

**Key West International Airport
Ad-Hoc Committee on Airport Noise**

Agenda for Tuesday, March 5th, 2019

Call to Order 2:00 pm Harvey Government Center

Roll Call

- A. Review and Approval of Meeting Minutes
 - 1. For October 2nd, 2018
- B. Ad-Hoc Committee Member
 - 1. Welcome new member Andrea Haynes, Signature Flight Support, as Alternate Aviation Representative
- C. Discussion of NIP Implementation
 - 1. Status of Construction of Building B, Floors 3-6 (34 units)
 - 2. Final Bid Document Preparation & Bidding of KW BTS Building C
- D. Other Reports:
 - 1. Noise Hotline and Contact Log
 - 2. Airport Noise Reports
- E. Other Discussion

ADA ASSISTANCE: If you are a person with a disability who needs special accommodations in order to participate in this proceeding, please contact the County Administrator's Office, by phoning (305) 292-4441, between the hours of 8:30 a.m. - 5:00 p.m., no later than five (5) calendar days prior to the scheduled meeting; if you are hearing or voice impaired, call "711".

KWIA Ad-Hoc Committee on Noise October 2nd, 2018 Meeting Minutes

Meeting called to order by Commissioner Dany Kolhage at 2:00 P.M.

ROLL CALL:

Committee Members in Attendance:

Commissioner Danny Kolhage
Peter Horton
Nat Harris
Sonny Knowles
Marlene Durazo
Dr. Julie Ann Floyd (via telephone)
Harvey Wolney
Norma Faraldo

Staff and Guests in Attendance:

Richard Strickland, Monroe County Director of Airports
Thomas J. Henderson, Monroe County Assistant Director of Airports
Deborah Lagos, DML & Associates
Steve Vecchi, THC
Andrea Haynes, Signature Flight Support
Michelle Gibson, Community
David Strobele, Community

A quorum was present. Commissioner Dany Kolhage chaired the meeting.

Review and Approval of Meeting Minutes for the March 6th and June 5th, 2018 Ad Hoc Committee Meeting

Commissioner Dany Kolhage asked if there were any comments or corrections to the minutes. None were mentioned. Marlene Durazo made a motion to approve the minutes; Nat Harris seconded the motion. The minutes were approved as presented.

Ad-Hoc Committee Members

Andrea Haynes of Signature Flight Support introduced herself and indicated she would be interested in representing Aviation on the Ad-Hoc Committee.

Dr. Julie Ann Floyd made a motion to nominate Andrea Haynes; Sonny Knowles seconded the motion. The motion was approved unanimously.

KWIA Ad-Hoc Committee on Noise October 2nd, 2018 Meeting Minutes

BOCC Meeting - September 19, 2018

Deborah Lagos reviewed the items approved by the BOCC related to the NIP.

Discussion of NIP Implementation

Steve Vecchi provided a Power Point Presentation including the following items:

1. KWBTs Master Phasing Plan Review
2. NIP Pilot Project Update
3. Update of KWBTs Asbestos Testing
4. Building B (Floors 3-6) Construction Progress
5. Building C Design Review Process Update
6. Building C Construction Plan and Challenges

Other Reports

Noise Hotline and Contact Log

Deborah reviewed the five calls received on the hotline. The call from Nathaniel Harris about a drone operating over Las Brisa prompted a discussion of drone operations and FAA regulations.

Airport Noise Report

The following articles were discussed:

1. Volume 30, Number 17, "JesSuite is Launch Customer for Zunum Regional Hybrid-Electric Aircraft,"
2. Volume 30, Number 19, "Enzyme Responsible for Vascular Damage from Aircraft Noise Identified,"
3. Volume 30, Number 19, "NASA Research Center Evaluating Noise of Future Aircraft,"
4. Volume 30, Number 19, "Remotely-Piloted Aircraft Flies Alone," and

Any Other Discussion

Two residents from Bertha Street expressed their concern over the level of aircraft noise at their recently-purchased home.

Peter Horton moved to adjourn the meeting, seconded by Nat Harris. The meeting adjourned at approximately 2:42 pm.

Key West International Airport Noise Hotline Log

Date of call	Time of call	Caller	Contact information	Message
11/2/2018	1:11 PM	Eric Van Hove	3704 Flagler Ave	There has been a noticeable increase in aircraft noise at his house recently.
1/5/2019	12:23 PM	Nathaniel Harris	La Brisa full-time resident	One of the local seaplanes going out to the Port flew right across La Brisa. This was not necessary. The wind was out of the Northwest.
1/23/2019		Susan Phillips	2827 Venetian	She is the new owner of this house and called to find out about the NIP. She was told she was eligible, but it would be several years before her turn.



Deborah Lagos <deborah.murphy.lagos@gmail.com>

3704 Flagler airplane noise

7 messages

Eric <evanhov1@gmail.com>
To: deborah.murphy.lagos@gmail.com

Thu, Nov 8, 2018 at 9:11 AM

Hi Deborah,

I have called the noise hot line last week in and left a voicemail regarding the increased airplane noise by my house. I believe it is a mixture of commercial and military planes. For example today I have heard three different planes loudly from inside my house at 8:56am, 8:58am and 9:02am. Yesterday I heard louder planes at 8:14am 11:11am and 12:01pm. Please advise if I should continue documenting the noise.

Sincerely,

Eric Van Hove
305 304 2553
3704 Flagler Ave.

Eric <evanhov1@gmail.com>
To: deborah.murphy.lagos@gmail.com

Wed, Nov 28, 2018 at 1:40 PM

Hi again Deborah. As per our conversation at the beginning of the month, these are the following times I have heard airport noise.

11/8
8:56am
8:58am
9:02 am
9:23am
9:34am
12:07 pm
12:54pm
12:58pm
1:09pm
9:03pm
9:07pm

11/9
7:54am
8:18am
8:53am
9:01am
9:17am
9:23am
9:31am
9:36am

11/11
6:07pm

11/12
11:16 am
1:10pm

11/13
10:25am
10:27am
10:46 am
11:32am
11:44am
12:11pm

11/15
2:20pm

11/16
1:44pm

11/17
10:23am
10:57am
11:00am
11:02am
12:12pm right over my house (small plane)
12:31pm
3:15pm
3:40pm
3:50pm
4:35pm

11/18
11:26am
11:28am
1:19pm
1:33pm
1:40pm
6:05pm

11/20
12:22pm
12:29pm
12:44pm
12:45pm
12:53pm
1:19pm
4:20pm
4:25pm
4:33pm
4:45pm
5:31pm

11/21
9:45am
10:45am
10:53am
11:02am coast guard helicopter
12:00pm maybe helicopter again
12:12pm
12:17pm
1:41pm
5:29pm

11/22
8:14am
8:45am

8:52am
11:38am
1:27pm
2:01pm
2:38pm
4:21pm
7:05pm

11/23
8:38am
1:46pm
4:27pm

11/24
8:40am

11/26
11:34am
12:30pm
3:06pm

11/28
11:37am
12:22pm
12:46pm
12:53pm
1:35pm

Please advise if I should continue tracking the noise while I am at my house.

Sincerely,

Eric Van Hove
305 304 2553

Begin forwarded message:

[Quoted text hidden]

Deborah Lagos <deborah.murphy.lagos@gmail.com>
To: evanhov1@gmail.com

Fri, Nov 30, 2018 at 12:28 PM

Hi Eric,

If you feel there has been an increase in aircraft noise that is bothering you, please continue to track and report it to me. Your house is located close to the airport, so I am not surprised you are hearing aircraft noise. However, if it seems to have increased in frequency and/or intensity, please let me know.

THANKS!
Deborah

Deborah Murphy Lagos & Associates, LLC
4635 Alisa Circle NE
Saint Petersburg, FL 33703
727.631.1553
deborah.murphy.lagos@gmail.com

[Quoted text hidden]

Eric <evanhov1@gmail.com>

Sun, Dec 30, 2018 at 12:32 PM

To: Deborah Lagos <deborah.murphy.lagos@gmail.com>

Hi Deborah,

I do think the airport noise has increased. Here are some more of my recent times where I can hear the planes inside my house.

12/5
10:47
11:19
13:08

12/6
11:29
11:48
11:58
12:02
12:03
12:04
12:13
12:23
12:25
12:27
12:29
12:30
12:34
12:38
12:40
12:45
13:14
13:44
13:54
14:35
14:37
14:52
14:59
15:22
15:26
15:32
15:38
15:57
16:41

12/7
10:41
11:08
11:45
11:49
11:52
11:56
12:03
12:06
12:09
12:12
12:18
12:20
12:22
12:35
14:41

14:45
14:49
14:57
15:11
15:30
15:33
15:39
15:44
15:48
16:05
16:08
16:13
16:31
16:41
16:56
16:58
17:07
17:39
18:00
18:05
18:11
18:15
18:27
18:32
18:39
18:53
19:09
19:12

12/8
9:05
9:17
13:14
13:26
13:34
13:43
13:55

14:13
14:23
14:45
15:09

12/9
12:33
12:44
16:11
17:01

12/10
12:36

12/11
9:31
10:27
10:56
11:24
12:27
18:13
18:58
19:19
20:21

12/12
8:28
8:35
8:51
9:00
9:07
16:05
16:00
14:16
16:25
14:33
15:32
15:56
16:05
17:05
17:06
17:08
17:54

12/14
18:57

12/18
20:56

12/19
20:21
21:09
21:34

12/23
9:55
9:57
18:31

12/24
20:53

12/25
17:17
17:21

12/26
19:36

12/27
8:39

12/29
11:11
11:27
12:58
13:46

12/30
11:01
11:09
11:27

12:13

12:28

Thank you,

Eric Van Hove

[Quoted text hidden]

Deborah Lagos <deborah.murphy.lagos@gmail.com>

Mon, Dec 31, 2018 at 2:30 PM

To: Eric <evanhov1@gmail.com>

Thank you! I will share your concerns with Monroe County's Ad-Hoc Committee on Noise. Their next meeting is March 5, 2019.

Deborah Murphy Lagos & Associates, LLC

4635 Alisa Circle NE

Saint Petersburg, FL 33703

727.631.1553

deborah.murphy.lagos@gmail.com

[Quoted text hidden]

Eric <evanhov1@gmail.com>

Sat, Feb 23, 2019 at 2:09 PM

To: Deborah Lagos <deborah.murphy.lagos@gmail.com>

Is this something I can/should attend?

Eric Van Hove

[Quoted text hidden]

Deborah Lagos <deborah.murphy.lagos@gmail.com>

Sat, Feb 23, 2019 at 2:33 PM

To: Eric <evanhov1@gmail.com>

Yes, the meeting is open to the public, and you are welcome to attend. One purpose of the committee is to provide a forum for people like yourself to express their concerns about aircraft noise.

If you decide to attend, the meeting is held at the Harvey Government Center, 1200 Truman Ave, on the second floor, in the BOCC meeting room. It starts at 2:00 and usually lasts about an hour.

I'm working on the agenda package right now, and I'll email you a copy when it's finished.

Deborah Murphy Lagos & Associates, LLC

4635 Alisa Circle NE

Saint Petersburg, FL 33703

727.631.1553

deborah.murphy.lagos@gmail.com

[Quoted text hidden]

Airport Noise Report



A weekly update on litigation, regulations, and technological developments

Volume 30, Number 33

October 5, 2018

FAA Annoyance Survey

SURVEY RESULTS INDICATE COMMUNITIES HIGHLY ANNOYED BEYOND 65 DNL CONTOUR

According to a May 3 Airports Council International – North America document – marked “Confidential, For ACI-NA Member Use Only” – there are “indications” that FAA’s long-awaited analysis of the results of its survey of aircraft annoyance in communities around 20 U.S. airports will show that:

- Communities have notably different levels of sensitivity to aircraft noise; and
- Communities are highly annoyed by noise in areas beyond 65 DNL, the current threshold for residential compatibility with airports and the point at which most federal sound insulation funding stops.

The ACI-NA document notes that the annoyance survey results will not be accompanied by any changes to FAA’s current aircraft noise policy, although results will be used by FAA to develop “science-based” noise policy in the future.

(Continued on p. 132)

San Francisco Int’l

SFO USING GBAS TO FINE TUNE ARRIVALS, REDUCE NOISE IMPACT ON COMMUNITIES

San Francisco International Airport has embarked on a project to use the Ground-Based Augmentation System (GBAS) to fine tune aircraft arrivals and reduce their noise impact on communities below that are located under concentrated NextGen flight paths.

GBAS approaches into SFO could allow aircraft to fly at slightly higher altitudes on their initial and intermediate approach legs into SFO, to descend on a slightly steeper angle on final approach, and to land farther down the runway on displaced thresholds.

Asked how much higher on approach altitudes could be raised with GBAS, Doug Yakel, Public Affairs Officer for SFO, told ANR, “We’re still studying altitudes and their potential noise benefit, but we fully expect that any increases in altitudes will come incrementally.

“GBAS procedures will initially mirror existing procedures, then seek to increase altitudes over communities incrementally, aided by future iterations which include procedures for aircraft to land further down our runways. We’d also be

(Continued on p. 133)

In This Issue...

Annoyance Survey ... An ACI-NA confidential document says there are “indications” that the long-overdue results of FAA’s annoyance survey of communities around 20 U.S. airports will show that communities have notably different levels of sensitivity to aircraft noise and that communities are highly annoyed by aircraft noise in areas beyond the 65 dB DNL contour - p. 131

San Francisco Int’l ... SFO will use GBAS, which augments the accuracy of GPS, to fine tune aircraft arrival paths and reduce noise impact on communities - p. 131

FAA Reauthorization ... The Senate finally approves the new FAA reauthorization bill and its many noise provisions sought by community groups. The leader of Queens Quiet Skies says passage of the legislation provides an opportunity and incentive for communities and the aviation industry to “enter into a rational dialogue” on NextGen - p. 133

FAA Survey, from p. 131

The annoyance survey was conducted to determine if there has been a shift over time in people's annoyance with civil aviation noise at varied sound levels.

If FAA's survey shows there has been a shift, as some European annoyance surveys have found, then FAA's current dose-response curve for annoyance – which indicates that only about 12% of people are highly annoyed by aircraft noise at a level of 65 dB DNL – will need to be revised.

The World Health Organization's European office will issue updated environmental noise guidelines next week on Oct. 10, which are expected to include a new dose-response curve for aircraft annoyance. So, we will soon see how the WHO curve differs from the so-called "Schultz Curve" that FAA relies on, which is a compilation of community response data on aircraft annoyance from the 1970s.

ACI-NA said in its confidential document that it will continue to stress the importance of having appropriate stakeholders involved in policy development if the FAA's annoyance survey is issued without policy recommendations.

The airport trade group said it will consider the survey results release without policy recommendations to be "the beginning of the conversation," and will consider it to be "premature to speculate about mitigation measures."

Of course, the mitigation measure that airports and airlines are most concerned about is residential sound insulation and how it will be funded if the 65 DNL contour (the current boundary within which homes are eligible for federally funded sound insulation) is expanded out to the 60 DNL contour line. That expansion would make hundreds of thousands of additional homes eligible for sound insulation funding through FAA's Airport Improvement (grant) Program and Passenger Facility Charge revenue.

It has already costs billions of federal dollars to insulate homes within the 65 DNL contour. It would likely take additional billions to insulate out to the 60 DNL contour.

Don't Have Full Story on Results Delay

FAA was expected to release its annoyance survey results by June but did not do so. Asked why, FAA told ANR, "We are assessing the data from the survey." The agency declined to comment on the accuracy of the ACI-NA document.

ACI-NA noted in its confidential report that "Results release had been expected Q2 2018, but now FAA has pulled back and is not setting a date certain for the release. FAA holding the results close – we do not yet have the full story."

The ACI-NA confidential report on FAA's annoyance survey was included as an appendix to a longer ACI-NA presentation on "Understanding the Complexities of Communities and Aircraft Noise," which was presented May 7 at the ACI-NA/AAAE Airport Board & Commissioners Conference.

The documents, which ANR found on the internet, were intended to bring airport officials up to speed on aircraft noise issues in anticipation of FAA's expected release of its annoyance survey results in June.

ACI-NA's documents show airports' concern with how the annoyance survey results will be released to the public and their desire to be part of that process.

The ACI-NA documents may have been removed from the internet. ANR could not find them again in an Oct. 4 search.

Airports Want Only One Dose-Response Curve

FAA originally planned to identify the 20 airports included in the annoyance survey and release individual dose-response curves (relating level of aircraft noise exposure to degree of annoyance) but the agency is now reconsidering that approach in light of airports' concerns, the ACI-NA confidential document explains.

ACI-NA said it is advocating that FAA only release one dose-response curve and give at least one week's notice to the 20 airports that the curve is being released.

FAA plans to provide ACI-NA with some advanced notice and review of highlights of the results. The airport trade group said it is working with FAA for as much notice as possible.

"FAA (Acting Deputy Administrator, Carl Burleson) has said to ACI-NA in meetings they will consider our input, and, based on our input, appears to be reconsidering the plan to identify the 20 [airports in the survey] individually. FAA stated they are committed to a single National approach on noise policy, and do not want to return to the patchwork of the early 1990s. They also note that communities truly do have different levels of tolerance and annoyance, and they have to consider how to handle this."

"... FAA said they are committed to working with ACI-NA and the airlines on how to frame the conversation. They also said they do not want to surprise the stakeholders and that the data will be released with a story," the ACI-NA document states.

Community Outreach Must Be Coordinated

ACI-NA stressed the importance of community outreach regarding the annoyance survey results and said airports and FAA "must be coordinated in that effort."

"There are concerns if FAA directly contacts communities without proper airport management coordination, which could result in the challenges similar to what has been experienced with the PBN/Metroplex projects," the ACI-NA document declared, adding "FAA expressed an appreciation for this point. However, we will continue to stay in contact with FAA, as they have not yet shared what their plans for community outreach may be."

ACI-NA said it is important to have the appropriate stakeholders involved in policy development.

"FAA was clear that the release of the [annoyance survey] data is intended to be a first step, as the FAA is committed to an open and transparent process. He [Burleson] expects the data of the survey to be used in an open conversation. We will continue to work with FAA to develop and better define what the policy follow-on steps will be."

Regarding ACI-NA's confidential document, Scott R. Elmore, ACI-NA Vice President for Marketing & Communications, told ANR, "Because airports often find themselves as the community representative in noise discussions, we continue to engage with our airport membership and the FAA as we learn how the results of this study may fit into any larger conversations about aircraft noise. We appreciate FAA's diligence in considering all sides of this important issue.

"From our ongoing dialogue with FAA, it's our understanding that work continues on the report. Because of that, the presentation you found might also be out of date."

FAA Survey, from p. 131

seeking patterns that keep aircraft further offshore if possible."

SFO officials initially presented their GBAS project to the SFO Community Roundtable in December 2017.

This February, the Roundtable established a Flight Procedures Subcommittee for the project, which includes representatives of SFO, the SFO Tower, and the Northern California TRACON (NCT), which is the FAA's Terminal Radar Approach Control facility in Rancho Cordova (near Sacramento) that manages air traffic for Northern California.

The Subcommittee also includes the FAA's Flight Procedures Team, FAA Flight Safety personnel, and representatives of United, Alaska, Delta, Southwest, and American airlines.

In late March, the Subcommittee began work on "GLS" overlays of existing approaches into SFO. GLS is an acronym for GBAS Landing System. It is the FAA's official term for a GBAS instrument approach procedure. The term GLS appears on every GBAS approach chart.

By Nov. 16, the air carriers and NCT plan to have completed simulator evaluations of the GLS overlay approaches, which are expected to be published by March 26, 2020.

By the end of this year, the Subcommittee plans to submit a request to FAA for permission to develop more innovative GLS approach procedures into SFO. However, that request will not be made until community feedback has been received. It is not clear at this point exactly what those more innovative procedures entail but SFO plans to be using them in late 2020.

GBAS Augments Accuracy of GPS

GBAS augments the Global Positioning System (GPS) used in U.S. airspace by providing corrections to the accuracy of an aircraft's GPS navigation position within a 23 nautical mile radius of an airport. GBAS high-frequency radio signals are accurate within one meter on horizontal and vertical directions.

GBAS, which can be installed by airports as a non-federal navigational aid, provides a satellite-based alternative to the Instrument Landing System (ILS). Both GBAS and ILS can be aligned with performance-based navigation proce-

dures (RNAV and RNP).

There are over 100 GLS approaches currently in use around the world, including at five U.S. airports: Newark Liberty, Houston Bush Intercontinental, Atlantic City, Grant County International, and Charleston International.

In addition to SFO, four other U.S. airports are currently planning to implement GBAS technology: LaGuardia, JFK, Seattle-Tacoma, and Atlanta Hartsfield-Jackson International.

Legislation

SENATE FINALLY PASSES FAA REAUTHORIZATION BILL

On a vote of 93 to 6, the U.S. Senate finally passed the Federal Aviation Administration Reauthorization Act of 2018 on Oct. 3. The House passed the bill, which includes almost 20 noise provisions, on Sept. 26 on a vote of 398 to 23 (30 ANR 126).

Neither the airline or airport trade groups commented on the noise provisions of the bill but community groups applauded them.

Asked to comment on the legislation, Janet McEneaney, president of Queens Quiet Skies, issued the following statement:

"The new FAA Reauthorization Act clearly shows the impact that aviation-focused community advocacy groups have had in Washington since 2012. The bill is by no means perfect, nor is it everything we asked for, but the provisions that were included on behalf of our communities are our way-points down the road toward accomplishing our eventual goals.

"Public health studies, environmental studies, noise studies, airspeed studies, dispersal headings, community involvement (not community engagement), FAA regional ombuds – all these were unimaginable six years ago. They are jumping-off points for cooperation among aviation stakeholders.

"Our community groups are not going away. It has become apparent that the industry must work with community organizations in order to get where it wants to go, and vice versa. The landscape has changed and old thinking must evolve with it. We all have an opportunity and incentive now to enter into a rational dialogue.

"Those who hesitate at this critical juncture, or try to hold on to the past, will lose. Queens Quiet Skies is actively pursuing constructive alliances to meet the differing interests of aviation stakeholders. It's possible for a robust aviation industry to exist along with environmental and health protections for the public. We invite you to work with us – not against us – to make that future happen."

Maryland Senators Applaud Bill

Maryland Sens. Ben Cardin and Chris Van Hollen (both Democrats) also lauded Senate passage of the bipartisan,

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five-year reauthorization of the FAA, which will now go to the president for his signature.

The legislation includes provisions put forward by both senators to mitigate the noise levels from incoming and outgoing flights at both Thurgood Marshall Baltimore-Washington and Washington National Airports.

The senators said they have been working for years with local Maryland communities, facilitating meetings and discussions between the FAA and local residents to bring some relief to those most harshly affected by recent changes in flight paths.

“Finally, we will have hard data to back up what many Marylanders already know: the recently altered flight paths are wreaking havoc on the people below. The FAA has to take notice and work with local communities to alleviate the most serious of problems,” said Sen. Cardin. “I appreciate the bipartisan support that helped move these provisions forward.”

“The FAA owes it to our communities to do their due diligence when selecting flight paths,” said Sen. Van Hollen. “This legislation will help ensure that our communities’ needs are better addressed, and I’m pleased that this directs the FAA to give fair consideration to public concerns, improve development of flight procedures, and reduce noise through various techniques.”

Noise provisions of the FAA reauthorization bill advanced by Sens. Cardin and Van Hollen include:

- Clarifying when airports must submit updated noise exposure maps and requiring FAA to consider noise concerns from affected communities when proposing new area navigation departure procedures or amending an existing procedure below 6,000 feet over noise sensitive areas.
- Directing FAA to conduct a review of the FAA’s community involvement in NextGen projects and requiring FAA to submit a report to Congress on how they can improve community involvement.
- Directing the FAA to review and evaluate existing studies of the relationship between aircraft approach and takeoff speeds and corresponding noise impacts on communities surrounding airports.
- Directing a review of the impacts of a phase out of stage 3 aircraft.
- Directing the Administrator to conduct a review of the relationship between aircraft noise and its effect on communities surrounding airports, requiring recommendations for revising land use compatibility guidelines.
- Directing the FAA to partner with an eligible university to study health impacts of noise from aircraft flights on residents exposed to a range of noise levels focusing on a major metropolitan area including Boston, Chicago, New York, the Northern California Metroplex, Phoenix, the Southern California Metroplex, and Washington, DC, region.
- Directing the FAA to carry out a pilot program to mitigate the impacts of aircraft noise, airport emissions, and water quality at airports.
- Creation of a program to research noise, emission, and fuel burn reduction options.

AIRPORT NOISE REPORT

Anne H. Kohut, Publisher

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Airport Noise Report



A weekly update on litigation, regulations, and technological developments

Volume 30, Number 34

October 12, 2018

Europe

WHO EUROPE SAYS 45.5% OF POPULATION WILL BE HIGHLY ANNOYED AT 65 LDEN LEVEL

Some 45.5% of the population will be highly annoyed by aircraft noise at a level of 65 dB Lden (day-evening-night level), according to environmental noise guidelines issued by the European Office of the World Health Organization on Oct. 10 and based on a review of research since 1999.

The WHO Europe estimate is about four times greater than the 12% of the population FAA assumes will be highly annoyed by aircraft noise at 65 dB LDN (day-night level) based on older research data from the 1970s that the agency relies on.

The Lden noise metric that the Europeans use is roughly equivalent to the LDN metric used in the United States. Lden is usually only a decibel or two greater than LDN because, like California's Community Noise Equivalent Level (CNEL), it includes a 5 dB evening weighting.

The guidelines also estimate that the number of people that will be highly sleep-disturbed by aircraft noise at night ranges from 11.3% of the population at 40 dB Lnigh and increases to 40% of the population at a level of 65 dB Lnigh.

(Continued on p. 136)

Europe

WHO ENV. NOISE GUIDELINES FOR EUROPE IDENTIFY LEVELS THAT WILL AFFECT HEALTH

The just released WHO Environmental Noise Guidelines for the European Region provide strong evidence that noise is one of the top environmental hazards to both physical and mental health and well-being in the European Region, WHO's European Office said in its announcement of the document. It continues:

Officially launched to countries and stakeholders in Basel, Switzerland on Oct. 10, 2018, the document identifies levels at which noise has significant health impacts and recommends actions to reduce exposure. For the first time, a comprehensive and rigorous methodological framework was applied to develop the recommendations.

"Noise pollution in our towns and cities is increasing, blighting the lives of many European citizens. More than a nuisance, excessive noise is a health risk - contributing to cardiovascular diseases, for example. We need to act on the many sources of noise pollution - from motorized vehicles to loud nightclubs and concerts - to protect our health," says Dr. Zsuzsanna Jakab, WHO Regional Director for Europe. "The new WHO guidelines define exposure levels to noise that should

(Continued on p. 137)

In This Issue...

WHO Noise Guidelines ...

Environmental Noise Guidelines for the European Region recommend that average aircraft noise exposure not exceed 45 Lden and night exposure not exceed 40 Lden, which one observer says could shut down overnight air express delivery business. Expect strong opposition by aviation industry. "WHO's perspective is an absolutist and unattainable one," acoustician Sanford Fidell says - p. 135

... New WHO guidelines identify levels that will affect people's health - p. 135

Airlines ... JetBlue announces that it plans to retrofit its entire fleet of Airbus A320s and 321s with vortex generators to stop annoying whistling tone during approach - p. 137

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WHO Europe asserts that its new environmental noise guidelines have global relevance because they are underpinned by evidence that has been rigorously reviewed. But the guidelines are only voluntary and FAA and European countries are under no obligation to adopt them.

Expect strong pushback by the aviation industry against the new WHO guidelines, which one observer speculated could shut down the overnight air express delivery business, if adopted.

Issuance of the new guidelines and dose-response tables for annoyance and sleep disturbance will likely be used by those outside the aviation industry to pressure FAA to update its 40-year-old aircraft noise policy and to force the agency to release the findings of its long-overdue annoyance survey at 20 unnamed U.S. airports.

Major Recommendations for Aircraft Noise

Following are the three major recommendations on exposure to aircraft noise made by the 12 noise effects researchers on the WHO Europe Environmental Noise Guideline Development Group (GDG):

- For average noise exposure, the GDG strongly recommends reducing noise levels produced by aircraft below 45 dB Lden, as aircraft noise above this level is associated with adverse health effects.
- For night noise exposure, the GDG strongly recommends reducing noise levels produced by aircraft during night time below 40 dB Lnight, as aircraft noise above this level is associated with adverse effects on sleep.
- To reduce health effects, the GDG strongly recommends that policy-makers implement suitable measures to reduce noise exposure from aircraft in the population exposed to levels above the guideline values for average and night noise exposure. For specific interventions the GDG recommends implementing suitable changes in infrastructure.

The recommendation to keep average noise exposures below 45 dB Lden was based only on annoyance data.

The group “was confident that there was an increased risk for annoyance below this exposure level [of 45.4 dB Lden], but probably no relevant risk increase for other priority health outcomes,” such as incidence of ischaemic heart disease or hypertension, permanent hearing impairment, or reading skills and oral comprehension in children, the guidelines explain.

The GDG made its recommendations for aircraft noise exposure “strong,” which means they can be adopted as policy in most situations, even though the quality of the research reviewed on the relationship between exposure to aircraft noise and incidence of ischaemic heart disease and hypertension was rated very low quality and low quality, respectively.

But the research review team said “a vast amount of evidence” proves the association between aircraft noise and annoyance. In total, 12 aircraft noise studies, including over 17,000 people, were used to model ERFs (exposure-response functions) of the relationship between Lden and % Highly Annoyed by aircraft noise.

Strategies to Reduce Noise Impact

Regarding what can be done to reduce aircraft noise impact, the WHO guidelines state the following:

“Prohibition or discouragement strategies against citizens moving to the direct proximity of airports, for example, can be implemented in the context of urban planning. Likewise, diverting flight paths above less-populated areas can lead to a reduction in exposure. In principle, such intervention measures do not involve any direct costs, although safety concerns may limit the feasibility of these strategies.

“Passive noise abatement measures like the installation of soundproof windows at the dwelling were also regarded as feasible and economically reasonable by the GDG, as these are implemented at several airports already.

