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AVIATION NOISE: MEASURING PROGRESS IN ADDRESSING COMMUNITY CONCERNS

(117–43)

REMOTE HEARING

BEFORE THE

SUBCOMMITTEE ON
AVIATION

OF THE

COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED SEVENTEENTH CONGRESS

SECOND SESSION

MARCH 17, 2022

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U.S. House of Representatives
Washington, DC 20515

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MARCH 15, 2022

SUMMARY OF SUBJECT MATTER

TO: Members, Subcommittee on Aviation
FROM: Staff, Subcommittee on Aviation
RE: Subcommittee Hearing on "Aviation Noise: Measuring Progress in Addressing Community Concerns"

PURPOSE

The Subcommittee on Aviation will meet on Thursday, March 17, 2022, at 10 a.m. EDT in 2167 Rayburn House Office Building and virtually via Zoom for a hearing titled, "Aviation Noise: Measuring Progress in Addressing Community Concerns." The hearing will examine aircraft noise, airport noise, noise mitigation strategies, methodologies for measuring noise, Federal Aviation Administration (FAA) community engagement, new and emerging technologies, and the implementation of noise provisions from the FAA Reauthorization Act of 2018. The subcommittee will hear testimony from two panels. The first panel will feature government witnesses from the FAA and the Government Accountability Office (GAO). The second panel will include witnesses from Airlines for America, Airports Council International, Aerospace Industries Association, National Organization to Insure a Sound-Controlled Environment (N.O.I.S.E.), and Joby Aviation.

BACKGROUND

I. FAA NOISE PROGRAMS

A. Noise Measurement Near Airports

The majority of airport-related noise is generated by the takeoff and landing of aircraft. The FAA measures noise based on a yearly day-night average sound level (DNL) produced by flight operations, which is measured in decibels.[1] DNL is an aggregate measure of aviation noise over a 24-hour period, with 10 decibels added to nighttime noise events between 10 p.m. and 7 a.m.[2] FAA has identified a DNL of 65 decibels as the threshold for significant adverse impact on the community and uses this standard in determining whether aircraft noise at a nearby airport is compatible with residential land uses.[3] According to the FAA, a comparable indoor sound comparison to the 65 decibels threshold would be a person speaking from three feet away.[4]

[1] 14 C.F.R. Part 150.
[2] *Id.*
[3] *Id.*
[4] FAA, *Fundamentals of Noise and Sound*, https://www.faa.gov/regulations__policies/policy__guidance/noise/basics/.

B. Regulatory Programs

a. Part 150

The Aviation Safety and Noise Abatement Act of 1979 (49 U.S.C. 47501 *et. seq*.) provides the FAA with statutory authority for providing federal funding of noise compatibility projects through the Airport Improvement Program (AIP).[5] The FAA administers its statutory authority under 14 C.F.R. Part 150 (hereinafter Part 150).[6] An airport operator is not required to participate in Part 150—instead or in conjunction with Part 150, airports can utilize funds received from the passenger facility charge (PFC) and can fund noise projects independent of Part 150, allowing them to work more directly with stakeholders and establish voluntary noise abatement or mitigation programs.[7]

When an airport decides to participate in Part 150, it is required to submit a Noise Exposure Map, which is a scaled geographic visualization of the airport, its noise contours, and the surrounding area depicting existing and future community noise exposures.[8] The airport must also formally submit a Noise Compatibility Program (NCP) to the FAA.[9] The NCP must show that the program: (1) reduces existing noncompatible uses and prevents or reduces the probability of the establishment of additional noncompatible uses; (2) does not impose an undue burden on interstate and foreign commerce; (3) does not derogate safety or adversely affect the safe and efficient use of airspace; (4) meets both local interests and federal interests of the national air transportation system; and (5) can be implemented in a manner consistent with all the powers and duties of the FAA Administrator.[10]

b. Part 161

The Airport Noise and Capacity Act (49 U.S.C. 47521 *et. seq*.) was enacted in 1990 in response to community noise concerns which had led to inconsistent restrictions on aviation.[11] The law called for a national aviation noise policy and increased FAA's authority over aviation noise matters.[12] The law also included mandates related to aircraft types based on noise and allowed airports some ability to restrict louder aircraft types.[13]

The FAA implemented associated regulations in 14 C.F.R. Part 161 (Part 161), which imposes requirements on airports seeking to implement certain noise rules or restrictions.[14] As such, airports which mandate noise and access restrictions must satisfy certain criteria, including requirements to: (1) be reasonable, nonarbitrary, and nondiscriminatory; (2) not create an undue burden on interstate or foreign commerce; (3) not be inconsistent with maintaining the safe and efficient use of the navigable airspace; (4) not conflict with a law or regulation of the United States; (5) be imposed following an adequate opportunity for public comment; and (6) not create an undue burden on the national airspace system.[15]

C. Aircraft Certification

The FAA imposes noise standards for airplanes operating in the United States.[16] The FAA classifies airplanes meeting noise standards into five stages, with Stage 1 being the loudest and Stage 5 the quietest.[17] Stage 1 and Stage 2 airplanes are currently prohibited except under very limited circumstances.[18] During the aircraft certification process, the FAA ensures that airplanes comply with U.S. noise standards. FAA can also recertify airplanes to comply with a more stringent noise certification standard than the standard to which it was originally certificated.[19] The recertification process is initiated by a manufacturer or operator.[20] The process for recertification is described in the graphic below:

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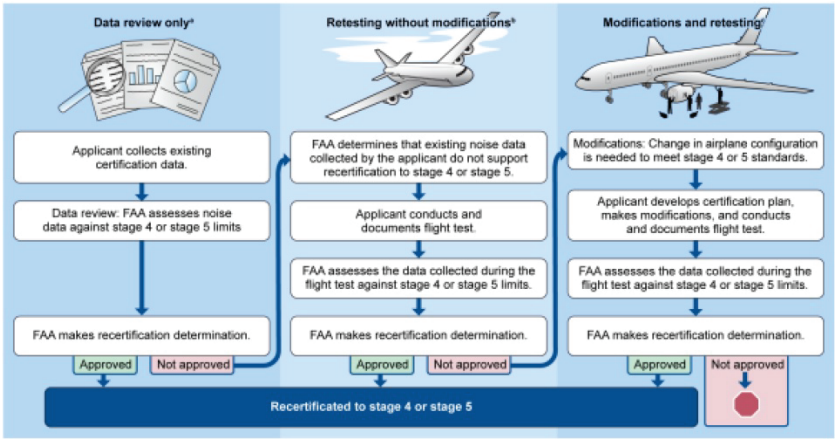
[5] Pub. L. No. 96–193 (1980).
[6] 14 C.F.R. Part 150.
[7] See 49 U.S.C. 47504; 49 U.S.C. 40117.
[8] *Id.*
[9] *Id.*
[10] *Id.*
[11] Pub. L. No. 101–508 (1990).
[12] *Id.*
[13] *Id.*
[14] 14 C.F.R. Part 161.
[15] *Id.*
[16] 14 C.F.R. Part 36.
[17] FAA, AC 36–1H—Noise Levels for U.S. Certificated and Foreign Aircraft (Nov. 15, 2001), *available at*: https://www.faa.gov/regulations__policies/advisory__circulars/index.cfm/go/document.information/documentID/22942.
[18] *See* FAA, *Aircraft Noise Levels and Stages*, https://www.faa.gov/noise/levels/.
[19] 14 C.F.R. 36.2(c).
[20] 14 C.F.R. Part 36.

Figure 1: Overview of FAA's Process for Recertificating Airplanes to Stage 4 or Stage 5 Noise Standards



Source: GAO analysis of Federal Aviation Administration (FAA) information. GAO–20–661

In a 2020 report, the GAO surveyed the aviation industry and FAA and evaluated data to find that while a majority of U.S. airplanes are Stage 3, most are able to meet more stringent noise standards.[21] The GAO found that 98 percent of current large commercial passenger airplanes and 79 percent of large commercial cargo airplanes are able to meet Stage 4 standards.[22] Because of this, many aviation stakeholders believe a phase-out of Stage 3 airplanes would not substantially reduce noise and could instead be costly and challenging.[23]

D. Implementation of Performance-Based Navigation Procedures in Metroplexes and Community Outreach

The FAA is in the midst of modernizing the national airspace system (NAS). The FAA's effort to modernize the air traffic system, referred to as the Next General Air Transportation System, or NextGen, is a large set of interconnected programs within the FAA that refreshes the air traffic control system by leveraging the capabilities provided by the Global Positioning System, fiberoptic broadband connections, and communications satellites, enabling transfers of vast amounts of data between aircraft in flight and ground facilities.[24] As part of this effort, the FAA is implementing new Performance-Based Navigation (PBN) routes and procedures to improve safety, increase airspace efficiency, reduce environmental impacts, and increase user access to the NAS, while simultaneously addressing air traffic growth.[25] According to the FAA, PBN will: [26]

- increase safety through procedures during descent that reduce the risk of crashes and loss of control;
- improve airport and airspace access in all weather conditions;
- reduce delays at airports and in dense airspace by applying new parallel routes, enabling new ingress/egress points around busy terminals, improving flight rerouting capabilities, making better use of closely spaced procedures and airspace, and de-conflicting adjacent to airport flows; and
- increase efficiency through less circuitous routes and optimized airspace, especially in lower flight altitude stratums.

The FAA has undergone the process of reconfiguring the NAS by redesigning airport terminal airspace around large areas with multiple airports called

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[21] GAO, *Aircraft Noise: Information on a Potential Mandated Transition to Quieter Airplanes* (Aug. 20, 2020), GAO–20–661, at 12.
[22] *Id.* at 13–14.
[23] *Id.* at 18.
[24] FAA, *How NextGen Works, available at* https:/www.faa.gov/nextgen/how_nextgen_works/
[25] FAA, *NextGen and Performance-Based Navigation* (Aug. 18, 2020), https://www.faa.gov/newsroom/nextgen-and-performance-based-navigation.
[26] *Id.*

Metroplexes.[27] As FAA took action, complaints from communities increased.[28] Complaints included airplanes routed over areas not previously overflown and increased concentrations of arriving and departing flights along narrower flightpaths and more frequent overflights.[29] In response to community concerns and provisions in the FAA Reauthorization Act of 2018, the FAA updated its Policy on Addressing Aircraft Noise Complaints and Inquiries from the Public in December 2019.[30] The FAA also established regional noise ombudsmen around the country to serve as public liaisons for issues about aircraft noise questions or complaints and provide technical support to airport noise working groups and roundtables.[31]

E. Helicopter Noise

a. FAA Tools to Address Helicopter Noise

While not legally mandated, the FAA works to reduce noise from civilian helicopters through a voluntary set of guidelines developed by the FAA and industry that identify noise mitigation practices called "Fly Neighborly."[32] The FAA has also developed helicopter route structures for some major metropolitan cities to assist in managing helicopter air traffic for safety and efficiency.[33] The following cities have helicopter route structures: Boston, Chicago, Dallas-Fort Worth, Detroit, Houston, Los Angeles, New York City, and the Washington, D.C. area.[34] While these routes are not imposed solely to mitigate noise, these routes can result in noise mitigation in some areas.[35]

b. Air Tour Management Plans

Under the National Park Air Tour Management Act of 2000, the FAA, in coordination with the National Park Service (NPS), were required to implement Air Tour Management Plans (ATMPs).[36] An ATMP is a plan used to develop acceptable and effective measures to mitigate or prevent the significant adverse impacts, if any, of commercial air tour operations upon natural and cultural resources, visitor experiences, and tribal lands. The FAA Modernization and Reform Act of 2012 amended the Act to allow the FAA and NPS to enter into voluntary agreements with air tour operators in lieu of developing management plans.[37]

F. FAA Research and New Technologies

The FAA has established a series of noise research programs including:

- *Federal Interagency Committee on Aviation Noise*. The FAA works with the Volpe Transportation Center, NASA, and other government agencies on noise research.[38]
- *Aviation Environmental Design Tool (AEDT)*. AEDT is a software system that models aircraft performance in space and time to estimate fuel consumption, noise, emissions, and air quality consequences.[39] It is used across industry, governments, and academia and is the primary tool used by the International Civil Aviation Organization.[40] The tool also facilitates FAA environmental review activities.[41]
- *ASCENT Center of Excellence*. The FAA uses the ASCENT program to explore ways to reduce noise exposure from airplanes, helicopters, and new entrants,

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[27] *Id.*
[28] GAO, *Aircraft Noise: FAA Could Improve Outreach through Enhanced Noise Metrics, Communication, and Support to Communities* (Sept. 28, 2021), GAO–21–103933 at 41.
[29] *Ibid*.
[30] FAA, *Federal Aviation Administration (FAA) Policy on Addressing Aircraft Noise Complaints and Inquiries from the Public* (Dec. 4, 2019), *available at*: https://www.faa.gov/regulations__policies/policy__guidance/envir__policy/media/FAA__NoiseComplaintPolicy__191204__FNL.pdf
[31] *Id.*
[32] GAO, *Aircraft Noise: Better Information Sharing Could Improve Responses to Washington, D.C. Area Helicopter Noise Concerns* (Jan. 7, 2021), GAO–21–200 at 6.
[33] *Id.* at 7–8.
[34] *Ibid*.
[35] *Ibid*.
[36] 49 U.S.C. § 40128 (2020).
[37] *Id.*
[38] FAA, Noise Research & Programs, *available at*: https://www.faa.gov/noise/research__programs/.
[39] FAA, Aviation Environmental Design Tool, *available at*: https://aedt.faa.gov/.
[40] FAA, Noise Research & Programs, *supra* note 43.
[41] *Id.*

such as through unmanned aircraft systems and advanced air mobility vehicles, among other things.[42]

- *Airport Cooperative Research Program (ACRP)*. ACRP is an industry-driven, applied research program that develops practical solutions to problems typically faced by airport operators. The ACRP aims to focus on issues that other Federal research programs do not address.[43]
- *Continuous Lower Emissions Energy and Noise (CLEEN) Program*. The CLEEN Program is a public-private partnership to accelerate the development of technologies to reduce aircraft noise and emissions and improve energy efficiency.[44]

II. Funding for Noise Mitigation

Airport operators may use Airport Improvement Program or Passenger Facility Charge funds for noise-related projects, including acquiring homes and relocating people, soundproofing homes and other buildings, and constructing noise barriers. Regarding sound insulation in homes, according to a September 2019 report to Congress, the FAA had funded over $6.91 billion through the AIP grant program and approved over $4.4 billion through the PFC program to insulate over 143,000 homes and other noise sensitive locations (e.g. schools and churches).[45]

A. Airport Improvement Program

The AIP was established by the Airport and Airway Improvement Act of 1982 (P.L. 97–248). Funds obligated for the AIP are drawn from the Airport and Airway Trust Fund, which is primarily funded from excise taxes imposed on domestic airline tickets, cargo waybills, and aviation fuel sales. The AIP generally funds projects that are needed to enhance airport safety, capacity, security, and noise mitigation. The AIP program provides federal grants to airports for airport development and planning. AIP funding distribution is based on a combination of formula grants and discretionary funds. Some airports use AIP formula funds for noise projects, however, most funding for airport noise projects comes from AIP discretionary funds. According to the CRS, between fiscal years (FYs) 2011 and 2020, AIP funded over $1.2 billion for airport noise projects.[46] Of this amount:

- Noise mitigation projects accounted for 88 percent;
- Land acquisition accounted for 9 percent; and
- Noise compatibility studies and planning accounted for 3 percent.[47]

B. Passenger Facility Charge

To provide additional resources for airport improvements, the Aviation Safety and Capacity Expansion Act of 1990 (P.L. 101–508) permitted airports to assess a charge on enplaning passengers called the passenger facility charge (PFC). The PFC is a federally-authorized user fee that an airport sponsor, subject to FAA-approval, may choose to levy on most enplaned passengers. Airports may impose a maximum $4.50 PFC on enplaning passengers, up to a maximum of $18 on a roundtrip ticket. PFC revenues may be used for a wider variety of projects other than AIP grants; most notably, PFC revenues are commonly used for terminal development projects that are unlikely to be funded through the AIP because AIP grants are typically used for higher-priority airside projects. PFCs may also be used to fund noise projects that are independent of Part 150.[48]

According to CRS, between FY2011 and FY2020, the FAA approved over $247 million in PFCs for airport noise projects. Of this amount:

- Noise mitigation projects accounted for 76 percent;
- Land acquisition accounted for 18 percent; and
- Noise compatibility studies and planning accounted for 6 percent.[49]

C. Other Airport Funding Sources

Airports may use their own operating revenues from commercial leases, parking charges, and other sources to fund noise projects as well, but FAA does not keep track of such spending.

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[42] ASCENT, https://ascent.aero/.
[43] FAA, Airport Cooperative Research Program (ACRP)—Airports, https://www.faa.gov/airports/acrp/.
[44] FAA, Continuous Lower Energy, Emissions, and Noise (CLEEN) Program, https://www.faa.gov/about/office__org/headquarters__offices/apl/research/aircraft__technology/cleen.
[45] CRS, *Federal Airport Noise Regulations and Programs* (Sept. 27, 2021), R46920, at 2.
[46] *Id.*
[47] *Id.*
[48] *Id.*
[49] *Id.*

III. NOISE-RELATED PROVISIONS IN THE FAA REAUTHORIZATION ACT OF 2018

In response to community concerns and requests from Members of Congress, the FAA Reauthorization Act of 2018 included a series of robust provisions designed to address aviation noise issues.[50] *A section-by-section summary of those provisions is included in the attached Appendix A. The status of implementation of these provisions is included in the attached Appendix B.*

IV. GAO RECOMMENDATIONS

Status of 2021 GAO Recommendations Related to Aircraft Noise

Recommendation	FAA Response	Status
The Administrator of the FAA should direct the Office of Environment and Energy to develop a mechanism to exchange helicopter noise information with operators in the D.C. area. (GAO–21–200 Recommendation 1)[51].	In December 2021, FAA officials told GAO that they are working to identify a mechanism to share complaint data with helicopter operators in the Washington D.C. area. FAA officials also stated that they plan to conduct quarterly meetings in the area with local helicopter operators to examine trends in helicopter complaint data and discuss helicopter noise mitigation efforts. FAA officials said they plan to begin holding and facilitating these meetings in spring 2022.	Open.
The Administrator of the Federal Aviation Administration should identify appropriate supplemental noise metrics, such as the ''number above'' metric, and circumstances for their use to aid in FAA's internal assessments of noise impacts related to proposed PBN flight path changes. (GAO–21–103933 Recommendation 1)[52].	As of January 2022, the FAA has said it is conducting a noise policy review and plans to consider whether and under what circumstances supplemental, companion, or alternative noise metrics are appropriate to inform research and policy considerations. FAA plans to complete this review by the end of 2022.	Open.
The Administrator of the Federal Aviation Administration should update guidance to incorporate additional communication tools that more clearly convey expected impacts, such as other noise metrics and visualization tools related to proposed PBN implementation. (GAO–21–103933 Recommendation 2)[53].	As of January 2022, the FAA plans to update guidance on community outreach by the end of 2022.	Open.
The Administrator of the Federal Aviation Administration should provide clearer information to airports and communities on what communities can expect from FAA, including the technical assistance FAA can provide. (GAO–21–103933 Recommendation 3)[54].	As of January 2022, the FAA plans to develop an appropriate process and post-implementation outreach tools by the end of 2022.	Open.

[50] Pub. L. No. 115–254 (2018).
[51] GAO, *Aircraft Noise: Better Information Sharing Could Improve Responses to Washington, D.C. Area Helicopter Noise Concerns* (Jan. 7, 2021), GAO–21–200, *available at* https://www.gao.gov/products/gao-21-200.
[52] GAO, *Aircraft Noise: FAA Could Improve Outreach through Enhanced Noise Metrics, Communication, and Support to Communities* (Sept. 28, 2021), GAO–21–103933, *available at* https://www.gao.gov/products/gao-21-103933.
[53] *Id.*
[54] *Id.*

WITNESSES

PANEL 1

- Kevin Welsh, Executive Director, Office of Environment and Energy, Federal Aviation Administration
  Accompanied by
  Beth White, Senior Strategist for Public and Industry Engagement, Air Traffic Organization
  Mike Hines, Manager, Office of Planning and Programming, FAA Office of Airports
- Heather Krause, Director, Physical Infrastructure, Government Accountability Office

PANEL 2

- Sharon Pinkerton, Senior Vice President of Regulatory and Legislative Policy, Airlines for America
- Frank R. Miller, Executive Director, Hollywood Burbank Airport, *on behalf of* Airports Council International–North America
- David Silver, Vice President for Civil Aviation, Aerospace Industries Association
- Emily J. Tranter, Executive Director, National Organization to Insure a Sound-Controlled Environment (N.O.I.S.E.)
- JoeBen Bevirt, CEO, Joby Aviation

APPENDIX A: SECTION-BY-SECTION SUMMARY OF NOISE-RELATED PROVISIONS IN THE FAA REAUTHORIZATION ACT OF 2018

Section 172. Authorization of certain flights by stage 2 aircraft. This section authorizes the FAA to initiate a pilot program to permit one or more operators of a stage 2 (noise designation level) aircraft to operate that aircraft in nonrevenue service into not more than four medium hub airports or nonhub airports if the airport and the operator meet specific criteria. The pilot program shall terminate on the earlier of either the date 10 years after the date of enactment of this Act, or the date on which the FAA determines that no stage 2 aircraft remain in service.

Section 173. Alternative airplane noise metric evaluation deadline. This section requires the FAA to complete the ongoing evaluation of alternative metrics to the current Day Night Level (DNL) 65 standard within 1 year of the bill's passage.

Section 174. Updating airport noise exposure maps. This section clarifies an existing statutory provision regarding the submission of noise exposure maps from airport operators to the FAA and when an airport must update them.

Section 175. Addressing community noise concerns. This section requires the FAA to consider the feasibility of dispersal headings or other lateral track variations to address noise concerns from affected communities, if asked by the airport owner and local community, when proposing new area navigation departure procedures or amending an existing procedure below 6,000 feet over noise sensitive areas.

Section 176. Community involvement in FAA NextGen initiatives located in Metroplexes. This section requires the FAA to review the FAA's community involvement practices for NextGen projects located in Metroplexes. NextGen is the FAA's ongoing effort to modernize technology used for air traffic control.

Section 178. Terminal sequencing and spacing. This section requires a report to Congress on the status of Terminal Sequencing and Spacing (TSAS) implementation across all completed NextGen Metroplexes with specific information provided by airlines regarding the adoption of aircraft equipage and the training of pilots in its use.

Section 179. Airport noise mitigation and safety study. This section directs the FAA to initiate a study to review and evaluate existing studies and analyses of the relationship between jet aircraft approach and takeoff speeds and corresponding noise impacts on communities surrounding airports.

Section 180. Regional ombudsmen. This section directs each FAA Regional Administrator to designate a Regional Ombudsman to serve as a regional liaison with the public on issues regarding aircraft noise, pollution, and safety.

Section 182. Mandatory use of the New York North Shore Helicopter Route. This section requires a public hearing regarding changes to the New York North Shore Helicopter Route. This section also requires an FAA review of the route regulations.

Section 186. Stage 3 aircraft study. This section directs the Comptroller General to conduct a review of the benefits, costs, and other impacts of a phase out of stage 3 (noise level designation) aircraft.

Section 187. Aircraft noise exposure. This section directs the FAA to conduct a review of the relationship between aircraft noise and its effect on communities surrounding airports. The FAA is then required to submit a report to Congress containing appropriate recommendations for revising land use compatibility guidelines in part 150 of title 14, Code of Federal Regulations.

Section 188. Study regarding day-night average sound levels. This section directs the FAA to evaluate alternative metrics to the current average day night level standard, using actual noise sampling and other methods to address community airplane noise concerns. This section also requires the FAA to submit a report to Congress.

Section 189. Study on potential health and economic impacts of overflight noise. This section directs the FAA to enter into an agreement with eligible institutions of higher education to conduct a study on the health impacts of noise from aircraft flights on residents exposed to a range of noise levels from such flights.

Section 190. Environmental mitigation pilot program. This section allows the DOT to carry out a pilot program comprised of no more than six projects at public-use airports aimed at achieving the most cost-effective and measurable reductions in or mitigation of the impacts of aircraft noise, airport emissions, and water quality at the airport or within five miles of the airport.

Appendix B: Status of Noise-Related 2018 FAA Reauthorization Act Provisions

Section	Title	Summary	Deadline	Status
172	Authorization of certain flights by stage 2 aircraft.	Initiate a pilot program to permit stage 2 aircraft to operate in a limited way at certain defined airports.	4/5/19	APL/AGC developed a Federal Register Notice (FRN) which is under review. Purpose of the FRN is to see if there is interest among airports meeting statutory requirements. If so, we will develop a pilot program.
173	Alternative airplane noise metric evaluation deadline.	Study alternatives to the DNL.	10/5/19	Complete.
174	Updating airport noise exposure maps.	Requires submission of an updated noise exposure map in certain instances.	No due date—change in policy.	Complete.
175	Addressing community noise concerns.	Study dispersion for new departures or airspace changes (on existing departures) at 6,000 feet or lower at the request of an airport.	No due date	In compliance, because FAA will consider any valid request from an airport but FAA is still formalizing repeatable process.
176	Community involvement in FAA NextGen projects located in metroplexes.	Review community engagement practices at Metroplex sites and report on ways to improve.	Review due 4/5/19 Report due 6/5/19	Complete. Report was submitted to Congress 7/2/20.
178	Terminal sequencing and spacing.	Provide a briefing on status of TSAS implementation across all metroplexes.	Briefing due 12/5/18.	Complete. Briefing complete on 11/27/18.
179	Airport noise mitigation and safety study.	Review existing studies and analysis of relationship between approach and takeoff speed and noise impacts and submit a report.	Initiate the review by 10/5/19. Report due 10/5/20.	Complete. The FAA submitted the report on 12/29/20.
180	Regional ombudsmen ...	Designate ombudsmen for each region.	Designate all ombudsmen by 10/5/19.	Complete.

Section	Title	Summary	Deadline	Status
182	Mandatory use of the New York North Shore Helicopter Route.	Take comments, hold a hearing and assess the North Shore route.	All due by 11/4/18	Completed all tasks on time.
183	State standards for airport pavements.	Requires FAA to provide technical assistance to a state to develop standards, for pavement on nonprimary public-use airports in the State.	No due date—change in policy.	Complete. Updated the appropriate advisory circular 12/6/19.
186	Stage 3 aircraft study	GAO study reviewing costs and benefits of phasing out stage 3 aircraft.	No FAA due date. GAO's study was due April 2020.	GAO study completed August 2020.
187	Aircraft noise exposure	Publish the noise survey with any recommendations determined necessary related to land use compatibility guidelines in part 150.	10/5/2020	The study was released. Late on the report articulating recommendation.
188	Study regarding day-night average sound levels.	Study alternatives to the DNL and publish a report on the findings.	Study and report due 10/5/19.	Complete. The report was submitted to Congress 6/24/20.
189	Study on potential health and economic impacts of overflight noise.	Study health impacts attributable to noise exposure from aircraft.	Enter into an agreement with university by 4/5/19. Submit the results of the study 90 days after receiving them.	Completed the agreement—it is with Boston University & MIT. It will be several years before they complete their study.

