

We would like these questions submitted by the SCSC RT TWG to SFO.

We appreciate your consideration of our input.

Darlene and Marie-Jo

1. **GBAS Overlay Approaches: we have been told that there is no change in altitudes, waypoints, etc. However, we have not seen detailed specifications to understand that there will not be any additional noise impacts.**
    a. What does “overlay” mean exactly?
        i. Where is it an exact copy of the current ILS approaches, and where and how is it different? Are there any changes to today’s arrival and approach procedures, which will be required or have been requested as part of the Overlay update, that are not strictly a one-for-one translation of RNAV and ILS into RNP to GLS?
        ii. What specific changes are involved in implementing a GBAS mirroring of the current ILS?
        iii. Does the 28L overlay require planes to approach the legacy localizer intercept point exactly as before at 3100 feet, 200 knots and flying upward or level? Or are these noise creating artifacts of the ILS and the Localizer smoothed out in the GBAS overlay to some extent?
        iv. How do the charted Tipp Toe and FMS Bridge RNAV/Visuals change with the RNP to GLS overlay? (The typical ATC instructions coming off “descend via SERFR” are “Over EDDYY, join the Tipp Toe visual approach, course only” or once past EDDYY, “Join the Tipp Toe Visual, Expect 28 L.”)
    b. Does the overlay make any attempt to address the current and known SERFR speed brake problem at EDDYY? Has this issue been discussed?
    c. How much will RNP reduce lateral separation over mid-Peninsula cities, and how narrow will the path be?
        i. If the answer is “there will be no reduction”, please explain why this will not happen.
        ii. What are the exact RNP specifications of the RNP segment over mid-Peninsula cities?
    d. Will the overlay approaches allow SFO to land more planes per hour?
        i. If so, please explain the expected potential increase in the context of pre-Covid usage rates.
        ii. If not, please explain why this will not happen in the future.
    e. What changes in noise impacts do you anticipate with the GBAS Overlay approaches?
    f. Will SFO measure noise before and after GBAS overlay approaches are implemented in October 2021?
        i. If so, what is SFO’s noise monitoring plan (when, where, for how long)?
        ii. If there is no plan, please explain why not.

2. **Current FAA constraints for 28L and 28R innovative approaches over mid-Peninsula cities: We understand that the SFO GBAS team is limited in their designs to optimize the approaches for noise abatement purposes because of constraints imposed by the FAA.**
    a. Please list all the GBAS-specific constraints currently imposed by the FAA that affect the optimal altitudes, speeds, descent angles, etc. that could reduce noise substantially.
    b. What are the specific constraints at EDDYY and why?
        i. Please explain in particular why the EDDYY altitude or location can't be changed given that such changes have occurred for SERFR3/SERFR4 and may occur in the future.
        ii. Why is the area around EDDYY, which is the termination of the SERFR4 STAR and the beginning of the RNP segment, so noisy (i.e., showing purple area)?
    c. Has the GBAS team discussed the descent angle of SERFR? In their meeting notes, the BSR Overlay Full Working Group noted that the descent angle was overly steep.
        i. In particular, what would the noise impact be if SERFR arrivals were less steep and crossed EDDYY at a higher altitude?
    d. What would be the optimal altitude, speed, and location for the end of a new SERFR STAR that would most reduce noise over mid-Peninsula cities if the arrival were fully designed from the runway back?

3. **Noise calculations for proposed innovative approaches:**
    a. For mid-Peninsula residential areas and extending 1 mile into the Bay, please show on a grid the expected impact differences before and after the proposed innovative approaches:
        i. Display data for different metrics: LAMAX, SEL, N-Above (start at 45 dB and use 5 dB increments up to 70 dB), T-Above (start at 45 dB and use 5 dB increments up to 70 dB).
        ii. Is it possible to report data using C-weighting and A-weighting?
    b. Explain the reasons behind potential noise increases and possible remedies.
        i. We want to understand in particular the effect of shallower or steeper descent angles .
    c. Explain whether the noise calculations take into account speed brakes and aircraft configuration.
        i. If yes, please pinpoint on the grid the assumed locations where speed brakes and changes in aircraft configuration and thrust levels would occur.
        ii. If no, how do you plan to estimate the noise impacts accurately?

4. **Additional details on proposed innovative approaches for 28L and 28R: we would like the detailed specifications for 28L and 28R to understand the potential noise reduction.** <u>For each 28L and 28R innovative approach</u>, please specify:
    a. Speeds and altitudes at waypoints, distance between waypoints, and descent angles in each segment.
    b. Expected aircraft configuration (e.g. flap schedules) and anticipated levels of thrust at waypoints (per representative aircraft and BADA4 modeling).
    c. How do horizontal and vertical separations for Closely Spaced Parallel Operations affect the descent angle on 28L?
        i. Will horizontal or vertical separation for 28L and 28R approaches change (or could change in the future) given that SFO is introducing new vertical separation for Closely Spaced Parallel Operations (e.g., .308 procedures) for the 19L and 19R approaches?
            1. If yes, please describe the changes. If no, please explain why not.
            2. Industry and FAA whitepapers describe similar GBAS-enabled vertical separation (potentially including displaced thresholds) to reduce the horizontal distance between sequentially arriving aircraft. Furthermore, SFO's presentation suggests that GBAS will not replicate the current 28R lateral offset.
            3. Please describe how vertical separation in Closely Spaced Parallel Operations will affect or constrain descent angles for 28L going forward.
    d. How do you plan to estimate the cumulative impact of GBAS innovative approaches given the mix of aircraft types and the potentially different noise profiles of each aircraft type?
        i. Will you model the noise impact of different aircraft types?
        ii. Will you run estimated impacts based on pre-Covid usage rates?
        iii. When and how will you share the data?

5. **Innovative "BDEGA-east down the Bay" approach:**
    a. Will more planes be able to use this approach? Why?
    b. Will planes using this approach always use just 28R or can they be assigned or request 28L as well?

c. DYAMD arrivals are sometimes vectored to 28L near FAITH, which is near the south end of the Bay. Could this become a standard procedure to increase use of a BDEGA RNP to GLS?

6. **Design questions on other potential innovative approaches for 28L and 28R:**
    a. In principle, could GBAS innovative approaches follow different ground tracks (e.g, a short final or curved approach) given that planes no longer need to connect to the old ILS system? Why or why not?
    b. What barriers stand in the way of low power and clean/low drag aircraft configuration through all descent segments?
        i. How could these barriers be removed?
        ii. How would migrating to low power/low drag arrival profiles affect altitudes, speeds, separation, etc.?

7. **Additional technical clarifications on the Glide Path Angle (GPA) for innovative approaches:** How are the GPAs in the GBAS presentation measured? Are they measured in straight lines from the runway out (as it is for ILS), or are they constants relative to the curvature of the earth (more likely for a GPS-based system)?
    a. If the angles are measured differently, how are the two normalized for comparison? (A 3 degree GPS derived angle is actually a lower altitude than a 2.85 ILS angle at Palo Alto’s distance from the airport.)

December 20, 2020

From

Sky Posse

To

SCSC Roundtable

Message

SCSC Roundtable - GBAS Information - Soliciting comments and questions

Dear SCSC Roundtable,

In response to your recent communication about GBAS, we applaud your efforts to get clarification from SFO about their project. We remind you that we have sent GBAS-specific questions to you, SFO, and the City of Palo Alto for follow up; these have not been answered and we reiterate them in our questions below.

Of grave concern is the potential for new precision technologies like GBAS to further negatively impact the health and wellbeing of people who are affected by the unresolved problems of Nextgen. We are alarmed that the FAA has been absent from any community involvement on GBAS as the FAA develops GLS procedures. FAA's absence is contrary to all we have heard from the FAA since 2018 when they launched a Community Involvement Performance Based Navigation (PBN) Desk Guide and FAA's representations to you that roundtables have a say in PBN development including that they look to you for what level of community involvement to perform.

As we've learned with PIRAT, getting public disclosures after procedures are published is nearly impossible. Thus the time for ensuring fair disclosure of GBAS' estimated impacts is now.

As we respond to your request, please note that we have many more questions for the FAA about environmental review and FAA community involvement, and ask you to please organize a review of these with the FAA.

At this time, per your request, we provide questions for your outreach to SFO.

Questions:

Please ask SFO to substantiate the information they shared with the SFO Roundtable in November 2020 that the GLS procedures listed in FAA's "IFP Production Plan" with a scheduled publication date of October 7, 2021 on the IFP Gateway were issued a CATEX in 2018 based on the sole criteria of it being an "overlay." If a CATEX has been published, does SFO have a copy?

We would like to know how SFO informed the FAA's decision to not consider anything but SFO's explanation of an "overlay" for the CATEX if it is verified. Per FAA Order 1050.1F, "overlay" is on a list of FAA categorical exclusions that states: "An action included within this list of categorically excluded actions is not automatically exempted from environmental review under NEPA. The responsible FAA official must also review Paragraph 5-2, Extraordinary Circumstances, before finalizing a decision to categorically exclude a proposed action." Was there nothing more that SFO provided but "overlay" that led to the FAA's determination?

Did SFO do any of their own impact estimates analysis? If so, what methodology do they use? Their presentations to the roundtables have analysis of only one aircraft, one flight, and a metric that the FAA does not use for NEPA reviews. What assumptions are they making for their project? Is an increase in SFO's capacity from GLS considered? Or the ability to land planes during fog thus increasing impacts to communities? Or the potential for concentration and increased vectoring?

SFO has presented that they can control GBAS so that if it causes harm they won't use it. While the Honeywell equipment is financed by SFO, the GLS procedures are the FAA's and part of a national infrastructure project; see NAC powerpoint Item 37 Page 54 (the NAC was asked to list their top priorities from the IFP gateway which has thousands of procedures and SFO GLS is among the 48 chosen by the NAC). Therefore, once the GLS publication/switch goes "on" it's part of national infrastructure. What agreement would assure that SFO does not use GBAS if it causes harm and who would define harm? SFO and FAA have dismissed an agreement they made in 2000 with Congresswoman Anna Eshoo to maintain SFO arrivals above 5000 feet near the waypoint MENLO now SIDBY; what assurances can we count on for agreements involving FAA and SFO beyond casual comments?

Last but not least, these are our GBAS Questions to SFO submitted to Mr. Daniel Lee at SFO daniel.lee@flysfo.com, per SFO's request after an SFO GBAS presentation in Palo Alto in October 2018. As an update, regarding the question about 2012 CATEX legislation, we have sufficient confirmation now in 2020 that 2012 CATEX legislation has never been applied and is probably not applicable to GLS unless SFO has other information. We will reserve our questions on this matter for FAA.

Thank you,

Sky Posse Palo Alto
www.skypossepaloalto.org

Attachment Name
20201220_Sky_Posse_SCSCRoundtable_GBAS Information

GBAS Questions to SFO

- SFO's plan to do "no harm" with GBAS is using current noise levels (post Nextgen implementation) as a baseline for SFO's procedures design, and preliminary estimates already show a projected increase in noise for some areas with GBAS. What noise standards and policies are being used to measure "no harm" - is SFO setting it's own standards and baselines?

- Why is SFO rushing to implement GBAS before the serious problems of traffic concentration and congestion at Menlo vicinity are resolved (including low and loud night flights). What role does SFO see for itself to urgently resolve these problems brought about since 2014?

- How involved is NorCal TRACON in helping SFO with GBAS? Who are the members of the working group developing GBAS? How many are airline and industry representatives? Which FAA departments are on the committee? Who is representing community interests?

- Who is the FAA official in charge of NEPA review for GBAS? How does SFO or United Airlines go about applying for a CATEX, what documentation is involved?

- To qualify for a CATEX (by-passing environmental review) 2012 legislation directed FAA to demonstrate that actions qualifying for a Catex meet a standard of reducing fuel burn, emissions, and noise. How is the noise reduction standard met; how is noise reduction measured?

- To use the "overlays" as noise baselines for proposed GBAS procedures, "overlays" should all have had previous FAA environmental review. What environmental documentation does SFO have for each of the "overlays"?

December 21, 2020

From	
Jeff Rosner	
To	
SCSC Roundtable	
Message	

Input on Sky Posse request

In my reading on the aircraft noise problems, I have been consistently impressed by the analytical approach of the EU commission...particularly note the IMPACT paragraph.

There are a number of methods they have put in place to control approach and takeoff trajectories to minimize both air pollution and noise over populated areas. The US has many studies and databases, but all of their trajectory control is based on cost to the airlines, not population health and well-being.

The following is from https://www.easa.europa.eu/eaer/appendix

Aircraft Noise and Performance (ANP) Database

The Aircraft Noise and Performance (ANP) database is maintained by the US Department of Transportation, EUROCONTROL and EASA. It provides the noise and performance characteristics for over 150 civil aircraft types, which are required to compute noise contours around civil airports using the calculation method described in Annex II of European Directive 2002/49/EC relating to assessment and management of environmental noise, ECAC Doc 29 and ICAO Doc 9911 guidance documents. ANP datasets are supplied by aircraft manufacturers for specific airframe-engine types, in accordance with specifications developed by the ICAO and European bodies. EASA is responsible for collecting, verifying and publishing ANP data for aircraft which fall under the scope of Regulation (EU) 598/2014.

EASA Certification Noise Levels28

EASA maintains a database of all aircraft noise certification levels which the Agency has approved. The database provides certified noise levels for over 34,000 aircraft variants, including jet, heavy and light propeller aircraft as well as helicopters. In this report, the certified noise levels are used to assess the Noise Energy Index, to attribute an ANP airframe-engine type to each aircraft type in the fleet using the ECAC Doc 29 4th Edition recommended substitution method, as well as to create the noise charts in the Technology and Design chapter.

IMPACT

IMPACT is a web-based modelling application used to assess the environmental impacts of aviation, and whose development, initiated in the context of the SESAR 1 programme, has since been steered and carried out by EUROCONTROL. It allows the consistent assessment of trade-offs between noise and full-flight gaseous emissions thanks to a common advanced aircraft performance-based trajectory model using a combination of the ANP database and the latest release of the BADA family. CO2, NOX, HC, CO and PM emissions are computed using the LTO emission indices in the ICAO EDB and FOI Turboprop Emissions database combined with the Boeing Fuel Flow Method 2 (BFFM2). PM emission indices of jet engines are estimated using the First Order Approximation (FOA3.0) method33. Both BFFM2 and FOA3.0 methods are detailed in the ICAO Airport Air Quality Manual (Doc 9889). The IMPACT methodology and data to assess fuel burn and emissions may differ from that used by Member States to report their emissions to UNFCCC or CLRTAP, hence the delta in estimates between these data sources.

System for Airport Noise Exposure Studies (STAPES)

STAPES is a multi-airport noise model jointly developed by the European Commission, EASA and EUROCONTROL. It consists of a software compliant with Annex II of Directive 2002/49/EC and ECAC Doc 29 modelling methodology, combined with a database of airports with information on runway and route layout, as well as the distribution of aircraft movements over these runways and routes. The 47 European airports within EU28 and EFTA modelled in STAPES are estimated to cover approximately three quarters of the total population exposed to aircraft noise levels of Lden 55 dB and above in this region.

Jeff Rosner, Palo Alto, CA

December 22, 2020

From

Robert Holbrook

To

SCSC Roundtable

Message

TWG Clarification from SFO on GBAS: My Comments and Questions

Thank you for the opportunity to submit questions regarding GBAS/GLS at SFO. First, a few comments:

• At the December Technical Working Group meeting, we learned that the only angle of descent considered for SFO's 28R GLS approach was 3.2 degrees. We were told that this angle was chosen to minimize wake turbulence and that "glide slopes might not have been considered from a noise perspective." Presumably, the intent is to increase the number of airplanes that can be landed at the airport. While the proposed slope presumably maximizes the altitude at which aircraft would enter this approach, we know that noise on the ground cannot be optimized simply by raising altitude. More jet thrust, faster speeds and the deployment of flaps and speed breaks can all quickly override the sonic gains from a few hundred feet of extra altitude. While it's no longer surprising to learn that noise was not a consideration for the glide slope proposed, the focus on efficiency alerts us to watch for increases or shifts in noise, which SFO staff has assured us they do not want.

• To that end, it is somewhat disappointing that only a single aircraft type was modeled for the noise analysis, and a narrow-bodied aircraft at that. I would expect more noise from heavier, wide-bodied models, other things being equal. More analysis should be considered before rolling out a change with such potentially important noise consequences.

Here are my questions:

• A 3.2-degree glide slope is proposed for the 28R GLS approach. Would the deployment of GBAS/GLS affect the glide slope for any of the 28L approaches? If so, how?

• What percentage of arrivals from EDDYY would likely be routed to the 28R GLS approach as opposed to the 28L approach that those arrivals typically use?

• Please provide more information on the expected noise of overflights using the GLS approaches:

- For the noise maps presented, please provide enlarged views of the shaded areas superimposed on streets that can be used to better gauge the extent of the noise shifts.
- Please assess the noise expected from a variety of aircraft, including wide-bodied aircraft, heavy aircraft and aircraft optimized for different descent gradients.
- How might these procedures alter where and how speed brakes and flaps are deployed?
- Please provide maps showing expected noise shifts for a representative sample of air traffic over a period of at least one busy hour.
- Please continue to model noise after the arrival procedure(s) terminate, at least until the aircraft have reached the Bay. (And thank you for the analyses that have done so.)

• Is the publication of GLS approaches partly driven by a desire to increase the number of planes that can be landed at SFO during busy periods? If so, are you aware of any analyses that have discussed expected improvements in efficiency? Please share what you can.

• Once a GLS approach is published, how will SFO be able to control its use? Could SFO constrain the use of the GLS approaches if actual noise exceeds expectations?

• From the NextGen Integration Working Group Rolling Plan for 2019-2021, p48, "An SFO trial of RNP to GLS showed 46 percent less fuel and 86 percent less noise impact, according to a 2018 Boeing briefing at a University of California-Irvine noise conference."

- Report: https://www.faa.gov/about/office_org/headquarters_offices/ang/nac/media/NACRecommendationNIWGRollingPlanReport2019-2021.pdf
- Web page linking to the report: https://www.faa.gov/about/office_org/headquarters_offices/ang/nac/

86% less noise impact – wow! While this is encouraging, I believe we must dig deeper before celebrating. Can you please provide more information about this trial? (Perhaps information from the Boeing briefing cited?) If the 86% reduction in noise impact was measured using the 'net noise reduction model' metric, which rewards the concentration traffic over a few unfortunate communities, the 'improvement' could actually be cause for deep concern, because it could reflect a sharp increase in concentration. If, on the other hand, the 86% reduction derives from improvements in per flight noise (the common sense interpretation of 'per flight noise', not the distorted interpretation adopted for CATEX2), this would be exciting!

• Can you provide more information about the innovative approaches described on slide 27 of the presentation SFO gave at the GBAS Information Meeting held in Palo Alto City Hall October 2nd, 2018? (That slide is attached to this email.) In particular, what does this mean: "OCEANIC, STELR and BDEGA WEST to EDDYY"? Is the idea that the terminal waypoint for these procedures would be set to EDDYY? If so, is the intent to continue to use EDDYY even if the BSR Overlay relocates it?

• (Two years ago, I sent variants of the questions in the two previous bullets to Daniel Lee, the SFO GBAS Program Manager, but I did not receive a response.)

• Finally, regarding the future use of GLS at SFO and elsewhere: Are you aware of any obstacles that would prevent GLS from eventually being used to define curved descent paths that better match the path an airplane would make under engine-idle conditions with minimal use of thrust and/or airplane surfaces? Do you have any suggestions for what, if anything, the Roundtable, the Community or the FAA should be doing to accelerate the rollout and adoption of these more noise-optimal approaches?

Thank you in advance for your consideration of these comments and questions,

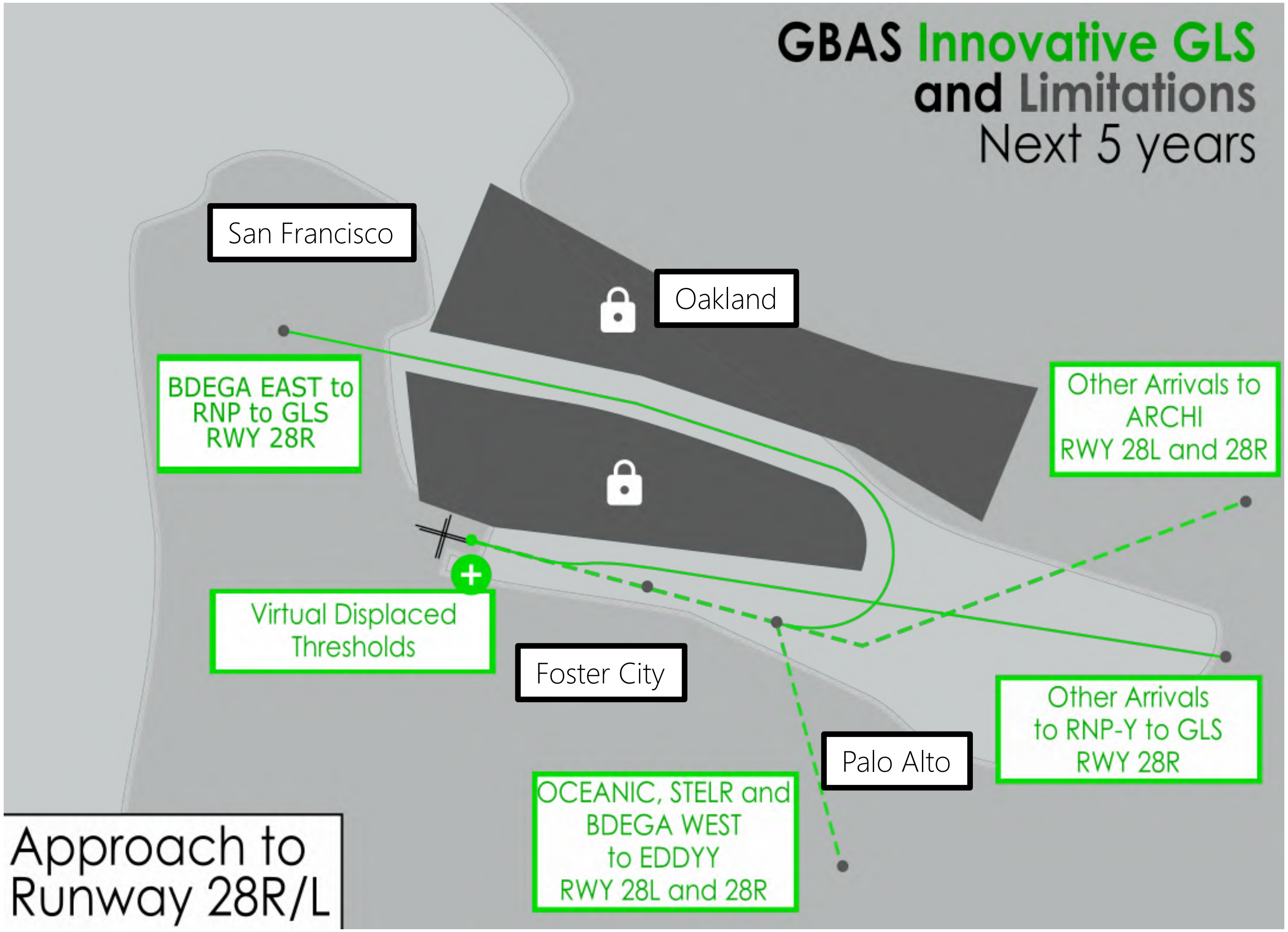
Robert Holbrook

Mountain View

Attachment Name

20201222_Robert_Holbrook_SCSCRoundtable_TWG Clarification

GLS Approach Short Term Limitations at SFO



December 22, 2020

From
Fredric Wells
To
SCSC Roundtable
Message

Latest SFO Roundtable

I watched most of the recent SCSC Roundtable:
https://www.youtube.com/watch?t=4242&v=MVkIO_Nc4Dw&feature=youtu.be

I am concerned that the FAA is making presentations to SCSC Roundtable and proceeding with noise problem resolutions without involving our Santa Cruz area. For example, there is now a whole new process to make noise complaints to the FAA, which I was totally unaware of, and so I've been reporting noise complaints in my usual fashion through stop.jetnoise.net. Most of the information I receive is from my Santa Cruz County Supervisor and Save Our Skies Santa Cruz.

In the recent FAA presentation at the SCSC Roundtable, it became apparent that the FAA is moving forward with the final phases on their noise mitigation, and are in process with an Environmental Impact Report.

I would greatly appreciate something which would clarify where we currently stand in regards to jet noise in Santa Cruz County, and returning to the old BSUR flight path but making it higher & better (quieter) for all concerned. Also, how do we make noise complaints that will count with the FAA, that isn't arduous?

Gloria Wells, Soquel

December 23, 2020

From
Ed Shikada
To
SCSC Roundtable
Message

SCSC Roundtable - GBAS Information - Soliciting comments and questions

Dear SCSC Roundtable,

Per your request, the City of Palo Alto asked our aviation technical consultant to review and comment on the GBAS material. Their feedback is provided in the attachment, and we are forwarding this for your consideration. We hope you find it helpful to your discussion of this issue.

Sincerely,

--Ed

Ed Shikada

City Manager

Attachment Name

20201223_Ed_Shikada_SCSCRoundtable_GBAS Information

JOHN C. FREYTAG, P.E., INCE Bd. Cert.
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CITY OF PALO ALTO
ATTN: ANDREW SWANSON, KPAO Airport Manager
250 Hamilton Avenue
Palo Alto, CA 94301
e: andrew.swanson@cityofpaloalto.org

22 December 2020

Subject: Response to SCSC Roundtable Comments on GBAS Procedure for SFO

Dear Mr. Swanson,

This letter provides comments by the Palo Alto noise and aviation consulting team (Jack Freytag and Dennis Hughes) in response to your message forwarded to us with the Evan Wasserman (ESA staff assistant to the Roundtable) message to “SCSC Roundtable Members and Interested Parties”. The subject is the proposed adoption of the Ground Based Augmentation System (GBAS) for San Francisco International Airport (SFO). The message attached a video of the Oct. 7, 2020 GBAS presentation to the SFO Roundtable Technical Working Group (TWG) Subcommittee and a Nov. 19, 2020 presentation to the SFO Community Roundtable Meeting. Some slides appeared to be redundant with the PowerPoint presentation of October 2, 2018 Palo Alto City Council.

The Ground Based Augmentation System (GBAS) augments GPS to provide precise navigation service for an airport and surrounding airspace using a Very High Frequency (VHF) data link. GBAS supports navigation and precision approach operations within 23 nautical miles from the GBAS reference point, typically located on the airport within three nautical miles of all supported runways, resulting in approach guidance within 20 nautical miles of runway thresholds. The U.S. version of GBAS was initially referred to as the Local Area Augmentation System (LAAS). GBAS equipment is either standard or available for most new commercial transport aircraft, including Boeing 737-NG, 747-8 and 787; and Airbus A320, A330/340, A350, and A380.

Both presentations outline the GBAS system, an augmentation to the existing Global Positioning System (GPS) enabling new approach flight tracks and slightly steeper descents than those from the existing Instrument Landing System (ILS). The presentation tout advantages:

1. Reduce Noise Impact to the Community
2. Create Redundant ILS Capabilities
3. Enhance Efficiency
4. Reduce Delays, this aspect was mentioned, but not fully explored in slide 4; CSPR. In affording decreased separation, GBAS allows for greater aircraft capacity and an attendant increase in noise exposure from increased air traffic volume.

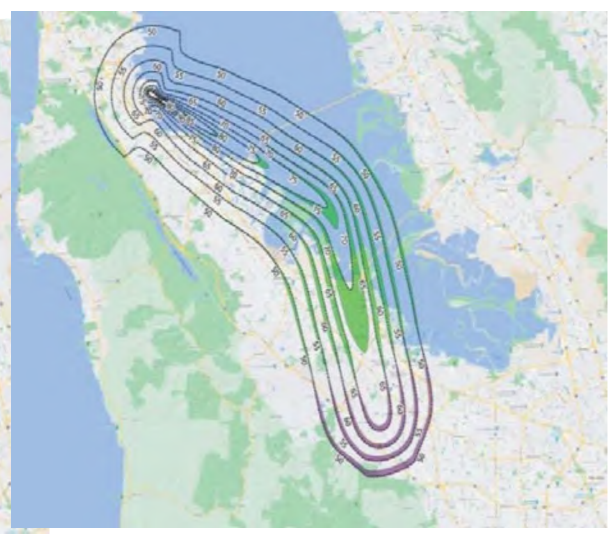
Four RNAV approach procedures have been overlaid on existing procedures using GBAS (GBAS Landing System, GLS), each of which uses the same ground track and waypoint altitudes as the existing procedures; only the final descent angle is changed. These GLS approaches were facilitated through the FAA and their CATEX program (FAAO 1050.1F, §5-6.5) without any consultation with the SCSC Roundtable; even after multiple requests.

All existing SFO approaches use the conventional Instrument Landing System (ILS) approach with a descent between 2.85° (for RWY 28L) and 3.00° (for RWY 28R). The proposed GBAS changes certain final descent profiles to 3.1 and 3.2 degrees, stating that the steeper descent raises the altitude above the Bay and Foster City, thereby decreasing noise exposure during the approach over that from the conventional ILS approach. Altitudes on the transition legs from ARCHI and EDDYY would not change. Noise and emissions impact will only increase with added traffic and usage in the future.

Low altitude vectoring and sequencing of aircraft (dispersion) to final approaches by NORCAL TRACON is the major cause of impacts on the City of Palo Alto, not the instrument procedures. Fifty five percent (55%) of SFO approaches are vectored.

The single aircraft modeling computer runs were done in lieu of using the customary fleet mix. The aircraft used was not identified either by type or category.

This noise reduction is reported in the comparison of two noise contours depicted in terms of maximum noise level (Lmax) for a single approach. The two figures shown below, from the slide presentation, were reportedly prepared by computer modeling. This appears to be in error. The figure on the left is the shown to be the contour using a GBAS approach; the one on the right using a conventional ILS approach. The reported 50 dB contour on the left is identically the 65 dB contour reported on the right. That is, the GBAS system is purported to reduce approach noise by 15 dB. This is not possible.



The maximum noise reduction from a steeper descent is directly beneath the flight track; the noise reduction diminishes further with distance from the flight track. That noise reduction is accurately computed directly below the flight track by the ratio of the GBAS elevation to the ILS elevation at any point using the inverse square law for spherical radiation. That is:

$$^{\Delta}SPL = 20 * \log_{10} [\tan(\Theta_{GBAS}) / \tan(\Theta_{ILS})]$$

Where $^{\Delta}SPL$ = L_{max} noise level reduction
Θ_{GBAS} = GBAS approach angle
Θ_{ILS} = ILS approach angle

For an approach angle of 3.2° versus 3.0° the L_{max} noise level reduction is 0.56 dB; for an approach of 3.2° versus 2.85° it is 1.0 dB. Since the minimum detectable difference in sound level is 3 dB, the GBAS noise reduction would be indiscernible for any aircraft approach events. The reported 15 dB noise reduction is clearly in error.

The GBAS approach clearly has some advantages as a backup to the ILS, in more precise navigation enabling a possible decreased aircraft separation, and enabling landing under the most limited visibility conditions.

However, it has no advantage in providing noise reduction. In fact, in affording decreased separation GBAS allows for greater aircraft capacity and an attendant increase in noise exposure from increased air traffic volume.

Sincerely yours,

John C. Freytag

John C. Freytag, PE, INCE Bd. Cert.
Freytag & Associates, LLC
President and CEO

December 23, 2020

From

Jennifer Landesmann

To

SCSC Roundtable

Message

SCSC Roundtable - GBAS Information - Soliciting comments and questions

Hi Evan, SCSC, Steve, Chris,

Thank you for soliciting input as the SCSC prepares to do outreach to SFO about GBAS.

I have submitted various comments and questions which I hope will be considered.

11/19/20 GBAS Follow Up

12/15/20 GBAS and Environmental Review

I have two additional questions

1) Will the eventual answers from SFO be discussed with Raquel Girvin who in her role as Ombudsman (pursuant to FAA Reauthorization 2018) should be facilitating answers and help us with our concerns? The most important answers we need of course is how the FAA declared a CATEX (if that is confirmed) - we need to know everything, what calculations were used, methodology, and assumptions. Who and what informed that decision.

2) What role does the airport have in the JO 7100.41A process?

Am sharing a video replay of my question to SFO at the SF Roundtable about this back in February 0f 2018.

February 7, 2018 public comment on transparency and role of airport in JO 7100.41A?

Again, thank you and wishing all Happy Holidays!

December 23, 2020

From
Jennifer Tasseff
To
Mary-Lynne Bernald
Message

Re: SCSC Roundtable - GBAS QUESTIONS for SFO

Hello SCSC Roundtable:

Questions for SFO staff regarding GBAS-

(MS Word document also attached- Same contents)

Questions for SFO staff regarding GBAS

BACKGROUND:

· Per the FAA, GBAS has airport capacity benefits. "GBAS will support complex procedures and terminal area paths that will compress the density of terminal operations without impacting safety, thus increasing capacity." https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/gnss/laas/benefits/

· This means that a new GBAS system at SFO will potentially allow more planes to arrive per hour into SFO airport, since terminal operations can be compressed https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/gnss/laas/benefits/https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/gnss/laas/benefits/.

· More planes landings typically translate to more airplane noise for residents on the ground.

· During multiple GBAS presentations by SFO to residents, a primary goal for the implementation of GBAS is to mitigate airplane noise on the ground. (SFO Powerpoint presentation Oct 2018) https://www.cityofpaloalto.org/civicax/filebank/blobdload.aspx?t=50569.56&BlobID=67068 Slide page 17 – "Improve Noise Impact to the Community")

RELATED QUESTIONS REGARDING POTENTIAL CAPACITY INCREASES DUE TO GBAS TECHNOLOGY-

1. How does SFO reconcile the fact that FAA sees the main benefit of GBAS as a means of increasing capacity at an airport, as compared to SFO promoting GBAS as a noise saving effort? Can SFO comment on the conflict of priority?

2. Does SFO plan (currently or in the future) to make use of GBAS in order to increase capacity of the airport? If not, what will prevent SFO, the airlines, or the FAA from exploiting GBAS to increase SFO airport capacity in the future, ultimately resulting in increased airplane noise over residents?

3. SFO staff have indicated that a main goal of GBAS is to reduce noise on the ground ("Improve noise impact to the community"). However, more operations at SFO due to GBAS would likely result in more (not less) cumulative airplane noise for residents on the ground. If GBAS will ultimately allow more planes to land per hour at SFO, how will SFO compensate for this cumulative noise increase? For example, assuming GBAS will potentially allow 8 more planes to land per hour at SFO than current technology allows, what will SFO do to reduce noise back to levels based only on current technology (without the GBAS enhancements).

Compare cumulative noise impact based on:

i. POTENTIAL maximum planes per hour with GBAS SFO equipment versus

ii. POTENTIAL maximum planes per hour WITHOUT implementation of SFO GBAS equipment

Please note, this increase in flight operations will not occur immediately. It will take years, perhaps decades, to occur. However, GBAS technology will potentially allow for an increase in airport capacity over time. So how is SFO planning to control the noise level (as promised), so that GBAS results in less airplane noise over time, and not more airplane noise as compared to the potential SFO capacity without GBAS?

NO SHIFTING OF AIRPLANE NOISE:

· SFO Roundtable (Roundtable Resolution No. 93-01) and SFO airport have a principle that airplane noise will not be shifted between communities. How will SFO assure that none of the GBAS innovative approaches will ultimately (currently or in the future) shift airplane noise or SFO flight paths to new communities where those SFO flight paths and/or noise did not exist previously (i.e., cities like Sunnyvale, Cupertino, Mountain View)?

NOISE TESTING:

1. When considering noise from GBAS, will modeling be performed on both a single noise event and a cumulative basis (i.e. 24 hour period, a one month, 6 month, yearly period)? What cumulative basis/period(s) will be used?

2. The modeling indicated during the SFO Roundtable working group meeting (Nov 19, 2020) indicated that modeling is being performed “on Generic narrow body aircraft (multiple types)”. Will multiple models and types of airplanes be used for GBAS flight path modeling (i.e. wide body, Airbus, etc.) to confirm less noise on a per flight basis? And if so, what types of plane models and types are planned for noise modeling?

3. Will before and after implementation noise measurements be taken? Will ANY increase in noise level be considered unacceptable, and if so, will that GBAS flight path be reverted back to a non-GBAS capable flight path? If not, what recourse would residents on the ground have at that point?

Significant Noise:

The implication by SFO is that GBAS would result in equal or less noise. Yet the “FAA has exercised its discretion to specify DNL 65 dBA as the ""significance threshold"" for the noise effects of its actions. FAA further defines a ""significant impact"" due to noise as any location exposed to noise greater than DNL 65 dBA and experiencing a 1.5 dBA or greater increase in noise due to an action.”

For these GBAS implementations, what will be considered unacceptable regarding noise level? Again, SFO has indicated that any increase in noise would not be acceptable regarding GBAS. However, in the future, how will FAA changes to the GBAS flight paths be evaluated? Once GBAS is implemented at SFO, will future flight path changes come under the authority of the FAA definition of “significant impact” (often citing a CATEX), leaving residents on the ground vulnerable to large noise increases without any recourse? How can this outcome be prevented once the GBAS equipment is operational?

Noise Projections in the future:

GBAS could potentially have large impacts on noise for groundlings. Because of that large impact, are there plans to model airplane noise based on projections 5,10,20 years in advance – Based on new projected aircraft fleets, increased capacity of SFO airport based on GBAS equipment versus no SFO GBAS equipment, etc.

If future model projections are not being conducted, how will SFO protect residents against future noise increases due to potential GBAS capacity increases in 5 or 10 years?

FUTURE AIRPLANE TECHNOLOGY – SHALLOWER DESCENTS

Newly engineered aircraft are generally being designed for shallower descents to optimize fuel consumption. In contrast, GBAS creates steeper descents. Will these newer aircraft have increased noise, since they are not optimized for a steeper descent profile?

Will future noise events potentially be very loud as these new “shallower descent” aircraft attempt to descend on steeper descent profiles under GBAS? Have these newer “shallow descent” airplanes been considered in the future modeling for noise?

REVERT BACK TO NON-GBAS FLIGHT PATH?

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MORE NOISE – IMPLIED OPTION TO SHUT DOWN GBAS IF MORE NOISE IS CREATED?

1. If GBAS results in more noise, will SFO decommission the GBAS equipment?

· Will SFO definitely have the ability and inclination to shut down GBAS in the future; Or will FAA and/or the airlines prevent the decommission of GBAS once it is placed into operation, regardless of the noise impacts?

· Will FAA prevent any ability to decommission GBAS once the GBAS capable flight paths have been created?

2. Can a legal contract be written to assure that SFO intends to honor their promise of creating no more noise on the ground, and will have the ability, authority, and inclination to shut down GBAS in the future even after the flight paths have been implemented by the FAA?

Thanks,

Jennifer

Attachment Name
20201223_Jennifer_Tasseff_Mary-Lynne_Bernald_Re SCSC Roundtable GBAS Questions for SFO

Questions for SFO staff regarding GBAS

From Jennifer (Sunnyvale)

BACKGROUND:

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    - Will FAA prevent any ability to decommission GBAS once the GBAS capable flight paths have been created?
2. Can a legal contract be written to assure that SFO intends to honor their promise of creating no more noise on the ground, and will have the ability, authority, and inclination to shut down GBAS in the future even after the flight paths have been implemented by the FAA?

December 24, 2020

From

SCSC Roundtable

To

Fredric Wells

Message

Latest SFO Roundtable

Dear Mr. and Mrs. Wells,

Thank you for your December 22, 2020 email regarding presentations at the SCSC Roundtable and SFO Roundtable. To clarify, the video link that you provided is to the SFO Roundtable, and is not related to the SCSC Roundtable. Both are separate forums to discuss aircraft noise issues. You have contacted the SCSC Roundtable. While we are unsure which presentation you are referring to, we would like to clarify that at recent meetings of the SCSC Roundtable there have not been any presentations by representatives of the FAA. Any recent presentations at the SCSC Roundtable have been either by SCSC Roundtable consultants, or SCSC Roundtable members. In addition, presentations and comments at the SCSC Roundtable meetings are not associated with the reporting of noise complaints. Noise complaints should always be reported through the FAA's website on the ""Noise Portal"" at the following link: https://noise.faa.gov/noise/pages/noise.html. The link to the FAA Noise Portal, and answers to other frequently asked questions can be found on the SCSC Roundtable website here.

To address your comment regarding representation for Santa Cruz County, we would like to confirm that the SCSC Roundtable is inclusive and representative of all member jurisdictions. In the fall of 2020 we were notified by Santa Cruz County that they would no longer be able to be a participating member jurisdiction of the SCSC Roundtable. The SCSC Roundtable continues to encourage input and welcomes reinstatement of prior membership in the future.

To address your comment regarding jet noise in Santa Cruz County, and as an update on the status of the Federal Aviation Administration’s (FAA) moving the southern approach to SFO back to the Big Sur route also known as the BSR Overlay, we have provided the following information for your reference.

FAA Representative, and Public Engagement Officer, Sky Laron provided an update on the BSR overlay development process at previous SCSC Roundtable meetings (most recent July 22, 2020) by reading aloud a summary letter from the FAA as transcribed in the meeting recap at the following link (agenda item 9).

We trust this information is helpful to you.

Regards,

SCSC Roundtable Staff

December 28, 2020

From
Mike McClintok
To
SCSC Roundtable
Message

Fwd: U.S. Department of Transportation Issues Two Much-Anticipated Drone Rules to Advance Safety and Innovation in the United States

U.S. Department of Transportation Issues Two Much-Anticipated Drone Rules to Advance Safety and Innovation in the United States

WASHINGTON — The U.S. Department of Transportation's Federal Aviation Administration (FAA) today announced final rules for Unmanned Aircraft (UA), commonly known as drones. The new rules will require Remote Identification (Remote ID) of drones and allow operators of small drones to fly over people and at night under certain conditions. These rules come at a time when drones represent the fastest-growing segment in the entire transportation sector – with currently over 1.7 million drone registrations and 203,000 FAA-certificated remote pilots.

Remote ID will help mitigate risks associated with expanded drone operations, such as flights over people and at night, and both rules support technological and operational innovation and advancements.

“These final rules carefully address safety, security and privacy concerns while advancing opportunities for innovation and utilization of drone technology,” said U.S. Secretary of Transportation Elaine L. Chao.

Remote ID (PDF) is a major step toward the full integration of drones into the national airspace system. Remote ID provides identification of drones in flight as well as the location of their control stations, providing crucial information to our national security agencies and law enforcement partners, and other officials charged with ensuring public safety. Airspace awareness reduces the risk of drone interference with other aircraft and people and property on the ground.

Equipping drones with Remote ID technology builds on previous steps taken by the FAA and the drone industry to integrate operations safely into the national airspace system. Part 107 of the federal aviation regulations currently prohibits covered drone operations over people and at night unless the operator obtains a waiver from the FAA. The new FAA regulations jointly provide increased flexibility to conduct certain small UAS without obtaining waiver.

“The new rules make way for the further integration of drones into our airspace by addressing safety and security concerns,” said FAA Administrator Steve Dickson. “They get us closer to the day when we will more routinely see drone operations such as the delivery of packages.”

The Remote ID rule (PDF) applies to all operators of drones that require FAA registration. There are three ways to comply with the operational requirements:

1. Operate a standard Remote ID drone that broadcasts identification and location information of the drone and control station;

2. Operate a drone with a Remote ID broadcast module (may be a separate device attached to the drone), which broadcasts identification, location, and take-off information; or

3. Operate a drone without Remote ID but at specific FAA-recognized identification areas.

The Operations Over People and at Night rule (PDF) applies to Part 107 operators. The ability to fly over people and moving vehicles varies depending on the level of risk a small drone operation presents to people on the ground. Operations are permitted based on four categories, which can be found in the executive summary (PDF) accompanying the rule. Additionally, this rule allows for operations at night under certain conditions.

The final rule requires that small drone operators have their remote pilot certificate and identification in their physical possession when operating, ready to present to authorities if needed. This rule also expands the class of authorities who may request these forms from a remote pilot. The final rule replaces the requirement to complete a recurrent test every 24 calendar months with the requirement to complete updated recurrent training that includes operating at night in identified subject areas.

Both rules will become effective 60 days after publication in the Federal Register. The Remote ID rule includes two compliance dates. Drone manufacturers will have 18 months to begin producing drones with Remote ID, with operators having an additional year to start using drones with Remote ID.

Contact Information: pressoffice@faa.gov

December 31, 2020

From
Susan Lawless
To
Legislative Committee
Message

Re: SCSC Roundtable - Legislative Committee - Agenda Packet Posted

Hi Evan:

I am new to this forum and attended the first half of the December meeting. Since that time, the traffic directly over my house has gotten much worse. A point that was brought up during the meeting that is the most useful one was that continuing to document metrics, complaints, and surveys will do NOTHING if the FAA is not willing to face and provide solutions to these issues. I agree that engaging Pete Budagudge is possibly the best hope for this worsening condition to change.

When I sent my first complaint to the SJ Airport, I was told my house is on a direct path to the landing for San Jose Airport flights and it saves the airlines money to use this direct path. That is not an acceptable answer. I have lived here for 25 years and only in the last two has the traffic gotten to a point of distraction to compel me to consider moving because I imagine once the airlines find a way to cut costs, it will stay this way.

I implore you to use any tool at your disposal to hep address this issue.

Thanks for your attention,

Susan Lawless

San Jose, CA 95118

January 04, 2021

From
Evan Wasserman
To
SCSC Roundtable
Message

Cities Association of Santa Clara County Code of Conduct

Dear SCSC Roundtable Members, Alternates, and Staff,

As requested by the Cities Association, we are distributing the attached Code of Conduct document for SCSC Roundtable reference, and for all current and future members of the Association. In addition we have placed the document on the SCSC Roundtable website.

Purpose of the Code of Conduct Policy

The Cities Association of Santa Clara County (CASCC) has adopted this Code of Conduct for members of the CASCC to assure both the public and CASCC members that the CASCC operates with integrity, fairness, efficiency, and respect.

This Code of Conduct applies to the members of CASCC during public meetings as well as during their interactions with other CASCC members and the public while CASCC members act in their capacity as CASCC representatives. This policy further applies to all committees, task forces, or other groups designated by the CASCC to work with or advise the CASCC, including the Planning Collaborative, and any bodies for whom CASCC serves as fiscal agent or sponsor, such as the Santa Cruz/Santa Clara Roundtable ("SCSC Roundtable"). SCSC Roundtable members and staff are similarly subject to the conditions and policies herein while they are acting as representatives of the SCSC Roundtable, as their actions and behavior reflect directly upon CASCC.

Thank you, and Happy New Year!

Regards,

Attachment Name

20210104_Evan_Wasserman_SCSCRoundtable_Cities Associationof Santa Clara

CITIES ASSOCIATION
OF SANTA CLARA COUNTY

Purpose of the Code of Conduct Policy

The Cities Association of Santa Clara County (CASCC) has adopted this Code of Conduct for members[1] of the CASCC to assure both the public and CASCC members that the CASCC operates with integrity, fairness, efficiency, and respect.

This Code of Conduct applies to the members of CASCC during public meetings as well as during their interactions with other CASCC members and the public while CASCC members act in their capacity as CASCC representatives. This policy further applies to all committees, task forces, or other groups designated by the CASCC to work with or advise the CASCC, including the Planning Collaborative, and any bodies for whom CASCC serves as fiscal agent or sponsor, such as the Santa Cruz/Santa Clara Roundtable ("SCSC Roundtable"). SCSC Roundtable members and staff are similarly subject to the conditions and policies herein while they are acting as representatives of the SCSC Roundtable, as their actions and behavior reflect directly upon CASCC.

CASCC and all covered individuals under this policy are committed to:

- Behaving honestly, truthfully and with integrity in all our transactions and dealings;
- Treating our members, CASCC staff, and the public fairly;
- Treating every member, staff, and the public with dignity and respect;
- Treating our staff with respect, fairness and good faith;
- Ensuring compliance with both the spirit and the letter of the law;
- Avoiding conflicts of interest;
- Appropriately handling actual or apparent conflicts of interest in our relationships;
- Acting responsibly toward the communities in which we work and for the benefit of the communities that we serve;
- Being responsible, transparent and accountable for all of our actions; and
- Setting a robust example of accountability, transparency, ethical conduct and effectiveness for collaborative intergovernmental associations like CASCC.
- Open and honest communication in the spirit of transparency.

[1] For ease of reference in the Code of Conduct, the term "member" refers to any member of the Cities Association of Santa Clara County, including the individual representatives of Santa Clara County cities who have been appointed to the Executive Board and Board of Directors. "Member" further refers to staff and any member of the SCSC Roundtable.

Anti-Discrimination and Anti-Harassment Policy

Objective

CASCC is committed to a work environment in which all individuals, members and staff alike, are treated with respect and dignity. Each individual has the right to work in a professional atmosphere that promotes equal employment opportunities and prohibits unlawful discriminatory practices, including harassment. Therefore, CASCC expects that all relationships among members, including with other members, the public, and staff, will be business-like and free of unlawful or explicit bias, prejudice and harassment.

CASCC has developed this policy to ensure that all its employees can work in an environment free from unlawful harassment, discrimination and retaliation. CASCC will make every reasonable effort to ensure that all concerned are familiar with these policies and are aware that any complaint in violation of such policies will be investigated and resolved appropriately.

Any member or staff person who has questions or concerns about these policies should request a discussion with the President or 1st Vice-President of CASCC, the CASCC Executive Director, and the CASCC attorney.

Dedication to Equal Employment Opportunity

It is the policy of CASCC to ensure equal employment opportunity without discrimination or harassment on the basis of race, color, religion, sex, sexual orientation, gender identity or expression, age, disability, marital status, citizenship, national origin, genetic information, or any other characteristic protected by law. CASCC prohibits any such discrimination or harassment.

Prohibition Against Retaliation

CASCC encourages reporting of all perceived incidents of discrimination or harassment. It is the policy of CASCC to promptly and thoroughly investigate such reports. CASCC prohibits retaliation against any individual who reports discrimination or harassment or participates in an investigation of such reports.

Prohibition Against Sexual Harassment

Sexual harassment constitutes discrimination and is illegal under federal, state and local laws. For the purposes of this policy, "sexual harassment" is defined, as in the Equal Employment Opportunity Commission Guidelines, as unwelcome sexual advances, requests for sexual favors and other verbal or physical conduct of a sexual nature when, for example: a) submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment, b) submission to or rejection of such conduct by an individual is used as the basis for employment decisions affecting such individual, or c) such conduct has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile or offensive working environment.

Sexual harassment may include a range of subtle and not-so-subtle behaviors and may involve individuals of the same or different gender. Depending on the circumstances, these behaviors may include unwanted sexual advances or requests for sexual favors; sexual jokes and innuendo; verbal abuse of a sexual nature; commentary about an individual's body, sexual prowess or sexual deficiencies; leering, whistling or touching; insulting or obscene comments or gestures; display in the workplace of sexually suggestive objects or pictures; and other physical, verbal or visual conduct of a sexual nature. These behaviors are prohibited and CASCC does not condone or permit any such conduct.

Prohibition Against Harassment and Hostile Work Environment

Harassment on the basis of any other protected characteristic is also strictly prohibited. Under this policy, harassment is verbal, written or physical conduct that denigrates or shows hostility or aversion toward an individual because of his or her race, color, religion, sex, sexual orientation, gender identity or expression, national origin, age, disability, marital status, citizenship, genetic information, or any other characteristic protected by law, or that of his or her relatives, friends or associates, and that: a) has the purpose or effect of creating an intimidating, hostile or offensive work environment, b) has the purpose or effect of unreasonably interfering with an individual's work performance, or c) otherwise adversely affects an individual's employment opportunities.

Harassing conduct includes epithets, slurs or negative stereotyping; threatening, intimidating or hostile acts; denigrating jokes; and written or graphic material that denigrates or shows hostility or aversion toward an individual or group that is placed on walls or elsewhere on the employer's premises or circulated in the workplace, on company time or using company equipment by e-mail, phone (including voice messages), text messages, social networking sites or other means.

CASCC also prohibits the creation of a hostile work-environment. A hostile work environment is defined as inappropriate behavior in the workplace that is either severe *or* pervasive enough to create an abusive work atmosphere for one or more individuals, including members or staff.

CASCC prohibits bullying behavior against members, staff, or the public, and prohibits members from improperly or abusively denigrating other members, staff, or the public while engaged in CASCC related business, including in communications with other members, staff, or the public regarding CASCC business.

Individuals and Conduct Covered

These policies apply to all members, staff employees and applicants for staff positions, whether related to conduct engaged in by fellow employees or by someone not directly connected to CASCC (e.g., an outside consultant).

The policies apply to the all committees, task forces, or other groups designated by the CASCC to work with or advise the CASCC, including the Planning Collaborative and SCSC Roundtable and its members, as well as staff employees and applicants for staff positions, so long as the CASCC continues to act as the fiscal agent for the SCSC Roundtable.

Conduct prohibited by these policies is unacceptable in the workplace, including during public meetings, while interacting with staff or members in person or via phone, email, and/or digital meeting, and in any work-related setting outside the workplace, such as business-related social events.

Reporting an Incident of Harassment, Discrimination or Retaliation

CASCC encourages reporting of all perceived incidents of discrimination, harassment or retaliation, regardless of the offender's identity or position. Individuals, including members or staff, who believe that they have been the victim of such conduct should immediately contact the CASCC President, 1st Vice-President, or Executive Director. CASCC encourages individuals who believe they are being subjected to such conduct to promptly advise the offender that his or her behavior is unwelcome and to request that it be discontinued. Often this action alone will resolve the problem. CASCC recognizes, however, that an individual may prefer to pursue the matter through complaint procedures described below.

Complaint Procedures

Individuals, including members or staff, who believe they have been the victims of conduct prohibited by this policy or believe they have witnessed such conduct should discuss their concerns with the CASCC Executive Director.

CASCC encourages the prompt reporting of complaints or concerns so that rapid and constructive action can be taken before relationships become irreparably strained. Therefore, while no fixed reporting period has been established, early reporting and intervention are the most effective method of resolving actual or perceived incidents of harassment.

Any reported allegations of harassment, discrimination or retaliation will be investigated promptly and referred to the CASCC Attorney. The investigation may include individual interviews with the parties involved and, where necessary, with individuals who may have observed the alleged conduct or may have other relevant knowledge.

CASCC will maintain confidentiality throughout the investigatory process to the extent consistent with adequate investigation and appropriate corrective action.

Retaliation against an individual for reporting harassment or discrimination or for participating in an investigation of a claim of harassment or discrimination is a serious violation of this policy and, like harassment or discrimination itself, will be subject to disciplinary action. Acts of retaliation should be reported immediately and will be promptly investigated and addressed.

Misconduct constituting harassment, discrimination or retaliation will be dealt with appropriately.

If a party to a complaint does not agree with its resolution, that party may appeal to the CASCC Executive Board by informing the CASCC Executive Director that the party would like to appeal the resolution of the complaint.

False and malicious complaints of harassment, discrimination or retaliation (as opposed to complaints that, even if erroneous, are made in good faith) may be the subject of appropriate responsive action.

Conflicts of Interest Policy

Conflicts of interest can raise governance and decision-making concerns for CASCC. They also may raise concerns in the mind of the public and members of the media, potentially undermining CASCC's reputation and good standing. Generally speaking, a conflict of interest is a situation in which a CASCC member or any covered individual under this policy has a personal or financial interest that compromises or could compromise the member's independence of judgment in exercising his or her responsibilities to CASCC or for those whom CASCC acts as fiscal agent.

Members are expected to minimize conflicts of interest, disclose ethical, legal, financial, and other conflicts, and remove themselves from decision-making if they would otherwise be called on to act on a conflict involving themselves or entities with which they are closely associated.

Under this policy, members are required to disclose actual or potential conflicts of interest, as well as certain relationships and transactions, to enable to take steps it considers necessary or advisable to address conflicts of interest. Depending on the circumstances, a relationship and/or transaction disclosed under this policy will fall into one of three categories: the relationship/transaction 1) is not a conflict of interest, 2) is a conflict of interest that is permitted provided that certain procedures are followed, or 3) is a conflict that is prohibited altogether.

Members should contact the CASCC Executive Director with any concerns regarding a potential or actual conflict of interest as soon as is practicable.

Adopted by the Board of Directors
November 12, 2020

January 4, 2021

From

Evan Wasserman

To

SCSC Roundtable

Message

SCSC Roundtable - Aviation Noise and Emissions Symposium 2021: virtual format and great price this year

Dear SCSC Roundtable Members, Alternates, and Staff,

For those interested in attending the 2021 Aviation Noise and Emissions Symposium, we are passing along the registration information for your reference. Registration is open now and accessible via the links below (registration at own expense).

Happy New Year!

The 2021 Aviation Noise and Emissions Symposium (Feb 23-26) is virtual this year. Many of the sessions are relevant for the advocacy efforts of Quiet Skies groups and community members.

Fortunately, the folks at U Cal Davis have announced a ""holiday special"": only $25 until Jan. 14th for community members.

Topics include:

- Aircraft Noise and Emissions Legislation in the Next Congress: Priorities, Perspectives and Predictions
- A Conversation with the Authors of “A Guide to U.S. Aircraft Noise Regulatory Policy”
- Aviation Emissions: Reduction Efforts and Current Research
- Aircraft Noise and Overflight Dispersion: Opportunities and Challenges
- The Direct and Indirect Impacts of Aviation on Human Health
- Climate Change and Aviation: Opportunities in the Midst of Adversity

All of the presentations will be pre-recorded and available to watch starting about a week ahead. The panel discussions will be live. Here are more program details:
https://anesymposium.aqrc.ucdavis.edu/program

The reduced price lasts until Jan. 14th. Registrants will have access to all of the pre-recorded talks and the live panel discussions. Here’s the link to register:

https://anesymposium.aqrc.ucdavis.edu/register

Best wishes,

Anne Hollander
Montgomery County Quiet Skies Coalition (of Maryland)
Member of the 2021 ANE Program Committee"

January 04, 2020

From
Brad Eggleston
To
SCSC Roundtable
Message

SCSC Roundtable - GBAS Information - Soliciting comments and questions

Hello SCSC Roundtable,

Could you please add me to your email distribution list?

Thanks and Happy New Year!

Brad

Brad Eggleston | Director of Public Works

January 06, 2021

From

Evan Wasserman

To

SCSC Roundtable

Message

SCSC Roundtable - FAA's Final Rule to Reintroduce Supersonic Aircraft

Dear SCSC Roundtable Members,

For reference and notification to SCSC Roundtable members we have posted an informational item on the SCSC Roundtable website in the “News” section regarding the FAA's Final Rule to Facilitate the Reintroduction of Civil Supersonic Flight.