“In relation to active abatement measures, the GDG acknowledged the “balanced approach” elaborated by International Civil Aviation Organization, which states that noise reduction should take place first at the source. As indicated by the Clean Sky Programme, this could, for example, entail shifting towards the introduction of new aircraft.

“This broad European research programme estimates that, depending on type, the shift to newly produced aircraft could lead to a reduction of approximately 55-79% of the area affected by aircraft noise, and consequently the population exposed. As this solution has been put forward by the aviation sector, it is considered feasible. Overall, this indicates that solutions to achieve recommended noise levels can be implemented and at reasonable costs.

“The GDG agreed that implementation of the recommendation to minimize the risk of adverse health effects due to aircraft noise for a majority of the population would require a reasonable amount of (monetary) resources. It noted, however, that the feasibility of implementing the measures could be hindered by the fact that costs and benefits are not equally distributed. In most cases, the health benefits citizens gain from interventions that reduce aircraft exposure are borne by private companies and public authorities.”

WHO’s Perspective Is Not Attainable

“The World Health Organization’s recently-released *Environmental Noise Guidelines for the European Region* proceed from a perspective which closely coincides with the European Union’s view that “no person should be exposed to noise levels which endanger health and quality of life,” acoustician Sanford Fidell of Fidell Associates, Inc. in Woodland Hills, CA, who has long experience in acoustical standards development, told ANR.

“This is an admirable perspective for an ideal world, in which no person’s health or quality of life would ever be in-

fringed for any reason, nor purchased at the cost of enormous public economic benefits.

“WHO’s perspective is an absolutist and unattainable one. Regulatory agencies are charged with seeking a balance between conflicting societal interests. The World Health Organization is not a regulatory agency, nor should its public health guidelines be confused with pragmatic regulatory goals.

“If the world were governed purely by WHO’s noise guidelines, noise would never disturb anyone’s sleep, nor interfere with anyone’s speech, nor annoy anyone in any degree. Few citizens of modern societies would consider trading the benefits of, say, motorized transportation or urban living, for such complete freedoms from noise effects.

“The real work of noise regulatory agencies is not to achieve a perfect world, but to identify politically and economically acceptable tradeoffs between ideal and realistic circumstances of noise exposure.”

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not be exceeded to minimize adverse health effects and we urge European policy-makers to make good use of this guidance for the benefit of all Europeans.”

What Is New

Compared to previous WHO guidelines on noise, this version contains five significant developments:

- Stronger evidence of the cardiovascular and metabolic effects of environmental noise;
- Inclusion of new noise sources, namely wind turbine noise and leisure noise, in addition to noise from transportation (aircraft, rail and road traffic);
- Use of a standardized approach to assess the evidence;
- A systematic review of evidence, defining the relationship between noise exposure and risk of adverse health outcomes; and
- Use of long-term average noise exposure indicators to better predict adverse health outcomes.

Driving Policy Action to Protect Communities from Health Effects of Noise

Targeted at decision-makers and technical experts, the new guidelines aim to support legislation and policy-making at the local, national and international level.

“Through their potential to influence urban, transport and energy policies, the Environmental Noise Guidelines contribute to the 2030 Agenda for Sustainable Development and support our vision of creating resilient communities and supportive environments in the Region,” said Dr. Jakab.

Although the guidelines focus on the European Region and provide guidance consistent with the European Union’s Environmental Noise Directive, they also have global relevance. The large body of evidence underpinning the recommendations was derived not only from noise effect studies in

Europe but also from research in other parts of the world, mainly America, Asia and Australia.

Furthermore, the guidelines highlight data and research gaps to be addressed in future studies.

An Independent Peer-Reviewed Development Process

The development process of the current guidelines was conducted by two independent groups of experts from the environmental noise community who adhered to a new, rigorous, evidence-based methodology. Eight peer-reviewed systematic reviews of the pertinent literature underpin the guidelines, incorporating significant research since the publication of the WHO Night Noise Guidelines for Europe in 2009.

The systematic reviews were based on several health outcomes – cardiovascular and metabolic effects, annoyance, effects on sleep, cognitive impairment, hearing impairment and tinnitus, adverse birth outcomes, and quality of life, mental health and well-being – and the effectiveness of interventions in reducing noise exposure and negative health impacts.

“These guidelines have been developed based on the growing body of evidence in the field of environmental noise research,” concludes Professor Stephen Stansfeld, Chair of the Guidelines Development Group. “They aim to support public health policy that will protect communities from the adverse effects of noise, as well as stimulate further research into the health effects of different types of noise.”

The WHO Europe Environmental Noise Guidelines can be downloaded at www.euro.who.int (under “News”).

Airlines

JETBLUE TO RETROFIT A320, 321S WITH VORTEX GENERATORS

On Oct. 10, JetBlue announces plans to retrofit its entire Airbus fleet with noise-reducing vortex generators.

“This move reflects JetBlue’s continued commitment to the communities where its customers and crewmembers live and work,” the airline said.

Beginning in 2015, JetBlue began taking delivery of new aircraft with vortex generators already installed. The airlines said it is committing to add the devices to its 138 remaining Airbus A320 family aircraft through 2021.

The small devices disrupt wind over ports on the wing, which can produce a “whistling” tone during approach into an airport that is especially annoying to communities below.

“While the airline industry has benefited from advances in technology and efficiency leading to quieter planes and engines, the work is never done,” said Joe Bertapelle, Director Strategic Airspace Programs, JetBlue.

“We’re pleased to incorporate this advancement across our Airbus fleet and contribute to our communities in a meaningful way as good corporate citizens.”

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Vortex generators will be installed on 130 existing JetBlue A320 aircraft and eight JetBlue A321 aircraft during their existing scheduled heavy checks with the full fleet wide install expected to be complete in 2021.

All future Airbus orders will be delivered with vortex generators already installed. The cost to retrofit the full Airbus fleet is less than \$1 million.

Electric Aircraft

ZUNUM SELECTS SAFRAN ENGINES FOR ITS HYBRID-ELECTRIC AIRCRAFT

Zunum Aero announced Oct. 4 that it has selected Safran Helicopter Engines to power its hybrid-to-electric commercial aircraft, which will be available in the early 2020s.

Zunum is pioneering development of a family of commercial hybrid-to-electric aircraft designed for regional operations.

Safran Helicopter Engines will provide a new generation engine turbine to drive the Zunum ZA10's electrical generator. "This turbo-generator will power this 12-seat, hybrid-to-electric 700-mile commercial aircraft, driving extraordinarily low operating costs, offering unprecedented door-to-door travel times that are two to four times faster than today. Zunum expects to light up 30,000 airports around the world with frequent and affordable air service," the firm said.

The Zunum aircraft under development, internally dubbed the ZA10, is the first in the company's family of regional, hybrid-to-electric aircraft. The new aircraft is designed to cruise and land on turbo-generator power alone, offering full redundancy.

"Today marks a significant milestone on the path to delivery of the ZA10," said Matt Knapp, co-founder and CTO of Zunum Aero. "The Zunum ZA10 aircraft will bring breakthrough performance to regional aviation, paving the way to fast, electrified, affordable high-speed air services to communities everywhere."

Florent Chauvancy, Safran Helicopter Engines EVP OEM Sales, added: "The Ardiden 3Z represents a very powerful complement to the ZA10 because of its exceptional performance, along with low operating and maintenance costs. This announcement marks a new step forward in demonstrating Safran ability to offer hybrid propulsive solutions for tomorrow's mobility solutions.

Near term milestones in the development of the ZA10 include ground and flight testing scheduled for 2019 with delivery of the aircraft targeted for the early 2020's. Zunum conducted ground tests of the ZA10's hybrid-electric power system at Chicago-area facilities earlier this year.

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A weekly update on litigation, regulations, and technological developments

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Standards

ANSI/ASA RETRACT STANDARD USED TO ASSESS SLEEP DISTURBANCE FROM AIRCRAFT NOISE

The American National Standards Institute and the Acoustical Society of America recently announced the retraction of an aircraft noise sleep disturbance standard adopted in 2008 that described a method of predicting the probability of awakening at least once per night due to transportation noise intrusions into residential sleeping quarters.

“ANSI/ASA S12.9-2008/Part 6 was developed primarily to assess sleep disturbance created by transportation noise, as required by the National Environmental Policy Act (NEPA) and by similar state legislation, for assessing nighttime noise impacts of major, government-funded projects. Limitations of the Standard that have become evident in the years since its publication outweigh its usefulness for its intended purpose,” ASA and ANSI explained in a joint technical report discussing their decision to rescind the standard.

The report continues: The decision of Working Group 15 of ANSI Committee S12 to withdraw ANSI/ASA S12.9-2008/Part 6 “implies that the method for calcu-

(Continued on p. 140)

Research

EU PROJECT SEEKS TO LINK TECHNOLOGY DEVELOPMENTS WITH ENVIRON. CONCERNS

The European Union is funding an ambitious research project that seeks to better understand the many factors that cause communities to be annoyed by aircraft noise in order to provide engineers and operational planners with the tools needed to allow them to design aircraft and imagine air traffic patterns that will reduce annoyance.

Called ANIMA (Aviation Noise Impact Management through Novel Approaches), the project is designed to help make the link between technological developments and environmental concerns.

The ANIMA project includes a large consortium of 22 partners throughout Europe: airports, aviation research centers in France, Germany, and The Netherlands, universities, small and medium-sized businesses (SMEs), and non-governmental organizations from 11 countries. Airbus and Safran are part of the project, as are Heathrow Airport and the Schiphol Group.

The research team includes nearly 70 experts from a broad range of disciplines, including acoustics, numerical simulation, psychology and sociology, land-use

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In This Issue...

Sleep Disturbance ... The American National Standards Institute and the Acoustical Society of America retract a 10-year-old standard used in NEPA analyses to predict the probability of sleep awakenings due to aircraft noise intrusions into residential sleeping areas - p. 139

Annoyance ... Leaders of an ambitious EU research project called ANIMA believe that the multi-factored nature of aircraft noise annoyance can only be understood by a multi-disciplinary research team - p. 139

SSTs ... GE Aviation completes the initial design of the first supersonic engine purpose-built for business jets. It will power Aerion Corporation's AS2 12-passenger supersonic business jet - p. 140

Hybrid-Electric Aircraft ... Heathrow Airport announces that first hybrid-electric aircraft to be put into regular service at Heathrow will not have to pay landing charges for an entire year - p. 141

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lating “at least one behavioral awakening per night” contained in the former Standard should no longer be relied upon for environmental impact assessment purposes. The Working Group believes that continued reliance on the 2008 Standard would lead to unreliable and difficult-to-interpret predictions of transportation-noise-induced sleep disturbance.

“The Working Group further believes that project alternatives that have been endorsed in already completed environmental assessments on the basis of calculations of “at least one behavioral awakening per night” may be in error and have overestimated numbers of expected awakenings. The Working Group understands that its decision to withdraw the 2008 Standard may be disruptive to acoustical consultants who rely on the Standard for environmental impact assessment purposes.

“Therefore, two Informative Annexes of the 2008 standard are included in this document for the guidance they can provide until more plausible and technically defensible means are developed for predicting sleep disturbance due to transportation noise.”

The two Annexes define ways to quantify the probability of behavioral awakening as a function of the single-event indoor A-weighted sound exposure level (ASEL) for an habituated population, and the probability of awakening a population with a sound that is new to an area.

“Practitioners and the public may benefit from information that describes the difference between awakening in habituated and unhabituated populations. Higher noise levels have been reported to be required to disturb sleep in an habituated population than for a non-habituated population [Ollerhead, 1992]. This finding may be relevant in assessments conducted for NEPA-related purposes of project-related noise effects on sleep disturbance,” a footnote in the report explains.

Reasons for Retracting Standard

The joint technical report explains that ANSI/ASA S12-9-2008/Part 6 does not usefully predict transportation-noise-induced sleep disturbance for the following reasons:

- It is based on analysis of a relatively small amount of non-representative information about noise-induced sleep disturbance;
- Its predictions of probabilities of “at least one awakening per night” are based on implausible and untenable statistical assumptions and analytic methods, and cannot be generalized from one airport to another;
- The predicted quantity (“at least one awakening per night”) does not usefully distinguish degrees of sleep disturbance among preferred and alternate project actions;
- For lack of cautions in the language of the Standard, its methods are readily misapplied, and its predictions of “at least one awakening per night” are easily over-interpreted;
- The standard attempts to characterize an intuitively appealing form of objectively measured sleep disturbance, but in so doing, it fails to acknowledge the many complexities

that impact sleep and other forms of sleep disturbance that are known to be sensitive to nighttime noise exposure; and

- The standard does not quantitatively address the roles of familiarity with noise sources and habituation to noise exposure as determinants of sleep disturbance.

Implications of Retraction

“The chief implication of the retraction of ANSI’s sleep standard is that practitioners of the black art of preparing environmental disclosure documents for airports will have to admit that they have no reliable means for estimating sleep disturbance due to new infrastructure projects. In other words, it will preclude them from hiding their ignorance behind the retracted standard,” an acoustical expert told ANR.

“They will probably prepare two or three pages of “on the one hand, but on the other...” discussion of the sleep literature in lieu of a standardized analysis – but in truth, the lack of a standard and the indeterminate nature of sleep interference due to aircraft noise won’t deprive decision makers of accurate, substantive information [because there is none]. (The retracted standard didn’t provide much in any event.)

“As for whether NEPA-like documents based on the retracted standard are now vulnerable to *post hoc* challenge, you’d be better served by posing the question to a lawyer rather than to an acoustician. Equations provided in “informational annexes” of standards are not part of standards themselves, but I suppose that in the absence of an actual standard, can be cited as best available information. (Not that such citations will be of much use to the decision makers for whom the disclosures are nominally made.)”

The retraction of the ASA/ANSI sleep disturbance standard points to the need for funding to conduct the research needed to understand under what circumstances aircraft noise disturbs people’s sleep.

SSTs

GE DESIGNS FIRST SST ENGINE BUILT JUST FOR BUSINESS JETS

At an Oct. 15 press conference with Aerion Corporation, GE Aviation announced that it has completed the initial design of the first supersonic engine purpose-built for business jets.

The engine is designed to meet stringent FAA Stage 5 subsonic aircraft noise standards and to beat current emissions standards.

The announcement was made at the annual convention of the National Business Aviation Association (NBAA) in Orlando.

The new engine class, called GE’s Affinity™ turbofan, is optimized with proven GE technology for supersonic flight and is timed to meet the launch of Aerion’s AS2 12-passenger supersonic business jet, which will operate at 1,000 mph.

Aerion plans to fly the AS2 in 2023 with certification in 2025.

“The Affinity is a new class of medium bypass ratio engines that provide exceptional and balanced performance across supersonic and subsonic flights. The Affinity integrates a unique blend of proven military supersonic experience, commercial reliability and the most advanced business jet engine technologies,” GE explained in a press release.

GE said its Affinity “is purposefully designed to enable efficient supersonic flight over water and efficient subsonic flight over land, without requiring modifications to existing compliance regulations. The engine is designed to meet stringent Stage 5 subsonic noise requirements and beat current emissions standards.”

Aerion is collaborating with GE Aviation, Lockheed Martin and Honeywell to develop the AS2.

“Our mission is to enhance global mobility with supersonic speed, starting with business aviation, and following with successively faster and larger designs for business and commercial aviation,” said Aerion CEO Tom Vice. “GE Aviation is making this new efficient, sustainable supersonic era possible through its pioneering work on the Affinity engine.”

Heathrow Airport

1ST HYBRID-ELECTRIC AIRCRAFT WILL PAY NO LANDING CHARGES AT HEATHROW FOR ONE YEAR

In a world first, London Heathrow Airport announced Oct. 16 that the first hybrid-electric aircraft to be put into regular service at the UK’s international hub will not have to pay Heathrow’s landing charges for an entire year, a prize worth nearly £1 million (\$1.3 million).

Airports are eager to attract hybrid-electric aircraft mainly to reduce growing aviation emissions but an added benefit will be reduced noise.

The Heathrow announcement coincided with its celebration of GreenBusiness Week and was inspired by the first short electric-powered flight carrying two passengers at Oslo Airport earlier this year.

Heathrow said it is looking to leverage its role as one of the world’s leading airports to drive sustainable change across the industry.

There are already more than 100 electric aircraft projects underway across the world and current industry thinking suggests electric aircraft could touch down at major international airports by 2030, Heathrow officials said.

They noted, however, that innovators are facing two main hurdles: the cost of development and current demand. The £1 million prize has been designed to incentivize airlines to invest in electric technology, helping to increase demand and speed up the arrival of zero-emissions flights at the UK’s biggest airport.

“Electric aircraft could be much quieter, cleaner and more

efficient than today’s fleet. With global air passengers expected to double by 2035, these changes will play a critical role in driving a sustainable future for the aviation sector and will support goals outlined in Heathrow’s own sustainability strategy – Heathrow 2.0,” the airport said.

Heathrow currently incentivizes airlines to bring their greenest fleet to Heathrow through the use of environmental charges, and will continue to work with airlines to develop these incentives in the future.

The prize comes alongside Heathrow’s existing plans to decarbonize the industry and pursue clean growth, including the quarterly “Fly Quiet and Green” league table which tracks airline performance on noise and emissions targets, and a partnership with Virgin Atlantic and LanzaTech to further the take-up of more sustainable biofuels.

Said Heathrow Chief Executive John Holland-Kaye, “Heathrow has long been a leader in sustainable aviation. We championed carbon neutral growth in global aviation, which will come into effect in 2020. The next frontier is zero carbon flying, and I hope this prize will help to make it a reality at Heathrow by 2030.”

Added Airbus Chief Technology Officer Grazia Vittadini, “With air traffic projected to double every 15 years, it is our duty as an industry to find solutions that ensure sustainable growth with minimal environmental impact. At Airbus, this is our driving force for developing electric and hybrid-electric propulsion technologies. We commend Heathrow Airport’s initiative to jump-start the adoption of hybrid-electric technologies with the launch of the Grand Innovation Prize!”

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planning, aviation operational management, and communication.

Project leaders are convinced that the multi-factored nature of aircraft noise annoyance can only be understood by a multidisciplinary research team.

ANIMA also has an advisory board that includes aviation noise experts, independent organizations that tackle aviation noise, and policy-makers.

On Oct. 9-11, the second technical review and project management meeting for ANIMA was held in Amsterdam and hosted by The Netherlands Aerospace Centre (NLR).

At the meeting, Laurent Leylekian of ONERA (Office National d’Etudes et Recherches Aérospatiales), the French national aerospace research center, who serves as the coordinator of the ANIMA project, highlighted the impact of the project.

“As we pass the first year of this project, we are seeing a high level of expectation from communities and industry on this project, which ANIMA is aiming to deliver. Moreover, the ANIMA project has the potential to provide end-users, such as airports, with novel approaches for noise impact mitigation,” he said.

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Non-Acoustical Factors

The ANIMA web site states, "Surveys show that for similar levels of noise, some communities around airports are complaining and some are not. Thus, we do know that beyond noise, non-acoustical factors are strongly affecting the capacity of communities to tolerate or to compensate the annoyance. Analyzing, disseminating and implementing mechanisms and measures that are actually allowing communities to accept reasonable levels of noise through engagement and/or compensation is the first objective of ANIMA."

The project also will develop a common strategic research roadmap for aviation noise reduction, which will include mitigation solutions, assessment of noise effects on populations, and best practices, paying special attention to community involvement.

ANIMA is one of three projects being funded by the European Union under its Horizon 2020 research and innovation program that deals with the aircraft noise problem from different, but complementary, standpoints.

The goal of ANIMA is to improve the quality of life in communities living in proximity of airports by mitigating the impact of perceived noise in psycho-acoustic terms.

ARTEM (Aircraft Noise Reduction Technologies and Related Environmental Impact) focuses on the integration of highly innovative technologies on aircraft, to be implemented from now until 2050.

AERIALIST (Advanced Aircraft-Noise-Alleviation Devices Using Metamaterials) is a fundamental research project and focuses on the use of metamaterials for the development of highly innovative technologies that can reduce noise radiation.

In Brief...

NextGen Advisory Committee Meeting

The NextGen Advisory Committee will meet on Oct. 31 at 8:30 a.m. at The Mitre Corporation facilities in a northern Virginia suburb of Washington, DC.

The meeting will take place in Building 1, MITRE 1 Conference Center, 7425 Colshire Dr., Tysons, VA.

The agenda for the meeting has not yet been announced but, when finalized, will be published on the FAA's Meeting web page at:

https://www.faa.gov/about/offices_ang/nac/

AIRPORT NOISE REPORT

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Research

AIR POLLUTION, TRANSPORT NOISE EFFECTS ARE ADDITIVE, SWISS RESEARCHERS REPORT

Air pollution and transportation noise are both associated with an increased risk of heart attacks. But studies on air pollution that do not take into account air traffic and other transportation noise tend to overestimate the long-term effect of air pollution on heart attacks, according to a study conducted by the Swiss Tropical and Public Health Institute and published Oct. 24 in the *European Heart Journal*.

Where air pollution is high, the level of transportation noise is usually also elevated. So, it is not only air pollution that negatively impacts health but car, train, and aircraft noise also increases the risk for cardiovascular diseases and diabetes, as previous research has demonstrated, the study explained.

Studies investigating the effect of air pollution without sufficiently taking into account the impact that noise exhibits on health, might overestimate the effect of air pollution, the study stressed.

In their study, the Swiss researchers looked at the combined effects of air pollution and transportation noise for heart attack mortality, by considering all deaths

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Low-Boom SST

NASA FLIGHTS OFF GALVESTON WILL TEST WAYS TO MEASURE RESPONSE TO LOW BOOMS

[Following is an Oct. 30 NASA news feature by Matt Kamlet, Public Affairs Specialist, NASA Armstrong Flight Research Center.]

NASA is set to begin a series of quiet supersonic research flights off the coast of Texas near Galveston to test ways to measure the community's response to a unique acoustic experience.

Normally, an aircraft flying at supersonic speeds (faster than Mach 1, the speed of sound) produces a sonic boom so loud that, today, commercial supersonic flight is prohibited over land.

Beginning Nov. 5, however, NASA test pilots will fly an F/A-18 supersonic research aircraft in a unique maneuver that creates a quieter "thump." Capturing how people and sensors on the ground respond to that sound is the goal for the Quiet Supersonic Flights 2018, or QSF18, campaign.

"QSF18 is a big step in NASA's efforts to understand what is required for acceptable supersonic overland flight," said NASA's Commercial Supersonic Tech-

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In This Issue...

Research ... Air pollution studies that do not take into account transportation noise tend to overestimate the long-term effect of air pollution on heart attacks, Swiss researchers report - p. 143

Low-Boom SSTs ... On Nov. 5, NASA will begin flight tests off the coast of Galveston, TX, with F/A-18 supersonic research aircraft to test ways to measure community response to low-level sonic booms - p. 143

... NASA conducts wind tunnel tests of low-boom SST model. Data will be used to develop simulation models, refine flight controls for low-boom supersonic demonstration plane that will begin flying over communities in 2023 - p. 144

San Francisco Int'l ... FAA will complete review of proposed update to SFO's Part 150 noise compatibility program by April 16, 2019. Public has until Dec. 26 to submit comments to FAA on the update - p. 146

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that occurred in Switzerland between 2000 and 2008. Analyses that only included fine particulates (PM_{2.5}) suggest that the risk for a heart attack rises by 5.2% per 10 µg/m³ increase in the long-term concentration at home. Studies which also account for road, railway and aircraft noise reveal that the risk for a heart attack attributable to fine particulates in fact increases considerably less; 1.9% per 10 µg/m³ increase. These findings indicate that the negative effects of air pollution may have been overestimated in studies which fail to concurrently consider noise exposure.

“Our study showed that transportation noise increases the risk for a heart attack by 2.0 to 3.4% per 10 decibels increase in the average sound pressure level at home,” said Martin Röösli, Head of the Environmental Exposures and Health Unit at Swiss TPH, and lead author of the published research. “Strikingly, the effects of noise were independent from air pollution exposure.”

Effects of Noise, Air Pollution Are Additive

The study also found that people exposed to both air pollution and noise are at highest risk of heart attack. Hence, the effects of air pollution and noise are additive.

“Public discussions often focus on the negative health effects of either air pollution or noise but do not consider the combined impact.” said Röösli. “Our research suggests that both exposures must be considered at the same time.”

This has implications for both policy as well as future research. Hence, Röösli and co-researchers recommend including transportation noise exposure in any further research related to air pollution and health to avoid overestimating the negative effects of air pollution on the cardiovascular system.

The study included all deaths (19,261) reported across Switzerland from the period 2000 to 2008. The air pollution (PM_{2.5}) was modeled using satellite and geographic data, calibrated with air pollution measurements from 99 measurement sites throughout Switzerland. Nitrogen dioxides (NO₂) were also modeled using 9,469 biweekly passive sampling measurements collected between 2000 and 2008 at 1,834 locations in Switzerland.

Transportation noise was modeled by well-established noise propagation models (sonRoad, sonRAIL and FLULA 2) by Empa and n-sphere. The air pollution and the transportation noise models were applied for each address of the 4.4 million Swiss adult citizen (aged 30 years and above).

The study by Héritier H et al. is “A systematic analysis of mutual effects of transportation noise and air pollution exposure on myocardial infarction mortality: a nationwide cohort study in Switzerland” (2018) *European Heart Journal*, ehy650, <https://doi.org/10.1093/eurheartj/ehy650>

The research was funded by the Swiss National Science Foundation (SNSF) and the Swiss Federal Office for the Environment (BAFU). The study was part of SiRENE (Short and Long Term Effects of Transportation Noise Exposure), an interdisciplinary research project combining experiments in

the sleep laboratory, epidemiological investigations, survey data, and acoustic calculations and modeling.

NASA**NASA CONDUCTS WIND TUNNEL TESTS OF LOW-BOOM SST MODEL**

[Following is an Oct. 25 NASA news feature by Eric Gillard, NASA Langley Research Center.]

It’s a long way from now until the year 2023 for researchers who hope their airplane will lead the next innovation of flight – which is just fine with aeronautics researcher Corey Diebler.

Diebler, who works in the Flight Dynamics Branch at NASA’s Langley Research Center in Hampton, Virginia, is the flight dynamics and simulation lead for the Low Boom Flight Demonstrator project.

“With this particular test, we’re breaking new ground,” Diebler said. “We’re going into a region where we don’t have any other data to guide us.”

NASA recently awarded Lockheed Martin Aeronautics Company a \$247.5 million contract to build a faster-than-sound X-plane — with the official designation of X-59 Quiet SuperSonic Technology, or QueSST — that will demonstrate quiet supersonic technologies in straight and level flight over a large area.

Part of the Low-Boom Flight Demonstration mission, the X-59 QueSST is shaped so that supersonic shockwaves do not coalesce together to create sonic booms. The noise nuisance associated with sonic booms prompted the government to ban supersonic flight over land years ago. Data from the X-59 project could be the path for new commercial markets in supersonic flight in the United States and internationally.

Before the X-59 sees the skies, it must undergo many rounds of testing. The current set of tests, conducted in Langley’s 12-Foot, Low-Speed Tunnel, collected low-speed aerodynamic stability and control data from a sub-scale X-59 model to expand upon previous experimental and computational predictions.

“Being a flight test project, it’s always good to know what lies out there beyond the edges of our planned flight envelope and understand how the airplane will behave when it gets in those regions ... should we find ourselves there,” Diebler said.

The wind tunnel data will be used to develop simulation models and refine vehicle flight controls, which will improve how the airplane flies, even at unlikely flight conditions.

“This data will give us a better understanding of where we can fly safely,” Diebler said. “We’ll use this data in our simulations and it will improve our predictions as to how well the airplane handles over a wider range of flight conditions.”

The test consisted of three phases: static stability and con-

trol tests, dynamic forced oscillation tests, and flow visualization tests using some and laser techniques.

The high angle of attack phase provided data at greater pitch angles than previous tested, which will improve the X-59 simulation at those conditions.

During forced oscillation tests, the X-59 model was put through roll, pitch, and yaw motions and the aerodynamic damping derivatives were measured. The damping derivatives are necessary to properly model the aircraft's response to unsteady events such as in-flight turbulence.

"When we're doing the forced oscillation tests, we force the model to roll at a defined rate," Diebler said. "We essentially extract how the aerodynamics resist that motion and hopefully dampen out the roll, pitch and yawing motions."

Finally, during the third phase of the test, smoke and lasers were used to illuminate the airflow to understand how the vortices created by the wings and canards behave and how they interact with other parts of the airplane such as the vertical tail or the engine inlet.

"This sort of testing gives you a real experimental grounding to see how it compares to the analytical methods," Diebler said.

An added bonus, according to Diebler, is that tunnel testing is more interactive than sitting at a computer, which makes it a fun change of pace.

"Testing a sub-scale model of the X-59 in our 12-Foot Tunnel is like tinkering in your garage due to the hands-on aspect," Diebler said. "When you do a test like this, you really get a feel for the airplane, even though it's a scaled model."

Computational fluid dynamics, even with its complex calculations, is growing in use, but tunnel testing can complement any information learned from it. "In a wind tunnel, once the model has been made, you can collect enormous amounts of data very quickly," Diebler said.

The X-59 QueSST is designed so that when flying supersonic, people on the ground will hear nothing more than a sonic thump – if anything at all. Lockheed Martin is scheduled to begin construction of the X-59 at its Skunk Works plant in Palmdale, California, in early 2019.

Once fully tested and deemed safe to fly within the national airspace, the X-59 in 2023 will begin making supersonic flights over select communities to measure residents' reactions to any noise they might hear.

The scientifically valid data gathered from these community overflights will be presented to U.S. and international regulators, who will use the information to help them come up with rules based on noise levels that enable new commercial markets for supersonic flight over land.

Before that happens, more data needs to be acquired for the X-59 to get ready to fly.

"The data that we're collecting is going to directly affect the vehicle flight controls and how well the airplane flies," Diebler said. "This test is an important step that will allow us to continue to refine the controls and make improvements as we get closer to first flight."

NASA, from p. 143

nology Project Manager Peter Coen. "This is the first time in decades that we have reached out to a large community as part of our supersonic research. NASA has performed similar tests at our Armstrong Flight Research Center, using similar sounds created by the same F/A-18. We've measured the noise levels and the impact on structures, as well as surveyed people for annoyance, to make certain that these tests are safe and well-planned. We greatly appreciate Galveston's interest and support."