Section	Title	Summary	Deadline	Status
190	Environmental mitigation pilot program.	Establish pilot program where up to 6 airports could receive grants for mitigation projects to reduce or mitigate aviation impacts on noise, air quality or water quality within 5 miles of an airport.	No due date	FAA issued a Federal Register notice on May 10, 2021. Section 190 required the FAA to create a pilot program for environmental mitigation. FAA provided the Notice of Funding Opportunity for the Environmental Mitigation Pilot Program, 86 Federal Register 25060, on May 10, 2021. The notice explained that FAA was accepting pre-applications from eligible airports and consortia for the Environmental Mitigation Pilot Program. The program will fund up to six projects that will measurably reduce or mitigate aviation impacts on noise, air quality or water quality at an airport or within five miles of the airport. Public-use airport operators had until July 9, 2021, to submit a preapplication to the FAA. Once FAA has reviewed all applications, the Agency will fund up to six projects that provide the greatest environmental benefits. The cost of each project cannot exceed $2.5 million. The federal share of the project cost is 50 percent with the selected airports providing the other 50 percent. Grants will be made from the noise and environmental set-aside of the Airport Improvement Program.

AVIATION NOISE: MEASURING PROGRESS IN ADDRESSING COMMUNITY CONCERNS

THURSDAY, MARCH 17, 2022

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON AVIATION,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:03 a.m. in room 2167 Rayburn House Office Building and via Zoom, Hon. Rick Larsen (Chairman of the subcommittee) presiding.

Members present in person: Mr. Larsen of Washington, Mr. DeFazio, Ms. Norton, Mr. Graves of Louisiana, Mr. Massie, Mr. Stauber, and Ms. Van Duyne.

Members present remotely: Mr. Carson, Ms. Davids of Kansas, Mr. Kahele, Ms. Williams of Georgia, Ms. Brownley, Mr. Payne, Mr. DeSaulnier, Mr. Lynch, Mr. Stanton, Mr. Lamb, Mr. Fitzpatrick, Mr. Balderson, Mr. Burchett, and Mrs. Steel.

Mr. LARSEN OF WASHINGTON. The subcommittee will now come to order.

I ask unanimous consent that the chair be authorized to declare a recess at any time during today's hearing.

Without objection, so ordered.

I also ask unanimous consent that Members not on the subcommittee be permitted to sit with the subcommittee at today's hearing and ask questions.

Without objection, so ordered.

As a reminder to everyone, again, please keep your microphone muted unless speaking. And if I hear any inadvertent background noise, I will request the Member please mute the microphone.

To insert a document into the record, a reminder to please have your staff email it to DocumentsT&I@mail.house.gov.

And I will recognize myself for an opening statement.

Good morning, and welcome to today's Aviation Subcommittee hearing titled, "Aviation Noise: Measuring Progress in Addressing Community Concerns."

Before I begin today, I want to wish all my colleagues on the subcommittee a happy St. Patrick's Day, and now I will turn to today's hearing.

At one time or another, all of us on this subcommittee have heard from constituents concerned about noise from airports and aircraft. In my district, Paine Field Airport in Snohomish County logged over 2,100 noise-related comments in January of this year alone.

Studies from the Federal Aviation Administration, the NASA Langley Research Center, and others have found that noise from airports and aircraft can have negative effects on residents' physical and mental health. These studies have also documented the impact of aviation noise on schools and businesses located near airports.

This subcommittee takes aviation noise seriously and is focused on finding meaningful solutions to this persistent issue.

The 2018 FAA reauthorization law included several provisions aimed at reducing and mitigating aircraft noise. The law was a victory for community advocates and other key stakeholders working to reduce the adverse impacts of airport and aircraft noise. As Congress prepares for the next FAA reauthorization, this subcommittee must evaluate how the FAA implemented provisions from the 2018 law and identify ongoing challenges. For instance, there are questions about whether the metrics used by the FAA to measure the impacts of aviation noise accurately portray the effects of noise on communities.

Now, prior to this hearing, I invited all Members of Congress to submit written statements for the record highlighting priorities and issues of importance to their constituents related to aviation noise. I want to thank my colleagues who have submitted testimony on this issue, and remind everyone the record is open until April 1st.

The issue of aviation noise is not just an annoyance, it is a public health issue, it is an economic issue, it is an equity issue, and certainly a quality of life issue. A disproportionate number of communities negatively impacted by aviation noise are historically disadvantaged communities. And since the 1970s, community advocates have raised the issue of noise with lawmakers and Federal agencies in hopes of protecting public health and noise-sensitive locations, like schools and churches, near where aircraft operate.

The subcommittee must ensure community advocates and the general public continue to have a voice in the FAA's ongoing efforts to alleviate aviation noise. For example, public participation must be included in the development of flight corridors based on performance-based navigation, or PBN. PBN is just one of many of the elements of the FAA's ongoing NextGen process designed to improve the management and efficiency of the national airspace. By providing more precise flightpaths for aircraft, PBN will offer significant economic and environmental benefits as it continues to be implemented, but also may concentrate noise emissions for certain communities.

Congress and the FAA must work with local communities to improve PBN implementation, while continuing the realization of other NextGen capabilities. And nearly 1 year ago, this subcommittee held a hearing on innovation in the U.S. airspace, and how emerging airspace entrants and new aviation technologies offer potential societal, safety, and environmental benefits.

The aviation sector continues to develop new methods for limiting and mitigating aircraft noise. Technological improvements in engines, alternative propulsion systems, and airframes have already led to reductions in aircraft noise.

The question before us today is, what more can Congress and the industry do to foster these improvements? Congress, Federal agencies, stakeholders, and the industry must lay the groundwork to meet these challenges that communities will face 10, 20, even 30 years down the road. We have already seen the effects that drones and other small, unpiloted vehicles can have on communities.

The next emerging technology is advanced air mobility, or AAM, aircraft, commonly known as flying taxis, which the AAM industry plans to introduce into the national airspace soon. So, I am encouraged by the prospects of these technologies, and interested to hear how the FAA and manufacturers are looking at potential noise impacts for communities when these aircraft fly.

In fact, working with my colleague, subcommittee Ranking Member Garret Graves and Representatives Titus and Balderson, along with others, I recently introduced H.R. 6270 to create a pilot program to help communities plan for AAM deployment into the NAS. Part of that planning process may include a description of efforts to reduce the adverse effects of aviation noise related to these aircraft.

Congress must be forward looking in dealing with the problems of today, while also preparing for the problems of 2050.

Just a heads-up before we get to the other opening statements. We will have two witness panels to further discuss aviation noise issues.

The first panel will include Government representatives from the FAA's Office of Environment and Energy, the Office of Airports, and the Air Traffic Organization. The GAO, or Government Accountability Office, is also here to discuss their reports on FAA's progress to limit and mitigate noise aircraft.

The second panel includes representatives from airlines, airports, manufacturers, and a community-based association concerned with this issue and working to find solutions.

I look forward to hearing from today's witnesses on the progress made since the enactment of the 2018 bill, and what steps Congress needs to take to prepare for the 2023 reauthorization bill to build on that progress. So, while the 2018 FAA reauthorization law included multiple provisions to help alleviate aviation noise, there are still ways to improve the implementation of these provisions and address our constituents' valid concerns.

Thank you, and I look forward to everyone participating in this discussion today as we try to tackle these issues in a collaborative manner.

[Mr. Larsen's prepared statement follows:]

Prepared Statement of Hon. Rick Larsen, a Representative in Congress from the State of Washington, and Chair, Subcommittee on Aviation

Good morning and welcome to today's Aviation Subcommittee hearing titled "Aviation Noise: Measuring Progress in Addressing Community Concerns."

Before I begin, I would like to wish all my colleagues on the Subcommittee a happy St. Patrick's Day.

And to my friend Mr. Lynch from Massachusetts, a happy Evacuation Day.

Now, turning to today's hearing. At one time or another, all of us on this Subcommittee have heard from constituents concerned about noise from airports and aircraft.

In my district, Paine Field Airport in Snohomish County logged over 2,100 noise related comments in January of this year alone.

Studies from the Federal Aviation Administration, the NASA Langley Research Center and others have found that noise from airports and aircraft can have negative effects on residents' physical and mental health.

These studies also have documented the impact of aviation noise on schools and businesses located near airports.

This Subcommittee takes aviation noise seriously and is focused on finding meaningful solutions to this persistent issue.

The 2018 FAA Reauthorization law included several provisions aimed at reducing and mitigating aircraft noise.

The law was a victory for community advocates and other key stakeholders working to reduce the adverse impacts of airport and aircraft noise.

As Congress prepares for the next FAA reauthorization bill, this Subcommittee must evaluate how the FAA implemented provisions from the 2018 law and identify ongoing challenges.

For instance, there are questions about whether the metrics used by the FAA to measure the impacts of aviation noise accurately portray the effects of noise on communities.

WHO IS HURT BY AVIATION NOISE?

Prior to this hearing, I invited all Members of Congress to submit written statements for the record highlighting priorities and issues of importance to their constituents related to aviation noise. I would like to thank my colleagues who submitted written testimony on this issue and remind them that the record is open until April 1.

The issue of aviation noise is not just an annoyance.

It is a public health issue;

It is an economic issue;

It is an equity issue; and

It is a quality-of-life issue.

A disproportionate number of communities negatively impacted by aviation noise are historically disadvantaged communities.

Since the 1970s, community advocates raised this issue with lawmakers and federal agencies in hopes of protecting public health and noise sensitive locations like schools and churches near where aircraft operate.

This Subcommittee must ensure community advocates and the general public continue to have a voice in the FAA's ongoing efforts to alleviate aviation noise.

For example, public participation must be included in the development of flight corridors based on Performance Based Navigation (PBN).

PBN is one of many elements of the FAA's ongoing NextGen process designed to improve the management and efficiency of the National Airspace System (NAS).

By providing more precise flight paths for aircraft, PBN will offer significant economic and environmental benefits as it continues to be implemented, but also may concentrate noise emissions for certain communities.

Congress and the FAA must work with local communities to improve PBN implementation, while continuing the realization of other NextGen capabilities.

EMERGING TECHNOLOGIES

Nearly one year ago, this Subcommittee held a hearing on innovation in U.S. airspace and how emerging airspace entrants and new aviation technologies offer potential societal, safety and environmental benefits.

The aviation sector continues to develop new methods for limiting and mitigating aircraft noise.

Technological improvements in engines, alternative propulsion systems and airframes have already led to reductions in aircraft noise.

The question before us today is what more can Congress and the aviation industry do to foster these technological improvements?

Congress, federal agencies, stakeholders and the industry must lay the groundwork to meet the challenges communities will face 10, 20 and 30 years down the road.

We have already seen the effects drones and other small unpiloted vehicles can have on communities.

The next emerging technology is advanced air mobility (AAM) aircraft or "flying taxis"; which the AAM industry plans to introduce into the NAS soon.

While I am encouraged by the prospects of these technologies, I am also interested to hear how the FAA and manufacturers are looking at potential noise impacts for communities where these AAM aircraft will fly.

Working with my colleagues Subcommittee Ranking Member Garret Graves and Reps. Titus and Balderson, along with others, I recently introduced legislation (H.R. 6270) to create a pilot program to help communities plan for AAM deployment into the NAS.

Part of that planning process may include a description of efforts to reduce the adverse effects of aviation noise related to these aircraft.

Congress must be forward-looking in dealing with the problems of today and also preparing for the problems of 2050.

Today we have two witness panels to further discuss aviation noise issues.

The first panel includes government representatives from the FAA's Office of Environment and Energy, the Office of Airports and the Air Traffic Organization.

The Government Accountability Office is also here to discuss their reports on the FAA's progress to limit and mitigate aircraft noise.

Today's second panel includes representatives from airlines, airports, manufacturers and a community-based association concerned with this issue and working to find solutions.

I look forward to hearing from today's witnesses on the progress made since enactment of the 2018 FAA reauthorization law and what steps Congress needs to take in the 2023 reauthorization bill to build on that progress.

While the 2018 FAA reauthorization law included multiple provisions to help alleviate aviation noise, there are still ways to improve implementation of these provisions and address our constituents' valid concerns.

Thank you and I look forward to this discussion to tackle these issues in a collaborative manner.

Mr. LARSEN OF WASHINGTON. And with that I will turn now to the ranking member, Representative Graves of Louisiana, for an opening statement.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Chairman. Mr. Chairman, thank you for having this hearing today.

I think it is important that we look at data when we look at issues like this. And there is a really great dataset that shows the progress that has been made. In 1970, there were 7 million complaints about aviation noise, 7 million. Yet in 2018, that number dropped to 430,000. So, it went from 7 million complaints in 1970 to 430,000 in 2018. Keep in mind, Mr. Chair, that the number of actual flights increased significantly during that period of time. So, the good news is that we are moving in the right direction: advances in aviation technology, we have seen safer aircraft, we have seen quieter aircraft, we have seen greater performance, greater convenience.

And as with anything, Mr. Chair, as you know, there are pros and cons, there are tradeoffs. And as we move forward, we have got to make sure that we continue to take into consideration absolutely the complaints, the concerns that are raised by those that are affected, but also take into consideration the benefits of commercial air travel, of general aviation, that has just had a tremendous impact on this country, on the growth and the convenience, on the ability to improve quality of life, business, seeing relatives, and other things.

As you mentioned in your opening statement, as we move forward, there have just been extraordinary advances in technology and advanced air mobility and unmanned aviation systems that have the ability to continue this incredible trend of dropping the number of noise complaints, of improving convenience, and improv-

ing performance and options for consumers across the United States, for citizens across the United States.

Mr. Chair, recently the Department of Defense worked with the National Capital region in evaluating complaints related to aviation noise, specifically looking at helicopters. A pretty amazing outcome of their analysis, between January of 2018 and August of 2021—so between January 2018 and August of 2021 there were in excess of 6,200 complaints, 6,200. However, half of them were from the same person. I am not sure if it was the pilot, or who, or if this person works, but half of them came from one person. Another 1,128 of the—I remind you—6,243 were from another person. In fact, 63 percent of the complaints were from just two people, and 89 percent of all of those complaints were from the top 10. Not to discount anyone's concerns, but I do think that it is important to take that into consideration as we move forward, and make sure that we are solving problems, that we understand the gravity of concerns as we move forward.

Today, we have a number of witnesses, but one is the CEO of Joby Aviation. And I really look forward to hearing from him talk about the opportunities, the advancement that is going to be available as a result of some of the technologies that they are pioneering, the improved experience for consumers and American citizens across the country that some of the amazing innovations in advanced air mobility and in unmanned systems are going to provide citizens of our country and citizens around the world, once again improving convenience, improving performance, and improving safety for American citizens.

So, within the realm of the possible and plausible, I look forward to hearing more about progress achieved and how the future of noise will be much quieter as innovations advance, and how Congress can be helpful to ensuring additional gains in this area.

So, Mr. Chair, again, I want to thank you for holding the hearing, and I look forward to hearing from our witnesses today.

[Mr. Graves of Louisiana's prepared statement follows:]

Prepared Statement of Hon. Garret Graves, a Representative in Congress from the State of Louisiana, and Ranking Member, Subcommittee on Aviation

Mr. Chair, thank you for having this hearing today.

I think it's important that we look at data when we are looking at issues like aviation noise. There is a great data set that shows the progress made.

In 1970, there were 7 million people exposed to significant levels of aircraft noise. Yet in 2018, that number dropped to 430,000. Keep in mind Mr. Chair, the number of actual flights increased significantly during that period of time. The good news is that we are moving in the right direction.

Advances in aviation technology have resulted in safer aircraft, quieter aircraft, greater performance, and greater convenience. And as with anything, there are pros and cons, and tradeoffs. As we move forward, we have to make sure that we continue to take into consideration the complaints and concerns raised by those that are affected. But also, we have to take into consideration the benefits of commercial air travel and general aviation that have had a tremendous impact on this country's growth, convenience, ability to improve quality of life and business, capability to see relatives, and other things.

As we move forward, there have been extraordinary advances in technology. Advanced air mobility and unmanned aviation systems have the ability to continue this incredible trend of dropping the number of noise complaints, improving conven-

ience, improving performance, and providing options for consumers and citizens across the United States.

Mr. Chair, recently the Department of Defense worked with the National Capital Region in evaluating complaints related to aviation noise, specifically looking at helicopters. There were some amazing outcomes in their analysis.

Between January 2018 and August 2021, there were in excess of 6,200 complaints. However, half of them were from the same person. Another 1,218 of the 6,243 total complaints were from another person. In fact, 63 percent of the complaints were from just two people and 89 percent of all of those complaints were from the top 10 sources of complaints. Not to discount anyone's concerns, but I do think it is important to take those numbers into consideration as we move forward and make sure that we're solving problems and understanding the gravity of concerns.

Today we have a number of witnesses, but one is the CEO of Joby Aviation, and I look forward to hearing him discuss the opportunities that are going to be available as a result of some of the technologies that they're pioneering. That includes the improved experience for consumers and Americans across the country who will benefit from some of the amazing innovations in advanced air mobility and unmanned systems. Once again, this technology can improve convenience, performance, and safety for American citizens. So, within the realm of the possible and the plausible, I look forward to hearing more about progress achieved, how the future of noise will be much quieter as innovations advance, and how Congress can help ensure additional gains in this area.

Mr. Chair, again I want to thank you for holding the hearing and look forward to hearing from our witnesses today.

Mr. LARSEN OF WASHINGTON. Thank you, Representative Graves. The Chair recognizes the chair of the full committee, Representative DeFazio of Oregon.

Mr. DEFAZIO. I thank the chair. Ranking Member Graves already talked a little bit about the extraordinary number of flights compared to earlier, and the noise issue, but we have got to look to the future, where we are looking at perhaps 10 billion passengers in 2040, 90 million flights. This is going to have an impact.

I am particularly interested in the testimony we will hear about new technologies, bypass technologies, other things that relate to engine design, or the hull and configuration of the airplane that can further mitigate noise. And I am pleased that we have the CLEEN Program, and we are making money available, and doing research, and moving in that direction.

The other issue has been with NextGen and performance-based navigation. The FAA did a pretty miserable job of communicating about this with communities. With Mike Capuano, former member of the committee, I sat through a number of meetings with the FAA.

One question we had which never really ever got answered was, would it be possible just not to run the same PBN every day over exactly the same place every day of the week? And could there be dispersed lateral tracks? I think this is something that hasn't been—I know it is expensive and time consuming to develop alternatives to one approach, but I think that is something that hasn't been fully explored by the FAA.

And then, of course, we will hear some criticism of their outreach thus far, although it appears that they are putting in place new parameters that, hopefully, will do a better job of listening to people in the impacted communities.

And then the mitigation on the ground, the use of AIP funds. I am pleased that we did, through the IIJA, make available more funds through AIP, which could be used for soundproofing, noise

barriers, and acquiring land in flightpaths or future flightpaths so as to mitigate the problems.

So, I am looking forward to hearing from a range of witnesses on what the solutions will be or could be as we move forward, so that we continue to make progress.

It is great that—I mean, Ranking Member Graves talked about one particular area, and the complaints by just a few individuals multiplied, but I have been in other cities where it is way more widely dispersed, and it doesn't just involve a few individuals. And we have got to deal with that as we continue to assist the aviation sector in its future growth.

With that, Mr. Chairman, I look forward to hearing from the witnesses.

[Mr. DeFazio's prepared statement follows:]

Prepared Statement of Hon. Peter A. DeFazio, a Representative in Congress from the State of Oregon, and Chair, Committee on Transportation and Infrastructure

Thank you, Chair Larsen, for calling this important hearing today focused on aviation noise. I would also like to thank the FAA, GAO, and the many aviation stakeholders appearing before us today.

As air travel has become cheaper and more accessible than ever before, the demand for air travel has dramatically increased. According to the International Civil Aviation Organization, the number of annual worldwide air passengers grew from 1.46 billion in 1998 to 4.5 billion in 2019. And as the aviation industry recovers from the pandemic, that number is expected to grow to nearly 10 billion scheduled passengers by 2040, with the number of departures expected to reach nearly 90 million.

This rising demand for air travel has created an urgent need to invest in the infrastructure necessary to accommodate the rising number of travelers at airports. For instance, last year, Airports Council International estimated a backlog of more than $115 billion in airport infrastructure needs to address the rising demand for air travel.

Last November, we made incredible strides in addressing this gap with the passage of the Infrastructure Investment and Jobs Act (IIJA), which provided $25 billion over five years to modernize and upgrade our nation's airport infrastructure. And I will continue to support an increase in the passenger facility charge, which hasn't been raised in over 20 years and is still critical to addressing airport's long-term infrastructure needs.

However, despite these needed investments, the growth in air travel and airport capacity does not come without a cost. Communities near airports know all too well that growth at an airport often yields increased noise emissions. And these noise emissions can be more than just temporary annoyances. Aircraft noise has the potential to cause sleep disturbances, contribute to hearing issues, and adversely affect a person's physical and mental health.

That is why it is imperative we do everything we can to ensure we reduce and mitigate these noise impacts on the communities around airports. This includes continuing to fund critical research and development programs, such as the Continuous Lower Energy, Emissions, and Noise, or CLEEN, Program. The CLEEN program is FAA's principal environmental effort to speed the development of new aircraft and engine technologies that reduce noise, emissions, and fuel burn. In pursuit of this mission, the program has leveraged over $600 million in public and private investments since its inception in 2010.

Moreover, we must also ensure that we are developing and deploying new and advanced technologies in a responsible way. For instance, the NextGen program has provided incredible benefits to the aviation industry. From 2010 to the present, NextGen programs have:

- Saved operators $1.25 billion in fuel costs;
- Slashed carbon emissions as a result;
- Delivered $4.2 billion back into the economy by reducing passengers' travel time; and
- Reduced non-fuel operating costs by $1.5 billion.

One of the advances that has allowed NextGen to deliver these benefits is performance-based navigation (PBN). PBN enables aircraft to fly more precise flight paths, thereby decreasing fuel use and carbon emissions and potentially reducing the number of people affected by aircraft noise by flying aircraft over fewer communities. But these more precise routes also could cause *more* noise emissions for the communities that remain in an aircraft's flightpath. As the FAA continues to deploy NextGen and other new technologies, it must do a better job of listening to these affected communities if the agency hopes to successfully address their concerns.

Effectively addressing aircraft noise also requires prioritizing funding for critical noise mitigation projects. Typically, these projects are funded through the FAA's Airport Improvement Program (AIP), which, among other things, provides funding for airports to help soundproof homes, construct noise barriers, acquire land, and fund other types of noise mitigation projects. Unfortunately, AIP funding has remained largely flat since this committee reauthorized the program in 2018 and, consequently, has been oversubscribed and is incapable of meeting the growing demand for noise mitigation in local communities.

Fortunately, the IIJA provided a once-in-a-lifetime opportunity to reverse this trend and finally provide airports with the resources they need to effectively alleviate harmful aircraft noise emissions in their communities. For instance, the IIJA provided $15 billion in formula funding to airports for AIP-eligible development projects, including noise mitigation. Airports should ensure a significant amount of this funding goes directly to these projects, thereby protecting the health of their local communities and limiting the adverse effects of growing airport capacity. If we fail to do so, then the tremendous economic and societal benefits that come along with improved airspace efficiency, newer aircraft technologies, and increased airport capacity risk being completely ignored by public.

I look forward to hearing from the witnesses on this important issue. I yield back.

Mr. DEFAZIO. Thank you.

Mr. LARSEN OF WASHINGTON. Thank you, Chair. I will now turn to our witnesses. We will be hearing testimony from witnesses on two panels today, with each panel followed by questions from Members.

So, on the first panel today we have Kevin Welsh, who is the Executive Director of the Office of Environment and Energy at the FAA. Accompanying Mr. Welsh is Beth White, Senior Strategist for Public and Industry Engagement at the Air Traffic Organization, the FAA; and Mike Hines, Manager, Office of Planning and Programing, Office of Airports at the FAA. Mr. Welsh, I think, will be giving the testimony. Ms. White, Mr. Hines, and Mr. Welsh will all be available for questions.

And then, after Mr. Welsh's testimony, we will hear from Heather Krause, who is a frequent visitor here at the committee, and the Director of Physical Infrastructure at the Government Accountability Office.

Thank you for joining us today, and we will turn now to Kevin Welsh of the FAA for your testimony.

Without objection, your full written statement will be included in the record. Since that is the case, the subcommittee requests you limit your oral testimony to 5 minutes. Mr. Welsh, you may proceed.

TESTIMONY OF KEVIN WELSH, EXECUTIVE DIRECTOR, OFFICE OF ENVIRONMENT AND ENERGY, FEDERAL AVIATION ADMINISTRATION, ACCOMPANIED BY BETH WHITE, SENIOR STRATEGIST FOR PUBLIC AND INDUSTRY ENGAGEMENT, AIR TRAFFIC ORGANIZATION, FAA, AND MICHAEL HINES, MANAGER, PLANNING AND ENVIRONMENTAL DIVISION, OFFICE OF AIRPORTS, FAA; AND HEATHER KRAUSE, DIRECTOR, PHYSICAL INFRASTRUCTURE, U.S. GOVERNMENT ACCOUNTABILITY OFFICE

Mr. WELSH. Good morning, and thank you, Chair DeFazio, Chair Larsen, Ranking Member Graves, and members of the subcommittee. Thank you for inviting me and my colleagues to speak with you today about the Federal Aviation Administration's role in reducing the impact of aircraft noise exposure.

The FAA's core mission is to provide the safest and most efficient aerospace system in the world. We are also committed and work closely with stakeholders to address the environmental impacts of aviation, such as climate change, local air quality, and noise. With respect to noise, the FAA's first actions to address noise were in the early 1960s, and we have continued to take action and address this issue seriously in the decades since.

Over time, with quieter aircraft, new operational procedures, and land-use planning measures, the country has seen a dramatic reduction in aircraft noise exposure. Since the 1970s, the number of people living in areas exposed to significant levels of aircraft noise declined from 7 million to around 450,000 in 2019. At the same time, the number of passengers increased from 200 million per year to nearly 1 billion per year. So, we have seen an overall reduction in noise contrasted with a steady growth in air traffic and passengers.

This is important context for where we are today. We do not share this information to minimize the ongoing concerns that aircraft noise has on communities and their experiences today. Instead, it is both to note the track record of improvement in the sector and highlight that, with the improvements made to date, further improvements have become increasingly more challenging. Addressing the noise concerns from one community or neighborhood will often result in noise impacts to another.

At the FAA, we are not standing by and, instead, have increased our efforts to address aircraft noise exposure and engage with stakeholders and communities. As we have long emphasized, successfully addressing aircraft noise requires collaboration and cooperation among all aviation stakeholders, including air carriers, airports, manufacturers, and communities. And we will continue to increase our collaboration to better address the issue.

With respect to technology and reducing aircraft noise at the source, the FAA is working closely with aerospace companies through the Continuous Lower Energy, Emissions, and Noise Program, or CLEEN, to accelerate the development and introduction of new technologies that will reduce noise, emissions, and fuel burn. The CLEEN Program has already led to the introduction of quieter technologies in today's aircraft fleet.