For now, this information is just being reported as a current event for reference to the SCSC Roundtable. To clarify, this is the final rule regarding special flight authorizations for supersonic aircraft – it is not the FAA’s final rule for supersonic aircraft noise standards (which hasn’t been published yet). In fact, the summary for the special flight authorization rule states the following:

“Outside the context of special flight authorizations under this final rule, the FAA continues generally to prohibit civil supersonic flight over land in the United States.”

Press Release – FAA Announces Final Rule to Facilitate the Reintroduction of Civil Supersonic Flight

WASHINGTON, DC — Today the U.S. Department of Transportation and the Federal Aviation Administration (FAA) issued a final rule (PDF) to facilitate the safe development of civil supersonic aircraft. The rule streamlines and clarifies procedures to obtain FAA approval for supersonic flight testing in the United States.

“Today’s action is a significant step toward reintroducing civil supersonic flight and demonstrates the Department’s commitment to safe innovation,” said U.S. Transportation Secretary Elaine L. Chao."

January 9, 2021

From
Marie-Jo Fremont
To
TWG - SCSC Roundtable
Message

Input to TWG Committee on FAA Environmental Review process

Technical Working Group members,

We appreciate your decision to allow community input on the TWG next steps for the FAA Environmental Review (ER) Process.

The current ER process is deficient: major problems include

Unattainable 65 dB DNL “Significance Threshold” for communities not adjacent to an airport: Under the current FAA order 1050-1F, the impacts of NextGen changes will never reach the level of “significant” for SCSC RT communities, located miles away from an airport.

Flawed workflow:

Lack of timely community involvement and information disclosure on the change and the estimated potential impacts. Current Community Involvement is too little, too late, and sometimes non-existent.

Missing a validation step to compare the actual impacts of a change against the ER-predicted impacts.

Inaccurate impact analyses for NextGen due to inadequate methods, tools, and definitions.

Unsuitable use of CATEX level of ER to implement major changes such as new RNAV procedures.

Per the 12/15/2020 TWG meeting discussion, we organized our input in two sections:

Discretionary items where the FAA has discretion to do things within existing rules and legislation.

Legislative items to provide to the Legislative committee to consider for future legislative changes.

Establishing where the FAA can exercise discretion based on existing legislation is necessary before identifying any new legislation that may be required. We would therefore recommend for the TWG to utilize Chris’ past FAA experience and expertise and ask him to compile a list of “discretionary items”, including public input received by Jan 10, with the goal to discuss the list at the next TWG meeting.

One outcome of the next TWG meeting would be to ask the SCSC RT to approve a letter to the FAA to ask them to confirm their discretionary power on the list of items. The letter should also ask the FAA what needs to be done for them to use their discretion to collaborate with the Roundtable to design and implement changes that will benefit the community. For instance, does the SCSC RT need to make formal requests to the FAA?

In parallel, in the discussion of the legislative items for input to the Legislative committee, we recommend for the TWG to also consider how to get the FAA to comply with existing legislation. In other words, how to enforce current legislation as it was intended? Getting guidance from Congressional staff on best practices to enforce existing legislation or draft new legislation may be helpful.

The attachment captures our input on the Discretionary and Legislative items as well as examples that illustrate enforcement issues, both for discretionary and legislative items.

Please feel free to contact us if we can assist in any way.

Regards,

Marie-Jo Fremont and Darlene Yaplee

Attachment: Input to SCSC RT TWG on FAA Environmental Review Process - 1_09_2021.pdf"

Attachment Name
20210109_Marie-Jo_Fremont_TWG_Input to TWG Committee

INPUT TO SCSC RT TWG ON FAA ENVIRONMENTAL REVIEW (ER) PROCESS

From Marie-Jo Fremont and Darlene Yaplee - 01/09/2021

A. **Discretionary items**
B. **Legislative items**
C. **Examples of Discretionary and Legislative items with problematic enforcement**

A. Discretionary items where the FAA has discretion to do things within existing rules and legislation.

1. **Change how the FAA estimates impacts to reflect the true impact on communities:**
   - Evaluate impact over people **all the way to the airport**: do not limit the assessment to the end of an arrival procedure and include all vectoring (before and after the end of a procedure). It is **unclear** if the FAA also has an arbitrary limitation **on the impact area for departure procedures**. For instance, does the FAA assess departure impacts until a certain altitude threshold or distance from the airport? Departing SFO and OAK flights overfly our communities at 15,000 ft or below and add to the noise impact.
   - Evaluate the total **aggregate** impact of **multiple procedures** (including the associated vectoring) from **multiple commercial airports** over the same communities when considering a change.
   - Show the **total aggregate impact of successive changes** (procedures and vectoring) over communities since NextGen changes started to be implemented.
   - Improve the representation of the expected impact of a proposed change by reporting **multiple metrics** (such as N-Above), not just DNL.
     i. Steve mentioned that a FAA Environmental Protection Specialist can decide which metrics to use. How can the SCSC RT make this metrics request for changes that may impact our communities?
   - Enhance pre-screening filters and AEDT for communities away from the airport to better estimate the impacts of a change in a NextGen environment. In particular, the AEDT noise model must **include critical factors** such as aircraft configuration in the noise model. In addition, provide error bars or confidence levels for the estimated DNL values. Accurate analyses are critical given that the results are used to determine the appropriateness of a proposed change.
   - Document **all assumptions** made in the environmental review analysis and the rationale behind each assumption.
   - Substantiate claims with **supporting evidence**.
2. **Put in place a validation step** in the ER process to **compare expected impacts** (as estimated in the environmental review analysis) **to actual impacts** (as measured after implementation of the change). The FAA must be held accountable on the predicted impacts described in the ER document to ensure that actual impacts are not worse than predicted impacts.
   - Include an **impact validation plan** in the ER process for Environmental Assessment and Environmental Impact Statement levels. At a minimum, the plan should specify the proposed noise monitor locations and rationale, the time period for noise monitoring, and the metrics that will be used to report actual impacts against predicted impacts.
   - Given that the AEDT noise model is not accurate for communities that are miles away from airports, it is critical that actual noise monitoring occurs in these communities to create an **accurate picture of aircraft noise impacts**.
3. **Allow airports to place noise monitors in communities outside the 65 dB DNL noise contour**.
   - Noise monitors will be required to perform the validation step in 2 above.

- In addition, noise monitors are critical to represent the true, actual impact of NextGen on communities outside the 65 dB DNL contour.

4. **Provide Community timely, relevant information** that is **accessible** and **understandable** by non-technical community members.
    - **Relevant information** means that the FAA would be required to provide:
        i. Reasons behind a proposed change:
            1. What specific safety or efficiency issues will the change address?
            2. What quantified improvements are expected and in what timeframe?
        ii. Detailed description of the change and comparison to prior state:
            1. What will change in terms of ground track, altitudes, speed requirements, waypoints, descent angles, anticipated speed brakes (deployment of flaps and slats) through the end of the procedure and for the vectoring that may occur before or after the end of the procedure?
            2. Will the change affect the number of operations and why?
            3. Will the frequency of planes (e.g., number of planes over a community in a given time period) change and why?
            4. Will the ground track concentration increase or decrease, and why?
        iii. Minutes of Full Working Group meetings as applicable.
        iv. ER analysis and results:
            1. Screening or modeling tools used with a description of all assumptions made and rationale behind, and answers with supporting evidence.
            2. Expected Community impacts characterized through several metrics, including N-Above, and all the way to the airport.
    - **Accessible** means that community members can access all relevant information through an FAA project website that is specific to the proposed change (for either an existing procedure or a new procedure). It also means that community members can subscribe to automated email notifications for new postings on the project website.
        i. The FAA recently created a Community Involvement website for the NorCal metroplex (see https://www.faa.gov/air_traffic/community_involvement/norcal/). What is needed is a similar website for each major change, e.g., a project website. Another example of an ER FAA website is the South-Central Florida site at http://www.metroplexenvironmental.com/fl_metroplex/fl_introduction.html
    - **Understandable** means that non-technical community members can understand the proposed change and how it may affect their community.
        i. Data need to be presented on Google road maps with sufficient resolution to see how communities could be impacted.
        ii. A “Before and After picture” needs to articulate in simple terms all items that will change (not just ground tracks) and how the modifications could positively or negatively impact the Community.
    - **Timely** means that **relevant information** (as described previously), in draft or final form, is made available to the Community **before** the environmental review can be finalized.
        i. Materials that are considered relevant information should be posted on the project website within 5 working days of being created either in draft or final form.

5. **Allow Community to comment on relevant information provided by the FAA, including the ability to provide input on the environmental review before it is finalized:** This means that community members, including roundtables:
    - **Can post comments regarding the proposed change on the project website**, similar to what industry members can do on the IFP gateway, with the **understanding that the FAA will give meaningful consideration to the community concerns and views** when making aviation decisions that may affect such communities.
    - **Have at least 3 months to review the draft of the ER and provide feedback,** which will be meaningfully considered and addressed by the FAA if it is relevant and appropriate, **before the ER is finalized**.
6. **Allow Community representation at the Full Working Group (FWG) for new procedure development**
    - **Participation**: Can the FAA use its discretion to include a member of the public (e.g., an elected official from the SCSC RT) in FWG meetings in addition to the Airport Operator, who is considered by the FAA to be the Community Representative?
    - **Communication**: Can the FAA use its discretion to
        i. Inform local roundtables if and when a FWG meeting will be held on a topic that may potentially impact their communities?
        ii. Allow the FWG designated Community Representative (e.g., Airport Operator) to inform the community of the meeting discussions and outcomes?
    - Background: For procedure development, the FAA may form a FWG whose participants include airlines, airport, Air Traffic Control, etc. The SCSC RT's request to attend the Big Sur Overlay FWG was denied by the FAA because the FAA stated that SFO (the airport operator) was the "community representative". In addition, SFO was forbidden from sharing any of the June 2019 FWG meeting information with the SCSC RT. Raquel Girvin, FAA Western Regional Manager, put a communication embargo on all BSR Overlay communication. The public had to resort to FOIA requests to get some information, which was heavily redacted.

B. Legislative items to provide to the Legislative committee to consider for future legislative changes.

1. **Change the "Significance Threshold"** for the "Noise and Noise-Compatible Land Use" environmental category
    - Under current rules, 65 dB DNL defines "significant impact" in terms of noise. This high threshold based on a single-metric means that our communities have not been "significantly impacted" by NextGen and will never be in the future either even if the FAA were to further concentrate aircraft or if traffic were to double from 2018 levels. The current threshold is unattainable for communities not adjacent to an airport .
        i. It would take about **80 supersonic booms per day** during daytime hours to raise DNL by 1.5 dB over a community already at a 63.5 dB DNL level, which is a typical DNL level close to an airport. Many more daily supersonic booms would be required for communities more than 5 miles away from the airport.
        ii. The SCSC RT communities would **need more than 10 times the number of flights** in 2018 to get close to a 65 dB DNL (if everything stays the same, DNL increases by 3 dB when the number of aircraft doubles).
        iii. Even with a thorough and accurate environmental review analysis, the NextGen implementation in the NorCal metroplex would not have been stopped because the impact would **never qualify as "significant"** for our communities.

iv. We know that NextGen has had a huge impact on our communities. Millions of noise complaints have been filed. The Select Committee and Ad Hoc Committee on SJC South Flow spent months reviewing the problem and issued recommendations to address it. The SCSC RT was created as a result.

- The DNL metric does not effectively or accurately reflect the actual impact of NextGen on communities. Additional metrics such as N-Above must also be considered in establishing the noise impact on communities and defining the threshold of "significant impact".
  i. N-Above counts the number of aircraft noise events above a certain noise level over a specific area. As such, it is a good measure of the frequency of aircraft over a community.
- Note that changing the "Significance threshold" should only apply to environmental review decisions (it would not need to apply to the current insulation programs, which are based on 65 dB DNL and established for communities located right by an airport).

2. **Modify the definitions of impact** to ensure that
   - **Cumulative impact captures the total aggregate impact** of
     i. **Multiple procedures from multiple commercial airports** over a community, not just one procedure from one airport as done today (from the community perspective, cumulative impact means noise from all arriving and departing aircraft that fly over the community, not the noise of aircraft on one procedure to or from one commercial airport), and
     ii. **Multiple changes over time** over a community. Because the FAA is allowed to reset the noise baseline after every change, the incremental impact of each individual change on our communities looks "small" and will remain below the threshold to be considered significant.
   - **Impact is estimated all the way to the airport**, not just to the end of an arrival procedure, and **includes the impact of vectored traffic before and after** the end of a procedure.
3. **Require an Environmental Assessment as the minimum level of environmental review for major changes and define major changes.**
   - The 1st level of NEPA, which is CATEX, would not be allowed for major changes. Today the FAA can issue a CATEX for changes such as creating a new RNAV procedure (example: PIRAT).
   - Major changes include but are not limited to new procedures (RNAV, RNP, or conventional), changes in existing procedures (including but not limited to changing or relocating waypoints as well as procedure endpoints, decreasing altitudes, adding or changing speed requirements), and vectoring modifications (including but not limited to new headings, new vectoring ceiling or floor altitudes).
4. **Require a mandatory consultation step with the Community before an Environmental Assessment or an Environmental Impact Statement can be finalized.**
5. **Make the implementation of major changes conditional upon validation of actual impacts**.
   - A change would be implemented on a temporary basis until actual noise measurements on the ground show that actual impacts are lower than or equal to the predicted impacts in the ER. If actual impacts were higher than predicted impacts, then the FAA would have to revert to the previous procedure that was in place before the change. The FAA would need to go back to the drawing board to propose a new change.
6. **Protecting the public health and welfare must be as important as efficiency for FAA priorities.**
   - The FAA consistently communicates and emphasizes aviation safety, efficiency, and

predictability, while rarely emphasizing its important responsibility to protect the health and welfare of communities from "aircraft noise and sonic boom" as described in [Transportation Code Title 49, 44715](#):

   i. *(a) STANDARDS AND REGULATIONS.—(1)(A) To relieve and protect the public health and welfare from aircraft noise and sonic boom, the Administrator of the Federal Aviation Administration, **as he deems necessary**, shall prescribe—*
   (i) standards to measure aircraft noise and sonic boom; and
   (ii) regulations to control and abate aircraft noise and sonic boom.
   [emphasis added].

- The words "***as he deems necessary***" are problematic because the FAA can decide whether to protect the health and welfare of communities. The FAA should not have discretion on this topic. The proposed [HR 5109 F-AIR Act](#) fixes the problem by requiring the FAA to consider impacts as equally important as efficiency:

   ii. *"Specifically, the FAA must ensure (1) the safety of aircraft as a primary priority in developing such plans and policy; and (2) the minimization of the impact of aviation noise, and other health impacts, on residents and communities, and other impacts of the use of airspace on the environment as a secondary priority on an equal basis with the efficient use of airspace".*

- Note that the NorCal Metroplex is the only Metroplex with **negative benefits**, which do not include the noise and health impacts on communities **(**see [FAA Community Involvement page for the NorCal Metroplex](#) and screenshot below). The NextGen NorCal Metroplex implementation was **not** more efficient and created unacceptable impacts to communities.

Projected Annual Benefits

Source: FAA – Northern California Metroplex Post-Implementation Analysis

Value of Fuel Savings
$-7.7 Million

Fuel Savings
-2.5 Million Gallons

Carbon Savings
-20.1 Thousand Metric Tons

Northern California Metroplex benefits were negatively impacted by several factors. These factors included: New departures introduced shallower climb profiles which led to higher fuel burn estimates; fuel cost decreased approximately 50% between time periods; differences in aircraft payload; and, higher wind conditions during the period analyzed. Flight distance for San Francisco arrivals also increased slightly.

Page last modified: May 13, 2020 5:27:13 PM EDT

7. **Require the FAA to implement mitigation measures for nighttime operations.**
   Mitigation measures could include:
   - Allowing local airports or local governments to establish night time curfews.
   - Designing and implementing noise abatement procedures and vectoring for maximum

noise reduction over communities even if such procedures are less efficient than the day time procedures.

i. Given that traffic is much lower during nighttime hours, the FAA has flexibility in designing procedures and approaches that take advantage of compatible land use and avoid residential communities.
ii. Examples: SERFR night arrivals, as proposed by the SFO Roundtable in November 2016, could arrive via ARCHI on the southern east side of the Bay. PIRAT night arrivals could connect with BDEGA over the Ocean north of the Golden Gate and use the BDEGA-east leg over the Bay to land at SFO.

- Increasing separation between aircraft (e.g., in-trail spacing) for nighttime procedures to give Air Traffic Control (ATC) more flexibility in sequencing arriving and departing aircraft to minimize noise impact on communities.
  i. Example: SFO and OAK night departures may at times prevent the use of the BDEGA-east leg. Increasing in-trail spacing would allow ATC to sequence aircraft more easily to reduce noise impact on communities.

C. Examples of Discretionary and Legislative items with problematic enforcement
How do we get the FAA to use its discretionary power to collaborate with the community to design and implement changes beneficial to the community as well as fulfill the requirements of existing legislation as it was intended?

Discretionary power examples:

- **Interpretation of community requests**: it seems that the FAA is allowed to interpret community requests (such as recommendations from the Select Committee) to justify changes that they want to make. PIRAT is an example. The Select Committee never requested to replace Oceanic Tailored Arrivals and non-Tailored Arrivals with a new RNAV OPD that would be available to all carriers for both SFO and OAK. However the FAA went ahead and implemented PIRAT, claiming that it was a community request.
- **Determination of recommendations that are feasible vs. not feasible**:
  - The FAA did not provide the specific reasons why they deemed some recommendations of the Select Committee or SFO Roundtable not feasible. “Safety” was often used as the reason but without any specific explanation.
  - When Representative Jackie Speier’s office pushed back on the “not feasible” NIITE-HUSSH recommendation, the FAA changed their conclusion to “feasible”. This example illustrates that feasibility conclusions may be arbitrary and not evidence-based.
- **Unwillingness to collaborate with SFO on GBAS innovative approaches that could reduce noise**: SFO requested working with the FAA to modify the end of the SERFR STAR (e.g., waypoint EDDYY) in order to avoid increasing noise for communities nearby. The FAA has consistently been unwilling to pursue the topic with SFO. In addition, the FAA does not allow any SFO GBAS innovative approaches to exploit the technically feasible 23 nmile-radius for GBAS approaches even though starting GBAS approaches far from the airport could potentially reduce noise substantially for many communities.

Existing legislation examples where the FAA did not fulfill requirements:

- **FAA Reauthorization Act of 2018, Sections 173 and 188 - FAA’s Report on DNL Metric and 65 DNL Standard for Airplane Noise, April 2020.**
  - 29 members of the Quiet Skies Caucus signed a letter to FAA Administrator Dickson, September 24, 2020. “The FAA’s report is unacceptable," said Rep. Karen Bass. “The FAA

failed to meet its mandate because it didn't evaluate alternative noise metrics, standing by standards that don't fully capture noise impacts. The FAA must go back to the drawing board and write a new report."
    - What is our recourse?
- **FAA Reauthorization Act of 2018, Section 176 - FAA's Review of Community Involvement (CI)**, **lessons learned and how those lessons will be integrated into CI practices in the future, July 2020.**
    - The FAA review was solely based on an internal survey within the Air Traffic Control organization and did not include direct input from the public.
    - The review states that "The FAA is committed to giving **meaningful consideration** [emphasis added] to community concerns when making aviation decisions that affect these localities and their residents." The review failed, however, to address the public's core concerns such as early and frequent engagement, disclosure of estimates that reflect the true impact on communities, and meaningful consideration of issues and views **prior** to the FAA making decisions. Instead, the FAA improvements are focused on FAA personnel: ensuring policy and guidance are up-to-date, developing additional training, and providing consistent guidance and CI activities.
    - How can a meaningful review be done that includes input from the public and addresses the lessons learned from the public involvement?
- **Congress's criteria for noise measurement**
    - Congress (US Code 49, Section 47502) requires that "**a single system of measuring noise**" have a "**highly reliable relationship between projected noise exposure and surveyed reactions of people to noise....**". The implementation of NextGen triggered millions of complaints from many communities around the country, including some that did not have an aircraft noise problem before NextGen. This unprecedented level of complaints shows that the system used by the FAA to project noise exposure under NextGen is no longer reliable.
    - Despite Section 47502, the FAA continues to use the DNL metric and the 65 DNL standard to issue Findings of No Significant Impact (FONSIs) in every case of NextGen rollouts. Furthermore, the delivery of Section 187 - Aircraft Noise Exposure Study, FAA Reauthorization Act of 2018 has been delayed for years even though the FAA was already working on re-evaluating methods to measure the effects of aircraft noise in mid 2015.

January 09, 2021

From
Mike McClintok
To
SCSC Roundtable
Message

OAK Forum January 20 Agenda Materials

Good morning all:

Attached are the agenda materials for the January 20, 2021 Forum Meeting. Please contact me if any questions.

Mike McClintock

Forum Facilitator

Attachment Name

20210109_Mike_McClintok_SCSCRoundtable Forum Noise Abatement Report 3Q-2020

20210109_Mike_McClintok_SCSCRoundtable Forum FAA WNDSR TWO LTR

20210109_Mike_McClintok_SCSCRoundtable Forum FAA HUSSH LTR

20210109_Mike_McClintok_SCSCRoundtable Forum FAA CALSTATE-SLZ1 Procedure

20210109_Mike_McClintok_SCSCRoundtable Forum Cal State and San Lorenzo Visual Appchs single page (1)

NOISE FORUM SUMMARY

North/South Field Working Groups

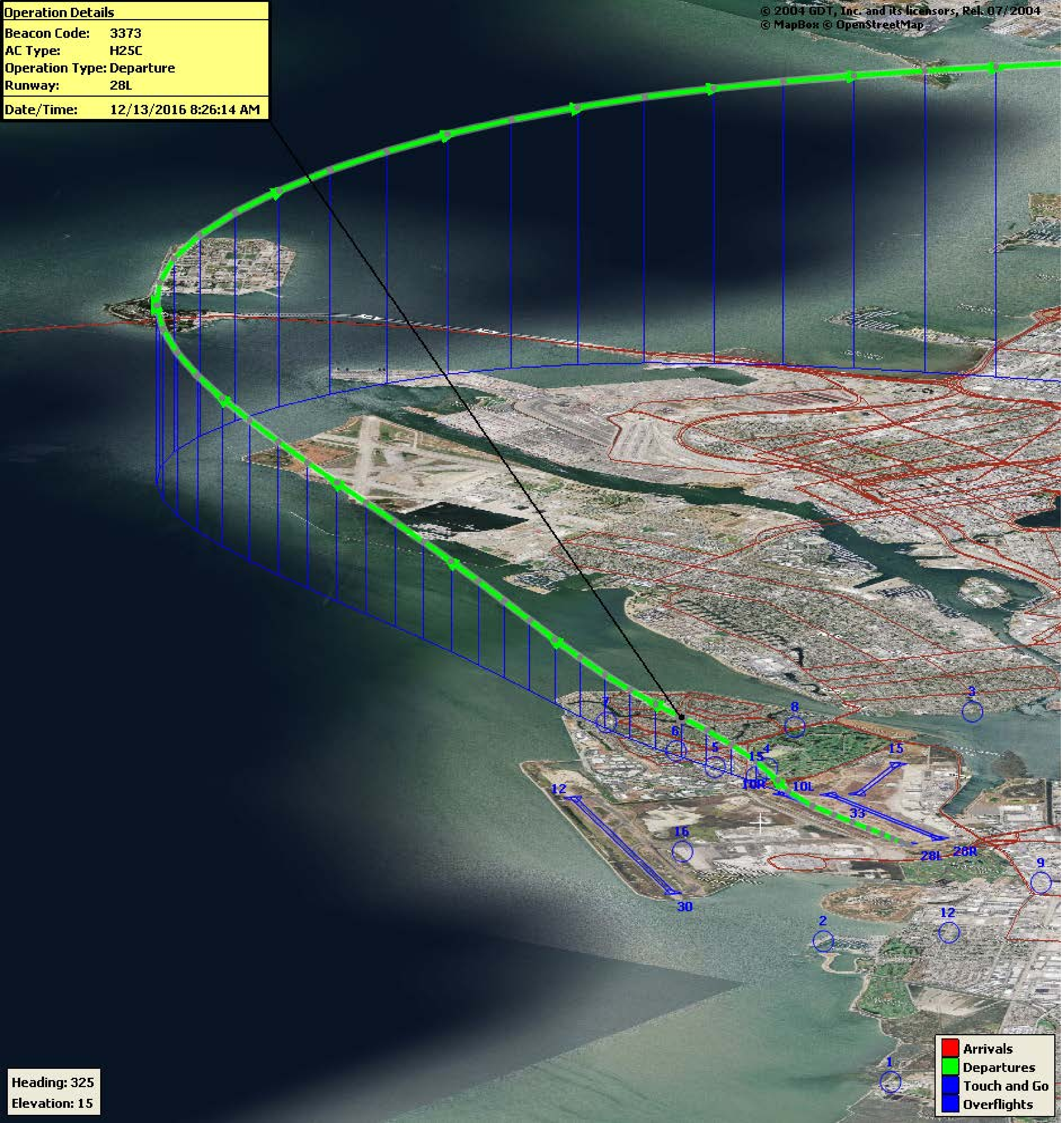
NOISE ABATEMENT REPORT

THIRD QUARTER 2020

Compliance Monitoring Quarterly Summary Comparison
Third Quarter 2020

	2019Q3		2020Q3	
	Compl.	N/C	Compl.	N/C
Runway 28R/L Jet Departure Compliance	95%	5%	96%	4%
Total Airport-wide Corporate Jet Departures	2,917	141	2,098	84
Runway 10R/L Jet Landing Compliance	0%	0%	0%	0%
Total Southeast Plan Corporate Jet Landings	0	0	0	0
North Field VFR Departure Compliance	96%	4%	93%	7%
Total Runways 28R/L & 33 Departures	325	14	236	19
North Field Quiet Hours Compliance	75%	25%	66%	33%
Total North Field Quiet Hours Departures	219	72	123	62
Runway 30 BFI Right Turn Departure Compliance	100%	0%	100%	0%
Total Runway 30 Turbojet Departures	21,252	5	11,698	7
Night Time Departure Compliance	93%	7%	99%	1%
Total Runway 30 Night Turbojet Departures	3,748	266	2,182	32
Runway 12 Night Departure Compliance	0%	0%	0%	0%
Total Runway 12 Night Turbojet Departures	0	0	0	0
Runway 30 East Turn Departure Compliance	100%	0%	100%	0%
Total Runway 30 East Turn Departures	5,981	13	4,220	17
100 Degree Radial Turbojet Landing Compliance	99%	1%	98%	2%
Total 100 Degree Radial Turbojet Landings	1,381	14	704	12
Engine Runup Program Compliance	100%	0%	100%	0%
Total Evening and Nighttime Engine Runups	11	0	16	0

Note: N/C means non-compliant. Percentage values are rounded out.

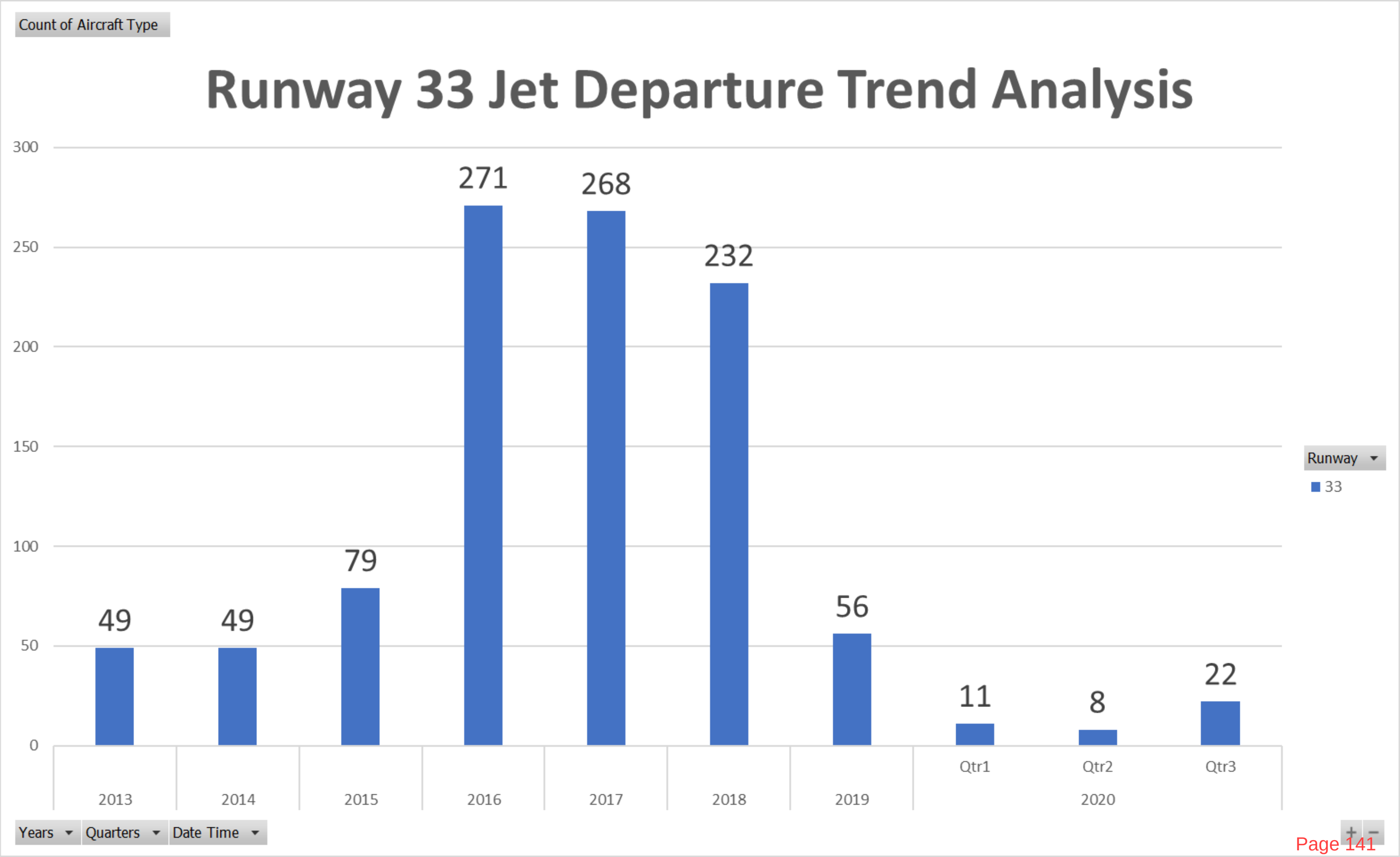


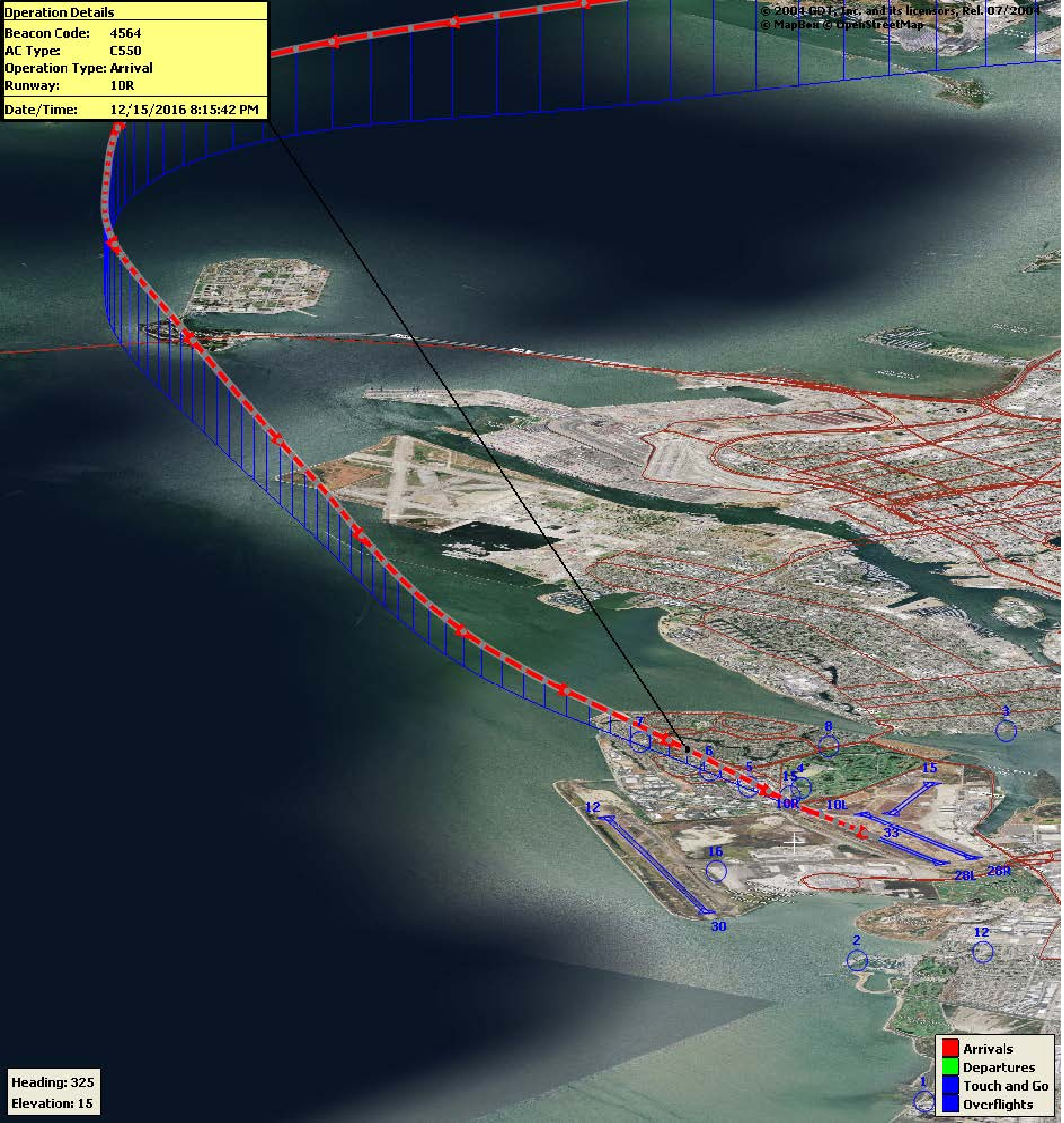
Runway 28R/L
Jet Departure NAP

2020Q3
96% Compliance
(2,182 total departures)
(84 non-compliant)

2019Q3
95% Compliance
(3,058 total departures)
(141 non-compliant)

RUNWAY 33 JET DEPARTURES
Third Quarter 2020

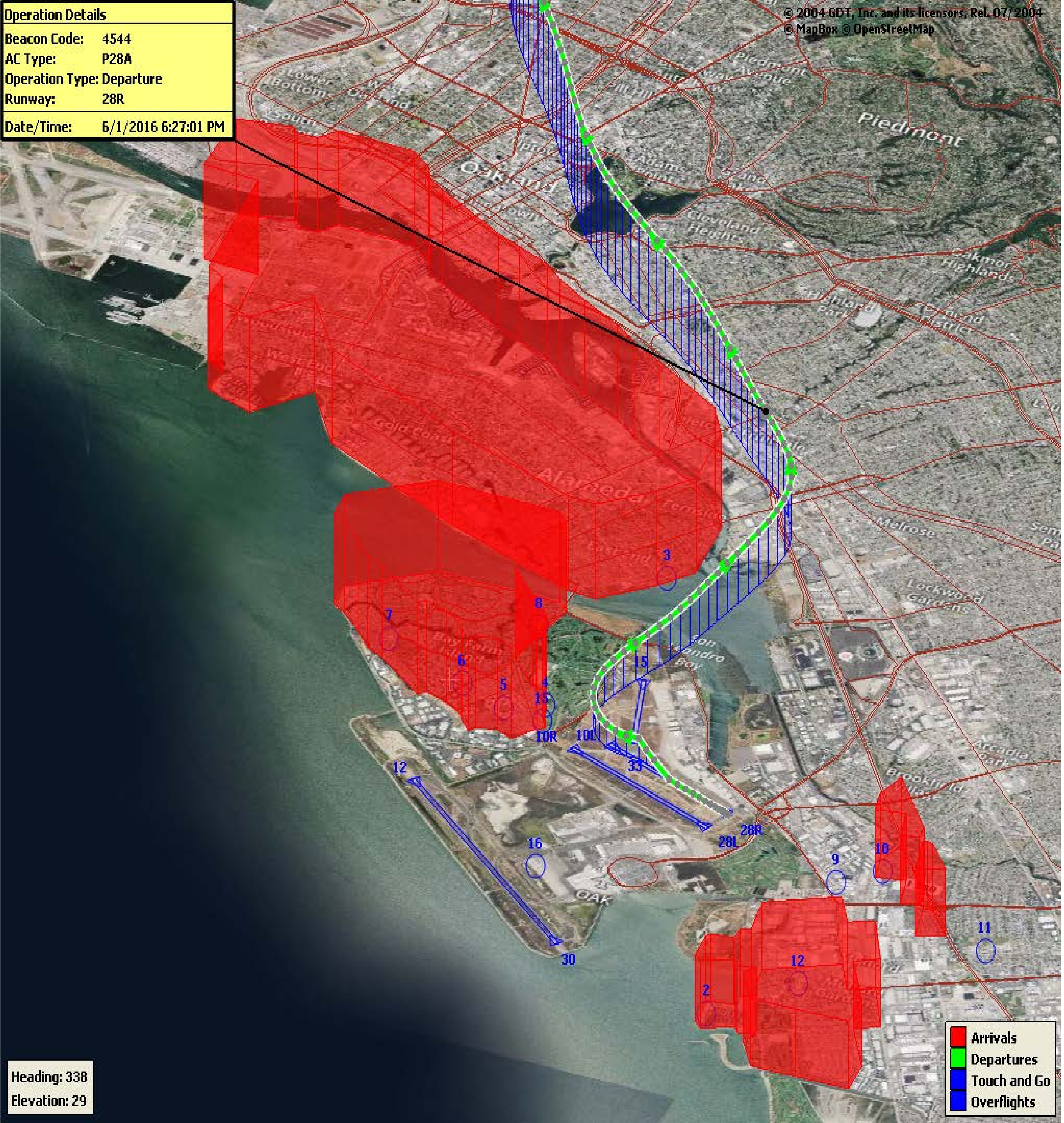




Runway 10R/L Jet Landing NAP

2020Q3
N/A
(0 total landings)
(0 non-compliant)

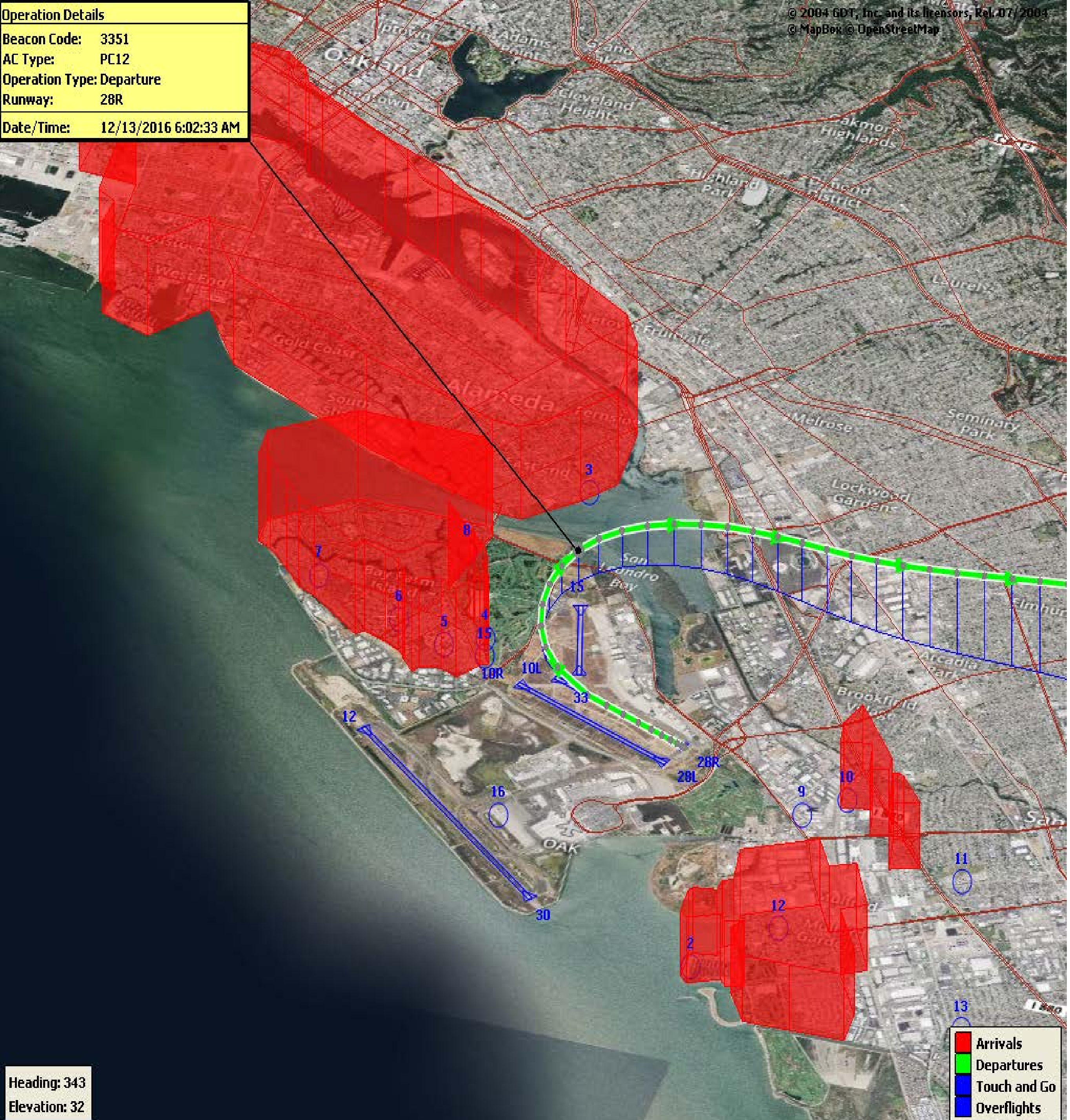
2019Q3
N/A
(0 total landings)
(0 non-compliant)



VFR Aircraft Departure NAP

2020Q3
93% Compliance
(255 total departures)
(19 non-compliant)

2019Q3
96% Compliance
(339 total departures)
(19 non-compliant)

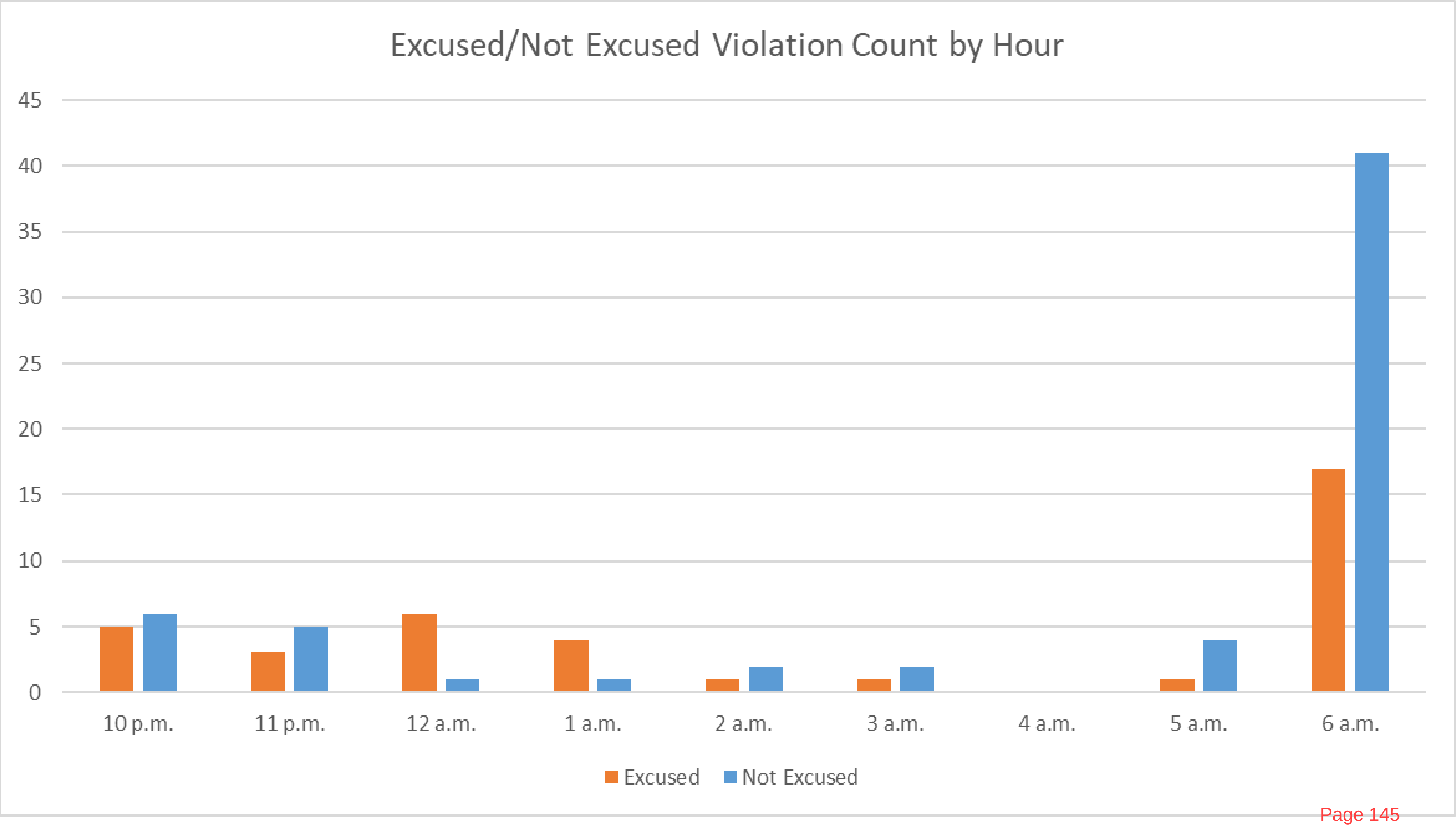


North Field
Quiet Hours NAP

2020Q3
66% Compliance
(185 total departures)
(62 non-compliant)

2019Q3
75% Compliance
(291 total departures)
(72 non-compliant)

North Field Quiet Hours NAP Non-Compliant by Hour



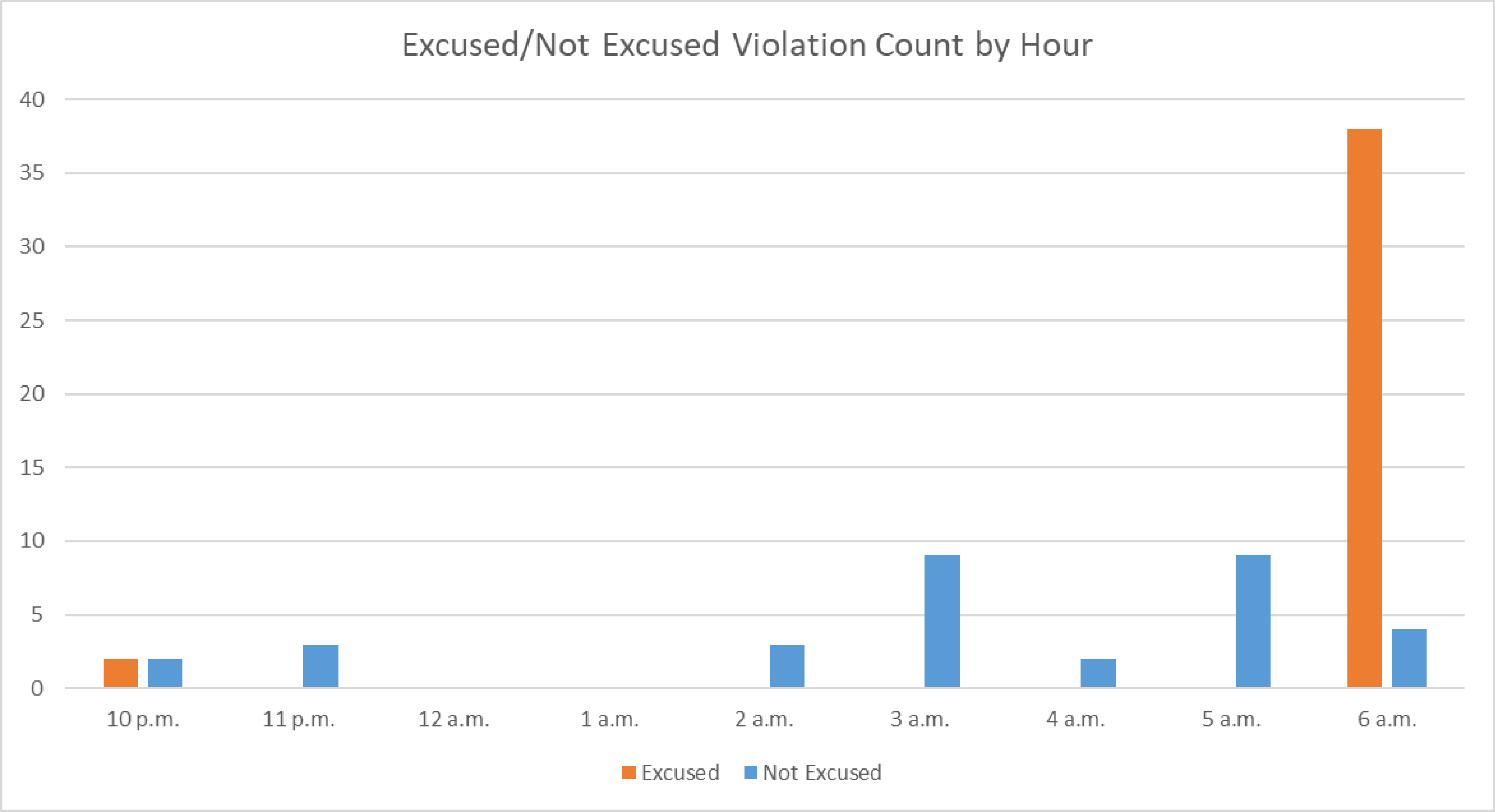
Night Time
Departure NAP

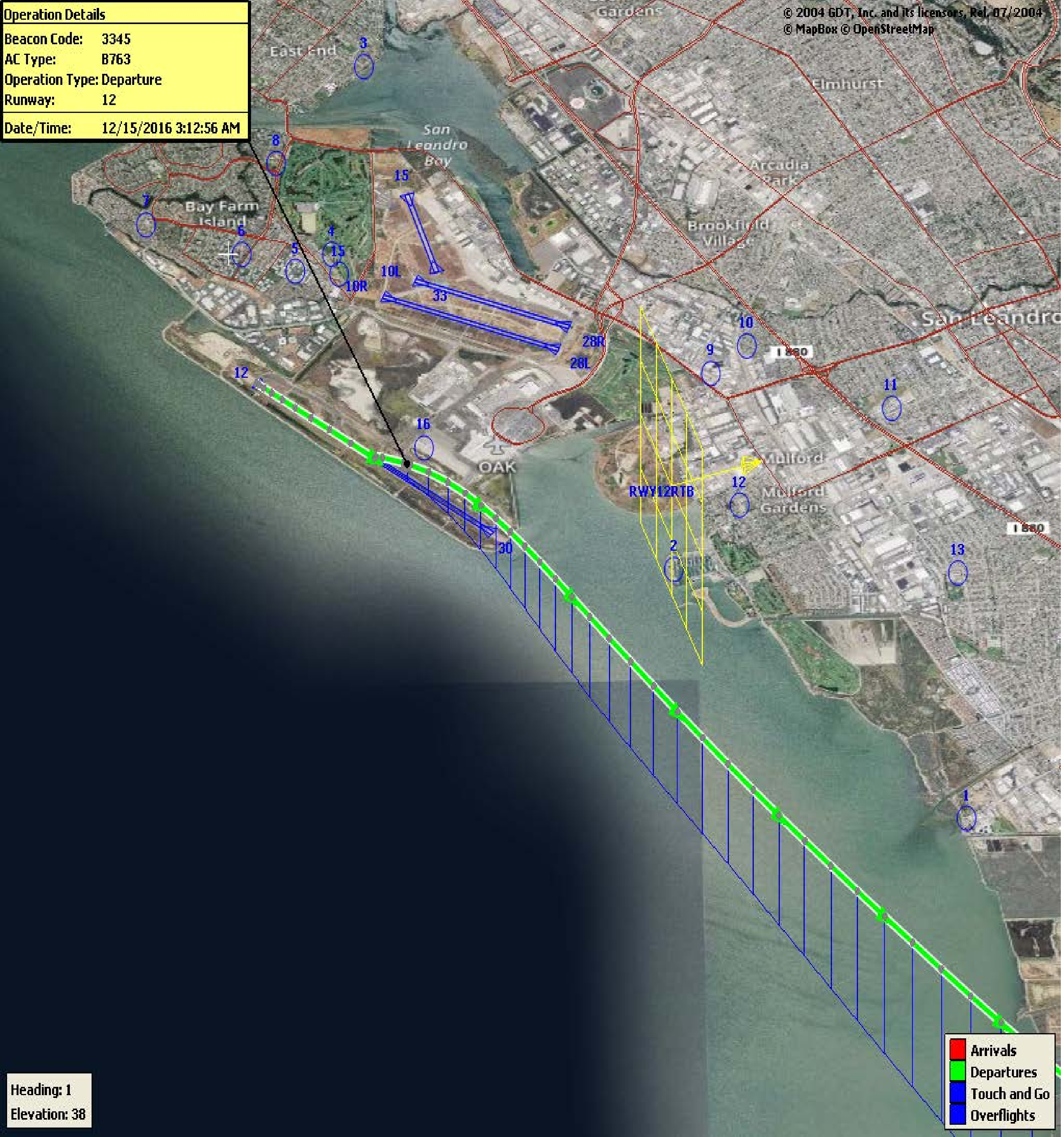
2020Q3
99% Compliance
(2,214 total departures)
(32 non-compliant)

***REBAS Gate non-compliant = 31**

2019Q3
93% Compliance
(4,014 total departures)
(266 non-compliant)

Night Time NAP Non-Compliant Count by Hour



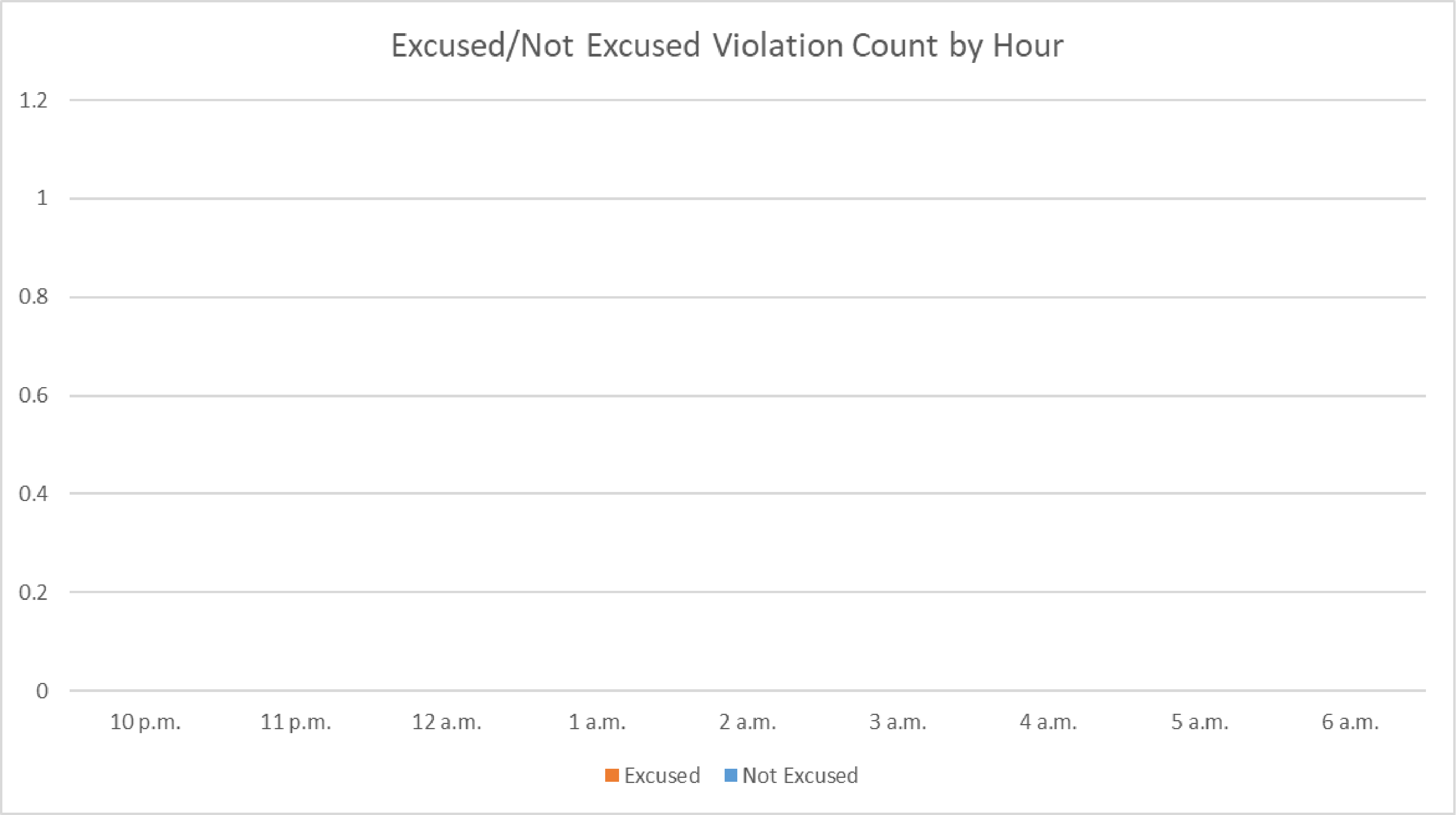


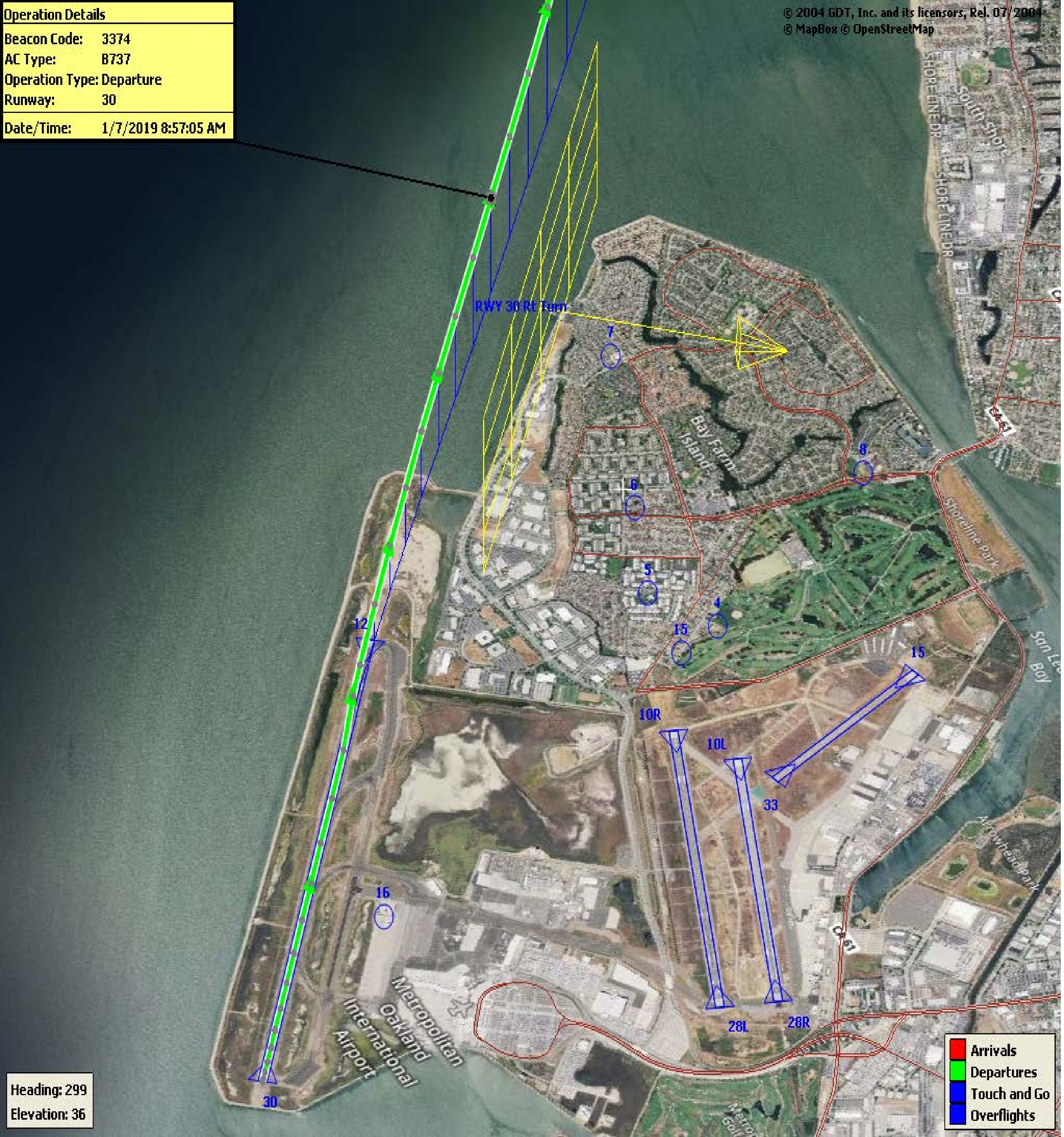
Runway 12 Night Departure NAP

2020Q3
N/A
(0 total departures)
(0 non-compliant)