The F/A-18 is a typical supersonic aircraft so, in order to shush the boom, it will be put into a quiet supersonic dive maneuver. Starting out over the water at around 50,000 feet the aircraft will be put into a special dive that still creates a regular sonic boom, however when the sound reaches land it should be heard as a quieter "thump" instead.

QSF18 is unique for another reason. For the first time, NASA's Johnson Space Center, located just north of Galveston, will provide critical support for a NASA activity that is about flight but not into space! The center's flight operations staff are part of the team supporting the QSF18 aircraft, pilots and other crew based out of nearby Ellington Field.

"NASA's role as a leader into new frontiers paves the way forward towards new technologies, opportunities, and milestones across multiple endeavors, as we have always done throughout our history," said Mark Geyer, director of NASA's Johnson Space Center. "As our efforts also continue to expand our boundaries and capabilities in space, Johnson Space Center is proud to be working with our colleagues at NASA's research centers at Langley and Armstrong, and to take part in the agency's aeronautics research efforts to lead aviation into a new era as 'One NASA.'"

500 People Will Be Surveyed

In Galveston, community feedback data will be gathered through the use of a survey, in which 500 recruited volunteer residents, if they hear the thumps, will define the level at which they were able to perceive the sound. QSF18 data will be used to help NASA better understand successful data collection methods for future flights using an experimental aircraft called the X-59 Quiet Supersonic Technology, or QueSST, demonstrator. Starting in 2022, the X-59 will directly fly over yet-to-be-selected communities to collect data using lessons learned from QSF18.

"Galveston is both honored and excited to be part of this project," said Galveston Mayor James Yarbrough. "This is the type of project that motivates engineers and innovators. In Galveston, we have a long and proud history of being involved in advances in science and technology, whether that's in medicine, rail, or shipping. In this case, our residents will have an opportunity to participate in a study to advance aviation and the design of commercial planes that can break the sound barrier quietly. We're excited to be a small part of it, and we'll do what we can to support NASA and help ensure

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the success of this study. Thanks to NASA for choosing Galveston as the location for testing this idea.”

While the “quiet thumps” produced by the F/A-18 present no risk of causing physical damage to people or structures, NASA has learned that elements such as atmospheric turbulence and humidity can influence how certain areas may perceive the sound, which may be heard differently from other areas. NASA will operate a number of microphone stations in the area to match up the community’s response with the decibel level of each sonic thump.

Additionally, NASA will have resources available to residents who would like to learn more about supersonic flight research, and how it may help lead to an exceptional reduction in commercial flight times. NASA has committed to engage the educators and youth of the Galveston area, through STEM learning activities. This features two web-based opportunities, including a “Seeing Sound” learning module, with classroom activities for students, and a citizen scientist activity for anyone in the Galveston area to submit data on the sounds they hear. (This activity is separate from the process of collecting official data responses from pre-selected community volunteers.)

Part 150 Program

FAA REVIEWING PROPOSED UPDATE TO SFO AIRPORT PART 150 PROGRAM

On Oct. 26, the FAA announced that it is reviewing a proposed Part 150 noise compatibility program update submitted for San Francisco International Airport by the City and County of San Francisco.

The existing Part 150 noise compatibility program for SFO was approved by the FAA on Sept. 7, 1983. The proposed update will be approved or disapproved by FAA on or before April 16, 2019.

The public has until Dec. 26 to comment on the proposed Part 150 program update, which can be viewed at <https://www.flysfo.com/community/noise-abatement/sfo-part-150-study/draft-report>

Comments should be submitted to Camille Garibaldi, Environmental Program Specialist, SFO-613, FAA, San Francisco Airports District Office, 1000 Marina Blvd., Suite 220, Brisbane, CA 94005-1835; tel: (650) 827-7613.

FAA asked that comments specifically reference whether the proposed measures may reduce the level of aviation safety or create an undue burden on interstate or foreign commerce, and whether they are reasonably consistent with obtaining the goal of reducing existing non-compatible land uses and preventing additional non-compatible land uses.

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Research

STUDY OFFERS INSIGHT INTO LINK BETWEEN CHRONIC NOISE EXPOSURE, HEART DISEASE

Exposure to environmental noise appears to increase the risk of heart attacks and strokes by fueling the activity of a brain region involved in stress response. This response, in turn, promotes blood vessel inflammation, according to preliminary research that will be presented in Chicago at the American Heart Association's Scientific Sessions 2018 event, which will be held on Nov. 10-12.

AHA said the event is a premier global exchange of the latest advances in cardiovascular science for researchers and clinicians.

The study findings reveal that people with the highest levels of chronic noise exposure – such as highway and airport noise – had an increased risk of suffering cardiovascular events such as heart attacks and strokes, regardless of other risk factors known to increase cardiovascular risk, the American Heart Association explained in a Nov. 5 press release on the research, which will be presented at a poster session at the meeting.

The results of the study offer much-needed insight into the biological mecha-

(Continued on p. 148)

Hollywood Burbank Airport

FAA HOLDS PUBLIC WORKSHOPS ON CONTROVERSIAL RNAV DEPARTURES PROCEDURES

Under pressure from elected representatives and the public, the FAA held public workshops on Nov. 7 and 8 on two controversial proposed RNAV departure procedures out of Hollywood Burbank Airport

The purpose of these workshops was to provide people with information about proposed amendments to two existing departure routes at Hollywood Burbank Airport – the OROSZ and the SLAPP. These amendments would tighten up the initial portion of the right turn that aircraft make shortly after departing and reduce the number of aircraft drift to the south before making their turns. We would do this by adding a precise, satellite-based segment to the initial part of the route," Ian Gregor, Communications Manager for FAA's Pacific Division, told ANR.

"We actually wanted to implement this kind of route for Burbank several years ago as part of the Southern California Metroplex project but were unable to due to technical issues. Subsequently, we overcame those technical issues and are now able to implement the route, which fulfills the terms of a [recent] legal settlement agreement we reached with the Benedict Hills Estates Association and Benedict

(Continued on p. 149)

In This Issue...

Research ... Preliminary findings of a study to be presented at an American Heart Association research event offer insights into how chronic noise exposure causes heart disease - p. 147

Hollywood Burbank Airport ... FAA holds two public workshops on controversial RNAV departure procedures out of Burbank airport that communities, elected officials want evaluated in formal env. review process - p. 147

Urban Air Mobility ... NASA officials welcome more than 400 participants with a stake in the future of UAM to Seattle for a two-day gathering at which the agency presented it plans to host a series of "Grand Challenges" to demonstrate the viability of air taxis, drones and other aircraft in an urban environment - p. 148

Election ... Rep. Peter DeFazio is expected to chair the House Transportation and Infrastructure Committee following mid-terms - p. 150

Research, from p. 147

nisms of the well-known, but poorly understood, interplay between cardiovascular disease and chronic noise exposure, researchers said.

“A growing body of research reveals an association between ambient noise and cardiovascular disease, but the physiological mechanisms behind it have remained unclear,” said study author Azar Radfar, M.D., Ph.D., a research fellow at the Massachusetts General Hospital in Boston. “We believe our findings offer an important insight into the biology behind this phenomenon.”

The study was funded in part by the National Institutes of Health and the American Heart Association.

Study Design

Dr. Radfar and colleagues analyzed the association between noise exposure and major cardiovascular events, such as heart attacks and strokes, among 499 people (average age 56 years), who had simultaneous PET and CT scan imaging of their brains and blood vessels. Diagnostic validation was done in a subset of 281 subjects.

All participants were free of cardiovascular illness and cancer at baseline. Using those images, the scientists assessed the activity of the amygdala – an area of the brain involved in stress regulation and emotional responses, among other functions.

To capture cardiovascular risk, the researchers examined the participants’ medical records following the initial imaging studies. Of the 499 participants, 40 experienced a cardiovascular event (e.g., heart attack or stroke) in the five years following the initial testing.

To gauge noise exposure, the researchers used participants’ home addresses and derived noise level estimates from the Department of Transportation’s Aviation and Highway Noise Map.

People with the highest levels of noise exposure (highest quartile versus others) had higher levels of amygdalar activity and more inflammation in their arteries. Notably, these people also had a greater than three-fold risk of suffering a heart attack or a stroke and other major cardiovascular events, compared with people who had lower levels of noise exposure.

That risk remained elevated even after the researchers accounted for other cardiovascular and environmental risk factors, including air pollution, high cholesterol, smoking and diabetes.

Additional analysis revealed that high levels of amygdalar activity appears to unleash a pathway that fuels cardiac risk by driving blood vessel inflammation, a well-known risk factor for cardiovascular disease.

More Research Needed

The researchers caution that more research is needed to determine whether reduction in noise exposure could meaningfully lower cardiovascular risk and reduce the number of cardiovascular events on a population-wide scale.

In the meantime, however, they said the new study findings should propel clinicians to consider chronic exposure to high levels of ambient noise as an independent risk factor for cardiovascular disease.

“Patients and their physicians should consider chronic noise exposure when assessing cardiovascular risk and may wish to take steps to minimize or mitigate such chronic exposure,” Radfar said.

She told ANR that the study has not been published in a scientific journal yet and she could provide no more details about it. ANR had asked what noise levels the subjects were exposed to.

Urban Air Mobility

NASA DISCUSSES PLAN TO HOST UAM ‘GRAND CHALLENGE’ SERIES

NASA officials welcomed more than 400 participants with a stake in the future of Urban Air Mobility (UAM) to Seattle last week for a two-day gathering in which the agency presented its plans to host a series of Grand Challenges for the UAM community.

Urban Air Mobility is defined as a safe and efficient system for passenger and cargo air transportation, such as flying taxis and package-delivery drones, in and around an urban area. Several companies currently are working to develop vehicles and the infrastructure necessary to make UAM a reality.

The purpose of the Grand Challenge, NASA explained in a Nov. 6 announcement, is to promote public confidence in UAM safety while capturing the public’s interest in a future many have imagined, or seen on television shows and movies, for decades.

“The vision to revolutionize air mobility in and around metropolitan areas is one of the most exciting frontiers in modern aviation,” said Jaiwon Shin, associate administrator of NASA’s Aeronautics Research Mission Directorate. “The turnout for this industry day signifies the community’s recognition that NASA is a leader in this area.”

For the first Grand Challenge, now set for late 2020, the idea will be to demonstrate safe operation of a piloted or remotely piloted aircraft capable of carrying at least one adult passenger within a simulated, challenging urban environment.

Participating organizations likely will involve many who attended the briefing in Seattle, including companies with an interest in building UAM vehicles; developing key onboard systems, such as electric propulsion, detect and avoid or command and control; or providing air traffic management for UAM aircraft operating over urban areas.

Also on hand were representatives from academia and local, state and federal government, including the Federal Aviation Administration, which will gather information from the Grand Challenge to inform policy decisions on safety,

certification and airspace integration of UAM operations.

“NASA is committed to working with our industry and government partners in any way we can to safely integrate these new options for passenger and cargo air transportation services into our skies,” Shin said.

NASA will use the Request for Information (RFI) process to let industry day participants and others indicate their interest in participating in the Grand Challenge. The RFI, to which responses are due by Nov. 16, also will help NASA assess the state of the art of industry-developed UAM hardware and systems, as well as collect input on ways to refine and optimize the Grand Challenge so it’s of the most help to industry.

Confidence in the future of UAM and the need for a Grand Challenge is buoyed by the results of two NASA-contracted market studies by teams led by Booz Allen Hamilton of McLean, Virginia, and Crown Consulting, Inc., of Arlington, VA. Links to the studies are at <https://www.nasa.gov/uamge>

Just recently completed, both studies found strong business cases and a highly committed UAM community pursuing the various user scenarios the two companies researched.

“Our findings point toward an exciting future for aviation serving new roles in society through Urban Air Mobility,” said Tom Edwards, Crown Consulting’s chief technology officer.

Among the potentially profitable success stories: by 2030, as many as 500 million flights a year for package delivery services and 750 million flights a year for air metro services.

Less likely to make a profit, according to the research, but still found to be a valuable service in the public interest: air ambulance services. The high up-front costs of building the infrastructure required to support UAM operations also could initially limit profitability for other types of air taxi services.

“The challenges and barriers are numerous, but we believe this technology will be a part of an amazing transformation of our air transportation system of the future,” said Chris Fernando, a senior associate with Booz Allen.

Those barriers include significant legal, regulatory, infrastructure and weather constraints, along with concerns about public perception related to noise, pollution and safety.

“It’s for all of these reasons the first Grand Challenge will be so important in helping to demonstrate the UAM community is making progress to overcome these challenges and realize all that this promising future has to offer,” Shin said.

Noise Could Affect Community Acceptance

In its Urban Air Mobility Market Study, Booz Allen Hamilton said that “adverse energy and environmental impact (particularly, noise) could affect community acceptance” of UAM, and that UAM “posed legal challenges that touch on most aspects of aviation, especially in the areas of air traffic control and management and flight standards, but also environmental policy, public use, land use, and local restrictions.”

A key finding of an exploratory survey of approximately 1,700 residents of five unnamed U.S. cities was that “existing noise concerns focus on traffic noise during the night and

early morning; noise from UAM could pose a more notable barrier in future as electric vehicles become more mainstream (potentially causing a reduction in overall ambient noise, making UAM more noticeable).”

The Booz Allen survey included residents of New York, Washington DC, Miami, Houston, Dallas, Denver, Phoenix, Los Angeles, San Francisco, and Honolulu.

Burbank, from p. 147

Hills Neighborhood Association south of the airport.” Gregor said that the pre- and post-Metroplex flight tracks are pretty much the same but did shift a little to the south.

On Nov. 6, prior to the workshops, California Congressman Brad Sherman (D) met with FAA officials to discuss the SLAPP and OROSZ procedures, which were proposed without FAA conducting an Environmental Assessment or consulting with the affected communities.

Residents affected by noise from the proposed departure procedures have formed a group called Studio City for Quiet Skies demanding that FAA disperse the departure paths so that no community gets all the noise impact.

Following the public outcry, FAA posted a draft initial environmental report last month that suggests using a categorical exclusion for the procedures. However, Gregor stressed that FAA has made no final decision on what environmental analysis of the proposed procedures it will conduct and has no timetable for making that decision, which could be influenced by public comments at the workshops and elsewhere.

Rep. Sherman met with Clark Desing, Director of the FAA’s Western Service Center, and Beth White, Senior Advisor for NextGen Communication and Branding, on Nov. 6.

“We began to explore why all take-offs from Burbank Airport take-off southwest. Some planes might perhaps take-off to the south, southeast, or east,” Sherman said in a statement following the meeting.

In August, Congressman Sherman wrote to the FAA formally requesting that the agency fully engage with impacted communities in the San Fernando Valley to address concerns over aviation noise.

Los Angeles City Councilman Paul Krekorian, and L.A. City Attorney Michael Feuer are also pushing back on FAA’s proposal to implement the RNAV departure procedures out of Hollywood Burbank Airport because of the noise impact they would have.

They say the proposed OROSZ and SLAPP RNAV departure procedures would shift and concentrate southbound departures, increasing noise over many schools, residential neighborhoods, parks, and other noise-sensitive areas in the San Fernando Valley and Santa Monica Mountains.

In an Aug. 23 letter to FAA, L.A. City Councilman Krekorian and City Attorney Feuer asserted that FAA is legally obligated to start a formal environmental review process to consider the impacts of the proposed RNAV departure procedures at Hollywood Burbank Airport.

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Pursuant to FAA Order 1050.1F [Environmental Impacts: Policies and Procedures], FAA cannot rely on a categorical exclusion to obviate the need to prepare an environmental assessment/environmental impact statement if “extraordinary circumstances” exist, they reminded FAA.

Krekorian and Feuer said at least three extraordinary circumstances exist that require the preparation of an EA for the two proposed RNAV departure procedures at Burbank Airport:

- They would have an impact on cultural resources protected under the National Historic Preservation Act;

- They would have an impact on properties protected under Section 4(f) of the Department of Transportation Act. This includes parks and wildlife refuges of the Santa Monica Mountains Conservancy; and

- They would have an impact on noise levels of noise sensitive areas and impacts on the quality of the human environment that are likely to be highly controversial on environmental grounds.

They urged FAA to consider an alternative to its proposed RNAV departure procedures that was proposed by the Burbank-Glendale-Pasadena Airport Authority. They said it might reduce aircraft noise impact by taking aircraft along U.S. Highway 101.

Studio City for Quiet Skies notes on its website that the City of Los Angeles is considering legal action against FAA over the departure paths as is a group of private citizens.

In Brief...

DeFazio Will Chair House T&I Committee

Rep. Peter DeFazio (D-OR) is expected to be named the new chairman of the House Transportation and Infrastructure Committee next week, following the Democrats’ takeover of the House in the Nov. 6 mid-term election.

DeFazio currently serves as the Ranking Member of the Committee. While aircraft noise has not been a primary concern of DeFazio, he is very knowledgeable on the issue. Whether he will be interesting in holding hearings on aircraft noise issues likely depends on whether the House Quiet Skies caucus seeks them and whether the T&I Committee is able to work with President Trump on an infrastructure bill, which could consume a lot of the committee’s time.

The Democratic takeover of the House finally gives the Quiet Skies Caucus, comprised almost entirely by Democrats, an opportunity shine. What they plan to do with that opportunity remains to be seen.

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Airport Noise Report



A weekly update on litigation, regulations, and technological developments

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November 16, 2018

AIP Noise Grants

NOISE GRANTS TOTALING \$116.8 MILLION AWARDED TO 16 AIRPORTS IN FISCAL 2018

Some 16 airports received a total of \$116.8 million in federal Airport Improvement Program (AIP) grants for noise mitigation projects in fiscal year 2018. That is \$33.5 million more than the \$83.2 million that 14 airports received for noise mitigation projects in fiscal year 2017, according to FAA data.

AIP funding levels for airport noise mitigation projects have generally been on a downward trend since they peaked in fiscal 2005 when 57 airports received a total of \$337.1 million in AIP grants.

The drop in AIP noise project funding levels following fiscal 2005 reflects a congressionally-mandated broadening of the special noise set-aside in the AIP program to also fund airport emission mitigation projects, federal belt-tightening, and an increase in the use of Passenger Facility Charges (PFCs) to fund airport noise mitigation projects.

FY 2018 Noise Mitigation Projects

The \$116.8 million in AIP noise grants awarded in fiscal 2018 includes:

- \$114,221,887 million to 11 airports for residential sound insulation;
- \$67,500 to one airport for sound insulation of public buildings;
- \$100,967 to one airport for noise monitoring system installation;
- \$2,418,127 to five airports for noise compatibility planning studies; and
- \$0 for land acquisition.

Highest AIP Grant Awards

The highest airport noise mitigation grant awards in fiscal 2018 all went to fund airport sound insulation programs. They were awarded to:

- Ft. Lauderdale-Hollywood Int'l: \$43 million for residential insulation;
- Los Angeles Int'l: \$30 million in two grants for residential insulation;
- San Diego Int'l: \$13.3 million for insulation, noise compatibility study;
- Chicago O'Hare Int'l: \$10.7 million for residential insulation;
- Atlanta-Hartsfield Int'l: \$6.5 million for residential insulation;
- Key West Int'l: \$4.1 million for residential insulation; and
- Tweed/New Haven: \$2.5 million for residential insulation.

AIP grants represent only one of two federal funding sources available to airport proprietors to fund noise mitigation projects. The other funding source is revenue from Passenger Facility Charges. ANR will report PFC noise data for fiscal 2018 later this year.

In This Issue...

AIP Grant Data ... This special issue of ANR provides data on grants awarded to airports for noise compatibility planning and noise mitigation projects under the federal Airport Improvement Program in fiscal year 2018.

Table 1. Grants for residential sound insulation - p. 152

Table 2. Grants for insulation of public bldgs - p. 152

Table 3. Grants for land acquisition/easements - p. 153

Table 4. Grants for noise monitoring systems - p. 153

Table 5. Grants for noise compatibility planning studies - p. 153

Table 6. Grants by airport for all noise compatibility projects in FY 2018 - p. 154

Highest Grant Awards ... Ft. Lauderdale-Hollywood Int'l received the highest grant award in FY 2018: \$43 million for residential sound insulation. LAX came in next with a total of \$30 million for residential sound insulation, which was followed by San Diego Int'l with \$13.5 million for insulation and a noise compatibility study.

Table 1: AIP Grants for Residential Sound Insulation in Fiscal 2018 (by contour)

<u>State</u>	<u>City</u>	<u>Airport</u>	<u>Sponsor</u>	<u>Amount</u>	<u>Contour</u>
CA	Fresno	Fresno-Yosemite	City of Fresno	\$1 million	65-69 DNL
CA	Inglewood	Los Angeles Int'l	City of Inglewood	\$20 million	65-69 DNL
CA	L.A. County	Los Angeles Int'l	Dev. Comm.	\$10 million	65-69 DNL
CA	San Diego	San Diego Int'l	Reg. Airport Auth	\$12 million	65-69 DNL
CT	New Haven	Tweed-New Haven	Airport Authority	\$2,504,946	65-69 DNL
FL	Broward Cty	Ft. Laud-Hollywood	County	\$43,431,405	65-69 DNL
FL	Monroe Cty	Key West Int'l	County	\$4,102,442	65-69 DNL
GA	Atlanta	Atlanta-Hartsfield	City of Atlanta	\$6,588,658	65-69 DNL
IL	Chicago	O'Hare Int'l	City of Chicago	\$10,717,636	65-69 DNL
WA	Seattle	Seattle-Tacoma Int'l	Port of Seattle	\$1,876,800	65-69 DNL
TX	Lardeo	Laredo Int'l	City of Laredo	\$2 million	65-69 DNL

Grand Total: Residential Sound Insulation: \$114,221,887

Table 2: AIP Grants for Sound Insulation of Public Buildings in Fiscal 2018

VT	Burlington	Burlington Int'l	City of Burlington	\$67,500	—
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Grand Total: Public Building Sound Insulation: \$67,500

Table 3: AIP Grants for Land Acquisition/Easements in Fiscal 2018

<u>State</u>	<u>City</u>	<u>Airport</u>	<u>Sponsor</u>	<u>Amount</u>	<u>Contour</u>
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(No grants awarded in this category in FY 2018).

Grand Total: Land Acquisition: \$0

Table 4: AIP Grants for Noise Monitoring System Installation in Fiscal 2018

<u>State</u>	<u>City</u>	<u>Airport</u>	<u>Sponsor</u>	<u>Amount</u>
PA	Philadelphia	Philadelphia Int'l	City of Phil.	\$100,967

Grand Total: Noise Monitoring System Installation: \$100,967

Table 5: AIP Grants for Noise Compatibility Plan Studies in Fiscal 2018

<u>State</u>	<u>City</u>	<u>Airport</u>	<u>Sponsor</u>	<u>Amount</u>
CA	San Diego County	San Diego Int'l	Reg. Airport Auth.	\$1,350,000
CT	Bridgeport	Sikorsky Memorial	City of Bridgeport	\$170,435
IN	Indianapolis	Indianapolis Int'l	Airport Authority	\$262,500
MA	Westfield	Westfield-Barnes	City of Westfield	\$35,192
TX	Ft. Worth	Ft. Worth Alliance	City of Ft. Worth	\$600,000

Grand Total: Noise Compatibility Planning Studies: \$2,418,127

Table 5: AIP Grants by Airport for All Noise Mitigation Projects in Fiscal 2018

<u>State</u>	<u>Airport</u>	<u>Insulation</u>	<u>Studies</u>	<u>Land</u>	<u>Monitoring</u>	<u>Total</u>
CA	Fresno-Yosemite	\$1,000,000				\$1,000,000
CA	Los Angeles Int'l	\$30,000,000				\$30,000,000
CA	San Diego Int'l	\$12,000,000	\$1,350,000			\$13,350,000
CT	Sikorsky Memorial		\$170,435			\$170,435
CT	Tweed/New Haven	\$2,504,946				\$2,504,946
FL	Ft. Lauderdale Int'l	\$43,431,405				\$43,431,405
FL	Key West Int'l	\$4,102,442				\$4,102,442
GA	Atlanta-Harstfield	\$6,588,658				\$6,588,658
IL	Chicago O'Hare	\$10,717,636				\$10,717,636
IN	Indianapolis Int'l		\$262,500			\$262,500
MA	Westfield-Barnes		\$35,192			\$35,192
PA	Philadelphia Int'l				\$100,967	\$100,967
WA	Seattle-Tacoma	\$1,876,800				\$1,876,800
TX	Ft. Worth Alliance		\$600,000			\$600,000
TX	Lardeo Int'l	\$2,000,000				\$2,000,000
VT	Burlington Int'l	\$67,500				\$67,500

Grand Total: All Noise Mitigation Projects: \$116,808,481

AIRPORT NOISE REPORT

Anne H. Kohut, Publisher

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Airport Noise Report



A weekly update on litigation, regulations, and technological developments

Volume 30, Number 39

November 23, 2018

NASA

LOCKHEED MARTIN BEGINS MANUFACTURING NASA'S X-59 LOW-BOOM SST DEMONSTRATOR

NASA announced Nov. 16 that Lockheed Martin Aeronautics Company of Palmdale, CA, recently began manufacturing the first part of NASA's X-59 Quiet SuperSonic Technology (QueSST) aircraft, a low-boom supersonic demonstrator that will be used to gather crucial community response data that the International Civil Aviation Organization (ICAO) will use to set a noise level for overland supersonic flight.

The X-59 QueSST is shaped to reduce the loudness of a sonic boom to that of a gentle thump. The supersonic aircraft will be flown above select U.S. communities to measure public perception of the noise – data that will help regulators establish new rules for commercial supersonic air travel over land.

“We’ve reached an exciting milestone not only for NASA but for airliners and passengers wishing to arrive to their destination in half the time,” said Craig Nickol, the NASA project manager for the Low-Boom Flight Demonstrator project.

“Manufacturing the first part of the X-59 is a step on a path that leads to the

(Continued on p. 156)

Organizations

COMMUNITY GROUPS FORMALLY ALIGN TO STRENGTHEN ADVOCACY, INFO SHARING

The informal coalition of grass-roots anti-noise community groups known as the National Quiet Skies Coalition has formally coalesced into a new not-for-profit corporation called the Quiet Skies Conference in order to strengthen their advocacy efforts and improve information sharing.

The goals of the new Quiet Skies Conference (QSC) focus on inclusion of communities in all stages of decision-making on flight path changes or new flight procedures that affect them; the use of noise metrics to measure the “true impact” of noise; and the protection of public health and the environment in communities impacted by aviation noise and pollution.

The Conference was formed by leaders of community anti-noise groups representing thousands of people in New York City, Minneapolis-St. Paul, Massachusetts, and Northern and Southern California. These groups, and similar groups around the country, were formed in reaction to the noise impact of focused flight paths that are the hallmark of FAA's implementation of NextGen.

Following is their Nov. 14 announcement on the QSC:

(Continued on p. 156)

In This Issue...

SSTs ... Lockheed Martin begins manufacturing NASA's X-59 Quiet SuperSonic Technology (QueSST) low-boom demonstrator aircraft, which will be used to gather community response data that ICAO will use to set noise levels for overland supersonic flight - p. 155

Community Advocacy ... The informal national coalition of community groups fighting the noise impact of NextGen focused flight paths has coalesced into a new not-for-profit corporation – called the Quiet Skies Conference – in order to strengthen their advocacy efforts and information sharing - p. 155

Litigation ... The State of Maryland asks a federal appeals court to compel the FAA to respond to an administrative petition the State filed with the FAA requesting revisions of RNAV procedures at BWI Airport. FAA says that no formal right exists to petition the FAA as the State of Maryland has done - p. 157

NASA, from p. 155

completion of an exciting research aircraft, quiet supersonic flight and new markets for faster air travel.”

When completed, the single-pilot experimental aircraft will go through a series of tests to prove its performance. Then the X-59 will fly over a number of U.S. communities, collecting data on how the public responds to the quiet “sonic thump.” U.S. and international regulators will use the data to potentially change the rules that currently ban supersonic flight over land.

Lockheed Martin was selected by NASA to build, design and conduct initial flight tests of the X-59. Work under the \$247.5 million contract began April 2 and runs through Dec. 31, 2021 (30 ANR 41).

Under the contract, Lockheed Martin will complete the design and fabrication of an experimental X-plane, which will cruise at 55,000 feet at a speed of about 940 mph (Mach 1.42) with a top speed of 990 mps (Mach 1.5).

The X-plane will create a sound about as loud as a car door closing, 75 Perceived Level decibel (PLdB), instead of a sonic boom.

NASA Commits to Three-Year Timeline

NASA announced Nov. 19 that it has officially committed to a development timeline that will lead to the first flight of its X-59 Quiet Supersonic Technology (QueSST) aircraft in just three years.

“This critical milestone comes after a rigorous review, Key Decision Point-C (KDP-C), that confirmed NASA’s continued support of the X-59, in terms of funding, and established an achievable development timeline for NASA’s first piloted, full-size X-plane in more than three decades” the agency said.

“This aircraft has the potential to transform aviation in the United States and around the world by making faster-than-sound air travel over land possible for everyone,” said NASA Administrator Jim Bridenstine. “We can’t wait to see this bird fly!”

KDP-C commits NASA to the full X-59 development effort through flight-testing in 2021. The cost and schedule commitments outlined in KDP-C align the project with program management best practices that account for potential technical risks and budgetary uncertainty beyond the project’s control.

“This is a monumental milestone for the project,” said Jaiwon Shin, NASA’s associate administrator for aeronautics. “I’m extremely proud of the team for its hard work getting to this point, and we all look forward to watching this aircraft take shape and then take flight.”

Management of X-59 QueSST development falls under the Low Boom Flight Demonstrator project, part of the Integrated Aviation Systems Program in NASA’s Aeronautics Research Mission Directorate.

Organizations, from p. 155

The founders of the National Quiet Skies Coalition have joined together to create a new organization called the Quiet Skies Conference (QSC).

In the spring of 2015, representatives from a few local aviation noise advocacy groups organized the National Quiet Skies Coalition, a forum to exchange information and ideas. Since then, some Coalition members have worked together informally on national issues.

Over the past few months, it has become apparent that the time is right to work together more formally. The result is the QSC, an enterprise for advocacy as well as information-sharing.