Another important tool is the FAA's Airport Noise Compatibility Planning Program. Since 1983, the program has provided more

than $10 billion in funding to more than 250 airports to support changes in local land-use planning, sound insulation, aircraft noise abatement procedures, and other measures.

In recent years, we have also significantly increased the FAA's community engagement on noise issues. Our community engagement framework is based on nine regional teams, each with a regional administrator, an air traffic service center, and other FAA officials who work with community engagement officers to work directly with communities to listen, share information, and address noise concerns. This is a top issue for our regional administrators, and we are carrying out efforts all across the Nation on a daily basis.

In line with this increased engagement, we have also launched the FAA's noise portal. This noise portal provides information on aircraft noise and a place to submit noise concerns and complaints directly to the FAA.

In late 2021, we initiated a comprehensive review of FAA's noise policy. This review will identify updates and improvements to the FAA noise policy based on the latest data and information available. This is a wide-ranging review, and will include evaluation of the day-night average sound level, known as DNL, as well as the 65 DNL threshold. We will also explore whether and under what circumstances supplemental noise metrics are appropriate. Most important, this review will include stakeholder outreach and engagement as part of the process, and before recommending any policy changes.

Finally, I would like to also note that nearly all the directives in the noise and environmental subtitle of the FAA Reauthorization Act of 2018 are complete, and we remain committed to completing the rest in a timely manner.

Chair Larsen, Ranking Member Graves, Chair DeFazio, members of the subcommittee, in summary, the FAA is and will continue to be fully committed to addressing the effects of aviation noise on communities, and working closely with all of our stakeholders and elected officials to do so. Thank you.

[Mr. Welsh's prepared statement follows:]

Prepared statement of Kevin Welsh, Executive Director, Office of Environment and Energy, Federal Aviation Administration

Chair Larsen, Ranking Member Graves, and Members of the Subcommittee: Thank you for inviting me to speak with you today about the Federal Aviation Administration's role in reducing the impact of aircraft noise exposure. My name is Kevin Welsh and I am the Executive Director of the FAA's Office of Environment and Energy. My office conducts research, develops policy, and collaborates with other FAA offices and the aviation community to address aircraft noise. Accompanying me today are my colleagues in this effort: Michael Hines, Manager of the Planning and Environmental Division in the Office of Airports; and Beth White, Senior Strategist for Community and Industry Engagement.

The FAA's core mission is to provide the safest and most efficient aerospace system in the world. This mission also includes addressing the environmental impacts of aviation, such as climate change, local air quality, and noise. Congress first gave the FAA the responsibility to regulate and address aircraft noise in 1968. In the decades since, the FAA has established a strong track-record of addressing the impacts of aircraft noise on communities by reducing noise from airplanes and engines through technology development and standard-setting, adopting Federal guidelines for compatible land use, providing Federal financial assistance for noise mitigation

measures, working with airport sponsors and stakeholders to develop noise abatement procedures, and communicating with stakeholders. Today, I would like to provide you with a summary of what we've done to achieve a substantial reduction in exposure to aircraft noise since that initial congressional mandate and outline our recent actions and plans to continue to address aviation noise and reduce exposure where possible.

Successfully addressing aviation noise requires collaboration, cooperation, and coordination across aviation stakeholders, including the FAA, air carriers, airports, aircraft manufacturers, local land use planning authorities, communities, and elected officials. Decisions about flight times, number of operations, and aircraft types are in the scope of private industry. Land use planning near airports, including the proximity of residential development, schools, and other noise-sensitive uses, is addressed at the state and local level. In short, the FAA has an important role in taking action to address aircraft noise, but we cannot do it alone.

Progress Over Time

During the last 50 years, we have seen a dramatic reduction in noise exposure despite a nearly five-fold increase in the number of passengers transported in the U.S. aviation system. Since the mid-1970s, the number of people living in areas exposed to significant levels of aircraft noise [1] in the United States has declined from roughly 7 million to about 440,000 in 2019. At the same time, the number of passengers has increased from approximately 200 million in 1975 to approximately 935 million in 2019. We are not, however, asserting that aircraft noise exposure is no longer a concern. Instead, exposure to aircraft noise has changed over time and making further reductions in noise has become more challenging. The FAA is not standing by, but instead we have increased efforts to understand and address aircraft noise reflecting today's environment.

Today's civilian aircraft are quieter than at any time in the history of jet-powered flight, but there are many more operations. The noise produced by one Boeing 707–200 flight, a typical airplane in the 1970s, is equivalent in noise to 30 Boeing 737–800 flights that are typical today.[2] While communities no longer experience very loud single flights, like the airplanes of the 1970s, they do experience more frequent operations of much quieter airplanes. This change in noise exposure has changed the way in which communities are impacted by noise. Despite this, the FAA has increased efforts to understand and address aircraft noise reflecting today's environment.

Continued Efforts to Reduce Aircraft Noise

The FAA, aircraft manufacturers, and airlines continue to work toward further reducing aircraft noise at the source through efforts like the Continuous Lower Energy, Emissions, and Noise (CLEEN) Program, which began in 2010. The FAA's CLEEN program provides funding to develop and accelerate the introduction of technologies that will reduce noise, emissions, and fuel burn. The technologies demonstrated during the first phase of CLEEN are estimated to result in a decrease in the land area exposed to noise by 14%. In 2021, the FAA initiated the third phase of CLEEN with over $100 million in funding and including a target for community noise exposure.

In addition to research and development, the FAA plays a leadership role in the development of international standards for noise certification at the International Civil Aviation Organization, including the establishment of the currently applicable Stage 5 noise requirements that were agreed in 2013, and a recent decision to evaluate the possibility of a more stringent noise standard.

Land Use Planning and Airport Noise Compatibility

Another factor in the reduction of aircraft noise exposure has been cooperative efforts by airports, airlines and other aircraft operators, State and local governments, and communities to reduce the number of people living in areas near airports exposed to significant levels of aircraft noise or provide other means of mitigation.

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[1] Under longstanding FAA policy, the threshold of *significant* aircraft noise exposure in residential areas is a Day-Night Average Sound Level of 65 decibels (dB). See the "Aviation Noise Abatement Policy," issued by the Secretary of Transportation and the FAA Administrator in 1976. This document is available on the FAA website at https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/.

[2] Based on an average of approach and takeoff certificated noise levels as defined in 14 CFR part 36.

Under the FAA's Airport Noise Compatibility Planning Program[3], airports may choose to consider measures to reduce existing noncompatible land uses, prevent new noncompatible land uses, and provide mitigation in areas exposed to significant levels of aircraft noise. Since 1983, the FAA has provided over $10 billion to more than 250 airports to use this program to implement changes in support of local land use planning and zoning, sound insulation, acquisition of homes and other noise-sensitive property, aircraft noise abatement routes and procedures, and other measures. The FAA issues grants to airport operators and local governments to fund noise mitigation projects under the program, including to sound-insulate homes, schools, and other noise-sensitive facilities. The FAA encourages participation by providing financial and technical assistance to airports to develop noise exposure maps and noise compatibility programs and to implement eligible noise-related mitigation measures, depending upon the availability of funding.

AIRSPACE MODERNIZATION

In 2012, Congress directed the FAA to accelerate Next Generation air traffic technologies.[4] The introduction of satellite-enabled Performance Based Navigation (PBN) procedures and more precise flight paths has improved the safety and efficiency of the national airspace system. It has also provided noise benefits by reducing the geographical area that flight paths cover, resulting in a reduction in the overall number of people exposed to aircraft noise. At the same time, however, the implementation of PBN, combined with a growth in air traffic, has increased the concentration and number of flights over certain communities. These changes, both air traffic procedures and air traffic growth, have resulted in new and increased concerns about aircraft noise, particularly by communities that are experiencing an increased number of flights, even if the overall noise levels have decreased. As a result, the FAA has significantly enhanced its focus on addressing noise concerns and working with communities, airports, and other key stakeholders.

COMMUNITY ENGAGEMENT

Since the initial years of PBN implementation, we have greatly expanded community outreach beyond the process requirements of the National Environmental Policy Act of 1969 to include broad and ongoing communications with airports, elected officials, and community leadership through *ad hoc* committees, task forces, and airport and community sponsored roundtables. Some of the most productive community groups are typically made up of representatives from multiple communities around an airport, who are or may be affected by aircraft operations, and may include the airline industry and other stakeholders who may serve in an advisory capacity. The FAA is fully committed to meaningful engagement and open dialogue with those affected by airspace changes and we routinely engage the public to understand specific challenges and concerns.

The FAA's community engagement framework is based on nine regional teams, each staffed by a regional administrator, a service center, and other FAA officials who work with community engagement officers to determine how to best engage with communities.[5] Our approach to community engagement is guided by time and experience proven practices and techniques described in detail in our Community Involvement Manual and our Community Involvement PBN Desk Guide. The FAA is constantly participating in community engagement activities and initiatives across the nation.

IMPROVED SYSTEMS

In addition to extensive outreach, we are constantly striving to provide communities with new tools that will help them access noise information resources. As part of our Noise Complaint Initiative, we have taken several meaningful actions to provide greater transparency regarding aviation noise complaints and inquiries submitted by the public. Through this initiative, the FAA seeks ways to address the underlying issues raised by the public, proactively educate, inform, and engage in aircraft noise issues, and partner with airports to gather their complaint data and better understand nationwide concerns. As part of this initiative, members of the public can, for example, access our web-based noise resources to learn more about aviation noise, access information on FAA noise research and noise programs, as

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[3] This process is outlined under 49 U.S.C. 47501 et seq., as implemented by 14 CFR part 150.

[4] See section 213 of PL 112–95: https://www.congress.gov/112/plaws/publ95/PLAW-112publ95.pdf.

[5] https://www.faa.gov/air__traffic/community__engagement/.

well as understand how to make a noise complaint.[6] The FAA has also designed a noise portal that accepts detailed complaint information and allows users to file noise complaints directly with the FAA.[7] For quick answers to frequently asked questions related to FAA's metroplex program, flight path information, regional administrators, and community engagement in general, users can also access our "chatbot". The chatbot is an artificial intelligence powered chat function that enables users easy access to the vast information on the FAA website.

NOISE RESEARCH AND POLICY

A key component of the FAA's noise research program is to better understand the effects of aircraft noise on individuals and communities through research into annoyance, health and human impacts (e.g., sleep, cardiovascular), speech interference, and children's learning. We also conduct noise modeling and develop noise metrics and environmental data visualization tools to help FAA and the aviation community estimate and share environmental impacts of aviation in a way that is accessible and understandable to the general public. These activities, including the research and development of tools and models, are critical to addressing aircraft noise, refining our approaches, and periodically updating policy.

As part of these efforts, we recently published the results of a nationwide survey regarding annoyance related to aircraft noise—the Neighborhood Environmental Survey.[8] This was a multi-year research effort and is one of many current FAA research efforts to update the scientific evidence of the relationship between aircraft noise exposure and its effects on communities around airports. The survey results were released along with an overview of FAA's broader noise research program in a January 2021 Federal Register Notice.[9] The notice requested public comment on the scope and direction of FAA's noise research program, and we received over 4,000 comments which are being reviewed to help inform the agency's noise research priorities and noise policy review planning efforts.

In late 2021, the FAA initiated a review of our noise policy as part of our ongoing commitment to address aircraft noise. This effort will build on our work to advance the scientific understanding of noise impacts as well as the development of analytical tools and technologies. Our review will be evidence-based, thorough, and collaborative. It will consider new evidence from the agency's noise research program, including from the Neighborhood Environmental Survey, and the distribution of environmental risks, tradeoffs, or externalities across communities. We expect to review the continued use of the Day-Night Average Sound Level (DNL) as the FAA's primary noise metric for assessing cumulative aircraft noise exposure, as well as whether DNL 65dBA should remain the definition of the limit for residential land use compatibility and the significant noise exposure threshold. We also expect to explore whether, and under what circumstances, supplemental or alternative noise metrics are appropriate to inform research and policy considerations. The review process will identify and assess other policy options not noted here, consider feedback on the notice, and, if appropriate, recommend policy updates. We also anticipate that our noise policy review will include stakeholder outreach as we consider any recommended policy changes.

CONCLUSION

The FAA is fully committed to a long-term effort to minimize the effects of aviation noise as part of the FAA's mission. To be successful, we will continue to work closely with all stakeholders and elected officials. Thank you for the opportunity to be here today.

Mr. LARSEN OF WASHINGTON. Thank you, Mr. Welsh.

Ms. Krause, you may proceed for 5 minutes.

Ms. KRAUSE. Chair Larsen, Chair DeFazio, Ranking Member Graves, and members of the subcommittee, thank you for the opportunity to discuss our work on aircraft noise.

While the aviation system moves millions of people and goods each day, the noise generated from aviation can severely diminish

[6] https://www.faa.gov/noise/inquiries/.
[7] https://noise.faa.gov/noise/pages/noise.html.
[8] https://www.faa.gov/regulations__policies/policy__guidance/noise/survey/.
[9] https://www.federalregister.gov/documents/2021/01/13/2021-00564/overview-of-faa-aircraft-noise-policy-and-research-efforts-request-for-input-on-research-activities.

the quality of life for nearby communities. Such noise can expose residents to various negative effects, such as disrupted sleep and health issues, and spur community objections to airport operations and continued growth.

Mitigating and addressing aviation noise involves multiple stakeholders. This includes affected communities, airports, aviation manufacturers, and aircraft operators, as well as FAA, who manages the air traffic control system and helps to fund airports.

Despite trends towards quieter airplanes and fewer people exposed to noise, community concerns about noise have persisted. In particular, FAA has been changing flightpaths around airports as part of its efforts to modernize the air traffic control system with performance-based navigation, or PBN. PBN allows for more precise flightpaths that reduce flying time, fuel use, and emissions.

Because of these new and more precise routes, noise is likely to be concentrated over a smaller area, meaning that, while fewer people may experience increases in noise, people directly under PBN routes may have more persistent noise.

Affected communities and Members of Congress have raised concerns about FAA's implementation of PBN, including whether it provided timely and adequate information about potential noise effects to the public.

My testimony today is based on our recent work examining FAA's efforts, and focuses on, one, how FAA engages with communities to understand and address noise concerns before and after implementation of PBN; and two, areas for improvement.

In response to rising community concerns and legal challenges, FAA increased its outreach efforts. For example, at locations where PBN was first implemented, FAA only conducted briefings with airport officials. Later, FAA expanded its outreach to members of the public, including holding public workshops and webinars.

However, community stakeholders across the country told us that the information the FAA provided on potential noise impacts was not clear enough to understand planned changes. In particular, our analysis showed that the metric FAA uses to assess noise impacts does not provide a clear picture of how changes in flightpaths or activity may affect noise levels at a given location.

This metric, the day-night average sound level, or DNL, takes into account multiple components of aircraft noise to create a single metric. Because of this, the same DNL level may be associated with vastly different numbers of flights at a given location. For example, small numbers of relatively loud operations can result in the same DNL as large numbers of quieter operations.

Because FAA relies on DNL for communicating noise impacts, communities may not have the information needed to understand how the number of flights over each location will change. After implementing PBN, FAA primarily conducts outreach through community forums established to address the noise concerns and provide some guidance on this outreach. However, some forums are unclear on how to engage productively with FAA and the extent to which they could expect FAA assistance in proposing changes or other measures to address noise concerns.

To address these various issues, we have recommended that FAA, one, identify additional metrics for assessing noise impacts of

new flightpaths; two, use additional tools to clearly convey expected impacts; and three, improve guidance for communities on effectively engaging with FAA. FAA concurred with our recommendations, and told us that they plan to act on them by the end of this year.

Taking actions like these will also be critical as aircraft operations evolve and increase. In particular, emerging technologies such as electric aircraft may present opportunities to reduce noise with quieter operations, but they could also present new noise challenges if they operate at a higher frequency and closer to populations.

In closing, FAA has an ongoing responsibility to balance the growing demand for aviation capacity against their noise effects on communities. Although FAA is unlikely to eliminate all noise concerns, improved information, expectations, and communication will enable communities, airports, airlines, and FAA to better anticipate and more meaningfully engage on noise issues.

This concludes my statement. I look forward to answering your questions.

[Ms. Krause's prepared statement follows:]

Prepared Statement of Heather Krause, Director, Physical Infrastructure, U.S. Government Accountability Office

AIRCRAFT NOISE: FAA SHOULD IMPROVE EFFORTS TO ADDRESS COMMUNITY CONCERNS

Chair Larsen, Ranking Member Graves, and Members of the Subcommittee:

Thank you for the opportunity to testify today on our body of work related to aircraft noise. While airports provide access to transportation for millions of people each day, aircraft noise can be disruptive to communities. It can potentially expose residents to a variety of negative effects, such as disrupted sleep and increased risk for cardiovascular disease,[1] and spur community objections to airport operations and continued growth. Despite trends toward increasingly quieter airplanes, community concerns about noise have persisted, particularly with regard to changing flight paths around airports as part of the Federal Aviation Administration's (FAA) efforts to modernize the national airspace. Moreover, new entrants to the national airspace—such as uncrewed aircraft systems, commonly known as drones—may further contribute to challenges with aviation noise issues. In coordination with stakeholders, FAA works to address noise concerns by conducting research on aircraft noise impacts, ensuring that aircraft meet federal noise standards, overseeing and funding airport noise mitigation projects, and conducting community outreach related to potential noise effects of proposed changes to the national airspace, among other efforts.

My testimony today is based largely on reports we issued in 2020 and 2021 related to aircraft noise.[2] Specifically, this testimony primarily describes: (1) the transition of the U.S.-based commercial fleet to quieter airplanes and (2) FAA efforts to engage with communities to understand and address aircraft noise concerns. To conduct our prior work, we reviewed relevant statutes and regulations. We also reviewed FAA documents on its application of aircraft noise standards, environmental impact analysis and community engagement practices in relation to the agency's im-

[1] M. Basner, C. Clark, A. Hansell, J. I. Hileman, S. Janssen, K. Shepherd, and V. Sparrow, "Aviation Noise Impacts: State of the Science," *Noise & Health*, vol. 19, no. 87 (2017) 41–50.

[2] See *AIRCRAFT NOISE: Information on a Potential Mandated Transition to Quieter Airplanes*, GAO–20–661 (Washington, D.C.: Aug. 20, 2020); *AIRCRAFT NOISE: Better Information Sharing Could Improve Responses to Washington, D.C. Area Helicopter Noise Concerns*, GAO–21–200 (Washington, D.C.: Jan. 7, 2021); and *AIRCRAFT NOISE: FAA Could Improve Outreach through Enhanced Noise Metrics, Communication, and Support to Communities*, GAO–21–103933 (Washington, D.C.: Sept. 28, 2021).

plementation of performance-based navigation (PBN).[3] We interviewed FAA officials and a range of industry and community stakeholders to discuss their perspectives on the impacts of aircraft noise and efforts to address it. More detailed information on our objectives, scope, and methodology can be found in each of the reports. For this statement we collected and reviewed updated information from FAA on its efforts to implement recommendations we made in our 2021 reports.

We conducted the work on which this testimony is based in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

BACKGROUND

FAA has an ongoing responsibility to balance the growing demand for aviation capacity against the environmental concerns and effects on communities caused by aircraft noise, whether that noise is caused by airplanes, helicopters, or new entrants to the national airspace. To address these concerns, FAA regulates aircraft noise by ensuring compliance with relevant noise standards through its aircraft certification process. FAA is also charged with implementing and enforcing limitations on the noise-related restrictions airports may place on aircraft operations (such as limiting certain types of planes) as well as noise standards for airports' noise mitigation projects that can receive federal funding.[4] FAA administers two programs—the Airport Improvement Program and Passenger Facility Charge program—that may fund airports' noise mitigation projects, including sound insulation of homes and other buildings near airports as well as land acquisitions. We last reported on these programs in 2012.[5]

In addition to FAA, airports, airlines, and other stakeholders have a role in addressing aircraft noise. For instance:

- Most airports are owned and operated by public authorities, such as cities, counties, or port authorities, which have primary responsibility for addressing community concerns about noise. Airports help FAA identify noise sensitive communities as well as participate in mitigation efforts such as funding the installation of sound insulation in homes and buildings exposed to significant aircraft noise. Also, collecting and addressing noise complaints is a shared responsibility between FAA and the airport authorities. Airport authorities generally do not have control over many of the causes of aviation noise such as the types of aircraft in service and traffic volume (generally controlled by airlines) or flight paths (generally controlled by FAA, in coordination with airlines).
- Airlines have a role in addressing aircraft noise concerns by, for example, coordinating with airports and FAA air traffic controllers to participate in voluntary airport noise abatement procedures or by transitioning their fleets to include newer, quieter aircraft.
- FAA has collaborated with helicopter industry groups to develop and update "Fly Neighborly" procedures and guidance, a voluntary set of guidelines that identify helicopter noise mitigation practices.

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[3] Performance-Based Navigation (PBN) involves making changes to existing flight procedures (that is, paths for planes to fly through the air using pre-determined flight maneuvers) to transition from a ground-based air traffic control system to one that uses satellite navigation. PBN procedures enable aircraft to fly a particular flight path more precisely, so aircraft will be closer to the "center line" of a flight path than when using conventional navigation procedures. Our work for GAO–21–103933 focused on PBN implementation at both metroplex projects (major metropolitan areas with multiple airports and complex air traffic patterns for which FAA has redesigned the airspace and deployed PBN procedures for several airports concurrently) and single-site airports (individual airports for which FAA has designed PBN procedures).

[4] FAA administers Airport Noise and Access Restrictions (14 CFR Part 161) and Airport Noise Compatibility Planning (14 CFR Part 150). Part 161 requires that certain airport operators receive approval from FAA to implement noise restrictions related to certain aircraft. Through the Part 150 program, FAA provides guidance to airports on the types of land uses that are incompatible with certain levels of airport noise and provides a process for airports to develop noise compatibility programs to reduce and prevent such uses. Airports that participate in this voluntary program can receive funding from FAA through the Airport Improvement Program for noise mitigation projects such as soundproofing buildings.

[5] GAO, *AIRPORT NOISE GRANTS: FAA Needs to Better Ensure Project Eligibility and Improve Strategic Goal and Performance Measures*, GAO–12–890 (Washington, D.C.: Sept. 12, 2012).

MOST COMMERCIAL AIRPLANES ARE QUIETER THAN REQUIRED

FAA issues what is known as a "type certificate" as part of a certification process for new aircraft designs to signify that the design is in compliance with applicable airworthiness, noise, and other standards. Airplanes are certificated to the noise standards that were in effect at the time of the type certificate application. In August 2020 we reported that, based on FAA data and GAO estimates, most U.S. large commercial jet airplanes were certificated at the minimum required stage 3 noise standards, but nearly all of them would be able to meet more stringent noise standards.[6] By analyzing January 2020 data from airlines and aviation manufacturers, we estimated that 96 percent of large commercial airplanes were manufactured with technologies that are able to meet more recent and stringent stage 4 or 5 standards. According to FAA officials and aviation stakeholders we interviewed, the primary reason many large commercial airplanes certificated as stage 3 produce lower than stage 3 noise levels is because engine and airframe technology has outpaced the implementation of noise standards. More recently, in response to the decrease in travel amid the COVID–19 pandemic, some airlines have accelerated retirement of certain airplanes, some of which are certificated as stage 3. For example, one airline told us it is retiring its MD–88 fleet—which constitutes the majority of its remaining stage 3 fleet—and MD–90 fleet.

Stakeholders we interviewed generally agreed that a government-mandated transition (i.e. phase-out) of stage 3 airplanes would not substantially reduce airport noise and could be costly and challenging. Since most U.S. large commercial jet airplanes are certificated at the minimum required stage 3 noise standards, a phase-out could require recertificating them to comply with stage 4 or 5 standards. This process could be costly for operators and manufacturers but would provide little reduction in noise since we found that nearly all of those aircraft already meet the more stringent noise standards. Further, airplanes currently unable to meet more stringent standards would require modifications or face retirement. For older airplanes that could not be recertificated to meet stage 4 or 5 standards, some operators could incur costs for replacement airplanes sooner than originally planned. Although stakeholders indicated that a phase-out would not substantially reduce noise, they identified other limited benefits newer airplanes generate, such as reduced greenhouse gas emissions and fuel consumption.[7] In addition, some stakeholders noted that factors other than noise from stage 3 airplanes are key contributors to airport noise in recent years. Such factors include a large increase in the number and frequency of flights at some commercial airports in recent years prior to the COVID–19 pandemic and changes to flight paths raising community noise concerns.

Looking to the future, emerging technologies may present opportunities to further reduce aircraft noise. For example, as we reported in November 2020, companies are developing innovative new aircraft designs, including electrically powered aircraft and aircraft with vertical takeoff and landing capabilities.[8] Among these potential future developments is the concept of advanced air mobility, which is expected to take advantage of the potential lower operating costs of electrified aircraft in support of moving people and cargo more quickly between local, regional, and urban places. According to FAA, significant technological improvements are expected to en-

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[6] See GAO–20–661. FAA classifies airplanes that meet the various noise standards into 5 stages. Airplanes classified as stages 1 and 2 (the noisiest aircraft) have been prohibited by regulation and statute respectively from operating in the United States. Airplanes operating today in the United States—classified as stages 3, 4, or 5—are much quieter. The Airport Noise and Capacity Act of 1990 required large jet airplanes to comply with stage 3 noise standards by 1999, leading to a phase-out of the noisiest airplanes (stage 1 and 2 airplanes). Pub. L. No. 101–508, § 9308, 104 Stat. 1388. Additionally, in 2013, FAA promulgated a rule in response to Section 506 of the FAA Modernization and Reform Act of 2012 that required smaller airplanes to comply with stage 3 standards by 2016. Adoption of Statutory Prohibition on the Operation of Jets Weighing 75,000 Pounds or Less That Are Not Stage 3 Noise Compliant, 78 Fed. Reg. 39576 (July 2, 2013) (codified at 14 C.F.R. § 91.881); FAA Modernization and Reform Act of 2012, Pub. L. No. 112–95, § 506, 126 Stat. 11, 105.

[7] At the time of our 2020 report, the U.S. commercial airplane fleet was younger and quieter when compared to the last time the federal government mandated a transition to quieter aircraft. For example, according to February 2020 data we reviewed for passenger and cargo airlines, the average age of the passenger airplane fleet was approximately 12 years, and for the cargo fleet, about 21 years. In comparison, in 2001, we reported that the average age of passenger and cargo airplane fleet was approximately 26 and 31 years old, respectively. See GAO–20–661.