2019Q3
N/A
(0 total departures)
(0 non-compliant)

Runway 12 Night Departure Non-Compliant Count by Hour





Runway 30 Bay Farm Right Turn NAP

2020Q3
100% Compliance
(11,705 total departures)
(7 non-compliant)

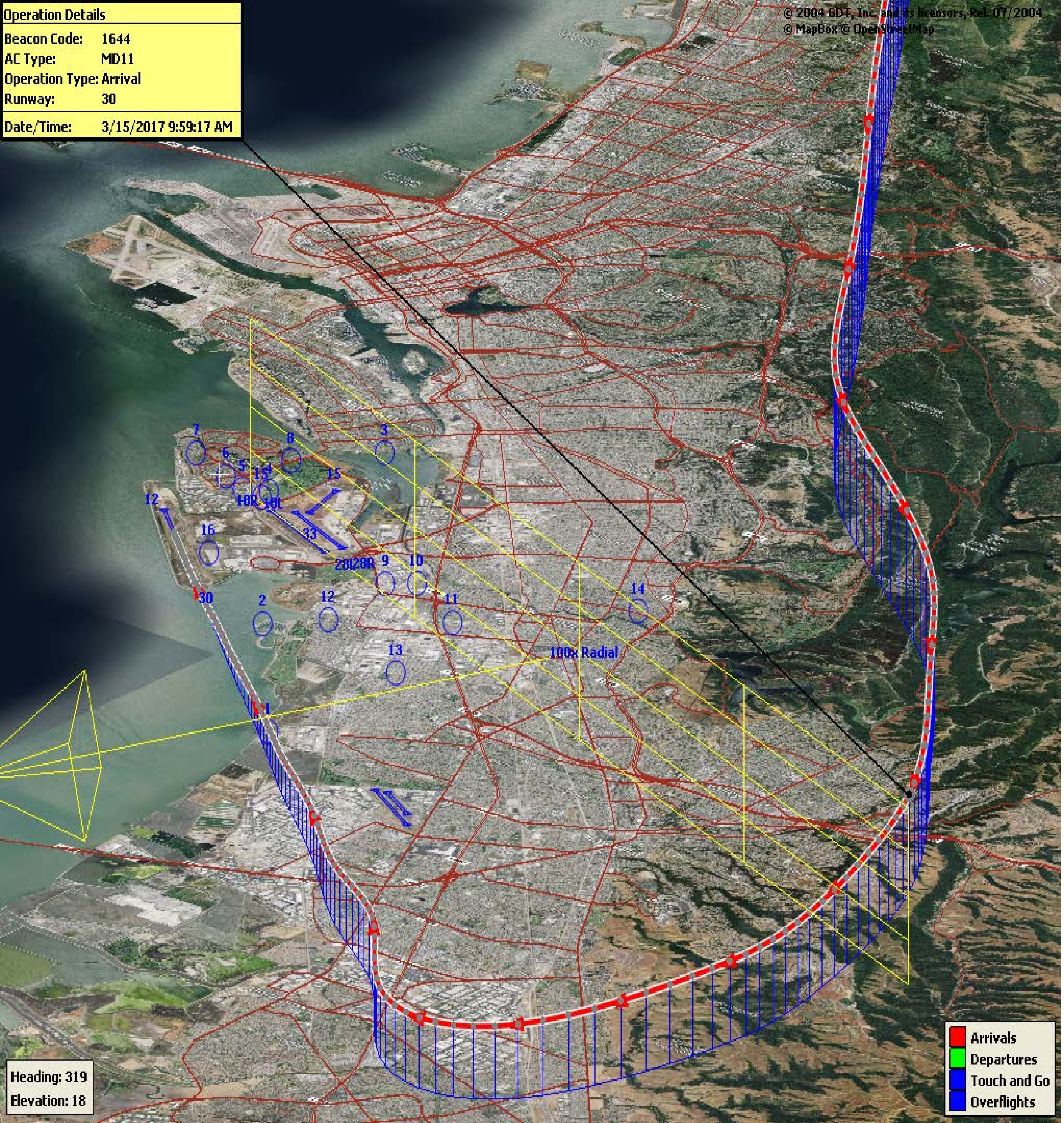
2019Q3
100% Compliance
(21,257 total departures)
(5 non-compliant)

Runway 30 East Turn NAP

2020Q3
100% Compliance
(4,327 total departures)
(17 non-compliant)

***Excused Departures = 29**

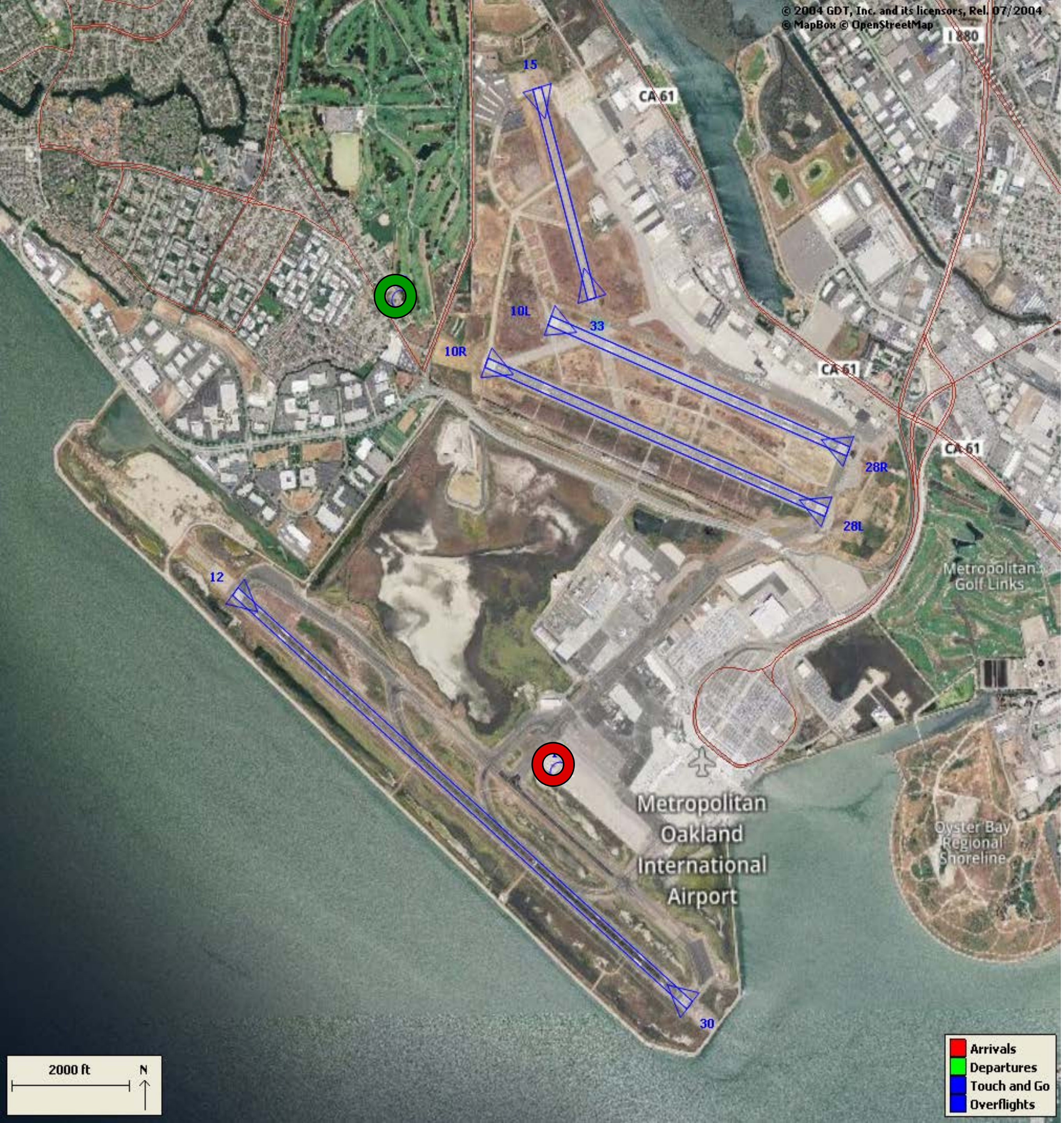
2019Q3
100% Compliance
(5,994 total departures)
(13 non-compliant)



100 Degree Radial At 3,000 ft. NAP

2020Q3
98% Compliance
(716 total landings)
(12 non-compliant)

2019Q3
99% Compliance
(1,395 total landings)
(14 non-compliant)



Engine Run-up NAP

2020Q3
100% Compliance
(16 engine run-ups)*
(0 non-compliant)

2019Q3
100% Compliance
(11 engine run-ups)
(0 non-compliant)

***Only above idle-power run-ups recorded.**

Compliance Monitoring Quarterly Summary Comparison
Third Quarter 2020 - Quarter-to-Quarter

	2020Q2		2020Q3	
	Compl.	N/C	Compl.	N/C
Runway 28R/L Jet Departure Compliance	96%	4%	96%	4%
Total Airport-wide Corporate Jet Departures	1,106	49	2,098	84
Runway 10R/L Jet Landing Compliance	85%	15%	N/A	N/A
Total Southeast Plan Corporate Jet Landings	11	2	0	0
North Field VFR Departure Compliance	87%	13%	93%	7%
Total Runways 28R/L & 33 Departures	124	18	236	19
North Field Quiet Hours Compliance	78%	22%	66%	33%
Total North Field Quiet Hours Departures	162	47	123	62
Runway 30 BFI Right Turn Departure Compliance	100%	0%	100%	0%
Total Runway 30 Turbojet Departures	7,676	3	11,698	7
Night Time Departure Compliance	99%	1%	99%	1%
Total Runway 30 Night Turbojet Departures	1,825	26	2,182	32
Runway 12 Night Departure Compliance	92%	8%	N/A	N/A
Total Runway 12 Night Turbojet Departures	48	4	0	0
Runway 30 East Turn Departure Compliance	100%	0%	100%	0%
Total Runway 30 East Turn Departures	2,712	3	4,220	17
100 Degree Radial Turbojet Landing Compliance	99%	1%	98%	2%
Total 100 Degree Radial Turbojet Landings	540	6	704	12
Engine Runup Program Compliance	100%	0%	100%	0%
Total Evening and Nighttime Engine Runups	11	0	16	0

Note: N/C means non-compliant. Percentage values are rounded out.

Table 1. North Field Night Aircraft Departure SEL Noise Measurements Total Aircraft Departures = 185											
Third Quarter 2020 (10:00 p.m. to 7:00 a.m.)											
NMT Number	Aircraft Noise Events Below SEL 80 dBA	Aircraft Noise Events SEL 80 - 84.9 dBA			Aircraft Noise Events SEL 85 - 89.9 dBA			Aircraft Noise Events SEL ≥ 90 dBA			Total Aircraft Noise Events
		Amount	Nightly Average	As Percentage of Departures	Amount	Nightly Average	As Percentage of Departures	Amount	Nightly Average	As Percentage of Departures	
1	0	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0
2	6	3	0.0	0.5%	6	0.1	1.1%	1	0.0	0.2%	16
3	25	3	0.0	0.5%	0	0.0	0.0%	0	0.0	0.0%	28
4	53	88	1.0	15.5%	13	0.1	2.3%	1	0.0	0.2%	155
5	80	43	0.5	7.6%	12	0.1	2.1%	2	0.0	0.4%	137
6	32	8	0.1	1.4%	5	0.1	0.9%	0	0.0	0.0%	45
7	17	5	0.1	0.9%	0	0.0	0.0%	0	0.0	0.0%	22
8	33	14	0.2	2.5%	1	0.0	0.2%	1	0.0	0.2%	49
9	5	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	5
10	3	1	0.0	0.2%	0	0.0	0.0%	0	0.0	0.0%	4
11	0	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0
12	0	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0
13	0	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0
14	0	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0
All NMTs	254	165	2	0	37	0	0	5	0	0	461

Table 2. Aircraft SEL Noise Measurements in Alameda - Total Aircraft Departures = 184											
Third Quarter 2020 (10:00 p.m. to 7:00 a.m.)											
NMT Number	Aircraft Noise Events Below SEL 80 dBA	Aircraft Noise Events SEL 80 - 84.9 dBA			Aircraft Noise Events SEL 85 - 89.9 dBA			Aircraft Noise Events SEL ≥ 90 dBA			Total Aircraft Noise Events
		Amount	Nightly Average	As Percentage of Departures	Amount	Nightly Average	As Percentage of Departures	Amount	Nightly Average	As Percentage of Departures	
3	25	3	0.0	1.3%	0	0.0	0.0%	0	0.0	0.0%	28
4	53	88	1.0	36.8%	13	0.1	5.4%	1	0.0	0.4%	155
5	80	43	0.5	18.0%	12	0.1	5.0%	2	0.0	0.8%	137
6	32	8	0.1	3.3%	5	0.1	2.1%	0	0.0	0.0%	45
7	17	5	0.1	2.1%	0	0.0	0.0%	0	0.0	0.0%	22
8	33	14	0.2	5.9%	1	0.0	0.4%	1	0.0	0.4%	49
Total	**240**	**161**	**1.8**		**31**	**0.3**		**4**	**0.0**		**436**

Table 3. Aircraft SEL Noise Measurements in San Leandro - Total Aircraft Departures = 1											
Third Quarter 2020 (10:00 p.m. to 7:00 a.m.)											
NMT Number	Aircraft Noise Events Below SEL 80 dBA	Aircraft Noise Events SEL 80 - 84.9 dBA			Aircraft Noise Events SEL 85 - 89.9 dBA			Aircraft Noise Events SEL ≥ 90 dBA			Total Aircraft Noise Events
		Amount	Nightly Average	As Percentage of Departures	Amount	Nightly Average	As Percentage of Departures	Amount	Nightly Average	As Percentage of Departures	
2	6	3	0.0	0.9%	6	0.1	1.8%	1	0.0	0.3%	16
9	5	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	5
10	3	1	0.0	0.3%	0	0.0	0.0%	0	0.0	0.0%	4
11	0	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0
12	0	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0
13	0	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0
14	0	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0
Total	**14**	**4**	**0.0**		**6**	**0.1**		**1**	**0.0**		**25**

Rolling Take-off Night Departure Procedure (1:00 to 5:00 AM) Third Quarter 2020, NMT 2						
	Aircraft Departures		Recorded Noise Events (a)	Lmax Average	SEL Average	Avg. Duration (seconds)
Baseline (November 2002) [A]						
DC10/MD10		87	32	69	78	22
MD11		32	13	70	79	24
A306		67	21	67	77	25
Third Quarter 2020 [B]						
	Total [X]	Est. Avg. Monthly [X/3]				
B763	186	62	11	65	73	13
DC10/MD10	48	16	9	65	73	12
MD11	205	68	42	65	74	14
A306	100	33	3	70	79	25
B757	149	50	5	70	74	14
B77L	126	42	2	76	80	13
Difference [A-B]						
DC10/MD10		-71	-23	-4	-5	-10
MD11		36	29	-5	-5	-10
A306		-34	-18	3	2	0

(a) For the current calendar quarter reported, ANOMS does not correlate all departures to their respective noise events; that is most, but not all, aircraft back-blast noise events are effectively correlated as the program software algorithms may misidentify an aircraft noise event.
Source: ANOMS (Airport Noise and Operations Monitoring System)

Rolling Take-off Night Departure Procedure (1:00 to 5:00 AM)
Third Quarter 2019, NMT 2

	Aircraft Departures		Recorded Noise Events (a)	Lmax Average	SEL Average	Avg. Duration (seconds)
Baseline (November 2002) [A]						
DC10/MD10	87		32	69	78	22
MD11	32		13	70	79	24
A306	67		21	67	77	25
Third Quarter 2019 [B]						
	Total [X]	Est. Avg. Monthly [X/3]				
B763	122	41	6	64	72	10
DC10/MD10	53	18	6	66	75	18
MD11	259	86	58	66	74	15
A306	116	39	13	67	76	17
B757	173	58	12	67	74	13
B77L	88	29	5	66	74	12
Difference [A-B]						
DC10/MD10		-69	-26	-3	-3	-4
MD11		54	45	-4	-5	-9
A306		-28	-8	0	-1	-8

(a) For the current calendar quarter reported, ANOMS does not correlate all departures to their respective noise events; that is most, but not all, aircraft back-blast noise events are effectively correlated as the program software algorithms may misidentify an aircraft noise event.
Source: ANOMS (Airport Noise and Operations Monitoring System)

Oakland International Airport
Noise Complaint Summary
July 2020

Community	Callers	Complaints
Alameda(BFI)	89	2718
Alameda(Central)	11	97
Albany	0	0
Berkeley	1	3
Castro Valley	1	57
Fremont	1	1
Hayward	5	40
Kensington	0	0
Oakland	7	2595
Piedmont	0	0
Richmond	1	758
San Francisco	0	0
San Leandro	3	4
Union City	0	0
San Lorenzo	0	0
Other Communities	15	985
Total	**134**	**7258**

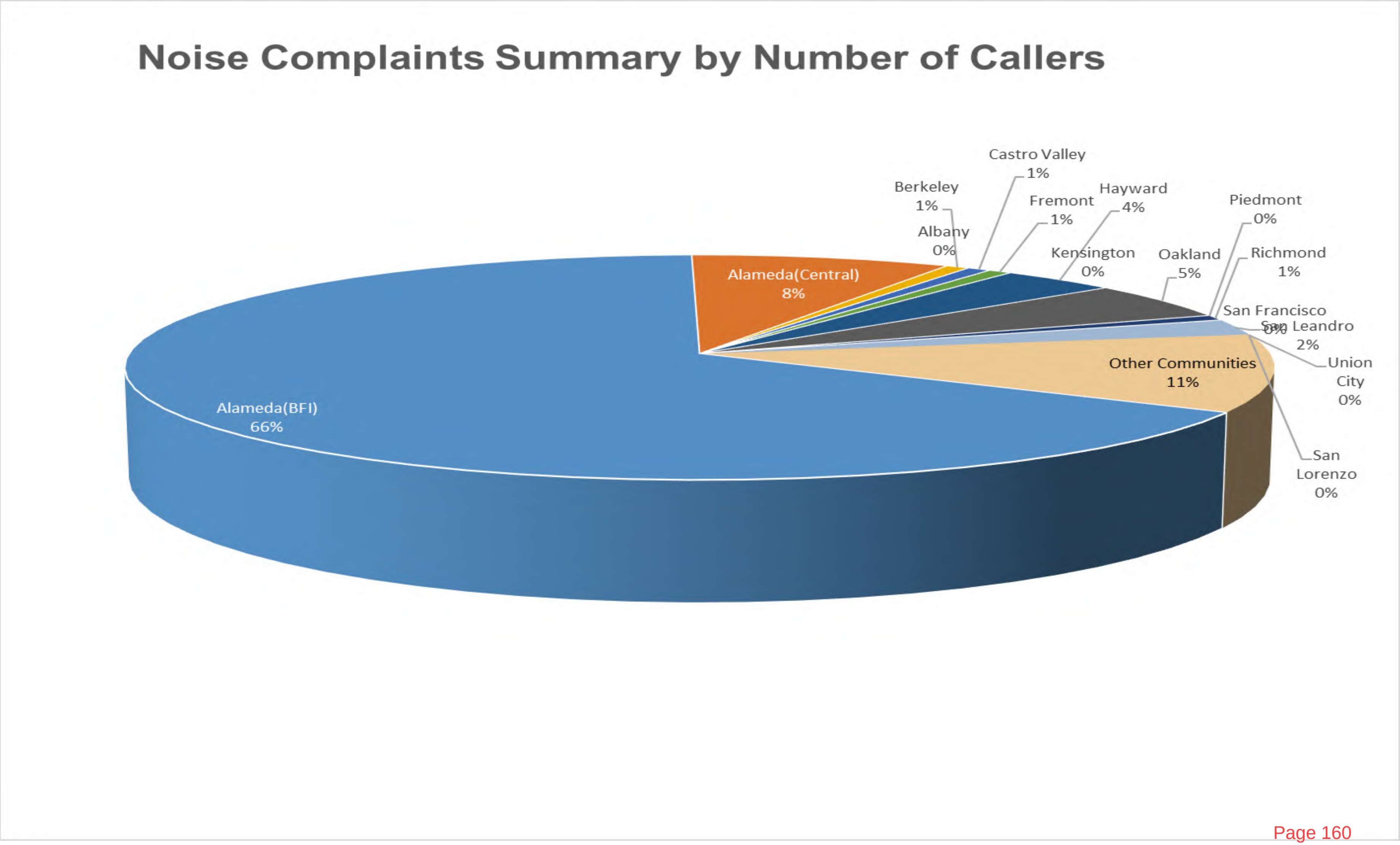
Complaints by Type	
Website	0
E-mail	2840
Phone	0
Viewpoint App	4418

Complaints by Time of Day	
Day (0700 - 1900)	3840
Evening (1900 - 2200)	1432
Night (2200 - 0700)	1986

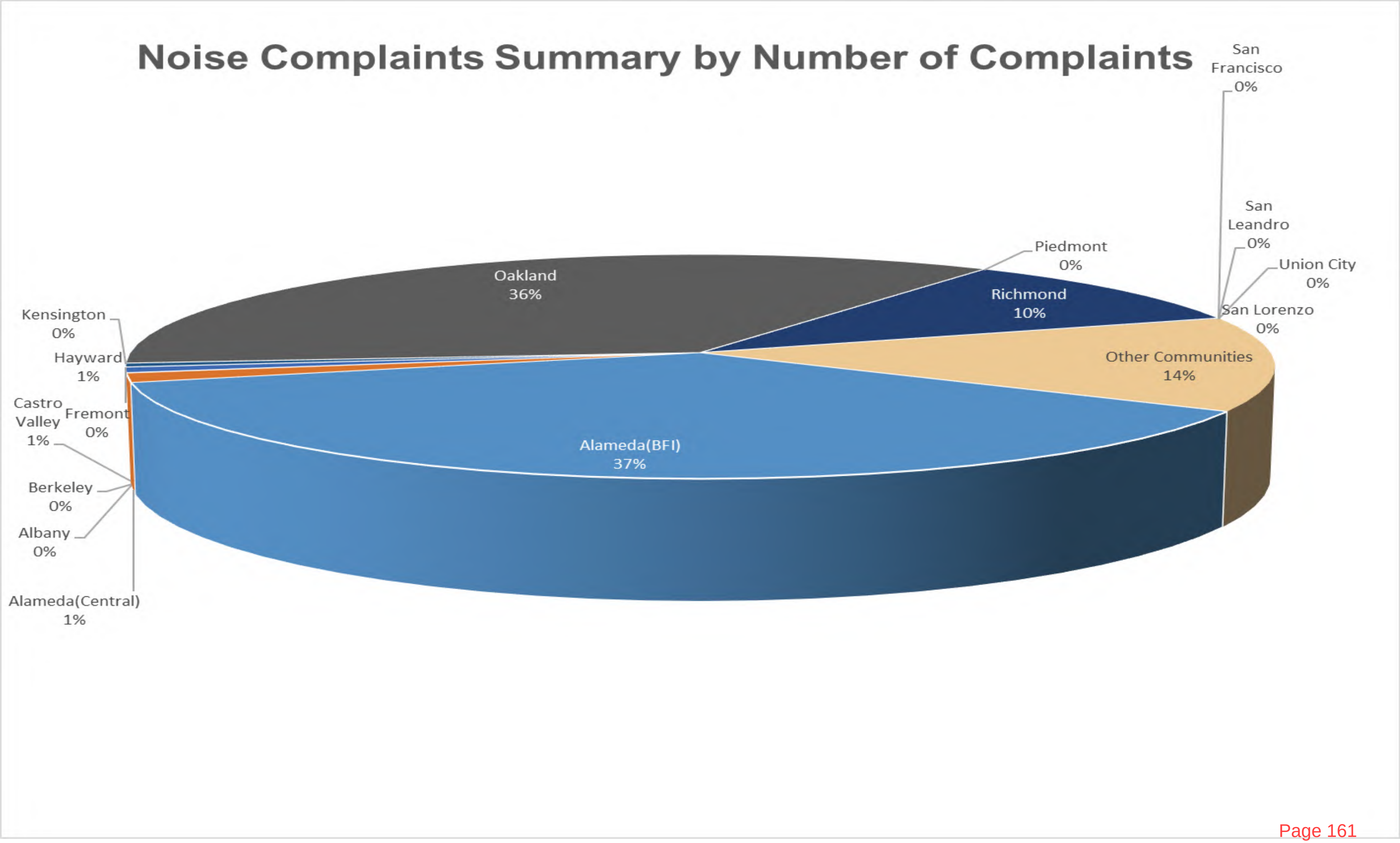
Complaints by Type of Operation	
Arrivals	3126
Departures	3604
Over-flights	423
Touch & Go	105
Not Linked to an Operation	0

Complaints by Type of Aircraft	
Business Jet	675
Helicopter	36
Jet	5272
Military	0
Not Reported (not linked to an aircraft)	0
Other (Type information not available)	411
Propeller	720
Turbo-prop	144

Number of Callers
July 2020



Number of Complaints July 2020



Oakland International Airport
Noise Complaint Summary
August 2020

Community	Callers	Complaints
Alameda(BFI)	87	2954
Alameda(Central)	16	361
Albany	0	0
Berkeley	1	29
Castro Valley	8	114
Fremont	1	1
Hayward	3	33
Kensington	0	0
Oakland	10	3192
Piedmont	0	0
Richmond	1	517
San Francisco	0	0
San Leandro	1	1
Union City	0	0
San Lorenzo	1	30
Other Communities	17	713
Total	**146**	**7945**

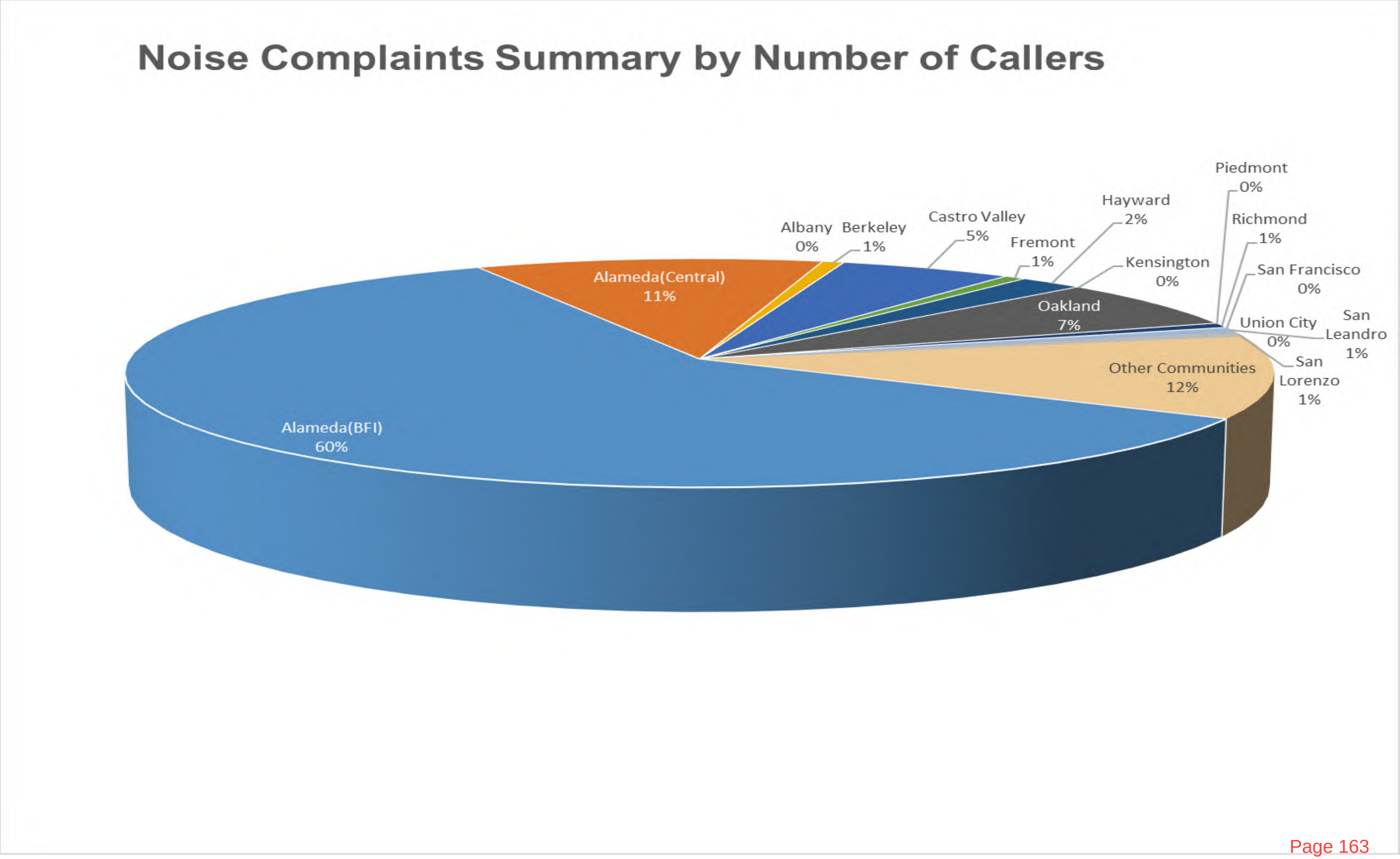
Complaints by Type	
Website	0
E-mail	3583
Phone	0
Viewpoint App	4362

Complaints by Time of Day	
Day (0700 - 1900)	3872
Evening (1900 - 2200)	2293
Night (2200 - 0700)	1780

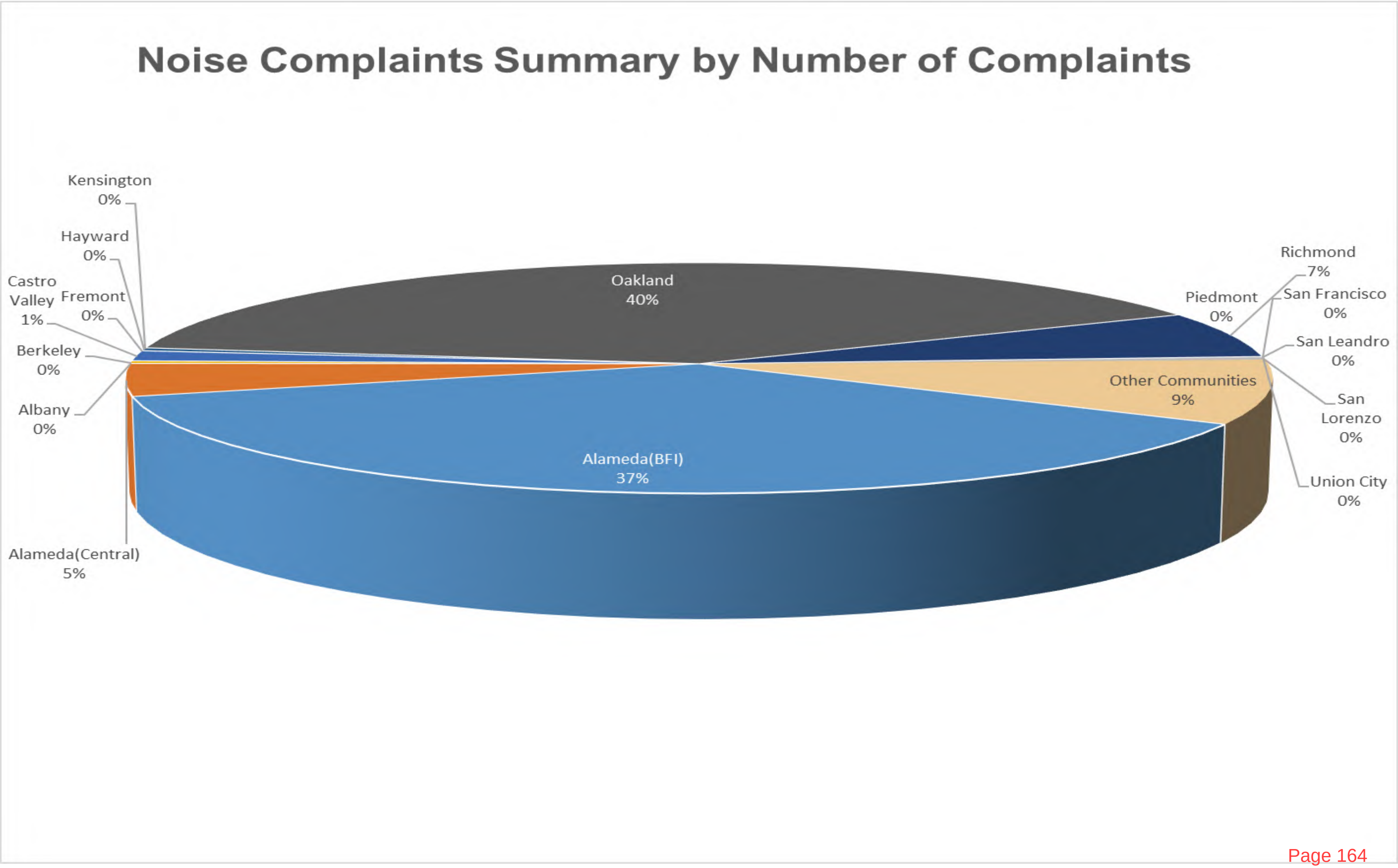
Complaints by Type of Operation	
Arrivals	3596
Departures	3962
Over-flights	269
Touch & Go	118
Not Linked to an Operation	0

Complaints by Type of Aircraft	
Business Jet	875
Helicopter	64
Jet	6007
Military	0
Not Reported (not linked to an aircraft)	0
Other (Type information not available)	137
Propeller	582
Turbo-prop	280

Number of Callers August 2020



Number of Complaints August 2020



Oakland International Airport
Noise Complaint Summary
September 2020

Community	Callers	Complaints
Alameda(BFI)	75	1894
Alameda(Central)	11	152
Albany	0	0
Berkeley	3	3
Castro Valley	3	104
Fremont	0	0
Hayw ard	3	4
Kensington	0	0
Oakland	11	2547
Piedmont	0	0
Richmond	2	588
San Francisco	2	2
San Leandro	1	2
Union City	0	0
San Lorenzo	0	0
Other Communities	13	663
Total	**124**	**5959**

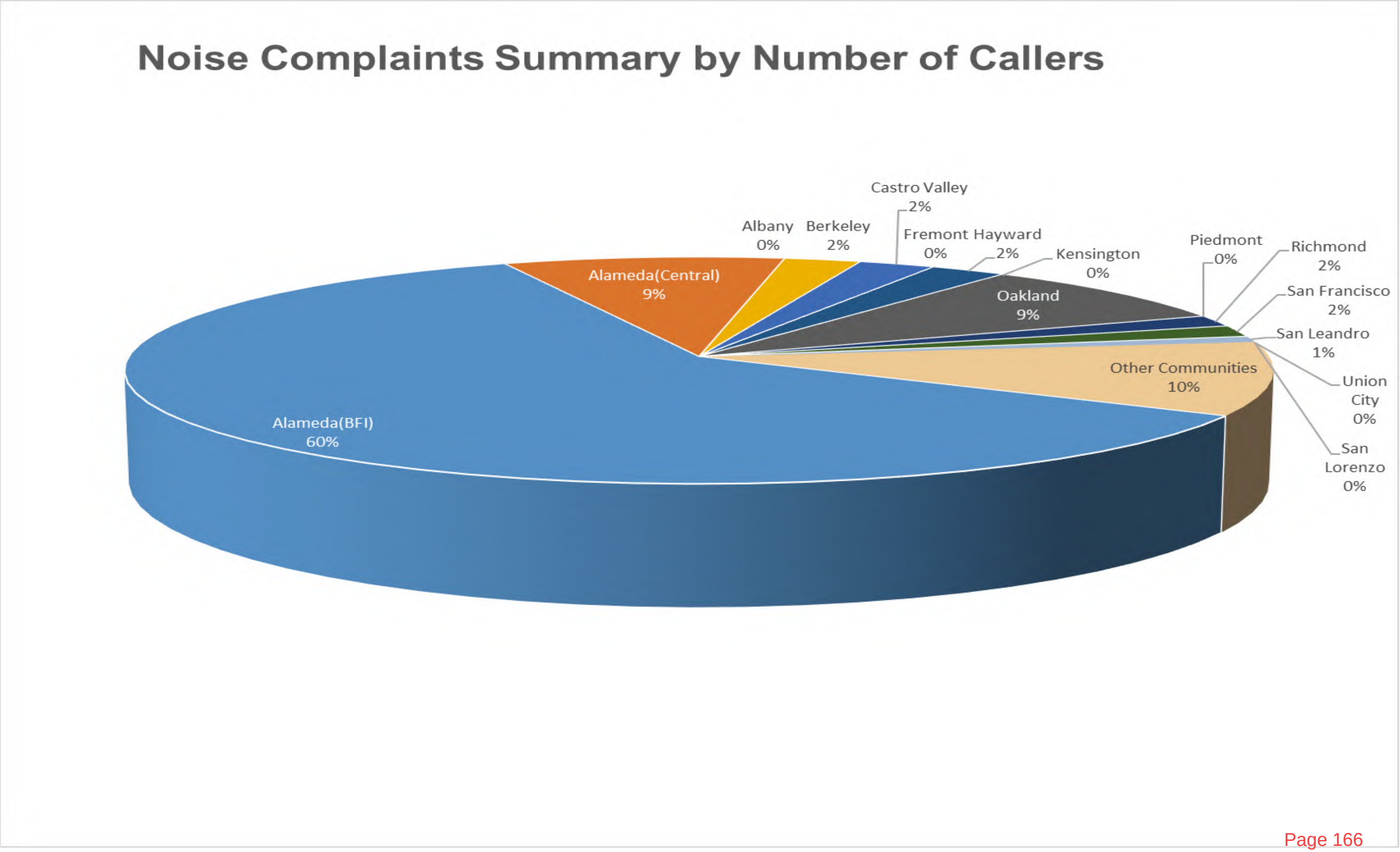
Complaints by Type	
Website	0
E-mail	2692
Phone	0
View point App	3267

Complaints by Time of Day	
Day (0700 - 1900)	2797
Evening (1900 - 2200)	1015
Night (2200 - 0700)	2147

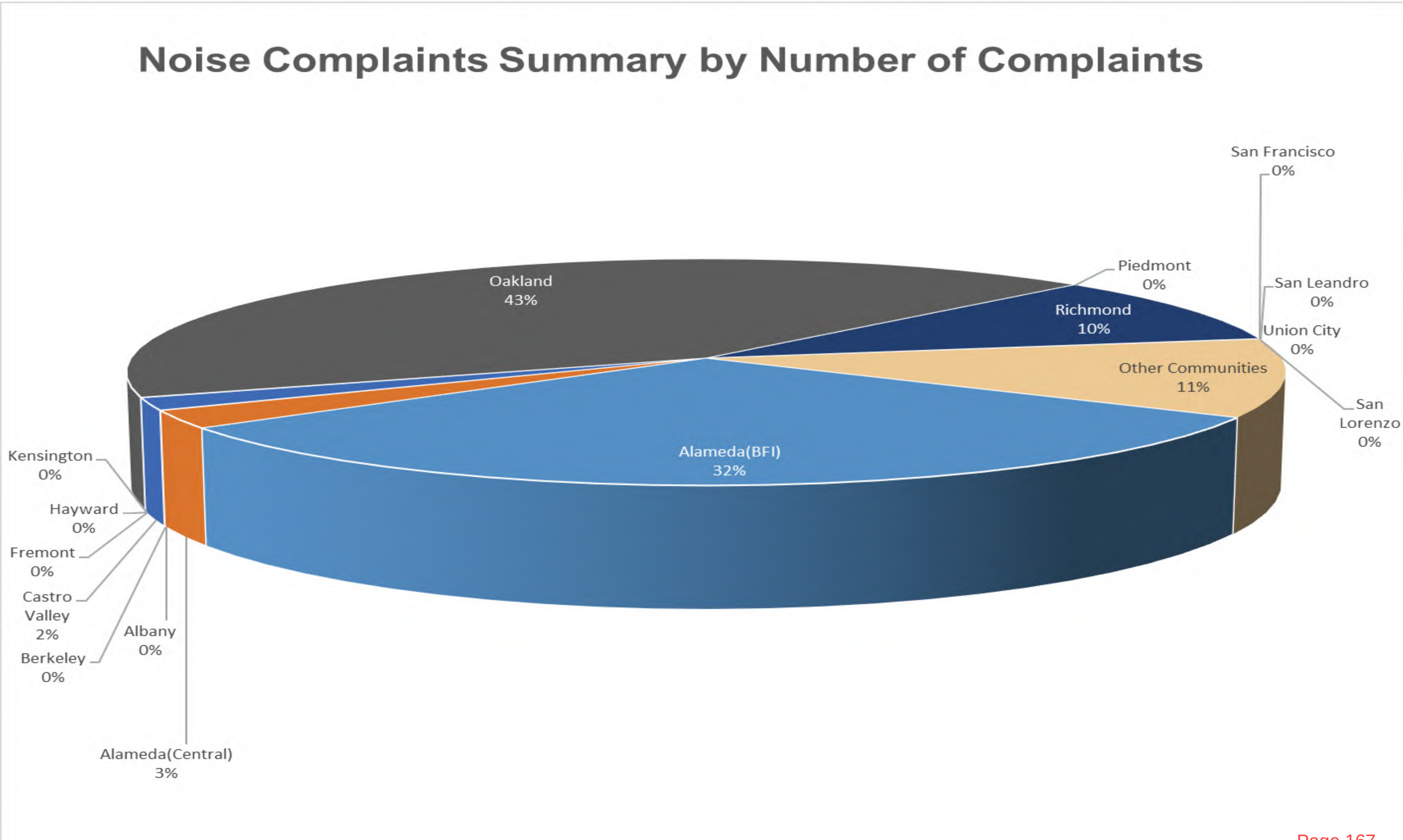
Complaints by Type of Operation	
Arrivals	2650
Departures	2884
Over-flights	306
Touch & Go	119
Not Linked to an Operation	0

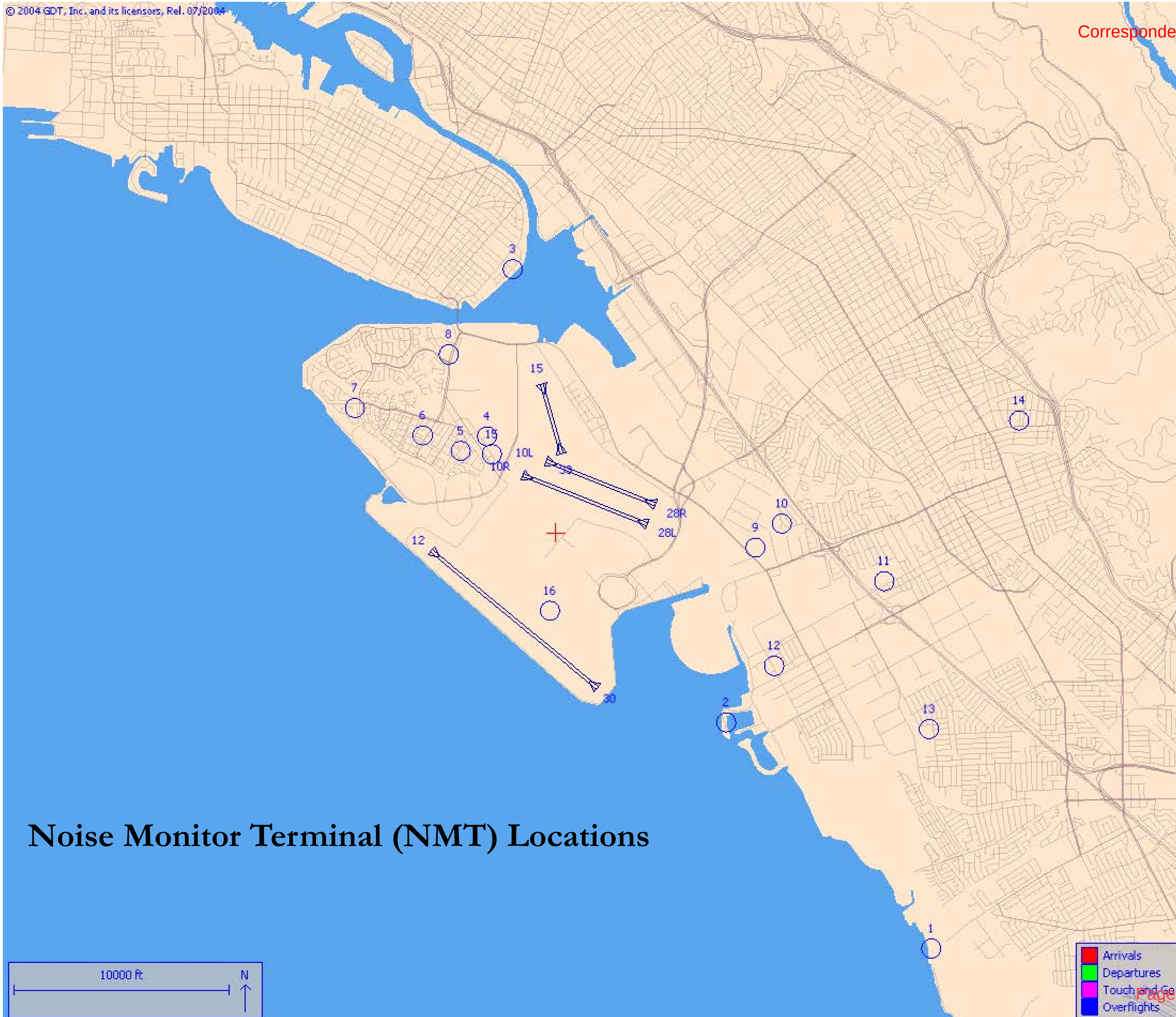
Complaints by Type of Aircraft	
Business Jet	641
Helicopter	35
Jet	4352
Military	0
Not Reported (not linked to an aircraft)	0
Other (Type information not available)	179
Propeller	588
Turbo-prop	164

Number of Callers September 2020



Number of Complaints September 2020




© 2004 GDT, Inc. and its licensors, Rel. 07/2004
Noise Monitor Terminal (NMT) Locations
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
15
33
10L
10R
28R
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12
30
10000 ft
N
Arrivals
Departures
Touch and Go
Overflights

OAKLAND AIRPORT-COMMUNITY NOISE MANAGEMENT FORUM

An Advisory Body to the Executive Director of the Port of Oakland

4 December 2020

Ms. Raquel Girvin
Regional Administrator, AWP-1
FAA Western-Pacific Region
777 S. Aviation Blvd
Suite 150
El Segundo, CA 90245

Via E-Mail

RE: Request for Update on WNDSR TWO Arrival Procedure

Dear Regional Administrator Girvin:

The Oakland Airport-Community Noise Management Forum has questions about some of the issues and concerns that were raised by the FAA during its briefing on the WNDSR TWO approach to the Forum on October 21, 2020.

The Forum's NextGen Subcommittee requests the opportunity to meet with the FAA technical experts who develops these procedures to review alternative flight paths. The Forum would also like the FAA to address in detail many of its concerns about the current WNDSR TWO Arrival and why the track of the current WNDSR TWO Arrival needs to shift to the west. Following are just some of the main Forum concerns and questions:

1. The FAA explained that the current WNDSR TWO Arrival procedure interferes with Travis AFB approach airspace in the northwestern area.
- Why not shift the WNDSR TWO Arrival track east more into Travis airspace and hand off aircraft to Travis Approach for control? Travis controls other General Aviation traffic every day (such as on airway V6 Northeast bound from OAK). Why not develop an arrival to the east of Mount Diablo (maybe southbound along V334) and hand-off aircraft to Travis from the north to monitor through their airspace? Other routes taking the OAK arrivals slightly further east and joining the OAKES TWO Arrival between TOOOL and FFIST to RWY 30 could also be developed.

2. The FAA stated that the current WNDSR arrival blocks departures from climbing out of the Bay Area.
- We were confused by this. If the current WNDSR arrival blocks departure aircraft from climbing, would not moving it to the East instead of the West allow those departing aircraft to climb sooner. Would you please provide some radar track examples of aircraft that are blocked by the arrival? Were the departing aircraft on the HUSSH or NIITE departures?

4 December 2020
Ms. Raquel Girvin
Regional Administrator, AWP-1
FAA Western-Pacific Region
Page Two

Were they on the daytime departure routes (OAKLAND FIVE or TRUKN)? We had a difficult time discerning those departing aircraft and how they interfered with the current WNDSR. Again, moving the WNDSR east (not west) would allow those departing aircraft to climb over the WNDSR arrivals. Please provide a graphic display of how this occurs.

3. The FAA stated the Hayward Airport Departures interfered with the OAK WNDSR Arrivals to RWY 30 from the north.

- A statement was made that the Hayward departures interfered with the WNDSR Arrivals. Would the FAA please explain how this is different from the procedures used by the FAA prior to implementation of NextGen procedures. We do not understand how this is different under NextGen procedures. Please provide a graphic display of how this is different from pre-NextGen operations.

These are a few of the major questions that the Forum has with reference to the briefing given for the WNDSR Arrival on October 21, 2020. If, in fact, these issues have been a safety factor for the last 5 years of Next Gen, we wonder why the FAA is choosing to impact MORE people by their proposed shift of the WNDSR arrival to the west instead of FEWER people by a shift to the East. At the VERY least, if the FAA wants to move the WNDSR as they desire, the FAA should have a higher and a wider nighttime arrival route for nighttime noise hours the same as they had pre-NextGen. These nighttime hours would be for the same time period as the HUSSH/NIITE procedures hours.

The Forum's NextGen Subcommittee is ready to meet with FAA technical specialists to review these and other procedures. Please let us know when specialists are available for a collaborative meeting. We look forward to meeting with them prior to, or on the day of the next Forum Meeting on January 20, 2021.

Thank you for your consideration, we look forward to scheduling meetings with your technical representatives soon.

Respectfully submitted:

By: *Michael R. McClintock* for Mr. Marcuzzo
Peter Marcuzzo, Chair
Forum NextGen/Metroplex Subcommittee

Authorized and Approved:

By: *Michael R. McClintock* for Mr. Lee
Benny Lee, Co-Chair

By: *Michael R. McClintock* for Mr. Jacobs
Walt Jacobs, Co-Chair

Cc: Honorable Barbara Lee, CA-13
Forum Members
Michael R. McClintock, Forum Facilitator

OAKLAND AIRPORT-COMMUNITY NOISE MANAGEMENT FORUM

An Advisory Body to the Executive Director of the Port of Oakland

December 5, 2020

Ms. Raquel Girvin
Regional Administrator, AWP-1
FAA Western-Pacific Region
777 S. Aviation Blvd
Suite 150
El Segundo, CA 90245

Via E-Mail

RE: Request for Status of HUSSH Departure from OAK RWY 30

Dear Regional Administrator Girvin:

Thank you for your attention to the pressing noise matters raised by the Oakland Airport-Community Noise Management Forum and the people of the East Bay areas of Alameda County and West Contra Costa County. As you know, the Forum's NextGen Subcommittee submitted a proposal requesting the re-evaluation of several of the new NextGen Metroplex procedures, including HUSSH. The proposal was initially submitted in 2017 with a substantial amount of follow up since then; but three years later, the FAA has yet to adequately respond to our proposal. At recent meetings with FAA technical experts, it was evident that they have made little progress regarding changes to the HUSSH procedure, saying only that the proposed changes are "under consideration" and that re-evaluation of the HUSSH procedure is "in the queue," giving no clear indication of when a response would be forthcoming. This non-response is unacceptable.

While we appreciate the attendance of FAA representatives at Noise Forum meetings, we are concerned that although the FAA has agreed to consider recommendations from local communities, the agency is doing little to resolve the issues associated with the HUSSH procedure. These changes and the resulting noise have negative health and quality-of-life effects on East Bay residents, families, and communities.

The Forum (specifically the Forum's NextGen Subcommittee) requests to meet with the technical staff of the FAA responsible for the development of these procedures to review alternative flight paths. The Forum would also like an update on the HUSSH TWO Departure. Specifically, what is the status of the HUSSH TWO Departure as it relates to the milestones and program timeline under the chart of the Performance Based Navigation Timeline?

C/O Michael R. McClintock & Co.
(415-203-9097) (360-899-9929)
1411 Northview Court, Mount Vernon, WA 98274
Glomike65@aol.com

December 5, 2020

Ms. Raquel Girvin
Regional Administrator, AWP-1
FAA Western-Pacific Region
Page Two

We would like clarity on the timeline and expected dates for the milestones. The FAA update at the meeting in October left it unclear as to what the future expectations are and how soon they might occur. In addition, we understand that the FAA is addressing each proposed change individually. The changes related to HUSSH proposed in the Subcommittee's Supplemental Proposal (dated January 2017) are minor, but they would greatly alleviate noise for impacted people. Therefore, we request that consideration of the HUSSH changes be expedited.

The Forum's NextGen Subcommittee is ready to meet with FAA technical specialists to review this and other procedures. Please let us know when specialists are available for a collaborative meeting at the Oakland International Airport. We hopefully look forward to meeting with them prior to the date of the next Forum Meeting on January 20, 2021.

Thank you for your consideration. We look forward to meeting with your technical representatives and an expeditious resolution of the noise impacts on our communities.

Respectfully submitted:

By: *Michael R. McClintock* for Mr. Marcuzzo
Peter Marcuzzo, Chair
Forum NextGen/Metroplex Subcommittee

Authorized and Approved:

By: *Michael R. McClintock* for Mr. Lee
Benny Lee, Co-Chair

By: *Michael R. McClintock* for Mr. Jacobs
Walt Jacobs, Co-Chair

Cc: Honorable Barbara Lee, CA-13
Forum Members
Michael R. McClintock, Forum Facilitator

OAKLAND AIRPORT-COMMUNITY NOISE MANAGEMENT FORUM

An Advisory Body to the Executive Director of the Port of Oakland

6 December 2020

Ms. Raquel Girvin
Regional Administrator, AWP-1
FAA Western-Pacific Region
777 S. Aviation Blvd
Suite 150
El Segundo, CA 90245

Via E-Mail

RE: Proposed Cal State Visual Approach and SLZ-1 Alternative

Dear Regional Administrator Girvin:

The Oakland Airport-Community Noise Management Forum's NextGen Subcommittee desires to meet with the technical staff of the FAA to discuss two important items per the above:

1. The implementation of a test period for the proposed Cal State Visual Approach for a period of 180 days. The Forum became aware of this proposed procedure about two years ago and is concerned that it will result in the concentration of aircraft along a single path over noise sensitive residential land uses, along with a concomitant increase in noise complaints. Experience has shown that it takes at least 90-180 days for those affected by a change in a flight procedure to react to or start to vehemently complain about the procedure.

2. The Forum requests that FAA procedures specialists accomplish a review of the Forum's proposal for a San Lorenzo Visual Approach (see attached) to determine if the procedure is feasible to fly with modern aircraft in today's RNP environment. The Forum believes that the proposed San Lorenzo Visual Approach improves upon the Cal State Visual Approach and allows aircraft to overfly fewer residential areas on the approach to OAK RWY 30.

The Oakland Forum's NextGen Subcommittee is ready to meet with FAA technical specialists to review these proposed procedures. Please let us know when specialists are available for a collaborative meeting. We look forward to meeting with them on or before the day of the next Forum meeting on January 20, 2021.

Thank you for your consideration. We look forward to scheduling meetings with your technical representatives soon.