The Quiet Skies Conference is a not-for-profit corporation. Its steering committee and Board of Directors is composed of the six founding members of the National Quiet Skies Coalition. Our goal is to more formally align the interests of advocacy groups nationwide and strengthen our representation. QSC will connect with national leaders, elected officials and aviation stakeholders on national issues. The Coalition’s Google Groups forum will continue to provide advocacy groups with a clearinghouse for information.

The QSC has formulated the following national goals as our initial advocacy platform:

A. Include community representation at all stages of the decision-making process when making decisions that affect communities.

1. Hold public hearings with public comment before changing flight procedures or implementing new flight procedures.
2. Design environmentally-sound flight procedures locally, with community input into design and planning in advance of FAA decision-making.
3. Include the impact of aviation noise and pollution on affected communities as a mandatory criterion when the FAA assesses the overall benefits of changes to aviation procedures.
4. Appoint a community representative as a voting member of each decision-making entity that makes aviation decisions affecting communities.
5. Establish a formal process to track the progress and completion of deliverables due under the 2018 Reauthorization Act and report them to Congress and the public.

B. Use metrics that measure the true impact of noise.

1. Support the development of accurate, appropriate noise metrics when considering the impact of aviation noise on affected communities. Report to Congress and the public on statute-mandated evaluation and development of supplemental metrics.
2. Update FAA calculation and modeling methods to reflect human experience of episodic aviation noise and vibra-

tion, including model validation with measured acoustic data recorded in communities located below flight paths. When considering flight path changes, the FAA should consider the concentration of extended noise, the frequency of flights, air traffic from 10PM to 7AM and the impact of low frequency noise.

3. Publish the existing annual noise contours and Noise Exposure Maps produced by FAA out to 55 dB DNL for at least the 30 largest airports.

4. Use the already-approved metric of N_x (e.g. N_{65}) when providing background data to communities about proposed flight path changes.

5. Replace or supplement the DNL metric with other updated metrics used successfully in other parts of the world.

6. Use metrics that distinguish between day and night noise.

C. Protect public health and the environment in communities impacted by aviation noise and pollution.

1. Restore full funding to the EPA's Office of Noise Abatement and Control.

2. Return to full NEPA environmental procedures. Eliminate the automatic categorical exclusion for all NextGen flight procedures. Calculate the environmental impacts of fuel emissions and aviation noise by cumulative rather than "per flight" measures.

3. Require the FAA to publish the results of its current Noise Annoyance Study no later than March 1, 2019.

4. Update the Airport Noise and Capacity Act of 1990 to include consideration of public health issues and restore some local controls.

We think the industry must work with community organizations in order to get where it wants to go, and vice versa. We see an opportunity to pursue strategic, collaborative relationships and foster rational discussion among aviation stakeholders. It is possible for a robust aviation industry to exist along with environmental and health protections for communities on the ground.

If your membership organization is in alignment with our goals and methods, we would welcome your support and participation. We look forward to working with aviation-focused advocacy groups to enhance our voice and presence, and empower our movement.

- Janet McEaney - Queens Quiet Skies (New York City)
- Steve Kittleson - MSP FairSkies Coalition (Minneapolis-St.Paul)
- Kevin Terrell - MSP FairSkies Coalition (Minneapolis-St.Paul)
- Adriana Poole - Boston West Fair Skies (Massachusetts)
- Jennifer Landesmann - Sky Posse Palo Alto (Northern California)
- Martin Rubin - Concerned Residents Against Airport Pollution (Southern California)

Litigation

MD ASKS D.C. COURT OF APPEALS TO COMPEL FAA TO CHANGE NOISY BWI FLIGHT PATHS

On Nov. 8, Maryland Attorney General Brian Frosh filed a petition with the U.S. Court of Appeals for the District of Columbia Circuit following the FAA's inaction regarding environmental impacts and flight paths at Baltimore-Washington Thurgood Marshall Airport (BWI).

"Maryland citizens continue to have their lives disrupted and are subjected to intolerable noise pollution due to the NextGen program's flight paths. For months, the FAA has refused to respond to our request for additional environmental surveys and changes to flight paths at BWI Thurgood Marshall Airport," Frosh told the Court.

"The FAA's inaction is unlawful," Frosh asserted, adding "today, my office filed a petition for review with the Court, asking the court to compel the FAA to respond and begin the process of altering flight paths at BWI. We are committed to restoring the quality of life for the thousands of Marylanders surrounding the airport."

In June, Frosh filed an administrative petition with the FAA requesting a supplemental environmental assessment as well as revisions to area navigation routes and procedures for BWI.

FAA Says No Right to Petition Exists

However, in a Sept. 10 letter, sent in response to Maryland's petition, Assistant FAA Chief Council for Airports & Environmental Law James Lofton said that "no formal right exists in the applicable statutes, regulations, or guidance to 'petition' the [FAA] Administrator as Maryland has done."

Lofton also told the attorney representing the State of Maryland, John Putnam of Kaplan Kirsch & Rockwell, that "FAA's actions with respect to the DC Metroplex Environmental Assessment and the identified procedures at BWI are fully implemented and were complete years ago. There is no major federal action associated with these actions, and FAA does not have a legal duty to supplement the reviews associated with those documents."

Lofton said FAA "declines" to respond to Maryland's administrative petition but noted that the agency did agree in July to reengage on noise issues with the DC Metroplex BWI Community Roundtable but will limit its involvement "to issues outside the scope of administrative petitions filed by the State of Maryland and Howard County, MD."

"If Maryland will withdraw its administrative petition," the FAA attorney told Putnam, FAA "is prepared to consider all recommendations from the roundtable addressing noise concerns at BWI. We believe that the roundtable is the proper forum to address the state's noise concerns from departing and arriving aircraft at BWI."

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Maryland's Petition

In its Nov. 8 petition to the D.C. Court of Appeals, the State of Maryland asked the Court "to review FAA's failure and/or refusal to take the following actions":

(1) Reinitiate consultation with the State Historic Preservation Officer in light of the discovery of unanticipated effects on historic properties, as required by the National Historic Preservation Act (NHPA); and

(2) Review of FAA Administrator's decisions to grant categorical exclusions with respect to flight procedures that were material changes from procedures previously in effect, as required by the National Defense Authorization Act for Fiscal Year 2017.

The State of Maryland asked the Court "to find that the FAA has unlawfully withheld and unreasonably delayed performing these nondiscretionary duties and to compel the FAA to reinitiate consultation and review the relevant categorical exclusions."

DOJ Asks Court to Dismiss MD Lawsuit

In related action, on Aug. 13, attorneys for the U.S. Department of Justice and the FAA asked the D.C. Circuit to dismiss the lawsuit filed by the State of Maryland, which also challenged changes to arrival paths into Washington National Airport on the ground that it was filed too late.

The litigation was filed on June 26, more than two years after FAA published amendments to air-traffic procedures used by aircraft arriving at National Airport in 2015. That is well beyond the 60-day window allowed for challenging FAA final orders and there are no reasonable grounds for allowing such a delay, DOJ and FAA asserted in their brief to the Court.

In response to DOJ and FAA's petition to dismiss their case, attorneys for the State of Maryland asserted that FAA has not met its "heavy burden" to show that Maryland's claims are conclusively time-barred, especially given the Court's August 2017 decision in *City of Phoenix v. FAA*.

In the *Phoenix* case, a three-judge panel of the D.C. Circuit made the rare finding that reasonable grounds did exist for filing the case beyond the 60-day window (29 ANR 111). The State of Maryland asserts that similar grounds for filing its case late also exist.

In the *Phoenix* case, the Court panel held that the City of Phoenix reasonably refrained from filing suit challenging catexed RNAV departure procedures at Sky Harbor International Airport because FAA "repeatedly communicated ... that the agency was looking into the noise problem, was open to fixing the issue, and wanted to work with the City and others to find a solution."

Similarly, over the course of two years, the FAA repeatedly assured the Reagan National Airport Community Working Group that it was considering its proposals to revise one of the arrival paths to DCA, that State of Maryland told the Court (30 ANR 118).

AIRPORT NOISE REPORT

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Airport Noise Report



5A weekly update on litigation, regulations, and technological developments

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PFCs

\$3.59 BILLION OF TOTAL PFC REVENUE DEVOTED TO NOISE MITIGATION PROJECTS

At the end of Fiscal Year 2018 (Oct. 31), some \$3.59 billion (3.5 percent) of the \$103.8 billion in Passenger Facility Charges (PFCs) that the FAA has approved for collection and use since 1991 has been designated for airport noise mitigation projects, according to agency data.

A total of 109 airports were using PFCs for noise mitigation projects at the end of fiscal 2018.

The FAA subdivides noise mitigation projects into six categories. Following is the total amount airports plan to collect for each category, as of Oct. 30, 2018, as well as the percentage that category represents of the total PFCs for noise mitigation being collected:

- \$1.55 billion (43.1 percent) for multi-phase projects;
- \$1.44 billion (40.1 percent) for soundproofing projects;
- \$542.6 million (15.1 percent) to purchase land/easements;
- \$20.6 million (0.6 percent) for miscellaneous projects;
- \$19.3 million (0.5 percent) for noise monitoring systems; and
- \$19.3million (0.5 percent) for planning.

LAX Breaks \$1 Billion Threshold

In fiscal year 2018, Los Angeles International became the first airport to break the one billion dollar threshold in terms of imposing PFCs for noise mitigation projects. LAX has now imposed \$1.04 billion in PFCs for noise mitigation efforts, mostly to fund sound insulation. And together Chicago O'Hare International Airport and Midway International Airport also have exceeded the one billion dollar mark, imposing \$1.5 billion in PFCs for noise mitigation, also mostly for sound insulation.

The following airports are using over \$100 million in PFCs for noise mitigation projects:

- Los Angeles International – \$1.042 billion;
- Chicago O'Hare International – \$989.5 million;
- Chicago Midway – \$510.9 million;
- Phoenix Sky Harbor International – \$297.1 million;
- Minneapolis-St. Paul International – \$188.7 million;
- Charlotte Douglas International – \$129.9 million;
- Seattle-Tacoma International – \$124.2 million;
- San Jose International – \$117.8 million; and
- Detroit Metropolitan Airport – \$104.6 million.

Passenger Facility Charges are only one source of revenue that airports use to fund noise mitigation projects. The other funding stream is the FAA's Airport Improvement Program. Data on AIP grants awarded for noise mitigation projects in fiscal 2018 were reported in the Nov. 16 issue of ANR (Vol. 30, No. 38).

In This Issue...

PFCs ... This special issue of ANR provides data obtained from the FAA on airports that are collecting Passenger Facility Charges (PFCs) to support various noise mitigation projects.

The data show that, since 1991, some 109 airports have imposed PFCs totaling \$3.59 billion to mitigate airport noise problems.

Table 1 shows a breakdown of all airport projects supported by PFCs, including airport noise mitigation projects - p. 160.

Table 2 shows PFCs for noise mitigation projects being collected by airports and the total amount of PFCs those airports have imposed for noise projects - p. 161.

FAA did not provide data by noise project type (soundproofing, land, planning, monitoring) for FY 2018. And, in Table 2, FAA provided the dates on which the noise projects funded by PFCs started and were completed, rather than providing the dates on which the PFCs could be imposed and used, as the agency had in the past.

APPROVED PASSENGER FACILITY CHARGES BY CATEGORIES
(as of Oct. 30, 2018)

<u>CATEGORY</u>	<u>PROJECT TYPE</u>	<u>AMOUNT</u>	<u>PERCENT</u>
<u>AIRSIDE</u>			
	RUNWAYS	\$ 7,682,762,230	43.8
	TAXIWAYS	\$ 2,982,920,389	17.0
	APRONS	\$ 1,985,910,461	11.3
	LAND	\$ 529,358,884	3.0
	EQUIPMENT	\$ 2,062,103,105	11.8
	PLANNING	\$ 702,105,361	4.0
	LIGHTING	\$ 324,022,463	1.8
	OTHER	\$ 1,255,441,867	7.2
	TOTAL	\$17,524,534,760	100
<u>LANDSIDE</u>			
	TERMINAL	\$35,303,773,924	90.1
	LAND	\$ 1,331,121,923	3.4
	SECURITY	\$ 2,546,991,200	6.5
	TOTAL	\$39,181,887,047	100
<u>NOISE</u>			
	LAND	\$ 542,677,360	15.1
	MULTI-PHASE	\$ 1,550,302,251	43.1
	SOUNDPROOFING	\$ 1,442,351,409	40.1
	MONITORING	\$ 19,328,656	0.5
	PLANNING	\$ 19,300,104	0.5
	OTHER	\$ 20,622,987	0.6
	TOTAL	\$ 3,594,582,767	100
<u>ACCESS</u>			
	ROADS	\$ 2,852,545,288	43.4
	RAIL	\$ 3,642,595,753	55.4
	LAND	\$ 16,728,615	0.3
	PLANNING	\$ 63,006,441	1.0
	TOTAL	\$ 6,574,876,097	100
<u>INTEREST</u>		\$33,830,975,347	100
SUBTOTAL		\$100,706,856,018	
DENVER		\$ 3,137,632,383	
PFC TOTAL		\$103,844,488,401	

SOURCE: FAA (PFC BRANCH)

PFC FUNDED NOISE PROJECTS (BY LOCATION)
(as of Oct. 31, 2018)

CITY	STATE	WORK CODE	AMOUNT	START	COMPLETE	TOTAL
Juneau	AK	Land	\$21,931	6/1/01	7/30/03	\$21,931
Birmingham	AL	Land	\$3,173,639	5/1/95	3/23/11	\$4,918,177
Birmingham	AL	Land	\$1,744,538	2/1/08	8/30/13	
Huntsville	AL	Land	\$7,767,354	3/6/92	6/28/94	\$5,492,201
Huntsville	AL	Land	\$1,377,575	3/6/92	11/22/95	
Huntsville	AL	Land	\$265,804	3/6/92	7/1/96	
Huntsville	AL	Land	\$68,954	12/1/97	12/1/98	
Huntsville	AL	Land	\$178,220	7/1/03	12/30/05	
Mobile	AL	Land	\$421,383	8/1/01	7/1/99	\$1,449,339
Mobile	AL	Planning	\$116,804	7/1/95	3/1/06	
Mobile	AL	Land	\$126,333	7/1/93	7/1/95	
Mobile	AL	Land	\$140,993	10/1/94	9/1/98	
Mobile	AL	Land	\$230,683	2/1/97	9/1/01	
Mobile	AL	Land	\$103,394	5/1/98	5/1/02	
Mobile	AL	Land	\$232,192	5/1/01	1/1/05	
Mobile	AL	Soundproofing	\$77,557	5/16/07	9/27/12	
Fort Smith	AR	Land	\$90,756	3/1/92	12/1/92	\$111,311
Fort Smith	AR	Monitoring	\$20,555	5/8/94	7/24/97	
Little Rock	AR	Land	\$3,314,737	5/1/06	10/15/15	\$4,736,189
Little Rock	AR	Land	\$1,421,452	5/1/92	8/1/99	
Bullhead City	AZ	Planning	\$8,250	9/13/11	1/31/16	\$8,250
Phoenix	AZ	Soundproofing	\$4,996,000	8/1/97	1/11/02	\$297,164,485
Phoenix	AZ	Land	\$35,051,425	10/29/03	2/28/06	
Phoenix	AZ	Soundproofing	\$34,048,279	5/19/03	2/28/06	
Phoenix	AZ	Multi-phase	\$75,000,000	3/1/05	4/30/09	
Phoenix	AZ	Multi-phase	\$25,900,000	10/1/08	2/28/10	
Phoenix	AZ	Multi-phase	\$120,168,781	6/1/10	6/1/16	
Phoenix	AZ	Planning	\$2,000,000	1/1/15	7/1/19	
Phoenix Mesa	AZ	Planning	\$11,175	1/1/99	5/1/01	\$11,175
Tucson	AZ	Land	\$396,888	12/7/94	11/19/97	\$3,685,361
Tucson	AZ	Land	\$3,288,473	2/1/91	12/15/94	
Bob Hope	CA	Land	\$27,829,178	9/1/91	11/1/99	\$95,838,410
Bob Hope	CA	Soundproofing	\$16,000,000	12/1/00	6/30/09	
Bob Hope	CA	Soundproofing	\$4,570,000	4/1/02	6/30/09	
Bob Hope	CA	Soundproofing	\$437,200	7/1/95	9/30/95	
Bob Hope	CA	Soundproofing	\$43,525,109	6/1/96	6/30/15	
Bob Hope	CA	Soundproofing	\$730,774	4/1/91	9/30/94	
Bob Hope	CA	Soundproofing	\$770,931	6/1/01	6/1/02	
Bob Hope	CA	Monitoring	\$64,836	9/1/99	11/30/99	
Bob Hope	CA	Planning	\$282,440	9/1/96	6/30/00	
Bob Hope	CA	Soundproofing	\$429,490	3/1/97	3/30/98	
Bob Hope	CA	Soundproofing	\$85,088	6/1/04	6/30/05	
Bob Hope	CA	Planning	\$113,364	4/1/07	3/31/17	
Bob Hope	CA	Monitoring	\$1,000,000	11/1/08	6/1/09	
Carlsbad	CA	Misc	\$18,226	10/8/07	12/31/15	\$18,226
Fresno	CA	Soundproofing	\$444,400	0/1/96	8/1/99	\$2,169,127

CITY	STATE	WORK CODE	AMOUNT	START	COMPLETE	TOTAL
Fresno	CA	Soundproofing	\$203,814	9/1/90	6/30/06	
Fresno	CA	Planning	\$56,799	3/1/04	6/30/06	
Fresno	CA	Planning	\$1,464,114	7/1/98	3/30/10	
Long Beach	CA	Soundproofing	\$4,600,000	8/1/09	6/30/13	\$4,600,000
Los Angeles	CA	Multi-phase	\$878,334,707	8/1/99	12/31/14	\$1,042,079,093
Los Angeles	CA	Monitoring	\$3,450,000	4/1/05	6/30/11	
Los Angeles	CA	Soundproofing	\$35,000,000	11/1/07	4/1/12	
Los Angeles	CA	Multi-phase	\$50,000,000	1/1/08	12/31/09	
Los Angeles	CA	Soundproofing	\$27,800,572	4/1/07	12/1/15	
Los Angeles	CA	Soundproofing	\$3,115,155	6/1/11	12/1/15	
Los Angeles	CA	Soundproofing	\$44,378,659	6/1/12	8/1/20	
Modesto	CA	Planning	\$15,750	12/1/06	1/6/10	\$15,750
Monterey	CA	Soundproofing	\$824,321	6/19/01	7/15/02	\$1,864,730
Monterey	CA	Planning	\$50,130	6/1/96	11/1/97	
Monterey	CA	Soundproofing	\$322,715	2/11/02	8/15/05	
Monterey	CA	Soundproofing	\$211,022	10/1/03	10/1/06	
Monterey	CA	Soundproofing	\$80,026	7/28/04	6/30/06	
Monterey	CA	Soundproofing	\$97,679	8/24/05	5/31/08	
Monterey	CA	Soundproofing	\$196,008	8/1/05	8/31/09	
Monterey	CA	Planning	\$15,000	7/1/06	6/30/08	
Monterey	CA	Soundproofing	\$67,829	2/25/09	6/30/10	
Oakland	CA	Monitoring	\$436,267	1/1/90	3/1/97	\$7,194,619
Oakland	CA	Soundproofing	\$240,000	4/4/97	3/31/00	
Oakland	CA	Soundproofing	\$6,199,070	6/1/99	11/24/99	
Oakland	CA	Monitoring	\$319,282	6/1/04	8/1/14	
Ontario	CA	Multi-phase	\$40,971,757	1/1/98	4/30/16	\$40,971,757
Sacramento	CA	Monitoring	\$1,525,491	3/1/97	6/1/98	\$1,525,491
San Diego	CA	Soundproofing	\$2,418,000	10/1/94	4/1/00	\$58,463,454
San Diego	CA	Soundproofing	\$1,122,000	4/19/99	2/10/03	
San Diego	CA	Monitoring	\$1,224,000	1/1/03	6/30/07	
San Diego	CA	Soundproofing	\$4,626,000	1/1/03	5/20/03	
San Diego	CA	Soundproofing	\$5,132,960	7/30/03	6/30/09	
San Diego	CA	Soundproofing	\$4,512,915	3/1/06	6/1/11	
San Diego	CA	Planning	\$241,555	6/3/1/06	6/1/11	
San Diego	CA	Soundproofing	\$9,612,376	7/1/10	6/30/12	
San Diego	CA	Soundproofing	\$17,469,000	9/1/12	8/1/19	
San Diego	CA	Monitoring	\$476,800	1/1/13	3/1/16	
San Diego	CA	Soundproofing	\$11,627,848	9/1/16	12/1/20	
San Jose	CA	Soundproofing	\$47,984,474	8/1/91	10/18/06	\$117,839,197
San Jose	CA	Monitoring	\$183,775	8/1/91	6/1/94	
San Jose	CA	Soundproofing	\$3,284,264	6/17/02	6/30/04	
San Jose	CA	Monitoring	\$76,684	4/1/99	6/1/99	
San Jose	CA	Soundproofing	\$4,500,000	4/2/03	6/30/11	
San Jose	CA	Monitoring	\$221,000	7/1/00	12/6/00	
San Jose	CA	Soundproofing	\$61,589,000	9/22/03	6/30/10	
Pueblo	CO	Planning	\$21,500	9/1/95	6/9/97	\$21,500
New Haven	CT	Planning	\$5,368	7/1/10	7/19/13	\$5,368
Windsor Locks	CT	Soundproofing	\$1,450,000	5/1/08	2/1/10	\$2,075,000
Windsor Locks	CT	Soundproofing	\$625,000	8/1/10	12/31/12	

CITY	STATE	WORK CODE	AMOUNT	START	COMPLETE	TOTAL
Fort Lauderdale	FL	Monitoring	\$658,000	3/11/92	9/30/96	\$44,990,047
Fort Lauderdale	FL	Easements	\$32,047	8/1/01	8/1/05	
Fort Lauderdale	FL	Soundproofing	\$35,000,000	8/1/10	12/31/19	
Fort Lauderdale	FL	Soundproofing	\$9,300,000	10/1/15	10/1/19	
Fort Myers	FL	Planning	\$132,000	12/1/93	6/1/95	\$132,000
Gainesville	FL	Land	\$144,869	7/1/97	12/1/00	\$153,847
Gainesville	FL	Planning	\$8,978	12/1/07	12/1/09	
Jacksonville	FL	Land	\$6,000,000	1/1/06	12/20/10	\$6,000,000
Key West	FL	Soundproofing	\$350,000	9/1/00	3/1/03	\$4,264,566
Key West	FL	Soundproofing	\$81,138	6/1/03	6/1/06	
Key West	FL	Soundproofing	\$70,715	11/1/02	4/1/05	
Key West	FL	Planning	\$1,980	8/15/02	8/15/04	
Key West	FL	Planning	\$1,980	6/1/03	12/1/04	
Key West	FL	Soundproofing	\$63,316	5/1/03	2/1/06	
Key West	FL	Planning	\$1,159	7/1/04	5/1/06	
Key West	FL	Soundproofing	\$200,239	2/1/05	5/8/06	
Key West	FL	Soundproofing	\$191,661	2/1/05	5/8/06	
Key West	FL	Soundproofing	\$56,536	8/1/07	2/1/08	
Key West	FL	Soundproofing	\$219,603	4/1/08	1/1/09	
Key West	FL	Soundproofing	\$33,038	8/1/08	2/1/09	
Key West	FL	Soundproofing	\$131,407	10/1/09	12/31/18	
Key West	FL	Planning	\$58,426	1/1/16	6/1/20	
Key West	FL	Soundproofing	\$2,803,368	12/1/17	12/1/22	
Melbourne	FL	Planning	\$21,200	7/1/12	9/1/16	\$21,200
Orlando	FL	Planning	\$21,919	12/18/90	5/31/91	\$1,174,287
Orlando	FL	Multi-phase	\$688,000	8/1/05	10/31/13	
Orlando	FL	Planning	\$28,395	2/1/99	12/1/00	
Orlando	FL	Land	\$199,189	8/1/02	3/1/07	
Orlando	FL	Land	\$73,775	8/1/06	4/1/10	
Orlando	FL	Land	\$65,789	6/1/08	12/1/10	
Orlando	FL	Land	\$97,220	9/1/09	8/1/13	
Pensacola	FL	Land	\$597,708	3/1/93	6/1/98	\$732,264
Pensacola	FL	Misc	\$65,076	3/1/95	6/1/96	
Pensacola	FL	Land	\$69,480	9/1/95	12/1/98	
Sarasota	FL	Land	\$3,063,506	10/1/91	6/17/09	\$4,538,410
Sarasota	FL	Land	\$1,474,904	10/1/91	4/17/06	
Tallahassee	FL	Land	\$3,128,225	5/1/99	1/31/04	\$3,257,555
Tallahassee	FL	Planning	\$129,330	7/1/98	3/3/98	
Tampa	FL	Misc	\$1,692,110	2/1/02	6/1/05	\$1,692,110
West Palm Beach	FL	Land	\$1,000,000	1/1/98	6/1/98	\$12,064,464
West Palm Beach	FL	Land	\$2,302,300	6/1/98	9/1/00	
West Palm Beach	FL	Land	\$374,616	1/1/99	9/1/00	
West Palm Beach	FL	Land	\$1,387,548	3/1/99	9/1/00	
West Palm Beach	FL	Land	\$5,000,000	9/1/99	9/1/00	
West Palm Beach	FL	Land	\$2,000,000	2/1/03	11/1/05	
Atlanta	GA	Land	\$7,380,420	8/1/99	9/15/06	\$37,405,420
Atlanta	GA	Soundproofing	\$30,025,000	11/1/08	5/28/20	
Des Moines	IA	Multi-phase	\$945,178	8/1/05	8/1/06	\$945,178
Bloomington	IL	Land	\$35,000	11/1/97	11/30/98	\$35,000

CITY	STATE	WORK CODE	AMOUNT	START	COMPLETE	TOTAL
Chicago Midway	IL	Misc	\$297,707	9/1/03	3/1/94	\$510,967,165
Chicago Midway	IL	Misc	\$11,493	5/1/95	10/1/95	
Chicago Midway	IL	Monitoring	\$887,978	6/1/95	12/1/96	
Chicago Midway	IL	Soundproofing	\$7,497,964	1/1/93	12/1/96	
Chicago Midway	IL	Soundproofing	\$1,140,000	4/1/97	10/1/97	
Chicago Midway	IL	Planning	\$1,425,000	11/1/94	4/1/96	
Chicago Midway	IL	Soundproofing	\$22,800,000	4/1/98	12/7/01	
Chicago Midway	IL	Soundproofing	\$71,817,307	6/1/96	2/1/01	
Chicago Midway	IL	Soundproofing	\$10,000,000	4/1/01	12/6/02	
Chicago Midway	IL	Misc	\$5,434,460	11/1/98	5/1/00	
Chicago Midway	IL	Soundproofing	\$20,000,000	3/1/01	12/13/02	
Chicago Midway	IL	Misc	\$6,478,580	8/5/02	11/29/02	
Chicago Midway	IL	Soundproofing	\$111,144,378	6/3/02	6/1/05	
Chicago Midway	IL	Soundproofing	\$233,209,000	4/1/08	11/1/12	
Chicago Midway	IL	Soundproofing	\$8,606,098	6/1/05	10/1/06	
Chicago Midway	IL	Misc	\$10,217,200	4/1/19	12/31/20	
Chicago O'Hare	IL	Multi-phase	\$586,857	6/1/95	5/1/00	\$989,502,335
Chicago O'Hare	IL	Monitoring	\$3,900,000	2/1/95	10/1/96	
Chicago O'Hare	IL	Misc.	\$42,389	5/1/95	9/1/95	
Chicago O'Hare	IL	Soundproofing	\$54,873,960	6/1/92	12/1/01	
Chicago O'Hare	IL	Misc	\$2,993,028	7/1/96	2/1/97	
Chicago O'Hare	IL	Planning	\$9,419,828	1/1/96	12/15/00	
Chicago O'Hare	IL	Soundproofing	\$179,513,603	6/1/96	2/1/01	
Chicago O'Hare	IL	Soundproofing	\$102,131,188	6/1/92	2/1/01	
Chicago O'Hare	IL	Soundproofing	\$21,922,127	6/1/97	12/15/99	
Chicago O'Hare	IL	Soundproofing	\$60,000,000	10/1/00	12/28/01	
Chicago O'Hare	IL	Soundproofing	\$54,400,000	12/17/01	12/27/02	
Chicago O'Hare	IL	Soundproofing	\$122,000,000	6/1/99	11/29/02	
Chicago O'Hare	IL	Soundproofing	\$8,000,000	4/1/02	10/1/03	
Chicago O'Hare	IL	Soundproofing	\$32,120,000	4/1/04	7/1/05	
Chicago O'Hare	IL	Soundproofing	\$4,880,000	4/1/04	12/1/04	
Chicago O'Hare	IL	Soundproofing	\$48,654,000	6/1/05	10/30/15	
Chicago O'Hare	IL	Soundproofing	\$27,750,650	9/23/05	4/30/07	
Chicago O'Hare	IL	Monitoring	\$2,000,000	9/20/06	10/3/14	
Chicago O'Hare	IL	Soundproofing	\$247,195,313	2/1/12	12/31/15	
Chicago O'Hare	IL	Soundproofing	\$4,635,392	9/1/08	9/1/12	
Chicago O'Hare	IL	Soundproofing	\$2,484,000	4/1/13	9/1/16	
Chicago Rockford	IL	Planning	\$16,088	2/1/93	3/1/99	\$16,088
Moline	IL	Land	\$335,915	8/1/91	6/1/94	\$700,999
Moline	IL	Land	\$365,084	6/1/95	6/1/97	
Peoria	IL	Land	\$382,426	5/1/94	5/1/96	\$816,880
Peoria	IL	Soundproofing	\$289,013	3/1/94	8/1/98	
Peoria	IL	Land	\$145,441	6/1/94	6/15/99	
Springfield	IL	Land	\$24,740	8/1/91	6/1/94	\$165,351
Springfield	IL	Land	\$14,721	8/1/91	11/1/92	
Springfield	IL	Land	\$551	3/27/92	4/28/93	
Springfield	IL	Land	\$12,275	8/1/91	7/1/92	
Springfield	IL	Land	\$24,897	8/1/91	6/1/94	
Springfield	IL	Land	\$88,167	12/1/93	9/1/99	