[8] GAO, *AVIATION CERTIFICATION: FAA Needs to Strengthen Its Design Review Process for Small Airplanes*, GAO–21–85 (Washington, D.C.: Nov. 16, 2020).

able electrically powered aircraft that will reduce noise traditionally associated with helicopter transportation.[9]

Additional Information and Communication Could Help FAA Better Understand Noise Impacts and Engage With Communities

As directed in the FAA Modernization and Reform Act of 2012, FAA has continued modernizing the national airspace through NextGen, a multi-billion dollar effort to implement technologies and capabilities, including PBN, which relies on satellite navigation.[10] PBN is intended to allow aircraft to fly more precise flight paths intended to reduce flying time, fuel use, and emissions. The precision and predictability of PBN procedures increase safety and may allow more planes to safely fly in a given airspace at the same time or in closer succession, which in turn would allow for increased airspace capacity if demand increases. However, because PBN flight procedures are more precise, noise is likely to be concentrated over a smaller area. As a result, while fewer communities overall may experience noise, those communities directly under new PBN flight paths may experience more frequent noise. Community concerns about increased noise after PBN implementation, among other factors, have led to legal challenges and delays, reducing the realized benefits of PBN.

As we reported in 2021, using additional metrics to assess the potential noise impacts of proposed PBN flight path changes may provide FAA with a better understanding of such impacts.[11] Currently, FAA assesses the potential noise impact of proposed flight path changes (such as PBN procedures) on locations within the area surrounding an airport by using the Day-Night Average Sound Level (DNL) metric.[12] Our analysis showed that because DNL takes into account both the amount of noise from each aircraft operation, as well as the average annual flights per day at a given location, the same DNL may be associated with vastly different numbers of flights above that location. As such, DNL does not provide a clear picture of the flight activity or associated noise levels at a given location. For example, as shown in figure 1, 100 flights per day can yield the same DNL as one flight per day at a higher decibel level.

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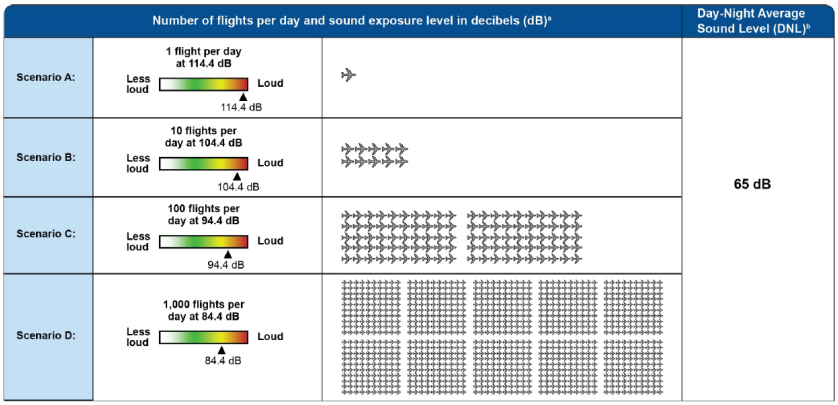
[9] Federal Aviation Administration, *Concept of Operations, v1.0: Urban Air Mobility (UAM)* (Washington, D.C.: June 26, 2020).

[10] Pub. L. No. 112–95, § 213, 126 Stat. 11, 46–50.

[11] See GAO–21–103933.

[12] DNL is expressed in decibels (dB), which measure the intensity (or loudness) of a sound. The higher the decibel level, the more intense the sound, and the louder it will be perceived. The National Environmental Policy Act of 1969 (NEPA), as amended, implementing regulations, and FAA's implementing Order require FAA to examine the potential impacts associated with a major federal action, including potential noise impacts. As a result, operational changes, such as changes to flight paths, as well as airport development proposals, such as adding new runways or otherwise expanding capacity, must be reviewed to identify potential noise effects.

Figure 1: Different Numbers of Flights and Sound Exposure Levels Result in a Day-Night Average Sound Level (DNL) of 65 Decibels



Source: GAO analysis of Federal Aviation Administration information. GAO–22–105844

Note: Sound exposure level (SEL) is a measure of the acoustic energy (that is, the sound pressure) of an individual noise event as if that event had occurred within a one-second time period.

[a] Decibel (dB): A measure of sound intensity, or loudness.

[b] Day-Night Average Sound Level (DNL): A cumulative measure of aircraft noise exposure at a particular location.

This analysis as well as recent research published by FAA demonstrate the limitations of FAA relying solely on DNL to identify potential noise impacts. In January 2021, FAA issued the results of a survey showing a substantial increase in the percentage of people who are highly annoyed by aircraft noise, including at lower DNL levels, as compared to earlier survey results. According to FAA, one factor that may have contributed to this increase is changes to the nature of noise exposure, such as changes to the number of flights overhead. Since no single metric can convey different noise effects, using additional metrics—such as changes in number of flights overhead—in designing proposed flight paths could help FAA identify and address potential noise concerns and better facilitate PBN implementation. We recommended that FAA identify appropriate supplemental noise metrics and circumstances for their use to aid in FAA's internal assessments of noise impacts related to proposed PBN flight path changes. As of March 2022, FAA said it is conducting a noise policy review and plans to consider whether and under what circumstances supplemental, companion, or alternative noise metrics are appropriate to inform research and policy considerations. FAA plans to complete their initial noise policy review by the end of 2022.

Over time, FAA has increased its community outreach efforts through the PBN implementation process. For example, at locations where PBN was implemented first, FAA only conducted briefings with airport officials. For later locations, however, FAA started to conduct more outreach with members of the public, including public workshops and webinars among other outreach activities. However, FAA could improve the public outreach it conducts prior to implementing PBN procedures. We reported that most community stakeholders said the information FAA provided on potential noise impacts during outreach efforts throughout the PBN-implementation process was not clear enough to understand the planned changes. For instance, because FAA described the impacts in terms of DNL, communities may not have had the information needed to understand how the number of flights over each location was expected to change. We recommended that FAA update guidance to incorporate additional communication tools that more clearly convey expected impacts, such as other noise metrics and visualization tools related to proposed PBN implementation. As of March 2022, FAA said it plans to update guidance on community outreach by the end of 2022.

FAA has also faced challenges in its outreach after implementation of PBN procedures. After implementing PBN, FAA primarily conducted outreach through community forums established to address noise concerns. However, members of some forums we spoke with were frustrated and unclear on how to productively engage

with FAA to address noise concerns. FAA had provided some public guidance on this process, but it was unclear about the extent to which communities could expect assistance from FAA in proposing changes to flight paths that cause noise concerns. For example, FAA's guidance advises that FAA's Air Traffic Organization can provide technical expertise on airspace procedural design when requested, but is unclear about the extent of the assistance available. We recommended that FAA provide clearer information to airports and communities on what communities can expect from FAA related to post-implementation outreach, including the technical assistance FAA can provide. As of March 2022, FAA said it plans to develop an appropriate process and post-implementation outreach tools by the end of 2022.

In addition to its PBN-related outreach, FAA has established positions within regional offices and headquarters to collect and respond to community complaints about aircraft noise. Within the Office of Policy, International Affairs, and Environment, the Aviation Noise Ombudsman serves as a public liaison for questions and complaints related to aircraft noise.[13] Additionally, in response to a requirement in the FAA Reauthorization Act of 2018, FAA established the Community Engagement Officer position within each of FAA's nine regional offices to serve as a regional ombudsman and coordinate public outreach with the appropriate FAA officials.[14] As we reported in 2021, FAA officials told us the agency seeks to respond to and address the noise complaints it receives, and complaints are generally forwarded to the appropriate regional offices.[15]

Related to helicopter noise complaints in particular, in 2021 we reported how FAA and industry stakeholders collect and respond to helicopter noise concerns in the Washington, D.C. area.[16] According to FAA data for 2017 through 2019, over 50 helicopter operators conducted approximately 88,000 helicopter flights within the D.C. area, though limited data on noise from these flights existed.[17] While FAA and operators reported taking steps to address public concerns on helicopter noise in the D.C. area, the ability of FAA and operators to address noise issues in the D.C. area was impeded because they did not consistently or fully share the information needed to do so. FAA receives and responds to complaints on helicopter noise from the public through its Noise Ombudsman and had recently developed online forms that improved FAA's ability to identify and respond to helicopter noise issues. However, according to nearly all of the 18 operators we interviewed, FAA had not communicated with them about helicopter noise or forwarded complaints to them. According to FAA, this was due to limitations on personally identifiable information on complainants that FAA can disclose to private operators. Similarly, operators often received noise complaints from the public that were not directed to the correct operator, but they did not typically share these complaints with FAA. As a result, operators had not consistently responded to residents' inquiries about helicopter noise and activity. For example, Fairfax County Police Department officials estimated that over 80 percent of noise complaints they received were unrelated to their flights, and thus they were unable to determine the source of the noise that spurred the complaint.

We recommended FAA develop a mechanism to exchange helicopter noise information with operators in the D.C. area. As of March 2022, FAA officials said they were working to identify a mechanism to share complaint data with helicopter operators in the area. FAA officials also stated that they plan to conduct quarterly meetings in the area with local helicopter operators to examine trends in helicopter complaint data and discuss helicopter noise mitigation efforts. FAA officials said they plan to begin holding and facilitating these meetings in spring 2022. Although our work related to helicopter noise focused on the Washington D.C. area, other cities may experience similar concerns about heavy helicopter traffic and, in general, seeking to increase communication among FAA, operators, and stakeholders may assist in addressing their concerns.

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[13] The Ombudsman was established by the Federal Aviation Reauthorization Act of 1996. Pub. L. No. 104–264, § 1210, 110 Stat. 3213 (codified at 49 U.S.C. § 106(q)).

[14] The FAA Reauthorization Act of 2018 required FAA to designate a regional ombudsman for each of FAA's regions. Pub. L. No. 115–254, § 180, 132 Stat. 3186, 3230. In addition to the regional noise ombudsmen, FAA also has a noise ombudsman, which is a separate national position that serves as a liaison with the public on issues regarding aircraft noise. FAA has also formed a Noise Complaint Initiative group consisting of representatives from across FAA with the goal of more efficiently and effectively responding to and addressing noise complaints.

[15] For additional information, see GAO–21–103933 regarding the handling of noise complaints related to airports and GAO–21–200 regarding the handling of noise complaints related to helicopters.

[16] See GAO–21–200.

[17] The D.C. area was defined in our report as the area within 30 miles of Ronald Reagan Washington National Airport.

As FAA continues in its efforts to expand the use and types of uncrewed aircraft systems and other emerging technologies into the national airspace system, these new aircraft could present new noise challenges. For example, electric take-off and landing vehicles have the potential for quieter operations but may also operate closer to populations and raise new concerns for communities. FAA stated in 2020 that stakeholder concerns about noise will need to be considered when designing corridors (defined airspace) where these aircraft might operate.[18] In addition, continued growth in commercial space launches is expected, but as we reported in 2020, stakeholders have expressed concerns that FAA's process for licensing launch sites may not adequately consider combined noise effects of commercial space activities with aviation activities on surrounding communities.[19] Assessing and addressing community noise concerns will be critical as the nature and extent of aircraft operations continues to evolve and increase. Fully implementing our prior recommendations can help FAA more effectively understand the effects of aircraft noise and address community concerns.

Chair Larsen, Ranking Member Graves, and Members of the Subcommittee, this concludes my prepared remarks. I would be pleased to respond to any questions that you may have at this time.

Mr. LARSEN OF WASHINGTON. Thank you very much for your testimony. I will now recognize myself for 5 minutes. I will start with Member questions.

First off for Ms. Krause, in your report, your GAO report, it references communities that feel the FAA is simply, "checking a box" in post-PBN implementation engagement, and you recommend the FAA provide clearer information to communities on what they can expect from the FAA. Is this a problem of the engagement process, or is this an issue internally in the FAA about the ability to incorporate input from communities?

Ms. KRAUSE. I think what we had found is that offering clear expectations to communities on what they might get in terms of assistance from FAA, and what that process should look like. And so, that is where we had recommended to FAA to kind of clarify what communities should expect and how that process might work.

Mr. LARSEN OF WASHINGTON. Mr. Welsh, what have you done about that recommendation? And understanding that this might be yours to answer or Ms. White or Mr. Hines.

Mr. WELSH. Yes, thank you. I will turn it to my colleague, Beth White, for this question.

Mr. LARSEN OF WASHINGTON. Thank you.

Ms. WHITE. Thank you for the question. Yes, one of the things I think we are referring to is, really, the level of expectation at the roundtable—through that roundtable process with airports. And the recommendation was to provide some clarity, really, on that. We were working on a form that we have that we have on the website talking about resources, how we best engage with roundtables, how we best engage through the regional process. We have reached out through our community engagement officers, through our regional administrators, and updated some of that guidance on our website very recently.

It is a challenge in looking at each one of these situations at a roundtable, what we may or may not be able to do with each one of those organizations, but we are doing our best to ensure that we kind of manage to the realm of the possible. Heather just men-

[18] Federal Aviation Administration, *Concept of Operations, v1.0: Urban Air Mobility (UAM)* (Washington, D.C.: June 26, 2020).

[19] GAO, *COMMERCIAL SPACE TRANSPORTATION: FAA Should Examine a Range of Options to Support U.S. Launch Infrastructure*, GAO–21–154 (Washington, D.C.: Dec. 22, 2020).

tioned managing expectations. That is where we are really starting, is trying to make sure folks understand what we can and can't do, and continue to have a dialogue.

Mr. LARSEN OF WASHINGTON. So, Ms. White, maybe this might be for you. What role is the regional ombudsperson playing in this outreach?

Ms. WHITE. Thank you very much for that question. The community engagement officer is also the regional ombudsman. They have the designation of regional ombudsman.

And I want to first actually thank you, thank Congress for the funding that is really a resource that we use here for hiring those individuals. They have become the focal point for our community engagement efforts.

In each one of the regions, there is a community engagement officer in each region. They are the representative that works with the airport noise officer. And if there is a leadership position at an airport roundtable, they are responsible to be the collection point for the discussion about what happens at that roundtable, the concerns that may be raised by the community, and we have restructured that process internally.

So, when we look at a new flight procedure or an airspace change, that community engagement officer is part of that process. They sit on that full working group, and they are there to raise the concerns that they have heard in those roundtable meetings and with those airports about community concerns. And if there is a question about whether or not they are not being heard, they have access to the regional administrator, and they have access to me at headquarters to help elevate the issue.

Mr. LARSEN OF WASHINGTON. Thank you. Back to Ms. Krause.

In your report, you discussed—I believe in your report, you discussed identifying alternative metrics for sound, creating sound envelopes and such. Are there alternative metrics?

Ms. KRAUSE. Yes, and the FAA had actually developed a report identifying some of those alternative metrics. And our recommendation is to—that no one metric is going to give a full picture of the noise impacts, but that looking at DNL along with some other metrics where appropriate could be useful.

So, things like time above or flights above, to get a sense of how much time folks are exposed to certain levels of noise, or how many aircraft they are exposed to, as well as sound level exposure. So, there are different metrics with different tradeoffs to consider.

Mr. LARSEN OF WASHINGTON. Yes, Mr. Welsh, do you have comments on that, and how FAA might approach those alternative metrics?

Mr. WELSH. Yes. And actually, I really agree with the comments that my colleague from GAO just made, because, number one, we currently today can use supplemental metrics and do. And number two, as we have talked about today, the increased concentration and number of flights has sort of changed the noise experience.

So, something like the number of flights above in a given period of time may be a really important supplemental metric, but I think most important is to underscore that all of these metrics have tradeoffs. The current DNL metric absolutely has tradeoffs, but the other metrics do, as well. So, in our current noise policy review,

these are the types of things that we are looking at to make a recommendation on how to proceed.

Mr. LARSEN OF WASHINGTON. Great, thank you. I am going to just turn my mic off for a moment and get direction on who is going to be next on Q&A. Hold on a second.

[Discussion off the record.]

All right, great. The Chair recognizes Ranking Member Representative Graves of Louisiana.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Chairman. I want to thank the witnesses for being with us today.

Mr. Welsh, the FAA has a very complicated task and, again, has an impressive safety record in regard to just the number of accidents and incidents, the safest way to travel. The FAA is really charged with, I guess, the safety and the efficiency of the National Airspace System.

Mitigating noise is something that you look at, and you diligently work to mitigate that, but can you talk about sort of the core mission of the FAA in regard to efficiency and safety, and sort of how that is your top mission?

Mr. WELSH. Yes. Thank you, Ranking Member Graves, absolutely.

Without question, that core mission of safety is the top priority of the agency. And so, when it comes to particular noise procedures, we are not going to trade off any amount of safety for noise.

That said, in many cases, we really can—we can—the gains can go hand in hand. But when we are talking about maybe it being more challenging today to identify improvements, it is because we are talking about greatly increased numbers of flights in very complex airspace. And there are safety issues to be considered, and maybe ones that are not obvious to the general public.

So, these are things that we take into account, and we work very carefully when we are looking at any changes to address noise considerations because, absolutely, safety is our mission and our top priority. Thank you.

Mr. GRAVES OF LOUISIANA. Thank you, and you touched on this a little bit, both in the chair's question and the one I just asked you, but I first need to put those statistics I gave earlier in the right context. I put them in the wrong context earlier. So, they were—in 1970 there were 7 million folks that were exposed to high levels of aviation noise, and that was reduced to 430,000 in 2018.

Can you talk a little bit—and again, I know you touched on this a bit, but directly can you touch on the tools that the FAA has used to have such a profound reduction in the number of people exposed to high levels of noise whenever you have had an extraordinary increase in the total number of flights during the same time?

Mr. WELSH. Yes. So, by far and away, the number-one reason for that reduction over time is the improvement in technology. With every generation of aircraft and engine, we see noise improvements, although, again, it is becoming more limited and more challenging as we proceed.

Number two, noise abatement operational procedures that are in place around the country.

And three, really importantly, the Noise Compatibility Program run by FAA's Office of Airports that I mentioned, as well.

Those are really some of the three—the big components. And then, of course, along with all of this, kind of working with communities, particularly in the last years, on ways to further mitigate noise exposure.

Mr. GRAVES OF LOUISIANA. Thank you.

Ms. Krause, looking forward, I talked in the opening statement, as did the chair, about incredible technologies in aviation space, UAS and AAM. Considering the metrics, or sort of the data points that we use now to measure noise impacts, what do we need to be thinking about moving forward on how that needs to change reflecting new technology?

Ms. KRAUSE. In terms of new technology, I think thinking ahead and better—now, better understanding the types of noise this technology might create, and the types of impacts, because they will be—if projected as the industry is talking about, could be operating at a much higher frequency and closer to population.

So, I think, first, understanding what types of noise that they create and the noise impacts, and then having that inform sort of standards and development of where these aircraft will operate.

Mr. GRAVES OF LOUISIANA. Thank you. I want to go back to the FAA, to Mr. Welsh for just a minute.

Mr. Welsh, I was looking at some of the other data I mentioned in my opening statement about the military's working with the Washington area on the helicopter flights, looking at National Airport, at Ronald Reagan National Airport. In 2019, two complainers accounted for 22.3 percent of all the complaints. That was in excess of 20,000 complaints a day, which is in excess of 50—excuse me, 20,000 complaints over the year, in excess of 50 complaints a day. I am not sure what these people do for work, but I am curious.

I understand the FAA didn't collect the data points, and doesn't oversee military operations. How do you use the noise complaint data to inform your role in mitigating noise, and do some of these outlier complaints that I referenced in my opening statement and now, does that obscure the work?

Mr. WELSH. So, first of all, in the data that we collect, we see a similar trend. About roughly 45 to 50 percent of the complaints are repeat complaints from the same individuals.

However, our primary reason for taking—we take these complaints and respond to them, so—to provide information where we can to address the concerns. So, that is our kind of number-one role we use. And now that we have this noise portal system that I mentioned, where we can better track the data, we are not using that to necessarily make policy changes based on any individual complaints, but we will use it to look at trends over time, or maybe identify hotspots if we do see a spike in concerns in a particular area.

So, the idea would be to use it over time, to kind of consider trends. But it is not really the primary driver of our policy, particularly given some of the issues that you pointed out.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Welsh.

I yield back.

Mr. LARSEN OF WASHINGTON. The Chair recognizes the chair of the full committee, Representative DeFazio of Oregon, for 5 minutes.

Mr. DEFAZIO. Thanks, Mr. Chairman.

Mr. Welsh, can you give us an example of where community engagement has gotten proposed changes enacted to mitigate problems in a particular community?

Mr. WELSH. Yes. Thank you, Chair. I will turn this to my colleague, Beth White.

Ms. WHITE. Thank you for the question, Representative DeFazio.

We have had pretty meaningful engagement on a number of different fronts with different communities. And I can actually point to some successes in San Francisco, Oakland area, and the L.A. Basin, and most specifically San Diego just recently, talking to the airport there. They worked collaboratively with stakeholders and the FAA and developed some solutions to some challenges, noise challenges, in the area.

I would say that in not every instance is there a possibility for there to be a solution. We have all mentioned that we are not removing noise, we are moving noise. So, in some instances there are the operational opportunity to move a flightpath, move a waypoint, adjust the procedure in a way that doesn't affect the safety and efficiency of the operation. But just because we don't have that opportunity in every area, it doesn't mean we are ceasing that engagement. And we remain optimistic that there may be things as we evolve, too, that may change that equation.

I think, really, what we are seeing is, the best way forward is getting the communities and the airports and others engaged in the process when it begins. So, not going back and trying to deconstruct an existing flightpath, but having that meaningful engagement on the front end of a project.

And we are really seeing that with the metroplex efforts in south central Florida, and some of the ones that came along at the end of our new enhanced community engagement. We have, in almost each instance in Florida, we have areas where the community brought to us as part of the process, working with the airport or, again, community roundtables, we were able to incorporate positive flight changes that impacted the community in a positive way.

So, I think that is really where we really want to head strategically in the future, is working with the front end of the project to engage more with the community prior to it getting to a design and implementation.

Mr. DEFAZIO. OK, that seems like some progress.

Looking at, Ms. Krause, your testimony and your graphics, I find it is really extraordinary on page 7, how it seems to me that the DNL is really a pretty indiscriminate measure when you see—you can meet the standards with—have got one really loud plane—I can't even count on the bottom graph. I guess it is 1,000 at 84.4 decibels, but because of the dispersal you still meet 65 decibels. This seems to really cry out for a new measurement, a new way of measuring things.

Ms. KRAUSE. Yes, and that is why we are recommending the FAA consider additional supplemental metrics to DNL.

I mean, changing DNL, as FAA is talking about reviewing, would have some implications to consider in terms of whether you change the metrics or change the threshold. There is regulatory and sort of budget considerations.

But regardless, we think, no one metric really does give a full picture. And so, other metrics, as we were talking about in terms of looking at the number of flights above, or the time above in terms of exposed to certain thresholds of noise, looking at a number of metrics will give communities a better understanding, and FAA a better understanding of potential impacts.

Mr. DEFAZIO. OK. And you also were somewhat critical of the engagement. We have been hearing about improved engagement, forward engagement, pre-engagement before developing routes. Have you seen that progress?

Ms. KRAUSE. In terms of following up on our recommendation, I know FAA has said that they are looking to update some of their guidance on the additional tools and information that might be available by the end of the year. So, we look forward to taking a look at those steps that they are taking in response to our recommendations.

Mr. DEFAZIO. OK, thank you.

Thank you, Mr. Chair.

Mr. LARSEN OF WASHINGTON. Thank you. I will now turn to Representative Fitzpatrick of Pennsylvania.

You are recognized for 5 minutes.

[No response.]

Mr. LARSEN OF WASHINGTON. Just waiting on Representative Fitzpatrick. All right.

[No response.]

Mr. LARSEN OF WASHINGTON. All right.

Representative Van Duyne.

[No response.]

Mr. LARSEN OF WASHINGTON. OK.

Representative Steel.

Mrs. STEEL. Thank you very much, Mr. Chairman.

Mr. LARSEN OF WASHINGTON. You are recognized for 5 minutes. Go ahead.

Mrs. STEEL. Great. The residents of Orange County and of my district care a lot about our airports. In addition to the convenience of having a world-class airport close to home, my constituents are also deeply concerned about the impacts noise and pollution have on our community.

Today I want to focus, as I have before, on the need for greater community engagement by the FAA with our constituents who are most impacted by airport noise. And we went through all these hearings with the FAA for a long time going through the metroplex implementation.

FAA has limited the community engagement officer's interactions to only interacting with the communities that have formed a formal roundtable. This means many in my district are excluded from working on solutions.

Mr. Welsh, it is my understanding that the law currently does not limit how the FAA ombudsman offices interact with local communities to address their concerns. Communities in my district have shared with me that FAA ombudsmen are not engaging with their communities outside of a formal roundtable. What does the FAA need to help fuel these critical conversations at the local level in a timely fashion?

Mr. WELSH. Thank you, Representative Steel. I am going to hand this to Beth White.

Ms. WHITE. Thank you, Representative Steel. Yes. In looking at communities around airports, we have found that it is the most effective way to use the historical place for communities to talk. And that is usually an airport and an airport-sponsored roundtable. And that is really because each individual community may have a desire to have a plane in one area versus another. It doesn't become that larger consensus conversation that the community is making a decision, it would be an individual community.

Now, I understand that the Orange County John Wayne Airport does not have a roundtable. That does not preclude the communities to bring a proposal—if they would like to see something addressed—to the airport, and the airport can bring it to us if that roundtable does not exist.

I will tell you that we were very successful in northern California in putting together and producing a community forum to talk about, in a post-metroplex world, how the operations are working, bring the stakeholders together, and then have a question-and-answer period to talk about what we might be able to do. We have had discussions about a similar type of meeting in southern California, which would allow questions and answers on these issues with your constituents. We are confirming and working with the community and the stakeholders now, but that would be another alternative that we'd offer.

But meeting with individual communities doesn't have a productive effect, because each community has a parochial interest in where they would like to see the aircraft move.

Mrs. STEEL. Ms. White, actually we have a roundtable with city council members from Newport Beach, Costa Mesa, the city of Santa Ana and Tustin. So, we are having—it is not just one community meet the groups, but this is a roundtable that—you know, constantly asking. But those meetings have been very hard to set up, except it has to go through my office to do it. When I was supervisor, we used to try to have a meeting, and then we had one meeting since I came to Congress.

So, you know what? Let's have a little more discussion after this hearing. I would love to talk to you, and I would love to introduce you to the roundtable if you don't know anything about it.

And then how can Congress improve the Office of Ombudsman to truly make them community engagement officers?

Ms. WHITE. Well, the community engagement officers, as I mentioned before, are an integral part of our team. They are the central focal point for all of the issues. And they coordinate with our Air Traffic Organization, they coordinate with our Airport District Offices, our Office of Communications, our regional administrators, our service centers. They are the point in bringing the issues that they see in the community and through their engagement back to the team.

They work, again, as I mentioned, with each one of the regions. They report up and make sure I am aware of issues so I can bring those to the headquarters' attention. I feel like they are really helping us integrate and increase our engagement efforts.

Mrs. STEEL. OK. So, you mean that you have officers that——

Mr. LARSEN OF WASHINGTON. The Representative's time has expired, and you can follow up with Ms. White. We are going to turn to Representative Carson of Indiana.

You are recognized for 5 minutes.

Mr. CARSON. Thank you very much, Chairman.

Just briefly—I am curious. Noise mitigation impact on air traffic efficiency, our committee has strongly supported efforts to improve the efficiency of air traffic management with performance-based navigation. This has also improved fuel efficiency and benefits to our environment. But I don't think we adequately anticipated the increase in noise level with the concentrated flightpaths.