C/O Michael R. McClintock & Co.
(415-203-9097) (360-899-9929)

1411 Northview Court, Mount Vernon, WA 98274
Glomike65@aol.com

6 December 2020
Ms. Raquel Girvin
Regional Administrator, AWP-1
FAA Western-Pacific Region
Page Two

Respectfully submitted:

By: *Michael R. McClintock* for Mr. Marcuzzo
Peter Marcuzzo, Chair
Forum NextGen/Metroplex Subcommittee

Authorized and Approved:

By: *Michael R. McClintock* for Mr. Lee
Benny Lee, Co-Chair

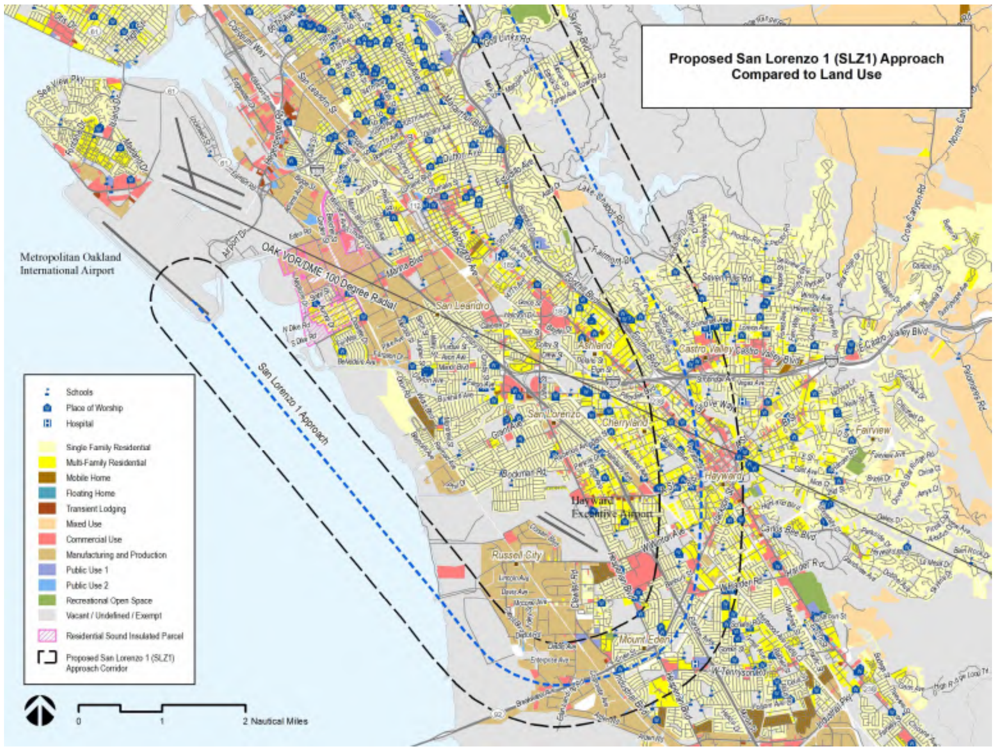
By: *Michael R. McClintock* for Mr. Jacobs
Walt Jacobs, Co-Chair

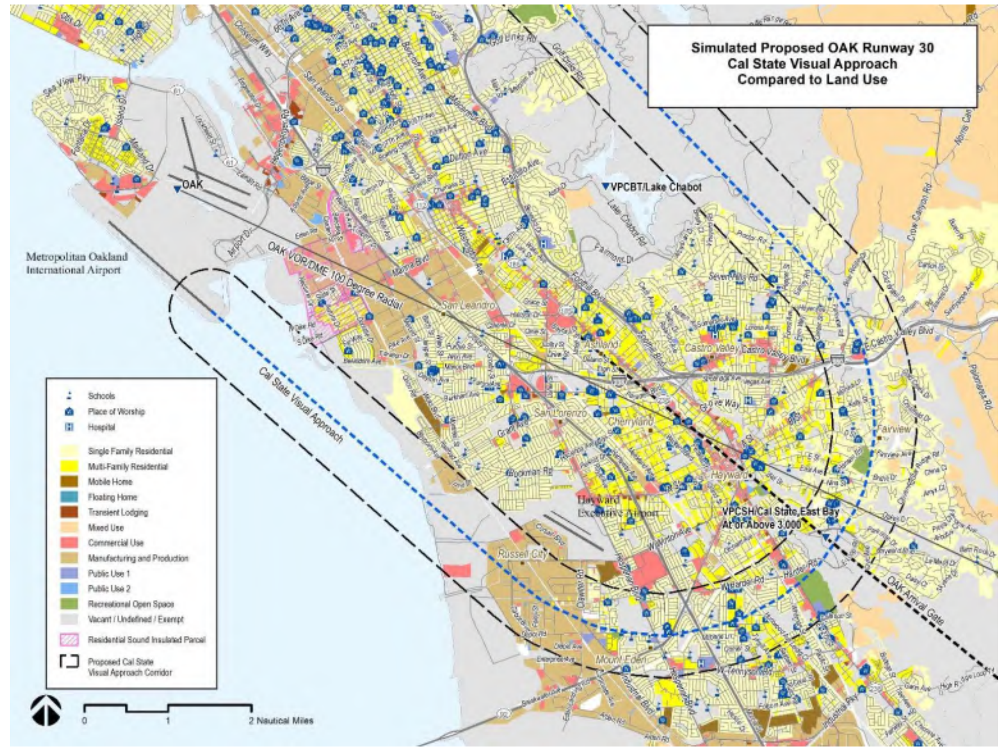
Attachments

Cc: Honorable Barbara Lee, CA-13
Forum Members
Michael R. McClintock, Forum Facilitator

C/O Michael R. McClintock & Co.
(415-203-9097) (360-899-9929)
1411 Northview Court, Mount Vernon, WA 98274
Glomike65@aol.com

All Land Use: Simulated Proposed Runway 30 SLZ1 Visual Approach Compared to Proposed Cal State Visual Approach





January 10, 2020

From

Robert Holbrook

To

TWG - SCSC Roundtable

Message

Input for TWG

Please find below my input for the Technical Working Group as requested at the December 15th meeting.

Robert Holbrook

Mountain View

Observations Regarding FAA Practices Involving Noise

In practice, the thresholds for mitigation defined by the FAA are far too high to afford protection from aircraft noise for residents who live more than a few miles from the airport. It hardly needs to be said that a noise standard used to qualify homeowners for sound insulation (DNL 65) is in no way suitable for residents affected by aircraft noise living five or more miles from an airport, and yet the vast majority of the 10m+ complaints at SFO since NextGen was rolled out have been from such residents. New noise mitigation procedures should be defined by the FAA along with the operational criteria (thresholds) that should, under normal circumstances, trigger the use of those mitigating procedures. These thresholds can and should employ a variety of different noise metrics.

The FAA does not appear to engage the public as stakeholders in the development of procedures. Due perhaps to a lack of transparency, the public does not feel that they can dialog with the FAA on changes to operations as they are being developed. The public and its representatives are not invited to participate in Full Working Groups, as industry is. Worse, there is no structured mechanism for the public to provide input to the FAA before a procedure is finalized, as there is for pilots. It is not clear whether or if the input provided in necessarily less formal ways by the public and their elected representatives is considered in the development or rollout of a procedure. Too often, community engagement is narrowly reduced to the FAA justifying a fait accompli to the public.

The metrics used to quantify noise and set policy do not correlate well with human annoyance. This area clearly needs work, and Congressmembers across the country have flagged that the FAA's recent report to Congress regarding alternatives to the use of DNL (FAA Reauth. Act of 2018, §188 & §173) missed the mark and needs further work. The community is further concerned that the software prediction tools the FAA uses understate actual noise on the ground for a variety of reasons including inaccurate prediction of traffic loads and varying real-world weather conditions to name only two. For procedures of substantial community concern, the actual noise on the ground after a procedure is implemented should be tied out to the noise predicted and cross-tabulated with noise complaints until the FAA's software models better approximate human annoyance.

The following questions regarding FAA authority could be considered for inclusion in a letter addressed to the Regional Administrator:

Questions for the FAA – What Actions are Within Their Power?

Layered mitigations

Is the FAA empowered to define operational practices that can be used to mitigate noise when efficiency permits (for example, during off-peak hours) along with the threshold criteria that determine when these procedures are to be implemented? If this has happened, please provide some examples along with the decision criteria used to trigger their use.

Safety

Does the FAA have a concept of 'acceptably safe' practices? What classes of metrics (such as Mean Time Between Failure) are used to regulate manufacturers who must trade off safety against product cost and other factors during the design process? Similarly, what classes of metrics are used to regulate the development and use of operational practices involving tradeoffs of safety against health concerns and other factors affecting residents? From a safety standpoint, could a procedure or practice that provided the level of safety available pre-NextGen be implemented for use today?

Part 161 Determinations

FAA decisions to date on Part 161 determinations arising from ANCA have deprived airport operators and local jurisdictions of any ability to use incentives to encourage airlines to reduce the noise of airplanes operating at their airports. Does the FAA have discretion to adopt different criteria to resolve Part 161 disputes that would provide airport operators or local jurisdictions with some power to deploy incentives?

Residents and their Representatives as Stakeholders in the Use of the National Airspace

Does the FAA view residents or their state, local and/or regional representatives as stakeholders that should be consulted in the process of developing policies and regulations that affect them? If so, please describe some success stories and clarify why, in your opinion, they were successful.

Does the FAA view residents or their state, local and/or regional representatives as stakeholders that should be consulted in the process of developing or altering operational procedures for which a CATEX has been issued? If so, what, if any, criteria have the FAA developed to guide the decisions to engage the public?

Does the FAA conduct stakeholder satisfaction reviews that evaluate structured feedback from each class of stakeholder and assess how that satisfaction could be improved going forward? If so, is this done regularly and at what interval? Are residents and their representatives considered stakeholders for this purpose?

January 11, 2021

From
Jennifer Landesmann
To
SCSC Roundtable
Message

SCSC Roundtable - GBAS Information - Soliciting comments and questions

Dear all,

I would like to add some further references to JO 7100.41A, ""dot 41""

please see the following:

Video replay of FAA presentation on procedure implementation and dot 41

June 2019

https://youtu.be/vOHVhSJsDu0?t=1546

Note that at the beginning of the presentation Favi refers to the Phase Two report to the Select Committee. Phase Two (Page 8) report is the first time we were given this info. The second time we were given info was in a presentation by FAA Julie Marks (joined at that meeting by the head of Airports). We reported on that meeting in this Sky Posse Update The Sky Posse March 2018 Update - Special Edition.

BTW - at the 2018 FAA presentation to communities, I spoke with the head of airports and Julie and shared that this information has apparently not reached our area (others also said this is not working this way), and the airports person committed to let airports know. I believe the name of the person from airports whom I spoke with is Elliot Black.

Thank you,

Jennifer

Attachment Name
20210112_J_Landesmann_Attach_PHASE 2 November 2017

b. Creation/Amendment of an instrument flight rules procedure: Amending or creating a new instrument flight rule procedure is an example of a non-rule making process. Given the variables involved with each of the following steps, the timelines provided are only intended on capturing the average time taken for each step. Since release of the November 2015 NorCal Initiative, the FAA has undertaken enhanced community outreach efforts. Although not specifically referenced within the following section and even if there is no legal requirement to do so, the FAA remains willing to address community noise concerns. As a result, the FAA undertakes its community outreach efforts and considers potential adjustments to address community noise concerns while remaining mindful that all arrival and departure procedures within the Northern California airspace are interconnected, interdependent and designed to improve safety and efficiency within the National Airspace System (NAS). To the extent the FAA determines a new requested procedure is initially feasible, flyable, and operationally acceptable from a safety point of view, then the FAA will conduct its formal environmental and safety reviews for this new federal action.

The steps in the instrument flight rules procedure processes are as follows:

- Initial Feasibility/Analysis of the procedure. The proponent of the procedure does initial research into the details and justifications for the new/amended procedure. This stage is completed once the proponent places the request and the associated justification into the IFP Information Gateway.
  Timeline: 45 days

- FAA Order 7100.41A: Performance Based Navigation (PBN) processing: This is the required process for all new and amended PBN procedures and/or routes, Area Navigation (RNAV)/Required Navigation Performance (RNP) Standard Instrument Departures (SIDs), RNAV Standard Terminal Arrivals (STARs) and RNAV routes. The FAA Order 7100.41A breaks down the design and implementation process into 5 stages:
  - Preliminary Activities: This includes the conduction of baseline analysis to identify expected benefits and develop conceptual procedures and/or routes for the proposed project.
  - Design Activities: This includes the creation of a working group in order to design a procedure/route that meets the project goals and objectives. An environmental review is included in this stage.
  - Development and Operational Preparation: The intent of this stage is to complete all pre-operational items necessary to implement the procedures and/or routes. This phase includes training, issuing notifications, automation, updating radar video maps, and processing documents. This phase ends when procedures and/or routes are submitted for publication.
  - Implementation: The purpose of the implementation phase is to implement the procedures and/or routes as designed. This phase starts with confirmation by the Full Working Group ("FWG") that all required pre-implementation

January 12, 2021

From
Todd Anderson
To
SCSC Roundtable
Message

New submission from Contact us

If you guys on the Committee are doing such a great job I would like for you to answer a question I have. Why has Kalitta Air been allowed to fly on the SERFR FLIGHT PATH and fly so early? Todays flight left LAX at 5:04am, arrived SFO 5:57am.
I reported the LOUD flight on STOP JET NOISE at 5:45am at 11392ft in Capitola. This has been going on for 6 years and you haven't done anything, nor has the FAA!
I DEMAND TO KNOW WHY YOU CANNOT STOP KALITTA AIR FROM FLYING SERFR SO EARLY!!!
DO SOMETHING CONSTRUCTIVE AND STOP BEING THE GATEKEEPERS FOR THE FAA AND THE CITY OF SANTA CTRUZ!!!
SHAMEFUL!

January 12, 2021

From
Todd Anderson
To
SCSC Roundtable
Message

New submission from Contact us

I just wrote you a few minutes ago. Here is my evidence (flights and times) that Kalitta Air 1920/CKS1920/K41920 is flying early.

Go to the website for Kalitta and look for yourself. There are 12 flights you can view for free, all flying LAX/SFO/SERFR. Here is the time range flying of those 12 days. Anywhere between 2:46am - 6:05am. Check it out! I'm 70 why do I have to put up with this BS!

Finally I DEMAND TO KNOW IF THE FAA OR YOU HAVE GIVEN KALITTA AIR A WAIVER OF SOME SORT

January 12, 2020

From
Mike McClintok
To
SCSC Roundtable
Message

Fwd: FAA Seeks Public Comment on Aviation Noise Effects and Mitigation Research Portfolio

Forum Members and all:

The following is FYI. I will forward separate notice from N.O.I.S.E. with links.

Mike McClintock
Forum Facilitator

FAA Seeks Public Comment on Aviation Noise Effects and Mitigation Research Portfolio
WASHINGTON – The Federal Aviation Administration (FAA) announced plans to seek public comment on the existing noise research portfolio, including the Neighborhood Environmental Survey, and additional areas recommended for investigation. The notice is available on FAA's website.
The FAA is sharing information on its aircraft noise research programs that includes a portfolio of research initiatives related to the effects of aviation noise impacts on the public, efforts to mitigate such noise exposure, and research regarding public perception of aviation noise. The public comment period opened today and the notice is published in the Federal Register.
Included in this posting are the results of the Neighborhood Environmental Survey, a multi-year research effort to review and improve FAA's understanding of community response to noise. The survey included responses from over 10,000 people living near 20 airports across the country, and the results show an increased level of reported annoyance due to aircraft noise in contrast to earlier surveys.
Successfully addressing noise requires continued and increased collaboration among all aviation stakeholders. In this regard, FAA has an important role to play in addressing noise issues, including continuing to improve the understanding of how airport noise impacts communities surrounding our nation's airports. As part of FAA's broader research on aircraft noise, this survey data and the research related to noise abatement will be used to inform FAA's approach on the relationship between aircraft noise exposure and the well-being of people living near airports and communities served by airports throughout the country.
FAA continues decades-long efforts to work with airport authorities, aircraft manufacturers, airlines, state and local governments, and communities to address noise concerns. FAA also collaborates with airport authorities and community groups to implement noise abatement procedures safely when operationally feasible. Today's

civilian aircraft are quieter than at any time in the history of powered flight, and FAA continues to work with manufacturers and air carriers to reduce noise at the source.
FAA works with local governments to encourage responsible land planning that avoids building residential housing in areas that will be exposed to significant airplane noise. In fact, over the last four decades, the number of Americans exposed to significant aviation noise near airports has been reduced from 7 million to just over 400,000–more than a 94% reduction. During the same period, the number of annual passengers increased from around 200 million per year to over 900 million per year. This demonstrates a decrease in the number of people exposed to significant noise while showing an increase in the number of passengers travelling in the aviation system.

January 12, 2021

From

Mike McClintok

To

SCSC Roundtable

Message

Fwd: ALERT -- FAA Neighborhood Environmental Survey

The following has the link to the Federal Register announcement.

MM

ALERT -- FAA Neighborhood Environmental Survey
Dear N.O.I.S.E. Members:

We wanted to make you aware that in today's Federal Register the FAA has released the findings of its long-awaited Neighborhood Environmental Survey. This survey was conduced in communities around 20 unnamed U.S. airports, to help determine if the agency needs to update its aviation noise policy. The survey received over 10,000 mail responses, making it the single largest survey of its kind undertaken at one time. The FAA has also invited public comment on the scope and applicability of these research initiatives to address aircraft noise, which is due before March 15, 2021. This is a significant announcement. We are in the process of reviewing the findings and will send additional updates as we learn more. The notice can be found here.

Emily Tranter

Executive Director
National Organization to Insure a Sound-Controlled Environment (N.O.I.S.E.)

Visit the N.O.I.S.E Website"

January 12, 2021

From
Jennifer Landesmann
To
SCSC Roundtable
Message

Long awaited Neighborhoods study is finally out

Dear SCSC Roundtable,

In my public comment at the SCSC recent NEPA 101 meeting, I highlighted that FAA's NEPA thresholds of significance were in question and under challenge awaiting the results of FAA's Neighborhoods Study. You may also recall the time I brought in a Monopoly board to express how unrealistic the estimates were for communities farther from the airport which you represent.

We don't need to wait anymore, see today's Federal Register about the NES here:

https://www.govinfo.gov/content/pkg/FR-2021-01-13/pdf/2021-00564.pdf

I would like to note that thanks to Representative Anna Eshoo, the Select Committee on South Bay Arrivals and the extraordinary efforts by Midpen cities - from the day the FAA came to meet us in Palo Alto City Chambers in July 2015 committing to ""research to make changes to understand where that (gap) is"" in their noise standards, the study has been under way. It has taken too long to release this but now we must all work together to follow up.

Please take a look at the implications for SCSC communities very closely. and when you respond I urge you to also please respond to FAA's generalizations about social media or that people suddenly like the outdoors more. You must please respond with our experience with what it means to brutally transform a previously quiet area to an airport runway.

I also ask that you please solicit input from all cities and interested parties before you formulate a final response.

Thank you

Jennifer

January 12, 2021

From
Evan Wasserman
To
SCSC Roundtable
Message

FW: Overview of FAA Aircraft Noise Policy and Research Efforts/ Noise Annoyance Survey Results to be released tomorrow (Jan 13)

Dear SCSC Roundtable Members and Alternates, For your reference, the FAA's Aircraft Noise Policy and Research Efforts have just been published through the Federal Register and the document has been attached for your review. In addition, attached is a summary document from the Airport Noise Report (ANR) for your convenience.

We have placed a link to the Federal Register information on the SCSC Roundtable website at the following location as an informational/news item. This document has been published as of this morning. Please also see the press release email pasted below from the FAA.

Regards,

Attachment Name
20210112_Evan_Wasserman_SCSCRoundtable_FW Overview of FAA Aircraft Noise

BILLING C

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[Docket No. FAA-2021-0037]

Overview of FAA Aircraft Noise Policy and Research Efforts: Request for Input on Research Activities to Inform Aircraft Noise Policy

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT)

ACTION: Notice of Research Programs and Request for Comments

SUMMARY: The FAA is releasing a summary to the public of the research programs it sponsors on civil aircraft noise that could potentially inform future aircraft noise policy. The FAA invites public comment on the scope and applicability of these research initiatives to address aircraft noise.

The FAA will not make any determinations based on the findings of these research programs for the FAA's noise policies, including any potential revised use of the Day-Night Average Sound Level (DNL) noise metric, until it has carefully considered public and other stakeholder input along with any additional research needed to improve the understanding of the effects of aircraft noise exposure on communities.

DATES: Comments on this notice must identify the docket number and be received on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN FEDERAL REGISTER].

ADDRESSES: Send comments identified by docket number FAA-2021-0037 using any of the following methods:

- Federal eRulemaking Portal: Go to http://www.regulations.gov and follow the online instructions for sending your comments electronically.

- Mail: Send comments to Docket Operations, M-30; U.S. Department of Transportation, 1200 New Jersey Avenue, SE, Room W12-140, West Building Ground Floor, Washington, DC 20590-0001.
- Hand Delivery or Courier: Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- Fax: Fax comments to Docket Operations at (202) 493-2251.

Privacy: The FAA will post all comments it receives, without change, to http://www.regulations.gov, including any personal information the commenter provides. Using the search function of the docket web site, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the Federal Register published on April 11, 2000 (65 FR 19477-19478), as well as at http://DocketsInfo.dot.gov.

Docket: Background documents or comments received may be read at http://www.regulations.gov at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION, CONTACT: Mr. Donald Scata, Office of Environment and Energy (AEE-100), Federal Aviation Administration, 800 Independence Ave., SW, Washington, DC 20591. Telephone: (202) 267-0606. Email address: NoiseResearchFRN@faa.gov

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BACKGROUND INFORMATION:

Since the mid-1970s, the number of people living in areas exposed to significant levels of aircraft noise[1] in the United States has declined from roughly 7 million to just over 400,000 today. At the same time, the number of commercial enplanements has increased from approximately 200 million in 1975 to approximately 930 million in 2018. The single most influential factor in that decline was the phased transition to quieter aircraft, which effectively reduced the size of the areas around airports experiencing significant noise levels. That transition was the result of the development of new technology by aircraft and engine manufacturers; establishment of

[1] Under longstanding FAA policy, the threshold of significant aircraft noise exposure in residential areas is a Day-Night Average Sound Level of 65 decibels (dB). See the "Aviation Noise Abatement Policy," issued by the Secretary of Transportation and the FAA Administrator in 1976. This document is available on the FAA website at https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/.

increasingly stringent noise standards for civil subsonic aircraft,[2] investments by U.S. airlines in newer, quieter aircraft; and requirements by the FAA and the United States Congress to phase out operations by older, noisier aircraft.

A second factor has been cooperative efforts by airports, airlines and other aircraft operators, State and local governments, and communities to reduce the number of people living in areas near airports exposed to significant levels of aircraft noise. Under the FAA's Airport Noise Compatibility Planning Program,[3] airports may voluntarily initiate a collaborative process to consider measures that reduce existing noncompatible land uses and prevent new noncompatible land uses in areas exposed to significant levels of aircraft noise. Since 1983, more than 250 airports have used this process to consider changes to local land use planning and zoning, sound insulation, acquisition of homes and other noise-sensitive property, aircraft noise abatement routes and procedures, and other measures. Over $6 billion in funding has been provided for airports to undertake noise compatibility programs and implement noise mitigation measures. The FAA encourages the process by providing financial and technical assistance to airport sponsors to develop Noise Exposure Maps and Noise Compatibility Programs, and implement eligible noise-related mitigation measures recommended in the program, depending upon the availability of funding.

In addition to noise compatibility planning, the FAA also issues grants to airport operators and units of local government to fund mitigation projects, most notably to sound-insulate homes, schools, and other noise-sensitive facilities. While sound insulation reduces indoor noise levels, it does not address concerns about noise interfering with the enjoyment of the outdoors.

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[2] Consistent with International Civil Aviation Organization standards, FAA has set increasingly more stringent aircraft certification noise standards, such as the Stage 5 noise certification standard. 82 FR 46123 (October 4, 2017).

[3] This process is outlined under 49 U.S.C. 47501 et seq., as implemented by 14 CFR part 150.

Moreover, there are limits to the effectiveness of sound insulation. In some areas with elevated noise levels, sound insulation may not sufficiently reduce interior noise levels to meet established interior noise standards.[4] Conversely, in areas where overall noise levels are lower, interior noise standards may already be met without additional sound insulation treatments.[5]

Today's civilian aircraft are quieter than at any time in the history of jet-powered flight. The FAA, aircraft manufacturers, and airlines continue to work toward further reducing aircraft noise at the source.[6] As an example, the noise produced by one Boeing 707-200 flight, typical in the 1970s, is equivalent in noise to 30 Boeing 737-800 flights that are typical today.[7] As a result, for many years there was a steady decline in the number of people exposed to significant noise in communities located near airports. In recent years, however, as aviation industry growth has led to an increase in operations in many areas, the number of people and the size of the areas experiencing significant aircraft noise has started to show a gradual expansion . The introduction of Performance Based Navigation (PBN) procedures, as needed to safely and efficiently modernize the national air transportation system[8], has also provided noise benefits for many by allowing for new and more efficient flight paths, but has in some places resulted in community concerns, particularly related to increased concentration of flights. In 2016, the FAA released an update to the FAA Community Involvement Manual to reaffirm the FAA's commitment to inform and involve the public, and to give meaningful consideration to

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[4] FAA Order 5100.38D, Appendix R.

[5] P.J. Wolfe et al., 2016 Costs and benefits of US aviation noise land-use policies Transportation Research Part D 44 (2016) 147–156, http://dx.doi.org/10.1016/j.trd.2016.02.010

[6] See, for example, information on the FAA's "Continuous Lower Energy, Emissions, and Noise" (CLEEN) Program at: https://www.faa.gov/about/office_org/headquarters_offices/apl/research/aircraft_technology/cleen/

[7] Based on an average of approach and takeoff certificated noise levels as defined in 14 CFR part 36.

[8] See Section 213, "Acceleration of NextGen Technologies," of the FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 213, 126 Stat. 11, 46-50 (2012), 49 USC 40101 note (PBN implementation required at key airports by statutory deadline).

community concerns and views as the FAA makes aviation decisions that affect community interests. The FAA has since developed and begun implementing a comprehensive and strategic approach to transform and enhance FAA community involvement practices, including working through airport community roundtables, to equitably discuss opportunities to shift or, when possible, reduce aircraft noise exposure.

OVERVIEW OF FAA RESEARCH ON AIRCRAFT NOISE:

Recognizing that aircraft noise remains a primary concern of many stakeholders, the FAA is actively working to understand, manage, and reduce the environmental impacts of global aviation through research, technological innovation, policy, and outreach to benefit the public.

With the vision of removing environmental constraints on aviation growth by achieving quieter, cleaner, and more efficient air transportation, the FAA has worked closely with a number of industry, academic, and governmental stakeholders to assemble a comprehensive portfolio of research activities (including leveraging research undertaken by others) aimed at guiding investments in scientific studies, analytical tools, and innovative technologies to better understand and manage aircraft noise. However, due to the complex nature of aircraft noise and the varied priorities and concerns of stakeholders, no single set of findings can completely guide decision making. A broad understanding of aircraft noise and any potential impacts, from many different perspectives, is therefore needed. Summaries of the FAA's key research, tools, and technology programs designed to potentially inform aircraft noise policy are provided below.

1) ***Effects of Aircraft Noise on Individuals and Communities***

Speech Interference and Children's Learning

Much of our current understanding on speech interference due to noise was established by the Environmental Protection Agency (EPA) in the 1970s.[9] The findings from these early research assessments are still relevant for today's considerations on the impacts from aircraft noise. However, the FAA is also investigating whether there are related considerations warranting more detailed studies. One area in particular is the potential effects of aviation noise on reading comprehension and learning motivation in children. Initial research in this area has shown there are challenges in designing effective studies, and this continues to be an area of interest to better inform noise mitigation and abatement strategies for schools and other noise-sensitive facilities. While additional research in this area is still being explored, the FAA has invested more than $440 million in sound insulation treatments at schools around the country[10] in order to mitigate any potential issues related to aircraft noise.

Health and Human Impacts Research

While community annoyance due to aircraft noise exposure provides a useful summary measure that captures public perceptions of noise, a full understanding of the impact of noise on communities requires a careful consideration of the potential physiological impacts as well. Knowledge of physiological impacts could also help the FAA develop targeted measures to address aircraft noise. Emerging research capabilities are providing new opportunities to examine specific impacts of noise on humans. When these are examined in a holistic manner with research on community annoyance, they could further inform aircraft noise policy

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[9] EPA, 1973, Public Health and Welfare Criteria For Noise, https://nepis.epa.gov/

[10] Provided through Airport Improvement Program funding since 1994.

considerations. The FAA is conducting research on the potential impacts of aircraft noise on cardiovascular health and sleep disturbance, as described below.

Impacts to Cardiovascular Health

In partnership with academic researchers that are being led by the Boston University School of Public Health, the FAA is working to understand the relationship between aircraft noise exposure and cardiovascular health. The researchers are doing this by leveraging existing national longitudinal health cohorts wherein statistically large numbers of people provide data about their health on a periodic basis over the course of many years. These studies are typically used to understand the relative risk of different factors like diet on different health outcomes like heart disease. The Boston University team is expanding the list of factors to include aircraft noise exposure such that it can be placed in context with other factors that could increase one's risk of cardiovascular disease. The team is leveraging existing collaborations with well-recognized and respected health cohorts including the Nurses' Health Studies and the Health Professionals Follow-Up Study, as well as a complementary study at Boston University that is examining the Women' Heath Initiative cohort through funding from the National Institutes of Health.

Sleep Disturbance

The FAA is working with a team led by the University of Pennsylvania School of Medicine to conduct a national sleep study that will quantify the impact of aircraft noise exposure on sleep. The study will collect nationally representative information on the probability of being awoken by aircraft noise exposure. The study will start with input being requested from approximately 25,000 respondents through a mail survey. These surveys will be used to determine the eligibility of respondents for a detailed field study that will involve roughly 400 volunteers. The volunteers in the detailed field study will use equipment provided by the research team to collect both noise and electrocardiography data in their homes while they sleep. The electrocardiography data combined with information on the level of aircraft noise exposure will advance our understanding of the physiological effects of aircraft noise on sleep.

Economic Impacts

In addition to the aforementioned community and physiological impacts, the FAA is also working with researchers at Massachusetts Institute of Technology (MIT) to conduct an empirical assessment of the economic impacts to businesses located underneath aircraft flight paths. This assessment will take into account the economic benefits from aviation activities, as well as potential environmental and health impacts that might reduce economic productivity. The FAA is also in the developmental stage of a research project that would build on existing work done by MIT that has used housing value data to reveal the willingness of people to pay to avoid aircraft noise exposure. This research is intended to serve as a follow on to the Neighborhood Environmental Survey (described in the next section), to determine whether the findings of that survey on residents' sensitivity to aviation noise is also reflected in their "revealed preferences" when making housing location decisions.

Neighborhood Environmental Survey

To review and improve the agency's understanding of community response to aircraft noise, the FAA initiated the *Neighborhood Environmental Survey* (NES) to help inform ongoing research and policy priorities on aviation noise. Section 187 of the FAA Reauthorization Act of 2018[11] requires the Administrator of the FAA to *"conclude the Administrator's ongoing review of the relationship between aircraft noise exposure and its effects on communities around airports. . . [and] submit to Congress a report containing the results of the review."*

[11] Pub. L. 115-254

Due to the interest from Congress and other stakeholders in the findings of this research, an expanded summary is provided in this notice below. The full text of the NES report, including a detailed description of the methodology and findings, as well as additional background material to help inform readers, is available on the FAA's website at: www.faa.gov/go/aviationnoise.

Overview of the Survey

Working with statisticians and noise experts,[12] the FAA worked with other Federal agencies that have statutory, regulatory, or other policy interests in aviation noise, to conduct a nationwide survey to update the scientific evidence on the relationship between aircraft noise exposure and its annoyance effects on communities around airports, based on today's aircraft fleet and operations. The NES included a range of questions on a variety of environmental concerns, including aviation noise exposure.

The team of expert consultants, under direction from the FAA, surveyed residents living around representative U.S. airports, drawing upon well-established research methods in order to ensure scientific integrity and historical continuity with prior studies, while also employing advancements in techniques for noise modeling and social surveys. The NES consisted of over 10,000 mail responses from residents in communities around 20 statistically representative airports across the Nation, making it the single largest survey of this type undertaken at one time. In addition to the mail responses, the consultants also conducted a follow-up phone survey, which included over 2,000 responses to a series of more detailed questions. The FAA is now considering the full NES results, in conjunction with additional research findings as they become available, to determine how they may inform its noise policy considerations.

Overview of Community Response to Noise

[12] The FAA contracted with Westat, a leading statistics firm, and HMMH, a leading noise consultancy, to conduct the survey.

Historically, two of the main types of information considered by the FAA and other Federal agencies in relating noise exposure to community response have been: (1) case studies analyzing individual and group actions (e.g., complaints or legal action) taken by residents of communities in response to noise; and (2) social surveys (such as the NES) that elicit information from community residents regarding their level of noise-induced annoyance. Annoyance is defined as a "summary measure of the general adverse reaction of people to noise that causes interference with speech, sleep, the desire for a tranquil environment, and the ability to use the telephone, radio, or television satisfactorily."[13] The results of social surveys of noise-induced annoyance are typically plotted as "dose-response curves" on a graph showing the relationship between the level of DNL[14] cumulative noise exposure and the percentage of the population that is "highly annoyed."

Current FAA noise policy is informed by a dose-response curve initially created in the 1970s known as the *Schultz Curve*.[15] This dose-response curve is generally accepted as a representation of noise impacts and has been revalidated by subsequent analyses over the years.[16] The dose-response relationship it depicts has provided the best tool available to predict noise-induced annoyance for several decades. In 1992, the Federal Interagency Committee on Noise (FICON) reviewed the use of the *Schultz Curve*, and created an updated version of the curve

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[13] Federal Agency Review of Selected Airport Noise Analysis Issues (FICON), 1992

[14] The Day-Night Average Sound Level (DNL or Ldn) is the 24-hour average sound level, in decibels, for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the periods between midnight and 7 a.m., and between 10 p.m., and midnight, local time. See 14 CFR § 150.7.

[15] See Schultz, T.J. 1978, "Synthesis of Social Surveys on Noise Annoyance," *Journal of the Acoustical Society of America* 64(2): 377-405.

[16] See Fidell, S., D. Barber, "Updating a Dosage-Effect Relationship for the Prevalence of Annoyance Due to General Transportation Noise," *Journal of the Acoustical Society of America*, 89, January 1991, pp. 221-233; also see Finegold, L.S., C.S. Harris, and H.E. von Gierke, 1992, Applied Acoustical Report: Criteria for Assessment of Noise Impacts on People, Journal of the Acoustical Society of America, June 1992; also see Finegold, L.S., C.S. Harris, and H.E. von Gierke, 1994, Community Annoyance and Sleep Disturbance: Updated Criteria for Assessing the Impacts of General Transportation Noise on People, Noise Control Engineering Journal, Volume 42, Number 1, January-February 1994, pp. 25-30.

using additional social survey data.[17] The updated dose response curve was found to agree within one to two percent of the original curve, leading FICON to conclude that "the updated *Schultz Curve* remains the best available source of empirical dosage-effect to predict community response to transportation noise."[18] According to the 1992 FICON Report, the DNL-annoyance relationship depicted on the *Schultz Curve* "is an invaluable aid in assessing community response as it relates the response to increases in both sound intensity and frequency of occurrence." Although the predicted annoyance, in terms of absolute levels, may vary among different communities, the *Schultz Curve* can reliably indicate changes in the level of annoyance for defined ranges of sound exposure for any given community.[19] While the validity of the dose-response methodology used to create the *Schultz Curve* remains well supported, its underlying social survey data, including the additional data used by FICON to update the curve, is now on average more than 40 years old and warrants an update. The NES was conducted to create a new nationally representative dose-response curve to understand how community response to aircraft noise may have changed.

The NES's collection of a nationally representative dataset on community annoyance in response to aircraft noise provides a contemporary update to the *Schultz Curve*, including technical refinements to improve its reliability. As with the *Schultz Curve*, the NES describes community annoyance in terms of the percentage of people who are "highly annoyed" and describes aircraft noise exposure in terms of the DNL noise metric. Based on the 1992 FICON Report, discussed previously, both the percentage of population highly annoyed and the DNL noise metric have

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[17] The FICON 1992 analysis added to the Schultz Curve's original database of 161 survey data points and calculated an updated dose-response curve using the same methodology but with a total of 400 survey data points.
[18] FICON, 1992
[19] Ibid., vol. 1, p. 2-6.

continued to be recognized for this purpose including by FICON's successor, the Federal Interagency Committee on Aviation Noise- in its 2018 report.[20]

NES Results

Compared with the *Schultz Curve* representing transportation noise, the NES results show a substantially higher percentage of people highly annoyed over the entire range of aircraft noise levels (i.e., from DNL 50 to 75 dB) at which the NES was conducted. This includes an increase in annoyance at lower noise levels. The NES results also show proportionally less change in annoyance from the lower noise levels to the higher noise levels.

Comparing the percent of population highly annoyed due to noise exposure between the updated *Schultz Curve* for transportation noise in the 1992 FICON Report and the NES:

- At a noise exposure level of DNL 65 dB, the updated *Schultz Curve* from the 1992 FICON Report indicated that 12.3 percent of people were highly annoyed, compared to between 60.1 percent and 70.9 percent within a 95 percent confidence limit from the NES.
- At a noise exposure level of DNL 60 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 6.5 percent of people were highly annoyed, compared to between 43.8 percent and 53.7 percent within a 95 percent confidence limit from the NES.
- At a noise exposure level of DNL 55 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 3.3 percent of people were highly annoyed, compared to between 27.8 percent and 36.8 percent within a 95 percent confidence limit from the NES.

[20] Federal Interagency Committee on Aviation Noise Research Review of Selected Aviation Noise Issues (FICAN), 2018

- At a noise exposure level of DNL 50 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 1.7 percent of people were highly annoyed, compared to between 15.4 percent and 23.4 percent within a 95 percent confidence limit from the NES.

Graphics comparing the updated *Schultz Curve* from the 1992 FICON Report and the curve from the NES are provided on the FAA website at www.faa.gov/go/aviationnoise.

Advancements in Survey Methodology

Earlier work to understand community response to noise, including Schultz's dose-response analysis, was based on the premise that the annoyance from any source of noise would be the same for a given DNL noise level. However, more recent work has shown that aircraft noise often results in higher levels of annoyance compared to the same level of noise from ground transportation sources.[21] There have been relatively few surveys of communities in the United States about aircraft noise undertaken over the last four decades. However, other countries around the world have conducted aircraft noise surveys during this time considering aircraft noise separately from noise from other modes of transportation. The results of these surveys, as reflected in a dose-response relationship published by the International Organization for Standardization,[22] have consistently shown higher levels of annoyance than exhibited by the *Schultz Curve*. Informed by these results, the national dose-response curve in the NES report reflects only responses to the question about aircraft noise exposure.

Other Factors

[21] See for example: Janssen, S., &Vos, H. (2011). Dose-Response Relationship between DNL and Aircraft Noise Annoyance: Contribution of TNO. Retrieved from TNO Report TNO-060-UT-2011-00207.

[22] International Organization for Standardization. (2016, March 1, 2016). International Standard 1996-1, Acoustics – Description Measurement and Assessment of Environmental Noise – Part 1: Basic Quantities and Assessment Procedures, 3rd edition.

In addition to enhancements in survey techniques and changes to the way aircraft operate, there are likely other factors contributing to a change in the way communities respond to aircraft noise. Future work is needed to fully understand the specific drivers behind these reasons, but several possibilities include:

- Changes to where people are choosing to live, including societal migration to increasingly urban environments.[23] Additionally, growth and changes to the makeup of suburban communities and their proximity to urban hubs may also be influencing factors on community expectations for aircraft noise exposure.
- How people work and live, including influencing factors such as increased in-home business and teleworking in today's economy.[24] Changes in expectations for spending time outdoors versus indoors and the associated aircraft noise exposure may also be a factor.
- The rise of social media, the internet, and other national and global information sources, leading to an increased awareness and perception of local and national noise issues.
- Overall societal response to noise due to a combination of these or other factors.

In addition to the NES, which focuses on annoyance, the FAA is also engaged in a range of research initiatives aimed at providing information on other impacts of aircraft noise, including effects on children's learning, sleep disturbance, and potential health effects. Each of these research initiatives focuses on a distinct type of potential adverse effect associated with aviation noise exposure. The potential adverse effects explored by these initiatives may also be factors

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[23] The U.S. Census Bureau indicates that the percentage of the population living in urban areas has increased from 73.6 percent in 1970 to 80.7 percent in 2010, an increase of 7.1 percent.

[24] Work to explore changes to how population distribution throughout the day are related to aircraft noise exposure is planned under Airport Cooperative Research Project (ACRP) 02-84 [Anticipated] http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4421

influencing the annoyance reported by the NES. However, research in these areas is still ongoing and therefore was not specifically addressed by the NES. Additional details on these research programs is provided below.

2) Noise Modeling, Noise Metrics, and Environmental Data Visualization

As a core component of FAA's work to address aircraft noise, as well as a requirement of its environmental regulatory commitments, the FAA must maintain the ability to accurately quantify aircraft noise exposure around airports and throughout the National Airspace System. High-fidelity modeling is the only practical method to accomplish this objective, as aircraft noise needs to be quantified over relatively large scales in an efficient and consistent manner. For more than four decades, the FAA has worked closely with industry, academic, and governmental stakeholders to advance research and development in aircraft noise modeling. This effort advances the analytical tools, metrics, data, and standards required to provide high quality results to inform the public and other stakeholders about noise exposure levels. The FAA has also been actively exploring ways to use emerging technologies to visualize environmental data including noise exposure.

Aviation Environmental Design Tool

The Aviation Environmental Design Tool (AEDT) is the FAA's required noise and environmental modeling application for all U.S. domestic regulatory analyses requiring FAA review. The AEDT also provides analysis support for the International Civil Aviation Organization - Committee on Aviation Environmental Protection, and is used as a research and assessment tool by other Federal agencies, universities, and industry stakeholders.

Through collaborations with government, university, and industry partners, the FAA actively manages AEDT to ensure that features and capabilities are developed to meet expanding environmental analysis needs, and to ensure that as new data and technologies become available they are incorporated in order to enhance modeling accuracy and efficiency. The AEDT builds on a legacy of noise modeling development, and is based on detailed aircraft-specific noise measurements and internationally accepted aircraft performance models and standards. A dynamic development process is used to create new versions of AEDT. This process allows for new features and capabilities to be added as needed, for example, when required by policy updates or informed by emerging research findings.

Noise Screening

Building from the high-fidelity noise modeling capabilities available through AEDT, the FAA is also working to develop an updated noise screening tool. This updated noise screening tool will use a simplified noise modeling process to facilitate an expedited review of proposed Federal actions where significant noise impacts are not expected. Such an approach is beneficial where a proposed Federal Action is limited in scope and could qualify for a categorical exclusion under the FAA's procedures for implementing the National Environmental Policy Act (NEPA).[25] The primary goal of updating the noise screening tool is to decrease the amount of time that an analyst will need to conduct an assessment while also ensuring a fully validated result that is readily understandable by the public. While the output from a noise screening tool cannot provide the same level of detail as a comprehensive modeling tool, the simplified process provides for an expedited initial view of any potential changes in aircraft noise exposure.

Environmental Data Visualization

The FAA has been developing ways to utilize geospatial data to improve the agency's ability to communicate environmental data to the public. For example, the FAA has designed an Environmental Visualization Tool to take advantage of the availability of high quality geospatial

[25] See FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Chapter 5 ("Categorical Exclusions").

data to deliver an agency-wide resource using a consistent, common visual language. Once fully implemented, this common visualization platform will serve the needs of multiple environmental programs within the FAA, including those presenting aircraft noise data to the public.

Supplemental Noise Metrics

The FAA's primary noise metric, DNL, was developed and validated to identify significant aviation noise exposure for land use and mitigation planning as well as for determining significant change in noise exposure under NEPA review. In some cases, however, it can be useful to supplement DNL with the use of other noise metrics. While other noise metrics may not provide as complete an understanding of the cumulative noise exposure from activity around an airport and its associated airspace, they often can provide opportunities to communicate the specific characteristics of noise changes due to the unique aspects of a proposed action. The FAA's NEPA procedures address the use of supplemental noise metrics.[26] To assist the public in understanding noise impacts, and to better facilitate communication among communities interested in systematic departure flight track dispersion, the FAA is working to assess the use of potential supplemental metrics. For a supplemental metric to be effective in evaluating potential means of achieving flight track dispersion, and to ensure that communities understand the impacts of dispersion (i.e., that dispersion does not eliminate noise but rather it may move noise to other neighborhoods), the supplemental metric will need to effectively communicate the changes in noise exposure that will occur in all of the communities affected by the change, both those that would be exposed to less noise and those that would be exposed to more noise.[27]

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[26] See FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Appendix B, paragraph B-1.6; *1050.1F Desk Reference*, Section 11.4.

[27] FAA, 2020, Report to Congress: FAA Reauthorization Act of 2018 (Pub. L. 115-254) Section 188 and Sec 173, https://www.faa.gov/about/plans_reports/congress/media/Day-Night_Average_Sound_Levels_COMPLETED_report_w_letters.pdf

3) Reduction, Abatement, and Mitigation of Aviation Noise

To directly address noise concerns, the FAA sponsors multiple research programs to explore different concepts for aircraft noise reduction. As aircraft noise is a complex issue, no single concept is capable of providing a universal solution. However, by conducting research across different areas, the FAA is developing solutions to reduce noise at its source, abate noise through operations, and mitigate the effects of noise on communities. The intent of this approach is to have a variety of options to reduce the noise being experienced by those living near airports around the country and to have options that could be tailored to specific airports.

Aircraft Source Noise Reduction

As noted previously, the single most influential factor in the historical decline in noise exposure was the phased transition to quieter aircraft. Through the public-private partnership of the Continuous Lower Energy, Emissions, and Noise (CLEEN) Program, the FAA and industry are working together to develop technologies that will enable manufacturers to create aircraft and engines with lower noise and emissions as well as improved fuel efficiency.[28] The technologies being accelerated by the CLEEN Program have relatively large technological risk. Government resources help mitigate this risk and incentivize aviation manufacturers to invest and develop these technologies. By cost-sharing the development with the FAA, industry is willing to accept the greater risk and can better support the business case for this technological development. Once entered into service, the CLEEN technologies will provide societal benefits in terms of reduced noise, fuel burn, and emissions throughout the fleet for years to come. In addition to the benefits provided by technologies developed under the CLEEN, the program leads to advances in

[28] See, for example, information on the FAA's "Continuous Lower Energy, Emissions, and Noise" (CLEEN) Program at: https://www.faa.gov/about/office_org/headquarters_offices/apl/research/aircraft_technology/cleen/.

the analysis and design tools that are used on every aircraft or engine product being made by these companies; this extends the benefits of the CLEEN Program well beyond the individual technologies being matured.

As new aircraft and engine technologies lead to quieter aircraft over time, the FAA works to establish aircraft certification standards based on noise stringency requirements. These standards are a requirement of the airworthiness process and are described in 14 CFR part 36. These requirements do not force manufactures to develop new technology. However, as new noise reduction technologies emerge they do ensure that new aircraft continue to meet increasingly quieter standards within the bounds of what is technologically feasible and economically reasonable..

Noise Abatement

The FAA is also supporting multiple efforts to identify means to abate noise through changes in how aircraft are operated in the airspace over communities. In the immediate vicinity of an airport, use of voluntary noise abatement departure procedures (NADP) has been a longstanding technique available to reduce noise. Recent research is examining the effectiveness of these procedures and identifying means of improving their use.

As the FAA works to modernize the National Airspace System, new aircraft flight procedures have been designed to take advantage of PBN technologies. To better understand both the environmental benefits and challenges posed by PBN, the FAA is working to re-examine ways to routinely consider noise during flight procedure design. This effort includes an exploration of how PBN can better control flight paths and move them away from noise-sensitive areas, how changes in aircraft performance could be safely managed to reduce noise, and how systematic departure flight track dispersion can be implemented to abate noise concerns.

In a recent partnership with the Massachusetts Port Authority (Massport) and MIT, the FAA jointly contributed to research considering how Area Navigation (RNAV) PBN procedures could be designed and implemented to reduce noise. Multiple concepts were explored that highlighted how collaborations between the FAA, airport operators, and community members can produce innovative noise abatement strategies.

A recently completed analysis of operational procedures that resulted from the Massport-MIT-FAA partnership shows that for modern aircraft on departure, changes in aircraft climb speed have minimal impact on the overall aircraft departure noise. The current best practice for NADP, using International Civil Aviation Organization distant community or "*NADP-2*" departure procedure, has been shown to minimize modeled noise impacts. This analysis also shows that for modern aircraft on arrival, changes in approach airspeed could have a noticeable impact (reductions of 4-8 dBA) on the overall aircraft noise at relatively large distances from touching down (between 10 and 25 nautical miles from the runway). While NADP procedures have the potential to reduce community noise, they may also have implementation challenges that will need to be overcome. Research is ongoing at MIT to address these challenges.[29]

In addition to airplane operations, the FAA is also examining the potential for helicopter noise abatement through changes in operational procedures. The FAA has partnered with the Volpe Center, the National Aeronautics and Space Administration, the Pennsylvania State University, and operator organizations to explore new ways to safely fly rotorcraft while also reducing noise through the Fly Neighborly Program.[30]

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[29] https://ascent.aero/project/analytical-approach-for-quantifying-noise-from-advanced-operational-procedures/, https://ascent.aero/project/aircraft-noise-abatement-procedure-modeling-and-validation/

[30] https://www.rotor.org/initiatives/fly-neighborly

Noise Mitigation Research

Noise mitigation is the effort to take actions to reduce the impact of aircraft noise exposure that occurs. The primary mitigation strategies involve encouraging responsible land use planning in airport communities and, where appropriate, the application of sound insulation treatments to eligible homes or other noise-sensitive public buildings (e.g., schools or hospitals). In extreme cases where sound insulation technologies cannot provide adequate mitigation, the acquisition of residential homes and conversion to non-residential land use is also an option.

As sound insulation treatment costs have continued to rise and new research on the human impacts from noise becomes available, the FAA is exploring the cost-benefit calculus of existing noise mitigation strategies and technologies in order to better direct where and how limited mitigation resources should be applied. Recent academic research[31] and internal assessments have raised questions about the benefits of sound insulation relative to the costs. While the relative benefits of sound insulation for noise exposures above DNL 65dB will depend on the individual home treatment costs, minimal benefit can be expected for sound insulation treatments applied for noise exposures below DNL 65dB.

AIRCRAFT NOISE POLICY BACKGROUND:

[31] Wolfe, Malina, Barrett & Waitz 2016, Cost and benefits of US Aviation noise land-use policies, Transportation Research Part D.

Community response to noise has historically been a primary factor underlying the FAA's noise-related policies, including the establishment of DNL 65 dB as the threshold of "significant" aircraft noise exposure. The FAA has been using a DNL of 65 dB as the basis for: (1) setting the agency's policy goal of reducing the number of people exposed to significant aircraft noise;[32] (2) the level of aircraft noise exposure below which residential land use is "normally compatible," as defined in regulations implementing the Aviation Safety and Noise Abatement Act of 1979,[33] and (3) the level of aircraft noise exposure below which noise impacts of FAA actions in residential areas are not considered "significant" under section 102(2)(C) of the National Environmental Policy Act of 1969.[34]

Research results, as reflected in the programs and studies described in this notice, will provide new information on how aircraft noise in communities near airports may be effectively managed and will inform future decision making on the FAA's aircraft noise policies.

However, as previously stated, the FAA will not make any determinations on implications from these emerging research results for FAA noise policies until it has carefully considered public and other stakeholder input, and assesses the factors behind any increases in community impacts from aircraft noise exposure. Unless and until any changes become effective, all existing FAA regulations, orders, and policies remain in effect. The FAA is committed to informing and

[32] See "Aviation Environmental and Energy Policy Statement," 77 FR 43137, 43138 (July 23, 2012), available on the FAA website at [URL]. The "noise goal" identified in this document includes "[r]educ[ing] the number of people exposed to significant noise around U.S. airports."

[33] 49 U.S.C. 47502. The regulations implementing this section are codified at 14 CFR part 150.

[34] 49 U.S.C. 4332(2)(C). See FAA Order 1050.1F, "Environmental Impacts: Policies and Procedures" (2015), Exhibit 4-1. The significance threshold for noise used for NEPA purposes in FAA Order 1050.1F is also used by the FAA for determining significant adverse noise effects under 49 U.S.C. 47106(c)(1)(B) for airport development projects involving the location of an airport or runway or a major runway extension. See 80 FR 44209, 44223 (July 24, 2015) (preamble to FAA Order 1050.1F).

involving the public, and to giving meaningful consideration to community concerns and views as the FAA makes aviation decisions that affect them.

COMMENTS INVITED:

The FAA recognizes that a range of factors may be driving concerns due to aircraft noise. However, as outlined in this notice, a broad understanding of aircraft noise and its potential impacts is needed in order to better manage and reduce concerns from aviation noise.

The FAA is inviting comments on these concerns to assist the agency in assessing how resources should be directed to better understand and manage the factors underlying the concern from aircraft noise exposure.

Comments that focus on the questions listed below will be most helpful. The more specific the comments, the more useful they will be in the FAA's considerations.

1) What, if any, additional investigation, analysis, or research should be undertaken in each of the following three categories as described in this notice:
   - Effects of Aircraft Noise on Individuals and Communities;
   - Noise Modeling, Noise Metrics, and Environmental Data Visualization; and
   - Reduction, Abatement, and Mitigation of Aviation Noise?
2) As outlined in this notice, the FAA recognizes that a range of factors may be driving the increase in annoyance shown in the Neighborhood Environmental Survey results compared to earlier transportation noise annoyance surveys—including survey methodology, changes in how commercial aircraft operate, population distribution, how people live and work, and societal response to noise. The FAA requests input on the factors that may be contributing to the increase in annoyance shown in the survey results.
3) What, if any, additional categories of investigation, analysis, or research should be undertaken to inform FAA noise policy?

Authority. National Environmental Policy Act (NEPA) 42 U.S.C. sections 4321 et. seq. Aviation Safety and Noise Abatement Act (ASNA) 49 U.S.C. sections 47501 et. seq., Federal Aviation Act, 49 U.S.C. section 44715.

Issued in Washington, DC.

Kevin Welsh,

Director, Office of Environment and Energy.

[FR Doc. 2021-00564 Filed: 1/12/2021 8:45 am; Publication Date: 1/13/2021]

January 12, 2020

From

Darlene Yaplee

To

SCSC Roundtable

Message

Late Breaking – Community Annoyance Survey

Anita and Chris,

FAA is expected to publish the results of its community annoyance survey in tomorrow's Federal Register.

dy

a draft is posted now. much more annoyance found in survey than predicted in Schultz Curve.

Comparing the percent of population highly annoyed due to noise exposure between the updated Schultz Curve for transportation noise in the 1992 FICON Report and the NES:

• At a noise exposure level of DNL 65 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 12.3 percent of people were highly annoyed, compared to between 60.1 percent and 70.9 percent within a 95 percent confidence limit from the NES.

• At a noise exposure level of DNL 60 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 6.5 percent of people were highly annoyed, compared to between 43.8 percent and 53.7 percent within a 95 percent confidence limit from the NES.

• At a noise exposure level of DNL 55 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 3.3 percent of people were highly annoyed, compared to between 27.8 percent and 36.8 percent within a 95 percent confidence limit from the NES.

• At a noise exposure level of DNL 50 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 1.7 percent of people were highly annoyed, compared to between 15.4 percent and 23.4 percent within a 95 percent confidence limit from the NES.

Graphics comparing the updated Schultz Curve from the 1992 FICON Report and the curve from the NES are provided on the FAA website at www.faa.gov/go/aviationnoise. {not there as of tonight}

January 13, 2020

From

Evan Wasserman

To

SCSC Roundtable

Message

SCSC Roundtable - Federal Register Publication and Airport Noise Report Alert

Dear SCSC Roundtable Members and Alternates,

For your reference, the FAA's Aircraft Noise Policy and Research Efforts have just been published through the Federal Register and the document has been attached for your review. In addition, attached is a summary document from the Airport Noise Report (ANR) for your convenience.

We have placed a link to the Federal Register information on the SCSC Roundtable website at the following location as an informational/news item. This document has been published as of this morning. Please also see the press release email pasted below from the FAA.

Regards,

Evan Wasserman

Attachment Name

20210113_Evan_Wasserman_SCSCRoundtable_Federal_Register
20210113_Evan_Wasserman_SCSCRoundtable_Federal_Register

Airport Noise Report Alert

In today's Federal Register FAA released the findings of its long-awaited Neighborhood Environmental Survey, which was conducted to improve the agency's understanding of community response to aircraft noise and help determine if the FAA needed to update its 40-year-old aircraft noise policy.

The survey, done to assess community annoyance to aircraft noise, consisted of over 10,000 mail responses in communities around 20 unnamed "statistically representative" airports across the United States. It is the single largest survey of its kind undertaken at one time.

The survey results are stunning:

Comparing the percent of population highly annoyed due to noise exposure in the updated "Schultz Curve" – which serves as the basis for FAA's current almost 40-year-old aviation noise policy – and the new Neighborhood Environmental Survey (NES) shows the following:

- At a noise exposure level of DNL 65 dB, the updated Schultz Curve indicated that 12.3 percent of people were highly annoyed, compared to between 60.1 percent and 70.9 percent within a 95 percent confidence limit from the NES.
- At a noise exposure level of DNL 60 dB, the updated Schultz indicated that 6.5 percent of people were highly annoyed, compared to between 43.8 percent and 53.7 percent within a 95 percent confidence limit from the NES.
- At a noise exposure level of DNL 55 dB, the updated Schultz Curve indicated that 3.3 percent of people were highly annoyed, compared to between 27.8 percent and 36.8 percent within a 95 percent confidence limit from the NES.
- At a noise exposure level of DNL 50 dB, the updated Schultz Curve indicated that 1.7 percent of people were highly annoyed, compared to between 15.4 percent and 23.4 percent within a 95 percent confidence limit from the NES.

FAA said it is "now considering the full NES results, in conjunction with additional research findings as they become available, to determine how they may inform its noise policy considerations."

The NES findings were included in a Jan. 13 FAA Federal Register notice inviting public comment by March 15 on the scope and applicability of various agency research initiatives on the effects of aircraft noise on individuals and communities; noise modeling and metrics; and reduction, abatement, and mitigation of aviation noise.

FAA said it “will not make any determinations based on the findings of these research programs for the FAA’s noise policies including any potential revised use of the Day-Night Average Sound Level (NDL) noise metric, until it has carefully considered public and other stakeholder input along with any additional research needed to improve the understanding of the effects of aircraft noise exposure on communities.