ICITY	STATE	WORK CODE	AMOUNT	START	COMPLETE	TOTAL
Indianapolis	IN	Land	\$42,532,859	1/1/93	12/31/00	\$43,106,543
Indianapolis	IN	Misc	\$498,684	1/27/98	11/10/00	
Indianapolis	IN	Planning	\$75,000	9/6/96	3/20/00	
Manhattan	KS	Planning	\$16,036	6/1/07	8/1/10	\$16,036
Covington	KY	Monitoring	\$138,090	11/1/93	11/16/97	\$45,449,469
Covington	KY	Multi-phase	\$26,057,786	7/15/91	12/31/99	
Covington	KY	Planning	\$336,954	4/1/92	1/1/93	
Covington	KY	Multi-phase	\$10,510,365	1/1/94	6/1/10	
Covington	KY	Planning	\$344,215	6/1/98	4/1/00	
Covington	KY	Multi-phase	\$3,293,643	1/1/01	12/31/11	
Covington	KY	Planning	\$1,087,628	11/1/03	9/30/08	
Covington	KY	Misc	\$125,000	3/1/03	12/31/05	
Covington	KY	Soundproofing	\$3,555,788	5/1/04	12/31/08	
Lexington	KY	Multi-phase	\$56,993	12/1/94	6/30/97	\$196,348
Lexington	KY	Multi-phase	\$139,355	1/1/96	5/1/98	
Louisville	KY	Land	\$75,594,112	1/1/96	6/30/17	\$79,168,612
Louisville	KY	Monitoring	\$224,500	1/1/01	5/1/04	
Louisville	KY	Soundproofing	\$250,000	7/1/10	3/31/12	
Louisville	KY	Soundproofing	\$2,650,000	5/1/13	12/31/17	
Louisville	KY	Planning	\$450,000	1/1/16	12/31/17	
Baton Rouge	LA	Multi-phase	\$1,315,124	5/1/97	12/31/07	\$1,315,124
New Orleans	LA	Multi-phase	\$3,750,000	1/1/05	12/31/10	\$3,750,000
Boston	MA	Soundproofing	\$15,323,217	1/1/91	12/31/00	\$30,211,432
Boston	MA	Soundproofing	\$8,590,000	7/1/01	2/29/08	
Boston	MA	Soundproofing	\$5,200,000	9/1/05	3/31/10	
Boston	MA	Soundproofing	\$1,098,215	7/1/12	6/1/15	
Baltimore	MD	Monitoring	\$1,578,000	7/1/11	12/31/18	\$1,578,000
Detroit	MI	Misc	\$225,000	9/1/93	12/1/01	\$104,695,156
Detroit	MI	Multi-phase	\$104,084,000	5/1/92	3/31/08	
Detroit	MI	Planning	\$386,156	10/1/03	9/30/09	
Traverse City	MI	Planning	\$7,238	9/10/04	9/3/05	\$7,238
Duluth	MN	Planning	\$17,255	10/1/94	7/1/98	\$17,255
Minneapolis	MN	Monitoring	\$230,273	11/1/90	2/1/96	\$188,762,970
Minneapolis	MN	Soundproofing	\$450,537	2/1/91	4/1/92	
Minneapolis	MN	Multi-phase	\$103,237,546	1/1/92	12/1/01	
Minneapolis	MN	Land	\$21,500,000	2/1/93	2/1/99	
Minneapolis	MN	Soundproofing	\$2,617,279	3/1/94	9/1/97	
Minneapolis	MN	Soundproofing	\$19,768,494	9/1/00	8/16/04	
Minneapolis	MN	Soundproofing	\$7,799,500	1/1/02	6/30/07	
Minneapolis	MN	Land	\$33,159,341	10/19/01	3/31/09	
Kansas City	MO	Land	\$10,766,850	8/1/95	12/1/04	\$10,766,850
St. Louis	MO	Land	\$22,177,178	9/11/5/90	6/30/11	\$54,451,862
St. Louis	MO	Land	\$31,766,148	1/5/90	4/30/16	
St. Louis	MO	Planning	\$508,536	9/1/07	8/1/11	
Rota	MP	Soundproofing	\$4,480	11/30/03	9/30/04	\$4,480
Saipan	MP	Soundproofing	\$80,648	11/1/03	9/30/04	\$80,648
Tinian	MP	Soundproofing	\$4,480	11/30/03	9/30/04	\$4,480
Great Falls	MT	Soundproofing	\$431,271	8/4/09	12/31/19	\$431,271
Missoula	MT	Planning	\$20,670	8/1/00	8/1/04	\$20,670

CITY	STATE	WORK CODE	AMOUNT	START	COMPLETE	TOTAL
Charlotte	NC	Multi-phase	\$2,408,536	1/1/00	7/1/02	\$129,949,498
Charlotte	NC	Land	\$79,285,796	4/1/97	12/1/05	
Charlotte	NC	Multi-phase	\$5,508,460	12/1/95	6/1/05	
Charlotte	NC	Planning	\$2,226,803	10/1-02	10/1/08	
Charlotte	NC	Flight Tracking	\$225,403	7/1/09	7/1/11	
Charlotte	NC	Planning	\$294,500	7/1/10	7/1/11	
Charlotte	NC	Land	\$40,000,000	1/1/14	12/31/18	
Pitt-Greenville	NC	Land	\$115,000	10/1/04	1/1/24	\$115,000
Fargo	ND	Land	\$351,532	10/11/06	12/1/06	\$361,548
Manchester	NH	Multi-phase	\$1,400,000	3/1/94	12/1/97	\$4,650,000
Manchester	NH	Soundproofing	\$3,250,000	10/1/99	6/1/09	
Las Vegas	NV	Land	\$26,250,000	5/1/93	12/5/13	\$57,764,023
Las Vegas	NV	Land	\$1,440,492	7/1/93	12/5/13	
Las Vegas	NV	Land	\$12,679,807	11/5/90	12/5/13	
Las Vegas	NV	Land	\$5,250,000	5/1/93	12/5/13	
Las Vegas	NV	Land	\$10,654,182	12/1/95	12/5/13	
Las Vegas	NV	Planning	\$1,489,542	5/1/92	1/1/94	
Reno	NV	Soundproofing	\$155,744	8/1/94	3/1/98	\$962,725
Reno	NV	Planning	\$339,994	8/1/01	8/1/01	
Reno	NV	Soundproofing	\$333,833	7/1/11	5/30/15	
Reno	NV	Soundproofing	\$133,154	12/1/12	11/30/14	
Albany	NY	Planning	\$45,000	3/1/94	6/1/00	\$45,000
Buffalo	NY	Multi-phase	\$1,997,550	5/25/09	10/30/13	\$5,056,480
Buffalo	NY	Soundproofing	\$3,058,930	10/1/08	12/10/18	
Islip	NY	Multi-phase	\$671,891	6/1/93	9/1/97	\$671,891
Syracuse	NY	Soundproofing	\$1,354,899	10/1/01	9/30/06	\$1,354,899
Akron	OH	Planning	\$4,146	11/1/95	6/1/97	\$184,328
Akron	OH	Land	\$14,635	12/1/91	3/1/93	
Akron	OH	Land	\$5,293	10/1/92	6/1/94	
Akron	OH	Land	\$19,210	1/3/92	6/1/93	
Akron	OH	Land	\$21,334	7/1/94	6/1/95	
Akron	OH	Planning	\$27,001	11/1/95	9/1/99	
Akron	OH	Planning	\$2,722	5/1/98	6/1/99	
Akron	OH	Land	\$12,911	3/1/99	3/1/01	
Akron	OH	Planng	\$77,076	9/1/12	3/1/15	
Cleveland	OH	Soundproofing	\$22,362,400	6/1/95	12/1/97	\$83,962,509
Cleveland	OH	Land	\$7,137,600	2/1/94	12/31/98	
Cleveland	OH	Soundproofing	\$8,595,641	3/1/98	12/31/00	
Cleveland	OH	Land	\$25,282,298	3/1/97	12/31/00	
Cleveland	OH	Planning	\$584,570	1/1/97	10/1/00	
Cleveland	OH	Soundproofing	\$20,000,000	5/1/98	12/1/04	
Columbus	OH	Misc	\$61,752	3/1/92	9/1/93	\$3,884,986
Columbus	OH	Misc	\$16,509	8/1/91	2/1/92	
Columbus	OH	Soundproofing	\$20,323	2/1/91	1/1/92	
Columbus	OH	Soundproofing	\$60,547	9/1/91	12/1/92	
Columbus	OH	Soundproofing	\$71,974	2/1/91	1/1/92	
Columbus	OH	Land	\$119,600	3/1/92	9/1/92	
Columbus	OH	Land	\$519,723	9/1/93	9/1/94	

CITY	STATE	WORK CODE	AMOUNT	START	COMPLETE	TOTAL
Columbus	OH	Land	\$379,070	9/1/93	9/1/94	
Columbus	OH	Soundproofing	\$269,810	4/1/94	10/1/94	
Columbus	OH	Planning	\$13,822	6/1/96	7/1/96	
Columbus	OH	Soundproofing	\$906,369	8/1/95	6/1/99	
Columbus	OH	Monitoring	\$219,653	3/1/10	12/1/12	
Columbus	OH	Misc	\$489,894	4/ /09	12/20/20	
Columbus	OH	Soundproofing	\$735,940	4/1/11	4/1/12	
Dayton	OH	Land	\$309,206	10/1/91	12/1/95	\$1,306,176
Dayton	OH	Planning	\$996,970	1/1/99	12/1/06	
Toledo	OH	Multi-phase	\$1,676,083	4/1/98	11/1/98	\$1,676,083
Tulsa	OK	Multi-phase	\$6,125,191	4/1/00	9/30/13	\$6,125,191
Portland	OR	Monitoring	\$715,750	1/1/05	12/31/13	\$715,750
Allentown	PA	Land	\$244,387	9/1/97	12/1/99	\$1,220,696
Allentown	PA	Land	\$220,475	9/1/97	12/1/99	
Allentown	PA	Monitoring	\$30,556	7/1/00	5/1/02	
Allentown	PA	Planning	\$33,334	5/1/01	12/1/02	
Allentown	PA	Land	\$91,944	9/1/00	2/1/03	
Allentown	PA	Soundproofing	\$500,000	1/1/02	6/1/05	
Allentown	PA	Soundproofing	\$100,000	12/1/00	4/1/04	
Erie	PA	Multi-phase	\$118,518	1/1/93	12/31/96	\$374,520
Erie	PA	Land	\$256,002	1/1/01	8/30/01	
Latrobe	PA	Planning	\$16,173	5/11/99	7/3/03	\$16,173
Pittsburgh	PA	Soundproofing	\$700,541	8/1/00	12/31/06	\$1,858,431
Pittsburgh	PA	Soundproofing	\$1,157,890	1/1/90	6/30/05	
State College	PA	Planning	\$10,000	9/6/00	7/31/04	\$10,000
Providence	RI	Land	\$15,157,387	7/1/99	7/1/02	\$36,757,985
Providence	RI	Land	\$12,658,400	7/1/06	6/1/12	
Providence	RI	Multi-phase	\$8,942,198	9/1/13	6/30/19	
Chattanooga	TN	Land	\$100,000	8/26/99	12/4/01	\$115,000
Chattanooga	TN	Land	\$15,000	3/1/98	12/4/01	
Knoxville	TN	Multi-phase	\$528,431	10/1/94	6/1/01	\$528,431
Nashville	TN	Planning	\$106,272	10/1/02	11/1/06	\$54,674,068
Nashville	TN	Multi-phase	\$54,447,421	6/1/90	6/30/92	
Nashville	TN	Monitoring	\$120,375	7/1/06	6/30/11	
Brownsville	TX	Planning	\$108,702	9/1/98	12/1/02	\$190,562
Brownsville	TX	Land	\$81,860	3/1/04	9/30/10	
Dallas Love	TX	Multi-phase	\$1,913,478	1/1/92	8/1/05	\$1,913,478
Dallas/Ft. Worth	TX	Monitoring	\$1,266,151	3/9/94	10/31/97	\$1,266,151
Harlingen	TX	Land	\$96,630	2/1/93	2/1/94	\$96,630
Laredo	TX	Planning	\$15,786	5/13/92	10/1/94	\$2,111,304
Laredo	TX	Soundproofing	\$2,081,872	8/1/09	12/1/17	
Laredo	TX	Planning	\$13,646	10/1/11	4/1/14	
San Antonio	TX	Soundproofing	\$42,539,846	4/1/05	10/31/18	\$42,784,999
San Antonio	TX	Monitoring	\$245,153	12/1/03	12/31/11	
Salt Lake City	UT	Land	\$523,788	5/1/94	10/1/95	\$1,379,268
Salt Lake City	UT	Land	\$331,072	7/1/98	2/1/99	
Salt Lake City	UT	Land	\$524,408	6/1/01	8/1/01	
Lynchburg	VA	Land	\$17,762	1/1/97	11/1/99	\$17,762

CITY	STATE	WORK CODE	AMOUNT	START	COMPLETE	TOTAL
Richmond	VA	Planning	\$15,931	12/1/93	10/1/95	\$15,931
Roanoke	VA	Land	\$145,000	9/2/03	4/1/06	\$388,308
Roanoke	VA	Planning	\$2,458	6/29/00	6/6/03	
Roanoke	VA	Multi-phase	\$240,850	8/29/03	9/30/10	
Burlington	VT	Land	\$996,869	1/1/01	12/31/13	\$1,012,739
Burlington	VT	Planning	\$5,463	3/1/06	12/31/07	
Burlington	VT	Planning	\$10,407	8/1/12	7/31/13	
Bellingham	WA	Land	\$166,000	1/1/92	12/9/99	\$1,352,350
Bellingham	WA	Land	\$732,000	8/1/91	3/1/95	
Bellingham	WA	Land	\$454,350	9/1/94	3/1/97	
Seattle	WA	Multi-phase	\$14,939,111	1/1/92	12/1/95	\$124,226,950
Seattle	WA	Soundproofing	\$16,134,627	1/1/92	12/1/97	
Seattle	WA	Soundproofing	\$153,212	1/1/92	12/1/95	
Seattle	WA	Multi-phase	\$43,000,000	1/1/96	9/30/05	
Seattle	WA	Multi-phase	\$50,000,000	1/1/98	12/31/20	
Appleton	WI	Land	\$14,502	9/1/91	10/1/92	\$14,502
Milwaukee	WI	Land	\$4,593,204	8/1/95	12/31/18	\$59,188,477
Milwaukee	WI	Land	\$1,921,127	11/1/95	12/31/18	
Milwaukee	WI	Misc	\$40,956	12/6/95	2/28/02	
Milwaukee	WI	Multi-phase	\$37,606,404	6/1/97	11/1/18	
Milwaukee	WI	Soundproofing	\$3,059,554	8/1/97	11/30/18	
Milwaukee	WI	Misc	\$50,000	6/1/01	3/1/02	
Milwaukee	WI	Misc	\$4,382,162	3/1/02	12/1/03	
Milwaukee	WI	Planning	\$230,000	1/1/02	11/30/10	
Milwaukee	WI	Soundproofing	\$6,953,470	11/1/09	2/27/16	
Milwaukee	WI	Misc	\$160,000	4/1/10	12/31/18	
Milwaukee	WI	Land	\$156,000	4/1/10	12/1/18	
Milwaukee	WI	Planning	\$35,600	7/1/10	12/1/10	
Cheyenne	WY	Land	\$81,192	2/1/94	3/1/96	\$210,951
Cheyenne	WY	Misc	\$129,759	7/1/97	10/1/98	
Jackson	WY	Monitoring	\$47,272	9/1/02	12/1/03	\$73,588
Jackson	WY	Monitoring	\$26,316	7/1/07	12/31/18	

Airport Noise Report



A weekly update on litigation, regulations, and technological developments

Volume 30, Number 42

December 7, 2018

Litigation

COURT REJECTS CHALLENGES TO FAA'S ENV. REVIEW OF SOCAL METROPLEX PROJECT

In a solid legal victory for FAA – but one with no precedential value – the U.S. Court of Appeals for the D.C. Circuit on Nov. 30 rejected four challenges to FAA's environmental review of airspace changes made under its Southern California (SoCal) Metroplex project.

A three-judge panel of the Court issued an unpublished memorandum denying the petitions for review of FAA's Environmental Assessment and Finding of No Significant Impact for the SoCal Metroplex project.

"Though the petitioners raise many arguments attacking the FAA's environmental analysis, they failed to show the agency's conclusions are arbitrary and capricious. The petitions for review are therefore denied," the panel concluded.

It found that none of the petitioners' objections to FAA's environmental analysis "identifies a significant deficiency under the National Environmental Policy Act (NEPA), the Vision 100 Act, or the Clean Air Act, and none of them indicates the FAA failed to take a 'hard look' at the environmental effects of the project."

(Continued on p. 170)

ACRP

GUIDEBOOK WILL HELP AIRPORTS PLAN FOR NEW ELECTRIC AIRCRAFT OPERATIONS

On Nov. 29, the Transportation Research Board issued a Request for Proposals (RFP) seeking a contractor to prepare a guidebook to help airport industry practitioners account for electric aircraft operations in their planning efforts.

Airport Cooperative Research Program (ACRP) Project 03-51, Electric Aircraft on the Horizon – An Airport Planning Perspective, will be funded at a level of \$450,000 and will run for 18 months.

The deadline for responding to the RFP is Jan. 15, 2019.

"Design innovation for electrically powered and hybrid-electric aircraft is accelerating rapidly, with the possibility of electric aircraft being rolled out in the next 5 years," TRB explained in a summary of the project.

"There are many potential benefits of electric aircraft, including lower O&M costs and reduced environmental impacts. But not all air service can be replaced by electrically powered aircraft, as batteries are heavy and significantly less energy dense compared with conventional aviation fuels, and electric aircraft may have different flight characteristics.

(Continued on p. 171)

In This Issue...

Litigation ... A federal appeals court rejects challenges to the Environmental Assessment FAA prepared for its Southern California Metroplex project. The ruling is a solid legal victory for the agency but has no precedential value because it was issued as an unpublished memorandum - p. 169

Electric Aircraft ... TRB is seeking a consultant to prepare a guidebook under its Airport Cooperative Research Program to help airports account for electric aircraft operations in their planning efforts - p. 169

Flight Path Dispersion ... The Boeing Company is awarded a patent on a method to modify aircraft flight paths so that aircraft remain within containment boundaries of RNP instrument flight procedures while reducing noise impact to communities underneath the flight path and meeting spacing requirements of air traffic controllers - p. 171

Litigation, from p. 169

While this is a solid legal victory for FAA, it is not a major victory because the Court's memorandum is unpublished, which means it is not available for citation as precedent because the Court deems its ruling to have insufficient precedential value.

The petitions for review were filed by Culver City, CA, the Santa Monica Canyon Civic Association, and two individuals in the case (*Donald A. Vaughn v. FAA* (No. 16-1377)), which originally consolidated eight separate lawsuits challenging SoCal flight path changes that FAA put into effect in 2016.

The City of Newport Beach, Orange County (which joined the lawsuit), City of Laguna Beach, and Benedict Hills Civic Association dropped their lawsuits after reaching settlement agreements with FAA.

FAA Considered Reducing Noise, Emissions

The Court of Appeals for the D.C. Circuit rejected the plaintiffs' arguments that the FAA had insufficiently considered reducing aircraft noise and emissions in its Environmental Assessment of the SoCal Metroplex.

The three-judge panel wrote:

"According to the petitioners, the FAA has a statutory duty not only to consider noise, but to consider ways of reducing it. Specifically, the SoCal Metroplex project is part of a broader FAA program called the Next-Generation Air Transportation System (NextGen), which aims to transition the national airspace from using outdated procedures to ones that take advantage of new technologies such as the Global Positioning System. One of the seven goals for NextGen is that the FAA must "take into consideration, to the greatest extent practicable, design of airport approach and departure flight paths to reduce exposure of noise and emissions pollution on affected residents." Vision 100 Act, § 709(c)(7). Based upon this goal, the petitioners argue the FAA must strive to reduce noise below the pre-existing level, rather than simply avoid any significant increase in noise.

"As we read the statute, however, the FAA has sufficiently considered reducing noise levels. The White Paper the FAA developed in response to public comments describes several ways in which the agency modified the project in order to address community concerns about noise. For example, due to "local concern about the proposed design eliminating [a particular] waypoint," which would lead to greater noise over certain areas, the FAA redesigned the procedures "with an intervening, redundant waypoint" in order to "address community concerns ... while providing the airspace safety and efficiency enhancements sought by the proposed action." These modifications demonstrate the FAA considered reducing noise and emission."

The panel also rejected arguments by the plaintiffs that the FAA had failed to adequately consider how the SoCal airspace changes would affect air quality and climate change.

Following is a summary of the Court's ruling on those issues by the law firm Kaplan Kirsch & Rockwell:

Air Quality Conformity.

"Petitioners argued that the FAA had failed to comply with the Clean Air Act's conformity requirements by concluding that the SoCal Metroplex could be presumed to conform to the Clean Air Act State Implementation Plan. Petitioners asserted that because most of the changes would occur below the 3,000-foot "mixing height" and would increase fuel burn, the FAA could not presume that the procedures would have only a *de minimus* effect. The Court rejected those arguments finding that, in fact, most of the changes would occur above 3,000 feet and that the FAA was justified in finding the changes below 3,000 feet were *de minimus* based on the multi-factor balancing test the FAA was authorized to use in connection with NextGen projects.

Climate Change/Greenhouse Gases.

"Petitioners argued that the FAA had failed to adequately consider how the SoCal Metroplex would affect global warming because the FAA claimed that the project would increase greenhouse gas emissions by only a small amount. Petitioners argued that Council on Environmental Quality guidance did not permit dismissing climate change impacts based only on a comparison to global emissions. The Court found, however, that the project greenhouse gas emissions were so small they fell below the CEQ's threshold for conducting further analysis.

Ruling Unlike Phoenix Case

"Unlike the Phoenix case in which the FAA relied on a Categorical Exclusion for its environmental analysis of NextGen procedures, the FAA prepared an Environmental Analysis and Finding of No Significant Impact before implementing the SoCal Metroplex," Kaplan Kirsch explained in announcing the Court's decision in *Vaughn*.

"On that record [in SoCal], the Court was willing to give the FAA considerable deference, with respect to both the FAA's balancing of interests in designing the new air traffic control procedures and in the FAA's construction of its own orders and guidance. This decision underscores how difficult it is to challenge FAA decisions regarding air traffic control and safety," the law firm explained.

Kaplan Kirsch represented the City of Phoenix in its successful challenge of RNAV departure procedures at Phoenix Sky Harbor International Airport.

On Aug. 29, 2017, a different three-judge panel of the U.S. Court of Appeals for D.C. Circuit dealt a major legal blow to FAA's implementation of NextGen airspace changes by ruling that the agency's imposition of new flight paths and NextGen procedures at Phoenix Sky Harbor International Airport violated federal law.

FAA's implementation of airspace changes without notifying local elected officials and residents was arbitrary and capricious and violated the National Historic Preservation

Act, the National Environmental Policy Act, the Department of Transportation Act, and FAA's Environmental Order 1050.1E, the Court held (20 ANR 111).

The *Phoenix* decision was the first to vacate NextGen routes for failure to follow environmental laws and involve stakeholders.

But the *Vaughn* ruling shows that Courts defer to FAA on technical matters and those considering challenging FAA NextGen airspace changes need to find major procedural flaw in FAA's environmental analysis or other major mistakes for the Court to rule against the agency.

Kaplan Kirsch also represents the State of Maryland in its challenge of NextGen arrival paths into Washington Reagan National Airport, which FAA also approved under a Categorical Exclusion, rather than conducting an Environmental Assessment. So Maryland's litigation, which will be considered by yet another three-judge panel of the D.C. Circuit next year, is more like the *Phoenix* case than the *Vaughn* case in terms of the type of environmental review FAA conducted.

Disappointed in Ruling

"Obviously, we are disappointed with the court's ruling," Steven Taber of the Pasadena, CA, law firm Leech Tishman Fiscaldo & Lampl, told ANR.

He represents Donald Vaughn and the Santa Monica Canyon Civic Association (SMCCA) in the case.

"I had held out hope that trying to address the issues of aviation noise through the specific mandate of Vision 100 would sway the court to require the FAA to take a harder look at the impact their actions have on people on the ground," Taber told ANR.

"The court's finding that a couple of tweaks to the flight routes based on a handful of community responses without addressing the overarching need for noise reduction satisfied Vision 100's mandate was unfortunate. In essence, the court treated the Vision 100 the same as the NEPA arguments: the FAA checked all of its procedural boxes, so it could move forward with its SoCal Metroplex project. This is just another decision that underlines the need for enforceable noise standards for aviation noise that protect public health."

He noted that "one bright spot [in the ruling] was that the Court rejected the FAA's argument that SMCCA should be dismissed because they did not file comments within the comment period. The Court brushed that argument aside, stating that the restriction is on the issues presented, not the parties," he explained.

Taber also stressed that the decision is not published, is not precedent for the court, and cannot be cited in future cases as precedent.

The plaintiffs Taber represents have made no decision yet regarding whether to seek reconsideration of the panel's ruling and/or a hearing *en banc* before the full D.C. Circuit, to appeal the ruling to the U.S. Supreme Court, or to accept the ruling.

ACRP, from p. 169

"Yet in certain applications (e.g., short-haul and cargo service), electric power may be more efficient than traditional power. The advent of electric aircraft offers both significant opportunities and disruptions for airports and their surrounding communities.

"Airports may have new roles to play regarding energy generation and transmission; at the same time, electric aircraft may impact revenue from fuel sales. Airports need guidance to be ready for the introduction and accommodation of electric aircraft into the airport environment."

The guidebook on electric aircraft should, among other things, "estimate environmental (e.g. emissions, local air quality, noise) and land use compatibility implications" of the addition of electric aircraft at airports.

Further information on the RFP is at <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4625>

Flight Path Dispersion

BOEING GETS PATENT ON METHOD TO DISPERSE PBN FLIGHT TRACKS TO REDUCE COMMUNITY NOISE

On Nov. 27, The Boeing Company was awarded a patent on a method for modifying a flight path to be flown by the aircraft "that causes the aircraft to remain within containment boundaries of a Required Navigation Performance (RNP) instrument flight procedure while reducing noise impact to the communities underneath the flight path and meeting the spacing requirements of the air traffic controller."

Boeing declined to discuss the patent with ANR but it appears to provide the variation in precise, narrow NextGen flight paths that communities have been demanding.

Details of Patent No. 10,140,873 "Performance-based track variation for aircraft flight management," can be viewed on the web site of the U.S. Patent and Trademark Office. Go to <http://patft.uspto.gov>. In the left hand column, click on "Number Search" in blue. Then type in the patent number.

The patent describes methods to implement variations in flight paths that can assist with spreading a noise footprint stemming from repeatable operations as well as reducing concentrated traffic patterns.

Following is an excerpt from the patent on why it was developed:

"Performance-Based Navigation (PBN), including the widely used Required Navigation Performance (RNP) and Area Navigation (RNAV) instrument procedures, are key parts of airspace modernization worldwide. For example, RNAV and RNP-based procedure deployment is a component of the United States' airspace modernization, the Federal Aviation Administration (FAA) NextGen program, that is imple-

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menting new PBN routes and procedures to leverage emerging technologies and aircraft navigation capabilities. Modern commercial aircraft fly PBN flight paths with very high precision. The aircraft can exploit high accuracy provided by global positioning system (GPS)-based navigation systems, modern Flight Management Systems (FMSs) and Flight Control Systems (FCSs). Due to this highly accurate path-keeping capability, the use of PBN removes much of the variability traditionally seen in aircraft flight paths, and results in highly repeatable operations.

“The benefits of using RNAV and RNP procedures thus include improved aircraft stability on approach, improved aircraft predictability for air traffic control, reduced fuel burn, lower track miles, improved airport capacity, reduced (concentrated) noise footprints, and paths tailored to avoid noise sensitive areas. However, these same procedures can be detrimental for the exact reason that modern commercial aircraft fly RNAV and RNP defined flight paths with very high precision.

“While accuracy and repeatability can be desirable, there are a number of operational and safety issues that could benefit from judicious variation in flight paths. For example, in approach operations, a concentrated noise footprint stemming from repeatable operations creates noise issues for communities under the flight paths. In addition, fixed, consistent flight paths mean that air traffic controllers (ATC) lose some ability to fine-tune aircraft longitudinal spacing that the ATC once exercised by vectoring traffic. Furthermore, highly repeatable path-keeping traffic means a higher risk of loss of separation between aircraft if the concentrated portions of the traffic streams conflict.

“Existing solutions related to path variation with use of RNP are limited to offsetting flight paths relative to the originally-defined procedure. For example, ATC may pull some traffic off of fixed routes to avoid or organize traffic using vectors. However, this negates efficiency and other benefits of fixed track use, and limits the ability of on-board aircraft systems to provide alerts supporting high integrity guidance and navigation. Further solutions provide for aircraft to fly an offset path, in which both the offset path and associated boundaries are shifted by an amount of the offset. However, this method is not usable in constrained airspace associated with arrival, approach and departure routes in a vicinity of airports where locations of original boundaries may be integral to safe operations.

“What is needed is a method that enables use of full margins of an RNP procedure based on measured performance to retain efficiency while also addressing noise concerns and manage spacing/timing of aircraft.”

Listed on the patent as the inventors are Charles Otis Adler of Bellevue, WA, Sheila Ruth Conway of Seattle, and Douglas A. Stoll of Bellevue.

AIRPORT NOISE REPORT

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Airport Noise Report



A weekly update on litigation, regulations, and technological developments

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Toronto Pearson Int'l

AIRPORT OUTGROWS SINGLE NOISE ADVISORY COMMITTEE; MOVING TO MULTIPLE FORUMS

In order to better carry out a five-year Noise Management Action Plan for Toronto Pearson International Airport launched earlier this year, the Greater Toronto Airports Authority (GTAA) has decided to end its over 20-year-old Community Environment and Noise Advisory Committee and replace it with several new Noise Management Forums.