How can noise mitigation be improved without diminished effectiveness for the air traffic improvements, or even fuel efficiency?

And where are the approaches that have worked well that could be utilized in other locations?

Mr. WELSH. Thank you, Representative. That is a great question, and also one of the more difficult questions that we are currently addressing.

It is particularly regarding that tradeoff of efficiency and noise procedures because we really do, when we look at these issues, need to look at them on a case-by-case basis if we are considering changing procedures to address noise concerns.

So, I don't have a specific example for you right now. Perhaps one of my colleagues does. But it is an area that we are very focused on and that we actually—we review. We will look at the fuel burn associated with changes. We will consider those tradeoffs when we are looking at these procedures, because, as you know, we are also very focused on opportunities to continue to reduce emissions and fuel burn from flights throughout the National Airspace System.

And I will just pause to see—I don't know if any of my colleagues want to add anything to that.

[Pause.]

Mr. WELSH. OK, that is it. Thank you.

Mr. CARSON. OK, second question: disproportionate impacts.

Many of my colleagues have pointed out, unfortunately, that some of the communities impacted the most by the worst of these noise problems are disadvantaged communities. Are noise mitigation actions being carried out in a way that doesn't double down on disproportionate impacts on disadvantaged communities?

Mr. WELSH. Thanks, Representative Carson. That is also a really good question. And I think I will start by saying, with President Biden's top priority on environmental justice and equity—and that really has flown down through the FAA—it is one of the top focuses of our Deputy Administrator, Brad Mims.

And so, when we undertake environmental reviews, and work on the issue of aircraft noise, we are absolutely focused on how we can improve environmental justice and equity in those decisions.

That is not to say that we are doing it perfectly, and that there is not a lot of work to do. There is, in fact, yes, absolutely, a lot of work to do to make this a more equitable topic and to reduce impacts on disadvantaged communities. But it is certainly among our top priorities, as we look at this issue.

Mr. CARSON. Thank you. Thank you. Thank you all.

Thank you, Chair, I yield back.

Mr. LARSEN OF WASHINGTON. Thank you. The Chair recognizes Representative Fitzpatrick of Pennsylvania for 5 minutes.

Mr. FITZPATRICK. Thank you, Mr. Chairman. I have a question for Mr. Welsh.

The Trenton-Mercer Airport. The flightpath is right over my district, and my constituents are directly impacted by an airport that is not even located in the State that I represent. TTN is currently seeking FAA approval for an "improvement project." I believe that this is an expansion project because, among other factors, it will make two outdoor and partially used gates into two indoor, fully used gates, which will clearly lead to a significant increase in traffic. This project includes building a brandnew terminal building over existing wetlands to house all four gates.

And obviously, my constituents, as am I, are rightfully concerned about the increase in noise and environmental impacts of this expansion. I believe that a cost-benefit analysis would show that TTN's goal is to increase traffic.

So, my question, sir, for Mr. Welsh, why doesn't the FAA require and publish a cost-benefit analysis for airport projects?

Mr. WELSH. Thank you, Representative Fitzpatrick. I am going to turn this to my colleague, Mike Hines, from the Office of Airports.

Mr. HINES. Thank you for that question. Well, the FAA does require a benefit-cost analysis for projects if the sponsor is seeking funding in excess of $10 million for capacity projects.

We understand this project to be a replacement project, as you said. And what we look at is what is the purpose of the project, and is it justified. And it is our understanding that this is a replacement terminal project, replacing what is currently there, that it will meet the needs of the forecast demand, which was included in the environmental assessment.

When you replace an old, aging facility, there are certain requirements that have to be met for today's standards. For example, the ADA, so the Americans with Disabilities Act standards have to be met. So, there are provisions in the new terminal for those. The Transportation Security Administration guidelines have to—our standards have to be met. So, a lot of times there is additional space just for those requirements.

We also understand that they are taking two aircraft that are essentially operating on the apron, and putting them on a contact gate. We think that does a couple of things: it provides a higher level of service; it provides security and safety for the passengers. Any time that you have—passengers have to walk out of a terminal onto an apron and onto an air stair, there are safety concerns for the passenger, and there are certainly security concerns for the airport.

Mr. FITZPATRICK. Mr. Hines, this project calls for making two rarely used outdoor gates into fully operational internal gates. So, would you agree that, by moving these two gates indoors and making them fully operational, it can cause an increase of annual [inaudible] in airport traffic?

Mr. HINES. So, the way we typically look at projects is we will do the forecast, and is the project meeting the forecast require-

ments. What you are talking about is induced demand, and we believe that the forecasts that were developed for this project are sound, and the facility that is being proposed will meet those requirements.

The desire for an airline, rather, to fly into a certain airport is a lot based on their business plan and, really, where their routes are currently structured.

Mr. FITZPATRICK. TTN has submitted traffic numbers that do not show their full growth over the last decade, another thing I would like you to address. The FAA employment data cited that this project uses 9 years of growing numbers plus 2020 figures to hide the pattern of growth.

So, could you tell us why the FAA would allow 2020, an outlier for air travel, to be included in the FAA forecasted data?

Mr. HINES. Well, it was my understanding that the forecasts were published in 2020 but used 2019 numbers. And, of course, we saw a decline in numbers through COVID, and the numbers, at least in the current draft, catch back up in a couple of years, and show modest growth through the planning period.

Mr. FITZPATRICK. Mr. Chairman, I yield back.

Mr. LARSEN OF WASHINGTON. Thank you. The Chair now recognizes Representative Kahele of Hawaii for 5 minutes.

Mr. KAHELE. Mahalo, Chair Larsen, Ranking Member Graves, and thank you for leading this issue that is of critical importance to my constituents here in Hawaii, which is aviation safety, aviation noise, and environmental impacts.

Mr. Chairman, the number-one issue in Hawaii is helicopter commercial air tour activities, and the associated noise throughout the State, which has been a topic of legislative and regulatory interest at both the Federal and State level for over 30 years.

On the island of Hawaii in 2017, the Hawaii Volcanoes National Park experienced 16,520 commercial air tours a year, second only in the Nation to the Statue of Liberty. That is an average of 46 air tours every single day, 365 days a year, over one of the Nation's most treasured national parks.

I really believe that Americans that go to our beloved national parks should be able to experience them in its quiet and pristine condition. However, air tour management plans, first passed by Congress in 2000, 22 years later have still not been implemented in Haleakalā National Park or Hawaii Volcanoes National Park.

According to the FAA, there are a total of 49 air tour operators conducting tours in the State of Hawaii. And at the core of regulation in Hawaii is the Hawaii Air Tour Common Procedures Manual and the air tour management plans over our national parks.

My question is for Mr. Welsh.

The last time the Hawaii Air Tour Common Procedures Manual was published was in August of 2008. It has lived beyond its useful life, and needs to be updated by the local Flight Standards District Office. There have been significant changes to population density and land use since then, and I believe that the FAA and our local FSDO need to implement new policies and procedures for rotary-wing and commercial air tours, because the current situation in Hawaii is unsustainable. So far, there has been very limited community input and lack of urgency in updating this manual.

So, my question is, can I get an update from you on both the air tour management plan for Hawaii Volcanoes National Park and Haleakalā?

And do you have an update on the Hawaii Common Air Tour Procedures Manual?

And moving forward, will I have your commitment in working together with community organizations and neighborhood boards here in Hawaii through the local Flight Standards District Office to update new policies and procedures, and ensure that they are not written exclusively by the local FSDO and air operators?

Mr. WELSH. Thank you, Representative Kahele.

Just starting with the last one, yes, you have our commitment on that score. As you mentioned, the Common Procedures Manual is something that needs to be updated. And the FAA's flight standards organization is planning to update the procedures associated with that, and modernize how we do that, and will absolutely include public engagement with the communities in Hawaii before doing that, while doing that.

The second topic, on the air tour management plans, the FAA and the National Park Service are currently developing air tour management plans for 24 national parks. We expect to complete approximately 12 to 15 of those by this summer. However, for the parks in Hawaii, it will take a bit longer to do because of the environmental considerations involved, the number of operations, and considerations regarding Tribal engagement. So, we are planning for that to take a little bit longer, but that is in part due to, like I said, the level of helicopter traffic there, and all of the stakeholder interest and consultations. But we are hard at work on that, and we are very closely working with the National Park Service on those air tour management plans. Thank you.

Mr. KAHELE. All right. Thanks, Mr. Welsh, I appreciate your commitment on that.

And mahalo, Mr. Chairman, and I yield back.

Mr. LARSEN OF WASHINGTON. Thank you. I will now recognize for 5 minutes the Representative from Minnesota, Representative Stauber.

Mr. STAUBER. Thank you, Chair Larsen and Ranking Member Graves, for holding this very important hearing today, and I want to thank all the witnesses for their testimony.

I won't have any questions, but I just want to make a few comments, and I agree with many of my colleagues today in the sense that noise mitigation really is a community issue. It is one that should be addressed at a local level, with the help of Federal resources.

There are plenty of folks who will never be happy with any amount of effort that industry, the community, or the airport itself puts in to mitigate noise and disturbances.

However, I would like to highlight an airport in my district that is truly doing it right. The Duluth International Airport has been an outstanding member of the community, and a proud home of the 148th Fighter Wing. They have been incredibly engaged with the community and proactive in voluntarily commissioning a part 150 noise study. This helped them identify current and future noise impacts on the surrounding community, and develop proactive solu-

tions that support thriving air commerce, are supported by the public, and enable the long-term presence of the 148th Fighter Wing. After various public workshops, numerous public advisory meetings, and engagement with the surrounding localities, the Duluth International Airport has cemented itself as a proactive and engaging partner in our community.

This is all to say that airports and industry work really hard to mitigate impacts to their neighbors. They are important job creators to their regions, and we must continue to enable them the freedom to work with their communities in ways that fit their needs.

Mr. Chair, I yield back.

Mr. LARSEN OF WASHINGTON. Thank you, Representative. The Chair now recognizes Representative Williams of Georgia for 5 minutes.

Ms. WILLIAMS OF GEORGIA. Thank you, Mr. Chairman. Today, y'all, I have people tuning in in my neighborhood in southwest Atlanta and the cities of East Point and College Park to listen to this discussion, because it is so critically important to our communities.

Noise and other emissions from our transportation sector are major issues in Georgia's Fifth Congressional District. And, y'all, I know firsthand, because my house is close enough to the Hartsfield-Jackson Atlanta International Airport, the world's busiest and most efficient airport, that planes fly over my neighborhood in southwest Atlanta every 60 seconds. I have timed them, and they start before daybreak and continue past midnight. So, noise issues are a big part of why I am the "no neighborhood nuisance" congresswoman.

Last month, I introduced bipartisan legislation to fund sound barriers for neighborhoods in my district that have too long had to deal with the highway noise. I am deeply committed to cleaner and quieter skies, and I am working on legislation with Chairman Larsen to benefit the communities where our airports reside.

And today I am glad that we are bringing the critical issue of aviation noise to the subcommittee, so that we can get the answers we need to help all of us live peaceful lives in our homes, no matter our zip code, and allowing our airports to continue to thrive.

Mr. Welsh, as you know, the GAO recommended that FAA employ additional communications tools to convey the impacts of noise to communities. I understand the FAA plans to update their guidance on community outreach by the end of the year. In the meantime, has the FAA begun to identify communications tools or key strategies for engagement?

And just let us know where things currently stand for everyone that is tuning in back in my district in Atlanta.

Mr. WELSH. Thank you, Representative Williams. I really appreciate your comments on this topic. And I will say just a couple of things and then hand it to my colleague, Beth White, who focuses on this topic every day.

But we are certainly not waiting to do the updates of our guidance. We are doing a lot of things in real time to help the public. I mentioned the noise portal. We are responding to complaints faster than we ever have before, with an average of 14 days' response. We have put new technology on our website to make information

more readily available, and of course, we are engaging with communities all over the country.

So, I will turn it to Beth to maybe highlight a couple more examples, but I really appreciate those comments.

Ms. WILLIAMS OF GEORGIA. Thank you.

Ms. WHITE. Yes, thank you, Representative. And I think that—just highlighting again—the challenge is that when people look out and see traffic on the road, they know exactly what we are talking about. They can see the congestion, they understand how things get into knots. When you are looking up in the sky, it is a whole different situation.

So, really, for us, developing more effective tools to help communicate how and why the National Airspace System works and what the challenges and constraints are is so important.

And we are working, as Kevin mentioned, we are not waiting. We are developing things that we are putting on our website. We are creating webinars. We are creating other videos and graphics that help us to do that. When we meet with communities, we are very prescriptive in making graphics that show what we are trying to visualize in ways that folks can understand, seeing maps that have communities on them, or roadways, or something that gives them that indication.

We have a very vast website. We just recently added an artificial intelligence chat bot to help folks find those questions, those answers quickly. Kevin mentioned the portal, and we are working diligently to continue to have those updates as fast as we can. But a constituent may have just a single question. And if they go to our website, it might be difficult to find that information.

So, we wanted to put that in place, not to be a barrier, not to be a robot between us and the public, but to help them find information that we may have there. We have added frequently asked questions. We have links to a system that actually visualizes and animates procedures so they can see exactly where they fly.

That chat bot will be moving into Spanish in the next year so we can, again, be more accessible to the community. And we have visualization tools we are working on for the website to even further help explain how and why the airspace operates, which, I think, is the most important point, is effective communication.

Ms. WILLIAMS OF GEORGIA. Thank you. On this committee, we must be doing all that we can to reduce aviation noise and other emissions. And our next generation aircraft need to be cleaner and quieter. Chairman Larsen and I are currently working to update and introduce the House companion of the AERO Act, which would invest in sustainable aviation fuel.

How would investments like this and investments in other aircraft improvements ultimately benefit communities living by our airports?

Mr. WELSH. Thank you. That is really exciting to hear, and it is an area that we are very focused on in the Office of Environment and Energy at FAA with the CLEEN Program that I mentioned in my testimony. And these changes, technology changes—as the aircraft enter the fleet with new technology, we are talking about lower emissions and noise, and improvements for the community.

And you mentioned sustainable aviation fuels, which are perhaps one of the most promising developments, in terms of utilizing existing infrastructure——

Ms. WILLIAMS OF GEORGIA. Mr. Welsh, as exciting as this topic is to me, I am out of time, and I am going to have to continue this conversation offline and report back to my district. Thank you so much for your time.

Mr. WELSH. Thank you.

Ms. WILLIAMS OF GEORGIA. Mr. Chairman, I yield back.

Mr. LARSEN OF WASHINGTON. Yield back. The Chair recognizes Representative Van Duyne of Texas for 5 minutes.

Ms. VAN DUYNE. Thank you very much, Mr. Chairman. And I agree. I mean, this can actually be a very exciting issue to some, especially if you are living right outside the airport, and you are affected by that noise. I was mayor of the city of Irving; DFW Airport is right in the middle of the city. And I can tell you, this is a really very important issue to a number of people.

But airports are a critical economic driver, at the same time, in many of our communities. And in my district, it is no different. DFW Airport is actually one of the largest in the world.

I understand the airport noise to be, predominantly, a local issue. But it often involves multiple stakeholders who have a distinctive authority and share responsibility concerning noise reduction and mitigation. Being a member of this community, it is important for all stakeholders to help address these issues.

At DFW Airport last summer, the airport had to adjust flightpaths on arrivals and departures, due to runway work. Beforehand, the airport reached out to community members to mitigate concerns and address the problem before all the complaints could come in. So, if people were notified of it, they knew. They knew that it was going to be short term, and they knew why it was happening, and I think they were much more accepting of it. And I think communication is key there.

I want to thank all of the panelists for being here, and I have a question for Mr. Welsh.

The 2018 FAA reauthorization bill established aviation noise ombudsmen to serve as a public liaison for questions and complaints related to aircraft noise. Can you tell me what the average response time is in addressing a community's concern or issue?

Mr. WELSH. Sure. Thank you, Representative, for that question.

I will just—as I just previously mentioned, in terms of the complaints we receive, our average response time is about 14 days right now.

And then I will turn it to my colleague, Beth White, if she has anything additional to add.

Ms. WHITE. No, I would just say, again, in some of the engagement then with the regions, whether it is the airport roundtable, our teams are working on a daily basis in communication with those roundtables, with those airports on any upcoming agendas or meetings that they may be having.

Ms. VAN DUYNE. OK, I appreciate that.

In an August 2020 report, GAO noted that, for those stage 3 aircraft that could meet more stringent noise standards, retesting of those aircraft without modifications could cost up to $1 million and

take between 2 to 3 years to complete. Does the FAA have plans to make the retesting and recertification of aircraft when no modifications are required—do you have plans to make that more expedient?

Mr. WELSH. Thank you. We don't currently have plans to do that, but the recertification, of course, wouldn't change the absolute noise level. And what we have found is that those stage 3 aircraft are increasingly in smaller numbers in the fleet. So, actually, our efforts are really focused on making sure that the latest technology gets into the fleet.

And in fact, just recently, at the International Civil Aviation Organization, we worked on a commitment to look at the existing noise standard, and consider updating it over the next 3 years.

Ms. VAN DUYNE. But is there any way that we could expedite it to actually save?

I mean, some of it is bureaucracy. Some of it is the regulatory redtape that we have got to work through. If you don't have plans, I would suggest—I mean, it is one thing to look at new technology coming in and to motivate that, but I think, with the existing technology that we have, if there is a way to expedite it, you might want to consider that.

Mr. WELSH. We will look into that.

Ms. VAN DUYNE. How accurate and reliable are FAA's noise models?

Do the FAA's noise models have the capacity to accurately assess noise from new airspace entrants, such as small and large drones and electrically powered aircraft?

Mr. WELSH. So, we have an AEDT model that is very good at addressing noise for conventional aircraft. But as you mentioned, the new entrants, the new types, we need to improve our tools, and we are in the process of doing that. And part of that is understanding the noise that those vehicles make, because, as we all know, these vehicles look different, they sound different, they operate differently.

So, we are in the process, working very closely with industry, on measuring noise and updating our tools to be able to better understand their noise exposure.

Ms. VAN DUYNE. OK, I appreciate that.

Ms. Krause, could I ask you, how can the FAA prepare for these new entrants when it comes to noise issues?

So, they are looking at it, but what specifically can they do?

Ms. KRAUSE. I think starting to understand and gather data on the noise impacts of these aircraft as they get into service, and there is data available, I think that will be important, as well as starting to think through locations of where these aircraft might operate, and how FAA might have a role in where those are located. Those are some areas to consider.

Ms. VAN DUYNE. All right, thank you.

I am not sure what my time is. I don't know if we started it, but——

Mr. LARSEN OF WASHINGTON. It's right now.

Ms. VAN DUYNE. Excellent. All right, thank you very much. I yield back.

Mr. LARSEN OF WASHINGTON. Thanks a lot.

The Chair recognizes Representative Payne of New Jersey for 5 minutes.

Mr. PAYNE. Thank you, Mr. Chairman.

Mr. Welsh, aviation noise is in populated areas. The problem can seem like an unavoidable one, given airplane flightpaths to airports. However, I understand that the FAA is making progress in the implementation of NextGen, which would upgrade the Nation's air traffic control systems to make use of enhanced capabilities in GPS communications satellites.

The system can also take advantage of new population data to identify new areas of concentrated populations.

How would routing planes to best avoid new population centers reduce aviation noise, and how can advances in NextGen be used to achieve that goal?

Mr. WELSH. Thank you, Representative Payne. So, there are certainly opportunities to do so with the new technologies in place, and looking at the impacts on communities.

As I mentioned, perhaps one of the most significant challenges is the tradeoffs that happen in these dense urban populated areas where we have noise trading off from one community to the other. And so, over the last few years, we have been working in Boston, for example, with the airport and MIT on exactly that: evaluating how we can use existing technology procedures and understanding of noise exposure to make improvements and identifying specific solutions.

There are opportunities there, though it is important to underscore that it is challenging, and there are a lot of tradeoffs that need to be considered among all the stakeholders.

Mr. PAYNE. Thank you.

Ms. Krause, I understand that, as part of the aircraft certification process, noise generated by airplane engines is one of the criteria that is examined. From your testimony, it appears that, while today's aircraft engines have the potential to reduce noise, there is always room for advancement.

How could future aircraft engines be designed so that the noise would be further dampened?

Ms. KRAUSE. I think there are efforts underway to look at electric engines, which hold some promise to addressing some of the noise issues. But I think, in terms of the ways that industry is talking about how those might be used, they could be at a very high frequency and sort of closer to populations.

And so, as you are looking at some of those new technologies, or how the aviation industry is transforming to new and different uses, it will be important to engage with affected communities and understand the impacts as they evolve.

Mr. PAYNE. Thank you. And in terms of the potential of electrifying the engines and that technology, how far along, do you have any idea?

Ms. KRAUSE. There is some testing going on of vehicles now. FAA may be able to speak to some of the actions they are taking when it comes to standards and certification efforts.

Mr. PAYNE. OK, thank you.

And, Mr. Chair, I will yield back.

Mr. LARSEN OF WASHINGTON. Thank you, Representative Payne. The Chair recognizes Representative Lynch of Massachusetts for 5 minutes.

Mr. LYNCH. Thank you, Mr. Chairman. I appreciate it.

Mr. Welsh, look, let me just say it is hard to reconcile your testimony with the testimony of Ms. Krause, and I tend to believe her.

As you know, I represent a big part of the city of Boston and 21 towns and 2 other cities, Brockton and Quincy, in the Eighth Congressional District in Massachusetts. And we have a hellacious problem with aircraft noise in my district. And I find it hard to believe that only 450,000 people across the country have been complaining about aircraft noise. I think I have got that many in my own district, just based on the calls I get and the calls that go into Logan Airport.

And I just want to say, in terms of your outreach program, with all due respect, the last FAA meeting that the FAA agreed to do in my community, my district, we had about 800 people show up, very angry about the nonresponsiveness of the FAA. So, I don't want to be rude, but you have got a lot of work to do in terms of doing real outreach and real listening to the people that we all work for. And that is the truth.

I don't live next to—well, let's—my airport isn't as big as Hartsfield-Jackson or Dallas-Fort Worth, but I live close enough to the airport that I can tell whether the passengers have their trays in the upright position. It goes right over my home. But there is no hope for me, I live so close to the airport. But there are a number of communities that are in the suburban areas of my district, such as the town of Milton, that it has become unbearable for many of the families there to enjoy their yards and go outside. The noise is just unbelievable and extremely unhealthy.

So, we are working with MIT to try to figure out some ways to mitigate the damage. But the damage is being done, and noise has become worse because of the NextGen RNAV system, which has a vector that all these flights go over the same homes each and every day, 365 days a year, and that is a system that you are pushing.

And so, having looked at this—and I am a cochair of the Quiet Skies Caucus, so I deal with this every single day—there are things that you can do to help. And I like the idea of the PBN and looking at case-by-case basis.

In my district, we are right on Boston Harbor. But the layout of the runways, which was established back in the 1930s, goes over the homes, not over the water. So, I have been trying to convince the FAA that we can realign these runways so that we maximize over-the-water landings and over-the-water takeoffs to save the people from the harm that they are experiencing right now. And I need your help on that.

When Logan Airport was laid out, there was very little air traffic in the 1930s, compared to now. And the population wasn't as densely settled. And the aircraft back then had very low thrust, so they needed to take off into the wind. That was much more important than today's situation.

So, I am just looking for some cooperation from the FAA to deal with these problems. Come to my district, have a meeting with us, we will go to Milton High School again. And I guarantee you there

will be at least 800 people waiting to talk to you. But you have got to do much better with your outreach, and we have got to be much more serious about—rather than just waiting for new technology, we have answers that are available now, but we have got to work together.

And we all work for these people, the public. The FAA has been one of the most unresponsive public agencies that I deal with and that my constituents deal with. And that is not a good reputation for the FAA to have. So, I just ask you to—I have consumed all my time, but you got to do better. You have got to do better. And I will meet you halfway, but you have got to do better. Thank you.

Mr. LARSEN OF WASHINGTON. Thank you, Representative Lynch.

Just to make sure the FAA—I won't call on the FAA to respond, but I want to make sure the FAA responds to Mr. Lynch's offer.

Now I will recognize Representative Stanton of Arizona for 5 minutes.

Mr. STANTON. Thank you very much, Mr. Chairman. During my time as mayor of the city of Phoenix, the FAA unilaterally altered flightpaths out of Sky Harbor International Airport. This was done without proper notice or public outreach to the city or to the surrounding neighborhoods.

Prior to those changes, the airport had fewer than 25 noise complaints a year. With the altered flightpaths, air traffic over city neighborhoods increased by 300 percent, and noise complaints skyrocketed to 12,000 a year; ended land-use and development decisions that I—as a member of city council and mayor—and the city had made over decades based on the air traffic routes that had been in place for decades.

Despite our best efforts to work with the FAA, we eventually had no other choice than to fight these changes in court. And we won. The court recognized the FAA's lack of engagement with the city and the affected communities, and noted that, "The FAA found a potential for controversy, but did not notify local citizens and community leaders of the proposed changes as the agency was obligated to do so, much less allow citizens and leaders to weigh in." This resulted in the implementation agreement between the city, the historic neighborhoods nearby the airport, and the FAA to return departure routes to their pre-2004 locations.

Now, fast forward a few years. In October, the FAA regional administrator for the Western Pacific region notified my office that the FAA was considering possible changes to the procedures at Sky Harbor, and that a working group was formed to study concept related to the airspace. I have questions regarding this issue.

Mr. Welsh, my understanding is that this working group will not reopen or in any way alter the implementation agreement with the city of Phoenix. Is that correct?

Mr. WELSH. Thank you, Representative Stanton. I do not know the answer to that question today, so I would have to follow up with you. I am not sure that my colleagues do either, but I will turn it to Beth, in case she does have information.

Mr. STANTON. Can anyone else answer that easy question? Is that correct, that there will not be an alteration to the implementation agreement with the city of Phoenix?

Ms. WHITE. I understand that there is going to be a full working group. It was set up for pre-COVID, around December, and then they had to readjust that as being rescheduled.

But I also would prefer, Representative, to get back to you on that answer, and not speak to legal matters without confirming.

Mr. STANTON. OK. I appreciate a swift answer to that very fair question.

Hard lessons were learned from the FAA's failure to conduct the proper environmental studies and public outreach before implementing the 2014 changes.

As the working group moves forward, community engagement and dialogue will be paramount. However, I am concerned that the FAA has not yet communicated with the public on this group, or the purpose. What is the FAA's plan and timeline for community engagement related to this working group with communities in the Phoenix metropolitan area, Mr. Welsh?

Mr. WELSH. Thank you, Representative. We will have to follow up with you. I apologize for not having a specific answer, but I also want to acknowledge your point about the lessons learned, and the fact that what we did in Phoenix—and have learned from it—has changed how we do business.

And so, we will absolutely follow up with you, and commit to that type of engagement.

Mr. STANTON. I appreciate that. I look forward to hearing that answer, and I am glad to hear that there were lessons learned for all involved.

How will the FAA ensure that any future flightpaths in the Phoenix area will be done with complete stakeholder and community engagement, Mr. Welsh?

Mr. WELSH. Thank you. I will hand that one to Beth.