To download the FAA’s Federal Register notice, google:

Overview of FAA Aircraft Noise Policy and Research Efforts: Request for Input on Research Activities to Inform Aircraft Noise Policy

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[Docket No. FAA–2020–1157]

Agency Information Collection Activities: Requests for Comments; Clearance of a Renewed Approval of Information Collection: Commercial Space Transportation Licensing Regulations

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice and request for comments.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995, FAA invites public comments about our intention to request the Office of Management and Budget (OMB) approval to renew an information collection. The information will determine if applicant proposals for conducting commercial space launches can be accomplished according to regulations issued by the Office of the Associate Administrator for Commercial Space Transportation.

DATES: Written comments should be submitted by March 15, 2021.

ADDRESSES: Please send written comments:

By Electronic Docket: www.regulations.gov (Enter docket number into search field).

By mail: Charles Huet, 800 Independence Avenue SW, Room 331, Washington, DC, 20591.

By fax: 202–267–5463.

FOR FURTHER INFORMATION CONTACT: Charles Huet by email at: *Charles.huet@faa.gov;* phone: 202–267–7427.

SUPPLEMENTARY INFORMATION:

Public Comments Invited: You are asked to comment on any aspect of this information collection, including (a) Whether the proposed collection of information is necessary for FAA's performance; (b) the accuracy of the estimated burden; (c) ways for FAA to enhance the quality, utility and clarity of the information collection; and (d) ways that the burden could be minimized without reducing the quality of the collected information. The agency will summarize and/or include your comments in the request for OMB's clearance of this information collection.

OMB Control Number: 2120–0608.

Title: Commercial Space Transportation Licensing Regulations.

Form Numbers: FAA Form 8800–1.

Type of Review: Renewal of an information collection.

Background: The Commercial Space Launch Act of 1984, 49 U.S.C. App. §§ 2601–2623, as recodified at 49 U.S.C. Subtitle IX, Ch. 701—Commercial Space Launch Activities, 49 U.S.C. 70101–70119 (1994), requires certain data be provided in applying for a license to conduct commercial space launch activities. These data are required to demonstrate to the Federal Aviation Administration (FAA), Associate Administrator for Commercial Space Transportation (AST), that a license applicant's proposed activities meet applicable public safety, national security, and foreign policy interests of the United States.

Respondents: Approximately 17 space launch applicants renewing applications.

Frequency: Information is collected on occasion.

Estimated Average Burden per Response: 163 hours.

Estimated Total Annual Burden: 2,779 hours.

Issued in Washington, DC.

Kelvin Coleman,

Deputy Associate Administrator, Commercial Space Transportation, Federal Aviation Administration.

[FR Doc. 2021–00480 Filed 1–12–21; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[Docket No. FAA–2021–0037]

Overview of FAA Aircraft Noise Policy and Research Efforts: Request for Input on Research Activities To Inform Aircraft Noise Policy

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Notice of research programs and request for comments.

SUMMARY: The FAA is releasing a summary to the public of the research programs it sponsors on civil aircraft noise that could potentially inform future aircraft noise policy. The FAA invites public comment on the scope and applicability of these research initiatives to address aircraft noise.

The FAA will not make any determinations based on the findings of these research programs for the FAA's noise policies, including any potential revised use of the Day-Night Average Sound Level (DNL) noise metric, until it has carefully considered public and other stakeholder input along with any additional research needed to improve the understanding of the effects of aircraft noise exposure on communities.

DATES: Comments on this notice must identify the docket number and be received on or before March 15, 2021.

ADDRESSES: Send comments identified by docket number FAA–2021–0037 using any of the following methods:

- *Federal eRulemaking Portal:* Go to *http://www.regulations.gov* and follow the online instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, M–30; U.S. Department of Transportation, 1200 New Jersey Avenue SE, Room W12–140, West Building Ground Floor, Washington, DC 20590–0001.
- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax:* Fax comments to Docket Operations at (202) 493–2251.

Privacy: The FAA will post all comments it receives, without change, to *http://www.regulations.gov,* including any personal information the commenter provides. Using the search function of the docket website, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the **Federal Register** published on April 11, 2000 (65 FR 19477–19478), as well as at *http://DocketsInfo.dot.gov.*

Docket: Background documents or comments received may be read at *http://www.regulations.gov* at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Mr. Donald Scata, Office of Environment and Energy (AEE–100), Federal Aviation Administration, 800 Independence Ave. SW, Washington, DC 20591. Telephone: (202) 267–0606. Email address: *NoiseResearchFRN@faa.gov.*

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Background Information

Since the mid-1970s, the number of people living in areas exposed to significant levels of aircraft noise [1] in the United States has declined from roughly 7 million to just over 400,000 today. At the same time, the number of commercial enplanements has increased from approximately 200 million in 1975 to approximately 930 million in 2018. The single most influential factor in that decline was the phased transition to quieter aircraft, which effectively reduced the size of the areas around airports experiencing significant noise levels. That transition was the result of the development of new technology by aircraft and engine manufacturers; establishment of increasingly stringent noise standards for civil subsonic aircraft,[2] investments by U.S. airlines in newer, quieter aircraft; and requirements by the FAA and the United States Congress to phase out operations by older, noisier aircraft.

A second factor has been cooperative efforts by airports, airlines and other aircraft operators, State and local governments, and communities to reduce the number of people living in areas near airports exposed to significant levels of aircraft noise. Under the FAA's Airport Noise Compatibility Planning Program,[3] airports may voluntarily initiate a collaborative process to consider measures that reduce existing noncompatible land uses and prevent new noncompatible land uses in areas exposed to significant levels of aircraft noise. Since 1983, more than 250 airports have used this process to consider changes to local land use planning and zoning, sound insulation, acquisition of homes and other noise-sensitive property, aircraft noise abatement routes and procedures, and other measures. Over $6 billion in funding has been provided for airports to undertake noise compatibility programs and implement noise mitigation measures. The FAA encourages the process by providing financial and technical assistance to airport sponsors to develop Noise Exposure Maps and Noise Compatibility Programs, and implement eligible noise-related mitigation measures recommended in the program, depending upon the availability of funding.

In addition to noise compatibility planning, the FAA also issues grants to airport operators and units of local government to fund mitigation projects, most notably to sound-insulate homes, schools, and other noise-sensitive facilities. While sound insulation reduces indoor noise levels, it does not address concerns about noise interfering with the enjoyment of the outdoors. Moreover, there are limits to the effectiveness of sound insulation. In some areas with elevated noise levels, sound insulation may not sufficiently reduce interior noise levels to meet established interior noise standards.[4] Conversely, in areas where overall noise levels are lower, interior noise standards may already be met without additional sound insulation treatments.[5]

Today's civilian aircraft are quieter than at any time in the history of jet-powered flight. The FAA, aircraft manufacturers, and airlines continue to work toward further reducing aircraft noise at the source.[6] As an example, the noise produced by one Boeing 707–200 flight, typical in the 1970s, is equivalent in noise to 30 Boeing 737–800 flights that are typical today.[7] As a result, for many years there was a steady decline in the number of people exposed to significant noise in communities located near airports. In recent years, however, as aviation industry growth has led to an increase in operations in many areas, the number of people and the size of the areas experiencing significant aircraft noise has started to show a gradual expansion. The introduction of Performance Based Navigation (PBN) procedures, as needed to safely and efficiently modernize the national air transportation system,[8] has also provided noise benefits for many by allowing for new and more efficient flight paths, but has in some places resulted in community concerns, particularly related to increased concentration of flights. In 2016, the FAA released an update to the FAA Community Involvement Manual to reaffirm the FAA's commitment to inform and involve the public, and to give meaningful consideration to community concerns and views as the FAA makes aviation decisions that affect community interests. The FAA has since developed and begun implementing a comprehensive and strategic approach to transform and enhance FAA community involvement practices, including working through airport community roundtables, to equitably discuss opportunities to shift or, when possible, reduce aircraft noise exposure.

Overview of FAA Research on Aircraft Noise

Recognizing that aircraft noise remains a primary concern of many stakeholders, the FAA is actively working to understand, manage, and reduce the environmental impacts of global aviation through research, technological innovation, policy, and outreach to benefit the public.

With the vision of removing environmental constraints on aviation growth by achieving quieter, cleaner, and more efficient air transportation, the FAA has worked closely with a number of industry, academic, and governmental stakeholders to assemble a comprehensive portfolio of research activities (including leveraging research undertaken by others) aimed at guiding investments in scientific studies, analytical tools, and innovative technologies to better understand and manage aircraft noise. However, due to the complex nature of aircraft noise and the varied priorities and concerns of stakeholders, no single set of findings can completely guide decision making. A broad understanding of aircraft noise and any potential impacts, from many different perspectives, is therefore needed. Summaries of the FAA's key

[1] Under longstanding FAA policy, the threshold of significant aircraft noise exposure in residential areas is a Day-Night Average Sound Level of 65 decibels (dB). See the ''Aviation Noise Abatement Policy,'' issued by the Secretary of Transportation and the FAA Administrator in 1976. This document is available on the FAA website at *https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/.*

[2] Consistent with International Civil Aviation Organization standards, FAA has set increasingly more stringent aircraft certification noise standards, such as the Stage 5 noise certification standard. 82 FR 46123 (October 4, 2017).

[3] This process is outlined under 49 U.S.C. 47501 *et seq.,* as implemented by 14 CFR part 150.

[4] FAA Order 5100.38D, Appendix R.

[5] P.J. Wolfe et al., 2016 Costs and benefits of US aviation noise land-use policies Transportation Research Part D 44 (2016) 147–156, *http://dx.doi.org/10.1016/j.trd.2016.02.010.*

[6] See, for example, information on the FAA's ''Continuous Lower Energy, Emissions, and Noise'' (CLEEN) Program at: *https://www.faa.gov/about/office_org/headquarters_offices/apl/research/aircraft_technology/cleen/.*

[7] Based on an average of approach and takeoff certificated noise levels as defined in 14 CFR part 36.

[8] See Section 213, ''Acceleration of NextGen Technologies,'' of the FAA Modernization and Reform Act of 2012, Public Law 112–95, 213, 126 Stat. 11, 46–50 (2012), 49 U.S.C. 40101 note (PBN implementation required at key airports by statutory deadline).

research, tools, and technology programs designed to potentially inform aircraft noise policy are provided below.

(1) Effects of Aircraft Noise on Individuals and Communities

Speech Interference and Children's Learning

Much of our current understanding on speech interference due to noise was established by the Environmental Protection Agency (EPA) in the 1970s.[9] The findings from these early research assessments are still relevant for today's considerations on the impacts from aircraft noise. However, the FAA is also investigating whether there are related considerations warranting more detailed studies. One area in particular is the potential effects of aviation noise on reading comprehension and learning motivation in children. Initial research in this area has shown there are challenges in designing effective studies, and this continues to be an area of interest to better inform noise mitigation and abatement strategies for schools and other noise-sensitive facilities. While additional research in this area is still being explored, the FAA has invested more than $440 million in sound insulation treatments at schools around the country [10] in order to mitigate any potential issues related to aircraft noise.

Health and Human Impacts Research

While community annoyance due to aircraft noise exposure provides a useful summary measure that captures public perceptions of noise, a full understanding of the impact of noise on communities requires a careful consideration of the potential physiological impacts as well. Knowledge of physiological impacts could also help the FAA develop targeted measures to address aircraft noise. Emerging research capabilities are providing new opportunities to examine specific impacts of noise on humans. When these are examined in a holistic manner with research on community annoyance, they could further inform aircraft noise policy considerations. The FAA is conducting research on the potential impacts of aircraft noise on cardiovascular health and sleep disturbance, as described below.

Impacts to Cardiovascular Health

In partnership with academic researchers that are being led by the Boston University School of Public Health, the FAA is working to understand the relationship between aircraft noise exposure and cardiovascular health. The researchers are doing this by leveraging existing national longitudinal health cohorts wherein statistically large numbers of people provide data about their health on a periodic basis over the course of many years. These studies are typically used to understand the relative risk of different factors like diet on different health outcomes like heart disease. The Boston University team is expanding the list of factors to include aircraft noise exposure such that it can be placed in context with other factors that could increase one's risk of cardiovascular disease. The team is leveraging existing collaborations with well-recognized and respected health cohorts including the Nurses' Health Studies and the Health Professionals Follow-Up Study, as well as a complementary study at Boston University that is examining the Women' Heath Initiative cohort through funding from the National Institutes of Health.

Sleep Disturbance

The FAA is working with a team led by the University of Pennsylvania School of Medicine to conduct a national sleep study that will quantify the impact of aircraft noise exposure on sleep. The study will collect nationally representative information on the probability of being awoken by aircraft noise exposure. The study will start with input being requested from approximately 25,000 respondents through a mail survey. These surveys will be used to determine the eligibility of respondents for a detailed field study that will involve roughly 400 volunteers. The volunteers in the detailed field study will use equipment provided by the research team to collect both noise and electrocardiography data in their homes while they sleep. The electrocardiography data combined with information on the level of aircraft noise exposure will advance our understanding of the physiological effects of aircraft noise on sleep.

Economic Impacts

In addition to the aforementioned community and physiological impacts, the FAA is also working with researchers at Massachusetts Institute of Technology (MIT) to conduct an empirical assessment of the economic impacts to businesses located underneath aircraft flight paths. This assessment will take into account the economic benefits from aviation activities, as well as potential environmental and health impacts that might reduce economic productivity. The FAA is also in the developmental stage of a research project that would build on existing work done by MIT that has used housing value data to reveal the willingness of people to pay to avoid aircraft noise exposure. This research is intended to serve as a follow on to the Neighborhood Environmental Survey (described in the next section), to determine whether the findings of that survey on residents' sensitivity to aviation noise is also reflected in their ''revealed preferences'' when making housing location decisions.

Neighborhood Environmental Survey

To review and improve the agency's understanding of community response to aircraft noise, the FAA initiated the *Neighborhood Environmental Survey* (NES) to help inform ongoing research and policy priorities on aviation noise. Section 187 of the FAA Reauthorization Act of 2018 [11] requires the Administrator of the FAA to ''*conclude the Administrator's ongoing review of the relationship between aircraft noise exposure and its effects on communities around airports . . . [and] submit to Congress a report containing the results of the review.*''

Due to the interest from Congress and other stakeholders in the findings of this research, an expanded summary is provided in this notice below. The full text of the NES report, including a detailed description of the methodology and findings, as well as additional background material to help inform readers, is available on the FAA's website at: *www.faa.gov/go/aviationnoise.*

Overview of the Survey

Working with statisticians and noise experts,[12] the FAA worked with other Federal agencies that have statutory, regulatory, or other policy interests in aviation noise, to conduct a nationwide survey to update the scientific evidence on the relationship between aircraft noise exposure and its annoyance effects on communities around airports, based on today's aircraft fleet and operations. The NES included a range of questions on a variety of environmental concerns, including aviation noise exposure.

The team of expert consultants, under direction from the FAA, surveyed residents living around representative U.S. airports, drawing upon well-established research methods in order to

[9] EPA, 1973, Public Health and Welfare Criteria For Noise, *https://nepis.epa.gov/.*

[10] Provided through Airport Improvement Program funding since 1994.

[11] Public Law 115–254.

[12] The FAA contracted with Westat, a leading statistics firm, and HMMH, a leading noise consultancy, to conduct the survey.

ensure scientific integrity and historical continuity with prior studies, while also employing advancements in techniques for noise modeling and social surveys. The NES consisted of over 10,000 mail responses from residents in communities around 20 statistically representative airports across the Nation, making it the single largest survey of this type undertaken at one time. In addition to the mail responses, the consultants also conducted a follow-up phone survey, which included over 2,000 responses to a series of more detailed questions. The FAA is now considering the full NES results, in conjunction with additional research findings as they become available, to determine how they may inform its noise policy considerations.

Overview of Community Response to Noise

Historically, two of the main types of information considered by the FAA and other Federal agencies in relating noise exposure to community response have been: (1) Case studies analyzing individual and group actions (*e.g.,* complaints or legal action) taken by residents of communities in response to noise; and (2) social surveys (such as the NES) that elicit information from community residents regarding their level of noise-induced annoyance. Annoyance is defined as a ''summary measure of the general adverse reaction of people to noise that causes interference with speech, sleep, the desire for a tranquil environment, and the ability to use the telephone, radio, or television satisfactorily.'' [13] The results of social surveys of noise-induced annoyance are typically plotted as ''dose-response curves'' on a graph showing the relationship between the level of DNL [14] cumulative noise exposure and the percentage of the population that is ''highly annoyed.''

Current FAA noise policy is informed by a dose-response curve initially created in the 1970s known as the *Schultz Curve.*[15] This dose-response curve is generally accepted as a representation of noise impacts and has been revalidated by subsequent analyses over the years.[16] The dose-response relationship it depicts has provided the best tool available to predict noise-induced annoyance for several decades. In 1992, the Federal Interagency Committee on Noise (FICON) reviewed the use of the *Schultz Curve,* and created an updated version of the curve using additional social survey data.[17] The updated dose response curve was found to agree within one to two percent of the original curve, leading FICON to conclude that ''the updated *Schultz Curve* remains the best available source of empirical dosage-effect to predict community response to transportation noise.'' [18] According to the 1992 FICON Report, the DNL-annoyance relationship depicted on the *Schultz Curve* ''is an invaluable aid in assessing community response as it relates the response to increases in both sound intensity and frequency of occurrence.'' Although the predicted annoyance, in terms of absolute levels, may vary among different communities, the *Schultz Curve* can reliably indicate changes in the level of annoyance for defined ranges of sound exposure for any given community.[19] While the validity of the dose-response methodology used to create the *Schultz Curve* remains well supported, its underlying social survey data, including the additional data used by FICON to update the curve, is now on average more than 40 years old and warrants an update. The NES was conducted to create a new nationally representative dose-response curve to understand how community response to aircraft noise may have changed.

The NES's collection of a nationally representative dataset on community annoyance in response to aircraft noise provides a contemporary update to the *Schultz Curve,* including technical refinements to improve its reliability. As with the *Schultz Curve,* the NES describes community annoyance in terms of the percentage of people who are ''highly annoyed'' and describes aircraft noise exposure in terms of the DNL noise metric. Based on the 1992 FICON Report, discussed previously, both the percentage of population highly annoyed and the DNL noise metric have continued to be recognized for this purpose including by FICON's successor, the Federal Interagency Committee on Aviation Noise in its 2018 report.[20]

NES Results

Compared with the *Schultz Curve* representing transportation noise, the NES results show a substantially higher percentage of people highly annoyed over the entire range of aircraft noise levels (*i.e.,* from DNL 50 to 75 dB) at which the NES was conducted. This includes an increase in annoyance at lower noise levels. The NES results also show proportionally less change in annoyance from the lower noise levels to the higher noise levels.

Comparing the percent of population highly annoyed due to noise exposure between the updated *Schultz Curve* for transportation noise in the 1992 FICON Report and the NES:

- At a noise exposure level of DNL 65 dB, the updated *Schultz Curve* from the 1992 FICON Report indicated that 12.3 percent of people were highly annoyed, compared to between 60.1 percent and 70.9 percent within a 95 percent confidence limit from the NES.
- At a noise exposure level of DNL 60 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 6.5 percent of people were highly annoyed, compared to between 43.8 percent and 53.7 percent within a 95 percent confidence limit from the NES.
- At a noise exposure level of DNL 55 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 3.3 percent of people were highly annoyed, compared to between 27.8 percent and 36.8 percent within a 95 percent confidence limit from the NES.
- At a noise exposure level of DNL 50 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 1.7 percent of people were highly annoyed, compared to between 15.4 percent and 23.4 percent within a 95 percent confidence limit from the NES.

Graphics comparing the updated *Schultz Curve* from the 1992 FICON Report and the curve from the NES are provided on the FAA website at *www.faa.gov/go/aviationnoise.*

[13] Federal Agency Review of Selected Airport Noise Analysis Issues (FICON), 1992.

[14] The Day-Night Average Sound Level (DNL or Ldn) is the 24-hour average sound level, in decibels, for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the periods between midnight and 7 a.m., and between 10 p.m., and midnight, local time. See 14 CFR 150.7.

[15] See Schultz, T.J. 1978, ''Synthesis of Social Surveys on Noise Annoyance,'' *Journal of the Acoustical Society of America* 64(2): 377–405.

[16] See Fidell, S., D. Barber, ''Updating a Dosage-Effect Relationship for the Prevalence of Annoyance Due to General Transportation Noise,'' *Journal of the Acoustical Society of America,* 89, January 1991, pp. 221–233; also see Finegold, L.S., C.S. Harris, and H.E. von Gierke, 1992, Applied Acoustical Report: Criteria for Assessment of Noise Impacts on People, *Journal of the Acoustical Society of America,* June 1992; also see Finegold, L.S., C.S. Harris, and H.E. von Gierke, 1994, Community Annoyance and Sleep Disturbance: Updated Criteria for Assessing the Impacts of General Transportation Noise on People, Noise Control Engineering Journal, Volume 42, Number 1, January–February 1994, pp. 25–30.

[17] The FICON 1992 analysis added to the Schultz Curve's original database of 161 survey data points and calculated an updated dose-response curve using the same methodology but with a total of 400 survey data points.

[18] FICON, 1992.

[19] Ibid., vol. 1, p. 2–6.

[20] Federal Interagency Committee on Aviation Noise Research Review of Selected Aviation Noise Issues (FICAN), 2018.

Advancements in Survey Methodology

Earlier work to understand community response to noise, including Schultz's dose-response analysis, was based on the premise that the annoyance from any source of noise would be the same for a given DNL noise level. However, more recent work has shown that aircraft noise often results in higher levels of annoyance compared to the same level of noise from ground transportation sources.[21] There have been relatively few surveys of communities in the United States about aircraft noise undertaken over the last four decades. However, other countries around the world have conducted aircraft noise surveys during this time considering aircraft noise separately from noise from other modes of transportation. The results of these surveys, as reflected in a dose-response relationship published by the International Organization for Standardization,[22] have consistently shown higher levels of annoyance than exhibited by the *Schultz Curve.* Informed by these results, the national dose-response curve in the NES report reflects only responses to the question about aircraft noise exposure.

Other Factors

In addition to enhancements in survey techniques and changes to the way aircraft operate, there are likely other factors contributing to a change in the way communities respond to aircraft noise. Future work is needed to fully understand the specific drivers behind these reasons, but several possibilities include:

• Changes to where people are choosing to live, including societal migration to increasingly urban environments.[23] Additionally, growth and changes to the makeup of suburban communities and their proximity to urban hubs may also be influencing factors on community expectations for aircraft noise exposure.

• How people work and live, including influencing factors such as increased in-home business and teleworking in today's economy.[24] Changes in expectations for spending time outdoors versus indoors and the associated aircraft noise exposure may also be a factor.

• The rise of social media, the internet, and other national and global information sources, leading to an increased awareness and perception of local and national noise issues.

• Overall societal response to noise due to a combination of these or other factors.

In addition to the NES, which focuses on annoyance, the FAA is also engaged in a range of research initiatives aimed at providing information on other impacts of aircraft noise, including effects on children's learning, sleep disturbance, and potential health effects. Each of these research initiatives focuses on a distinct type of potential adverse effect associated with aviation noise exposure. The potential adverse effects explored by these initiatives may also be factors influencing the annoyance reported by the NES. However, research in these areas is still ongoing and therefore was not specifically addressed by the NES. Additional details on these research programs is provided below.

(2) Noise Modeling, Noise Metrics, and Environmental Data Visualization

As a core component of FAA's work to address aircraft noise, as well as a requirement of its environmental regulatory commitments, the FAA must maintain the ability to accurately quantify aircraft noise exposure around airports and throughout the National Airspace System. High-fidelity modeling is the only practical method to accomplish this objective, as aircraft noise needs to be quantified over relatively large scales in an efficient and consistent manner. For more than four decades, the FAA has worked closely with industry, academic, and governmental stakeholders to advance research and development in aircraft noise modeling. This effort advances the analytical tools, metrics, data, and standards required to provide high quality results to inform the public and other stakeholders about noise exposure levels. The FAA has also been actively exploring ways to use emerging technologies to visualize environmental data including noise exposure.

Aviation Environmental Design Tool

The Aviation Environmental Design Tool (AEDT) is the FAA's required noise and environmental modeling application for all U.S. domestic regulatory analyses requiring FAA review. The AEDT also provides analysis support for the International Civil Aviation Organization—Committee on Aviation Environmental Protection, and is used as a research and assessment tool by other Federal agencies, universities, and industry stakeholders.

Through collaborations with government, university, and industry partners, the FAA actively manages AEDT to ensure that features and capabilities are developed to meet expanding environmental analysis needs, and to ensure that as new data and technologies become available they are incorporated in order to enhance modeling accuracy and efficiency. The AEDT builds on a legacy of noise modeling development, and is based on detailed aircraft-specific noise measurements and internationally accepted aircraft performance models and standards. A dynamic development process is used to create new versions of AEDT. This process allows for new features and capabilities to be added as needed, for example, when required by policy updates or informed by emerging research findings.

Noise Screening

Building from the high-fidelity noise modeling capabilities available through AEDT, the FAA is also working to develop an updated noise screening tool. This updated noise screening tool will use a simplified noise modeling process to facilitate an expedited review of proposed Federal actions where significant noise impacts are not expected. Such an approach is beneficial where a proposed Federal Action is limited in scope and could qualify for a categorical exclusion under the FAA's procedures for implementing the National Environmental Policy Act (NEPA).[25] The primary goal of updating the noise screening tool is to decrease the amount of time that an analyst will need to conduct an assessment while also ensuring a fully validated result that is readily understandable by the public. While the output from a noise screening tool cannot provide the same level of detail as a comprehensive modeling tool, the simplified process provides for an expedited initial view of

[21] See, for example: Janssen, S., &, Vos, H. (2011). Dose-Response Relationship between DNL and Aircraft Noise Annoyance: Contribution of TNO. Retrieved from TNO Report TNO–060–UT–2011–00207.

[22] International Organization for Standardization. (2016, March 1, 2016). International Standard 1996–1, Acoustics—Description Measurement and Assessment of Environmental Noise—Part 1: Basic Quantities and Assessment Procedures, 3rd edition.

[23] The U.S. Census Bureau indicates that the percentage of the population living in urban areas has increased from 73.6 percent in 1970 to 80.7 percent in 2010, an increase of 7.1 percent.

[24] Work to explore changes to how population distribution throughout the day are related to aircraft noise exposure is planned under Airport Cooperative Research Project (ACRP) 02–84 [Anticipated] *http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4421.*

[25] See FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures,* Chapter 5 (''Categorical Exclusions'').

any potential changes in aircraft noise exposure.

Environmental Data Visualization

The FAA has been developing ways to utilize geospatial data to improve the agency's ability to communicate environmental data to the public. For example, the FAA has designed an Environmental Visualization Tool to take advantage of the availability of high quality geospatial data to deliver an agency-wide resource using a consistent, common visual language. Once fully implemented, this common visualization platform will serve the needs of multiple environmental programs within the FAA, including those presenting aircraft noise data to the public.

Supplemental Noise Metrics

The FAA's primary noise metric, DNL, was developed and validated to identify significant aviation noise exposure for land use and mitigation planning as well as for determining significant change in noise exposure under NEPA review. In some cases, however, it can be useful to supplement DNL with the use of other noise metrics. While other noise metrics may not provide as complete an understanding of the cumulative noise exposure from activity around an airport and its associated airspace, they often can provide opportunities to communicate the specific characteristics of noise changes due to the unique aspects of a proposed action. The FAA's NEPA procedures address the use of supplemental noise metrics.[26] To assist the public in understanding noise impacts, and to better facilitate communication among communities interested in systematic departure flight track dispersion, the FAA is working to assess the use of potential supplemental metrics. For a supplemental metric to be effective in evaluating potential means of achieving flight track dispersion, and to ensure that communities understand the impacts of dispersion (*i.e.,* that dispersion does not eliminate noise but rather it may move noise to other neighborhoods), the supplemental metric will need to effectively communicate the changes in noise exposure that will occur in all of the communities affected by the change, both those that would be exposed to less noise and those that would be exposed to more noise.[27]

(3) Reduction, Abatement, and Mitigation of Aviation Noise

To directly address noise concerns, the FAA sponsors multiple research programs to explore different concepts for aircraft noise reduction. As aircraft noise is a complex issue, no single concept is capable of providing a universal solution. However, by conducting research across different areas, the FAA is developing solutions to reduce noise at its source, abate noise through operations, and mitigate the effects of noise on communities. The intent of this approach is to have a variety of options to reduce the noise being experienced by those living near airports around the country and to have options that could be tailored to specific airports.

Aircraft Source Noise Reduction

As noted previously, the single most influential factor in the historical decline in noise exposure was the phased transition to quieter aircraft. Through the public-private partnership of the Continuous Lower Energy, Emissions, and Noise (CLEEN) Program, the FAA and industry are working together to develop technologies that will enable manufacturers to create aircraft and engines with lower noise and emissions as well as improved fuel efficiency.[28] The technologies being accelerated by the CLEEN Program have relatively large technological risk. Government resources help mitigate this risk and incentivize aviation manufacturers to invest and develop these technologies. By cost-sharing the development with the FAA, industry is willing to accept the greater risk and can better support the business case for this technological development. Once entered into service, the CLEEN technologies will provide societal benefits in terms of reduced noise, fuel burn, and emissions throughout the fleet for years to come. In addition to the benefits provided by technologies developed under the CLEEN, the program leads to advances in the analysis and design tools that are used on every aircraft or engine product being made by these companies; this extends the benefits of the CLEEN Program well beyond the individual technologies being matured.

As new aircraft and engine technologies lead to quieter aircraft over time, the FAA works to establish aircraft certification standards based on noise stringency requirements. These standards are a requirement of the airworthiness process and are described in 14 CFR part 36. These requirements do not force manufactures to develop new technology. However, as new noise reduction technologies emerge they do ensure that new aircraft continue to meet increasingly quieter standards within the bounds of what is technologically feasible and economically reasonable.

Noise Abatement

The FAA is also supporting multiple efforts to identify means to abate noise through changes in how aircraft are operated in the airspace over communities. In the immediate vicinity of an airport, use of voluntary noise abatement departure procedures (NADP) has been a longstanding technique available to reduce noise. Recent research is examining the effectiveness of these procedures and identifying means of improving their use.

As the FAA works to modernize the National Airspace System, new aircraft flight procedures have been designed to take advantage of PBN technologies. To better understand both the environmental benefits and challenges posed by PBN, the FAA is working to re-examine ways to routinely consider noise during flight procedure design. This effort includes an exploration of how PBN can better control flight paths and move them away from noise-sensitive areas, how changes in aircraft performance could be safely managed to reduce noise, and how systematic departure flight track dispersion can be implemented to abate noise concerns.

In a recent partnership with the Massachusetts Port Authority (Massport) and MIT, the FAA jointly contributed to research considering how Area Navigation (RNAV) PBN procedures could be designed and implemented to reduce noise. Multiple concepts were explored that highlighted how collaborations between the FAA, airport operators, and community members can produce innovative noise abatement strategies.

A recently completed analysis of operational procedures that resulted from the Massport-MIT–FAA partnership shows that for modern aircraft on departure, changes in aircraft climb speed have minimal impact on the overall aircraft departure noise. The current best practice for NADP, using International Civil Aviation Organization distant community or

[26] See FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures,* Appendix B, paragraph B–1.6; *1050.1F Desk Reference,* Section 11.4.

[27] FAA, 2020, Report to Congress: FAA Reauthorization Act of 2018 (Pub. L. 115–254) Section 188 and Sec 173, *https://www.faa.gov/about/plans_reports/congress/media/Day-Night_Average_Sound_Levels_COMPLETED_report_w_letters.pdf.*

[28] See, for example, information on the FAA's ''Continuous Lower Energy, Emissions, and Noise'' (CLEEN) Program at: *https://www.faa.gov/about/office_org/headquarters_offices/apl/research/aircraft_technology/cleen/.*

''*NADP–2*'' departure procedure, has been shown to minimize modeled noise impacts. This analysis also shows that for modern aircraft on arrival, changes in approach airspeed could have a noticeable impact (reductions of 4–8 dBA) on the overall aircraft noise at relatively large distances from touching down (between 10 and 25 nautical miles from the runway). While NADP procedures have the potential to reduce community noise, they may also have implementation challenges that will need to be overcome. Research is ongoing at MIT to address these challenges.[29]

In addition to airplane operations, the FAA is also examining the potential for helicopter noise abatement through changes in operational procedures. The FAA has partnered with the Volpe Center, the National Aeronautics and Space Administration, the Pennsylvania State University, and operator organizations to explore new ways to safely fly rotorcraft while also reducing noise through the Fly Neighborly Program.[30]

Noise Mitigation Research

Noise mitigation is the effort to take actions to reduce the impact of aircraft noise exposure that occurs. The primary mitigation strategies involve encouraging responsible land use planning in airport communities and, where appropriate, the application of sound insulation treatments to eligible homes or other noise-sensitive public buildings (*e.g.,* schools or hospitals). In extreme cases where sound insulation technologies cannot provide adequate mitigation, the acquisition of residential homes and conversion to non-residential land use is also an option.

As sound insulation treatment costs have continued to rise and new research on the human impacts from noise becomes available, the FAA is exploring the cost-benefit calculus of existing noise mitigation strategies and technologies in order to better direct where and how limited mitigation resources should be applied. Recent academic research [31] and internal assessments have raised questions about the benefits of sound insulation relative to the costs. While the relative benefits of sound insulation for noise exposures above DNL 65dB will depend on the individual home treatment costs, minimal benefit can be expected for sound insulation treatments applied for noise exposures below DNL 65dB.

Aircraft Noise Policy Background

Community response to noise has historically been a primary factor underlying the FAA's noise-related policies, including the establishment of DNL 65 dB as the threshold of ''significant'' aircraft noise exposure. The FAA has been using a DNL of 65 dB as the basis for: (1) Setting the agency's policy goal of reducing the number of people exposed to significant aircraft noise; [32] (2) the level of aircraft noise exposure below which residential land use is ''normally compatible,'' as defined in regulations implementing the Aviation Safety and Noise Abatement Act of 1979,[33] and (3) the level of aircraft noise exposure below which noise impacts of FAA actions in residential areas are not considered ''significant'' under section 102(2)(C) of the National Environmental Policy Act of 1969.[34]

Research results, as reflected in the programs and studies described in this notice, will provide new information on how aircraft noise in communities near airports may be effectively managed and will inform future decision making on the FAA's aircraft noise policies.

However, as previously stated, the FAA will not make any determinations on implications from these emerging research results for FAA noise policies until it has carefully considered public and other stakeholder input, and assesses the factors behind any increases in community impacts from aircraft noise exposure. Unless and until any changes become effective, all existing FAA regulations, orders, and policies remain in effect. The FAA is committed to informing and involving the public, and to giving meaningful consideration to community concerns and views as the FAA makes aviation decisions that affect them.

Comments Invited

The FAA recognizes that a range of factors may be driving concerns due to aircraft noise. However, as outlined in this notice, a broad understanding of aircraft noise and its potential impacts is needed in order to better manage and reduce concerns from aviation noise.

The FAA is inviting comments on these concerns to assist the agency in assessing how resources should be directed to better understand and manage the factors underlying the concern from aircraft noise exposure.

Comments that focus on the questions listed below will be most helpful. The more specific the comments, the more useful they will be in the FAA's considerations.

(1) What, if any, additional investigation, analysis, or research should be undertaken in each of the following three categories as described in this notice:

- Effects of Aircraft Noise on Individuals and Communities;
- Noise Modeling, Noise Metrics, and Environmental Data Visualization; and
- Reduction, Abatement, and Mitigation of Aviation Noise?

(2) As outlined in this notice, the FAA recognizes that a range of factors may be driving the increase in annoyance shown in the Neighborhood Environmental Survey results compared to earlier transportation noise annoyance surveys—including survey methodology, changes in how commercial aircraft operate, population distribution, how people live and work, and societal response to noise. The FAA requests input on the factors that may be contributing to the increase in annoyance shown in the survey results.

(3) What, if any, additional categories of investigation, analysis, or research should be undertaken to inform FAA noise policy?

Authority: National Environmental Policy Act (NEPA) 42 U.S.C. 4321 *et. seq.*, Aviation Safety and Noise Abatement Act (ASNA) 49 U.S.C. 47501 et. *seq.*, Federal Aviation Act, 49 U.S.C. 44715.

Issued in Washington, DC.

Kevin Welsh,

Director, Office of Environment and Energy.

[FR Doc. 2021–00564 Filed 1–12–21; 8:45 am]

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[29] *https://ascent.aero/project/analytical-approach-for-quantifying-noise-from-advanced-operational-procedures/, https://ascent.aero/project/aircraft-noise-abatement-procedure-modeling-and-validation/.*

[30] *https://www.rotor.org/initiatives/fly-neighborly.*

[31] Wolfe, Malina, Barrett & Waitz 2016, Cost and benefits of US Aviation noise land-use policies, Transportation Research Part D.

[32] See ''Aviation Environmental and Energy Policy Statement,'' 77 FR 43137, 43138 (July 23, 2012), available on the FAA website at [URL]. The ''noise goal'' identified in this document includes ''[r]educ[ing] the number of people exposed to significant noise around U.S. airports.''

[33] 49 U.S.C. 47502. The regulations implementing this section are codified at 14 CFR part 150.

[34] 49 U.S.C. 4332(2)(C). See FAA Order 1050.1F, ''Environmental Impacts: Policies and Procedures'' (2015), Exhibit 4–1. The significance threshold for noise used for NEPA purposes in FAA Order 1050.1F is also used by the FAA for determining significant adverse noise effects under 49 U.S.C. 47106(c)(1)(B) for airport development projects involving the location of an airport or runway or a major runway extension. See 80 FR 44209, 44223 (July 24, 2015) (preamble to FAA Order 1050.1F).

January 18, 2021

From

Mike McClintok

To

SCSC Roundtable

Message

Recent FAA Items of Interest--FYI

Forum members and all:

Last week the FAA released information on its aircraft noise policy research efforts and Neighborhood Environmental Survey (NES). So, because there is a lot of information involved which may not be that easily accessed by the public, and at the request of Forum Co-Chair Walt Jacobs (Alameda Citizen Representative), the attached memorandum has been prepared which should answer the majority of questions that anyone might have. These items are NOT on the Forum's January 20 agenda, but for anyone with questions, they can be asked during the Public Comment period (Agenda Item #6). Please let me know if you need any additional information.

Mike McClintock

Attachment Name

20210118_Mike_McMclintok_SCSCRoundtable_Recent FAA items of interest

MEMORANDUM
OAKLAND AIRPORT-COMMUNITY NOISE MANAGEMENT FORUM

Date: January 18, 2021

To: Forum members and all interested parties

From: Mike McClintock, Forum Facilitator

Subject: Recent FAA Activities of Interest

On January 13, 2021, the FAA released information that should be of interest to the Forum, as well as other interested parties:

- Overview of FAA Aircraft Noise Policy and Research Efforts: Request for Input on Research Activities to Inform Aircraft Noise Policy (see Part I, below); and
- FAA Neighborhood Environmental Survey (see Part II, Pg. 11).

These two notices came in too late to be included in the agenda for the January 20, 2021 Forum meeting, but will likely generate questions at the meeting. The following are, for the most part, unedited extracts from the two notices in case anyone has not been able to access the actual Federal Register notices. ***Should you wish to comment, please send your comments directly to the FAA at the addresses listed below, and in the format requested.***

PART I--OVERVIEW OF FAA AIRCRAFT NOISE POLICY AND RESEARCH EFFORTS: REQUEST FOR INPUT ON RESEARCH ACTIVITIES TO INFORM [FAA] AIRCRAFT NOISE POLICY [Federal Register, Vol. 86, No. 8, January 13, 2021, P. 2722]

In this notice the FAA has released a summary of its research programs on civil aircraft noise and is inviting public comment on the scope and applicability of these research initiatives to address aircraft noise. The FAA will not make any determinations based on the findings of these research programs for the FAA's noise policies, including any potential revised use of the Day-Night Average Sound Level (DNL) noise metric until it has carefully considered public and other stakeholder input along with any additional research needed to improve the understanding of the effects of aircraft noise exposure on communities.

Timeline: Comments on this notice must identify the docket number and be received on or before March 15, 2021.

Addresses: Send comments identified by docket number FAA–2021–0037 using any of the following methods:

• **Federal eRulemaking Portal:** Go to http://www.regulations.gov and follow the online instructions for sending your comments electronically.
• **Mail:** Send comments to Docket Operations, M–30; U.S. Department of Transportation, 1200 New Jersey Avenue SE, Room W12–140, West Building Ground Floor, Washington, DC 20590–0001.
• **Hand Delivery or Courier:** Take comments to Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
• **Fax:** Fax comments to Docket Operations at (202) 493–2251.

Privacy: The FAA will post all comments it receives, without change, to http://www.regulations.gov, including any personal information the commenter provides. Using the search function of the docket website, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the Federal Register published on April 11, 2000 (65 FR 19477–19478), as well as at http://DocketsInfo.dot.gov.

Docket: Background documents or comments received may be read at http://www.regulations.gov at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For Further Information Contact: Mr. Donald Scata, Office of Environment and Energy (AEE–100), Federal Aviation Administration, 800 Independence Ave. SW, Washington, DC 20591. Telephone: (202) 267–0606. Email address: NoiseResearchFRN@faa.gov.

Comments to the FAA are Invited on the Following Subjects

1. Effects of Aircraft Noise on Individuals and Communities:
   - Speech Interference and Children's Learning;
   - Neighborhood Environmental Survey;
   - Health and Human Impacts Research;
   - Impacts to Cardiovascular Health;
   - Sleep Disturbance; and
   - Economic Impacts
2. Noise Modeling, Noise Metrics, and Environmental Data Visualization
   - Aviation Environmental Design Tool;
   - Noise Screening;
   - Environmental Data Visualization; and
   - Supplemental Noise Metrics
3. Reduction, Abatement, and Mitigation of Aviation Noise
   - Aircraft Source Noise Reduction;
   - Noise Abatement;
   - Noise Mitigation Research; and
   - Aircraft Noise Policy Background

Background

According to the FAA's Federal Register notice:

- The number of people living in areas exposed to significant levels of aircraft noise (i.e., DNL/CNEL 65 dB) in the U.S. has declined from ~7 million to just over 400,000 since 1970; while the number of commercial air passenger enplanements has gone from ~ 200 million in 1975 to ~ 930 million in 2018.
- The single most important factor in this decline was the phased transition to quieter aircraft; along with cooperative efforts by airports, airlines and other aircraft operators, State and local governments, and communities to reduce the number of people exposed to significant levels of aircraft noise through airport noise compatibility planning, mitigation projects, and acoustically-insulating homes, schools and other noise-sensitive facilities.

- The introduction of Performance Based Navigation (PBN) procedures, as needed to safely and efficiently modernize the national air transportation system, has also provided noise benefits for many by allowing for new and more efficient flight paths, but has in some places resulted in community concerns, particularly related to increased concentration of flights.
- In 2016, the FAA released an update to the FAA Community Involvement Manual to reaffirm the FAA's commitment to inform and involve the public, and to give meaningful consideration to community concerns and views as the FAA makes aviation decisions that affect community interests.
- The FAA has since developed and begun implementing a comprehensive and strategic approach to transform and enhance FAA community involvement practices, including working through airport community roundtables, to equitably discuss opportunities to shift or, when possible, reduce aircraft noise exposure.

Overview of FAA Research on Aircraft Noise

According to the Federal Register notice, the FAA recognizes that aircraft noise remains a primary concern for many stakeholders, and is actively working to understand, manage, and reduce the environmental impacts of global aviation through research, technological innovation, policy, and outreach to benefit the public. With the vision of removing environmental constraints on aviation growth by achieving quieter, cleaner, and more efficient air transportation, the FAA has worked closely with a number of industry, academic, and governmental stakeholders to assemble a comprehensive portfolio of research activities (including leveraging research undertaken by others) aimed at guiding investments in scientific studies, analytical tools, and innovative technologies to better understand and manage aircraft noise. However, due to the complex nature of aircraft noise and the varied priorities and concerns of stakeholders, no single set of findings can completely guide decision making. A broad understanding of aircraft noise and any potential impacts, from many different perspectives, is therefore needed.

Summaries of the FAA's key research, tools, and technology programs designed to potentially inform its aircraft noise policy are provided below.

1. Effects of Aircraft Noise on Individuals and Communities

- **Speech Interference and Children's Learning** -- Much of the FAA's current understanding on speech interference due to noise was established by the Environmental Protection Agency (EPA) in the 1970s. The findings from these early research assessments are still relevant for today's considerations on the impacts from aircraft noise. However, the FAA is also investigating whether there are related considerations warranting more detailed studies. One area in particular is the potential effects of aviation noise on reading comprehension and learning motivation in children. Initial research in this area has shown there are challenges in designing effective studies, and this continues to be an area of interest to better inform noise mitigation and abatement strategies for schools and other noise-sensitive facilities. While additional research in this area is still being explored, the FAA has invested more than $440 million in sound insulation treatments at schools around the country in order to mitigate any potential issues related to aircraft noise.

- **Health and Human Impacts Research** -- While community annoyance due to aircraft noise exposure provides a useful summary measure that captures public perceptions of noise, a full understanding of the impact of noise on communities requires a careful consideration of the potential physiological impacts as well. Knowledge of physiological impacts could also help the FAA develop targeted measures to address aircraft noise. Emerging research capabilities are providing new opportunities to examine specific impacts of noise on humans. When these are examined in a holistic manner with research on community annoyance, they could further inform aircraft noise policy considerations. The FAA is conducting research on the potential impacts of aircraft noise on cardiovascular health and sleep disturbance, as described below.

- **Impacts to Cardiovascular Health** -- In partnership with academic researchers that are being led by the Boston University School of Public Health, the FAA is working to understand the relationship between aircraft noise exposure and cardiovascular health. The researchers are doing this by leveraging existing national longitudinal health cohorts wherein statistically large numbers of people provide data about their health on a periodic basis over the course of many years. These studies are typically used to understand the relative risk of different factors like diet on different health outcomes like heart disease. The Boston University team is expanding the list of factors to include aircraft noise exposure such that it can be placed in context with other factors that could increase one's risk of cardiovascular disease. The team is leveraging existing collaborations with well-recognized and respected health cohorts including the Nurses' Health Studies and the Health Professionals Follow-Up Study, as well as a complementary study at Boston University that is examining the Women' Heath Initiative cohort through funding from the National Institutes of Health.

- **Sleep Disturbance** -- The FAA is working with a team led by the University of Pennsylvania School of Medicine to conduct a national sleep study that will quantify the impact of aircraft noise exposure on sleep. The study will collect nationally representative information on the probability of being awoken by aircraft noise exposure. The study will start with input being requested from approximately 25,000 respondents through a mail survey. These surveys will be used to determine the eligibility of respondents for a detailed field study that will involve roughly 400 volunteers. The volunteers in the detailed field study will use equipment provided by the research team to collect both noise and electrocardiography data in their homes while they sleep. The electrocardiography data combined with information on the level of aircraft noise exposure will advance our understanding of the physiological effects of aircraft noise on sleep.

- **Economic Impacts** -- In addition to the aforementioned community and physiological impacts, the FAA is also working with researchers at Massachusetts Institute of Technology (MIT) to conduct an empirical assessment of the economic impacts to businesses located underneath aircraft flight paths. This assessment will take into account the economic benefits from aviation activities, as well as potential environmental and health impacts that the FAA is also in the developmental stage of a research project that would build on existing work done by MIT that has used housing value data to reveal the willingness of people to pay to avoid aircraft noise exposure. This research is intended to serve as a follow on to the Neighborhood Environmental Survey (described in the next section), to determine whether the findings of that survey on residents' sensitivity to aviation noise is also reflected in their ''revealed preferences'' when making housing location decisions.

- **Neighborhood Environmental Survey (NES)**--To review and improve the agency's understanding of community response to aircraft noise, the FAA initiated the Neighborhood Environmental Survey (NES) to help inform ongoing research and policy priorities on aviation noise. Section 187 of the FAA Reauthorization Act of 2018 11 requires the Administrator of the FAA to ''conclude the Administrator's ongoing review of the relationship between aircraft noise exposure and its effects on communities around airports . . . [and] submit to Congress a report containing the results of the review.'' Due to the interest from Congress and other stakeholders in the findings of this research, an expanded summary is provided in this notice below. The full text of the NES report, including a detailed description of the methodology and findings, as well as additional background material to help inform readers, is available on the FAA's website at: www.faa.gov/go/aviationnoise.

Overview of the Survey -- Working with statisticians and noise experts,12 the FAA worked with other Federal agencies that have statutory, regulatory, or other policy interests in aviation noise, to conduct a nationwide survey to update the scientific evidence on the relationship between aircraft noise exposure and its annoyance effects on communities around airports, based on today's aircraft fleet and operations. The NES included a range of questions on a variety of environmental concerns, including aviation noise exposure. The team of expert consultants (including HMMH), under direction from the FAA, surveyed residents living around representative U.S. airports, drawing upon well-established research methods in order to ensure scientific integrity and historical continuity with prior studies, while also employing advancements in techniques for noise modeling and social surveys. The NES consisted of over 10,000 mail responses from residents in communities around 20 statistically representative airports across the Nation, making it the single largest survey of this type undertaken at one time. In addition to the mail responses, the consultants also conducted a follow-up phone survey, which included over 2,000 responses to a series of more detailed questions. The FAA is now considering the full NES results, in conjunction with additional research findings as they become available, to determine how they may inform its noise policy considerations.

- **Overview of Community Response to Noise**-- Historically, two of the main types of information considered by the FAA and other Federal agencies in relating noise exposure to community response have been: (1) Case studies analyzing individual and group actions (e.g., complaints or legal action) taken by residents of communities in response to noise; and (2) social surveys (such as the NES) that elicit information from community residents regarding their level of noise-induced annoyance. Annoyance is defined as a ‘‘summary measure of the general adverse reaction of people to noise that causes interference with speech, sleep, the desire for a tranquil environment, and the ability to use the telephone, radio, or television satisfactorily.’’ The results of social surveys of noise-induced annoyance are typically plotted as ‘‘dose-response curves’’ on a graph showing the relationship between the level of DNL cumulative noise exposure and the percentage of the population that is ‘‘highly annoyed.’’

  Current FAA noise policy is informed by a dose-response curve initially created in the 1970s known as the Schultz Curve. This dose-response curve is generally accepted as a representation of noise impacts and has been revalidated by subsequent analyses over the years. The dose-response relationship it depicts has provided the best tool available to predict noise-induced annoyance for several decades. In 1992, the Federal Interagency Committee on Noise (FICON) reviewed the use of the Schultz Curve, and created an updated version of the curve using additional social survey data. The updated dose response curve was found to agree within one to two percent of the original curve, leading FICON to conclude that ‘‘the updated Schultz Curve remains the best available source of empirical dosage-effect to predict community response to transportation noise.’’ According to the 1992 FICON Report, the DNL-annoyance relationship depicted on the Schultz Curve ‘‘is an invaluable aid in assessing community response as it relates the response to increases in both sound intensity and frequency of occurrence.’’ Although the predicted annoyance, in terms of absolute levels, may vary among different communities, the Schultz Curve can reliably indicate changes in the level of annoyance for defined ranges of sound exposure for any given community. While the validity of the dose-response methodology used to create the Schultz Curve remains well supported, its underlying social survey data, including the additional data used by FICON to update the curve, is now on average more than 40 years old and warrants an update. The NES was conducted to create a new nationally representative dose-response curve to understand how community response to aircraft noise may have changed.

The NES's collection of a nationally representative dataset on community annoyance in response to aircraft noise provides a contemporary update to the Schultz Curve, including technical refinements to improve its reliability. As with the Schultz Curve, the NES describes community annoyance in terms of the percentage of people who are ''highly annoyed'' and describes aircraft noise exposure in terms of the DNL noise metric. Based on the 1992 FICON Report, discussed previously, both the percentage of population highly annoyed and the DNL noise metric have continued to be recognized for this purpose including by FICON's successor, the Federal Interagency Committee on Aviation Noise in its 2018 report.

NES Results -- Compared with the Schultz Curve representing transportation noise, the NES results show a substantially higher percentage of people highly annoyed over the entire range of aircraft noise levels (i.e., from DNL 50 to 75 dB) at which the NES was conducted. This includes an increase in annoyance at lower noise levels. The NES results also show proportionally less change in annoyance from the lower noise levels to the higher noise levels. Comparing the percent of population highly annoyed due to noise exposure between the updated Schultz Curve for transportation noise in the 1992 FICON Report and the NES:

- At a noise exposure level of DNL 65 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 12.3 percent of people were highly annoyed, compared to between 60.1 percent and 70.9 percent within a 95 percent confidence limit from the NES.
- At a noise exposure level of DNL 60 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 6.5 percent of people were highly annoyed, compared to between 43.8 percent and 53.7 percent within a 95 percent confidence limit from the NES.
- At a noise exposure level of DNL 55 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 3.3 percent of people were highly annoyed, compared to between 27.8 percent and 36.8 percent within a 95 percent confidence limit from the NES.
- At a noise exposure level of DNL 50 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 1.7 percent of people were highly annoyed, compared to between 15.4 percent and 23.4 percent within a 95 percent confidence limit from the NES.

Graphics comparing the updated Schultz Curve from the 1992 FICON Report and the curve from the NES are provided on the FAA website at www.faa.gov/go/aviationnoise.

Advancements in Survey Methodology -- Earlier work to understand community response to noise, including Schultz's dose-response analysis, was based on the premise that the annoyance from any source of noise would be the same for a given DNL noise level. However, more recent work has shown that aircraft noise often results in higher levels of annoyance compared to the same level of noise from ground transportation sources.21 There have been relatively few surveys of communities in the United States about aircraft noise undertaken over the last four decades. However, other countries around the world have conducted aircraft noise surveys during this time considering aircraft noise separately from noise from other modes of transportation. The results of these surveys, as reflected in a dose-response relationship published by the International Organization for Standardization, have consistently shown higher levels of annoyance than exhibited by the Schultz Curve. Informed by these results, the national dose-response curve in the NES report reflects only responses to the question about aircraft noise exposure.

Other Factors -- In addition to enhancements in survey techniques and changes to the way aircraft operate, there are likely other factors contributing to a change in the way communities respond to aircraft noise. Future work is needed to fully understand the specific drivers behind these reasons, but several possibilities include:

• Changes to where people are choosing to live, including societal migration to increasingly urban environments. Additionally, growth and changes to the makeup of suburban communities and their proximity to urban hubs may also be influencing factors on community expectations for aircraft noise exposure.
• How people work and live, including influencing factors such as increased in-home business and teleworking in today's economy. Changes in expectations for spending time outdoors versus indoors and the associated aircraft noise exposure may also be a factor.
• The rise of social media, the internet, and other national and global information sources, leading to an increased awareness and perception of local and national noise issues.
• Overall societal response to noise due to a combination of these or other factors.

In addition to the NES, which focuses on annoyance, the FAA is also engaged in a range of research initiatives aimed at providing information on other impacts of aircraft noise, including effects on children's learning, sleep disturbance, and potential health effects. Each of these research initiatives focuses on a distinct type of potential adverse effect associated with aviation noise exposure. The potential adverse effects explored by these initiatives may also be factors influencing the annoyance reported by the NES. However, research in these areas is still ongoing and therefore was not specifically addressed by the NES. Additional details on these research programs are provided below.

2. Noise Modeling, Noise Metrics, and Environmental Data Visualization

As a core component of FAA's work to address aircraft noise, as well as a requirement of its environmental regulatory commitments, the FAA must maintain the ability to accurately quantify aircraft noise exposure around airports and throughout the National Airspace System. High-fidelity modeling is the only practical method to accomplish this objective, as aircraft noise needs to be quantified over relatively large scales in an efficient and consistent manner. For more than four decades, the FAA has worked closely with industry, academic, and governmental stakeholders to advance research and development in aircraft noise modeling. This effort advances the analytical tools, metrics, data, and standards required to provide high quality results to inform the public and other stakeholders about noise exposure levels. The FAA has also been actively exploring ways to use emerging technologies to visualize environmental data including noise exposure.

- **Aviation Environmental Design Tool** -- The Aviation Environmental Design Tool (AEDT) is the FAA's required noise and environmental modeling application for all U.S. domestic regulatory analyses requiring FAA review. The AEDT also provides analysis support for the International Civil Aviation Organization— Committee on Aviation Environmental Protection, and is used as a research and assessment tool by other Federal agencies, universities, and industry stakeholders. Through collaborations with government, university, and industry partners, the FAA actively manages AEDT to ensure that features and capabilities are developed to meet expanding environmental analysis needs, and to ensure that as new data and technologies become available they are incorporated in order to enhance modeling accuracy and efficiency. The AEDT builds on a legacy of noise modeling development, and is based on detailed aircraft-specific noise measurements and internationally accepted aircraft performance models and standards. A dynamic development process is used to create new versions of AEDT. This process allows for new features and capabilities to be added as needed, for example, when required by policy updates or informed by emerging research findings.

- **<u>Noise Screening</u>** -- Building from the high-fidelity noise modeling capabilities available through AEDT, the FAA is also working to develop an updated noise screening tool. This updated noise screening tool will use a simplified noise modeling process to facilitate an expedited review of proposed Federal actions where significant noise impacts are not expected. Such an approach is beneficial where a proposed Federal Action is limited in scope and could qualify for a categorical exclusion under the FAA's procedures for implementing the National Environmental Policy Act (NEPA). The primary goal of updating the noise screening tool is to decrease the amount of time that an analyst will need to conduct an assessment while also ensuring a fully validated result that is readily understandable by the public. While the output from a noise screening tool cannot provide the same level of detail as a comprehensive modeling tool, the simplified process provides for an expedited initial view of any potential changes in aircraft noise exposure.

- **<u>Environmental Data Visualization</u>** -- The FAA has been developing ways to utilize geospatial data to improve the agency's ability to communicate environmental data to the public. For example, the FAA has designed an Environmental Visualization Tool to take advantage of the availability of high-quality geospatial data to deliver an agency-wide resource using a consistent, common visual language. Once fully implemented, this common visualization platform will serve the needs of multiple environmental programs within the FAA, including those presenting aircraft noise data to the public.

- **<u>Supplemental Noise Metrics</u>** -- The FAA's primary noise metric, DNL, was developed and validated to identify significant aviation noise exposure for land use and mitigation planning as well as for determining significant change in noise exposure under NEPA review. In some cases, however, it can be useful to supplement DNL with the use of other noise metrics. While other noise metrics may not provide as complete an understanding of the cumulative noise exposure from activity around an airport and its associated airspace, they often can provide opportunities to communicate the specific characteristics of noise changes due to the unique aspects of a proposed action. The FAA's NEPA procedures address the use of supplemental noise metrics. To assist the public in understanding noise impacts, and to better facilitate communication among communities interested in systematic departure flight track dispersion, the FAA is working to assess the use of potential supplemental metrics. For a supplemental metric to be effective in evaluating potential means of achieving flight track dispersion, and to ensure that communities understand the impacts of dispersion (i.e., that dispersion does not eliminate noise but rather it may move noise to other neighborhoods), the supplemental metric will need to effectively communicate the changes in noise exposure that will occur in all of the communities affected by the change, both those that would be exposed to less noise and those that would be exposed to more noise.