The airport has outgrown a single noise committee, GTAA said. It believes the new Noise Management Forums will provide a more inclusive way to engage with all stakeholder groups while enabling action on its noise mitigation goals.

GTAA's Community Environment and Noise Advisory Committee has been the only formal forum for elected officials, community members, and the public to participate in regular discussions with industry partners about airport noise impacts around Toronto Pearson International. But as the GTAA moves to deliver on its ambitious Noise Management Action Plan, it said that "more forums for more productive, sustainable, and inclusive discussions with stakeholders are necessary."

(Continued on p. 174)

FAA

FAA BEGINS PUBLIC OUTREACH FOR SOUTH-CENTRAL FLORIDA METROPLEX PROJECT

FAA announced Dec. 11 that early next year it will begin involving the public in development of new flight paths and air traffic control procedures that will be implemented under its South-Central Florida Metroplex project.

"We will involve the public as we design the new procedures, and conduct the required environmental review," said Michael O'Harra, Regional Administrator for the FAA Southern Region.

"Early next year we will hold public meetings across Central and South Florida. We encourage the public to attend the workshops to talk with experts, learn how proposed changes could affect their communities and provide comments that we will consider as we finalize the new procedures."

Florida is the only state with four major international air carrier airports: Miami International Airport (KMIA), Fort Lauderdale-Hollywood International Airport (KFLL), Orlando International Airport (KMCO), and Tampa International Airport (KTPA). The South-Central Florida Metroplex will focus on these airports, where operations have a direct effect throughout the NAS. The Agency also will propose

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FAA ... Public outreach for South-Central Florida Metroplex project begins early next year with public workshops across project area - p. 173

Technology ... Scientists at Nanyang Technological University in Singapore develop a prototype of a noise cancelling device that can cut environmental noise coming through open windows by half - p. 175

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Part 150 Program ... FAA approves noise exposure maps for Westover Airport in Chicopee, MA - p. 176

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New Noise Forums

So, in 2019, the GTAA will launch the following Toronto Pearson Noise Management Forums, a series of briefings, tables, and working groups that “will help the airport work smarter with its communities and collaborate better with industry”:

Noise Accountability Board: This is an industry committee made up of senior representatives from the GTAA, NAV CANADA, Transport Canada, airline representatives, as well as senior public servants from neighboring municipalities and the province of Ontario. This Board will meet quarterly and will provide technical expertise on noise and growth initiatives, spurring action and collaboration to progress the airport’s Noise Management Action Plan. Materials will be made available publicly following each meeting.

Pearson Public Meetings: This is a series of expanded-format public meetings that will take place three times a year, designed for residents to learn more about airport operations, hear about the airport’s noise management efforts, and provide feedback to industry partners. These meetings will be live-streamed and recorded, and the materials will be made available publicly afterwards. Community groups and elected officials are welcome to attend.

Political Briefings: This is a dedicated forum hosted three times a year, where elected officials from all levels of government receive Noise Management Action Plan briefings and represent their constituents’ interests in the noise management conversation with industry partners. Materials will be made available publicly following each meeting.

Neighborhood Table: This is a dedicated table hosted three times a year, where residents’ associations and noise groups receive Noise Management Action Plan briefings and participate in the noise management conversation with industry partners. These meetings will provide a better forum to have more detailed, informed, and responsive discussions than are possible at larger public events. Materials will be made available publicly following each meeting.

Community Advisory Committees and Reference Panels: These will provide residents with the opportunity to contribute to the development of airport noise policies for specific elements of the Noise Management Action Plan.

Community Proposal Review Panel: This is a panel of industry experts that will provide a preliminary review of community-based proposals for noise management. The Community Proposal Review Panel will publicly publish the submissions it receives, as well as its responses, twice per year.

External Process Audit: Every two years, a third-party assessment will be commissioned to evaluate the airport’s activities and progress towards delivering the Noise Management Action Plan. Results will be reported publicly.

In concert with the activities of the new Noise Management Forums, the GTAA said it will continue to host resident working groups, workshops, special public meetings and other initiatives to inform the development of new policies and programs described by the Noise Management Action Plan.

More information regarding the Noise Management Forums will be available at www.torontopearson.com in early 2019.

The airport’s Noise Management Action Plan is at <https://torontopearson.com/noisemanagement/#>

FAA, from p. 173

changes to procedures for Palm Beach International Airport, and various satellite airports.

The FAA said it has not updated many of the air traffic procedures for Central and South Florida airports in years. While the procedures are safe, they no longer are the most efficient due to advances in technology.

The South-Central Florida Metroplex will develop more direct and efficient satellite-based routes into and out of major airports, enhancing safety and flight efficiency. The Metroplex project also will modify some existing procedures at these airports to ensure that they seamlessly connect to the heavily traveled Atlantic Coast Routes between the Northeastern U.S. and Florida.

The South-Central Florida Metroplex proposes to replace dozens of existing air traffic procedures with more direct and efficient satellite-based routes into and out of major airports, enhancing safety and efficiency. The new satellite-based procedures are a key component of the FAA’s Next Generation Air Transportation System (NextGen). Metroplex initiatives are complete or are underway in 11 metropolitan areas across the country.

The National Environmental Policy Act of 1969 (NEPA) requires the FAA to identify and publicly disclose any potential environmental impacts of the proposed procedures. The Agency plans to begin the environmental review in spring 2019. FAA will offer the public the opportunity to comment on the proposal during the environmental review.

As locations, dates and times of the meetings are confirmed, they will be posted on the FAA Community Involvement webpage.

Technology

NOISE CANCELLING DEVICE CUTS NOISE THROUGH OPEN WINDOWS BY HALF, SINGAPORE UNIV. SAYS

[Following is a recent press release from Nanyang Technological University in Singapore describing a device that has the potential to supplement or complement residential sound insulation.]

Nanyang Technological University, Singapore (NTU Singapore) researchers have developed a device that can reduce noise pollution entering buildings even while windows are wide open.

Designed to be mounted onto window grilles, the device could reduce up to 50 percent of noise coming from nearby environments such as busy roads, train tracks or from construction activities.

The device uses ‘active noise control’ technology - found in many high-end headphones that cancels external noise - that is adapted to work in a large open area.

The benefits are two-fold: windows can be left open for fresh air without disturbance from external noise pollution, and reducing the need for air-conditioning to keep the interiors of buildings and homes cool.

Professor Gan Woon Seng, Director for NTU’s Centre for Infocomm Technology (INFINITUS), who led the research said, “Compared to noise cancellation headphones, what we have achieved is far more technically challenging as we needed to control the noise in a large open area, instead of just around the ear.

This noise cancellation technology is an example of research innovations that NTU is encouraging under its Smart Campus initiative, which aims to improve quality of life for society through the development of new sustainable and technological solutions and by trialling them on its campus first.

Using Sound To Remove Noise

Currently at the prototype stage, the device uses 8 watts of power, similar to a small portable Bluetooth speaker. Several units are placed together to form a grid-like array on a window grille to reduce external noise.

The device uses a special sound emitting mechanism which works like a speaker and is hooked up to a processing unit. Equipped with a microphone, it can detect noise even before it reaches the window and computes the attributes of the incoming noise in real-time.

It quickly emits a countering sound or “anti-noise” that has the same waveform characteristics of the invading noise but with one difference: it is inverted or “flipped”.

When both outside noise and anti-noise converge, they cancel each other out, resulting in a softer ambient sound entering living spaces.

“Our innovation not only computes the right amount and type of “anti-noise” to emit, but also does it faster than the

detected noise can reach inside the building,” explained Prof Gan, who teaches at NTU’s School of Electrical & Electronic Engineering.

The research team conducted the tests using a soundproof chamber at the university’s labs that houses a mock room with windows and doors, resembling a typical room in a home. Various recorded sounds from construction sites, jet engines and trains were used as noise sources during the tests.

They are now developing the technology further by improving its noise cancellation efficiency, making them smaller, and more cost-effective to produce.

Prof Gan said, “We are currently finding ways to improve the technology further so that it can be used not only at window grilles with large openings, but also provide a cost-effective solution that can be easily installed and replaced. Ultimately, we aim to integrate this technology into window grilles that can help mitigate urban noise pollution conveniently.”

The researchers are also working with government agencies in Singapore to further improve the technology to make it viable for commercial and residential applications.

The project was jointly developed with the University of Southampton in the United Kingdom, and Tottori University in Japan.

It is supported by Singapore’s Ministry of National Development and the National Research Foundation in the Prime Minister’s Office, under the ‘Land and Liveability National Innovation Challenge’ (L2 NIC) Research Programme.

Litigation

GROUP SEEKS TO BLOCK RUNWAY EXTENSION AT PALOMAR AIRPORT

Citizens for a Friendly Airport – which represents a group of Carlsbad, CA, residents – filed a lawsuit against San Diego County on Nov. 29 seeking to overturn the County Board of Supervisors’ approval of the McClellan-Palomar Airport Master Plan Update, which was based on the Final Program Environmental Impact Report (PEIR) for the project approved by the County Board of Supervisors on Oct. 10.

The Master Plan Update approves an up to 800-foot extension of the airport’s only runway, which the citizens group fears will increase air traffic, noise, and pollution and constitutes an expansion of the airport. Their lawsuit alleges that certain actions and approvals related to the project violated California environmental and other laws.

The County asserts that a longer runway is needed to safely accommodate current and future aircraft and that extension of the runway would not be an expansion of the airport because the airport boundaries would not change.

“The approved Updated McClellan-Palomar Airport Master Plan appears to be nothing more than an attempt by the County of San Diego to turn McClellan-Palomar Airport into a large regional airport to offload capacity from San Diego

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International Airport – an objective that was hidden from the public during the entire planning process,” said Hope Nelson, spokesperson for Citizens for a Friendly Airport (c4fa).

“In fact, she added in a prepared statement, “comments made by three BOS members at the October 10th meeting clearly demonstrate this intention. Therefore, after great consideration, because of a lack of transparency in the planning process and deficient environmental studies, Citizens for a Friendly Airport (c4fa) was forced to file this lawsuit to protect the residents of North San Diego County.”

Citizens for a Friendly Airport said that for more than a year it attempted to work with the County to clarify the purpose and need for the proposed airport expansion. Over 1,100 comments were submitted to the County by the public during the first issue of the draft PEIR. More comments were submitted during the second partial re-issue of the document. Extensive comments also were submitted by c4fa members, according to the plaintiffs.

“Despite these efforts, and with continued lack of transparency, on October 10, 2018, the McClellan- Palomar Airport Master Plan and PEIR were passed by the County Board of Supervisors. Against their own County Staff recommendations, the BOS voted unanimously 4-0 ... to pass the largest and most aggressive airport expansion option presented. Citizens for a Friendly Airport opposes the project and challenges the County for its violation of CEQA and other laws.

San Diego County has not commented on the lawsuit, which was filed in Superior Court of the State of California, County of San Diego Central Division.

In Brief...

FAA Approves NEMs for Westover

FAA announced Dec. 6 that noise exposure maps for Westover Airport in Chicopee and Ludlow, MA, are in compliance with applicable federal requirements.

The agency also said that it is reviewing a proposed Part 150 airport noise compatibility program for the airport, which will be approved or disapproved on or before May 6, 2019.

The public has until Jan. 7, 2019, to comment on the proposed program, which can be obtained from Richard Doucette, FAA Airports Division, 1200 District Ave., Burlington, MA 01803. FAA did not provide his telephone number or email address.

Comments on the proposed Part 150 program should be submitted to Mr. Doucette.

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Noise Guidelines

WHO AIRCRAFT NOISE EXPOSURE GUIDELINE CHALLENGED BY LAUDED NOISE RESEARCHER

A highly-lauded Norwegian noise effects researcher has challenged the dataset used by the World Health Organization to recommend in its new Environmental Noise Guidelines for the European Region that average noise exposure to aircraft noise be kept below 45 dB Lden because aircraft noise above that level is associated with adverse health effects.

The new WHO guidelines “are based on an arbitrary selection of existing studies comprising an imperfect and faulty set of data not representative for the general airport population,” Truls Gjestland, a senior researcher *emeritus* at the Trondheim, Norway, firm SINTEF – one of Europe’s largest independent research organizations – concluded in a paper highlighted in the *International Journal of Environmental Research and Public Health* (Vol. 15, Issue 12, Dec. 2018).

Because of his standing as a preeminent authority in the field of community noise annoyance research, Gjestland’s paper will cast doubt on the adequacy of the new WHO Environmental Noise Guidelines on aircraft noise exposure.

(Continued on p. 178)

Annoyance

TIME TO INTRODUCE NEW IDEAS IN QUEST TO PREDICT ANNOYANCE TO AIRCRAFT NOISE

[Calling the conventional search over the past half century for a “holy grail” of aircraft annoyance prediction “futile,” Norwegian noise effects expert Truls Gjestland, senior researcher emeritus at the independent Norwegian research firm SINTEF, points the way forward in a paper presented in August at INTER-NOISE 2018 in Chicago entitled “Fifty years of aircraft noise annoyance – time to introduce new ideas.” Following are excerpts from that paper:]

Transportation noise was first recognized as a major environmental pollutant in the 1960s. Many formal attempts have subsequently been made in laboratory and field settings to quantify and predict adverse consequences of noise exposure. Many such attempts have involved social surveys conducted with residents of neighborhoods near noise sources of interest to estimate the prevalence of a consequential degree of annoyance (or other adverse effects of noise exposure) within groups of respondents with more or less uniform noise exposure.

Adverse effects of noise that have been investigated have included sleep distur-

(Continued on p. 179)

In This Issue...

WHO Environmental Noise Guidelines for European Region ... Eminent Norwegian noise effects researcher Truls Gjestland challenges the dataset used by the World Health Organization for recommending that average noise exposure to aircraft noise should not exceed 45 dB Lden.

He asserts that some of the airport annoyance surveys included in the dataset on which the recommendation was based focused on age groups known to be especially sensitive to aircraft noise or did not follow standard ISO survey protocols, which violated WHO’s strict survey selection criteria and caused misleading conclusions to be made by the WHO Guideline Development Group - p. 177

Annoyance ... In a paper presented at INTER-NOISE 2018, Gjestland says it’s time to introduce new ideas into the so far “futile” quest to predict aircraft annoyance; supports Community Tolerance Level, which quantifies non-acoustic factors - p. 177

WHO Guidelines, from p. 177

Gjestland has more than 50 years' experience in research on environmental noise issues, in particular community response to noise, and people's reactions to noise. He has been a member of the International Commission on Biological Effects of Noise (ICBEN) since 1983, and has acted as an advisor to the International Civil Aviation Organization, the World Health Organization, the European Aviation Safety Agency, and the U.S. Federal Aviation Administration.

He has been active in international standardization on assessment of environmental noise and on soundscape topics; has been president of the Acoustical Society of Norway for 10 years; vice-president of the European Acoustics Association, and secretary general of the former Federation of Acoustical Societies of Europe. He also is a fellow of the Acoustical Society of America.

Recommendations on Aircraft Noise Exposure

WHO issued its new environmental noise guidelines on Oct. 10 (30 ANR 135). They include the following major recommendations on exposure to aircraft noise that were made by 12 noise effects researchers on the WHO Europe Environmental Noise Guideline Development Group (GDG):

- For average noise exposure, the GDG strongly recommends reducing noise levels produced by aircraft below 45 dB Lden, as aircraft noise above this level is associated with adverse health effects.
- For night noise exposure, the GDG strongly recommends reducing noise levels produced by aircraft during night time below 40 dB Lnight, as aircraft noise above this level is associated with adverse effects on sleep.
- To reduce health effects, the GDG strongly recommends that policy-makers implement suitable measures to reduce noise exposure from aircraft in the population exposed to levels above the guideline values for average and night noise exposure. For specific interventions the GDG recommends implementing suitable changes in infrastructure.

The recommendation to keep average noise exposures below 45 dB Lden was based only on airport annoyance survey data and it is that dataset and its analysis that Gjestland is challenging.

WHO's recommendation that aircraft noise exposure should be kept below 45 dB Lden "is based on the idealistic assumption that nobody should ever be exposed to noise levels which endanger complete individual well-being or quality of life, and, as such, it is useless for general regulatory purposes," Gjestland asserted in his journal paper, "A Systematic Review of the Basis for WHO's New Recommendation for Limiting Aircraft Noise Annoyance."

"Nevertheless," he added, "the recommendation will be observed with great interest by individuals and groups advocating reduced noise exposure from aviation. It is therefore

unfortunate that the recommendation is based on a very imperfect and faulty set of data."

WHO Dataset

The WHO dataset, on which its recommendation that average aircraft noise exposure should not exceed 45 dB Lden is based, includes 12 airport noise annoyance studies done from 2001 – 2011 that surveyed a total of 17,094 respondents.

The studies – which were conducted at airports in Amsterdam, Athens, Berlin (Tegel), Heathrow, Milan (Malpensa), Stockholm, Amsterdam, Zurich, Vietnam (Ho Chi Minh, Hanoi, and Da Nang), and Frankfurt – were subject to the following strict selection criteria:

- Participants should be members of the general population;
- Participants should have at least five years residency near the airport; and
- Annoyance questions and response formats should follow (as closely as possible) recommendations on how to conduct annoyance surveys provided by ICBEN and/or the International Standards Organization (ISO).

Selection Criteria Violated

But Gjestland contends that his paper "shows that the selection of surveys included in the WHO dataset has been made in violation of several of the selection criteria specified by the research group." Specifically:

- The respondents in half of the surveys were not representative of the general population. The selection favored special age groups that are known to be especially sensitive to aircraft noise.
- Half of the selected studies did not follow the standard protocol for annoyance surveys recommended by ISO, but instead, questions that are likely to yield higher annoyance scores, were used.
- The required length of residency by the respondents was not met at one airport [Athens].
- Data from two airport surveys [Athens and Milan] have been included despite the fact that these two datasets were considered non-representative and rejected for further pooled analyses by the researchers who conducted these surveys.
- Data from one specific airport [Amsterdam] comprises about 40 percent of the total dataset. This gives this specific airport a prominent and disproportionate influence on a selection that is supposed to be representative for airports world wide.
- The selected airports comprise 63-80 percent data from HRC (High Rate Change) airports. Gjestland said there is a significant difference between the prevalence of annoyance

observed at so-called “high-rate” change airports (ones where there has been an abrupt change in the number of aircraft operations or public discussion of such change within three years of the annoyance survey) as compared to the “low-rate” change airports. The percentage of HRC airports included in the WHO dataset is much higher than is observed among airports in general, he said.

Alternative Selection of Surveys

In his paper, Gjestland analyzed an alternative selection of airport annoyance surveys that also were conducted after 2000. He determined that these surveys strictly followed the original strict selection protocol set for the WHO guidelines.

This alternative analysis of airport annoyance surveys yielded an average dose-response function which is shifted almost 5 dB compared to the one presented in the WHO guidelines, he reported.

“The results indicate that the respondents to these surveys on average ‘tolerate’ 5 dB higher noise exposure than the WHO selection in order to express the same degree of annoyance,” Gjestland explained.

He said the recommendations in the new WHO guidelines with respect to aircraft noise annoyance “seem to be based on an arbitrary selection of surveys that have not been conducted according to internationally standardized methods and that do not adhere to pre-set selection criteria. In addition, the selection is not representative for airports in general. This study shows that a selection of different surveys based on an identical selection protocol, yields very different results.

“The dataset provided by the WHO Systematic Review Team should not have been accepted for publication in the WHO report, and thus caused misleading conclusions to be made by the WHO Guideline Development Group.”

ANR will contact the members of the WHO Guideline Development Group for comment on Gjestland’s paper later this week, after the new year begins.

Annoyance, from p. 177

bance, interference with conversation, listening to radio or television, and annoyance (McKinnell, 1973) (Alexandre, 1973). Most field studies of annoyance have assumed that a measure of noise exposure can, by itself, account for useful amounts of variance in social survey data on the prevalence of noise-induced annoyance in communities.

Even in the earliest field studies, observed associations between noise exposure and individual subjective responses have been weak. When self-reports of adverse reactions to noise have been pooled across respondents with similar noise exposure, however, the correlation between the noise and the mean responses are typically greater.

Non-Acoustic Factors

... Non-acoustic factors were soon recognized as playing an important role in determining individual annoyance reac-

tions (Job, 1988). Some researchers even suggested that noise exposure itself was among the less important determinants of the prevalence of noise-induced annoyance (McKinnell, 1969). Others argued that weak associations of noise exposure with annoyance prevalence rates were due to mis-measurement of acoustical influences on annoyance (Schultz, 1978). A wide variety of acoustic factors other than cumulative, long-term exposure have been suggested as predictors of annoyance.

Further analyses (Basner et al. 2017) of surveys on noise annoyance have shown that cumulative measures of noise exposure *per se*, expressed in units similar to Day-Night Average Sound Level (DNL), rarely account for as much as half of the variance in community-level data. The prevalence of noise-induced annoyance in communities is clearly moderated by factors other than noise exposure.

Acoustic factors that have been identified as moderating community response to transportation noise include maximum sound levels, numbers of flights, fleet composition, and their respective distributions over time. All of these factors are highly correlated with cumulative noise exposure.

Non-acoustic factors include individual noise sensitivity, community economic dependence on airport operation, fear of crashes, attitudes of malfeasance and misfeasance toward the noise source, and so forth. In the aviation industry, all “non-DNL factors” are commonly referred to as “non-acoustic.”

Individual- (rather than community-) level factors may also account for minor additional amounts of variance, but are primarily of academic interest, and are of little or no value as practical predictors of annoyance prevalence rates for regulatory and policy analyses.

Time to Look for Another Strategy

... After half a century of meager success in predicting community reaction to transportation noise, it is time for a new approach. The first step in developing a more sophisticated understanding of community response to transportation noise is to formally acknowledge that responses to questions of the form “How annoyed are you by aircraft noise?” are controlled not only by noise exposure, but also by a variety of non-acoustic (or more specifically, “non-DNL”) factors.

As Basner et al. have noted (2017), noise exposure alone accounts for only about a third of the variance of individual responses. Since the aggregate influence of these non-acoustic factors varies from one airport community to the next, it may be futile to seek a single function that accurately describes the relationship between noise exposure and prevalence of annoyance in all airport communities.

Conclusion

... Efforts have been made for more than half a century to establish a single, general dose-response curve that usefully describes the relationship between the average noise level, DNL, and the prevalence of people highly annoyed by aircraft noise. Planners and decision makers rely on such curves

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to describe the impact of noise on people and communities.

The examples shown in this paper indicate that this search is futile. Community response to aircraft noise exposure is determined not only by the noise level itself, but also a variety of non-acoustic factors. These factors can vary considerably from one community to the next. Similar responses, i.e. percentage highly annoyed, can be found in communities with a noise exposure difference of 20 dB or more.

Several dose-response curves have been proposed, and some of them are being used by official authorities. However, their fit to the existing pool of annoyance survey results is rather poor.

Fidell et al. (2011) have proposed an alternative approach. Instead of looking for a one-curve-fits-all solution, they point to the fact that the annoyance caused by aircraft noise is, to a large extent, determined by a number of non-acoustical factors. The noise level itself explains only about one third of the variance of the individual responses. Fidell et al. have shown that the annoyance response in a community can be successfully modeled by a Community Tolerance Level, which is a quantification of the influence of all non-acoustical factors. This is a single value parameter given by the community's annoyance decision criterion. So far, this criterion can only be found through direct survey methods.

However, further analyses of existing survey data may prove a way of dividing airports in different categories that may be characterized by separate "average CTL values" and corresponding dose-response curves. As shown in this paper the rate of change of airport operations is an important parameter. Likewise, the number of aircraft movements regardless of noise level seems to be of importance. The effect of other main characteristics should be further explored.

Community Tolerance Level

[U.S. psychoacoustician Sanford Fidell of Fidell & Associates in Woodland Hills, CA, and colleagues developed the Community Tolerance Level, which is defined as the day-night sound level at which 50 percent of the people in a particular community are predicted to be highly annoyed by noise exposure.

The CTL method is explained in international standard ISO 1996-1 (ISO, 2016).]

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O'Hare Int'l

FAA SEEKS PUBLIC COMMENT ON DRAFT EIS FOR NIGHTTIME RUNWAY ROTATION PLAN

The public has until midnight on Feb. 27 to submit comments on FAA's Draft Environmental Impact Statement for the proposed interim nighttime runway rotation plan for O'Hare International Airport.

Formally called the "Written Re-Evaluation of the O'Hare Modernization Environmental Impact Statement for the Interim Fly Quiet Runway Rotation Plan," the plan is designed to more equitably distribute the noise impact of nighttime aircraft operations.

Since September 2015, the Fly Quiet Committee of the O'Hare Noise Compatibility Commission (ONCC) has worked with the Chicago Department of Aviation, airlines, and the FAA to evaluate ways to improve the existing Fly Quiet Program at O'Hare to reduce noise concerns, many of which arose or increased after FAA revised the O'Hare airspace and changed the runway configuration to an east-west alignment.

Airports and community groups around the country are watching the ONCC's

(Continued on p. 2)

Litigation

JUDGE RULES NOISE TAKINGS LAWSUIT OVER NEW O'HARE RUNWAY FILED TOO LATE

In December, a Cook County, IL, judge dismissed an aircraft noise case filed by dozens of homeowners in Bensenville, IL – near O'Hare International Airport – on the ground that it was filed too late.

The plaintiffs live near a new O'Hare runway (Runway 10C-28C) that opened on Oct. 17, 2013, and directed heavy aircraft over their homes, allegedly depriving them of the enjoyment of their property, legally called a taking or avigation easement.

The plaintiffs initially filed their case on Oct. 1, 2015, which was two years after the runway opened and beyond the one-year statute of limitations provided in state law for filing such litigation.

On Feb. 24, 2017, the plaintiffs filed an amended complaint alleging that air traffic from the runway significantly increased between late 2014 and 2015 creating a new cause of action, which they asserted extended the statute of limitations past the date the runway opened and went into operation.

Cook County Circuit Judge Thomas R. Mulroy rejected both arguments.

"Weeks after this Runway opened, Plaintiffs new or should have known the na-

(Continued on p. 3)

In This Issue...

O'Hare Int'l ... FAA seeks comment on Draft EIS for proposed Interim Fly Quiet Runway Rotation Plan developed by O'Hare Noise Compatibility Commission - p. 1

... Judge dismisses lawsuit filed by dozens of residents near O'Hare alleging that noise from new runway caused a taking of their property - p. 1

Heathrow ... Airport opens consultation asking local communities to help shape the airport's plans for its future airspace, both with two existing runways and with proposed new runway - p. 2

Aircraft Design ... Boeing unveils latest version of Transonic Truss-Braced Wing, which will allow aircraft to fly higher and faster than earlier designs - p. 3

Quiet SST ... Collins Aerospace will provide avionics, enhanced vision system for NASA's X-59 Quiet Supersonic Technology (QueSST) demonstrator aircraft - p. 4

O'Hare, from p. 1

effort in hopes they are successful and can be duplicated in other locations. At issue is the problem of how to get some communities to accept more noise so that other communities can be given respite from it. Letting communities know on which days they will be exposed to aircraft noise and on which days they will not, will provide them with some sense of control over the noise source, which is an important factor in reducing annoyance.

FAA has supported the development of the new proposed nighttime runway rotation plan.

“The ONCC oversaw three Fly Quiet Runway Rotation Plan tests to collect data on proposed runway configurations that could provide near-term relief to the highest impacted communities surrounding O’Hare,” FAA explains on its website.

In December 2017, the ONCC recommended that Test 3 be submitted to the FAA for a Proposed Interim Fly Quiet Runway Rotation Plan. The CDA submitted the request to the FAA in February 2018.

Noise Impact of Proposed Plan

A discussion of the noise impact of the Proposed Interim Runway Rotation Plan begins on page 1-18 of the Draft EIS, which is available at http://www.faa.gov/airports/airport_development/omp/ifq_re_eval/

“In general,” the Draft EIS explains, “the Proposed Interim Fly Quiet would cause a net increase in the area covered by the 65 DNL contour. While some area would experience an increase in acreage, others would experience a decrease due to the changes in nighttime runway use.”

The proposed runway rotation plan:

- Would include 973 newly exposed housing units within the area of the 65 DN contour and 392 housing units would be newly excluded from the area of the 65 DN contour;
- Would expose 138 people in 69 housing units across nearly 18 acres to a significant noise increase, and would expose 3,253 people in 1,094 housing areas across nearly 166 acres to a reportable noise increase; and
- Would also expose nine people in three housing units across nearly 35 acres to a significant noise decrease, and would expose no one to a reportable noise increase.

Public Workshops Scheduled

The FAA also will host public workshops in four communities in the Chicago area on the Draft Written Re-Evaluation of the O’Hare Modernization Environmental Impact Statement (Draft Re-Evaluation) for the Interim Fly Quiet Runway Rotation Plan for Chicago O’Hare International Airport.

The workshops will be held on Feb. 4 in Elk Grove Village, IL; on Feb. 5 in Niles, IL; on Feb. 6 in River Grove, IL; and on Feb. 7 in Elmhurst IL.

FAA said it is important to note that, if approved, the Proposed Interim Fly Quiet Runway Rotation Plan would be approved only through January 2021 when Runway 9R/27L is

closed for construction to extend it. If continued, a new nighttime runway rotation plan would have to be developed to consider the extended runway’s noise impact.

Heathrow Airport

HEATHROW ASKS COMMUNITIES TO HELP SHAPE FUTURE AIRSPACE

On Jan. 8, London Heathrow Airport launched an Airspace and Future Operations consultation through which it is asking local communities to help shape the airport’s plans for its future airspace – both for the existing two runways and as part of the proposed new runway.

This is the latest milestone for Heathrow expansion following the landmark Parliamentary vote last summer allowing the project to move forward.

By a margin of four-to-one, a majority of Members of Parliament voted to approve the UK Airports National Policy Statement, which provides support for Heathrow expansion. The launch of this stage of the consultation keeps Heathrow on schedule to deliver expansion, which Heathrow officials said is part of the key trading infrastructure Britain will need to succeed post-Brexit.