Ms. WHITE. Thank you, Representative. And I want to echo what Kevin said, that I do think that the situation in Phoenix, and as we developed the number of the metroplex projects, was definitely a turning point and a lesson learned for the FAA on outreach, and what we needed to do, and how we needed to do it sooner and in different ways, in ways that we really were doing a better job of explaining what we are talking about with the purpose and need, really, of these procedures as we modernize the National Airspace System.

As we just talked about a minute ago, talking about a full working group, we have been engaging with the airport, the region has, on this very early. We are working on a communications and community engagement strategy with the airport, with the local offices there to ensure that we are reaching out to the community, taking those lessons learned, and ensuring that we are getting out effectively and early.

Mr. STANTON. One final point, and that is this: I am a mayor. I come to this job in Congress with a mayor's hat. We work really hard at the local level to develop land-use plans around our airport. We have an urban airport. We are blessed with an urban airport. We make land-use plans around the airport to best facilitate the balance between protecting neighborhoods, particularly historic neighborhoods, and the needs of a growing airport. And what the FAA did was kind of upended that balance. And we hope in the fu-

ture that you will take into better account the important land-use decisions that local officials have made to——

Mr. LARSEN OF WASHINGTON. The Representative's time has expired.

Mr. STANTON [continuing]. Best implement aviation in our community.

Thank you so much.

Mr. LARSEN OF WASHINGTON. Thank you. The Chair recognizes Congresswoman Holmes Norton from Washington, DC, for 5 minutes.

[No response.]

Mr. LARSEN OF WASHINGTON. Just a moment. We have Members who are signed up to speak who are not on screen. So, I am going to give folks a moment to get back on the screen, if the witnesses would just be patient.

[Pause.]

[Discussion off the record.]

Mr. LARSEN OF WASHINGTON. OK, that concludes questions for panel 1. I want to thank the witnesses from the FAA and the GAO. We will have some followup questions for you all, and I look forward to getting prompt answers to those, as well as prompt answers to the questions that were asked of you by Members today.

So, with that, we will move on to panel 2, and I thank the witnesses from panel 1.

And as panel 2 comes up on the screen, we will let folks know for the record we will be hearing testimony from witnesses on panel 2. I ask the witnesses on the panel to please turn the cameras on, and keep them on for the duration of the panel.

The witnesses on panel 2 are Sharon Pinkerton, the senior VP of regulatory and legislative policy at Airlines for America; Frank R. Miller, the executive director of Hollywood Burbank Airport, he will be here on behalf of Airports Council International–North America; David Silver, who is the vice president for civil aviation of Aerospace Industries Association; Emily J. Tranter, the executive director of the National Organization to Insure a Sound-Controlled Environment; and JoeBen Bevirt, the CEO of Joby Aviation.

I want to thank you for joining us today, and we look forward to your testimony.

Without objection, our witnesses' full statements will be included in the record.

Since your written statement has been made part of the record, the subcommittee requests that you limit your oral testimony to 5 minutes.

And we will hear from the witnesses in the order that I have introduced them. So, we will start with Sharon Pinkerton of Airlines for America.

You are now recognized for 5 minutes.

TESTIMONY OF SHARON PINKERTON, SENIOR VICE PRESIDENT, LEGISLATIVE AND REGULATORY POLICY, AIRLINES FOR AMERICA; FRANK R. MILLER, EXECUTIVE DIRECTOR, HOLLYWOOD BURBANK AIRPORT, ON BEHALF OF AIRPORTS COUNCIL INTERNATIONAL–NORTH AMERICA; DAVID SILVER, VICE PRESIDENT FOR CIVIL AVIATION, AEROSPACE INDUSTRIES ASSOCIATION; EMILY J. TRANTER, EXECUTIVE DIRECTOR, NATIONAL ORGANIZATION TO INSURE A SOUND-CONTROLLED ENVIRONMENT (N.O.I.S.E.); AND JOEBEN BEVIRT, FOUNDER AND CHIEF EXECUTIVE OFFICER, JOBY AVIATION

Ms. PINKERTON. Chair Larsen, Ranking Member Graves, members of the subcommittee, thank you for inviting Airlines for America to be part of this important discussion on reducing noise.

We have made significant progress working together in reducing noise impacts. In fact, since 1975, the number of people exposed to significant levels of aircraft noise has dropped by 94 percent at the same time the number of people traveling has more than quadrupled.

Now, we recognize that, despite this tremendous progress, more work remains to be done. And that is why you have the airlines' commitment and our commitment to continue to work on both reducing our aircraft noise footprint and our——

Mr. LARSEN OF WASHINGTON [interrupting]. Ms. Pinkerton, this is the chair. You are not showing up on the screen, so you can check your camera, please.

Ms. PINKERTON. Can you see me now?

Mr. LARSEN OF WASHINGTON. Thank you very much. Now I can see you. We could hear you, we couldn't see you.

Ms. PINKERTON. Very good.

Mr. LARSEN OF WASHINGTON. Thank you. All right, go ahead, just continue where you were.

Ms. PINKERTON. Thank you. We have made good progress on both the noise side, but also the emissions side, as well.

The fuel efficiencies we have achieved over the last many decades equate to taking 27 million cars off the road each year.

As you know, last year, in coordination with the administration, we announced our mutual goals of achieving net-zero emissions by 2050, as well as having 3 billion gallons of cost-competitive, sustainable aviation fuel available by 2030.

Now, you might be asking why I am talking about climate change at a noise hearing, but that is because these two goals are really interdependent, and sometimes in conflict with each other, which we will talk more about later. But with that context, what I would like to do today is talk about what actions carriers are taking to reduce noise.

Well, first, I would be remiss if I didn't state the obvious, and that is that COVID initially devastated our industry, bringing it to a standstill. The last 2 years have been rocky, but there is no doubt that less noise was generated. Fortunately, domestic operations are recovering. International operations are still lagging. Most experts don't expect our operations to return to 2019 levels until 2023 at the earliest, maybe 2024.

But if there is a silver lining to COVID and this demand drop-off, carriers not only parked planes, but we retired our oldest and

noisiest fleet. Carriers have spent almost $60 billion in the last 5 years on quieter and more efficient aircraft and engines, as well as other technologies. And those airplanes are 50 percent quieter than planes we bought just 10 years ago. That is important because, as you have heard the FAA say, reducing noise at the source through improving technology is the most effective way to reduce noise.

That is also why airlines have been leading advocates for more resources spent on research and development programs for noise-reducing technologies.

Last year, we helped spearhead the Green Aviation Coalition, with all stakeholders urging Congress to devote more resources to FAA's CLEEN and ASCENT Programs that you heard the FAA discuss.

So, we have got technology and operations that airlines are using to drive down noise, but standards play a key role, as well. And as a result, A4A and our members are key participants in the process at the International Civil Aviation Organization as they develop more stringent noise standards for new aircraft.

The stage 5 standard, which has been effective since 2018, requires new aircraft to be 35 percent quieter. And as the FAA mentioned, ICAO has already turned their attention to developing the next more stringent standard.

In addition, airlines are engaging with the FAA as they evaluate the 65 DNL metric. We don't have a position on whether the metric should be changed, or other metrics should be used, but we are very open to having a data and evidence-driven discussion about the issues that FAA outlined.

Finally, community roundtables. They are absolutely a critical tool in the toolbox for addressing noise. As you well know, Congress asked the FAA to step up their engagement in community roundtables. A4A and our carriers supported FAA in doing that. We stepped up our own engagement, as well, to be at the table. We recognize that, even when NextGen procedures result in overall reduction in noise, noise can shift, or be concentrated over certain flightpaths, creating legitimate concerns. That is why these roundtables are such a critical element of balancing the sometimes conflicting goals of noise and emissions reductions. We want to accomplish both.

To wrap up, we have made significant progress in reducing both noise and emissions, but we know more work remains to be done. We need to utilize all the tools in our toolbox if we are going to achieve our shared goal, which is a safe and efficient air traffic control system that supports a vibrant aviation system that creates excellent jobs, connects people, keeps our supply chain moving, all while minimizing our noise and emissions footprint.

Thank you again for this opportunity. I am happy to take any questions.

[Ms. Pinkerton's prepared statement follows:]

Prepared Statement of Sharon Pinkerton, Senior Vice President, Legislative and Regulatory Policy, Airlines for America

On behalf of our Airlines for America® (A4A) members,[1] thank you Chairman Larsen and Ranking Member Graves for the opportunity to testify today. The U.S. airlines have long understood that if we are to remain a critical engine of prosperity and progress we must proactively address and reduce environmental impacts associated with flying. This is especially true with regard to aircraft noise, and engaging with and responding to concerns of local communities will continue to be essential to successfully addressing aircraft noise in the future.

With a strong track record of deploying new, quieter technology and implementing noise abatement operational procedures, the U.S. airlines have played a critical role in the tremendous reductions in aircraft noise exposure achieved in the United States to date. Indeed, Federal Aviation Administration (FAA) data confirm that the number of people exposed to significant levels of aircraft noise in the United States dropped by 94% between 1975 and 2019, even as enplanements nearly quintupled[2] and the importance of air transportation to the continued vitality and growth of our national, state and local economies dramatically increased. Before the COVID–19 pandemic U.S. airlines drove about 5% of the nation's GDP, transporting 2.5 million passengers and 58,000 tons of cargo per day, helping drive $1.7 trillion in annual economic activity and more than 10 million jobs.

Aircraft noise cannot be addressed in isolation as we face equally pressing needs to address other environmental impacts—especially climate change. This can be challenging as technologies and strategies that reduce noise can have independent, often countervailing effects on other environmental impacts. For example, procedures and technologies that reduce noise may negatively affect fuel efficiency and, thus, aircraft emissions, including emissions of greenhouse gases (GHGs). Despite these challenges, our success in dramatically reducing aircraft noise has been matched by equally dramatic success in reducing aircraft emissions. Over the past several decades, the U.S. airlines have improved fuel efficiency and reduced GHG emissions by investing billions in fuel-saving aircraft and engines, innovative technologies like winglets (which improve aerodynamics), and cutting-edge route-optimization software. As a result, between 1978 and 2019, U.S. carriers improved their fuel efficiency by over 135%, saving more than 5 billion metric tons of carbon dioxide (CO2), which is equivalent to taking more than 27 million cars off the road on average in *each* of those years. Looking at a more recent snapshot, data from the Bureau of Transportation Statistics confirm that the U.S. airlines improved their fuel- and CO2-emissions efficiency by 40% between 2000 and 2019.

As leaders of a global aviation coalition, we have been committed to aggressive emissions goals for many years. In March 2021, A4A and our carriers announced a significant strengthening of our goals: we pledged to work across the aviation industry and with government leaders in a positive partnership to achieve net-zero carbon emissions by 2050. A4A carriers also pledged to work with the government and other stakeholders toward a rapid expansion of the production and deployment of commercially viable Sustainable Aviation Fuel (SAF) to make 2 billion gallons available to U.S. aircraft operators in 2030. On September 9, 2021, as a complement to the federal government's announcement of a SAF "Grand Challenge," A4A and its members increased the A4A SAF "challenge goal" by an additional 50%, calling for 3 billion gallons of cost-competitive SAF to be available for use in 2030. These

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[1] A4A's members are: Alaska Airlines, Inc., American Airlines, Inc., Atlas Air, Inc., Delta Air Lines, Inc.; Federal Express Corporation, Hawaiian Airlines, JetBlue Airways Corp., Southwest Airlines Co., United Airlines Holdings, Inc. and United Parcel Service Co. Air Canada, Inc. is an associate member.

[2] From 1975 to 2019, the number of enplaned passengers grew from 202 million to 967 million, while the number of people exposed to significant levels of aircraft noise fell from 7 million to about 440 thousand. From 2000 to 2019, noise exposures were reduced by 50% while enplanements rose 37%. See: https://www.airlines.org/dataset/u-s-airlines-tremendous-noise-record. During this period, cargo service grew even more rapidly, rising over 600% from 6.2 revenue ton miles (RTMs) in 1975 to 43.5 RTMs in 2019. *See also* FAA, *Overview of FAA Aircraft Noise Policy and Research Efforts: Request for Input on Research Activities To Inform Aircraft Noise Policy*, 86 Fed. Reg. 2722, 2723 (January 13, 2021) ("Since the mid-1970s, the number of people living in areas exposed to significant levels of aircraft noise in the United States has declined from roughly 7 million to just over 400,000 today. At the same time, the number of commercial enplanements has increased from approximately 200 million in 1975 to approximately 930 million in 2018") (footnote omitted); FAA History of Noise ("In 1975, one person on the ground experienced significant noise exposure for every 30 enplanements, compared to today where more than 2100 enplanements are flown for every person on the ground experiencing significant noise exposure.") (available here: https://www.faa.gov/regulations__policies/policy__guidance/noise/history/).

new goals were adopted in the midst of the most severe economic crisis the commercial aviation sector has ever faced, demonstrating the strength of the airline industry's commitment to the environment and the depth of our recognition that environmentally responsible growth is essential to the vitality of our sector.

We recognize that despite our tremendous progress to date, aircraft noise remains a critical concern to many, particularly local communities. As such, ensuring continued progress in addressing aircraft noise levels—together with reducing aircraft emissions—remains a critical concern to U.S. airlines. A4A and our members are especially attuned to the reality that any particular person experiencing aircraft sound may have a negative experience and that changes in the sound environment—including those resulting from changes in aircraft operations—can influence that experience. Accordingly, we are strongly committed to continued progress and support the array of aircraft noise management regulations and procedures in place to address aircraft noise as well as ongoing efforts to assess concerns about aircraft noise. Here, it is essential to continue to improve community engagement, to continue participation in processes leading to the adoption of new or changed aircraft operational procedures and to reaffirm and expand the commitment of funding for research and development of noise reduction technologies. Finally, we welcome and strongly support the FAA's initiative to conduct a comprehensive, evidence-based, and inclusive review of existing noise policy.

AIRLINES' EFFORTS TO ADDRESS AIRCRAFT NOISE

The tremendous progress made in reducing aircraft noise over the last several decades did not occur by happenstance. Rather, this success is the result of hard work and collaboration among policymakers, including Congress, the FAA and state and local officials, and aviation stakeholders including airlines, airports, aircraft and engine manufacturers, and community representatives. A4A and our member airlines are proud to have had a critical role in this success and welcome this opportunity to briefly highlight the activities that have brought past progress. We are committed to continuing these efforts and are confident they will contribute to further reducing aircraft noise and positively and proactively addressing ongoing public concerns.

Reducing Aircraft Noise at the Source

Acquiring Quieter Aircraft

Reducing noise at the source is inarguably the best way to reduce aircraft noise impacts on communities and deployment of new, quieter aircraft has been a key focus of carriers. Indeed, the FAA has affirmed that "the single most influential factor" contributing to the dramatic decline in the public's exposure to aircraft noise has been the "transition to quieter aircraft, which effectively reduced the size of the areas around airports experiencing significant noise levels."[3] Despite the significant financial challenges posed by the COVID–19 pandemic, airlines have continued to invest heavily in new aircraft. From 2017–2021, U.S. cargo airlines spent approximately $20 billion on aircraft and related equipment and took delivery of 154 aircraft; for 2022, they plan to spend an additional $5 billion for new aircraft, with 77 on firm order. U.S. passenger airlines took delivery of more than 1,300 new aircraft from 2017–2021, spending approximately $48 billion on aircraft, with plans to spend approximately $15 billion this year[4] and firm orders for 2,198 new aircraft for delivery in 2022 and beyond. These new aircraft are 75% quieter than first generation jets and 50% quieter than jets coming off the line 10 years ago.[5] The practical impact of the 75% reduction noise produced by aircraft is to decrease the area impacted by aircraft noise by an even greater amount.[6] Operating much quieter air-

[3] 86 Fed. Reg at 2723.

[4] Total capital expenditures of U.S. publicly traded passenger airlines were $73 billion from 2017–2021 and are expected to reach a record $23 billion in 2022 alone. This tally includes payments made for aircraft and other flight equipment, ground and other property and equipment (e.g., vans, air stairs, lavatory trucks, deicing vehicles), airport and other facility construction and information technology. The expenditures for aircraft are conservatively estimated to account for two-thirds of total capital expenditures.

[5] CRS, *Supersonic Passenger Flights* (Nov. 14, 2018) at 11 ("[I]n general, the subsonic commercial aircraft fleet is considered to be 75% quieter overall than aircraft produced in the 1970s"): The Boeing Company, *2021 Sustainability Report* at 21 ("each new generation of Boeing airplanes reduces emissions and fuel use 15%–25% more than the previous generation and has noise footprints up to 50% smaller than its predecessors").

[6] See National Aeronautics and Space Administration (NASA), *Fact Sheet: NASA's Quiet Aircraft Technology Program* (available here: https://www.nasa.gov/centers/langley/pdf/

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craft also enables carriers to provide more service without increasing overall noise impacts to the communities they serve: as the FAA affirms, "the noise produced by one Boeing 707–200 flight, typical in the 1970s, is equivalent in noise to 30 Boeing 737–800 flights that are typical today." [7]

While the pandemic severely impacted the industry, it also accelerated the turnover of our industry's fleet as older, noisier, and less efficient planes have been grounded and will ultimately be replaced by quieter and more efficient aircraft as we continue to emerge from the crisis. As a result, carriers started 2021 with an operating fleet nearly 20% smaller than at the beginning of 2020, with the bulk of aircraft removed from service being older aircraft with greater noise footprints. In fact, in 2020, the top nine carriers retired 339 aircraft, with 280 more retirements announced to occur in the coming years. From 2017–2021, the 11 top passenger carriers and their regional airline partners removed over 1,500 aircraft from service, with over half removed in the last two years. So, as we build back our fleets from COVID–19 we will not only start from base fleet that is quieter but, as demand for air travel recovers, we will meet that demand by expanding our fleets with quieter (and more fuel-efficient) aircraft.

Supporting More Stringent Aircraft Noise Standards

A4A and our members have also strongly supported the development and implementation of increasingly stringent aircraft noise standards, which help ensure that as airlines acquire new aircraft those aircraft are ever quieter. As you know, aircraft noise certification standards are developed and approved at the international level through the International Civil Aviation Organization (ICAO) and incorporated into U.S. law by the FAA. International coordination and cooperation are critical to ensure aircraft manufacturers can market their aircraft throughout the world and airlines have access to aircraft with improved noise performance. A4A and its member carriers commit significant time and resources to the ICAO process and have long supported the development of successively more stringent aircraft noise standards as we see this as critical to helping reduce aircraft noise at the source. The latest ICAO noise certification standard (codified as the Stage 5 noise standard in the United States) went into effect for large aircraft at the end of 2017 and for small aircraft in 2020. This new standard requires a cumulative reduction of 7 decibels from Stage 4 standards (ICAO's Chapter 4 standards adopted in 2006), which required a cumulative reduction of 10 decibels from the Stage 3 (ICAO Chapter 3) limit.[8] In an August 2020 report, the U.S. Government Accountability Office (GAO) found that "96 percent of large commercial airplanes [in the United States] are able to meet stage 4 or 5 standards." [9] Importantly, the recent February 2022 meeting of ICAO's Committee on Aviation Environmental Protection (CAEP), agreed that it would explore development of a new "dual" standard governing aircraft noise and CO2 emissions, updating the existing standards by combining them into one "integrated" standard that would strengthen both aspects.[10] This will be challenging, but as pointed out above there can be significant interdependences (tradeoffs) between noise and CO2 emissions and A4A is fully supportive of this effort. A4A—as always—will be participating in this ICAO effort to establish a standard that will provide the foundation for the production and certification of even quieter and more fuel-efficient aircraft in the future.

Supporting Investment in Research & Development

The U.S. airlines also are engaged in public-private partnerships with FAA, National Aeronautics and Space Administration (NASA) and aircraft and engine manufacturers to further advance quiet aircraft technology through efforts such as FAA's Continuous Lower Energy, Emissions and Noise (CLEEN) and Center of Excellence for Alternative Jet Fuels and Environment (ASCENT) programs. The CLEEN program has the longstanding goal to achieve a 25dB cumulative noise reduction relative to Stage 5. As part of CLEEN III, the noise goal has been updated to include

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70882main_FS-2002-09-73-LaRC.pdf). See also EASA, Aircraft Noise—Figure 2.1 (available here: https://www.easa.europa.eu/eaer/topics/technology-and-design/aircraft-noise).

[7] 86 Fed. Reg. at 2723 (footnote omitted).

[8] For more detailed discussion of the history of ICAO's noise standards, see Government Accountability Office, *Aircraft Noise—Information on a Potential Mandated Transition to Quieter Airplanes* (August 2020) at 7–10.

[9] *Id.*, "Highlights" summary.

[10] The Obama Administration negotiated the existing first-of-its-kind CO2 Certification Standards for Aircraft, which were adopted by ICAO in 2017 and adopted into U.S. law in January 2021 (*Final Rule, Control of Air Pollution From Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures*, 86 Fed. Reg. 2136 (Jan. 11, 2021) and will not be fully implemented until 2028.

a new element that explicitly targets reductions in community noise exposure. CLEEN has supported development of multiple technologies that help reduce noise, including adaptive trailing edge systems, advanced acoustic fan and liners, and composite frame, integrated propulsion system nacelle and ultra-high bypass propulsion technologies. An analysis completed by the Georgia Institute of Technology has confirmed that technologies developed "in the first phase of CLEEN will contribute to a 14% decrease in the land area exposed to significant noise, as defined by a day-night noise level (DNL) of 65 dB."[11] CLEEN III will support development of quiet high-lift systems and landing gears as well as advanced engine fan, combustor and nacelle technologies that will further reduce noise.[12] Importantly, Clean III also includes an effort to develop "noise-optimized flight path algorithms with integration into the Air Traffic Management System" to enable reduction of community noise exposure. As discussed above, airlines are investing billions to acquire these technologies in the form of new aircraft and engines as they become available. Importantly, CLEEN and ASCENT are also advancing our understanding of the relationship between aircraft noise exposure and health impacts, helping ensure that policy is based on sound, peer-reviewed science.

Responsibly Implementing New Noise-Reducing Aircraft Operational Procedures and Championing Community Engagement

Implementation of the Next Generation Air Transportation System (NextGen) has been a key priority of both the FAA and airlines as it is essential to improving the safety, efficiency and capabilities of the National Airspace System (NAS). Performance Based Navigation (PBN) is a core element of NextGen and a key to delivering its benefits including the potential to reduce environmental impacts on communities. NextGen not only improves safety of flight, it also critically improves efficiency, which directly translates into emissions reductions, not only of carbon emissions but other "criteria" pollutants subject to National Ambient Air Quality Standards (NAAQS), such as oxides of nitrogen (NOx, a precursor to the formation of ozone) and particulate matter (PM). Reductions of such pollutants can be particularly relevant in areas that have failed to attain NAAQS (known as non-attainment areas), many of which are urban areas where achieving environmental justice is a particular challenge that must be met.[13] Accordingly, A4A and our member carriers are keen to ensure implementation of NextGen delivers these benefits to local communities.

Implementation of new procedures can also reduce net noise exposures around an airport. However, we recognize that in some cases PBN procedures may concentrate flight paths such that certain members of the community experience more noise or frequency of noise events, while others benefit from noise reductions. In addition, there have been challenges in communicating to affected communities the potential changes in the noise environment that can come with implementation of new procedures. No one benefits when new procedures are put in place after public consultation only for the procedures to be questioned on grounds that potential impacts were not properly communicated. Airlines devote a great deal of time and resources to ensure the successful development and implementation of new procedures. Uncertainty regarding newly adopted procedures not only puts their considerable benefits at risk but raises the specter of reverting to less efficient procedures that potentially increase overall noise impacts as well as emissions.

For these reasons, A4A and our members have championed improvements to the process used to develop new procedures to ensure communities are heard and their views taken into account as the procedures are developed and implemented. For example, A4A and our members were active participants in the NextGen Advisory Committee's (NAC) PBN Blueprint Community Outreach Task Group, which developed recommendations and best practices for community engagement for large and small NextGen projects, much of which centered on engaging with communities re-

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[11] Continuous Lower Energy, Emissions and Noise Program (CLEEN) Summary and Status Report (available here: https://www.faa.gov/newsroom/continuous-lower-energy-emissions-and-noise-cleen-program#__Toc80621736). An analysis of the noise benefits of CLEEN II technologies is expected this year.

[12] See https://www.faa.gov/newsroom/continuous-lower-energy-emissions-and-noise-cleen-program

[13] A4A and its members have long supported development and implementation of increasingly stringent aircraft engine standards governing NOx emissions. In addition, we strongly support the Environmental Protection Agency's pending proposal to adopt PM standards for aircraft engines. *Control of Air Pollution from Aircraft Engines: Emissions Standards and Test Procedures*, 87 Fed. Reg. 6324 (February 3, 2022).

garding aircraft noise exposures.[14] More recently, A4A was the principal author of a report prepared to respond to the FAA's request to the NAC for further advice regarding "delivery and use of PBN capabilities and in achieving operational benefits."[15] This report underscored that "the aviation community supports the sentiments in the FAA Administrator Dickson's January 24, 2020 letter to House of Representatives Member, Eleanor Holmes Norton, that the FAA is committed to engagement and dialogue with communities."[16] The report went on to affirm:

> There is a recognition from the aviation community and the FAA that *this engagement must include local communities*. The FAA has employed a series of enhancements to its community engagement efforts, incorporating interface opportunities at several points throughout the procedure development process. This engagement occurs early and often on multiple levels to ensure an understanding of the need for the procedural changes and what the proposed changes could mean to the community.
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> *While this engagement has increased the time and cost associated with the development and implementation of PBN procedures, it is necessary and appropriate*. The expectation of the Workgroup is that the FAA's efforts to expand community engagement and to increase outreach and partnership with airport authorities will help address concerns and decrease costly challenges. *The aviation community will continue to support the FAA in its community engagement efforts to further the common goal of national PBN proliferation*.[17]

We have done more than just champion improvement of community outreach efforts: A4A and our members have been actively engaged in numerous community roundtables throughout the country. A4A, for example has presented by invitation to community roundtables for Ronald Reagan National (DCA), Charlotte Douglas International (CLT), San Francisco International (SFO), Chicago O'Hare International (ORD) and Minneapolis-St. Paul International (MSP) and participated directly in former Congressman Rouda's Coastal Orange County Aircraft Noise Mitigation Task Force. A4A has also facilitated our members' participation in multiple FAA community outreach sessions regarding procedure changes, including at the Las Vegas, Denver, South-Central Florida, Northern California and Southern California Metroplexes. A4A members also have proactively engaged with communities, participating directly in community roundtables dedicated to addressing aircraft noise issues at airports throughout the country, including:

- DCA: Reagan National Community Noise Working Group
- Seattle International (SEA): SEA Stakeholder Advisory Round Table (StART)
- John Wayne International (SNA): City of Newport Beach and Airport Working Group; Coastal Orange County Aviation Noise Task Force
- Los Angeles International (LAX): LAX/Community Noise Roundtable
- John F. Kennedy International (JFK) and LaGuardia International (LGA): New York Community Aviation Roundtable, JFK Airport Committee and LGA Airport Committee
- Fort Lauderdale-Hollywood International (FLL): Broward County Aviation Department Noise Abatement Committee
- Baltimore/Washington Thurgood Marshall International (BWI): DC Metroplex BWI Community Roundtable
- Louisville Muhammad Ali International (SDF): SDF Community Noise Forum
- CLT: Airport Community Roundtable
- ORD: O'Hare Noise Compatibility Commission
- San Francisco International (SFO): SFO Airport/Community Roundtable
- MSP: Metropolitan Airports Commission—Noise Oversight Committee
- Boston Logan International (BOS): Massport Community Advisory Committee
- San Diego International (SAN): Airport Noise Advisory Committee

In this context, it is important to point out that to successfully address impacts of aircraft noise on communities, all stakeholders need to pull in the same direction. We note that even with strong engagement from airlines, airports and other community members warning against adoption of local plans that permit land uses incom-

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[14] *See* PBN Blueprint Community Outreach Task Group—Report of the NextGen Advisory Committee in Response to a Tasking from The Federal Aviation Administration (June 2016).