3. Reduction, Abatement, and Mitigation of Aviation Noise

To directly address noise concerns, the FAA sponsors multiple research programs to explore different concepts for aircraft noise reduction. As aircraft noise is a complex issue, no single concept is capable of providing a universal solution. However, by conducting research across different areas, the FAA is developing solutions to reduce noise at its source, abate noise through operations, and mitigate the effects of noise on communities. The intent of this approach is to have a variety of options to reduce the noise being experienced by those living near airports around the country and to have options that could be tailored to specific airports.

- **<u>Aircraft Source Noise Reduction</u>** -- As noted previously, the single most influential factor in the historical decline in noise exposure was the phased transition to quieter aircraft. Through the public-private partnership of the Continuous Lower Energy, Emissions, and Noise (CLEEN)

Program, the FAA and industry are working together to develop technologies that will enable manufacturers to create aircraft and engines with lower noise and emissions as well as improved fuel efficiency. The technologies being accelerated by the CLEEN Program have relatively large technological risk. Government resources help mitigate this risk and incentivize aviation manufacturers to invest and develop these technologies. By cost-sharing the development with the FAA, industry is willing to accept the greater risk and can better support the business case for this technological development. Once entered into service, the CLEEN technologies will provide societal benefits in terms of reduced noise, fuel burn, and emissions throughout the fleet for years to come. In addition to the benefits provided by technologies developed under the CLEEN, the program leads to advances in the analysis and design tools that are used on every aircraft or engine product being made by these companies; this extends the benefits of the CLEEN Program well beyond the individual technologies being matured.

As new aircraft and engine technologies lead to quieter aircraft over time, the FAA works to establish aircraft certification standards based on noise stringency requirements. These standards are a requirement of the airworthiness process and are described in 14 CFR part 36. These requirements do not force manufactures to develop new technology. However, as new noise reduction technologies emerge they do ensure that new aircraft continue to meet increasingly quieter standards within the bounds of what is technologically feasible and economically reasonable.

- **Noise Abatement** -- The FAA is also supporting multiple efforts to identify means to abate noise through changes in how aircraft are operated in the airspace over communities. In the immediate vicinity of an airport, use of voluntary noise abatement departure procedures (NADP) has been a longstanding technique available to reduce noise. Recent research is examining the effectiveness of these procedures and identifying means of improving their use.

  As the FAA works to modernize the National Airspace System, new aircraft flight procedures have been designed to take advantage of PBN technologies. To better understand both the environmental benefits and challenges posed by PBN, the FAA is working to re-examine ways to routinely consider noise during flight procedure design. This effort includes an exploration of how PBN can better control flight paths and move them away from noise-sensitive areas, how changes in aircraft performance could be safely managed to reduce noise, and how systematic departure flight track dispersion can be implemented to abate noise concerns.

  In a recent partnership with the Massachusetts Port Authority (Massport) and MIT, the FAA jointly contributed to research considering how Area Navigation (RNAV) PBN procedures could be designed and implemented to reduce noise. Multiple concepts were explored that highlighted how collaborations between the FAA, airport operators, and community members can produce innovative noise abatement strategies.

  A recently completed analysis of operational procedures that resulted from the Massport-MIT-FAA partnership shows that for modern aircraft on departure, changes in aircraft climb speed have minimal impact on the overall aircraft departure noise. The current best practice for NADP, using International Civil Aviation Organization distant community or ‘‘NADP–2’’ departure procedure, has been shown to minimize modeled noise impacts. This analysis also shows that for modern aircraft on arrival, changes in approach airspeed could have a noticeable impact (reductions of 4-8 dBA) on the overall aircraft noise at relatively large distances from touching down (between 10 and 25 nautical miles from the runway). While NADP procedures have the potential to reduce community noise, they may also have implementation challenges that will need to be overcome.

Research is ongoing at MIT to address these challenges. In addition to airplane operations, the FAA is also examining the potential for helicopter noise abatement through changes in operational procedures. The FAA has partnered with the Volpe Center, the National Aeronautics and Space Administration, the Pennsylvania State University, and operator organizations to explore new ways to safely fly rotorcraft while also reducing noise through the Fly Neighborly Program.

- **Noise Mitigation Research** -- Noise mitigation is the effort to take actions to reduce the impact of aircraft noise exposure that occurs. The primary mitigation strategies involve encouraging responsible land use planning in airport communities and, where appropriate, the application of sound insulation treatments to eligible homes or other noise-sensitive public buildings (e.g., schools or hospitals). In extreme cases where sound insulation technologies cannot provide adequate mitigation, the acquisition of residential homes and conversion to nonresidential land use is also an option. As sound insulation treatment costs have continued to rise and new research on the human impacts from noise becomes available, the FAA is exploring the cost-benefit calculus of existing noise mitigation strategies and technologies in order to better direct where and how limited mitigation resources should be applied. Recent academic research 31 and internal assessments have raised questions about the benefits of sound insulation relative to the costs. While the relative benefits of sound insulation for noise exposures above DNL 65dB will depend on the individual home treatment costs, minimal benefit can be expected for sound insulation treatments applied for noise exposures below DNL 65dB.

- **Aircraft Noise Policy Background** -- Community response to noise has historically been a primary factor underlying the FAA's noise-related policies, including the establishment of DNL 65 dB as the threshold of ''significant'' aircraft noise exposure. The FAA has been using a DNL of 65 dB as the basis for:
  - Setting the agency's policy goal of reducing the number of people exposed to significant aircraft noise;
  - the level of aircraft noise exposure below which residential land use is ''normally compatible,'' as defined in regulations implementing the Aviation Safety and Noise Abatement Act of 1979, and
  - the level of aircraft noise exposure below which noise impacts of FAA actions in residential areas are not considered ''significant'' under section 102(2)(C) of the National Environmental Policy Act of 1969.

Research results, as reflected in the programs and studies described in this notice, will provide new information on how aircraft noise in communities near airports may be effectively managed and will inform future decision making on the FAA's aircraft noise policies.

However, as previously stated, the FAA will not make any determinations on implications from these emerging research results for FAA noise policies until it has carefully considered public and other stakeholder input, and assesses the factors behind any increases in community impacts from aircraft noise exposure. Unless and until any changes become effective, all existing FAA regulations, orders, and policies remain in effect. The FAA is committed to informing and involving the public, and to giving meaningful consideration to community concerns and views as the FAA makes aviation decisions that affect them.

Comments Invited: The FAA recognizes that a range of factors may be driving concerns due to aircraft noise. However, as outlined in this notice, a broad understanding of aircraft noise and its potential impacts is needed in order to better manage and reduce concerns from aviation noise. The FAA is inviting comments on these concerns to assist the agency in assessing how resources should be directed to better understand and manage the factors underlying the concern from aircraft noise exposure. Comments that focus on the questions listed below will be most helpful. The more specific the comments, the more useful they will be in the FAA's considerations, e.g.

- What, if any, additional investigation, analysis, or research should be undertaken in each of the following three categories as described in this notice:
  • Effects of Aircraft Noise on Individuals and Communities;
  • Noise Modeling, Noise Metrics, and Environmental Data Visualization; and
  • Reduction, Abatement, and Mitigation of Aviation Noise?
- As outlined in this notice, the FAA recognizes that a range of factors may be driving the increase in annoyance shown in the Neighborhood Environmental Survey results compared to earlier transportation noise annoyance surveys—including survey methodology, changes in how commercial aircraft operate, population distribution, how people live and work, and societal response to noise. The FAA requests input on the factors that may be contributing to the increase in annoyance shown in the survey results.
- What, if any, additional categories of investigation, analysis, or research should be undertaken to inform FAA noise policy?

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PART II—FAA NEIGHBORHOOD ENVIRONMENTAL SURVEY
[https://www.faa.gov/regulations_policies/policy_guidance/noise/survey/#intro**]**

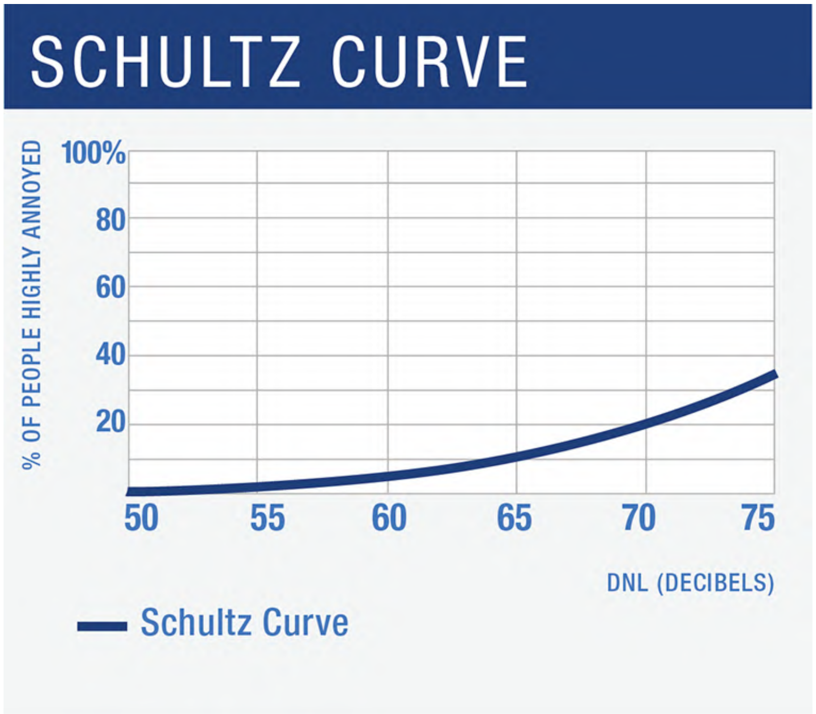
The FAA conducted a nationwide survey regarding annoyance related to aircraft noise and is seeking public comment. Please review the survey introduction, read the survey report, and provide your comments.

Below is an introduction to the survey and an overview of the methodology, results, and public comments requested.
Introduction
Methodology
Results
Public Comments Requested

INTRODUCTION

RATIONALE FOR A NEW SURVEY

While the Schultz Curve remains the accepted standard for describing transportation noise exposure-annoyance relationships, its original supporting scientific evidence and social survey data were based on information that was available in the 1970s. The last in-depth review and revalidation of the Schultz Curve was conducted in 1992. More recent analyses have shown that aviation noise results in higher annoyance than other modes of transportation. Recent international social surveys have also generally shown higher annoyance than the Schultz Curve. These analyses and survey data indicate that the Schultz Curve may not reflect the current U.S. public perception of aviation noise:



To ensure that FAA's continued efforts to reduce the effects of aircraft noise exposure on communities is based upon accurate information, FAA conducted a nationwide survey to measure the relationship between aircraft noise exposure and annoyance in communities near airports. This survey would capture the community response to a modern fleet of aircraft as they are being flown today and it would use best practices in terms of noise analysis and data collection. The responses from the survey have been used to create a new National Curve.

The Survey results show that there has been a substantial change in the public perception of aviation noise, relative to the Schultz Curve, and will ultimately inform future FAA noise initiatives.

METHODOLOGY

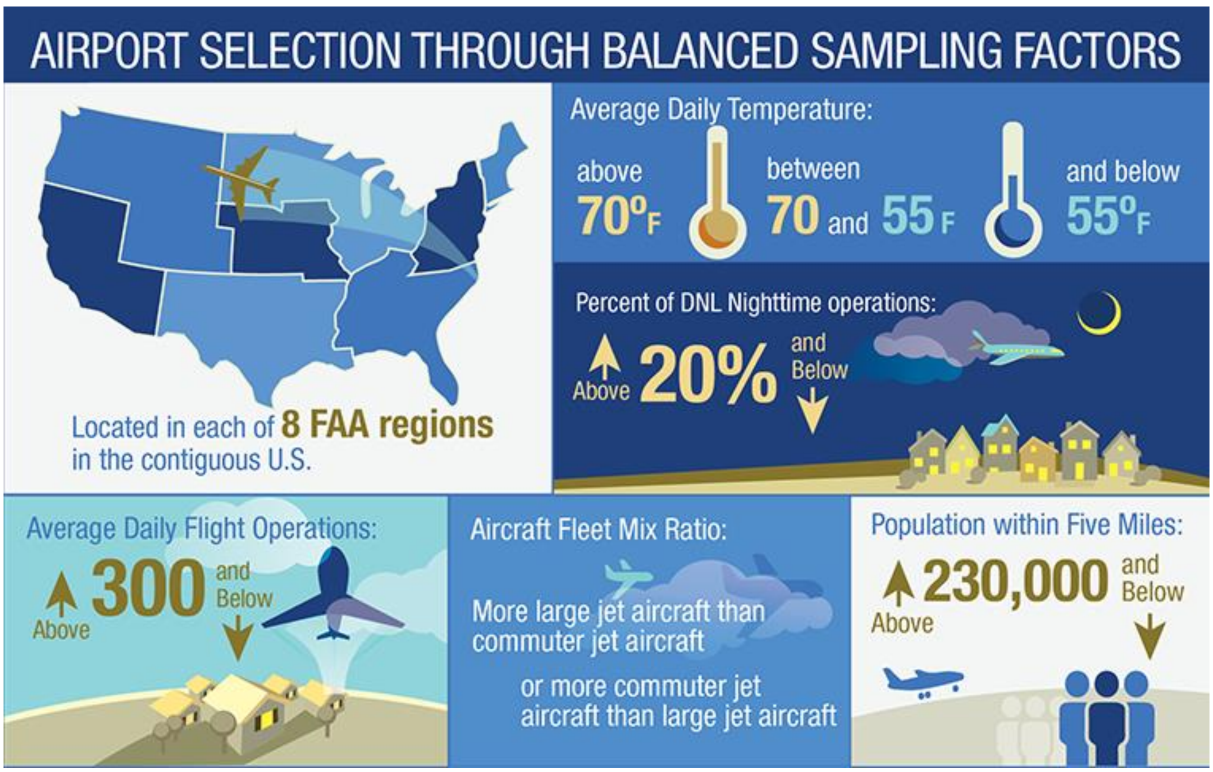
OVERVIEW

The FAA surveyed more than 10,000 residents living near 20 representative airports via a mailed questionnaire. The questionnaire was presented to the public as a *Neighborhood Environmental Survey* and asked the recipient if different environment concerns bother, disturb, or annoy them. Noise from aircraft was one of the thirteen environmental concerns that were covered in the Survey. Since the aircraft noise question was one of 13 environmental concerns listed, the recipient did not know this was in fact an airport community noise survey. The data from the Survey, the single largest survey of this type undertaken at one time, was used to calculate the new National Curve and provides a contemporary picture of response to aircraft noise exposure. A follow up phone survey was also offered to the 10,000 mail survey respondents, and just over 2,000 elected to participate. The phone survey was designed to provide additional insights on how the mail survey respondents feel about aircraft noise.

METHODOLOGY SPECIFICS:

Airport Selection -- At the outset of the work, the FAA assembled a team of statisticians, survey experts and aircraft noise experts to determine the best methods for conducting the survey. The team decided to survey communities around a representative set of airports. A statistical approach was used to develop a set of airports that would be representative of the entire nation. A total of 95 airports met the initial criteria that ensured the selected airports would have a minimum number of jet aircraft operations and households exposed to noise:

From the 95 airports meeting the initial criteria, a final set of 20 airports was selected for the survey by using a method referred to as "balanced sampling." The FAA chose a set of six factors to ensure that the 20 airports selected for the survey shared the same characteristics as the original set of 95 airports.



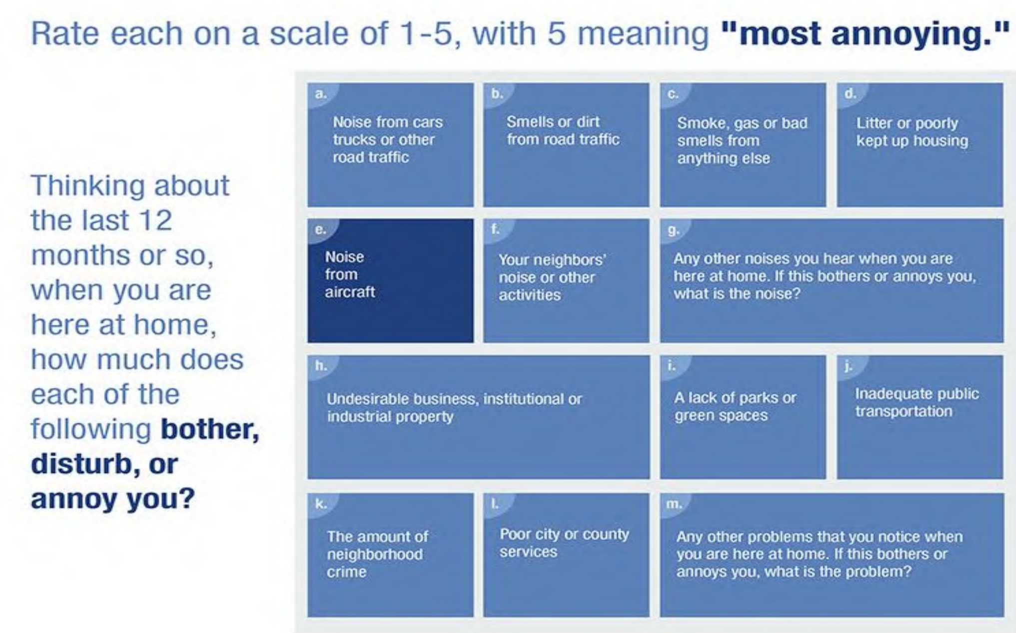
<u>Population Selection</u> -- For each of the 20 airports selected, household addresses were considered based on their aircraft noise exposure. A DNL of 50 dB was chosen as the minimum noise exposure to be eligible for inclusion in the survey. In order to ensure households exposed to a range of noise levels were considered, the Survey aimed to obtain a distribution of respondents in five groups of 5-decibel increments (50-55 DNL dB, 55-60 DNL dB, etc.). Of the selected airports, there was a smaller pool of households exposed to noise levels above DNL 65dB than households exposed to lower noise levels. The drop-off in households for noise levels above DNL 70dB was even more pronounced. As a result, the number of respondents for these noise levels were smaller than the other categories.

Total Number of Survey Responses	
DNL dB Categories	**Survey Respondents**
50-55	3,592
55-60	3,481
60-65	2,016
65-70	914
70+	325
Total	**10,328**

<u>Mail Survey Data Collection</u> -- The U.S. Postal Service Computerized Delivery Sequence File (CDSF) was used to develop the addresses to which the Survey would be sent. The Survey was distributed to each selected household by the U.S. Postal Service (and via express mail in some cases) in six separate "waves" over a 12-month period starting in October 2015. English and Spanish versions were distributed to each household, along with a pre-paid $2 gift card as an incentive. The survey was sent to 40,000 households and over 10,000 people responded to the Survey by filling out the questionnaire and sending it back to the research team.

The survey questionnaire followed the recommendations of the leading international research organization on noise-induced effects on human beings. It included the key question: "Thinking about the last 12 months or so, when you are here at home, how much does each of the following bother, disturb, or annoy you?" For this question there were 13 different environmental topics, and survey respondents were asked to rate their annoyance on a scale from one to five (five being most annoyed).

Response data from questions were then analyzed, but with the focus placed on the responses to item "e" in the list, namely "Noise from Aircraft." This question is highlighted in the figure below for clarity, but all questions were presented equally in surveys issued to respondents.



<u>Phone Survey Data Collection</u> -- Mail survey respondents were also invited to participate in a follow up phone survey. A $10 gift card was offered as an incentive and approximately two thousand respondents agreed to participate. The phone survey included a wide range of questions designed to provide further information about the reasons why respondents may be concerned about aircraft noise. While the results are insightful, it is important to note that the phone survey findings do not maintain the same statistical robustness as the primary mail survey.

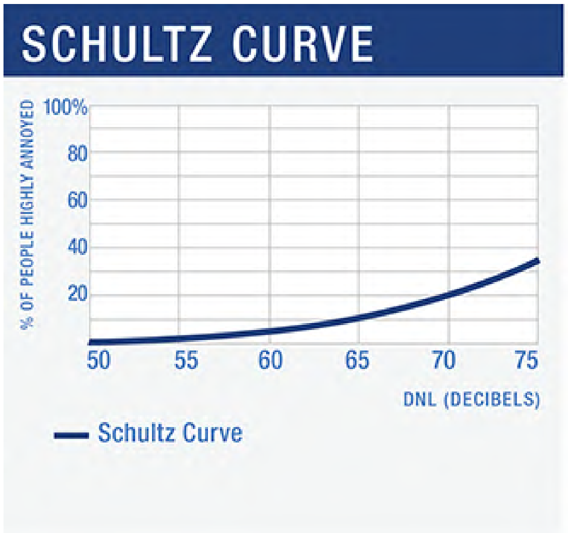
Noise Modeling **--** Using the FAA's Integrated Noise Model (INM), DNL was computed twice for each airport. Note that although INM was replaced in 2015 by the FAA's Aviation Environmental Design Tool (AEDT), the noise modeling for the survey had begun prior to the release of AEDT and had been used to inform the selection the respondents. The use of INM was maintained for consistency throughout the project.

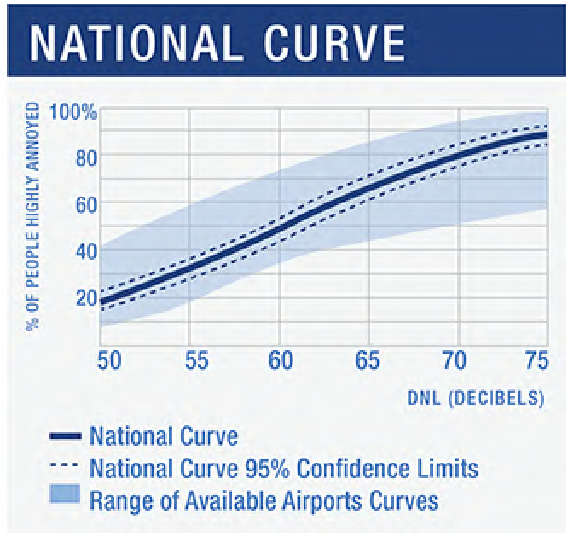
The first DNL computation determined which addresses would receive the mail Survey. To determine the noise model inputs, a year of radar flight tracking data from 2012-2013 was used, which includes data detailing aircraft flight paths, runway usage, time of day flight occurrences, and aircraft type.

The second DNL computation for each of the 20 airports adjusted these inputs to reflect actual 2015 aircraft operations levels. This coincided with the Survey distribution. Updated noise levels were then paired with the Survey response data to create the National Curve.

RESULTS

A new National Curve was created by combining the Survey responses from the question on "Noise from Aircraft" with the modeled aircraft noise levels. Compared with the existing Schultz Curve, the new National Curve shows a substantial increase in the percentage of people who are highly annoyed by aircraft noise over the entire range of aircraft noise levels considered, including at lower noise levels.





The new Survey was designed to use a consistent approach across each airport community surveyed. This has allowed for an enhanced ability to provide additional statistical information about the new results, such as the 95% Confidence Limits and range of results from each of the 20 airports, as shown on the plot above. This was not possible with the older Schultz Curve.

When comparing the two curves, a variety of factors should be considered. Both analyses were conducted using the best survey data and understanding available at their time. However, many changes and advances have occurred in the 40 years since the Schultz Curve was created.

Potential factors for these differences still need to be explored; but to provide additional insight, mail survey respondents were also invited to participate in a detailed phone survey aimed at understanding the underlying reasons for annoyance to aircraft noise. The majority of phone survey respondents who were likely to be annoyed by aircraft noise indicated that they have experienced being "Startled", "Frightened", or "Awakened" by aircraft at home. Those who were bothered, disturbed, or annoyed by "General Traffic Noise" or "Smells" were also more likely to be annoyed by aircraft noise.

For additional information on the Survey, the FAA has prepared a detailed technical report:

PUBLIC COMMENTS REQUESTED

The FAA has issued a Federal Register Notice (FRN) to share the breadth of ongoing efforts at FAA on aircraft noise and to seek comment from the public [***NB: this link will take you to the information set forth above in Part I of this memo***]. The FAA recognizes that a range of factors may be driving the increase in annoyance shown in the Neighborhood Environmental Survey results compared to earlier transportation noise annoyance surveys. Within the FRN, the FAA is requesting input on the factors that may be contributing to the increase in annoyance shown in the survey results. The FAA is also interested in hearing from the public on what, if any, additional investigation, analysis, or research should be undertaken to inform FAA noise policy.

[ADDENDUM] AIRPORT NOISE REPORT ALERT

Airport Noise Report (ANR), the only newsletter published exclusively for those interested in the complex topic of aircraft noise, reports that the FAA recently released the findings of its long-awaited Neighborhood Environmental Survey, which was conducted to improve the agency's understanding of community response to aircraft noise and help determine if the FAA needed to update its 40-year-old aircraft noise policy.

The FAA survey, done to assess community annoyance to aircraft noise, consisted of over 10,000 mail responses in communities around 20 unnamed "statistically representative" airports across the United States. It is the single largest survey of its kind undertaken at one time.

The survey results are stunning, notes the *ANR*:

Comparing the percent of population highly annoyed due to noise exposure in the updated "Schultz Curve" – which serves as the basis for FAA's current almost 40-year-old aviation noise policy – and the new Neighborhood Environmental Survey (NES) shows the following:

- At a noise exposure level of DNL 65 dB, the updated Schultz Curve indicated that 12.3 percent of people were highly annoyed, compared to between 60.1 percent and 70.9 percent within a 95 percent confidence limit from the NES.

- At a noise exposure level of DNL 60 dB, the updated Schultz indicated that 6.5 percent of people were highly annoyed, compared to between 43.8 percent and 53.7 percent within a 95 percent confidence limit from the NES.

- At a noise exposure level of DNL 55 dB, the updated Schultz Curve indicated that 3.3 percent of people were highly annoyed, compared to between 27.8 percent and 36.8 percent within a 95 percent confidence limit from the NES.

- At a noise exposure level of DNL 50 dB, the updated Schultz Curve indicated that 1.7 percent of people were highly annoyed, compared to between 15.4 percent and 23.4 percent within a 95 percent confidence limit from the NES.

FAA said it is "now considering the full NES results, in conjunction with additional research findings as they become available, to determine how they may inform its noise policy considerations."

The NES findings were included in a Jan. 13 FAA Federal Register notice inviting public comment by March 15 on the scope and applicability of various agency research initiatives on the effects of aircraft noise on individuals and communities; noise modeling and metrics; and reduction, abatement, and mitigation of aviation noise.

FAA said it "will not make any determinations based on the findings of these research programs for the FAA's noise policies including any potential revised use of the Day-Night Average Sound Level (NDL) noise metric, until it has carefully considered public and other stakeholder input along with any additional research needed to improve the understanding of the effects of aircraft noise exposure on communities.

To download the FAA's Federal Register notice, google:

Overview of FAA Aircraft Noise Policy and Research Efforts: Request for Input on Research Activities to Inform Aircraft Noise Policy

END

January 20, 2021

From
Lydia Kou
To
SCSC Roundtable
Message

RE: Panelist for SCSC Airport/Community Roundtable

Dear Evan,

My apologies for not introducing you to the Mayor's new assignee to the Santa Clara Santa Cruz Roundtable, please meet Councilmember Greer Stone who is cc'ed in this email.

Thank you Evan for your services on the roundtable.

Kindest regards,

Lydia Kou - Council Member

January 21, 2021

From
Mike McClintok
To
SCSC Roundtable
Message

FWD: OAK Forum Presentation 1-20-2021
Forum members and all:

FYI. Attached are the presentations from the January 20, 2021 Forum meeting. Also, here are a couple of links that Durre Cowan of the FAA provided that might be useful:

Main FAA Noise Page: https://www.faa.gov/noise/

Noise Portal: https://noise.faa.gov/noise/pages/noise.html

Mike McClintock

Forum Facilitator

Attachment Name

20210121_Mike_McClintok_SCSCRoundtable_AircraftSpeedReport2Congress_HMMH_January2021_OAKFina

20210121_Mike_McClintok_SCSCRoundtable_Noise Portal Privacy Statement

20210121_Mike_McClintok_SCSCRoundtable_OAK Forum News Presentation 012021_FINAL

20210121_Mike_McClintok_SCSCRoundtable_OAK Forum -Noise Portal_01202021

20210121_Mike_McClintok_SCSCRoundtable_Report to Congress on Airport Noise   Mitigation and Safety Study -- 12.23.20

Evaluation of Speed on Aircraft Noise

FAA Report to Congress – December 2020

Includes MIT Report ICAT-2020-03, April 2020

FAA Report to Congress

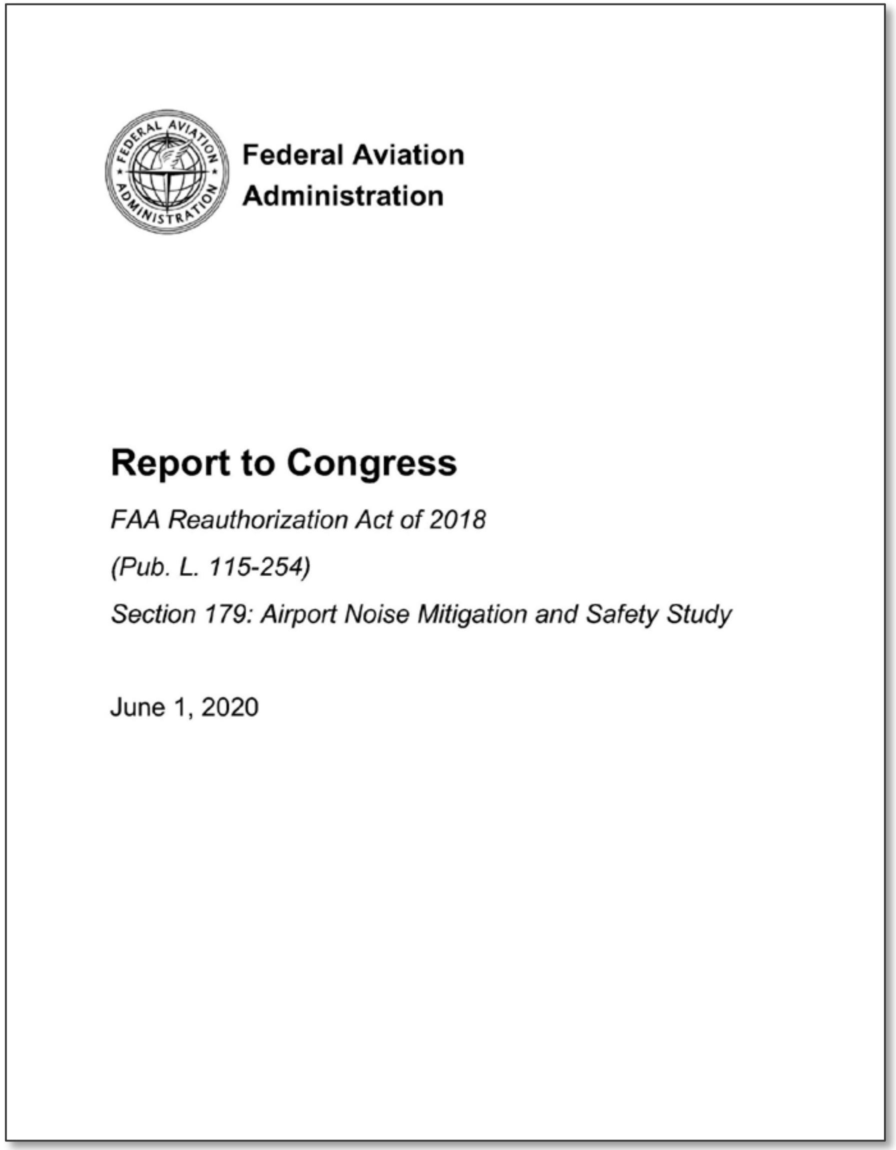
Provided to four members of Congress via letters on December 23, 2020

- Committee on Commerce, Science, and Transportation
  - Roger Wicker (R-MS), Chairman
  - Maria Cantwell (D-WA), Ranking Member
- Committee on Transportation and Infrastructure
  - Peter A. DeFazio (D-OR), Chairman
  - Sam Graves (R-MO), Ranking Member

Presentation Outline

- FAA Reauthorization Act of 2018, Section 179
- Aircraft Noise Sources
- Takeoff Noise
- Approach Noise
- Report Conclusions

https://www.faa.gov/about/plans_reports/congress/media/Airport_Noise_Mitigation_Safety_Study_report_PL115-254_Sec179.pdf



Federal Aviation Administration

Report to Congress

FAA Reauthorization Act of 2018

(Pub. L. 115-254)

Section 179: Airport Noise Mitigation and Safety Study

June 1, 2020

FAA Reauthorization Section 179 Requirements

1. Review and evaluate existing studies and analyses of the relationship between jet aircraft approach and takeoff speeds and corresponding noise impacts on communities surrounding airports
2. Determine whether a decrease in jet aircraft approach or takeoff speeds results in significant aircraft noise reductions
3. Determine whether the jet aircraft approach or takeoff speed reduction necessary to achieve significant noise reductions jeopardizes aviation safety; or decreases the efficiency of the National Airspace System, including lowering airport capacity, increasing travel time, or increasing fuel burn
4. Determine the advisability of using jet aircraft approach or takeoff speeds as a noise mitigation technique
5. Determine whether any metropolitan areas specifically identified in Section 189 (b)(2) of the Act would benefit without significant impact to aviation safety or the efficiency of the National Airspace System

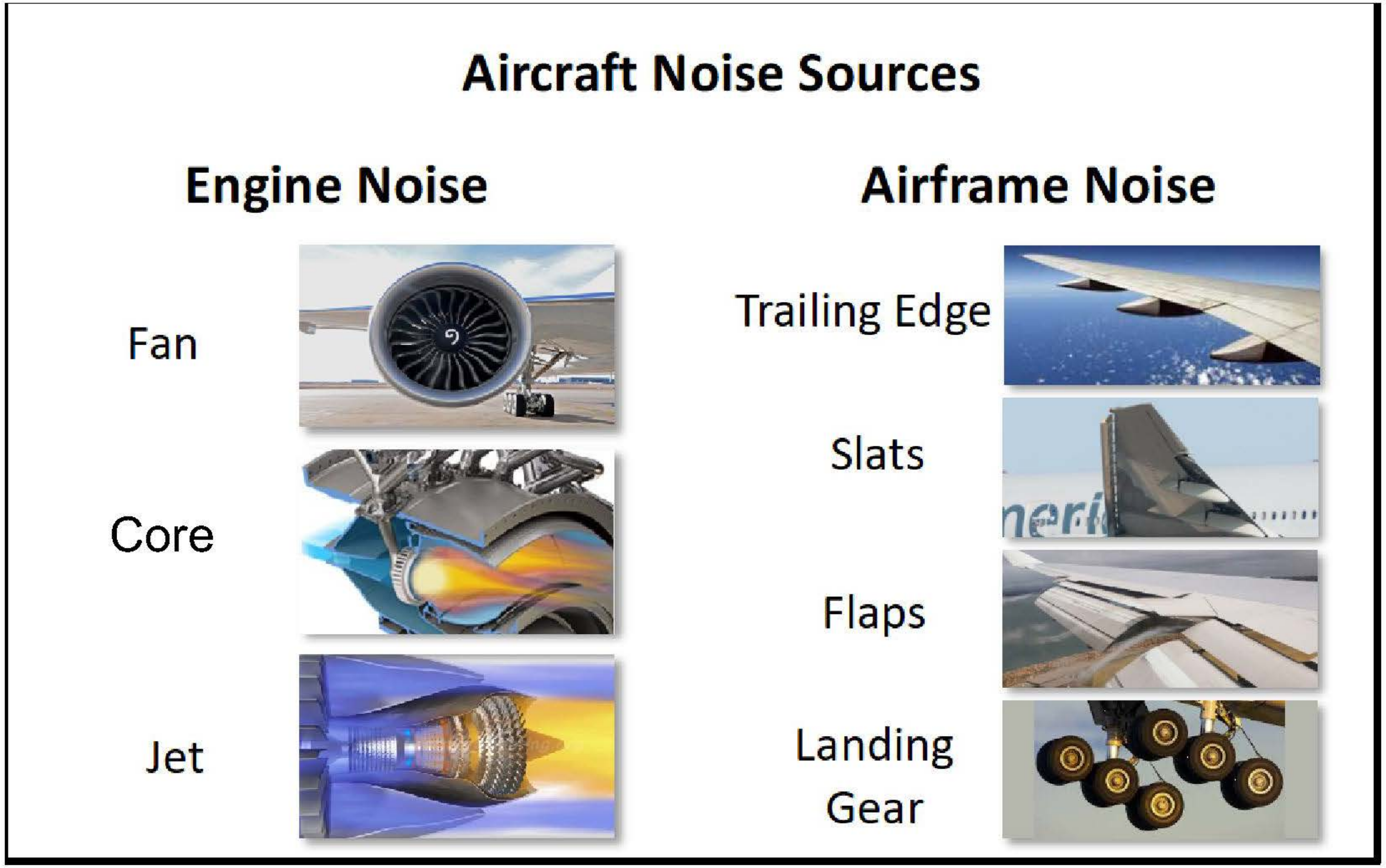


Fig. 1 Primary Conventional Turbofan Aircraft Noise Sources

Source: *Evaluation of the Impact of Transport Jet Aircraft Approach and Departure Speed on Community Noise*, MIT International Center for Air Transportation Report No. ICAT-2020-03, April 2020.

Aircraft Noise Sources

Takeoff Noise

- Engines continue to be the dominant noise source during jet aircraft takeoffs
- Engine noise increases with:
  - Increased power setting
  - Increased difference between:
    - Speed of the high velocity jet airflow
    - Speed of the aircraft
- MIT evaluated the following jet aircraft takeoff scenarios with NASA's Aircraft Noise Prediction Program (ANOPP)
  - "Close-In" Noise Abatement Departure Profile (NADP 1) vs "Distant" Noise Abatement Departure Profile (NADP 2)
  - Reduced climb speed to maintain the aircraft at the minimum safe airspeed with flaps up until 10,000 feet in altitude

Takeoff Noise

Two jet aircraft takeoff scenarios evaluated:

1. Changing the location of the start of acceleration and flap retraction through NADPs
2. Reduced climb speed to maintain the aircraft at the minimum safe airspeed with flaps up until 10,000 feet in altitude

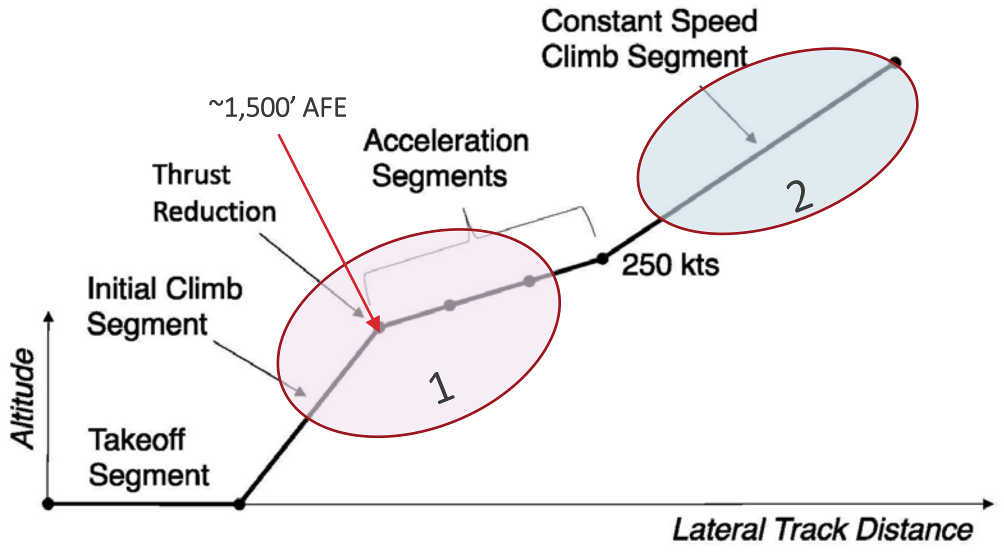


Fig. 4 Typical Departure Procedure Divided into Segments, Consistent with NADP 2.

Sources: (1) *Evaluation of the Impact of Transport Jet Aircraft Approach and Departure Speed on Community Noise*, MIT International Center for Air Transportation Report No. ICAT-2020-03, April 2020. (2) HMMH annotations (red arrow and red outlined ellipses).

Results of Takeoff Noise Evaluation

1. NADP Evaluation

Changes in the acceleration location on departure results in minimal (likely not noticeable) noise reduction

2. Reduced Climb Speed

Because the noise is dominated by the engines during the climb, the climb speed does not have a significant effect on noise

Approach Noise

- Airframes have become a more dominant noise source during jet aircraft approaches
- Airframe noise sources are highly sensitive to aircraft speed and speed is tightly coupled to the deployment of flaps, slats and landing gear
- MIT evaluated a delayed deceleration approach (DDA) concept with NASA's Aircraft Noise Prediction Program (ANOPP)

Pros and Cons of DDA Concept

Pros

- Reduced noise from engines and airframes 10 to 25 miles from touch down
- Reduced fuel burn due to:
  - Reduced flight times
  - Lower engine thrust settings

Cons

- Ideal deceleration profile varies by:
  - Aircraft type
  - Weight
  - Weather
- Varying deceleration rates poses a challenge to air traffic controllers in terms of:
  - Sequencing
  - Spacing

Report Conclusions

- Takeoff
  - Changes in aircraft climb speed after initial acceleration do not noticeably affect the overall aircraft takeoff noise due to the dominance of engine noise
- Approach
  - Delaying the deceleration of the aircraft on approach could reduce noise between 4 and 8 dB (noticeable) 10 to 25 miles from touch down
  - Additional work is required to validate this potential noise benefit and resolve implementation challenges

hmmh

Questions/Discussion

Presented by Sarah Yenson, HMMH

Privacy Statement

This notice is provided in accordance with the Privacy Act, 5 U.S.C. 552a (e) (3), and concerns the information requested on this web form. AUTHORITY: 44 U.C.S. 3101; Public Law 112-95, Section 341 (3)(A). FAA Modernization and Reform Act of 2012 PRINCIPAL PURPOSE(S): This information will be used to investigate reports of alleged violations involving aviation safety. ROUTINE USE(S): This information may be shared with the Agencies within the Department of Transportation with areas of responsibility for issues being reported, or pursuant to the routine uses identified in the System of Records Notice DOT/FAA 845, Administrator's Correspondence Control and Hotline Information System. To see the routine uses go to https://www.transportation.gov/individuals/privacy/privacy-act-system-records-notices

DISCLOSURE: Voluntary; failure to furnish the requested information may result in an inability to thoroughly investigate your allegations and may therefore result in an inability to respond to your report.

Oakland Airport/Community Noise Management Forum

Noise News and Update

Christian Valdes

January 20, 2021

FAA

FAA IMPLEMENTS NEW ARRIVAL PROCEDURE AT JFK TO REDUCE NOISE ON LONG ISLAND

NY Senator Charles Schumer (D) and Rep. Tom Suozzi (D) announced Dec. 7 that aircraft noise over Long Island will be reduced by procedural changes for aircraft flying into John F. Kennedy International Airport that the FAA has ordered.

The new arrival procedures, which apply only to aircraft arriving on Runway 22 at JFK, will reduce noise over the communities of Huntington Station, Huntington, East Norwich, Old Brookville, Roslyn, East Williston, and New Hyde Park, they said in a joint statement.

Under the new procedure, all aircraft flying into JFK must maintain the highest operational altitude as long as possible when conditions, traffic volume, and workload permit. All aircraft landing at JFK must remain at or above 3,000 feet until they are within 15 miles of the airport.

- Arriving aircraft noise over Long Island, NY will be reduced.
- Aircraft must maintain highest operational altitude as long as possible.
- At or above 3,000 feet until 15 miles from JFK.
- FAA actions mark a huge relief for thousands of residents.

737 MAX

- FAA Administrator signed order to remove the MAX's grounding
- Before returning to service:
  - Design changes must be made.
  - FAA must approve pilot training program revisions for each airline.
  - Maintenance of parked MAX's.

Supersonic

KANSAS DOT, FAA TO ESTABLISH SUPERSONIC TRANSPORTATION CORRIDOR OVER STATE

The Kansas Department of Transportation (KDOT) and the FAA have finalized an agreement to establish the Kansas Supersonic Transportation Corridor (SSTC) for use in testing non-military aircraft that fly faster than the speed of sound, Kansas Gov. Laura Kelly (D) announced Dec. 18.

"To be able to deliver this new opportunity for our country is yet another example of Kansas cementing its reputation as a national leader in the aviation industry," Gov. Kelly said. "This high-altitude flight corridor gives Kansas a strategic advantage in attracting companies involved in the development of supersonic aircraft, and will play a significant role in our state's ability to encourage economic development as we recover from the COVID-19 pandemic."

- The Kansas Supersonic Transportation Corridor (SSTC) will be used by non-military aircraft testing supersonic flight.
- Industry forecasts 300 supersonic aircraft in 10 years.
- $40 billion in revenue and numerous jobs.
- 770-mile racetrack-shaped corridor at 39,000 feet.
- Place to test NASA's "quiet boom" technology.

Technology

VERDEGO, EMBRY-RIDDLE TEAM TO MITIGATE E-AIRCRAFT NOISE

VerdeGo Aero, a hybrid-electric aerospace powertrain firm and tenant in Embry-Riddle Aeronautical University's Research Park in Daytona Beach, Florida, has teamed up with the university to develop and commercialize patent-pending technology designed to mitigate electric aircraft noise.

Under an exclusive option agreement, VerdoGo Aero CEO Eric Bartsch and Executive Chair Erik Lindbergh will further develop the Embry-Riddle technology for commer-

- Team will develop technology to reduce electric aircraft noise.
- Propellers and rotors are relatively noisy.
- Technology will automatically adjust the pitch of propeller and motor torque to maintain constant thrust.
- Will be applied to UAM's.
- "Lower-noise mode" similar to Blue Thunder.

Emissions

EPA Finalizes Airplane Greenhouse Gas Emission Standards

In this action, the Administrator is adopting greenhouse gas (GHG) emission standards that apply to certain new commercial airplanes, including all large passenger jets. These standards match the international airplane carbon dioxide (CO_2) standards adopted by the International Civil Aviation Organization (ICAO) in 2017. This action implements EPA's authority under the Clean Air Act and assures the worldwide acceptance of U.S. manufactured airplanes and airplane engines.

- First time EPA has regulated planet-warming emissions.
- Apply to new aircraft designs as of Jan. 2020 and to in-production aircraft in 2028.
- Final Rule would align the US with ICAO emission standards.
- New aircraft in 2016 would meet the 2028 standard.
- EPA to skip 30-day waiting period, preventing Biden administration from strengthening it.

Land Use

RDU OPPOSES LAND USE CHANGE ALLOWING RESIDENTIAL DEV. IN OVERLAY DISTRICT

The Raleigh-Durham Airport Authority informed the Morrisville, NC, Town Council Oct. 15 that it strongly opposes a proposed change to the Town's 2009 Land Use Plan that would authorize multi-family residential development in areas within RDU's existing Airport Overlay District (AOD).

Such a change would expose residents to high noise levels and frequent over-flights from arriving and departing aircraft, the Airport Authority told the Town Council.

- Town of Morrisville, NC proposed changes to its 2009 Land Use Plan that would allow residential development.
- Residents would be subject to high aircraft noise levels and frequent overflights.
- Expose RDU and the Town to future legal and financial risks.

Land Use

COUNTY APPROVES HOMES IN 65 CONTOUR OF UPDATED NOISE MAP IT IS IGNORING

On a vote of 7 to 3, the Fairfax County, VA, Board of Supervisors on Nov. 17 approved an application to build 134 townhomes four miles from the end of the main runway at Dulles International Airport and directly under its flight path where future townhome buyers will be subject to over 200 overflights day and night from aircraft flying about 950 feet above their heads.

Rooftop terraces are optional.

- Fairfax County, VA Board of Supervisors rezoned 12-acre lot from commercial to high-density residential.
- Area is in the 1993 60 DNL, but in the 2019 65 DNL.
- Residents will be subject to 200 daily overflights at 950 feet.
- Only 1 Supervisor had sole authority to consider the 2019 updated noise map.

UAM

NASA BEGINS FLIGHT TESTING CAMPAIGN FOR FUTURE AIRSPACE MOBILITY

The project describes the process as "anchor and evolve" – the helicopter represents the anchor of current FAA standards required for helicopters to fly today. Testing with industry will then evolve from these standards to mimic what an eVTOL will need to safely fly.

During the flight testing, test pilots will be flying the helicopter in ways based on how the project thinks eVTOLs will fly in the future. This includes flying terminal operations with representative real-time eVTOL flight plans and trajectories while testing interactions with a third-party airspace service provider.

- Advanced Air Mobility National Campaign began flight testing.
- Helicopter as a surrogate UAM.
- Evolving current standards to create a viable market.
- Related News: The FAA's BEYOND Program.

Noise Compensation

NEW LAW COMPENSATES FOR AIRPORT NOISE WITHOUT LAWSUIT

The South Korean Cabinet approved a law on Nov. 17 that will provide monetary compensation monthly to residents suffering from noise from military airports and shooting ranges without their need to sue.

Under the law, people residing near military airports and ranges are entitled to receive up to 60,000 won ($52.40) per person per month without filing a lawsuit, the *South Korean Herald* reported Nov. 17.

- South Korean law will provide compensation to residents near military airport and shooting ranges.
- Residents will receive approximately $52 USD monthly.
- Law will be reviewed every 5 years.
- Two U.S. military bases are subject to this law.

FAA – NES

FAA Home ▸ Regulations & Policies ▸ Policy & Guidance ▸ Aviation Noise ▸ Neighborhood Environmental Survey

Neighborhood Environmental Survey

FAA conducted a nationwide survey regarding annoyance related to aircraft noise and seeks public comment. Please review the survey introduction, read the survey report, and provide your comments.

As part of FAA's ongoing research program on aircraft noise, the Agency conducted a nationwide survey regarding annoyance related to aircraft noise. Below is an introduction to the survey and an overview of the methodology, results, and public comments requested.

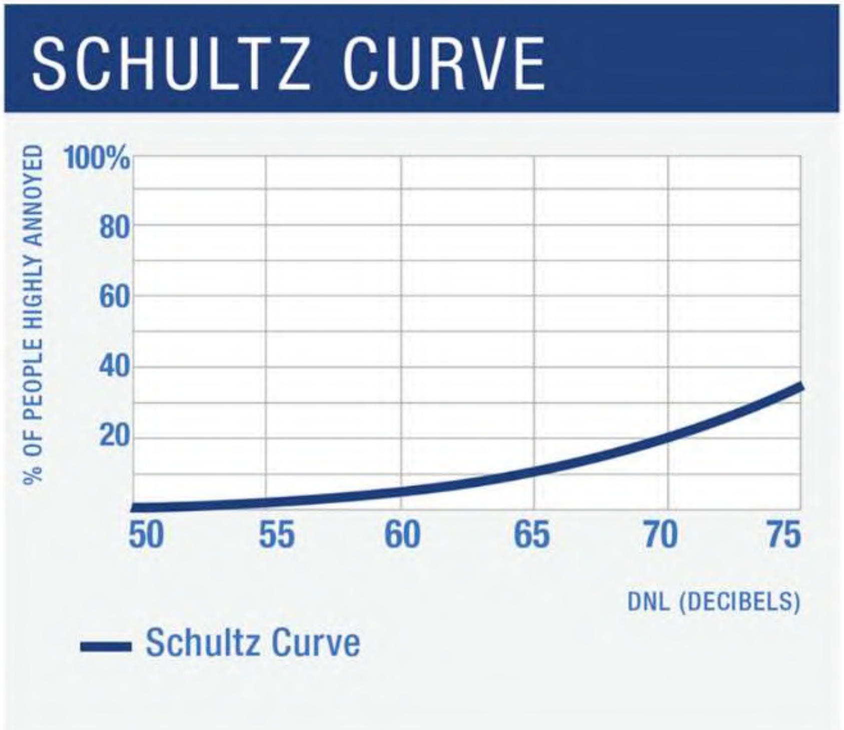
2/3 OF PEOPLE IN 65 DNL CONTOUR ARE HIGHLY ANNOYED BY AIRCRAFT NOISE, SURVEY SHOWS

In a Jan. 13 *Federal Register* notice, FAA released the findings of its long-awaited Neighborhood Environmental Survey, which was conducted to improve the agency's understanding of community annoyance with aircraft noise and to help determine if the FAA needs to update its 40-year-old aircraft noise policy.

The survey results are stunning.