Key Topics

The eight- week Airspace & Future Operations consultation is set to run from Jan. 8 to March 4. It seeks feedback on several key topics:

- Airspace change for an expanded Heathrow: the local factors Heathrow should consider in different geographic areas when designing future flight paths.
- Airspace change to make better use of the two existing runways: the local factors Heathrow should consider in different geographic areas when designing new flight paths for some aircraft arrivals on its existing two runways.
- Future operations for an expanded Heathrow: how Heathrow will operate its three runways in the future – this includes managing noise, respite through runway and airspace alternation, directional preference, and night flights.

Over 30 public consultation events will be held across local London area boroughs throughout the consultation period, where members of the public will be able to ask questions and provide their feedback.

A full list of dates, times and locations can be found at: <http://afo.heathrowconsultation.com>

The consultation documents and feedback forms are available online for the entire duration of the consultation period, as well as at a number of document inspection locations may also be submitted via post.

This major public consultation follows Heathrow’s first consultation on expansion, which was held from January to March 2018. Heathrow will hold a further consultation in June on its emerging plans for expansion including the new runway and associated physical infrastructure, as well as pre-

senting options to mitigate and manage the effects of the airport's growth.

"Delivering expansion responsibly is a key priority for Heathrow and the process of open and transparent public consultation is crucial to building the right plan for the future airport," airport officials said in announcing the new consultation.

Heathrow said it is holding a multi-stage consultation process "to ensure that stakeholders have the best opportunity to be involved throughout the process. This approach to consultation will help shape Heathrow's future plans, and ensure it creates a legacy of jobs, growth and trade for a truly global Britain while delivering on its commitments to local communities."

Emma Gilthorpe, Heathrow's Executive Director for Expansion, urged local people to participate in the consultation.

"Heathrow's aim is to design a sustainable, fair, and more efficient future airport while connecting the UK to global growth. It is crucial that our plans maximize the benefits of expansion across the country, including for the communities closest to us – and working in partnership with our neighbors is just one way of ensuring they do so. We are committed to delivering expansion responsibly, and we encourage everyone to have their say and take part," Gilthorpe said.

Aircraft

BOEING UNVEILS LATEST LIGHT, ULTRA-THIN WING CONCEPT

On Jan. 8, Boeing unveiled the latest version of a light-weight, ultra-thin and more aerodynamic wing concept known as the Transonic Truss-Braced Wing (TTBW), which researchers say will fly higher and faster than previous TTBW concepts.

The new configuration is designed to offer unprecedented aerodynamic efficiency while flying at Mach 0.80.

The strikingly long, thin wing is supported by a dramatic angled brace that rises from the bottom of the aircraft.

From end-to-end, the folding wings measure 170 feet. The high wingspan is made possible by the presence of a truss, which supports the extended length of the ultra-thin wing.

Originally, the TTBW was designed to fly at speeds of Mach 0.70 – 0.75. To increase the aircraft's cruise speed, the new concept now has an optimized truss and a modified wing sweep. By adjusting the wing sweep angle, the truss can carry lift more efficiently. The end result was a more integrated design that significantly improved vehicle performance.

The new changes follow extensive wind tunnel testing at NASA Ames Research Center. For nearly a decade, Boeing and NASA have been studying the concept as part of the Subsonic Ultra Green Aircraft Research (SUGAR) program. The research focuses on innovative concepts that reduce noise and emissions while enhancing performance.

Litigation, from p. 1

ture and extent of the noise impact from the flights," Judge Mulroy wrote in his order granting motions by the City of Chicago for Summary Judgment against the plaintiffs.

"When the City built, opened and began to use the Runway Plaintiffs were put on notice that overflights and noise would continue into the future. In fact, Plaintiffs in their depositions admitted they were painfully aware of the noise and disruption immediately after the Runway opened ... Thus, there is no factual dispute that Plaintiffs knew or should have known as of October 2013 of the events which gave rise to their Complaints.

Assertion of Second Taking Rejected

"However, they argue that a second taking occurred because, they allege, the air traffic and noise increased a year after the Runway opened. Thus, they argue the statute of limitations began to run anew in 2014."

"To extend the one-year statute of limitations or to begin the running of a new statute of limitations, Plaintiffs must show that the impact on their property from the Runway substantially increased after October 2014, thus creating a new taking," the judge explained in his Order.

"In addition, Plaintiffs must prove that the interference with the use and enjoyment of their property increased and that the new activities resulted in an additional diminution of the value of Plaintiffs' property," the judge added.

But the judge held that undisputed data filed by the City of Chicago "demonstrates that the most significant change in overflight of Plaintiffs' property occurred on Oct. 17, 2013, when the Runway opened. The pattern established then and in the following months shows that there were no fundamental changes in use of the Runway from that date through the first two years of operations."

The judge also noted that an analysis of noise levels in the Plaintiffs' neighborhood done by a consultant for the City of Chicago showed that the noise level increased by 5 dB DNL between Oct. 17, 2013, when the Runway was opened, and Sept. 30, 2014. However, during the three years after October 2014, the average noise exposure over the Plaintiffs' property did not increase significantly.

"Plaintiffs use certain selective data to argue that overflights increased and were different from another particular time, and that that difference constitutes a new taking. The Court, however, cannot look to a limited specific time and ignore previous months when considering whether the air traffic has significantly increased in order to create a new taking," Judge Mulroy explained.

He found that the plaintiffs had failed to establish that a second, increased incremental taking of an avigation easement occurred subsequent to Oct. 1, 2014, which would extend the statute of limitations.

The plaintiffs also asserted in their lawsuit that, even if the statute of limitations does not apply, the City of Chicago's representatives "made repeated public promises and represen-

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tations to Plaintiffs that the City was working on various initiatives to alleviate the impact of the Runway upon the residents.” This was done, they argued, in order to mislead Plaintiffs and to delay them from filing their lawsuit.

But the judge ruled that the plaintiffs failed to support that argument in the way the law requires. “The various statements and announcements made by representatives of the City, its Aviation Department, and committees were not ‘affirmative acts’ by the City that are binding and which would support equitable estoppel [the legal defense the plaintiffs were asserting] ... Furthermore, even if the statements were affirmative acts, it was not reasonable for Plaintiffs to rely on the statements in delaying the filing of this action,” Judge Mulroy wrote.

The case, *Jack Riser, et al. v. City of Chicago* (No. 15 L9955) was filed in the Circuit Court of Cook County, IL, County Department, Law Division.

The plaintiffs were represented by Chicago attorney Leonard Meyer and colleagues. The City of Chicago was represented by Eric Pilsk of the law firm Kaplan Kirsch and Rockwell and by Diane Pezanoski of the City of Chicago Department of Law.

SSTs

COLLINS WILL PROVIDE AVIONICS FOR NASA’S QUIET SST DEMONSTRATOR

Lockheed Martin has selected Collins Aerospace, a business unit of United Technologies Corp., to provide avionics for NASA’s X-59 Quiet Supersonic Technology (QueSST) demonstrator aircraft, which is expected to take its first flight in 2021.

The X-59 is being developed by Lockheed Martin for NASA to collect data that could make supersonic commercial travel over land possible through low sonic boom technology.

Collins also will provide a “dual multi-spectral enhanced vision system (EVS-3600)” that will enable pilots to land in nearly all conditions using advanced visual sensors leveraging long wave, infrared technology.

In order to achieve supersonic speeds with a low sonic boom signature, the X-59 must have a long and slender shape which makes a forward-looking window impractical.

The X-59 is designed to create a sound about as loud as a car door closing, instead of a sonic boom. It will be used to collect data on the acceptability of the quiet sonic boom generated by the aircraft, helping NASA establish an acceptable commercial supersonic noise standard to overturn current regulations banning supersonic travel over land.

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Gov't Shutdown

SHUTDOWN AFFECTING PROJECTS, WORKING GROUPS, NOISE PROVISIONS IN FAA REAUTH.

Invited to comment on the impact of the ongoing partial federal government shutdown on aircraft noise mitigation efforts, ANR subscribers said it is leaving key FAA officials unavailable to approve airport projects, to participate on noise working groups and other forums, and perhaps even to conduct upcoming scheduled community noise workshops on a proposed Fly Quiet nighttime runway rotation program for O'Hare International Airport and on airspace changes planned for the South-Central Florida Metroplex project.

The shutdown also will likely delay FAA's implementation of many of the 20 noise provisions that were included in legislation reauthorizing FAA's programs, which are intended to force FAA to update its decades old aircraft noise policy and to address concentrated NextGen flight path noise.

No airports receiving noise mitigation funding through FAA's Airport Improvement Program or involved in FAA's Part 150 Airport Noise Compatibility Program commented on how or whether the partial government shutdown will affect them.

(Continued on p. 6)

Litigation

STATE OF MARYLAND ASKS APPEALS COURT NOT TO DISMISS ITS CASE OVER FLIGHT PATHS

The State of Maryland asked the U.S. Court of Appeals for the D.C. Circuit to deny the FAA's motion to dismiss its challenge of flight path changes into Ronald Reagan National Airport that shifted aircraft noise from Virginia to Maryland.

In its Jan. 16 opening brief in the case, *State of Maryland v. FAA* (No. 18-1173), attorneys for the State urged the Court to hold that the FAA's amendments to the Runway 19 approach paths are arbitrary and capricious and to require the FAA to conduct a "proper" environmental analysis of the flight path changes.

One of the main points at issue in the case is whether "reasonable grounds" exist for the State to have missed the 60-day filing deadline for its litigation. In its brief, the State of Maryland compared the facts in its case to those in the City of Phoenix's challenge of RNAV departure procedures at Sky Harbor International Airport.

The Court ruled in August 2017 that reasonable grounds existed in the *Phoenix* case for filing beyond the 60-day deadline because the FAA had made public statements that created a reasonable expectation that the agency "might fix the noise problem without being forced to do so by a court" (29 ANR 111).

(Continued on p. 7)

In This Issue...

Gov't Shutdown ... Asked how the partial federal government shutdown is affecting them, ANR subscribers say it is leaving key federal officials unavailable to approve airport projects and to participate on airport noise roundtables and other forums and will delay FAA's implementation of the 20 aircraft noise provisions in the 2018 FAA reauthorization bill. The ripple effects of the shutdown will go on for many months, one warns - p. 5

Litigation ... The State of Maryland asks a federal appeals court not to dismiss its case challenging flight path changes into Reagan National Airport that moved noise from Virginia to Maryland; argues that "reasonable grounds" exist for having filed its lawsuit beyond the 60-day window - p. 5

Heathrow ... London Assembly report calls for halt in air traffic growth, ban on nighttime operations at Heathrow and London City airports to reduce noise impact - p. 7

Shutdown, from p. 5

But one official at an airport not participating in the 150 program said the shutdown is not affecting their noise mitigation efforts.

But while the shutdown may not be having much of an immediate impact on airport noise mitigation projects, attorney Peter Kirsch warns that the ripple effects of the shutdown will likely continue through late 2019.

The shutdown effects also might ripple through the federal court system, forcing changes in briefing schedules and court dates due to lack of court funds or availability of Department of Justice attorneys to work on cases.

Following are ANR subscriber comments on the impact of the partial federal government shutdown:

Impacting Project Schedules

“So far funding for our noise work has not been affected by the government shutdown, but the schedules of some of our noise and environmental projects have been impacted due to the unavailability of key government staff to provide timely reviews and approvals.

“For example, while the folks in the ADOs are funded and working, their counterparts in FAA’s Legal Division, FAA’s Office of Environment and Energy, and the Advisory Council on Historic Preservation are furloughed.

“Delays in getting the required environmental approvals delay the start of these projects, which then impacts the construction schedules, airlines, air cargo operators, and traveling public. An article in the *Everett Herald* regarding the initiation of air service at Paine Field illustrates this point.”

Steven R. Alverson
Senior Vice President
ESA | Environmental Science Associates

Alaska Airlines told the Everett, WA, *Herald Business Journal* that it will delay the start of commercial passenger service at Paine Field “by at least three weeks” due to the partial federal government shutdown.

Alaska Airlines had planned to begin service on Feb. 11 but has delayed it until March 4.

“Alaska and United Airlines plan a combined 24 daily flights at a new passenger terminal at the airport, but they are awaiting Federal Aviation Administration approval. The officials who must sign off on a final environmental assessment are on furlough,” the article explained.

Will Delay FAA Reauth. Noise Provisions

“The government shutdown delays actions needed to deliver on the noise provisions in the 2018 FAA Reauthorization bill (H.R. 302). Any slowdown is concerning in the already long five-six years of FAA not confronting the deleterious effects of NextGen on communities around the country. Costs to people and municipalities dealing with this environmental disaster are rising and multiplying, and is more conse-

quential than how many new flights to Hawaii are needed from three competing airports (within 35 miles of each other) such as SFO, OAK and SJC; or how to let drones freely buzz at night. When government re-opens FAA needs to sharpen focus on dealing with this very real problem.”

Jennifer Landesmann
Sky Posse Palo Alto, CA

A summary of the noise provisions included in the 2018 FAA reauthorization bill and the timeline for implementing them are in the Sept. 28, 2018, issue of ANR (Vol. 30, No. 32).

The noise provisions force FAA, under a relatively tight timeline, to conduct the studies and produce the data needed to develop policies and procedures to deal with concentrated NextGen noise impact, to determine whether FAA needs to find an alternative to its controversial DNL noise metric, to update its Part 150 land use compatibility guidelines and its outdated noise policy, and to phase out Stage 3 aircraft that cannot meet Stage 4 noise standards.

The noise provisions in the FAA reauthorization legislation also require FAA to conduct a study in at least eight metropolitan areas to determine whether living under concentrated NextGen flight paths affects people’s health and to issue a proposed rule defining landing and takeoff noise requirements for civil supersonic aircraft by March 2, 2020.

The government shutdown will likely delay all this critical work, much of which was to have been completed within six months to a year.

FAA Not Participating on Working Group

“Due to the shutdown, FAA is not attending the DCA noise working group meetings, or working on projects that have been in the works for several years.”

Michael Jeck
Airport Noise Office
Metropolitan Washington Airports Authority

The technical and policy expertise that FAA staff provides in working with airports, airlines, and community representatives on aircraft noise roundtables, working groups, and other noise and NextGen forums is essential to their success.

Ripple Effects Will Go On for Months

“While the FAA Airports Division has been only minimally affected by the shutdown, other FAA functions have been seriously affected. Seemingly routine matters such as securing a part 77 [on safe, efficient use and preservation of the navigable airspace] (Form 7460) review, obtaining FSDO [Flight Standards District Offices] approvals and certifications, and, more generally, receiving informal guidance and opinions from the FAA have all been delayed.

“Even more importantly, the shutdown will have effects for months and months after the government reopens – the

FAA will not be able to reopen and just return to normal because it will face backlogs from the shutdown. It is anyone's guess how long it will take FAA functions to return to normal but it is likely to be months and months.

"Exacerbating these disruptions, the FAA Reauthorization Act of 2018 mandated that the FAA issue dozens of reports, studies, regulations, orders and guidance. There are likely to be months-long delays in implementing key provisions of the new statute.

"The focus of much of the media has of course been on the impacts of the shutdown on federal employees – which has been serious, and in some cases, life disrupting. But the ripple effects will be even broader – for airports who cannot secure timely approvals, for airlines who do not receive necessary certifications, for communities whose programs will be delayed, and for other stakeholders who will see expected agency actions delayed. It could easily be late 2019 before the effects on non-federal entities are resolved.

Peter J. Kirsch
Kaplan Kirsch & Rockwell LLP

Litigation, from p. 5

The State of Maryland acknowledged that it filed its petition well after 60 days from the FAA's first use of the procedures, but argued that the FAA "drove the timing of this lawsuit by creating an expectation that changes to the new procedures were being evaluated."

"On the same day that the FAA first informed the Washington Reagan National Airport Community Working Group that it had revised the approach paths and explained what it had done, the FAA also publicly stated that it would consider development on an alternative procedure. On numerous subsequent occasions, the FAA reassured the Working Group that it would further collaborate on revisions to the flight paths," Maryland argued.

"Those public statements created a reasonable expectation that the FAA 'might fix the noise problem without being forced to do so by a court' – the criteria the Court used in the *Phoenix* case to conclude that "reasonable grounds" existed for the City of Phoenix to have missed the filing deadline, the State of Maryland asserted.

One of the attorneys representing the State of Maryland is John Putnam of Kaplan Kirsch & Rockwell, who won the *Phoenix* case, and is guiding the State of Maryland's case.

No Public Notice of Flightpath Changes

In 2015, the FAA made the series of amendments to arrival flight paths for Runway 19 at Ronald Reagan Washington National Airport that shifted flights out of northern Virginia and concentrated aircraft noise over resources and communities in Maryland.

"Before making those changes, the FAA provided no public notice of its plan, performed no noise analysis, and did not

evaluate the potential impacts to historic resources, parks, or recreational areas," the State of Maryland told the Court.

Although the FAA asserts that it applied a categorical exclusion to avoid environmental review under the National Environmental Policy Act, the record contains no evidence that the FAA reached such a determination at the time it amended the flight paths, Maryland said.

"Nor is there any evidence that the FAA considered the impacts of its actions or undertook any consultation on historic resources, parks, or recreation areas protected by the National Historic Preservation Act, and Section 4(f) of the Department of Transportation Act. The FAA violated NEPA, the NHPA, and Section 4(f) through its complete failure to perform the necessary environmental analyses."

The State of Maryland told the Court that it only became apparent in April 2018, long after the arrival procedures were changed and when FAA sent two letters to the State, "that the FAA had not been fully transparent with the public and that it might no longer cooperate with Maryland and other local officials to further change the flight paths to address Maryland's noise concerns.

"The first letter admitted that, contrary to its previous statements made in response to repeated public and elected-official requests, the FAA had produced no environmental documentation before amending the flight paths. The second letter signaled that the FAA would invoke the statute of limitations should Maryland file suit. Maryland reasonably filed suit within 60 days of those two communications," the State explained.

Maryland asked the Court to "deny the FAA's motion to dismiss, hold that the FAA's amendments to the Runway 19 approach paths are arbitrary and capricious, vacate those decisions, and remand to the FAA for a proper analysis."

The FAA and Department of Justice reply brief is due on Feb. 15 but the partial government shutdown could delay its submission.

UK

LONDON ASSEMBLY REPORT CALLS FOR HALT IN AIR TRAFFIC GROWTH AT HEATHROW

A new report, entitled *Aircraft Noise*, published Jan. 23 by the London Assembly Environment Committee, says noise nuisance levels are unacceptable and calls for a halt on all air traffic growth at Heathrow and London City airports.

The London Assembly represents Londoners in City Hall. The Assembly scrutinizes and monitors the Mayor. They examine the Mayor's actions to determine whether or not they suit the public interest. Along with the Mayor, the London Assembly is responsible for policing, transport, housing, planning and the environment.

Heathrow has recently announced plans for 25,000 extra flights a year, bringing new areas of London under its flight

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paths. Meanwhile, London City Airport, in the middle of its own significant expansion, saw record passenger numbers in 2018.

“But as the appetite for air travel grows, so does the misery for those who have no choice but to live with a debilitating noise invasion,” the Assembly Environment Committee said.

The Committee said its report “builds on evidence given by residents who told the Committee of a dawn chorus of disruption that continued well after their children’s bedtime.”

The report details the impact of altitude, flight paths and out-of-hours flights on the noise landscape.

No Night Flights

Among the report’s recommendations are:

- The Independent Commission on Civil Aviation Noise should use lower thresholds for disturbance, allowing residents to leave their windows open when they need to.
- Air traffic at Heathrow and London City should not increase and Heathrow’s third runway should not go ahead.
- Air traffic controllers should minimize continuous stacking and maximize descent and ascent to keep aircraft further from the ground for longer. They should also minimize overlap between City and Heathrow flight paths.
- There should be no night flights, and restrictions on early morning flights should be strengthened. All London airports should provide predictable periods of respite.

“The experiences of residents living with the daily nightmare of overhead noise are deeply worrying,” said Caroline Russell, chair of the London Assembly’s Environment Committee. “There are significant health impacts that follow from an inability to sleep, relax and concentrate.

“This drive towards filling airspace capacity must be checked. For too many people, including children, aircraft noise is a major dominant intrusion into their everyday lives. It is not an acceptable price to pay for air travel. It isn’t right and must be challenged.

“We have already made clear our objection to the expansion of Heathrow but aviation authorities and operators must prioritize the health and well-being of Londoners and give us a break.”

The London Assembly report can be downloaded at:

<https://www.london.gov.uk/sites/default/files/aircraft-noise-report.pdf>

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Airport Noise Report



A weekly update on litigation, regulations, and technological developments

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SSTs

UNCONSTRAINED COMMERCIAL SST FLEET WOULD PRODUCE UP TO 150-200 BOOMS A DAY

A unconstrained commercial supersonic aircraft network of 2,000 aircraft operating in 2035 would produce 150-200 sonic booms a day in heavily impacted areas, a new paper by The International Council on Clean Transportation (ICCT) predicts.

However, the noise model used by the ICCT assumes an SST reference aircraft that only meets Stage 3 aircraft noise certification standards and does not employ low-boom technology that NASA is developing. The reference SST was developed from publicly available data on Boom Technology's "Overture" 55-seat commercial SST, which is currently under development and is assumed to be delivered at a rate of 200 per year starting in 2025.

Such a fleet of SSTs could double the area around airports exposed to substantial noise pollution compared to existing subsonic aircraft of the same size, the ICCT report estimated.

It also predicted that substantial parts of the world would experience disruptive sonic booms from such SST aircraft. Canada, Germany, Iraq, Ireland, Israel, Roma-

(Continued on p. 10)

UAM

HONEYWELL, PIPISTREL AGREE TO EXPLORE UAM; BOEING'S PAV MAKES FIRST TEST FLIGHT

Honeywell and the Slovenian light aircraft manufacturer Pipistrel have signed a memorandum of understanding that will bring both companies together to explore and develop solutions for the urban air mobility market.

The companies will integrate Honeywell avionics, navigation, flight control systems, connectivity and other beneficial products and services onto a future Pipistrel Vertical Takeoff and Landing (VTOL) air vehicle to support fully autonomous operations in the future.

Urban air mobility is an aviation industry term for on-demand and automated passenger or cargo-carrying air transportation services, typically flown without a pilot. Urban air mobility services will bring innovative new ways for people to travel around cities and rural areas, while reducing congestion.

"This is the beginning of a long-term relationship to collectively pursue the future of urban air mobility," said Ivo Boscarol, founder and president of Pipistrel.

"Honeywell's expertise in integrated avionics and flight control systems, systems integration, certification, and manufacturing, combined with our capabilities in designing and developing advanced light aircraft, makes us the perfect pairing to

(Continued on p. 12)

In This Issue...

SSTs ... A fleet of commercial SST aircraft like the one Boom Technology is developing would produce 150-200 sonic booms a day in heavily impacted areas, an ICCT report warns - p. 9

UAM ... Honeywell, Pipistrel sign MOU to explore urban air mobility; Boeing's autonomous passenger vehicle makes first test flight - p. 9

SFO ... Airport launches high school educational curriculum called Sound Waves to engage next generation of aviation professionals - p. 10

Conferences ... Two keynote addresses will highlight program for 2019 UC Davis Aviation Noise and Emissions Symposium - p. 11

News Briefs ... FAA announces its approval of noise exposure maps for Atlanta Hartsfield-Jackson Int'l Airport; FAA announces availability of EIS for proposed interim nighttime runway rotation plan for Chicago O'Hare Int'l - p. 11

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nia, Turkey, and parts of the United States would experience frequent sonic booms; the most heavily impacted regions could be exposed to between 150 and 200 sonic booms per day, or up to one boom every five minutes over a hypothetical 16-hour day.

The two airports expected to have the most commercial SST operations in 2035, Dubai and London Heathrow, could each see more than 300 operations per day, the ICCT said. Other airports – including Los Angeles, Singapore, San Francisco, New York-JFK, Frankfurt, and Bangkok – could each see 100 or more daily commercial SST flights, the ICCT estimated from modeled data.

ICAO Meeting Begins

The ICCT paper was issued on Jan. 30, just two days before the International Civil Aviation Organization's Committee on Aviation Environmental Protection (CAEP) began meeting in Montreal from Feb. 1-12 to discuss progress toward developing noise certification standards for a new generation of supersonic aircraft.

ICAO is initiating work on SST standards for landing and takeoff noise (LTO), air pollution, sonic boom, and cruise CO₂. A full set of standards may be finalized by 2025 and take effect before 2030, the ICCT noted.

The ICCT paper paints a dire picture of the noise impact a fleet of commercial SSTs that do not meet more stringent noise standards and low-boom standards would have.

“Regulators are faced with two choices: either to develop new SST standards that would allow those aircraft to produce more noise, air pollution, and climate pollution than new subsonic designs, or to apply existing subsonic standards to SSTs,” the ICCT asserted.

“Aspiring SST manufacturers could boost public acceptance for their designs by committing to meet existing LTO noise and cruise CO₂ standards for subsonic aircraft and by supporting new en route noise standards that would mandate low-boom technology. Lacking these commitments, manufacturers may find it difficult to access additional capital to finalize their aircraft designs: to date, Boom has raised about \$141 million, or about 2% of the \$6 billion it estimates will be needed to fully develop its aircraft,” the ICCT said.

The ICCT said its modeling of the impact an unconstrained network of new commercial SSTs would have on the environment “highlights the need for robust environmental standards to manage the expected noise and CO₂ impacts or reintroducing commercial SSTs.

Did Not Model Low-Boom SST

The ICCT paper modeled the landing and takeoff (LTO) noise, sonic boom, and carbon dioxide emissions from a fleet of 2,000 commercial SSTs expected to operate approximately 5,000 flights per day in 2035 at 160 airports located predominantly in Europe, North America, the Middle East, Asia, and Oceania.

The ICCT model is based on a sonic boom intensity on the order of 95 PLdB (Perceived Level of noise), which would be perceived as “two explosive, low-frequency impulsive sounds akin to artillery fire or an explosion.”

The ICCT did not model the significantly lower 75 PLdB sonic boom noise level – which would be equivalent to the volume of a car door slamming – that NASA hopes to achieve with its Quiet Supersonic Transport (QueSST) demonstrator aircraft currently under development by Lockheed-Martin.

The ICCT report explained that the 95 PLdB sonic boom intensity it used in its modeling was based on:

- Boom's claim that its 55-seat “Overture” commercial SST flying at Mach 2.2 will produce a sonic boom intensity about 15 dB below that of Concorde, which peaked at 109 PLdB, and on;

- Boeing's estimates that the sonic boom of a smaller configuration (765-076E) aircraft, which would carry 30 passengers at Mach 1.6 to 1.8, would be between 91 and 100 PLdB.

SSTs capable of the low boom that NASA seeks will not be deployed for near-term SST designs, the ICCT said. Further “preliminary design work completed for NASA by Boeing suggest a fuel burn penalty on the order of 10% for a 5dB reduction in perceived boom ... This indicates a tradeoff between en route noise and fuel burn that may limit the uptake of low-boom technologies unless mandated,” the report explains in a footnote.

In a fleet of SSTs without low-boom technology, significant sonic boom exposure would be felt in North America, the ICCT warned.

“Newfoundland and Nova Scotia in Canada, and coastal Maine in the United States, would experience the largest impacts. In the Mountain West and Great Plains, parts of Arizona, Colorado, Nebraska, and Utah plus Western Alaska would experience sonic booms about every six to 10 minutes (100 to 150 times daily), while much of the Midwest, Oregon, and western Alaska would experience a sonic boom at roughly 20-minute intervals (50 times per day). Other states, including California, Florida, and Hawaii, would experience little or no sonic boom, although exposure to LTO noise at their airports could be significant.”

The report, “Noise and climate impacts of an unconstrained commercial supersonic network,” can be downloaded at the ICCT website (www.theicct.org).

San Francisco Int'l

CURRICULUM ENGAGES HIGH SCHOOL STUDENTS ON NOISE

On Jan. 29, San Francisco International Airport (SFO) announced the launch of a brand new high school education curriculum called Sound Waves – an innovative study of how sound carries in and around the airport – to help engage the next generation of aviation professionals.

“SFO has created a unique, hands-on learning curriculum that leads students to explore the science of sound waves, how sound travels and its impact on human beings,” said Airport Director Ivar C. Satero.

“These lessons give young people a chance to explore the science, technology, and engineering behind how airports operate, and provides insightful opportunities for future careers at SFO.”

The education materials were created by and for teachers, and meet the requirements of the California Department of Education Content Standards NGSS HS PS 4.1. Over the course of five days, the lesson sequence includes:

- Inquiry-based Introduction to Waves
- Sound Scavenger Hunt
- Sound and Mediums Investigation
- Sound and Particles Demonstrations
- Unique On-Site Summative Experience - How SFO’s

Noise Abatement Office decodes sounds around the airport

The program concludes with a special tour at SFO that features internship and airport career opportunities.

If interested in the program, visit Sound Waves: A High School Education Curriculum and complete the form. Once submitted, the airport will provide slides with instructions and customizable worksheets for students, coordinate material pick-up and schedule a tour.

Conferences

HIGHLIGHTS OF PROGRAM FOR UC DAVIS NOISE, EM. SYMPOSIUM

Two keynote addresses will highlight the 2019 UC Davis Aviation Noise and Emissions Symposium, which will be held on March 3-5 in Jacksonville, FL.

Ian Jopson of the UK’s National Air Traffic Services, will describe how NATS works with communities in the UK on NextGen airspace changes and how it differs from what is done in the U.S.

Todd Linder of the Jacksonville Aviation Authority’s Cecil Air & Spaceport, will discuss a new kind of noise impact: horizontal launch operations by reusable launch vehicles.

Among the aircraft noise-related presentations at the symposium will be discussions by:

- Dr. John Housman of MIT on research being done on aircraft dispersion at Boston Logan International Airport and other concepts to reduce noise impact on communities;
- Kevin Welsh of FAA’s Office of Environment and Energy on FAA efforts to understand and address aviation noise challenges;
- Mike McKee of Denver International Airport on the results of using PBN procedures at DEN;
- Blake Cushnie and Jonathan Bagg of NAV CANADA on how their agency uses PBN for noise mitigation;
- Brian Will of Queens Quiet Skies and Zafar Zafari of

the University of Maryland on the trade-off between optimizing flight patterns and human health;

- Emily Tranter of the National Organization to Insure a Sound-controlled Environment (N.O.I.S.E.) on legislative updates;
- Joe DiPardo of the Noise Division of FAA’s Office of Environment and Energy, on an Aviation Environmental Design Tool (AEDT) update;
- Jim Hileman of FAA’s Office of Environment and Energy on FAA’s CLEEN program;
- George Bye of Bye Aerospace on electric aircraft taking flight sooner than you think;
- Diane Jackson of Naples Airport on how it demonstrates its commitment to being a good neighbor;

General aviation noise issues and noise issues on the horizon also will be addressed at the symposium.