[15] Letter from Daniel K. Elwell, FAA Deputy Administrator (December 10, 2019), included as Appendix A to *Final Report of the Major Air Carrier Performance Based Navigation (PBN) Way Forward Workgroup for the FAA's PBN Clarification Tasking to the NextGen Advisory Committee (NAC)* (June 2020) (2020 PBN Way Forward Report).

[16] 2020 PBN Way Forward Report at 18–19.

[17] 2020 PBN Way Forward Report at 19 (emphasis added).

patible with aircraft noise, local governments have nonetheless approved such plans. Recently, the City of Newport Beach approved a 13-acre development including a 314-apartment building near John Wayne International Airport, and the Fairfax County Board of Supervisors approved the construction of residential townhouses directly under the flightpath and within Dulles International Airport's 65 dBA DNL noise contours. Certainly, such actions are not the only reason for the challenges we all face in addressing aircraft noise and, as discussed in detail above, airlines recognize their responsibility to take strong measures to reduce noise impacts. However, it is imperative that local governments also take into account public concerns about aircraft noise and act responsibly when considering land use decisions within their jurisdictions.

Supporting Airports in the Development of Airport Noise and Land Use Compatibility Planning Studies (Part 150 Studies)

Airlines also support airports in the development of Airport Noise and Land Use Compatibility Planning Studies (known as "Part 150 Studies" because they are undertaken pursuant to a process defined in 14 CFR Part 150).[18] Under the FAA's Part 150 program, an airport can voluntarily develop a Noise Exposure Map and consider noise mitigation measures to reduce exposure to significant aircraft noise levels around airports both by reducing existing and preventing new noncompatible land uses, such as residential housing or schools. Such measures are included in a Noise Compatibility Program (NCP) developed through a collaborative process which must include public notice and opportunity to comment before it is submitted to FAA for approval. Airlines have participated alongside community members in the development of Part 150 Studies across the country. Noise mitigation measures can include noise insulation and land acquisition programs as well as aircraft noise abatement routes and procedures.[19] The programs are largely funded through two sources, Passenger Facility Charges (PFCs, federally approved local taxes collected by airlines and remitted to airports) and Airport Improvement Program (AIP) grants (funded through the Airport and Airway Trust Fund, which is predominately funded through taxes on airlines and their customers). To date, more than 250 airports have used the Part 150 process to implement noise mitigation measures costing nearly $10 billion.[20]

LOOKING FORWARD—AIRLINES SUPPORT TAKING A HARD, EVIDENCE-BASED LOOK AT NOISE POLICY

A4A and our members welcome FAA's recent confirmation that it is undertaking a comprehensive review of current federal policy on aircraft noise. We agree with FAA Administrator Dickson's affirmation that this review must be "thorough and nuanced" and based on evidence,[21] including data developed through FAA research and its Neighborhood Environmental Survey (NES), as detailed in its recent Federal Register Notice on FAA Aircraft Noise Policy and Research Efforts.[22] This science-based approach to assessing current aircraft noise policy is completely consistent with the law and common sense.

We commend the FAA's decision to avail itself of the Federal Mediation and Conciliation Service to ensure the process is broadly inclusive and attracts participation from all interested stakeholders, including local communities. An inclusive, science-based discussion that "challenge[s] long-standing assumptions"[23] is entirely appropriate. Among the important issues that will be considered are (a) whether the Day-Night Average Sound Level (DNL) metric should continue to be used as the metric to assess noise exposure, (b) if so, whether the DNL 65 dBA should continue to define the "significant noise exposure threshold" and the compatibility of residential land uses, and (c) whether the use of alternative or supplemental metrics may be appropriate in some circumstances. In this context, we also commend the FAA statement that it "will not make any determinations on implications from the emerging

[18] This program is authorized by the Aviation Safety and Noise Abatement Act of 1979, 49 U.S.C. §47501 et seq.

[19] Implementation and funding of measures included in a Part 150 NCP requires more than FAA approval of the NCP; other requirements, such as FAA safety review and final approval of noise abatement procedures and compliance with requirements under the National Environmental Policy Act (NEPA) are prerequisites to implementation and funding.

[20] FAA has provided nearly $6 billion in AIP grants, while airlines have collected more than $3.4 billion in PFC revenue devoted to noise mitigation measures. https://www.faa.gov/airports/environmental/airport_noise/part_150/funding/

[21] Letter from FAA Administrator Dickson to the Honorable Stephen F. Lynch (May 10, 2021).

[22] 86 Fed. Reg. 2722 (January 13, 2021).

[23] Letter from FAA Administrator Dickson to the Honorable Stephen F. Lynch (May 10, 2021).

research results for FAA noise policies until it has carefully considered public and other stakeholder input, and assesses the factors behind any increases in community impacts from aircraft noise exposure."[24] This is particularly important where the issues are so complex and nuanced. For example, the GAO has observed:

> Using additional metrics for regulatory activities or as a significance threshold could require policymakers to develop new standards against which to judge aircraft noise and balance competing priorities regarding the safety and efficiency of the national airspace, aviation noise, and fuel emissions, among others. Additionally, other available metrics may not incorporate all of the elements of noise required by law (for instance, metrics conveying the number of overhead flights may not account for the duration of noise events). It is also important to recognize that the extent to which FAA can address noise impacts identified through the use of supplemental metrics may be limited due to a range of constraints related to airspace safety and security as well as competing priorities such as fuel efficiency.[25]

Additionally, the airport-specific results from the NES show that responses to aircraft noise exposure at the same DNL varies widely, suggesting that more than just aircraft noise exposure is driving those responses. A science-based assessment of aircraft noise policy requires an understanding of the role co-determinants play in people's responses to aircraft noise. It will also be important for FAA to consider that if, as the Congressional Research Service has observed, its "findings and recommendations based on these studies support an adjustment to the 65dB threshold, this would have policy and budgetary implications," including increasing airport funding needs for Part 150 programs and potentially reducing the tax base of local governments surrounding airports by taking away land available for commercial/residential development.[26]

These are all important considerations that must be taken into account in the FAA's review of current aircraft noise policy. A4A is confident that the inclusive, evidence-based approach the FAA has committed to will produce effective results and provide the foundation for successfully addressing aircraft noise impacts in the future.

CONCLUSION

A4A remains committed to using all the tools in our toolbox to strive for an aviation system that is safe and efficient, while minimizing the impact of noise and emissions.

Mr. LARSEN OF WASHINGTON. Thank you very much. The Chair recognizes now Mr. Frank Miller, on behalf of Airports Council International–North America.

You are recognized for 5 minutes.

[Pause.]

Mr. MILLER. I apologize.

Thank you, Chairman Larsen and Ranking Member Graves, for inviting me to participate in today's hearing. I am Frank Miller, executive director of the Hollywood Burbank Airport in southern California. I appreciate this opportunity to speak with you about the efforts, progress, and remaining challenges in addressing community concerns related to aviation noise.

Turning from the national perspective to the specific experiences I have had as executive director at Hollywood Burbank Airport and addressing community concerns related to aircraft noise, I would like to highlight recent outreach efforts and measures that will be initiated in the near future.

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[24] 86 Fed. Reg. 2722, 2728 (Jan. 13, 2021).

[25] GAO, *Aircraft Noise—FAA Could Improve Outreach through Enhanced Noise Metrics, Communication and Support to Communities* (September 2021) at 29 (footnote omitted).

[26] Congressional Research Service, Federal Airport Noise Regulations and Programs (September 27, 2021) at 15.

In 2018, Hollywood Burbank Airport held two night-time public meetings in Burbank, where community members provided comments relative to their own personal experiences with aircraft noise and the southern California metroplex flightpath changes in March of 2017. In response to community concerns voiced in these earlier meetings over SoCal metroplex and the FAA's implementation of its next generation air transportation system, the Hollywood Burbank Airport and Van Nuys Airport convened the Southern San Fernando Valley Airplane Noise Task Force to investigate the issues that were previously raised.

The task force consisted of a set of eight voting members from the cities of Burbank, Glendale, Pasadena, and Los Angeles. The task force also included five nonvoting members representing the offices of Senator Feinstein, former Senator Harris, Congressman Schiff, Congressman Sherman, and Congressman Cárdenas. Staff from the FAA, the Burbank-Glendale-Pasadena Airport Authority, and Los Angeles World Airports attended the task force's meetings as technical advisors.

The task force conducted seven meetings over an 8-month period. At the final meeting, which lasted more than 8 hours on May 6 and May 7, 2020, the task force successfully completed its objective of developing a set of recommendations to address community noise issues related to aircraft operations from Hollywood Burbank Airport and Van Nuys Airport. Most of the recommendations were directed to the FAA, but Hollywood Burbank Airport is moving forward on items that are specific to it.

Most significantly, after a few more months of recovery from the COVID–19 pandemic, Hollywood Burbank Airport will conduct a new Part 150 Noise Compatibility Study. This study will measure current and future aircraft noise levels and their associated effects on the surrounding communities. It will outline actions that will reduce or minimize aircraft noise over sensitive areas. It will establish land-use guidelines to address compatibility between the airport and its surrounding communities. It will identify areas where aircraft noise is present, and encourages land uses that are compatible. And it will develop a comprehensive Noise Compatibility Program for the airport.

In conjunction with the part 150 study, Hollywood Burbank Airport will convene a Citizen's Advisory Committee to help the community stakeholders understand the process and the final analysis. It is currently anticipated that the committee will include Burbank, Glendale, Pasadena, and Los Angeles residents nominated by their local government officials. The committee will function until the part 150 study has been completed and submitted to the FAA, which is estimated to take approximately 8 months.

Hollywood Burbank Airport will respectfully request that Congress provide additional funding for the FAA's part 150 program to support Airport Improvement Program grant awards that help with noise mitigation for noncompatible land uses and sound insulation.

In an ongoing effort to address the impact of aircraft noise, Hollywood Burbank Airport continues to monitor noise complaints reported by residents in the surrounding communities. To provide nighttime noise relief through a voluntary curfew, Hollywood Burbank Airport has a standing request to all commercial airlines that

they refrain from scheduling departures or arrivals between 10 p.m. and 6:59 a.m.

Additionally, Hollywood Burbank Airport utilizes WebTrak, a community-facing platform that provides flight information to the public and tracks noise inquiries. Community members can submit a noise inquiry through WebTrak or contact the toll-free, 24-hour Noise Concerns Hotline.

Hollywood Burbank Airport also publishes a quarterly noise monitoring report on its website that documents the noise impact boundary of the airport, as defined by Federal law.

Thank you for the opportunity this morning to speak to you.

[Mr. Miller's prepared statement follows:]

Prepared Statement of Frank R. Miller, Executive Director, Hollywood Burbank Airport, on behalf of Airports Council International–North America

Thank you, Chairman Larsen and Ranking Member Graves, for inviting me to participate in today's hearing. I am Frank Miller, Executive Director of the Hollywood Burbank Airport in Southern California. I appreciate this opportunity to speak with you about the efforts, progress, and remaining challenges in addressing community concerns related to aviation noise.

NATIONAL PERSPECTIVE

As Congress considers the topic of aviation noise, I believe it is critical that Congress takes into account two factors, particularly when considering any potential next steps. First, airports across the country have a wide range of experiences related to aircraft noise. Over the past four decades, the aviation community—including airports, the FAA, and aircraft operators—have made great investment and strides to reduce the impact of aircraft noise through a variety of means, including quieter aircraft, improved flight procedures, acoustic treatment of residential and other noise-sensitive structures, and land use initiatives. As a result, many U.S. airports have reduced or eliminated controversy over aircraft noise in their communities. However, in other communities, despite very similar efforts, aircraft noise remains a subject of significant controversy and creates ongoing challenges for airports. This varying experience underscores that there is no guaranteed "one-size-fits-all" way to address the problem of aircraft noise across the country.

Second, it is critical to bear in mind that the aviation industry has been particularly hard hit from the COVID–19 pandemic and resulting economic crisis. Even as travel begins to return to pre-pandemic levels, other shocks—such as escalating oil prices, supply chain challenges, and labor shortages—create uncertainty as to when the industry will achieve a level of economic stability. This is a particularly sensitive time for airports, which are striving to be good neighbors and provide world-class facilities and services, while working to recover from historically low levels of revenue and continued uncertainty about the course of recovery. Airports are also working to balance all aspects of sustainability, equity, and environmental issues beyond noise, such as air quality emissions, as just one example. Any discussion about national noise policy needs to reflect these challenges, as well as the limited ability of airports to absorb new costs.

I would note that community concerns related to aircraft noise most often are directed to the airport. However, airports do not have authority over the FAA. Moreover, pursuant to the Airport Noise and Capacity Act (ANCA) enacted over 30 years ago, federal law bars airports from imposing new noise controls on aircraft operators. While each airport crafts community engagement programs that are appropriate for its individual facility and community situation, I think it is fair to say that all airports invest significant resources in terms of both staff time and money. I will share some specific Hollywood Burbank Airport examples.

I am sure Congress is also interested in the airport perspective on the FAA's Neighborhood Environmental Survey (NES), which was released in January 2021. Airport staff who work with concerned communities, as I and my staff do, are not surprised by the findings that many communities are more sensitive to aircraft noise today than they were nearly 50 years ago when the national noise policy based on the 65 Day/Night Sound Average Level (DNL) was first established. Generally airports find that the FAA's historic approach to aircraft noise issues has served the

industry well. By relying primarily on the 65 DNL standard as a threshold of compatibility, FAA policy has provided an easily applicable standard to serve as a guide for responding to aircraft noise concerns, and has provided a degree of flexibility to allow for State and local governments to set a different threshold of compatibility. This affords reliable clarity, which, in turn, has helped the industry make enormous strides towards reducing, and in some places eliminating, community concerns about aircraft noise and towards providing meaningful noise mitigation to the residents most affected by aircraft noise.

That said, airports acknowledge that many people have questioned whether the 65 DNL threshold accurately reflects the limit of non-compatible and/or significant noise impacts, and whether the Schultz Curve accurately reflects current aircraft noise exposure effects on communities near U.S. airports. Accordingly, I applaud the FAA for undertaking the NES and beginning the process of examining and updating U.S. aircraft noise policy as necessary to reflect current concerns and potential effects on people.

The airport community believes that any new aircraft noise policy should be based on a clearly defined set of goals that have been identified based on objective, empirical factors. While the NES is an important first step to providing relevant information, it is only the first step and should be backed by additional data. Airports support the ongoing, and future, efforts by the FAA to develop the empirical data needed to inform any changes to aircraft noise policy.

In response to the FAA's Federal Register notice announcing the release of the NES, Airports Council International–North America (ACI–NA), the trade association for airports, provided the following comments on further research that is needed in order to inform any policy revisions. I include them here as items that Congress may want to consider, as congressional funding would be key to this research.

1. General Comments on Further Research

The NES suggests that the historic understanding of the levels at which aircraft noise becomes "highly annoying" is no longer consistent with current perceptions of aircraft noise. In the past, the 65 DNL standard focused on areas relatively close to airports where noise impacts were the greatest, so that was a reasonable guide for aircraft noise policy. Because the NES suggests that the area in which people are "highly annoyed" is much greater than previously assumed, the NES raises the more fundamental question of whether the goal of aircraft noise policy should be to reduce the number of people who are "highly annoyed" by aircraft noise, or to address specific, and objectively measurable, impacts, such as health impacts, education impacts, sleep disruption, or other environmental impacts of aircraft overflights, as currently being studied by FAA. If the goal is to reduce levels of "high annoyance," the FAA should conduct research to develop a better understanding of what causes someone to become "highly annoyed," how to more uniformly quantify that "annoyance," and how to measure success in reducing levels of "high annoyance," particularly given the subjective nature of "annoyance." If the goal is to address other more specific impacts, the FAA should conduct research to define acceptable levels of such impacts.

It is imperative that the FAA define the goal of its aircraft noise policy in order to appropriately direct further research and frame solutions that are appropriate to actual societal problems. This is critical because any change in the FAA's noise significance and compatibility threshold will affect a suite of different financial, legal and policy areas including:

- Aircraft Noise Liability
- Airport Development (Planning and NEPA)
- Benefit-Cost Analysis Guidance
- Airspace Use and Changes, Including NextGen, PBN and Metroplex Changes
- Land Use Compatibility
- Sound Insulation Programs
- Community Engagement
- Relationships (including rents and charges) with Airlines and Other Users
- Economic Impacts
- Part 150 Program
- Land and Easement Acquisition
- Noise Monitoring
- Airport Noise Management Costs

Although it is premature to formulate or advocate any specific proposals, I urge Congress and the FAA to adopt the following high-level principles to guide analysis of the NES and consideration of any aircraft noise policy changes:

- *Science-based*: Any changes to federal policy on aircraft noise must be based on the latest science. Results from the underlying FAA research projects should be made public in a usable form.
- *Stakeholder engagement and transparency*: Any changes in aircraft noise policy must be preceded by a robust stakeholder engagement effort by the FAA, with meaningful dialogue and opportunities for input from airports. The FAA must clearly communicate the policy development process, any changes in policy, and the justification for the changes to all stakeholders.
- *Roles and responsibilities*: The FAA must take ownership of its role regarding the regulation of aircraft noise, and must clearly communicate its role to the public and stakeholders.
- *Funding*: Airport funding is already extremely constrained, and airports should not be mandated to pay more for noise abatement and mitigation, regardless of the outcome from the policy discussions, without an adequate funding source.
- *Effective*: Aircraft noise policy must address identifiable problems and provide cost-effective solutions to those problems.
- *Clear standards*: Any new aircraft noise policy should be accompanied by clear guidance and standards for evaluating aircraft noise impacts in all applicable regulatory contexts, such as Part 150, NEPA, new air traffic procedures, and AIP funding. This should include clear thresholds for evaluation, specific guidance on the use of alternative noise metrics, and clarity on the kinds of impacts that merit consideration.
- *Forward Looking*: Any new aircraft noise policy should be forward looking, minimize disruption, and not attempt to revise or undo Records of Decision or other FAA approvals that have been issued based on current policy. Likewise, any new aircraft noise policy should minimize the need to revise, amend, or reconsider studies or projects ongoing at the time the new policy is issued. Airports and the Federal government have made considerable investments of time and treasury, and a change in aircraft noise policy should not jeopardize that investment by affecting the validity of already completed, or ongoing review and approval processes.

2. Specific Areas of Further Research

ACI–NA noted that Chapter 8 of the NES concludes by stating "[f]urther research is underway by the project team to examine historical trends in aircraft noise annoyance data, including comparisons to other recent research." I appreciate that updates on the research in important areas such as Children's Learning, Health and Human Impacts Research, and Economic Impacts are provided through the REDAC process. It would be helpful, however, if the FAA could identify milestones in the studies and make some level of interim information available. Airports would also benefit from the non-auditory health effects of noise being conveyed in a way that is understandable by the public [1].

In addition, airports recommend that the FAA conduct the following research, and make that research available to stakeholders, as it considers changes to aircraft noise policy:

a. While "annoyance" appears to be correlated to DNL, the FAA should further research whether there is a more precise cause of such annoyance, such as the frequency of overflights, changes in flight patterns, the loudness of individual overflights, or some other acoustic factor(s).
b. Similarly, the FAA should further research the extent to which non-acoustic factors—such as demographic and socio-economic factors, vehicular and other non-aircraft noise, recent airport or aviation-related controversies, air emissions, and aviation incidents—may play a role in levels of annoyance, as suggested by recent research.[2]
c. The FAA notes in the Federal Register that aircraft noise generally results in higher levels of annoyance than other sources, including ground transportation. Further research is appropriate to understand why that it is, and why people indicate high levels of annoyance with aircraft noise that is far quieter than many other sources of noise that people accept and, in some cases, choose.
d. The feasibility of phasing out noisier aircraft and accelerating introduction of quieter engines and airframes.

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[1] See ACRP Research Road maps at: https://public.tableau.com/profile/hmmh1#!/vizhome/ACRPResearchRoadmapAirportEnvironmental/ACRPAirportEnvironmentalResearchRoadmap

[2] E.g., Diana Sánchez, Jack Naumann, Nicole Porter, & Andy Knowles, *Current Issues in Aviation Noise Management: A Non-Acoustic Factors Perspective*, The 22nd International Congress on Sound and Vibration (July 2015; C. Asensio, L. Gasco, & G. de Arcas, *A Review of Non-Acoustic Measures to Handle Community Response to Noise Around Airports* Current Pollution Rep. (June 2017).

e. Further integrating consideration of noise impacts into the design and implementation of flight procedures and routes that are not limited to just geographic location (performance, speed, climb and descent rates, etc.).
f. The FAA noted in its February 22, 2021 presentation on the NES that "noticeable" flight event characteristic, (*i.e.*, the number of events having a maximum sound level at or above 50 dB, NA50Lmax), demonstrated marginal significance and should be investigated further because of the high correlation of NA50Lmax with DNL. ACI–NA believes that research regarding the specific kinds of noise events that cause higher levels of annoyance will yield important information to guide future policy development. The FAA should similarly consider using other "supplemental metrics" to better understand the specific causes of annoyance and associated health impacts.
g. Although the FAA reaffirmed the use of DNL in its 2020 Report to Congress,[3] experience shows that many complaints arise from anomalous, notably disruptive single events and that supplemental metrics can provide a useful way to focus understanding on the nature, or causes, of complaints or annoyance. To that end, the FAA should examine the appropriate role of additional/supplemental noise and operations metrics in NEPA, Part 150, and related guidance and orders before implementing any change(s) to aircraft noise policy. Further, to the degree that supplemental metrics are adopted, the FAA should provide clear guidance on what these metrics would be used for, criteria for using these supplemental metrics, how the use of multiple metrics would work together, and relationships to annoyance and potential health impacts.
h. Additional research should include determination of quantifiable impacts of aircraft noise—such as health impacts, sleep disturbance, education impacts, life expectancy, and property values—that is necessary to put the "annoyance" data in context and also to identify critical environmental impacts that new policies can (and should) address. I understand that the FAA is currently pursuing a number of research projects related to aircraft noise, several of which have been underway for a number of years. Airports would like to understand whether there are ways in which the studies could be accelerated with increased funding or other methods. The acceleration of ongoing studies relates to our request to understand the road map to updating policy. As pieces of research similar to the NES are released, airports will be required to manage continued uncertainty while waiting for policy updates.
i. Research on the change in both noise and operational metrics correlated to the change in annoyance to aid in better understanding the significance of a change.
j. In the NES, the FAA stated that "Recent academic research and internal assessments have raised questions about the benefits of sound insulation relative to the costs." Airports would like to learn more about the internal assessments that the FAA has conducted and the conclusions reached in those assessments. Further research on the cost-benefit of noise mitigation measures may also help inform future aircraft noise policy.
k. Airports recognize the likelihood of including benefit-cost analyses as a means to aid in deciding appropriate policy decisions. Accordingly, airports recommend the FAA conduct research defining an appropriate cost effectiveness methodology that is consistently applied in aiding decision-making related to policy. Airports also recommend the findings be documented and coordinated with stakeholders and results be made available to the members.
l. The Airport Cooperative Research Program has undertaken several research projects, including an Environmental Research Road Map[4]. Airports request that the FAA's research portfolio include the following noise items identified in that road map:
    a. Assessing Community Annoyance of Noise from Unmanned Aerial Systems
    b. Best Practices for Effective Sound Insulation
    c. Best Practices for Stakeholder Engagement and Assessment and Reporting on Multiple Noise Metrics—Airports particularly are interested in learning if the dataset from the NES would provide new areas of knowledge related to noise metrics.
m. As noted in the Federal Register notice, the FAA has continually developed its high-fidelity modeling capabilities. As AEDT becomes more and more complex, it becomes more of a "black-box" to community members. Research on

[3] FAA, *Report to Congress, FAA Reauthorization Act of 2018 (Pub. L. 115–254) Section 188 and Sec. 173* (April 14, 2020).
[4] http://www.trb.org/ACRP/researchroadmaps.aspx

the soft skills of how to explain the model and make public its results would be helpful to airports.

As the aviation system recovers from the downturn caused by the pandemic, the FAA should conduct research to understand shifting community perspectives and reactions to aircraft noise during the next several years resulting from potential lifestyle changes (e.g., working and learning from home) and psychological effects resulting from stay-at-home orders, limited human interaction, etc.

The last item that I would like to note is that new entrants are on the horizon. There are a number of groups working on new vehicles ranging from smaller delivery drones up to five- or six-passenger light electric vehicles (eVTOL) that would compete with taxi-like services. Based on the lessons learned and experience with community concerns related to aviation noise, now is the time that Congress should be considering and setting policy related to the community acceptance issues that the new entrants may encounter.

HOLLYWOOD BURBANK AIRPORT COMMUNITY OUTREACH

Turning from the national perspective to the specific experiences I have had as Executive Director at Hollywood Burbank Airport in addressing community concerns related to aircraft noise, I would like to highlight recent outreach efforts and measures that will be initiated in the near future.

In 2018, Hollywood Burbank Airport held two nighttime public meetings in Burbank where community members provided comments relative to their own personal experiences with aircraft noise and the Southern California (SoCal) Metroplex flight path changes in March of 2017.

In response to community concerns voiced in these earlier meetings over SoCal Metroplex and the FAA's implementation of its *Next Generation Air Transportation System*, the Hollywood Burbank Airport and Van Nuys Airport convened the Southern San Fernando Valley Airplane Noise Task Force (Task Force) to investigate the issues that were previously raised. The Task Force consisted of a set of eight voting members from the cities of Burbank, Glendale, Pasadena, and Los Angeles. The Task Force also included five non-voting members representing the offices of Senator Feinstein, former Senator Harris, Congressman Schiff, Congressman Sherman, and Congressman Cárdenas. Staff from the FAA, the Burbank-Glendale-Pasadena Airport Authority, and Los Angeles World Airports attended the Task Force's meetings as technical advisors.

The Task Force conducted seven meetings over an eight-month period. At the final meeting, which lasted more than eight hours on May 6 and May 7, 2020, the Task Force successfully completed its objective of developing a set of recommendations to address community noise issues related to aircraft operations from Hollywood Burbank Airport and Van Nuys Airport. Most of the recommendations were directed to the FAA, but Hollywood Burbank Airport is moving forward on items that are specific to it.