Comparing the percent of populations highly annoyed due to noise exposure predicted in the 1992 updated "Schultz Curve" – which serves as the basis for FAA's current aviation noise policy – with the percent of the population found to be highly annoyed to aircraft noise in the new Neighborhood Environmental Survey (NES) shows the following:

NES - Introduction



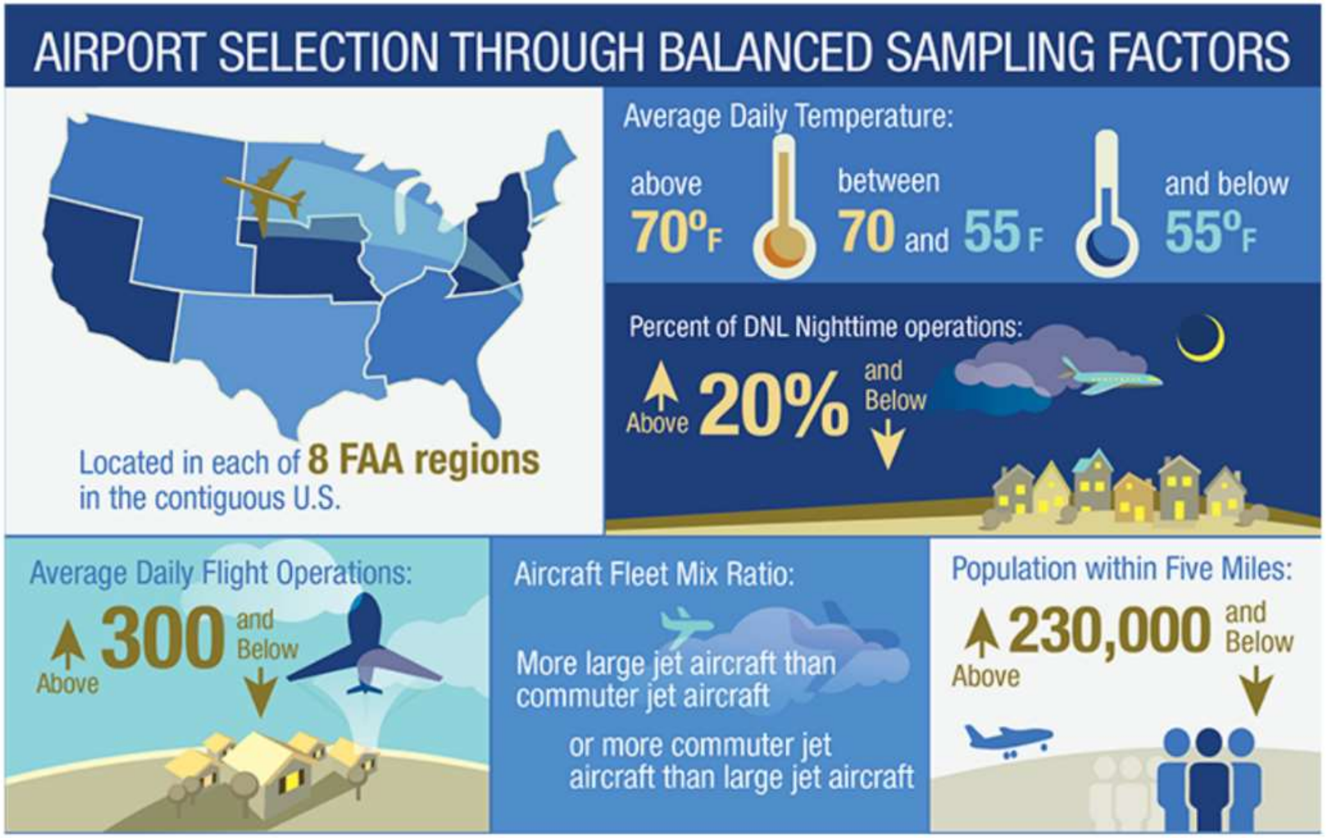
Source: FAA (2021)

- Developed in 1979
- Revalidated in 1992
- International research show higher annoyance levels
- Survey, led by HMMH, was used to create a new National Curve

NES - Methodology

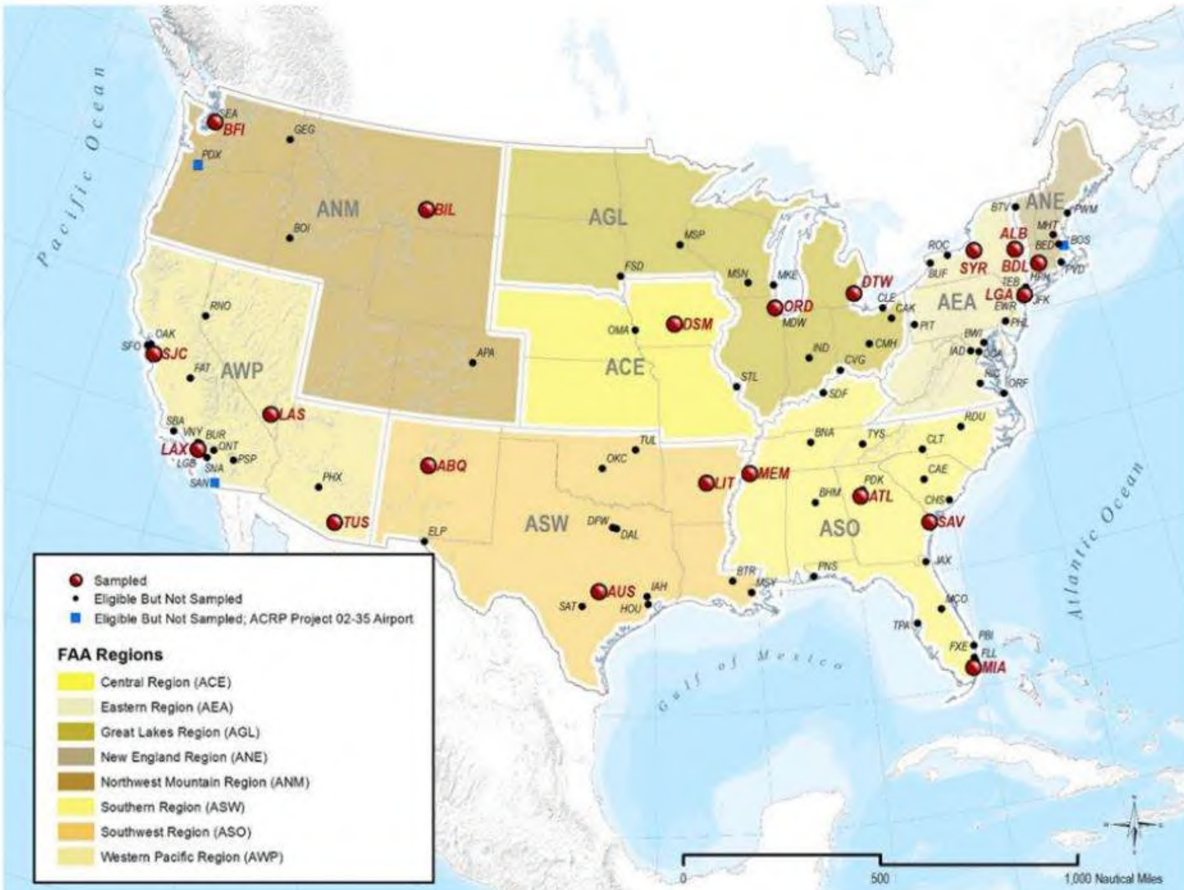
Source: FAA (2021)

NES - Methodology



Source: FAA (2021)

NES - Methodology



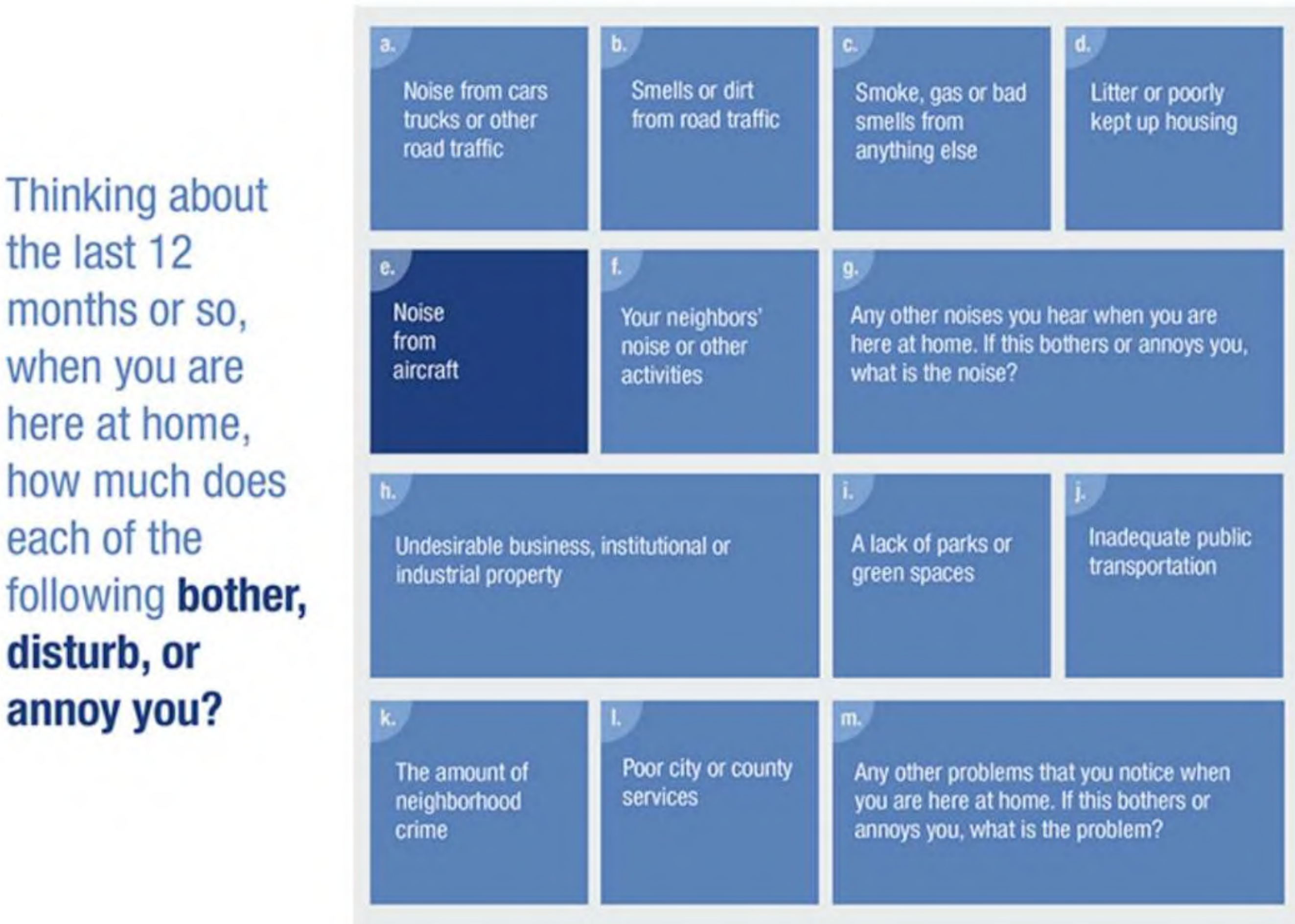
Source: FAA (2021)

- 10,328 responded (40% response rate)

Total Number of Survey Responses	
DNL dB Categories	**Survey Respondents**
50-55	3,592
55-60	3,481
60-65	2,016
65-70	914
70+	325
Total	**10,328**

Source: FAA (2021)

NES - Methodology

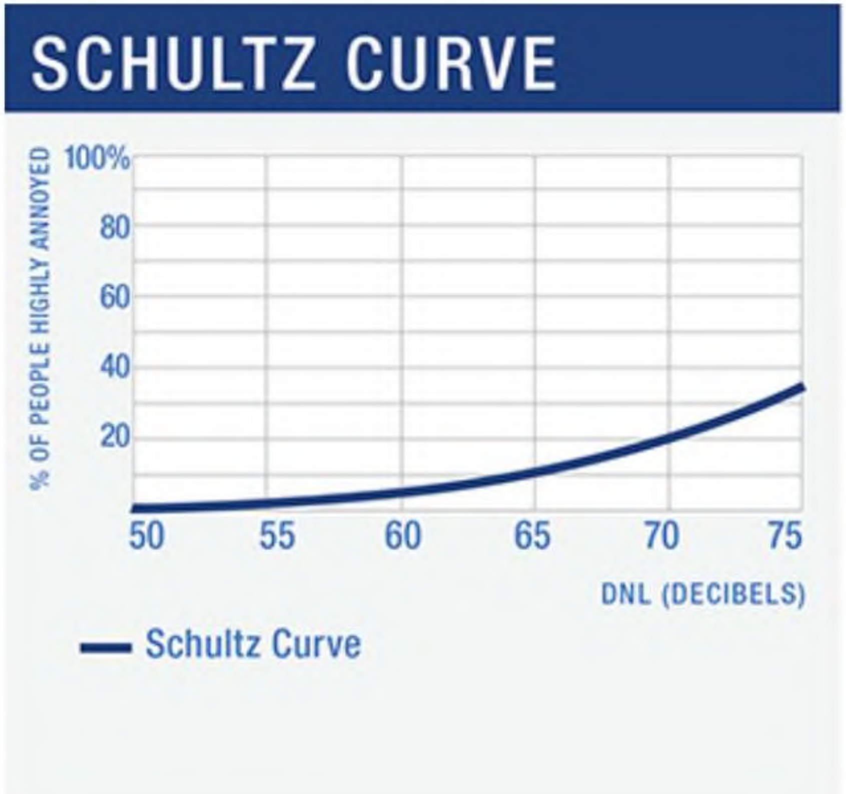


Source: FAA (2021)

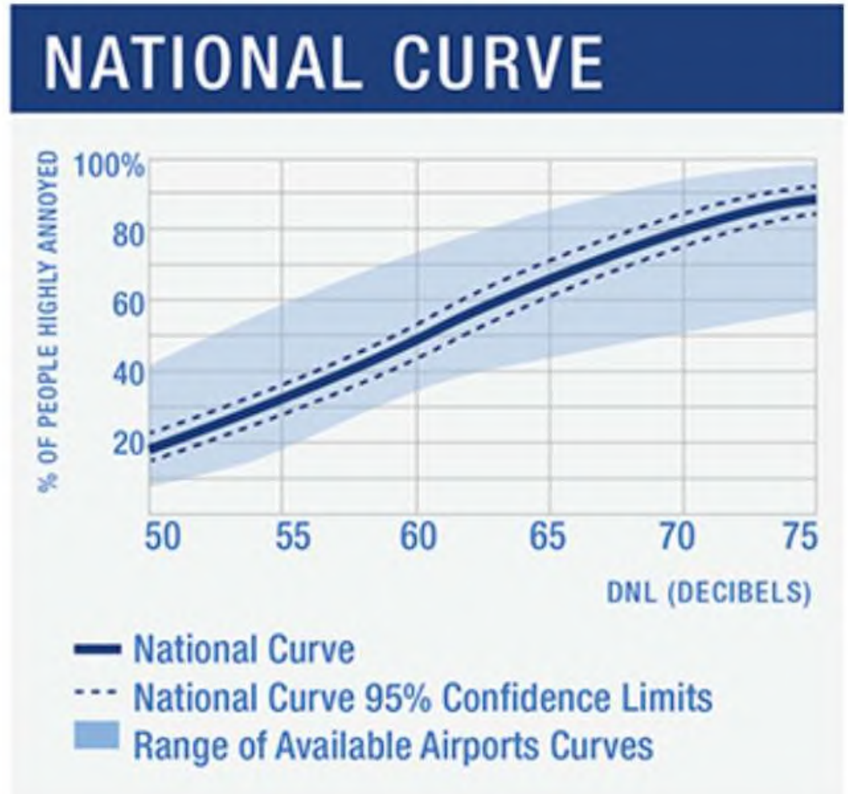
- Scale from 1 to 5
- “very” or “extremely”

- “highly annoyed” to noise from aircraft

NES - Results



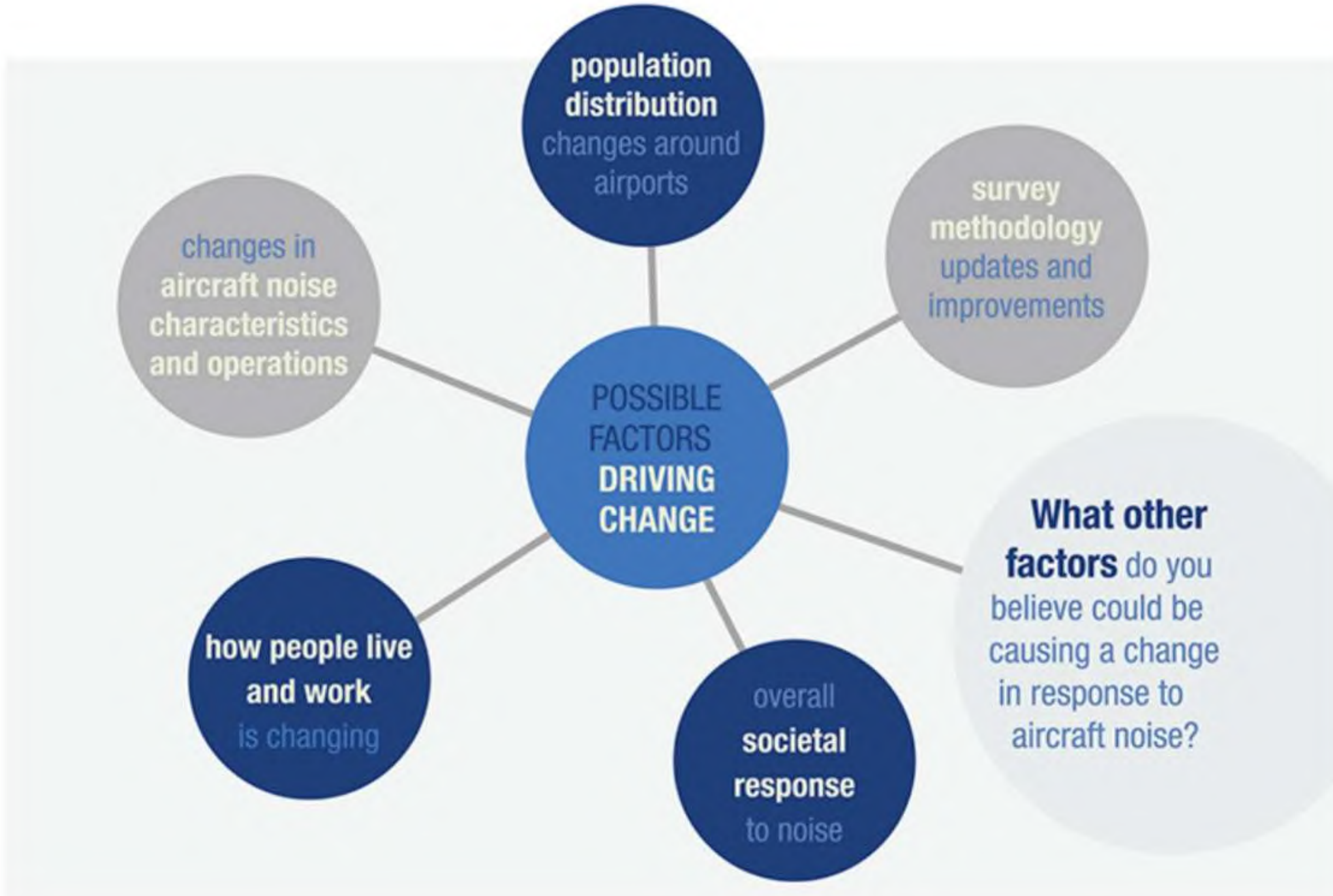
Source: FAA (2021)



Source: FAA (2021)

- At 65 dB DNL, increase from 12.3% to 60.1 - 70.9%
- At 60 dB DNL, increase from 6.5% to 43.8 - 53.7%
- At 55 dB DNL, increase from 3.3% to 27.8 - 36.8%

Public Comments Requested



Source: FAA (2021)

Public Comments Requested

Source: FAA (2021)

Questions?

FAA Noise Portal

Partnering Airports Overview

Discussion with:

Oakland Airport/Community Noise Management Forum

Date: January 20, 2021

Noise Portal – Purpose and Goals

Purpose: *to identify how the FAA can more efficiently and effectively respond to and address noise complaints in a clear, consistent and repeatable manner that is responsive to the public and applies the best use of FAA resources.*

Part 1

Identify and implement improved and consistent agency-wide policy and procedures for the FAA's process to respond to noise complaints / inquiries, and

Part 2

Identify and evaluate potential actions that the FAA might take to better address the underlying issue raised by complaints, particularly regarding the implementation of NextGen procedures.

Noise Portal Process (FAA Roles & Responsibilities)

FAA Office of the Environment and Energy

Responsible for establishing and maintaining FAA's noise complaint process, the Noise Complaint/Inquiry Database and Tracking System (Noise Portal), and national aircraft noise website

FAA Regional Administrator Offices

Act as the single data collection and coordination point at the regional level for public noise complaints/inquiries and establish and maintain regional aircraft noise websites

FAA Noise Ombudsman

Addresses unresolved complaints at the Regional Administrator level

Regional Administrator Offices and Noise Ombudsman

Coordinate responses to the public with the relevant FAA Lines of Businesses and Staff Offices

FAA Community Engagement Officer

Key team members for planning, implementing and managing community engagement related to aviation noise issues in their assigned areas

FAA Noise Portal Process (Public)

Information from incoming complaints is stored in an FAA database, and is updated automatically via the FAA Noise Portal entries. The FAA Noise Ombudsman addresses unresolved complaints at the regional level through the Noise Portal by reaching out to the FAA staff offices as needed.

1) Public reviews aircraft noise related information on FAA Regional Aircraft Noise Website

2) **Public submits noise complaint/ inquiry through FAA Aircraft Noise Complaint/ Inquiry System**

3) **FAA Regional Administrator's Office receives incoming complaint/ inquiry and coordinates response with responsible FAA staff office**

4) **Regional Administrator Office responds to public through the FAA Noise Portal**

5) Regional Administrator Office addresses FAA related issues and may direct the public to the airport sponsor for airport related issues

Why FAA is Partnering with Airports

1. **Minimize duplication of efforts**
2. **Avoid contradictory, inconsistent messaging**
3. **Set up channels for communication and information sharing**
4. **Strengthen relationships**

Example Process with Partnering Airport Concept

FAA Policy on Addressing Aircraft Noise Complaints / Inquiries from the Public

Introduction: Addressing aircraft related noise is a shared responsibility among the FAA, airport sponsors, airlines, state and local government, and communities.

Policy: FAA seeks to efficiently and effectively respond to and address FAA related aircraft noise complaints and inquiries from the public in a clear, consistent, and repeatable manner that is responsive and applies the best use of FAA resources.

Highlights from the FAA policy include:

- Establishing and utilizing the FAA website to provide the public with up-to-date information regarding on-going projects including FAQs, public meetings and educational information on FAA noise and policy issues.
- Identifying specific information the public must include for the FAA to fully address the complaints/inquiry.
- Utilizing the FAA Noise Portal for consistent reporting and tracking of noise complaints and inquiries.
- Accepting and registering noise complaints and inquiries with the necessary information submitted through the FAA Noise Portal, by postal mail, or by voice message.
- Not accepting noise complaints or inquiries from third party automated applications or devices.
- Not responding to the same general complaint or inquiry from the same individual more than once.
- Coordinating with partnering airport sponsors to share applicable noise complaint/inquiry data.
- Providing timely responses to aircraft noise and inquiries.
- Focusing on the content of the noise complaints/inquiries FAA receives not the volume

Questions

U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

December 23, 2020

The Honorable Roger Wicker
Chairman, Committee on Commerce,
Science, and Transportation
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

This letter transmits the Federal Aviation Administration (FAA) report to Congress under Section 179 of Public Law 115-254, the FAA Reauthorization Act of 2018 (the Act).

Section 179 directs the FAA to submit a report on the results of an Airport Noise Mitigation and Safety Study that includes the following:

(1) review and evaluate existing studies and analyses of the relationship between jet aircraft approach and takeoff speeds and corresponding noise impacts on communities surrounding airports;

(2) determine whether a decrease in jet aircraft approach or takeoff speeds results in significant aircraft noise reductions;

(3) determine whether the jet aircraft approach or takeoff speed reduction necessary to achieve significant noise reductions jeopardizes aviation safety; or decreases the efficiency of the National Airspace System, including lowering airport capacity, increasing travel times, or increasing fuel burn;

(4) determine the advisability of using jet aircraft approach or takeoff speeds as a noise mitigation technique; and

(5) if the Administrator determines that using jet aircraft approach or takeoff speeds as a noise mitigation technique is advisable, whether any of the metropolitan areas specifically identified in Section 189(b)(2) of the Act would benefit from such a noise mitigation technique without a significant impact to aviation safety or the efficiency of the National Airspace System.

We look forward to continued collaboration with your staff and would be happy to schedule time to brief you further if desired.

We have sent identical letters to Chairman DeFazio, Senator Cantwell, and Congressman Graves.

Sincerely,

Steve Dickson
Administrator

Enclosure

U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

December 23, 2020

The Honorable Peter A. DeFazio
Chairman, Committee on
Transportation and Infrastructure
House of Representatives
Washington, DC 20515

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Sincerely,

Steve Dickson
Administrator

Enclosure

U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

December 23, 2020

The Honorable Maria Cantwell
Ranking Member, Committee on Commerce, Science,
  and Transportation
United States Senate
Washington, DC 20510

Dear Senator Cantwell:

This letter transmits the Federal Aviation Administration (FAA) report to Congress under Section 179 of Public Law 115-254, the FAA Reauthorization Act of 2018 (the Act).

Section 179 directs the FAA to submit a report on the results of an Airport Noise Mitigation and Safety Study that includes the following:

(1) review and evaluate existing studies and analyses of the relationship between jet aircraft approach and takeoff speeds and corresponding noise impacts on communities surrounding airports;

(2) determine whether a decrease in jet aircraft approach or takeoff speeds results in significant aircraft noise reductions;

(3) determine whether the jet aircraft approach or takeoff speed reduction necessary to achieve significant noise reductions jeopardizes aviation safety; or decreases the efficiency of the National Airspace System, including lowering airport capacity, increasing travel times, or increasing fuel burn;

(4) determine the advisability of using jet aircraft approach or takeoff speeds as a noise mitigation technique; and

(5) if the Administrator determines that using jet aircraft approach or takeoff speeds as a noise mitigation technique is advisable, whether any of the metropolitan areas specifically identified in Section 189(b)(2) of the Act would benefit from such a noise mitigation technique without a significant impact to aviation safety or the efficiency of the National Airspace System.

We look forward to continued collaboration with your staff and would be happy to schedule time to brief you further if desired.

We have sent identical letters to Chairman Wicker, Chairman DeFazio, and Congressman Graves.

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Ranking Member, Committee on Transportation and
Infrastructure
House of Representatives
Washington, DC 20515

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Federal Aviation Administration

Report to Congress

FAA Reauthorization Act of 2018

(Pub. L. 115-254)

Section 179: Airport Noise Mitigation and Safety Study

June 1, 2020

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Introduction

In Section 179 of the Federal Aviation Administration (FAA) Reauthorization Act of 2018 (Public Law 115-254), Congress directed the FAA Administrator to:

(1) review and evaluate existing studies and analyses of the relationship between jet aircraft approach and takeoff speeds and corresponding noise impacts on communities surrounding airports;
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This document fulfills the requirement to submit to the appropriate committees of Congress a report on the results of the study.

The report in Appendix A was prepared by the Massachusetts Institute of Technology (MIT) International Center for Air Transportation (ICAT). The FAA Office of Environment & Energy has been working with MIT since 2015 through the ASCENT Center of Excellence for Alternative Jet Fuels and Environment. This research has focused on developing a noise analysis method with improved fidelity, accuracy, and utility for evaluation of advanced operational procedures. MIT has used this framework to evaluate candidate operational concepts for community noise reduction, with additional focus on identifying operational repercussions and implementation barriers. This research partnership formed the basis for the study contained in Appendix A on the relationship between jet aircraft speed and noise on approach and departure.

Report Summary

Aircraft noise can be broken out by engine and airframe noise sources. Historically, engine noise has been the dominant source, particularly for high power flight phases such as takeoff. However, as engines have become quieter due to technological advancements such as increased bypass ratio, airframe noise has become an increasingly important consideration for reduced power settings. During approach, the deployment of flaps, slats, and landing gear can be the dominant noise source depending on the specific aircraft and flight procedure. With respect to speed, engine noise generally increases with increased power setting, and also increases with increasing difference between the speed of the high velocity jet airflow and the speed of the aircraft. Airframe noise sources are highly sensitive to speed. Additionally, speed is tightly coupled to the aircraft configuration. At slower speeds, high-lift devices are deployed to reduce stall speed, which causes an increase in airframe noise.

Assessing these interdependent noise effects necessitates the use of a noise evaluation framework. The analysis requires a model that includes the effects of speed on each of the various aircraft noise components. While the Aviation Environmental Design Tool (AEDT) is the FAA's primary environmental tool for assessment of FAA actions subject to the National Environmental Policy Act (NEPA), it is not designed to capture some of the unique effects under consideration in this study. For this reason, MIT built a framework to utilize NASA's Aircraft Noise Prediction Program (ANOPP). ANOPP uses a combination of semi-empirical and physics-based methods to compute noise at the airframe and engine component level. ANOPP's ability to capture source noise impacts of various components as a function of more detailed aspects of a flight procedure (e.g., speed or configuration changes) makes it well suited for this study. In order to run ANOPP, MIT also integrated into their framework other tools and models to provide detailed aircraft geometry, engine performance, and flight procedure input information.

A typical departure consists of the aircraft accelerating as the flaps are retracted and thrust is reduced to a climb setting. This climb profile leaves two primary options to consider for varying speed in the departure phase for noise abatement: 1) changing the location of the start of acceleration and flap retraction, and 2) reducing the climb speed. MIT examined 1) through the lens of the standard ICAO Noise Abatement Departure Procedures (NADP) 1 and 2. NADP 1 is designed to benefit close-in communities, while NADP 2 is designed to benefit communities farther out from the airport. The procedures differ primarily in where the start of acceleration and flap retraction occurs, and so they are used as examples to show the impact of speed and configuration on departure noise. MIT conducted a noise comparison of example profiles that fit the NADP 1 and 2 parameters for representative narrow- and wide-body aircraft. The resulting analysis shows a small difference in noise between the two procedures (between 0.4 and 1.2 dBA).

The second departure concept examined by MIT is reduced climb speed. In a typical departure, once the aircraft is in a clean configuration (flaps, slats, and gear retracted), the aircraft continues to accelerate to 250 knots, which is the maximum speed permitted below 10,000 ft in the United States. The goal of the reduced climb speed concept is to maintain the aircraft at the minimum safe airspeed with flaps up until 10,000 ft, thereby reducing the highly speed-dependent clean airframe noise. Whether this effect is significant enough to be noticeable relative to the engine noise is dependent on how aerodynamically smooth the airplane is, i.e., how much noise is generated from the air flow over the wings. MIT's assessment of reduced speed climb profiles against nominal departure profiles for modern narrow- and wide-body aircraft shows minimal difference in noise (less than 0.5 dBA).

The above findings on speed are consistent with the fact that engine noise is dominant on departure. For modern aircraft, variations to aircraft speed, flap retraction, and acceleration altitude have minimal impact on the overall aircraft departure noise. For context, the minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. Aircraft on departure operate at moderate to high thrust levels, and thus engine noise is generally sufficiently loud that reductions in noise generated by the airframe through speed and configuration management fall below this detectability threshold. Additionally, non-standard speed procedures, such as reduced speed climbs, pose implementation and safety challenges that could negatively affect the operation of the airspace and may be costly to resolve. For these reasons, modifying speed on departure does not appear to be a promising opportunity for noise reduction.

On approach, flaps and slats are progressively deployed in order to allow the wing to maintain lift at lower speeds and to provide drag to slow the aircraft. MIT focuses on a delayed deceleration approach (DDA) concept in which the deceleration of the aircraft is delayed such that the aircraft can have flaps and slats up and operate at low thrust for as long as possible to reduce both airframe and engine noise. This procedure still allows the aircraft to slow to the final approach speed prior to the stabilization point. In addition to the potential noise benefit, prior analyses have shown that the reduced flight time and thrust from a DDA yields significant reductions in fuel burn.

MIT conducted a noise analysis of DDA profiles against a standard deceleration approach for representative narrow- and wide-body aircraft. In the examples presented, the DDA is shown to have a noise benefit in the range of 4 to 8 dBA, with the benefit occurring between 10 and 25 nautical miles out from the runway. Closer in to the runway, the DDA and the standard deceleration approach result in the same noise levels given the requirement for the aircraft to be fully configured and stable for landing. In contrast to the departure phase, engine thrust on approach is often low and thus airframe noise components, such as flap and slat noise, are more easily heard. This is why an approach where deceleration is delayed such that the aircraft can maintain a flaps and slats retracted configuration for as long as possible while also delaying the need to increase thrust is beneficial in terms of noise.

While the DDA concept has the potential to reduce noise, its implementation has challenges. Key among those is that the ideal deceleration profile varies by aircraft type and depends on aircraft weight and weather conditions. Pilots may need procedures and guidance on how to manage the deceleration of the aircraft given these factors. Varying deceleration rates would also pose a challenge to air traffic controllers in terms of sequencing and spacing aircraft. Additionally, though the noise modeling shows a potential benefit from this concept, this benefit needs to be validated through noise measurement of actual aircraft operations. These challenges require further study and are being supported by the FAA through the ASCENT Center of Excellence.

In summary, the primary conclusions of the report are as follows:

1. Changes in aircraft climb speed do not have an appreciable impact on the overall aircraft departure noise due to the dominance of engine noise.
2. On arrival, delaying the deceleration of the aircraft could have a noticeable noise impact (reductions in the range of 4 to 8 dBA for certain locations), but this change will only occur between 10 and 25 nautical miles out from the runway.
3. Additional work is required to validate this potential noise benefit and resolve implementation challenges.

Appendix A: Evaluation of the Impact of Transport Jet Aircraft Approach and Departure Speed on Community Noise

MIT International Center for Air Transportation

Evaluation of the Impact of Transport Jet Aircraft Approach and Departure Speed on Community Noise

Prof. R. John Hansman

Jacqueline Thomas

Report No. ICAT-2020-03

April 2020

MIT International Center for Air Transportation (ICAT)

Department of Aeronautics & Astronautics

Massachusetts Institute of Technology

Cambridge, MA 02139 USA

I. Introduction

This report evaluates the impact of changing aircraft speed during approach and departure on community noise for transport category jet aircraft. This analysis is part of a broader study investigating the opportunities to modify approach and departure procedures to reduce community noise impact. This report also addresses a requirement in Section 179 of the FAA Reauthorization Act of 2018 (H.R. 302) to evaluate the relationship between jet aircraft approach and takeoff speeds and corresponding noise impacts on communities surrounding airports.

II. Impact of Speed on Aircraft Source Noise

The primary sources of noise from aircraft are engine and airframe noise, as shown in Fig. 1. Historically jet engine noise has been the dominant noise source, particularly during high power settings on takeoff. Modern engines have become significantly quieter [1] and airframe noise has become increasingly important during landing and for some reduced power settings. Aircraft speed impacts engine and airframe noise differently, as discussed briefly below.

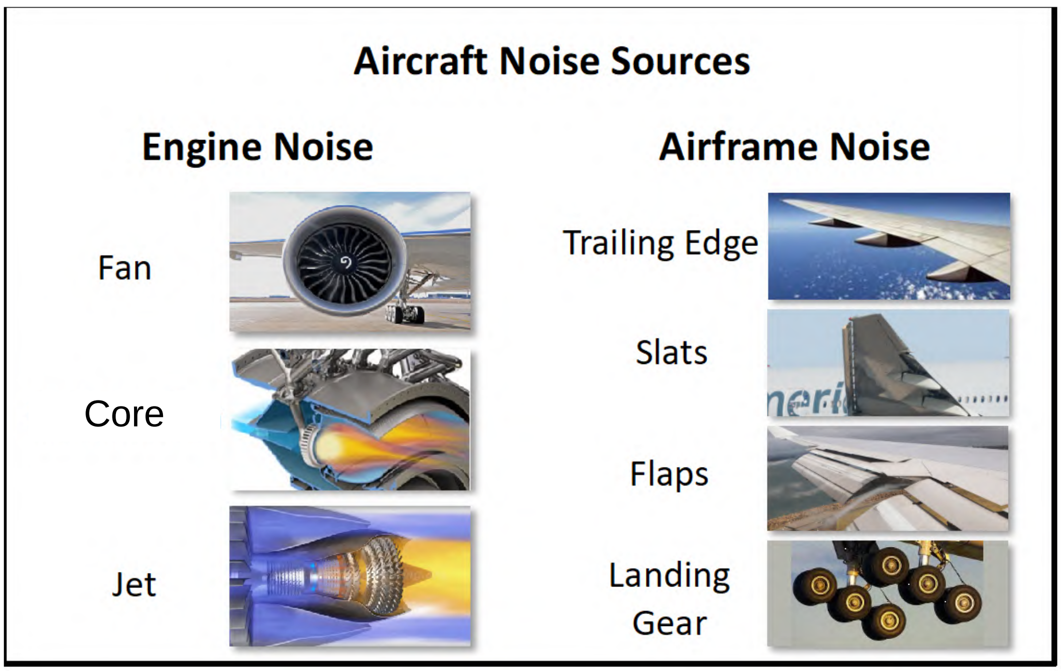


Fig. 1 Primary Conventional Turbofan Aircraft Noise Sources

Example breakdowns of the various noise components for a representative narrow-body jet transport aircraft after initial departure and on final approach are shown in Fig. 2. Engine noise is dominant on departure with most of the noise coming from the fan, followed by the jet. Airframe noise is more significant on approach, particularly due to the deployment of flaps, slats, and landing gear, and dominates the noise when engine settings are low. The exact magnitude of noise components, and how they relate to each other, depends on the specific aircraft and flight procedure.

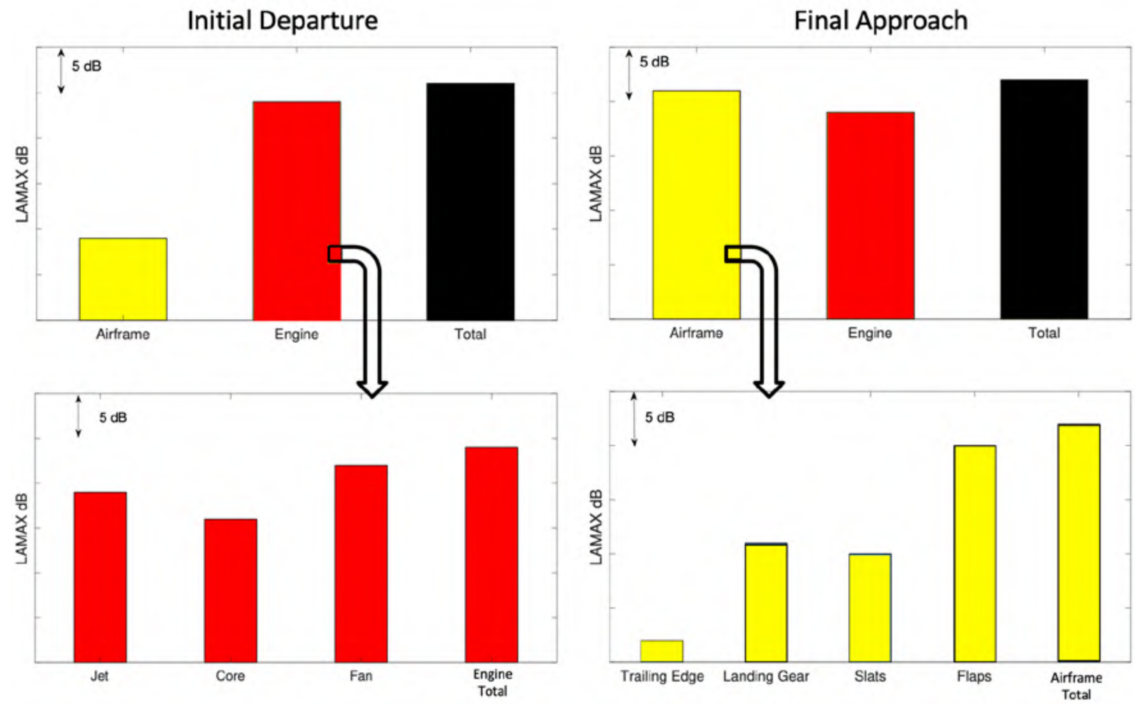


Fig. 2 Comparisons of Different Aircraft Noise Sources on Initial Departure and Final Approach for a Representative Narrow-Body Aircraft

1. Impact of Speed on Engine Noise

Engine noise arises primarily due to fan, combustion, and jet noise. *Fan* noise arises due to turbulent air passing rotating fan blades and stator vanes [2], *combustion* noise arises due to the combustion of hot gases in the engine core and subsequent propagation through the turbine [3], and *jet* noise arises primarily due to the turbulent mixing of fast jet exhaust airflow with slower ambient air [4]. In general, the engine noise will increase with increased power setting. Engine noise also increases with increasing difference between the speed of the high velocity jet airflow and the speed of the aircraft, which impacts the turbulent mixing of the shear layers in the engine exhaust.

2. Impact of Speed on Airframe Noise

Airframe noise comes from turbulence generated by the aircraft airframe, usually around geometry changes. This includes noise from the basic wing and tails, known as *trailing edge* noise, as well as additional noise from the devices that extend into the airflow such as *flaps*, *slats*, and *landing gear*. All of these airframe noise sources are highly sensitive to aircraft speed. Clean trailing edge and slat noise scales with velocity to the 5th power [5][6]. Flap noise scales with the 5th power of velocity for low frequencies and the 6th power of velocity for high frequencies [7]. Landing gear noise scales with the 6th power of velocity [8].

In addition to the source noise effect described above, speed is also tightly coupled to aircraft flight aerodynamics and therefore impacts the configuration of the aircraft (i.e. flaps, slats, and landing gear settings). At slower speeds, the flaps and slats are extended to reduce the stall speed, which causes an increase in airframe noise.

III. Modeling Framework

In order to model the effect of speed on community noise, a model that includes the effects of speed on each of the various aircraft noise components is needed. These detailed speed impacts on community noise are not captured in the Aviation Environmental Design Tool [9]. For this evaluation, the NASA Aircraft Noise Prediction Program (ANOPP) [10] was used as the base aircraft noise model. ANOPP is a semi-empirical model that computes noise from each of the sources discussed in section II, including engine sources (fan, core, and jet) and airframe sources (trailing edge, flaps, slats, and landing gear). In order to model these individual noise sources, ANOPP requires detailed inputs, including detailed aircraft geometries, internal engine performance states, and aircraft flight profile states (position, thrust, velocity, configuration). ANOPP outputs single-event noise grids which are then used for noise impact assessments. The modeling framework showing the source of these inputs is shown in Fig. 3.

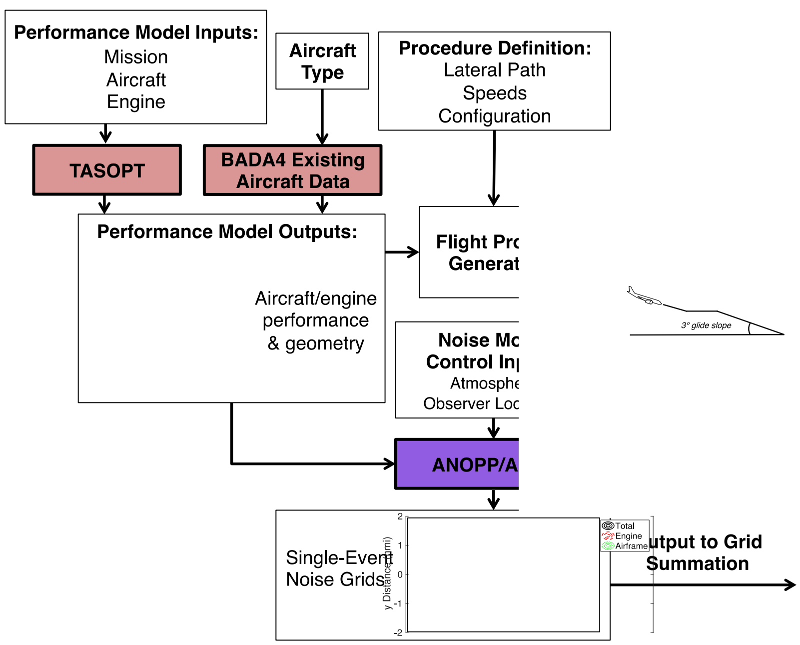


Fig. 3 Integrated Aircraft Performance, Flight Procedure, and Noise Analysis Process for Modeling Effects of Speed on Community Noise

Noise modeling requires the internal engine performance states, such as combustor exit temperature, as well as airframe geometry, including the wing, flap, slat, and landing gear geometry. Engine performance states that vary with the thrust and velocity throughout the approach or departure procedure are calculated using the Transport Aircraft System OPTimization (TASOPT) program [11], which is a physics-based model that jointly sizes and optimizes the airframe, engine, and flight mission of a "tube and wing" transport aircraft. Engine sizing in this program is a work-balance-based, engine component matching formulation [12] that sizes an engine for design conditions and then provides engine state maps for off-design thrusts and flight speeds. The airframe geometry is also sized in this method based on aerodynamic and structural requirements and is verified from publicly available aircraft performance and geometry data for current aircraft [13][14]. With these inputs ANOPP provides component level aircraft noise estimates based on the thrust, velocity, configuration, position, and altitude changes in a flight profile. Use of these performance and noise tools has been validated against Federal Aviation Administration noise certification data [15].

The detailed flight profile (thrust, velocity, configuration, and altitude) of the approach or departure procedure of interest is computed by the Flight Profile Generator shown in Fig. 3. Based on a given arrival or departure procedure definition, such as a continuous descent or low thrust takeoff, the Flight Profile Generator computes the vertical flight profile—or the required thrust, velocity, and glideslope—with a point mass model that satisfies the weight, drag performance, and configuration speed limitations of a given aircraft. These flight performance characteristics are provided by Eurocontrol's Base of Aircraft Data (BADA 4) [16], a database of aircraft performance parameters from aircraft manufacturers and validated by comparison with ASDE-X radar observed flight profiles for current procedures.

For each arrival or departure procedure, the thrust, velocity, configuration, and altitude profiles are modeled on a segment-by-segment basis. Using the flight performance characteristics from BADA 4, force-balance is used to determine either: the flight path angle given a thrust and velocity or acceleration constraint, the resulting acceleration or velocity from a flight path angle and thrust constraint, or the resulting thrust from a flight path angle and velocity or acceleration constraint. This force balance process determines the acceleration/deceleration lengths, which are then integrated into the segment model to generate altitude, velocity, and thrust profiles versus flight path length.

Noise outputs are obtained as singe-event noise grids. Maximum A-weighted sound pressure level ($L_{A,MAX}$) is the primary noise metric at observer locations used in this paper. Outputted grids can be overlaid at desired airports and runways where the noise impact is to be measured. Population distributions from the 2010 census were used to measure population exposure to noise levels due to a specific flight procedure.

For each arrival and departure procedure evaluated in this report, the community noise impact was modeled for a representative narrow-body jet transport aircraft (Boeing 737-800 with CFM56-7B engines) and a representative wide-body jet transport aircraft (Boeing 777-300 with Trent 892 engines)).

IV. Effect of Aircraft Speed on Departure

1. Options to Change Aircraft Speed on Departure

In a typical departure procedure, shown in Fig. 4, the aircraft accelerates on the runway and performs its initial climb segment at a predetermined takeoff thrust and at an initial takeoff speed. The initial takeoff speed is dependent on aircraft takeoff weight and climb performance and set by safety considerations to provide a speed margin above the stall speed. Because of the criticality of stall margin and climb gradient at low altitude, the initial takeoff speed is not considered a candidate speed to be modified.

After reaching a transition altitude, usually between 1,000 ft and 2,000 ft, the thrust is reduced to a climb setting and the aircraft accelerates to a target climb speed. The thrust reduction is recommended for noise reduction in ICAO document 8168 [17]. The target climb speed is typically 250 knots, which is the maximum speed permitted below 10,000 ft in the United States. After the thrust reduction and as the aircraft accelerates, the flaps are incrementally retracted until the wing is in its flap and slat retracted configuration. This is consistent with what ICAO describes as Noise Abatement Departure Procedure 2 (NADP 2) in document 8168 [17].

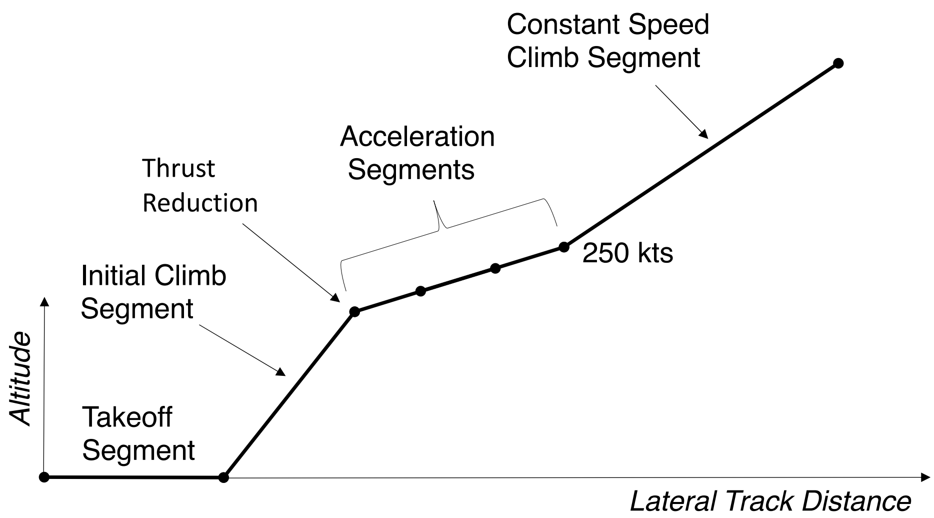


Fig. 4 Typical Departure Procedure Divided into Segments, Consistent with NADP 2.

There are two primary options to consider for varying speed in the departure phase after the takeoff and initial climb segment:

- Changing location of the start of acceleration and flap retraction
- Reducing the climb speed

2. Changing Location of the Start of Acceleration and Flap Retraction

Modifying the acceleration and flap retraction location has been considered previously. ICAO has recommended two procedures that consider where the location of the start of acceleration and flap retraction occurs in ICAO document 8168, published in 2006 [17]. They are Noise Abatement Departure Procedures (NADP) 1 and 2, shown in Fig. 5. These procedures are used as examples to show how modifying the location of the start of acceleration and flap retraction impacts community noise.

In the NADP 1 procedure, after the initial thrust reduction at a cutback altitude, typically between 800 ft and 1,500 ft, the aircraft holds its initial climb speed of up to V2 + 20 knots[1] to an altitude of 3,000 ft. At 3,000 ft, the aircraft accelerates to its final climb speed of 250 knots. In the NADP 2 procedure, after the transition altitude, the aircraft accelerates to either its flaps up speed + 20 knots or its final climb speed.

The altitude gain of the NADP 1 between the thrust cutback altitude and 3,000 ft due to holding the slower speed of V2 + 20 knots is meant to benefit close in communities, while the altitude gain in the NADP 2 after the aircraft has accelerated to its final climb speed is meant to benefit far out communities. The NADP 2 is the standard procedure in the United States and NADP 1 is the standard procedure internationally.

[1] V2 is the takeoff safety speed, or 1.2 times the stall speed on takeoff

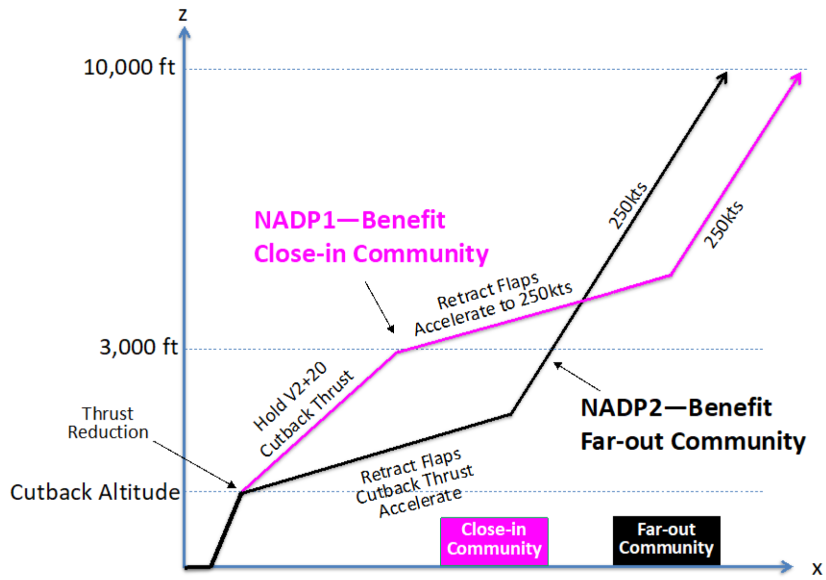
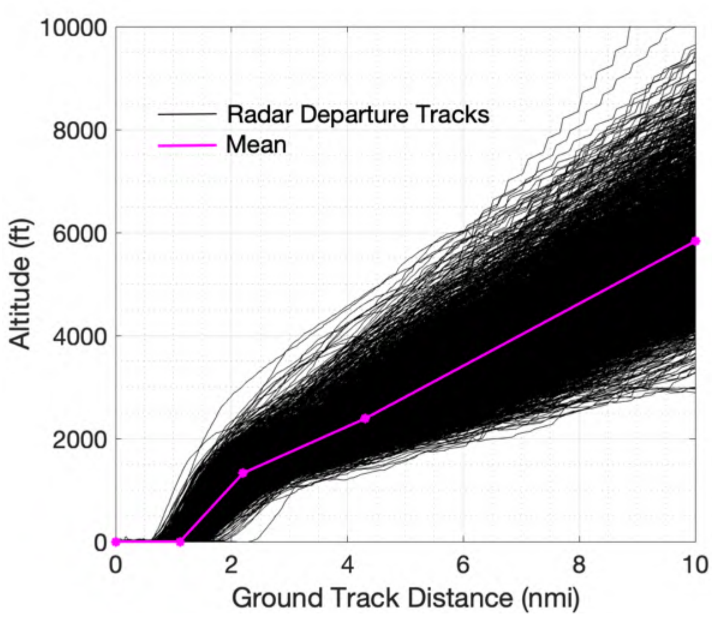


Fig. 5 Difference in Acceleration Height on Departure Represented by NADP 1 (3,000 ft Acceleration Height) and NADP 2 (1,500 ft Acceleration Height) Comparison.

The noise impact of a representative narrow-body jet aircraft (Boeing 737-800) performing an NADP 2 procedure compared to an NADP 1 procedure was investigated. The NADP 1 and 2 definitions do not specify the climb angle during the acceleration segments. Therefore, reference climb angles and velocities were determined to be the mean Airport Surface Detection Equipment, Model-X (ASDE-X) radar data observed at Boston Logan Airport (BOS) in 2017. An example of the observed altitude and velocity profiles from this data for Boeing 737-800 aircraft are shown in Fig. 6 along with the mean profiles. The velocity data shows that the start of acceleration occurs beginning after the initial cutback at about 1,500 ft, which is consistent with the NADP 2 procedure definition.



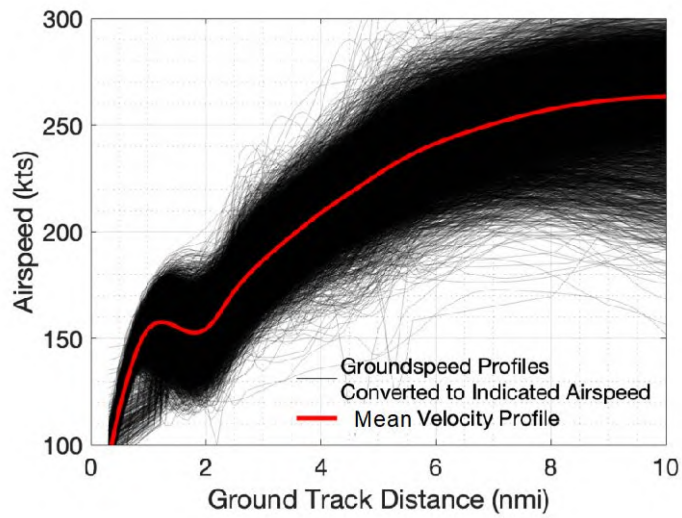


Fig. 6 ASDE-X Radar Altitude and Velocity Data of Boeing 737-800s on Departure at BOS in 2017.

Modeled flight profiles of the representative narrow-body aircraft for both the NADP 1 and NADP 2 are depicted in Fig. 7, which shows the comparison of altitude, velocity, and thrust profiles. The weight was assumed to be 90% of the maximum takeoff weight for this aircraft[2]. The thrust was assumed to be the same between the two procedures to provide a comparison of impacts due only to the change in acceleration height. Between the thrust cutback altitude and 3,000 ft, the aircraft performing the NADP 1 had a steeper climb angle than in the NADP 2 due to maintaining the slower V2 + 20 knots in this region rather than accelerating.

[2] Maximum Takeoff Weight assumed to be 174,000 lbs for the Boeing 737-800.

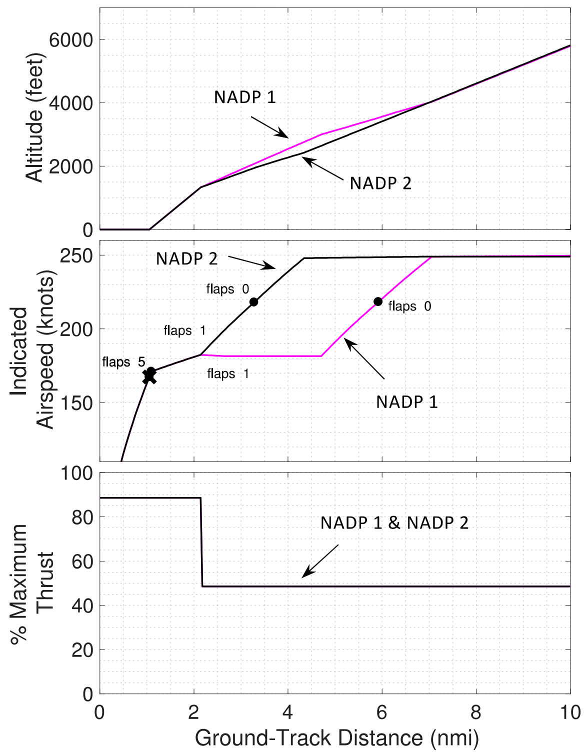


Fig. 7 Comparison of Altitude, Velocity, and Thrust Profiles for a Narrow-Body Aircraft Performing NADP 1 (magenta) and NADP 2 (black)

Noise impacts for the representative narrow-body aircraft performing the NADP 1 and NADP 2 are shown in Fig. 8, which presents the peak noise ($L_{A,MAX}$) under the flight track during a straight out departure. The difference in $L_{A,MAX}$ noise under the flight track for the NADP 2 and NADP 1 procedures is shown Fig. 9. Fig. 10 shows the corresponding $L_{A,MAX}$ contours.

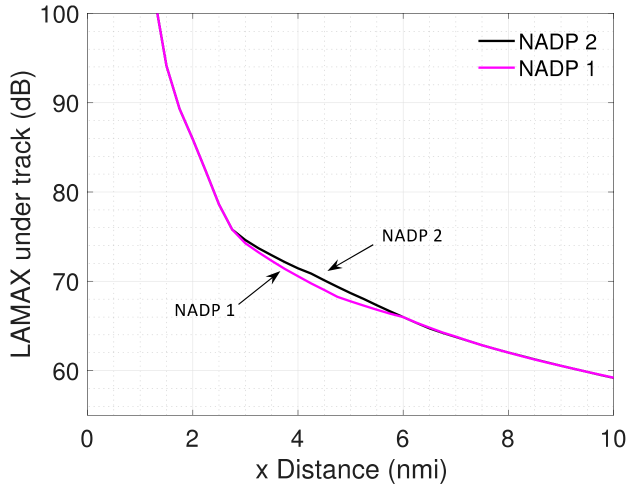


Fig. 8 Undertrack $L_{A,MAX}$ (dBA), NADP 2 and NADP 1 Noise for a Representative Narrow-Body Aircraft.

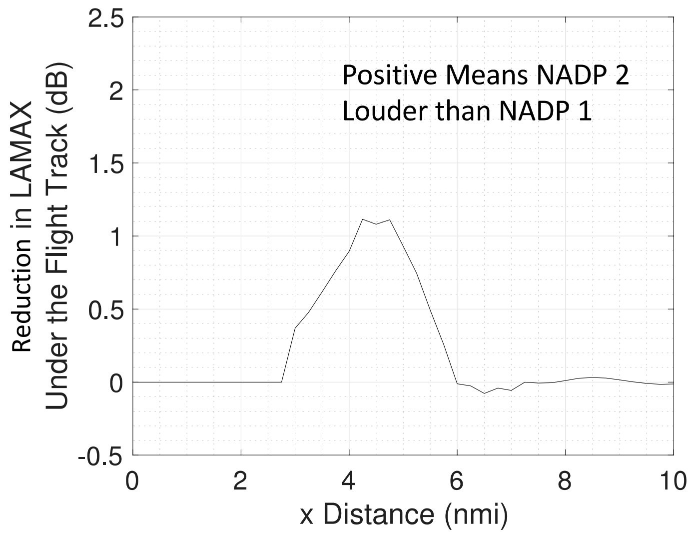


Fig. 9 Reduction in Undertrack $L_{A,MAX}$ (dBA), NADP 1 compared to NADP 2 for a Representative Narrow-Body Aircraft

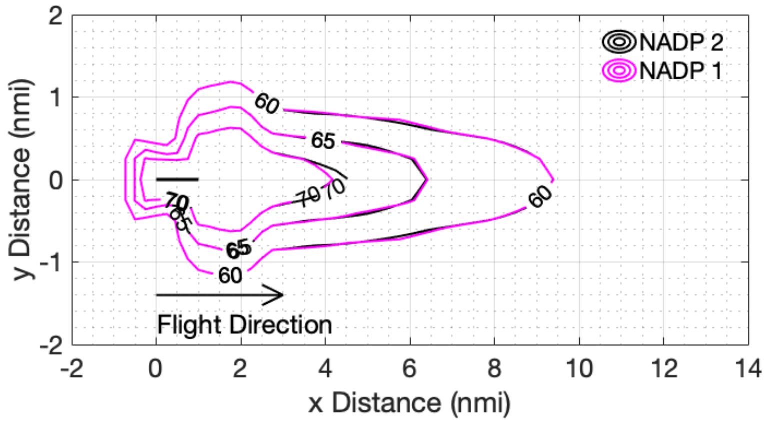
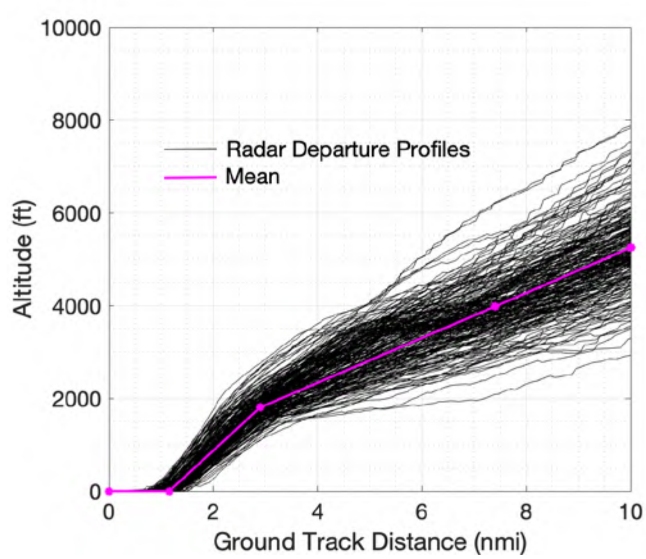


Fig. 10 NADP 1 and 2 $L_{A,MAX}$ (dBA) contours for a Representative Narrow-Body Aircraft

Fig. 9 shows NADP 1 results in a maximum noise reduction of 1.2 dBA between 3 and 6 nautical miles (nmi) from takeoff compared to the NADP 2 due to the extra altitude gained during the climb in this segment. This results in a small reduction of the extent of the 70 dBA LMAX contour when flying the NADP 1 compared to the NADP 2, as can be seen in Fig. 10. After 6 nmi the two procedures converge and there is insignificant difference between NADP 1 and NADP 2. The small, 1.2 dBA, maximum noise reduction occurs over a limited spatial area and is therefore not considered a significant noise reduction.