At a Community Workshop set for Sunday, March 3, representatives of community anti-noise groups from around the country will discuss the practices and procedures they want to see the FAA and the aviation community adopt in engaging with communities on NextGen airspace changes. They will present to the symposium for consideration those areas of community engagement they all can agree on.

For further information on the symposium, go to <https://anesymposium.aqrc.ucdavis.edu>

In Brief...

Atlanta Noise Maps

On Jan. 31, the FAA announced its determination that the Noise Exposure Maps submitted by the City of Atlanta Department of Aviation for Hartsfield-Jackson International Airport under FAA Part 150 Airport Noise Compatibility Program are in compliance with applicable federal requirements.

For further information, contact Felicia Reeves in FAA Atlanta Airports District Office; tel: (404) 305-6708.

EIS for Proposed O’Hare Interim Fly Quiet

On Jan. 31, FAA announced the availability of the “Draft Re-Evaluation of the O’Hare Modernization Environmental Impact Statement for the Proposed Interim Fly Quiet.”

This is an environmental impact statement the agency prepared for a proposed interim nighttime runway rotation plan for O’Hare developed by the O’Hare Noise Compatibility Commission in conjunction with the FAA.

The public has until midnight on Feb. 27 to submit comments on FAA’s Draft Environmental Impact Statement for the proposed interim nighttime runway rotation plan for O’Hare International Airport (31 ANR 1). The Draft Re-Evaluation is available online at:

http://www.faa.gov/airports/airport-development/omp/ifq_re_eval/

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advance the urban air mobility market.

“Pipistrel was chosen to be one of Uber’s vehicle development partners for its urban mobility solution, and our VTOL air vehicle features next-generation propulsion technology for achieving embedded lift. We have the concept that unlocks a cost-attractive electric VTOL opportunity by addressing efficiency and noise hurdles in vehicle lift, hover and cruise stages of flight.”

Honeywell and Pipistrel will be using Honeywell’s vast experience in avionics and flight controls along with Pipistrel’s knowledge of aircraft design to support the initial phases of a demonstration program in early 2019. A schedule announcing flight demonstrations for the vehicle prototypes will be released later in the year.

Boeing PAV Prototype Makes First Test Flight

In related news, Boeing said Jan. 23 that it successfully completed the first test flight of its autonomous passenger air vehicle (PAV) prototype in Manassas, VA.

Boeing NeXt, which leads the company’s urban air mobility efforts, utilized Boeing subsidiary Aurora Flight Sciences to design and develop the electric vertical takeoff and landing (eVTOL) aircraft and will continue testing to advance the safety and reliability of on-demand autonomous air transportation.

The PAV prototype completed a controlled takeoff, hover and landing during the flight, which tested the vehicle’s autonomous functions and ground control systems. Future flights will test forward, wing-borne flight, as well as the transition phase between vertical and forward-flight modes. This transition phase is typically the most significant engineering challenge for any high-speed VTOL aircraft.

“In one year, we have progressed from a conceptual design to a flying prototype,” said Boeing Chief Technology Officer Greg Hysop. “Boeing’s expertise and innovation have been critical in developing aviation as the world’s safest and most efficient form of transportation, and we will continue to lead with a safe, innovative, and responsible approach to new mobility solutions.”

Powered by an electric propulsion system, the PAV prototype is designed for fully autonomous flight from takeoff to landing, with a range of up to 50 miles. Measuring 30 feet long and 28 feet wide, its advanced airframe integrates the propulsion and wing systems to achieve efficient hover and forward flight.

“This is what revolution looks like, and it’s because of autonomy,” said John Langford, president and CEO of Aurora. “Certifiable autonomy is going to make quiet, clean, and safe urban mobility possible.”

AIRPORT NOISE REPORT

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Airport Noise Report



A weekly update on litigation, regulations, and technological developments

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Legislation

BILL WOULD REQUIRE CONSENSUS REPORT ON HEALTH EFFECTS OF FLYING OVER HOMES

On Feb. 5, Congressman Stephen Lynch (D-MA), Co-Chair of the Congressional Quiet Skies Caucus for the 116th Congress, introduced the *Air Traffic Noise and Pollution Expert Consensus Act* (H.R. 976), which would require the FAA to sponsor an Expert Consensus Report issued by the National Academies of Sciences, Engineering and Medicine on the health effects of airplanes flying over residential areas.

Expert Consensus Reports produced by the National Academies examine scientific and technological issues of national importance.

Rep. Lynch said his legislation, which has 18 co-sponsors, would make available the best scientific information on the health impacts of air traffic noise and pollution by requiring the FAA to sponsor an Expert Consensus Report from the Division of the National Academies of Sciences, Engineering, and Medicine.

Under the bill, the National Academies would be required to convene a committee of health and environmental science experts within 30 days. The committee would examine the health impacts of air traffic noise and pollution and issue the
(Continued on p. 14)

SSTs

BOEING INVESTS IN AERION TO ACCELERATE DEVELOPMENT OF SUPERSONIC AIRCRAFT

On Feb. 5, Boeing announced a partnership with Aerion, a Reno, Nev.-based company pioneering next-generation supersonic aircraft, beginning with a supersonic business jet.

As part of the agreement, Boeing made what it called a “significant investment” in Aerion to accelerate technology development and aircraft design, and unlock supersonic air travel for new markets. However, the terms of the deal were not disclosed.

Boeing said it will provide engineering, manufacturing, and flight test resources, as well as strategic vertical content, to bring Aerion’s AS2 supersonic business jet to market. The AS2 is designed to fly at speeds up to Mach 1.4 or approximately 1,000 miles per hour. With the ability to fly up to 70 percent faster than today’s business jets, the AS2 will save approximately three hours on a transatlantic flight while meeting “environmental performance requirements,” Boeing said.

The AS2 is slated for first flight in 2023.

“Boeing is leading a mobility transformation that will safely and efficiently

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Expert Consensus Report with their findings. The report would be submitted to the FAA Administrator, the Secretary of Health and Human Services, the Administrator of the Environmental Protection Agency, and relevant Congressional Committees, including the House Committee on Transportation and Infrastructure and the House Committee on Oversight and Government Reform.

‘Imperative’ to Understand Health Effects

“There is a clear demand from our constituents that we look into the impacts of flight paths across the country,” said Rep. Lynch. “It is imperative that we understand and remedy any health effects caused by aircraft flying over residential areas, and the burden is on the FAA to produce this information.”

Lynch noted that federal and regional transportation authorities have received an increased number of complaints around airplane noise as new flight paths have been implemented as part of the FAA’s Next Generation Air Transportation System.

NextGen shifted flight paths in and out of airports, causing increased airplane activity over certain residential areas, Lynch explained. He said that in Massachusetts alone, the Massachusetts Port Authority (MASSPORT) received over 71,000 complaints about aviation-related noise from across 83 communities, including Hull, Hingham, Milton, and Boston, in 2018, which increased the number of complaints received in 2017 by almost 20%, and almost doubled the amount of complaints received in 2016.

Congressman Lynch sits on the Aviation Subcommittee of the House Committee on Transportation and Infrastructure.

Co-sponsors of the bill include: Congressional Quiet Skies Caucus Co-Chair Eleanor Holmes Norton (D-DC), Congressional Quiet Skies Caucus Vice-Chairs Thomas Suozzi (D-NY) and Mike Quigley (D-IL), Quiet Skies Caucus members Raja Krishnamoorthi (D-IL), Ted Lieu (D-CA), Anna Eshoo (D-CA), Jamie Raskin (D-MD), Adam Smith (D-WA), Brad Sherman (D-CA), Dan Lipinski (D-IL), Alan Lowenthal (D-CA), Jackie Speier (D-CA), Judy Chu (D-CA), Grace Napolitano (D-CA), Jan Schakowsky (D-IL), Karen Bass (D-CA), and Kathleen Rice (D-NY), and Julia Brownley (D-CA), who is not listed as a caucus member

Reauthorization Requires Health Study

FAA reauthorization legislation signed into law last year requires the FAA to enter into an agreement with an eligible institution of higher education to conduct a study on the incremental health impacts attributable to noise exposure that results from aircraft flights, including sleep disturbance, and elevated blood pressure.

That study will focus on residents in metropolitan areas of Boston, Chicago, District of Columbia, New York, the Northern and Southern California Metroplex areas, Phoenix, Seattle, and other areas as may be identified by the FAA.

House T&I Committee**LARSEN ELECTED TO CHAIR HOUSE AVIATION SUBCOMMITTEE**

Rep. Rick Larsen (D-WA) was elected by his colleagues as Chairman of the House Transportation and Infrastructure Committee’s Aviation Subcommittee, which has jurisdiction over all aspects of civil aviation and oversees the FAA.

As a result of the mid-term elections, the Democrats now control the U.S. House of Representatives, which means that all House committees are now under Democratic leadership.

“With the passage of the *Federal Aviation Administration Reauthorization Act of 2018*, the Aviation Subcommittee will focus on overseeing the implementation of the bill and have an opportunity to explore new issues. With safety as our guiding principle, I would like to explore what is possible and on the horizon in aviation and what is needed to ensure the United States keeps innovating and remains globally competitive,” Larsen said in a Jan. 24 statement.

“As Aviation Subcommittee Chair, I am committed to strengthening aviation safety by responding to safety incidents and regulatory gaps in the FAA’s oversight of the U.S. aviation industry; investing in the future of aviation through fostering technological innovation to advance the safe and efficient integration of new users; improving U.S. competitiveness through robust federal investment in aviation and airport infrastructure, supporting U.S. manufacturers and increasing and developing our aviation workforce; and enhancing consumer protections for passengers,” said Larsen.

“I look forward to working with Rep. Garret Graves (R-LA) who will serve as Ranking Member [of the Aviation Subcommittee], and the Members of the Subcommittee.”

Rep. Larsen did not mention aircraft noise in his statement so ANR asked if he planned on addressing any aircraft noise issues, particularly the noise produced by concentrated NextGen flight paths which is causing widespread noise complaints in communities around the country. ANR also asked whether the new Aviation Subcommittee chairman will monitor FAA’s progress in implementing the 20 noise provisions included in the 2018 FAA Reauthorization Act.

In a statement to ANR, Rep. Larsen said:

“One of the areas the Subcommittee will focus on is fostering innovation in U.S. aviation and aerospace through the advancement of NextGen. The FAA reauthorization bill makes progress toward the development and implementation of state-of-the-art NextGen technologies in U.S. airspace. With timely input from various stakeholders and communities, U.S. companies will be able to tailor aviation products and services to better address pressing local challenges, such as noise.

“The Aviation Subcommittee will conduct oversight of the 20 noise provisions in the FAA reauthorization bill and work with industry, the administration and aviation stakeholders on implementation to ensure the United States remains the gold standard in flight.”

Although the new Aviation Subcommittee Chairman is not a member of the House Quiet Skies Caucus, his tenure on the Aviation Subcommittee has schooled him on the aircraft noise issue and he is actively seeking to mitigate the impact of Navy EA-18G Growler operations at Naval Air Station Whidbey Island, WA, on his constituents.

Senate Aviation Subcommittee

Sen. Ted Cruz (R-TX) will chair the Senate Commerce Committee's Subcommittee on Aviation and Space and Sen. Kyrsten Sinema (D-AZ) will serve as the Subcommittee's Ranking Member.

Democrat Sinema replaces Republican Sen. Jeff Flake (R-AZ), who decided not to run for reelection.

Aircraft

P&W GTF ENGINES POWER INAUGURAL DELTA A220 FIGHTS

Pratt & Whitney, Airbus, and Delta Air Lines celebrated the entry into service of the airline's A220 aircraft powered by Pratt & Whitney GTF™ engines on Feb. 7.

The occasion, which makes Delta the first A220 operator in North America, was commemorated with a gate celebration at LaGuardia Airport in New York.

The A220, exclusively powered by the GTF engine, offers double-digit improvement in operating costs compared to current generation aircraft. It is 20% more fuel efficient and provides a 75% reduction in noise footprint and NOx emissions 50% below the ICAO CAEP 6 regulation, according to P&W.

In April 2016, Delta announced its order of 75 firm A220 aircraft with options for up to 50 additional aircraft powered by Pratt & Whitney GTF engines. In January, Delta added 15 firm aircraft, increasing its total firm order to 90 A220 aircraft.

Delta also announced selection of the GTF engine to power its order of 100 firm A321neo aircraft in December 2017 with options for up to 100 additional aircraft. Additionally, Delta TechOps joined Pratt & Whitney's growing MRO network, which supports the GTF engine fleet and Pratt & Whitney customers worldwide.

"Delta has been a pioneer in the aviation industry for decades and today we celebrate another milestone with the Delta team as their new A220 aircraft enters service," said Rick Deurloo, senior vice president of sales, marketing and customer support at Pratt & Whitney.

"Delta's GTF-powered A220 joins more than 330 other Pratt & Whitney powered aircraft already in service with Delta. Pratt & Whitney and Delta have built a strong and trusted relationship over the years and we are confident that Delta will enjoy the GTF engine's proven economic and environmental benefits on the A220 aircraft."

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connect the world faster than ever before," said Steve Nordlund, vice president and general manager of Boeing NeXt. "This is a strategic and disciplined leading-edge investment in further maturing supersonic technology. Through this partnership that combines Aerion's supersonic expertise and Boeing's global industrial scale and commercial aviation experience, we have the right team to build the future of sustainable supersonic flight."

Founded in 2003 to develop new, more efficient aerodynamic technologies for supersonic aircraft, Aerion introduced its AS2 12-passenger business jet design in 2014. The company unveiled the AS2's GE Affinity engine design in 2018.

GE describes its Affinity engine as "a twin-shaft, twin-fan turbofan controlled by a next generation Full Authority Digital Engine Control (FADEC) for enhanced dispatch reliability and onboard diagnostics. It is purposefully designed to enable efficient supersonic flight over water and efficient subsonic flight over land, without requiring modifications to existing compliance regulations. The engine is designed to meet stringent Stage 5 subsonic noise requirements and beat current emissions standards."

"The AS2 is designed to fly efficiently overland at Mach 0.95, just below the speed of sound and below the point at which a boom is created," Jeff Miller, Aerion's Vice President for Marketing and Communications, told ANR.

"Boomless Cruise"

"Under certain conditions," Miller added, "it may fly up to Mach 1.2 in a mode we term Boomless Cruise. In this operating mode, we are assessing atmospheric conditions and adjusting speed so that a weak boom will always refract off of warmer layers of the atmosphere and not reach the ground. We intend to demonstrate this capability during FAA certification testing."

Asked how Boomless Cruise works, Miller explained that it is "unique technology being developed by Aerion. On-board avionics will collect atmospheric data and calculate maximum speed so as not to boom the ground. Because the speed of sound is a function of temperature and is higher at the ground than at, say, 50,000 feet, at relatively low supersonic speeds the boom will essentially dissipate or refract off of warmer layers of the atmosphere.

"This phenomenon occurs because of the physics of the atmosphere, not because of specific aerodynamic design of the aircraft. That is why Boomless Cruise is achievable at only low supersonic speeds. However, it does require some unique avionics development. We expect to begin flight testing the system in 2024."

The FAA Reauthorization Act of 2018 requires FAA to reassess, at two-year intervals beginning in 2020, whether the existing ban on supersonic overland flights in the United States can be lifted and replaced by an en-route (sonic boom) noise standard.

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UAM

AIA FOCUSES ON URBAN AIR MOBILITY AT T&I HEARING ON INFRASTRUCTURE

The House Transportation & Infrastructure Committee held its first hearing under Democratic control on Feb. 7 and it focused on “why investing in our nation’s infrastructure cannot wait.”

Eric Fanning, President and CEO of the Aerospace Industries Association focused his testimony on Urban Air Mobility (UAM), a concept that “will change the way people connect with each other and travel through on-demand passenger transportation services,” he told the Committee.

“The aviation industry is on the verge of a technological innovation that will revolutionize the way we move goods and people,” Fanning asserted in written testimony. “Much like Henry Ford did with the Model T and the Wright Brothers did with the first flight, UAM technologies will change people’s lives – and our world – for the better.

“And UAM is just part of this new world,” he added. “I’ve already mentioned the role Unmanned Aircraft Systems (UAS) and drones will play, but there are so many other new innovations with their own impact, from the supersonic planes that will be managed by new and improved air traffic systems to the commercial space flights that will make us rethink airports around the world – and beyond.

“This vision is not theoretical; it will happen. But in order for America to be the leader that gets there, we must recommit to our partnership between industry and government, including of course, the U.S. Congress.

Fanning told the House Transportation Committee that there must be collaboration between all levels of government for UAM to succeed.

“Industry will continue to work with the federal government to set the standards and rules that will govern operations. However, local governments and their partners also have a key role to play in that process. Cities and states will need to update their infrastructure to allow for takeoffs and landings of the aircraft. Building, parking garages, and other surfaces could be repurposed to allow for UAM operations, but only with the active involvement of local governments.

“Before there is widescale operational use of UAM, cities will also need to work with industry and focus on developing emergency landing sites and other safety procedures. To take advantage of these emerging technologies, we ask states, cities, and counties to begin these analyses in their local areas. While widespread UAM flight may be a few years away, cities and states must begin preparing for them now.

“Because the future of American infrastructure is coming – and sooner than you think ...”

AIRPORT NOISE REPORT

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UAM

SAFETY, NOISE ARE TOP CONCERNS OF PUBLIC ABOUT UAM VEHICLES, AIRBUS SURVEY FINDS

Safety and noise are the top concerns of the public about Urban Air Mobility (UAM) vehicles, such as air taxis and package delivery drones, according to a survey conducted by a division of Airbus' Urban Mobility Unit.

The study surveyed 1,540 people from Los Angeles, Mexico City, Switzerland, and New Zealand to determine their perceptions on safety, noise, inequity, visual pollution, and privacy in relation to UAM deployment.

According to the study, nearly one in two people surveyed are in favor of UAM deployment. In fact, 44% indicate they support, or strongly support, the initiative, Airbus reported.

The findings also reveal that 41% of participants perceive these aerial vehicles to be safe or very safe. Moreover, safety (55%) ranks as participants' leading concern for UAM implementation in their communities, followed by sound types (49%) and sound volume (48%) generated by the aerial vehicle.

"Communities need to be educated on UAM to facilitate public acceptance,"

(Continued on p. 18)

Gov't Shutdown

SHUTDOWN JEOPARDIZED NEXTGEN AIRSPACE IMPROVEMENTS IN NE CORRIDOR, A4A SAYS

The recent 35-day federal government shutdown has impacted FAA's NextGen air traffic modernization efforts and jeopardized airspace improvements in the Northeast Corridor (the congested airspace between Boston and Washington, DC) that are central to the goals of the NextGen Advisory Committee, Airlines for America President and CEO Nicholas Calio told the House Aviation Subcommittee at a Feb. 13 hearing.

"Because [NextGen] is both a planning and implementation initiative, the shutdown has impacted near-term improvements and longer-term implementations being supported by the [aviation] industry, essentially halting the development and operational testing of technologies for NextGen," Calio told the Subcommittee in written testimony.

Regarding airspace improvements in the Northeast Corridor, Calio said, "We face the potential of the FAA not being able to deliver on commitments of more effective and efficient metering of aircraft at Newark and LaGuardia Airports."

He said there is now doubt about promised anticipated improvements in NextGen procedures, and questions about pending improvements to high altitude

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Airbus UTM Head of Airspace Management Isabel Del Pozo De Poza said. “From our perspective, the study findings are very positive and demonstrate there’s growing support.”

The study also analyzed perceptions by demographics, such as the age groups and geographic areas that are most likely to be accepting of UAM in the future. Specifically, participants living in Mexico City (67%) and Los Angeles (46%) indicated they are likely or very likely to use UAM. Furthermore, the 25-34 age group had the most positive initial reaction (55% positive), compared to the 75-84 age group (15% positive).

“Our aim is to bring the public’s voice to the table to create an ecosystem that better prepares cities and city dwellers for autonomous and electric aerial vehicles in a way that takes into account their desires, hopes and fears,” Airbus UTM Head of Deployment Jessie Mooberry said.

To produce the study, Airbus UTM said its team rigorously reviewed academic literature and conducted expert interviews with city officials, aircraft manufacturers, academics, and policymakers.

For future studies, Airbus UTM will continue to work with communities around the world to study this new technology’s potential.

Read the complete study here: airbusutm.com.

*Air Taxis***FRAPORT DEVELOPING CONCEPTS FOR AIRPORT AIR TAXI SERVICES**

The German companies Fraport AG and Volocopter GmbH said Feb. 12 that they have joined forces to develop concepts for ground infrastructure and operations required to bring air taxi services to airports, beginning with Frankfurt Airport.

They are focusing on the development of so-called Volocopter Ports, which will enable smooth passenger handling and efficient integration of electric air taxis into existing transport infrastructure.

In the future, they said, Volocopter Ports could link existing urban transportation junctions with one another and provide connections to and from Frankfurt Airport (FRA), which Fraport manages.

“Autonomous flying will fundamentally change aviation in the years to come,” Anke Giesen, Fraport AG’s executive board member for operations (COO), explained.

“We want to be the first airport in Europe to harness the potential of electric air taxis in partnership with pioneer Volocopter – for the benefit of our passengers and the Frankfurt/Rhine-Main region. This partnership underscores Fraport AG’s role as a key driver of innovation in diverse fields.”

Florian Reuter, CEO of Volocopter GmbH, added: “Providing the ideal connection between the city center and the

airport poses a huge challenge for the world’s major cities. Together with Fraport AG, we are excited to pioneer the implementation of an air taxi service at one of Europe’s most important airports.

“We will be tapping into Fraport’s wealth of experience to integrate the Volocopter Service safely and efficiently into the complex array of processes required at a major international airport.”

Volocopter said it has already demonstrated that its electrically-powered vertical take-off multicopters meet the requirements of Urban Aerial Mobility in various test flights, most notably in Dubai.

Based on drone technology, the Volocopter air taxi offers space for two people “and is a suitable urban transport solution thanks to its quiet and zero-emissions flying,” the company said.

On its website, Volocopter said people “will be astounded” by how quiet its electric air taxi is.

“Because all 18 rotors acoustically operate within a narrow frequency band, they appear to the human ear to be only twice as loud as one single rotor. In contrast, a helicopter is numerous times louder with its main and tail rotors as well as its turbine. For comparison: A Volocopter 2X [is two-seat air taxi] within 75 meters distance is as quiet as the smallest helicopter within 500 meters distance, that is a factor of 7!”

*Electric Aircraft***AIRBUS ANNOUNCES WORLD’S FIRST ELECTRIC AIRPLANE RACE**

On Feb. 5, Airbus announced Air Race E, the world’s first electric airplane race, which is set to launch its inaugural series in 2020.

Airbus is the Official Founding Partner of Air Race E. The competition aims to drive the development and adoption of cleaner, faster, and more technologically advanced electric engines that can be applied to urban air mobility vehicles and, eventually, commercial aircraft.

Air Race E will follow a format similar to the popular Air Race 1 series of the sport known as formula one air racing. Eight electric-powered airplanes will race directly against each other on a tight 5-km circuit, just 10 meters above the ground, and at speeds faster than any land-based motorsport.

“We want to motivate manufacturers to showcase their technologies across the full spectrum of electric propulsion systems and components,” said Grazia Vittadini, Chief Technology Officer of Airbus. “This partnership enables us to demonstrate our commitment to staying at the leading edge of electric propulsion and developing a new ecosystem.”

Air Race E CEO Jeff Zaltman said, “We couldn’t be happier or more optimistic for success with Airbus as our Official Founding Partner. This partnership is a significant milestone in the evolution of electric power in aviation. Together, we’re working to create a mainstream platform in which innovation

in electric propulsion can be developed, nurtured, and accelerated more rapidly.”

Airbus will work alongside other Air Race E partners, including the University of Nottingham. The University is currently developing a prototype race airplane powered by an integrated electric motor, battery, and power electronics system. The plane will help shape the model and rules for the inaugural Air Race E race in 2020.

Electric Aircraft

BYE TRAINER COMPLETES FLIGHT TEST WITH SIEMENS MOTOR

Bye Aerospace’s electric Sun Flyer 2 successfully completed its first official flight test with a Siemens electric propulsion motor Feb. 8 at Centennial Airport, south of Denver, CO.

The Sun Flyer family of aircraft, including the 2-seat Sun Flyer 2 and the 4-seat Sun Flyer 4, aims to be the first FAA-certified, practical, all-electric airplanes to serve the flight training and general aviation markets. Siemens will provide electric propulsion systems for the Sun Flyer 2 airplane.

The all-electric Sun Flyer requires no aviation fuel and results in zero emissions and “significantly lower noise pollution compared to conventional aircraft,” Bye said.

George E. Bye, CEO of Bye Aerospace, the developer of the Sun Flyer, said the initial flight with the Siemens motor went flawlessly. “The airplane performed exactly as planned,” he said. “My thanks to the entire Siemens team for their participation as we enter this next, important flight test phase of Sun Flyer 2 with the Siemens electric propulsion system.”

Sun Flyer 2’s program application to the FAA was accepted under FAR 23 certification criteria in the spring of 2018. The Sun Flyer 2 prototype will conduct extensive additional flight test activities in 2019 and continue to work closely with FAA representatives on certification activities. Current flight test focus areas are propulsion system, envelope expansion, and systems optimization.

“This successful test flight is a proud moment for the Siemens and Bye Aerospace teams and marks a milestone in bringing the age of electric flight to life,” said Dr. Frank Anton, Executive Vice President and Head of eAircraft, Siemens. “The Siemens electric propulsion system offers a clean, cost-efficient and silent propulsion alternative to the flight training market without compromising performance or safety.”

Shutdown, from p. 17

routes, because of delays in EnRoute DataComm that are driven by operational bandwidth of FAA facilities.

At its June 27, 2018, meeting, NAC Chair and FedEx President David Bronczek said that reducing aircraft delay in the busy Northeast Corridor is his main goal for the NAC this year. Bronczek and FAA Acting Administrator Dan Elwell also urged airline officials to take a more active role in FAA community engagement efforts, which they believe are crucial to successfully implementing PBN procedures in the Northeast Corridor (30 ANR 81).

Legislation Would Protect FAA

While the Aviation Subcommittee’s hearing focused on the impact of the shutdown on the aviation system, it also provided an opportunity for the aviation industry to voice its strong support for legislation to protect FAA programs and personnel – and the U.S. aviation industry as a whole – from future shutdowns of the federal government.

Calio said the aviation industry supports the “Aviation Funding Stability Act of 2019,” introduced on Feb. 8, which was sponsored by House Transportation & Infrastructure Committee Chairman Rep. Peter DeFazio (D-OR) and Chairman of the House Subcommittee on Aviation Rep. Rick Larsen (D-WA).

Their legislation would do two things:

- Authorize the FAA to continue to draw from its Airport and Airway Trust Fund (AATF) during a lapse, with no General Fund contributions. The AATF generates enough revenue from the domestic passenger ticket tax, commercial fuel tax, general aviation gasoline tax, and cargo tax, among other sources, to sustain all of the agency’s programs without a General Fund contribution; and
- Allow the entire agency to operate at current funding levels, with no Congressional action required. This ensures that all FAA programs function uninterrupted and that all FAA employees are paid for their important work.

Germany

DLR TO FOCUS ON ELECTRIC, UNMANNED AIRCRAFT IN 2019

Electric aircraft, unmanned aircraft, and digitalization are the three areas of aviation research the German Aerospace Center (Deutsches Zentrum fuer Luft-und Raumfahrt; DLR) plans to pursue in 2019, the aerospace agency explained at its annual press conference in Berlin, held on Feb. 14.

This year, DLR aviation researchers said they will continue to develop concepts for new propulsion technologies with the goal of making future air transport quieter and emission-free. Electric propulsion systems have the potential to reduce noise, be energy efficient, and climate neutral, all at once, they stressed.

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DLR aeronautics and energy researchers flight-tested the first four passenger, fuel cell-powered aircraft – HY4 – back in 2016. Test flights of the next evolutionary stage of this aircraft are planned for 2019. In addition to various energy sources and propulsion technologies, scientists are also working on new operating models and aircraft configurations, such as distributed propulsion systems.

Whether they are used for urban freight transport, disaster relief or future passenger transport in the form of air taxis, Unmanned Aircraft Systems (UASs) are on the threshold of taking on a major economic role in the civil aviation sector, the DLR noted.

The agency said it is working towards the establishment of a national test center for unmanned aerial vehicles – the first in Europe – in order to advance the development of new technologies for safe flight, precise positioning, and stable data connections to ground stations.

DLR aeronautics research also is taking the next steps towards the digitalization of aviation. Virtual products – highly accurate and true-to-life representations of aircraft over their entire lifecycle – will make both the development and the maintenance of aviation systems more efficient and thus more cost-effective in the future, DLR explained.

NASA

NASA KEEPS ALL-ELECTRIC X-PLANE MOTORS COOL BY ADDING NACELLES

NASA is preparing to explore electric-powered flight with its X-57 Maxwell, a unique all-electric aircraft that features 14 propellers along its wing. Those very small, yet highly efficient motors will produce a tremendous amount of power, but with power comes heat, and too much heat can cause issues for an aircraft.

Adding a cooling system to the X-57's sleek design would add bulk and require design changes that could negatively impact the aircraft's performance, NASA explained in a Feb. 12 news release.

"To deal with the heat problem, engineers at NASA's Glenn Research Center devised a custom-designed 'skin', or nacelle, around the aircraft's motor electronics to significantly cool them without changing the aircraft's shape or design.

"This new cooling nacelle design ... was proven during a recent wind tunnel test where engineers subjected one of the X-57's motors to various simulated flight conditions. With testing now complete, the design information will be sent to engineers at NASA's Armstrong Flight Research Center where they continue to work toward the X-57's first flight."

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