The NADP 2 procedure compared to an NADP 1 procedure was also investigated for a representative wide-body aircraft (Boeing 777-300) using a similar analysis. The reference altitude and velocity climb profiles for Boeing 777-300 departures at Boston Logan Airport (BOS) from 2017 are shown in Fig. 11. The velocity data shows that for Boeing 777-300 departures at BOS, the start of acceleration begins after the initial cutback at about 1,900 ft, which is also consistent with the NADP 2 procedure.



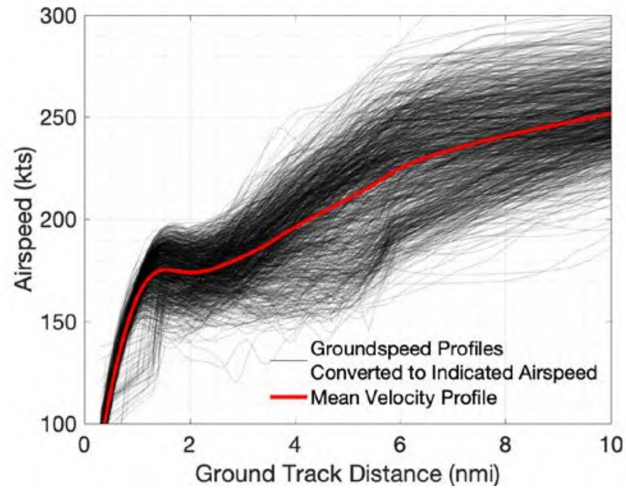


Fig. 11 ASDE-X Radar Altitude and Velocity Data of Boeing 777-300s on Departure at BOS in 2017.

Modeled flight profiles of the representative wide-body aircraft for both the NADP 1 and NADP 2 are depicted in Fig. 12, which shows the comparison of altitude, velocity, and thrust profiles. The weight was assumed to be 90% of the maximum takeoff weight for this aircraft[3].

[3] Maximum Takeoff Weight assumed to be 659,550 lbs for the Boeing 777-300

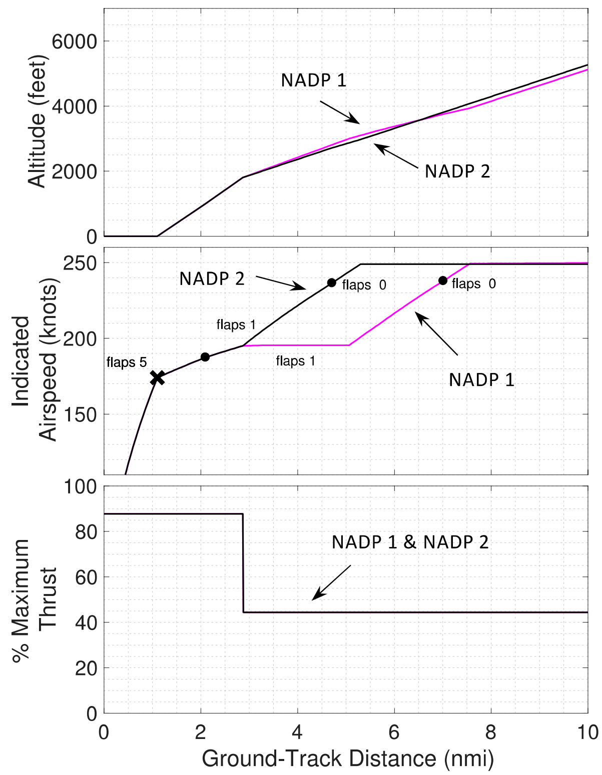


Fig. 12 Comparison of Altitude, Velocity, and Thrust Profiles for a Representative Wide-Body Aircraft Performing NADP 1 (magenta) and NADP 2 (black)

Noise impacts for the representative wide-body aircraft performing the NADP 1 and NADP 2 are shown in Fig. 13 as the peak noise ($L_{A,MAX}$) under the flight track during a straight out departure. The difference in $L_{A,MAX}$ is shown in Fig. 14. Fig. 15 shows the corresponding $L_{A,MAX}$ noise contours.

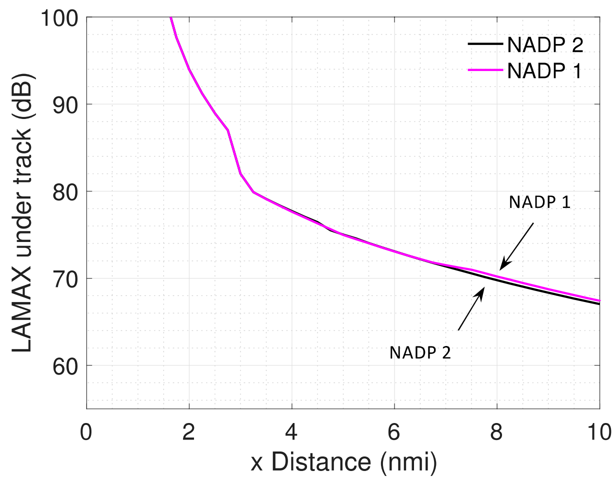


Fig. 13 Undertrack $L_{A,MAX}$ (dBA), NADP 2 and NADP 1 Noise for a Representative Wide-Body Aircraft.

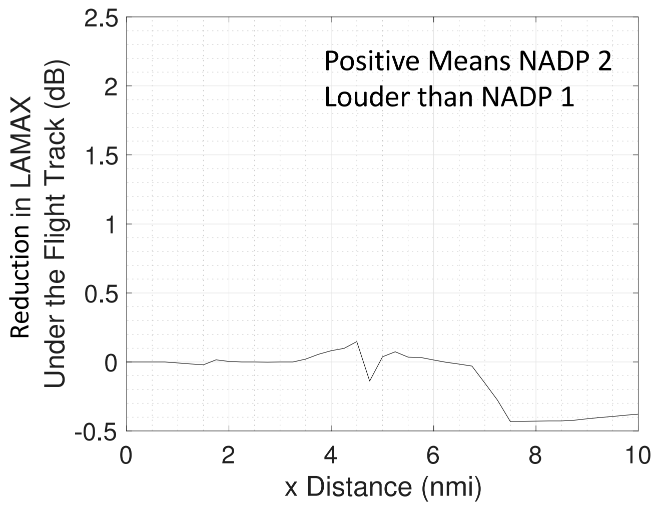


Fig. 14 Reduction in Undertrack $L_{A,MAX}$ (dBA), NADP 1 compared to NADP 2 for a Representative Wide-Body Aircraft.

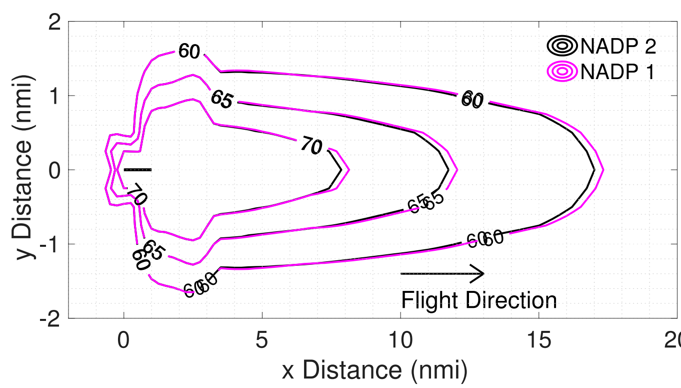


Fig. 15 NADP 1 and 2 $L_{A,MAX}$ (dBA) contours for a Representative Wide-Body Aircraft.

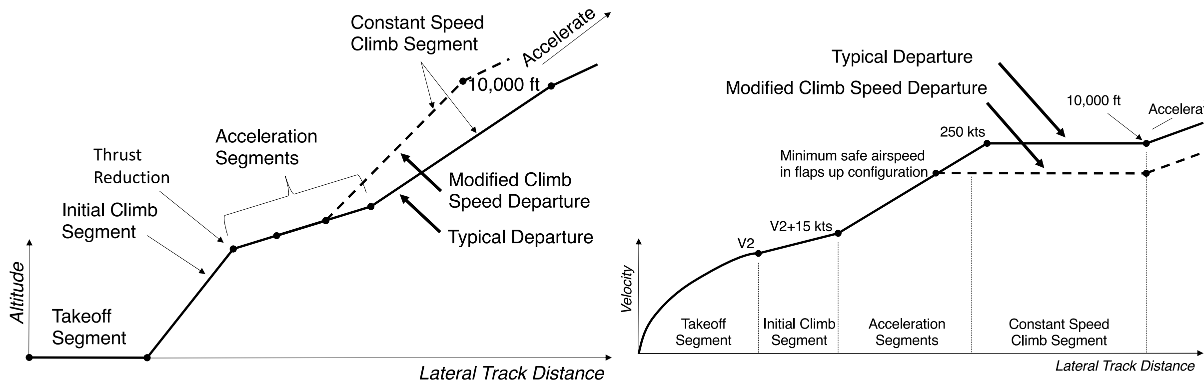
Fig. 14 shows that the undertrack noise levels are quite similar up until 7 miles after which the NADP 2 has a slightly lower (0.4 dBA) noise level due to the slightly higher altitude of the NADP 2 procedure in this region. This can also be seen in a small reduction of the 60, 65, and 70 dBA contours in Fig. 15.

The results show that changes in the acceleration location on departure results in small differences in community noise impacts compared to current departure procedures. Currently observed procedures in the U.S. are consistent with NADP 2 and it does not appear that changing the acceleration location would result in significant reduction in community noise impacts.

3. Reduced Climb Speed

Another option for varying the speed on departure is to reduce the climb speed after initial acceleration, which would reduce the airframe noise during the climb segment and would reduce the total noise if the airframe noise is greater than the engine noise. The typical departure from Fig. 4 was used to provide a basis of comparison to consider where varying the speed on departure would impact community noise.

In the reduced speed departures, aircraft were assumed to maintain the same weight, altitude profile, and velocity profile as the typical departure through the initial climb segment until the aircraft accelerated to the minimum safe airspeed with flaps up, which was maintained to 10,000 ft as shown in Fig. 16. The minimum safe airspeed in the flaps up configuration was assumed to be 1.3 x V_{stall}. The flaps up configuration was assumed to minimize flap noise and any icing impact during the climb. Aircraft were assumed to have maintained the same thrust profile as the typical departure, which results in higher climb profiles for the reduced speed departures. A speed of 220 knots was assumed to be the minimum safe airspeed in the flaps up configuration for the representative narrow-body aircraft, while 240 knots was assumed for the representative wide-body aircraft. The weight was assumed to be 90% of the maximum takeoff weight for both aircraft as referenced in the previous section.



a) altitude profile b) velocity profile

Fig. 16 Reduced Climb Speed Departure Definitions.

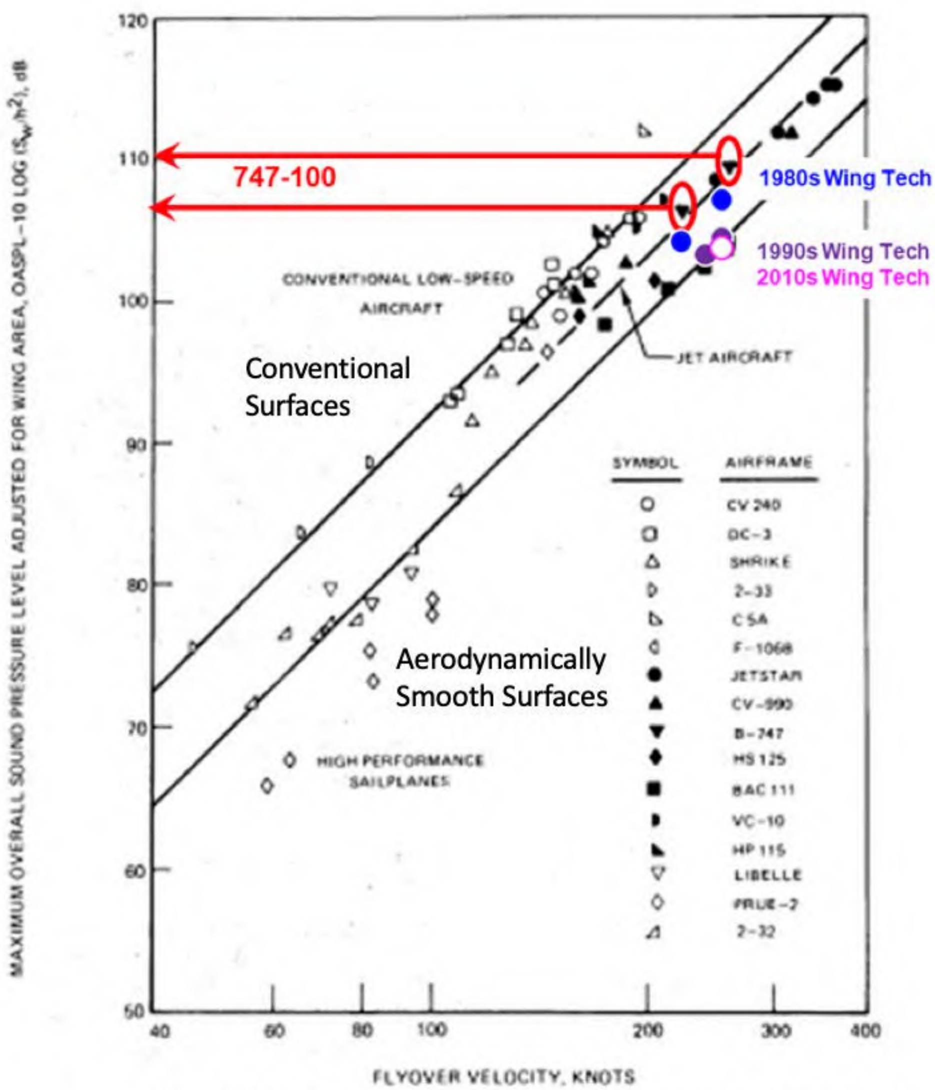
Because the flaps, slats, and gear are retracted during a reduced speed climb, the airframe noise is from only the trailing edge noise and thus improvement from a reduced climb speed would only occur only if the trailing edge noise is greater than the engine noise during climb. The trailing edge noise is normally not measured during standard certification flight testing which is focused on measuring noise in the landing or takeoff conditions when the flaps, slats and landing gear are extended. As a consequence there is very little public data for trailing edge noise for modern aircraft in the clean (flaps, slats and gear retracted) configuration.

The ANOPP noise model for trailing edge noise uses a correlation generated from flight tests conducted by NASA in the 1970s [18][19] of multiple aircraft in flaps up, gear up, idle thrust[4] configurations, at flight speeds up to 350 knots. This data was used to formulate the trailing edge noise model by Fink used in ANOPP [5]. The original 1970s data is shown in Fig. 17. The noise magnitude was found to be a function of the 5th power of the flight velocity. The flight test data also showed a residual variability for different aircraft types which was suggested to be due to variability in wing surface aerodynamic smoothness

[4] While taking measurements with engines off would have been ideal for measuring clean airframe noise, large aircraft such as the Convair 990 and the Boeing 747 were instead tested at idle thrust to mitigate safety risks [17].

between high performance sailplanes and conventional aircraft. Fink observed an 8 dBA difference in the correlation lines used for conventional wing surfaces of the 1970s and aerodynamically smooth wing surfaces as shown by the solid lines in Fig. 17. The ANOPP noise model has the option to use the “aerodynamically smooth” or “conventional” wing surface assumption. Based on the public 1970s data, most transport aircraft would have the louder “conventional” wing surface.

Recent data provided by NASA [20] and Boeing for modern aircraft and also plotted on Fig. 17 indicate that modern aircraft wing technologies have a lower clean trailing edge noise level closer to the “aerodynamically smooth” aircraft assumption. As a consequence, the quieter “aerodynamically smooth” trailing edge noise levels were used in this analysis.



MAXIMUM OVERALL SOUND PRESSURE LEVEL FOR CLEAN AIRFRAMES, NORMALIZED WITH RESPECT TO WING AREA

Fig. 17 Maximum Overall Sound Pressure Level From 1970s flight Fight Tests of Aircraft with Flaps and Gear Up versus Velocity from Ref. [5]. 1980s, 1990s, and 2010s Wing Tech Data Provided by Boeing from Ref. [21]

The noise impacts of the representative narrow-body aircraft performing reduced speed departures compared to typical departures was investigated. The $L_{A,MAX}$ noise under the flight track for the 220 and 250 knots climb speeds are shown in Fig. 18. The corresponding difference in $L_{A,MAX}$ noise under the flight track between the 250 knots climb speed departure and 220 knots climb speed departure is shown in Fig. 19. The reduction in noise from reducing the climb speed from 250 to 220 knots occurs between 3.5 and 8 miles and is less than 0.5 dBA.

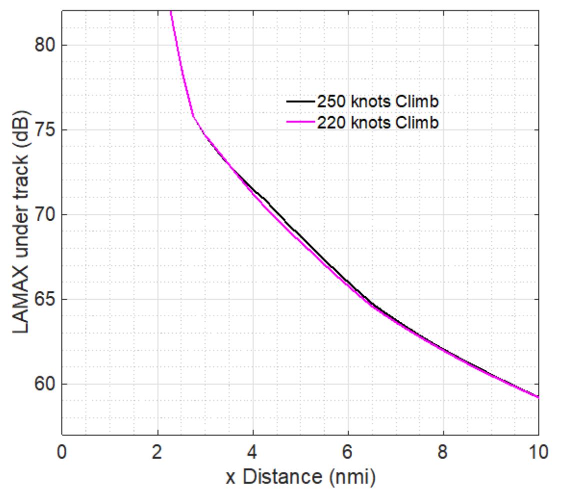


Fig. 18 $L_{A,MAX}$ (dBA) Under the Flight Track for 250 knot Climb Speed Departures and 220 knot Climb Speed Departures for a Representative Narrow-Body Aircraft.

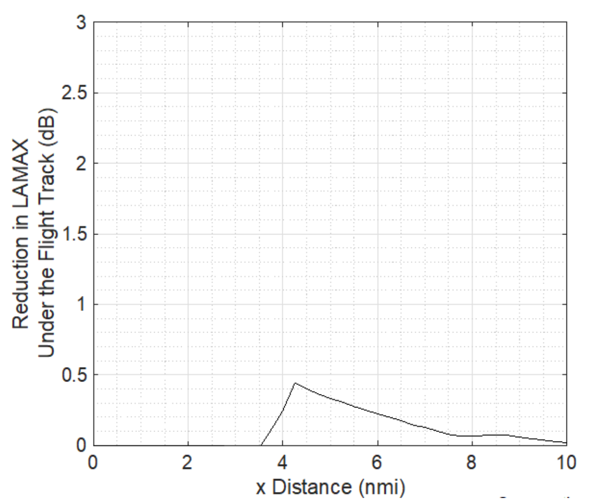
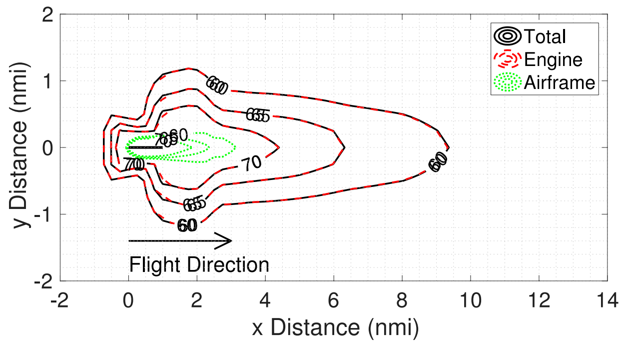
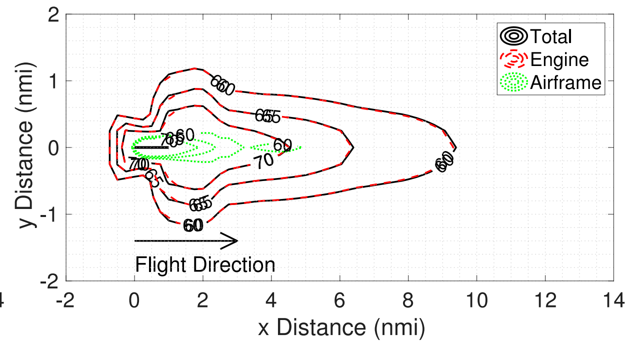


Fig. 19 Reduction in $L_{A,MAX}$ (dBA) for 220 knot Compared to 250 knot Climb Speed Departure for a Representative Narrow-Body Aircraft.

Engine, airframe, and total $L_{A,MAX}$ noise contours of a takeoff for the representative narrow-body aircraft are shown in Fig. 20 for typical and reduced climb speeds of 250 knots and 220 knots with the aerodynamically smooth wing surface assumption.



a) 220 knots climb speed



b) 250 knots climb speed

Aerodynamically Smooth Wing Surface Assumption

Fig. 20 $L_{A,MAX}$ (dBA) Noise Contours 220 and 250 knot Climb Speed Departures for a Representative Narrow-Body Aircraft.

The reason for there being only a small noise difference from varying the climb speed can be seen in the noise contours in Fig. 20, which break out the airframe and engine noise. Because the noise is dominated by engine noise during the climb the climb speed does not have a significant effect on the noise contour.

Similar trends in noise impact were seen for the representative wide-body aircraft. The $L_{A,MAX}$ noise under the flight track for the 240 and 250 knot climb speeds with the "aerodynamically smooth" wing surface assumption is shown in Fig. 21. The difference in the resulting $L_{A,MAX}$ noise under the flight track is insignificant as shown in Fig. 22. Again this is due to the dominance of engine noise during climb, which can be seen in the noise contours in Fig. 23.

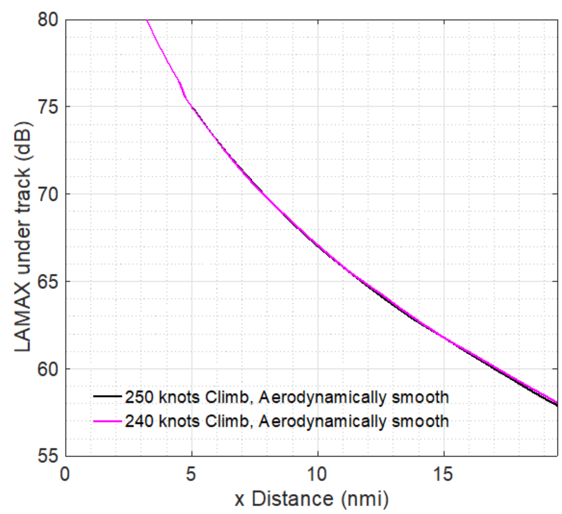


Fig. 21 $L_{A,MAX}$ (dBA) Under the Flight Track for 250 knot Climb Speed Departures and 240 knot Climb Speed Departures for a Representative Wide-Body Aircraft.

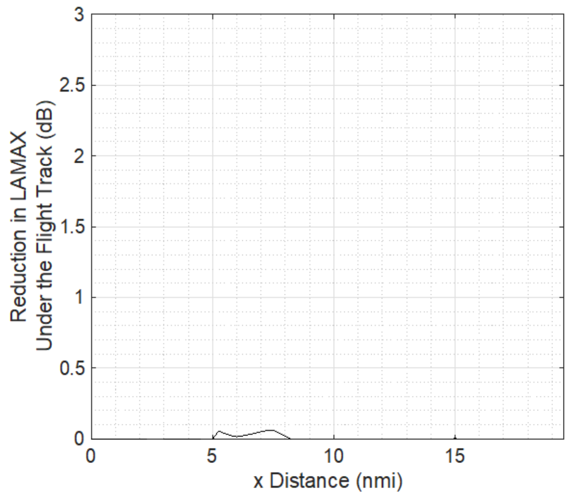
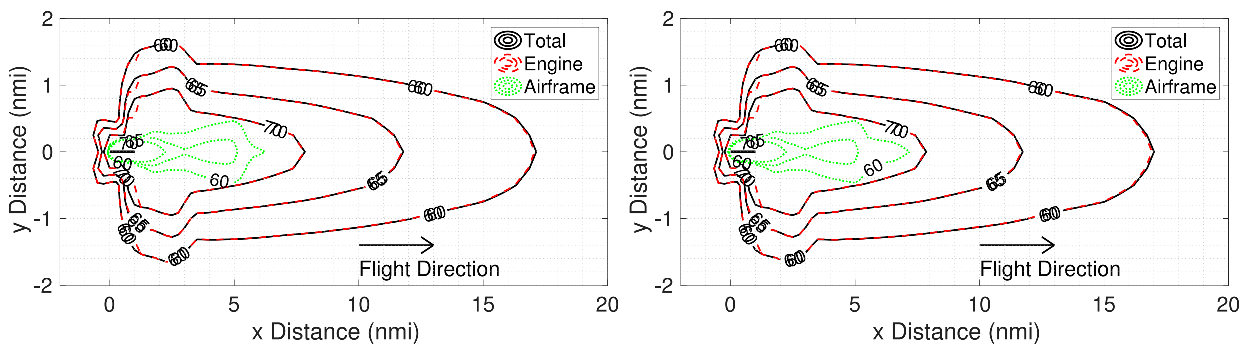


Fig. 22 Reduction in $L_{A,MAX}$ (dBA) for 220 knot Compared to 250 knot Climb Speed Departure for a Representative Wide-Body Aircraft.



a) 240 knots climb speed

b) 250 knots climb speed

Aerodynamically Smooth Wing Surface Assumption

Fig. 23 $L_{A,MAX}$ (dBA) Noise Contours 240 and 250 knot Climb Speed Departures for a Representative Wide-Body Aircraft.

V. Effect of Speed on Approach

1. Options to Change Aircraft Speed on Approach

A typical approach procedure is shown in Fig. 24 to provide a basis of comparison to consider where varying the speed on approach would impact community noise. Typical approach procedures consist of an initial descent segment from a starting altitude, deceleration segments where flaps and slats are deployed, a level segment and an interception with the Instrument Landing System (ILS) glide slope (in some cases the approach procedure may also be a continuous descent to the ground), and a final descent to touchdown, as depicted in Fig. 24.

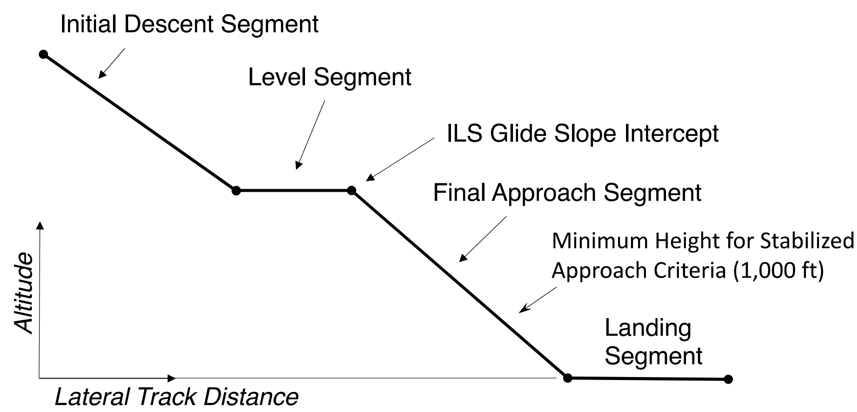


Fig. 24 Typical Approach Procedure Divided Into Segments

The Flight Safety Foundation Approach-and-Landing Accident Reduction Briefing Note 7-1 suggests that all aircraft should meet the stabilized approach criteria at a minimum of 1,000 feet above the airport surface in instrument meteorological conditions [22], meaning the aircraft is fully configured for landing and at a constant final approach speed between V_{REF} and V_{REF} + 20 knots[5]. This point is highlighted on Fig. 24. The stabilization point may occur further from touchdown than 1,000 ft.

Example approach procedures from Airport Surface Detection Equipment, Model X (ASDE-X) radar for Boeing 737-800 approaches into Runway 4R at Boston Logan International Airport (BOS) in 2017 are depicted in Fig. 25. The data show aircraft typically leveling off at 4,000 ft before intercepting the ILS glide slope. The 4000 ft level segment is consistent with published ILS procedure for Runway 4R at BOS, however the presence and altitude of published level segments vary due to ATC and terrain considerations. Fig. 25 also shows the corresponding velocity profiles which show most of the flights are stabilized in speed at 1,700 ft, corresponding to the outer marker location at BOS runway 4R [23]. Before the stabilization point, deceleration locations and rates vary, as is seen in the velocity data in Fig. 25. The mean velocity profile is shown in red. An example of a velocity trajectory for an aircraft which decelerated early is shown in green while an example of an aircraft which delayed its deceleration is shown in blue.

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[5] V_{REF} is the landing reference speed, or 1.3 times the stall speed with landing flaps and depends on the weight and density altitude

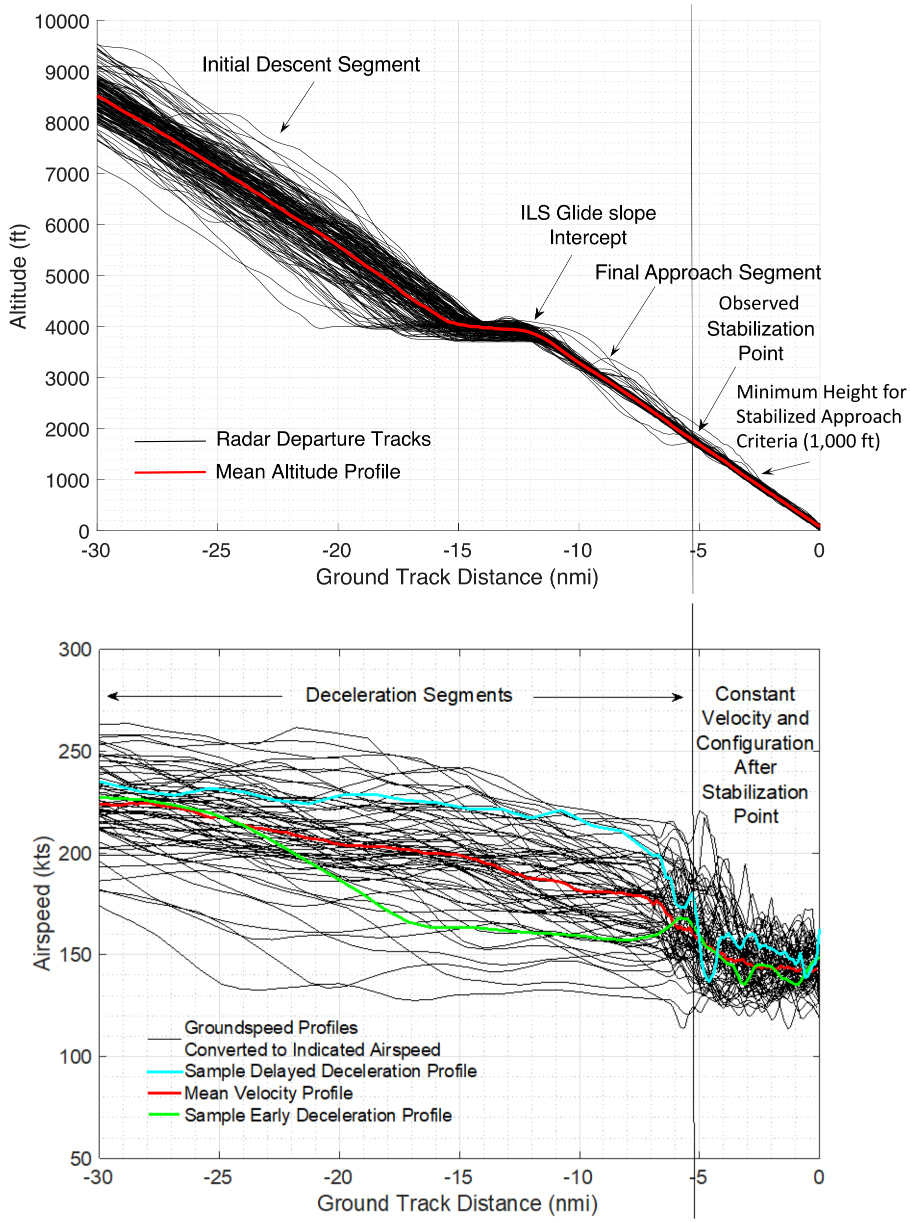


Fig. 25 ASDE-X Radar Altitude and Velocity Data of Boeing 737-800s Performing ILS Approaches with 4,000 ft Level-Offs into Runway 4R at BOS in 2017.

Flaps and slats are required to be deployed when speeds are reduced on approach to allow the wing to maintain lift at the lower speeds and to provide drag to slow the aircraft. Aircraft have multiple flap/slat configurations (typically 4 to 7) and deploy flaps and slats when they have decelerated to 10 knots below the maximum allowable speed for each configuration. Aircraft that decelerate relatively early in the approach require flaps and slats to be deployed early and to increase engine thrust to compensate for the additional drag for much of the approach profile [24]. This results in an early onset of configuration noise from flaps and slats and additional engine noise for early deceleration approaches.

An alternative is a delayed deceleration approach. In a delayed deceleration approach, the deceleration is delayed such that the aircraft can have flaps and slats up and operate at low thrust for as long as possible to reduce both configuration and engine noise. The aircraft deceleration is delayed to a location such that it is still able to slow to the final approach speed prior to the stabilization point. Prior analyses have shown that the reduced flight time and thrust during this type of procedure yields significant reductions in fuel burn [24]. The reduced thrust and delaying of flap and slat deployment are also beneficial for noise.

2. Delayed Deceleration Approach

Varying speed on approach involves delaying the start of the deceleration segments, known as a delayed deceleration approach, while maintaining the safety requirement that the aircraft must be fully configured and at the final approach speed prior to the stabilization point. Speed, altitude, configuration, and thrust are highly coupled on approach and various combinations of approaches can be carried out. In this section, example noise impacts of a representative narrow-body and wide-body aircraft performing a delayed deceleration approach procedure are compared to a standard deceleration approach.

Flight profiles of the representative narrow-body aircraft (Boeing 737-800) for both baseline and delayed deceleration approach procedures were generated and are shown in Fig. 26. The weight was assumed to be maximum landing weight[6]. The baseline case is a 3 degree ILS approach with a 4,000 ft level-off and a standard deceleration profile. The standard deceleration profile was assumed to be the mean deceleration profile seen in the ASDE-X velocity data in Fig. 25. Flap and slat deployment were assumed to occur once the aircraft decelerated to 10 knots below the maximum slat and flap speeds for each configuration. The 1,700 ft location, which corresponds to the outer marker location at BOS runway 4R [23], was assumed to be the stabilization point where the aircraft was at the final approach speed, assumed to be V_{REF} + 10 knots—and fully configured for landing. This was consistent with observations and represents a 700 ft buffer from the stabilized approach criteria minimum height of 1,000 ft.

The baseline case is compared to a delayed deceleration approach. For the delayed deceleration approach, the location of the start of the deceleration from 250 knots was assumed to be the point at which at idle thrust, the aircraft would be able to meet the final flaps 30 configuration speed at 2,000 ft. The resulting flight profiles are shown in Fig. 26. The distance to touchdown where the flaps 1 through flaps 30 configuration settings were deployed are marked on the indicated airspeed profiles.

[6]The maximum landing weight for a Boeing 737-800 assumed to be 146,000 lbs.

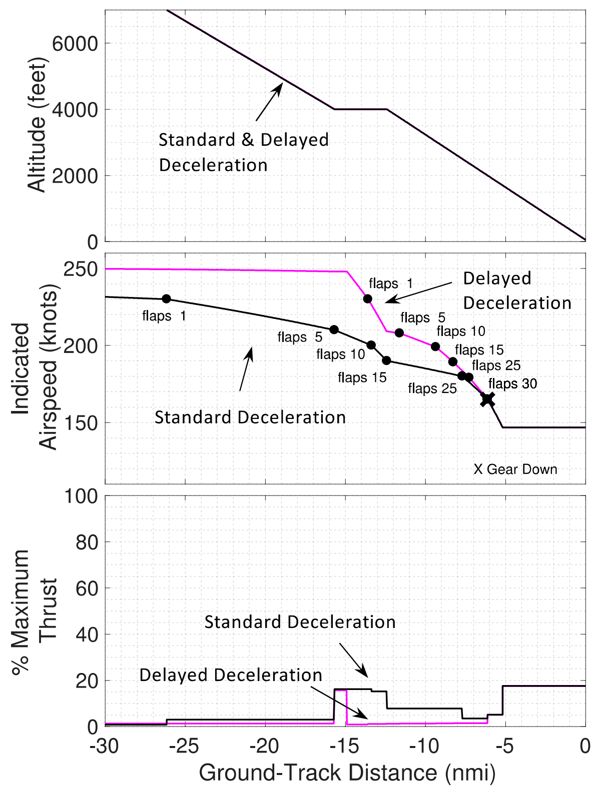


Fig. 26 Altitude, Velocity, and Thrust Profiles for a Representative Narrow-Body Aircraft Performing Standard Deceleration (black) and Delayed Deceleration (magenta) Approaches with 4,000 ft Level-Off

The black lines in Fig. 26 represent the velocity and thrust profiles of the baseline, standard deceleration approach and the magenta lines represent the profiles for the delayed deceleration approach. Once the aircraft decelerates the thrust must increase to maintain velocity in order to meet the stabilized final approach velocity which results in the higher thrust levels for the standard deceleration. The locations of flap deployment are closer to touchdown for the delayed deceleration approach, and the thrust is at idle for most of the procedure.

Fig. 27 shows the reduction in the total $L_{A,MAX}$ noise under the flight track due to the delayed deceleration approach compared to the standard deceleration. Modeled $L_{A,MAX}$ under the flight track of the various noise components for the ILS procedure with a 4,000 ft level-off is shown in Fig. 28 for reference.

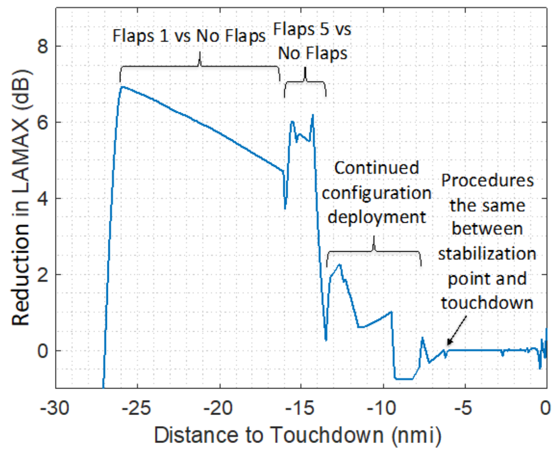
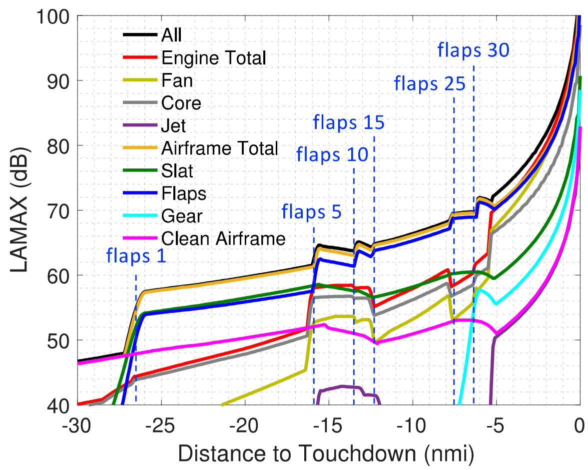
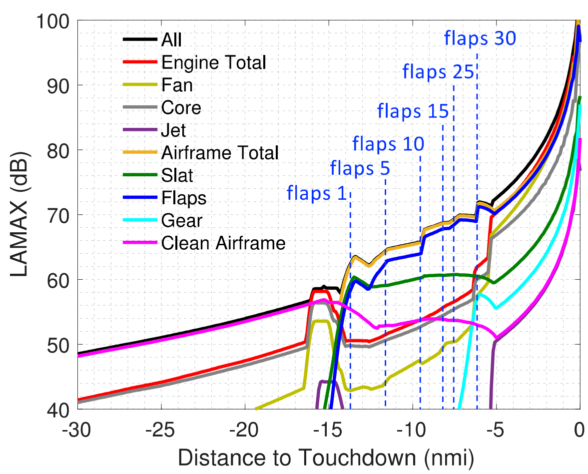


Fig. 27 Reduction in $L_{A,MAX}$ (dBA) Under the Flight Track for Delayed Deceleration Approach Compared to Standard Deceleration for a Representative Narrow-Body Aircraft,



a) Standard Deceleration



b) Delayed Deceleration

Fig. 28 Noise Levels Under the Flight Track for Different Noise Components, Representative Narrow-Body Aircraft Approaches with 4,000 ft Level-Off

As Fig. 27 indicates, between 26 and 16 nmi from touchdown, flaps 1 were deployed in the standard deceleration case but not in the delayed deceleration case. Noise is reduced by approximately 6 dBA by delaying the flaps 1 deployment in this region. Between 16 and 14 nmi from touchdown, flaps 5 were deployed in the standard deceleration case but no flaps were deployed in the delayed deceleration case, resulting in an additional 6 dBA reduction in this region. The most significant reductions are beyond 14 nmi from touchdown. No difference in the noise is observed between the stabilization point at 6 nmi and touchdown. Fig. 28 shows that the flap and slat noise dominate the overall noise levels before the stabilization point. The delay in the flap and slat deployment, as well as the decrease in thrust, resulted in a delay in the flap and slat noise onset and decrease in engine noise for the delayed deceleration approach compared to the standard deceleration approach. Thus, delaying the deceleration such that the aircraft can maintain the flaps and slats up configuration and idle thrust levels for as long as possible in the approach in this example would have a significant impact on reducing community noise.

Similar results were observed for a representative wide-body aircraft (Boeing 777-200). Noise impacts of the representative wide-body aircraft performing a delayed deceleration approach procedure are compared to a standard deceleration procedure below.

Flight profiles for both baseline and delayed deceleration approach procedures were generated and are shown in Fig. 29. The weight was assumed to be maximum landing weight[7]. The baseline case was a 3 degree ILS approach with a 4,000 ft level off with a standard deceleration profile. The standard deceleration profile was assumed to be the mean deceleration profile seen in the ASDE-X data for Boeing 777-200 aircraft at Boston Logan Airport in 2017. Flap and slat deployment were assumed to occur once the aircraft decelerated to 10 knots below the maximum slat and flap speeds for each configuration. The 1,700 ft location, which corresponded to the outer marker location at BOS runway 4R [23], was assumed to be the stabilization point where the aircraft were at V_{REF} + 10 knots and fully configured.

For the delayed deceleration approach, the location of the start of the deceleration from 250 knots was assumed to be the point at which at idle thrust, the aircraft would be able to meet the final approach configuration of flaps 30 speed at 2,000 ft. The resulting flight profiles are shown in Fig. 29. The distance to touchdown where flaps 1 through flaps 30 were deployed are marked on the indicated airspeed profiles.

[7] The maximum landing weight of the Boeing 777-200 assumed to be 455,000.

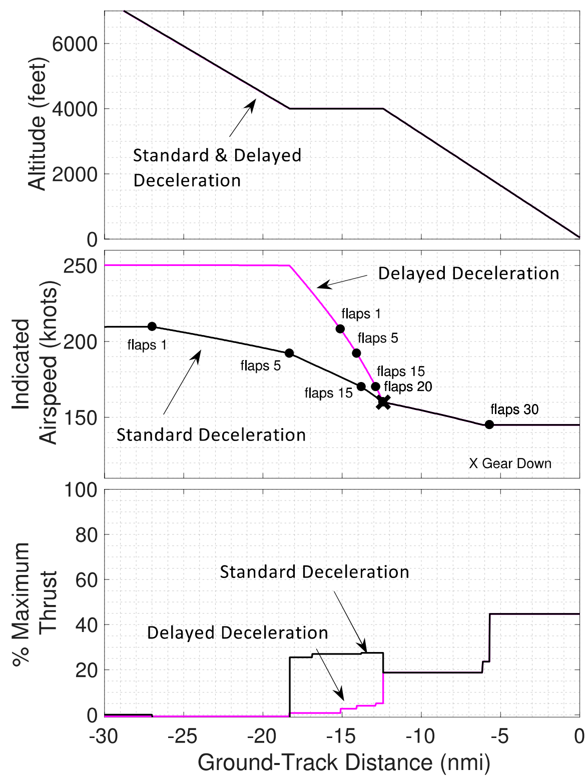


Fig. 29 Altitude, Velocity, and Thrust Profiles for Representative Wide-Body Aircraft Performing a Standard Deceleration (black) and Delayed Deceleration (magenta) Approach with 4,000 ft Level-Off

The black lines in Fig. 29 represent the velocity and thrust profiles of the baseline standard deceleration approach and the magenta lines represent the profiles for the delayed deceleration approach. Flaps 20 and gear down are required for this aircraft to have enough drag to perform the 3 degree final descent after the ILS intercept. Thus, the two procedures are the same after the ILS intercept.

Fig. 30 shows the reduction in the total $L_{A,MAX}$ noise under the flight track due to the delayed deceleration approach compared to the standard deceleration. Modeled $L_{A,MAX}$ under the flight track of the various noise components for the ILS procedure with a 4,000 ft level-off is shown in Fig. 31 for reference.

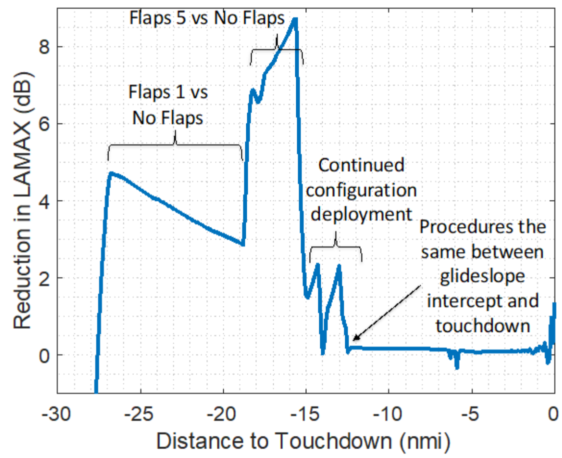
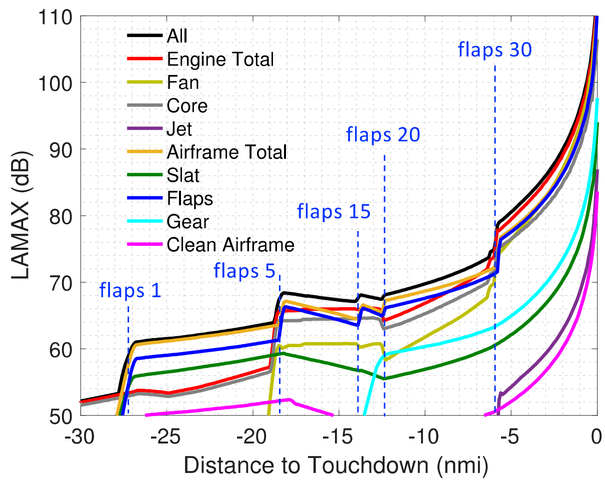
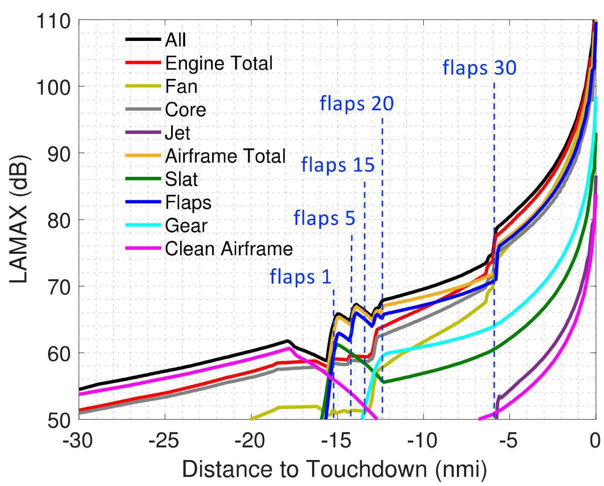


Fig. 30 Reduction in $L_{A,MAX}$ (dBA) Under the Flight Track for Delayed Deceleration Approach Compared to Standard Deceleration for Representative Wide-Body Aircraft



a) Standard Deceleration



b) Delayed Deceleration

Fig. 31 Noise Levels Under the Flight Track for Different Noise Components, Representative Wide-Body Aircraft Approaches with 4,000 ft Level-Offs

As shown in Fig. 30, noise is reduced by about 4 to 8 dBA by delaying the deceleration and subsequent flaps 1 and flaps 5 deployment. The most significant reductions are beyond 15 nmi from touchdown. The delay in the flap and slat deployment, as well as the decrease in thrust during the level segment between 19 and 13 nmi to touchdown, results in a decrease in the configuration noise and engine noise for the delayed deceleration approach compared to the standard deceleration approach. After the intercept with the ILS at 13 nmi, the two procedures have the same noise impact. In this example, beyond the ILS intercept at 13 nmi from touchdown, delaying the deceleration such that the aircraft can maintain a clean configuration and idle thrust levels for as long as possible is shown to have a significant impact on reducing community noise.

Significant noise benefits were observed when delaying deceleration and subsequent flap and slat deployment for both aircraft assessed. There does appear to be a significant noise benefit from delayed deceleration approaches.

3. Operational Implications of Delayed Deceleration Approaches

While there appears to be a significant noise benefit from delayed deceleration approaches, there are operational challenges associated with this procedure from both a cockpit and air traffic control perspective that require further study. One key issue is that the deceleration performance will vary by aircraft type. Even for the same aircraft type, the deceleration performance will be affected by aircraft weight as well as winds and air density.

From the cockpit perspective, pilots will need procedures or guidance to manage aircraft deceleration on approach considering aircraft weight, winds, and air density to assure that the aircraft reaches the stable approach criteria prior to the stabilization point. The guidance or procedures could include speed, thrust and configuration targets. Some initial work has been done on cockpit displays for planning optimal flap, slat, and landing gear release locations based on operating conditions. One example system is the Low Noise Augmentation System (LNAS) by DLR Flight Systems [25], which includes an electronic flight bag function that shows the closest or latest location from the runway where flaps, slats, and gear can be deployed and still meet the stable approach at a target location. Another similar system is an Airbus Flight Management System mode on the A350 that gives deceleration and flap deployment guidance [26].

From an air traffic control perspective, different deceleration rates for different aircraft will also create challenges in sequencing aircraft. Airborne aircraft are subject to minimum separation requirements. In general, aircraft must be separated by 3 nautical miles horizontally and/or 1,000 ft. vertically. Detailed separation requirements are specified in FAA Joint Order 7110.65Y [27]. Air traffic controllers must provide a sufficient time or distance interval between approaching aircraft to ensure the required separation between leading and trailing aircraft. However, the delayed deceleration schedules that yield the greatest noise reduction will vary by aircraft. As a result, research is required to determine how to implement delayed deceleration procedures and if aircraft specific procedures are warranted or if less aggressive decelerations that all aircraft can fly provide sufficient noise benefit.

An additional air traffic consideration is that procedure design criteria may need to be adjusted to allow larger turn radii which would be required for higher speed turns.

VI. Conclusion

This analysis shows that for modern aircraft on departure, changes in aircraft climb speed have minimal impact on the overall aircraft departure noise (less than 0.5 dBA over the entire departure procedure). Varying flap retraction and acceleration location was shown to result in minimal differences in the departure profile and small differences in noise (less than 1.2 dBA over the entire departure procedure). The current practice, which is consistent with the ICAO NADP 2 departure procedure, appears to be close to the minimum noise impact modeled.

This analysis shows that for modern aircraft on arrival, changes in approach airspeed could have a noticeable impact (reductions of 4-8 dBA) on the overall aircraft noise at relatively large distances from touching down (between 10 and 25 nmi from the runway). Engine thrust on approach is often low and thus airframe noise components, such as flap and slat noise, are more easily heard on approach than on departure. If aircraft decelerate early in an approach, then flaps and slats must be released. The release of these devices results in a noticeable change in approach noise. Thus, a delayed deceleration approach where deceleration is delayed such that the aircraft can maintain a flaps and slats retracted configuration for as long as possible while also delaying the need to increase thrust on approach is beneficial in terms of noise reduction. This procedure has the potential to reduce community noise but has implementation challenges, including the ability of pilots to know where to begin the deceleration for different aircraft weights and weather conditions and how air traffic controllers will sequence aircraft with different deceleration rates. Additionally, though the noise modeling shows a potential benefit from this concept, it is desired to validate this benefit through noise measurement of actual aircraft operations. These challenges require further study and are being supported by the FAA through the ASCENT Center of Excellence.

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January 22, 2021

From
Darlene Donahue
To
Mary-Lynne Bernald
Message

FAA response to Ms. Bernald SCSC BDEGA letter dated November 24, 2020:

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Good afternoon,

Please find the attached FAA response to Ms. Bernald SCSC BDEGA

letter dated November 24, 2020.

Have a great afternoon.

Darlene Donahue

Administrative Specialist

Attachment Name

20210122_Darlene_Donahue_Mary-Lynne Bernald_FAA Response to Ms. Bernald SCSC BDEGA letter dated November 24, 2020

U.S. Department
of Transportation
Federal Aviation Administration

Western-Pacific Region
Office of the Regional Administrator

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

January 21, 2021

Ms. Mary-Lynne Bernald
Chairperson
Santa Clara/Santa Cruz Counties Airport/Community Roundtable
PO Box 3144
Los Altos, CA 94024

Dear Ms. Bernald:

Subject: BDEGA Arrivals/FAA Response to the Roundtable's Letter Dated November 24, 2020

Thank you for your letter dated November 24, 2020, in which you requested information about the Federal Aviation Administration's (FAA) reasons for the limited increase in the use of the east downwind leg for BDEGA arrivals to San Francisco International Airport (SFO) during reduced traffic volumes.

In your letter, you compared 2005 BDEGA and east downwind (Down the Bay [DTB]) operations to 2020 operations. The FAA is not able to revert to the 2005 air traffic conditions as they no longer exist. Some of the variables precluding a reversion include: improvements in aircraft performance (which enabled more precise procedures), changes in air traffic control operational procedures, and implementation of the Northern California (NorCal) Metroplex Project Performance Based Navigation procedures. Changes made during the NorCal Metroplex project were part of the larger effort to modernize our national airspace system, as mandated by Congress. In 2014, the FAA completed an environmental review of the NorCal Metroplex Project in accordance with applicable regulations, policies, and procedures. This review found that no significant or reportable noise impact thresholds would be reached as a result of proposed implementation of the BDEGA ONE and eight other SFO arrival procedures. Subsequently, the FAA amended BDEGA, and that environmental review also indicated no significant or reportable noise impact thresholds would be reached as a result of its proposed implementation.

Vectoring and sequencing aircraft into the Bay Area airports, while maintaining a safe and efficient traffic flow in a highly dynamic environment, does not solely depend on volume. The FAA's Northern California Terminal Radar Approach Control facility (NCT) currently routes BDEGA arrivals DTB to the extent operationally feasible, and SFO's Runway 28R is listed within NCT's Standard Operating Procedures (SOP) as the preferred arrival runway. Current BDEGA usage is the best that we can do under current circumstances. We will continue to use the BDEGA East routing when traffic and weather allow for it. Due to the interaction with other SFO and OAK traffic, it is not feasible to utilize the BDEGA East procedure and more frequently than we currently are. NCT will continue to reinforce the use of this procedure through training and briefings to air traffic personnel. Also, due to safety concerns, the FAA rarely enacts temporary procedures and would not be able to in this situation, particularly since the termination of the procedure would be based on volume—which is imprecise and fluctuates—and not a set date.

While the FAA is using DTB for arrivals when possible, its use is partially determined by the number of aircraft on the DYAMD arrival as well as other constraints (listed below). The air traffic controller must decide—at least 25 miles northwest of SFO— whether aircraft can be vectored for DTB based on such constraints. As for the NIITE/HUSSH departures, they conflict with the BDEGA arrival procedure; however, they do not affect DTB arrival aircraft due to altitude separation. Some of the other constraints affecting the ability to increase the use of DTB for arrivals are:

- Separation requirements from arrivals to Oakland International Airport (OAK). When there are OAK arrivals, the BDEGA arrivals are vectored on the west downwind to ensure separation is maintained between the SFO arrivals and OAK arrivals, as required by FAA Order 7110.65Y, *Air Traffic Control*.
- DYAMD arrivals. Even when the arrival volume is not high, a sufficient interval that provides separation between aircraft, as required by FAA Order 7110.65Y, *Air Traffic Control*, still must exist for air traffic control to sequence aircraft on arrival.
- SFO 050 departures also fly down the bay and use the same corridor.
- Use of simultaneous dependent approaches to closely spaced parallel runways at SFO. Simultaneous approaches under FAA Order 7110.308C, *1.5-Nautical Mile Dependent Approaches to Parallel Runways Spaced Less Than 2,500 Feet Apart* (.308 Ops), began in October 2012, and aircraft cannot use DTB while .308 Ops are in use.
- Additional air traffic coordination. Although not a large contributing factor, extra coordination is sometimes required between controllers at NCT to use DTB.
- Foreign carriers are no longer vectored to the east downwind leg. Due to the confined path allowed for DTB aircraft, air traffic control instruction must be understood and executed by the pilot without undue delay. Miscommunication with some foreign air carriers previously resulted in unsafe situations while using DTB. To avoid such miscommunication and further ensure safe operations, foreign air carriers no longer use the east downwind leg.
- Periods of higher arrival rates. Although the overall volume of arrivals has decreased, there are still periods of higher volume.

Your second question asks whether DTB is considered an integral part of the BDEGA arrival procedure. All arrival paths to SFO are considered integral to the safe and efficient use of the airspace surrounding SFO.

In response to your suggested changes:

- Increasing in-trail spacing. Increasing in-trail spacing may cause unnecessary delays contrary to the FAA's mission to provide the safest, most efficient airspace system in the world.
- Creating a curved arrival procedure. The FAA is working to create a new DTB Ground Based Augmentation System Landing System (GLS) approach. A GLS approach is

similar to an area navigation approach. It is a standalone approach and will not connect to any arrival route. The FAA does not support connecting DTB to any arrival route—the DTB transition was removed from the BDEGA due to multiple pilot deviations, several resulting in a loss of standard separation and one near mid-air collision.

- Coordinating SFO or OAK departures to allow BDEGA-east arrivals if conflicts exist. DTB is already used as much as possible.
- Making BDEGA-east the default leg for SFO arrivals from the north during night time (10 PM to 7 AM). When an airport has a runway use program, FAA Order 7110.65Y, *Air Traffic Control*, Paragraph 3-5-1, states, "ATC will assign runways deemed to have the least noise impact." NCT's SOPs list SFO's Runway 28R as the preferred runway.

I want to take this opportunity to stress that the FAA is committed to working with the SCSC Roundtable. We appreciate the opportunity to review and respond to your concerns, as we continually strive to improve the safety and efficiency of flight in this country. If we can be of further assistance, please contact my office at (424) 405-7000.

Sincerely,

Raquel Girvin
Regional Administrator