Most significantly, after a few more months of recovery from the COVID–19 pandemic, Hollywood Burbank Airport will conduct a new Part 150 Noise Compatibility Study. The study will:

- Measure current and future aircraft noise levels and their associated effects on the surrounding communities.
- Outline actions that will reduce or minimize aircraft noise over sensitive areas.
- Establish land use guidelines to address compatibility between the airport and its surrounding communities.
- Identify areas where aircraft noise is present and encourages land uses that are compatible.
- Develop a comprehensive Noise Compatibility Program for the airport.

In conjunction with the Part 150 Study, Hollywood Burbank Airport will convene a Citizen's Advisory Committee to help the community stakeholders understand the process and the final analysis. It is currently anticipated that the Committee will include Burbank, Glendale, Pasadena, and Los Angeles residents nominated by their local government officials. The Committee will function until the Part 150 Study has been completed and submitted to the FAA, which is estimated to take approximately eight months.

Hollywood Burbank Airport will respectfully request that Congress provide additional funding for the FAA's Part 150 program to support Airport Improvement Program (AIP) grant awards that help with noise mitigation for non-compatible land uses and sound insulation.

In an ongoing effort to address the impact of aircraft noise, Hollywood Burbank Airport continues to monitor noise complaints reported by residents in the surrounding communities. To provide nighttime noise relief through a voluntary cur-

few, Hollywood Burbank Airport has a standing request to all commercial airlines that they refrain from scheduling departures or arrivals between 10 p.m. and 6:59 a.m. Additionally, Hollywood Burbank Airport utilizes WebTrak, a community-facing platform that provides flight information to the public and track noise inquiries. Community members can submit a noise inquiry through WebTrak or contact the toll-free 24-hour Noise Concerns Hotline. Hollywood Burbank Airport also publishes a Quarterly Noise Monitoring Report on its website that documents the noise impact boundary of the airport as defined by federal law.

Finally, one thing has not changed during the pandemic: airports continue to face substantial infrastructure needs. As travelers begin to return to U.S. airports, inadequate airport infrastructure that fails to meet the growing needs of local businesses and tourists puts in jeopardy the economic recovery of American cities, states, and regions. In addition to creating jobs, new investments in airports can be valuable tools in helping local communities attract air service, which increases competition and leads to lower airfares for passengers. Airports need additional resources to build the terminals, gates, checkpoints, and ramp areas necessary to attract new air carriers and entice existing ones to expand service. The traveling public gets more choices and lower airfares when airports can build the facilities that provide more airline options and more service alternatives.

In March 2021, ACI–NA released an updated infrastructure needs report detailing the more than $115 billion in infrastructure needs across the national airport system over the next five years. Because this survey was conducted during the pandemic last summer, it does not fully account for all of the new public health-related infrastructure upgrades airports need to make, such as future HVAC improvements to provide airports the ability to keep up with developing air quality technology, additional space for physical distancing near gates, and touchless technology to assist passengers. Coupled with a current debt burden of nearly $90 billion from past projects, the report clearly shows that airports are falling further behind in efforts to upgrade facilities and improve the overall experience for passengers.

Airports greatly appreciate the $20 billion in airport-infrastructure funding included in the bipartisan infrastructure bill. This one-time infusion of capital will help jumpstart new projects around the country. Given the $115 billion in infrastructure needs across the system, though, Congress must find new ways to ensure continuity in funding more of these much-needed improvement projects once the new federal funding has been exhausted.

As leading economic engines in their communities, airports are an integral part of the overall travel and tourism industry. ACI–NA and our member airports will continue to work together with our government and industry partners to weather this current crisis so we can get Americans and international passengers traveling again through an aviation system that is stronger, safer, more secure, and more resilient than ever.

Thank you for this opportunity today.

Mr. LARSEN OF WASHINGTON. Thank you very much. I now recognize Mr. David Silver of the Aerospace Industries Association for 5 minutes.

Mr. SILVER. Chairman Larsen, Chairman DeFazio, Ranking Member Graves, and members of the subcommittee, thank you for inviting me to appear today. My name is David Silver, and I serve as the vice president of civil aviation for Aerospace Industries Association.

For over 100 years, AIA has advocated for America's aerospace and defense companies and the more than 2 million men and women who are the backbone of our industry.

For decades, aircraft manufacturers have invested in many successful initiatives that have reduced public exposure to aircraft noise, while still allowing the industry to grow and deliver huge mobility benefits to our society. For example, today's aircraft have cut noise levels in half, compared to those made between 1980 and 2007. This significant change is a result of newer, quieter engines, as well as airframe and other design improvements.

According to the FAA, the number of people exposed daily to significant aviation noise in the U.S. declined by roughly 94 percent

since 1975. AIA appreciates this committee's past leadership in supporting research and development that has greatly contributed to the improvements seen to date, such as higher bypass ratio engines, more aerodynamic airframes, and improved engine nacelle treatments, all developed cooperatively with industry, and all improving the noise environment.

Despite previous improvements in aircraft technology and airport operations, our industry realizes that the work is not done. AIA's members continue to make significant investments in technology that will further reduce the aviation-related noise near airports. AIA is committed to working with international bodies, Federal agencies, and Congress to better understand, reduce, and mitigate the impact of noise on these communities.

Internationally, we recognize this must be accomplished in a holistic manner and consistent with the global nature of aviation. I say more about this in my written testimony, but we strongly support the International Civil Aviation Organization's balanced approach, which offers a global baseline for addressing noise issues.

Domestically, effective partnerships between the FAA, NASA, and the aviation industry are critical to increasing improvement in the noise characteristics of aircraft. We believe collaborative support for aviation research and development is vital for aviation's future, and the opportunity exists today to double down on these public-private partnerships, and accelerate the next generation of aircraft and engines.

An example of this is the Sustainable Flight National Partnership, a cooperative effort by the FAA, NASA, and industry to accelerate the development of more efficient aircraft and engine technologies. This partnership targets up to a 30-percent improvement in fuel savings, compared to today's airplanes, which also delivers substantial reductions in noise and emissions.

AIA member companies are exploring a range of technologies for the next generation of aircraft for introduction in the 2030s, offering improvements and fuel efficiency of 15 to 25 percent, compared to current aircraft. Realizing these benefits will require both public and private investment in U.S. manufacturing, especially given the impact of COVID–19 and the billions of dollars in investment being made by European governments in support of similar efforts overseas.

Congress can help in these efforts by continuing to support increased funding for the FAA's Continuous Lower Energy, Emissions, and Noise—CLEEN—Program to accelerate reductions in noise and other emissions in conjunction with fuel efficiency improvements; supporting and expanding the alternative fuel and low-emission aviation technology grant program in the House-passed Build Back Better legislation, and introduced in the Senate as the AERO Act; passing the Advanced Aviation Infrastructure Modernization Act to establish a pilot program to provide grants related to advanced air mobility infrastructure; and helping drive the development of a comprehensive, long-term research agenda that supports transformational aviation technologies, leveraging partnerships between industry and Government agencies, including the Departments of Transportation, Defense, Energy, and NASA.

AIA applauds the committee for this opportunity to discuss the important topic of community noise, and allowing industry to provide our views, and ongoing research, and our significant efforts to reduce both noise and emission impacts. We appreciate the support of Congress in authorizing and appropriating funds for vital FAA research that will lessen aircraft noise for existing and emerging technologies like supersonic and AAM aircraft systems.

We look forward to working with this committee as you consider important policy changes related to aviation noise this year and in next year's FAA reauthorization bill.

Thank you, and I look forward to your questions.

[Mr. Silver's prepared statement follows:]

Prepared Statement of David Silver, Vice President for Civil Aviation, Aerospace Industries Association

INTRODUCTION

Chairman Larsen, Ranking Member Graves, and members of the subcommittee, thank you for inviting me to appear today. My name is David Silver, and I serve as Vice President of Civil Aviation for the Aerospace Industries Association (AIA). For over 100 years, AIA has advocated for America's aerospace and defense (A&D) companies and the more than two million men and women who are the backbone of our industry.

OUR INDUSTRY'S ROLE IN REDUCING NOISE

Aircraft manufacturers have been investing in ways to reduce aircraft noise for many years. To date there have been many successful initiatives that have reduced the exposure of the general public to aircraft noise, while still allowing the industry to grow and deliver huge mobility benefits to our society.

Illustrating this trend, aircraft produced after 2010 generate approximately half the noise of aircraft made between 1980 and 2007. This significant change came from newer, quieter engines as well as airframe and design improvements developed after 2010 which are significantly quieter.

According to the Federal Aviation Administration (FAA), the number of people exposed daily to significant aviation noise in the U.S.[1] declined from roughly 7 million in 1975 to just over 454,000 today. Over the same time period, the number of enplanements[2] increased from 202 million in 1975 to 890 million today and the U.S. population grew by more than fifty percent.

AIA appreciates this committee's past leadership in supporting research and development (R&D) that greatly contributed to the improvements seen to date. The longstanding partnership between government and industry has resulted in significant improvements in both noise and emissions, as noted above, and we believe that continued cooperation is critical to future success. Examples of these improvements include higher bypass ratio engines, more aerodynamic airframes, and improved engine nacelle treatments, all developed cooperatively with industry, and all improving the noise environment.

Despite these improvements, our industry realizes the work is not done. AIA's members continue to make significant investments in technology that will further reduce the aviation-related noise occurring near our nation's airports.

WORKING WITH GOVERNMENT TO REDUCE ENVIRONMENTAL FOOTPRINT

Noise is one category comprising the environmental footprint of aviation. The aviation industry has long been involved with efforts to reduce the entire environmental footprint, including emissions, noise, and efforts to reduce climate change. For example, AIA and our members have committed to achieving net-zero carbon emissions from the U.S. aviation sector by 2050. Internationally, many of these improvements are supported by governments, industry, and non-governmental organi-

[1] Defined as noise of 65 DNL or greater, a metric which measures cumulative noise exposure over an average 24 hours.

[2] An enplanement equals one person flying on a single commercial flight.

zations working together at the International Civil Aviation Organization (ICAO), a specialist branch of the United Nations. Due to the global interconnectivity of aviation, ICAO provides the necessary framework to ensure environmental standards and regulatory practices are attainable and coordinated globally to ensure success.

Domestically, we continue to work with the FAA and the U.S. Department of Transportation (DOT). AIA commends the FAA's work to better understand, reduce, and mitigate the impact of noise on communities, and its wider actions to increase community outreach to those affected by aircraft noise through community roundtables and other measures. AIA strongly supports the data-driven approach the FAA is taking to ensure that aircraft noise policy continues to reflect the latest science on this matter. AIA also appreciates that the FAA recognizes the importance of stakeholder engagement in decisions related to aircraft noise policy and we are committed to continuing our input on all aspects of aviation noise.

We were pleased to receive the most recent update of the U.S. Aviation Climate Action Plan, which set out the U.S. government's plan to achieve net-zero greenhouse gas emissions for the U.S. aviation sector by 2050, a goal in line with our own efforts. The plan builds on our industry's commitment to net-zero and highlights specific actions and policy measures to foster innovation and drive change across the entire sector. Though focused primarily on emissions, we believe this plan will have a positive effect on aircraft noise because many of the pathways to emissions reduction have the secondary effect of reducing aircraft noise. These improvements will come about largely through: (1) development of new, more efficient aircraft and engine technologies; (2) improvements in aircraft operations throughout the National Airspace System; (3) electrification, and potentially hydrogen, as solutions for short-haul aviation; and (4) advancements in airport operations across the United States.

We see much of this progress accomplished under the framework of the Sustainable Flight National Partnership, a cooperative effort by NASA, the FAA, and industry to accelerate the development of more efficient aircraft and engine technologies targeting up to a 30 percent improvement in fuel savings compared to today's planes, while also delivering substantial reductions in noise and emissions.

The potential for improvement is not limited to technology, but also includes opportunities in aircraft operational efficiency. While the U.S. National Airspace System is significantly more efficient than in the past,[3] opportunities remain to reduce fuel burn and noise in all phases of flight. These include boosting efficiency during taxi, takeoff, and landing, as well as flying optimized trajectories.

ICAO'S BALANCED APPROACH—A HOLISTIC APPROACH FOR TACKLING AIRCRAFT NOISE

Despite previous improvements in aircraft technology and airport operations, AIA is committed to working with international bodies, FAA, and the Congress to identify ways to further reduce and mitigate the impacts of aviation noise.

This must be accomplished in a holistic manner and consistent with the global nature of aviation. We believe the ICAO Balanced Approach[4] offers a global baseline for addressing noise issues. The Balanced Approach consists of identifying the noise problem at specific airports and identifying which of four available elements can reasonably address the issue. The four elements of the Balanced Approach are: (1) Reduction of Noise at the Source (Technology Standards); (2) Land Use Planning and Management; (3) Noise Abatement Operational Procedures; and (4) Operating Restrictions.

1. Reduction of Noise at Source (Technology Standards)

Today we look to the certification of new products to ensure the latest available noise reduction technology is incorporated into aircraft. For example, the application of the new ICAO Chapter 14 international noise standard is expected to greatly reduce the number of people affected by significant aircraft noise (defined as an average sound level throughout the day of 55 decibels). Between 2020 and 2036, average noise levels will reduce to below 55 decibels for more than one million people. Industry is continuously looking at three particular areas to contribute to these improvements: engine technology, aerodynamics, and new materials.

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[3] See for example, FAA's NextGen Annual Report for FY20, p. 19, at https://www.faa.gov/nextgen/media/NextGenAnnualReport-FiscalYear2020.pdf.

[4] *Aircraft Noise*. International Civil Aviation Organization. Retrieved April 14, 2021, https://www.icao.int/environmental-protection/pages/noise.aspx

Engine Technology

The increase in fan size allows the industry to increase the amount of air, while also reducing the speed of the air as it moves around the nozzle, thereby achieving high- or ultra-high bypass ratios. Historically the nozzle was the noisiest part of the engine. The shift to higher bypass ratios reduces the noise. Today fan noise remains the dominant source.

With the introduction of ultra-high bypass ratio engines employing geared turbofan technology (GTF), one manufacturer further reduces fan speed. This technology allows additional slowing of the fan, preventing the tips of the fans from potentially becoming supersonic. This feature can further reduce a major noise source, reducing the noise footprint by over 75 percent.

Reshaping the nozzles changes the air flow coming out of them to specifically reduce noise, leading to the 'chevron nozzle' design. This technology, combined with the use of new materials such as acoustic lining around the sides and underneath the engine shroud (cowl), has also significantly reduced engine noise.

We have reached a point when it comes to noise that we can no longer concentrate on one area. Every part of the engine plays a role—the fan, booster, compressor, combustor, turbine section and exhaust area. Through public-private partnerships between NASA, the FAA (CLEEN Program), industry, and universities, we expect to see continuous improvements in these areas with each generation of engine.

Aerodynamics

The landing gear, landing gear doors, extended flaps, and the simple fact of moving a large object through the air no matter how streamlined, creates noise. Better aerodynamics means less air resistance, which means less noise. A more aerodynamically 'slippery' commercial aircraft gives us an opportunity to affect take-off noise characteristics. On takeoff, this allows the operator to either reduce the required take-off thrust due to less air resistance or maintain the same amount of thrust but climb more quickly, meaning that the aircraft is higher above a community at the end of the runway. By using the ICAO balanced approach either of these could be used based upon the needs of a specific airport.

However, there is a tradeoff in the landing phase of flight. The more aerodynamic an aircraft, the more effort that may be required to slow it down. In some cases, the pilot needs to deploy spoilers and landing flaps earlier, which has the potential to generate additional noise on approach to the runway.

Over the last few years, a series of NASA flight tests successfully demonstrated technologies that achieve significant reductions in the noise generated by aircraft and heard by communities near airports. The Acoustic Research Measurement (ARM) flights conducted at NASA's Armstrong Flight Research Center in California tested technology to address airframe noise, or noise that is produced by non-propulsive parts of the aircraft, during landing. The flights successfully combined several technologies to achieve a greater than 70 percent reduction in airframe noise. NASA also evaluated options to modify the landing gears and flaps to reduce noise during take-off and landing, directly focusing their R&D efforts on the major cause of noise complaints around airports. The goal of NASA and its industry research partners is to substantially improve the quality of life for communities that experience aircraft noise today.

New Materials

A lighter airplane is quieter because it requires less thrust to keep the aircraft in the air. Aircraft designers are continuously looking to increased composite use and advanced manufacturing techniques to further reduce the weight of an aircraft, while maintaining the high safety requirements.

2. Land Use Planning and Management

The second pillar of ICAO's Balanced Approach is land use planning and management. This is an effective means to ensure that activities near airports are compatible with aviation. The goal is to minimize the population affected by aircraft noise by effective land use zoning around airports. Compatible land use planning, and management is a vital instrument in ensuring that the gains achieved by the reduced noise of the latest generation of aircraft are not offset by further residential development around airports.

3. Noise Abatement Operational Procedures

The way aircraft are operated during day-to-day operations may also present noise impacts that reach the ground. ICAO assists in the development and standardization of operational procedures that reduce noise while maintaining safety. These measures include noise preferential runways and routes and noise abatement procedures for takeoff and landing. The appropriateness of any of these measures

depends on the physical layout of the airport, its surroundings, and the expected air traffic and air traffic management system, but in all cases the procedure must give priority to safety considerations. With the support of air navigation service providers and airport operators, airlines and pilots can implement noise reduction procedures such as reduced thrust takeoffs, displaced landing thresholds and continuous descent operations to further reduce noise.

Controlling where planes fly during takeoff and landing has important impacts on community noise. The placement and use of runways is fundamental. For example, the routing of aircraft over bodies of water often reduces the impact of community noise. One goal of air traffic management (ATM) is to map out flight tracks that avoid the most densely populated areas wherever possible. Recent developments in navigation performance mean that aircraft can now follow more precise tracks. This reduces the overall area exposed to noise, but often results in some communities being subjected to a higher number of flyovers. ATM planning must be undertaken in close consultation with community leaders to effectively consider the tradeoffs between flight track concentration and flight track dispersion.

4. Operating Restrictions

The final element of the ICAO Balanced Approach involves operating restrictions—banning certain aircraft at noise-sensitive airports or limiting their hours of operation. However, operating restrictions of this kind can present significant economic implications for the airlines.

AIA believes that continued application of the Balanced Approach allows the global aviation industry to continue making progress on noise while effectively involving all layers of government, local communities, and stakeholders. We believe the first three elements (technology standards, land use planning and management and noise abatement operational procedures) will often provide the greatest contribution to resolving community noise issues.

CURRENT STANDARDS AND FUTURE CHANGES

In 2013, ICAO introduced Chapter 14 in the ICAO Annex, establishing a new standard in noise reduction. It stipulated that new aircraft models must be at least seven decibels quieter than those built to the previous Chapter 4 standard. That means that all new aircraft certified to this standard will have half the noise footprint of aircraft that are one generation older. It is up to individual regulatory bodies, particularly states of design like the United States, to either adopt the ICAO standard or (as the U.S. does) codify it in their individual national regulations. U.S. industry appreciates the framework established by "Stage 5" within 14 CFR Part 36, in which the FAA adopted the more stringent noise certification standards for new aircraft in line with ICAO Annex 16 Volume I Chapter 14.

AIA member companies are currently working with ICAO's Committee for Aviation Environmental Protection (CAEP) to update the Chapter 14 limits to encourage even quieter aircraft in the future. These may include more stringent limits for existing aircraft and the first noise standard designed for the next generation of supersonic aircraft. AIA member companies are also working closely with ICAO to begin exploration of future noise standards for emerging technology such as advanced air mobility (AAM) aircraft. We believe the speedy adoption of ICAO standards in areas such as noise and emissions is critically important, not only to improve the noise environment but also to ensure that U.S. manufacturers stay competitive in both established and emerging global aviation markets.

FUTURE AIRCRAFT TYPES

New aircraft under current development will have a major impact on future aviation operations around the globe. These include supersonic aircraft and advanced air mobility aircraft.

Supersonic Aircraft

Supersonic flight began famously in 1947 when U.S. pilot Chuck Yeager broke the sound barrier. Commercial airlines began flying oceanic routes in 1973, most famously the Concorde. Due to a wide array of challenges, including untenably high operating costs, extensive maintenance requirements for an aging fleet, and overland supersonic flight restrictions instituted by the United States and other countries, British Airways announced the retirement of the Concorde in April 2003. There has not been commercial supersonic flight into or out of the United States for nearly 20 years.

Several of our industry partners are currently working on new aircraft designs and improved engines that would enable the U.S. to lead the reintroduction of civil

supersonic flight. Our industry understands the environmental and economic challenges associated with these aircraft and are working to solve them. While overland routes remain unavailable due to the sonic boom generated when the aircraft breaks the sound barrier, industry efforts are focused on design requirements to be successful in transoceanic flight (avoiding sonic booms over land) as well as research and development of low boom technologies, which allow an aircraft to break the sound barrier with a quieter "thump" rather than triggering an unacceptable sonic boom. These companies are committed to design supersonic aircraft to meet the current subsonic Stage 5 noise levels using innovative advanced procedures.

These environmental challenges include not only noise, but also carbon dioxide (CO2) and nitrogen oxide (NOx) emissions. Importantly, ICAO is also looking to address these issues through harmonized international rules, spurred on in part by FAA's leadership in proposing a noise rule for supersonic aircraft pursuant to Section 181 of the FAA Reauthorization Act of 2018. This work by the FAA on an updated noise rule for supersonic aircraft paved the way for development of a harmonized international rule through ICAO. At the most recent Committee on Aviation Environmental Protection conference (CAEP 12), a new work item was added to set stringencies (limits) for both landing and takeoff noise and emissions for new supersonic aircraft.

Setting noise and emissions limits before an aircraft is produced is a groundbreaking step strongly supported by the aviation industry. It will allow aircraft and engine manufacturers to work on designs that meet or exceed these standards, making future supersonic aircraft both economically and environmentally positive.

Advanced Air Mobility Aircraft

Advanced Air Mobility (AAM) is the emergence of transformative airborne technology to transport people and goods in both rural and urban environments. AAM technologies promise to transform how people and cargo are moved, with significant benefits to the U.S. economy. In the United States alone, the AAM market is estimated to reach $115 billion annually and employ more than 280,000 people by the year 2035.

AAM involves a new type of aircraft known as electric vertical takeoff and landing, or eVTOL. These types of aircraft can take off and land vertically like a helicopter and then shift to flight like a fixed-wing airplane. Additionally, eVTOLs are community friendly, with measured noise levels 100 times quieter than a helicopter. This will allow them to integrate into a city without the noise footprint of other aircraft.

Over time, changes to FAA's regulatory process may be needed to enable higher volumes of AAM operations and autonomous operations. In addition, AIA applauds Chairman Larsen and Ranking Member Graves for introducing bipartisan legislation in support of state and local planning for AAM systems (the "Advanced Aviation Infrastructure Modernization Act"). This legislation would authorize a new grant program that would lay the groundwork for communities to plan their development and deployment of AAM technology. In doing so, it would provide assistance for local governments to specifically assess the siting of public use vertiports and any potential environmental effects of AAM operations. We believe this legislation is a strong step forward to ensure any noise impacts from this emerging technology are understood local communities.

How to Get There Faster and Quieter

A critical factor for increased improvement in the noise characteristics of aircraft is continuing the effective partnership between the FAA, the National Aeronautics and Space Administration (NASA), and the aviation industry. We believe collaborative support for aviation research and development is vital for aviation's future, and the opportunity exists today to double down on these public-private partnerships and accelerate the next generation of aircraft and engines.

AIA member companies are exploring a range of technologies for next-generation aircraft for introduction in the 2030s, offering improvements in fuel efficiency of 15 to 25 percent compared to current aircraft. To realize these benefits, U.S. manufacturers will require support to remain competitive, given the impact of Covid-19 and the billions of dollars in investment being made by European governments in support of similar efforts overseas. Congress can help in these efforts by:

- Continuing to support increased funding for the FAA's Continuous Lower Emissions, Energy and Noise (CLEEN) Program to accelerate reductions in noise and other emissions in conjunction with fuel efficiency improvements;

- Supporting and expanding the Alternate Fuel and Low Emission Aviation Technology grant program in the House-passed Build Back Better legislation and introduced in the Senate as S. 3125 ("Aviation Emissions Reduction Opportunity" or AERO Act);
- Passing H. R. 6270, the "Advanced Aviation Infrastructure Modernization (AAIM) Act", to establish a pilot program to provide grants related to Advanced Air Mobility infrastructure;
- Helping to drive the development of a comprehensive, long-term research agenda that supports transformational aviation technologies, leveraging partnerships between industry and government agencies including NASA and the Departments of Transportation, Defense, and Energy; and
- Continuing to support NASA's work in the development of enabling technologies for next generation aircraft, such as new airframes and engines that reduce noise and emissions while improving efficiency. This should include accelerating the timetable for a NASA subsonic demonstrator 'X-plane' incorporating airframe innovations, to ensure U.S. companies can bring these technologies to maturity ahead of European competitors.

On air traffic management improvements, the FAA continues to make significant progress in delivering enhancements to the National Airspace System (NAS) and reducing noise through its NextGen efforts. Congress should continue to invest in and prioritize these improvements, which are expected to further reduce noise through 2030. The FAA should also ensure performance-based navigation (PBN) routes are complemented by efforts to promote community involvement in changes to airspace structure, delivering positive outcomes for community noise.

CONCLUSION

AIA applauds the Committee for this opportunity to discuss the important topic of community noise and allowing industry to provide our views on ongoing research and our significant efforts to reduce both noise and emissions impacts. We appreciate the support of Congress in authorizing and appropriating funds for vital FAA and NASA research that will lessen aircraft noise, and your support for emerging technologies like supersonic and AAM aircraft systems. We look forward to working with this Committee as you consider important policy changes related to aviation noise this year and in the next FAA reauthorization bill.

Mr. LARSEN OF WASHINGTON. Thank you, and the Chair now recognizes Emily Tranter, executive director of N.O.I.S.E.

Ms. Tranter, you are recognized for 5 minutes.

Ms. TRANTER. Thank you. Good morning, Chair Larsen, Ranking Member Graves, and members of the committee. Thank you for the opportunity to be with you today and share perspective on progress and tools towards addressing community aviation noise concerns. My name is Emily Tranter, and I am the executive director of the National Organization to Insure a Sound-Controlled Environment, or N.O.I.S.E.

N.O.I.S.E. is the country's oldest advocacy organization representing a community perspective on aviation noise impacts. Our organization is comprised of elected officials from all over the United States, all directly impacted by aviation noise and operations. Our board alone represents communities adjacent to major airports in Minneapolis, Atlanta, Washington, DC, Louisville, and the Denver area.

As you know, NextGen establishes flight tracks that become part of a complex and growing network of procedures. For the efficiency of NextGen implementation, the tracks should be designed to be stable and sustainable, long term. To that end, it is important to design tracks that will be acceptable to the FAA and community.

NextGen is a transformational infrastructure investment, and deserves the same due diligence and community input as any other

major transportation system on the ground would warrant, as well as ensuring that this infrastructure does not cause undue harm.

To be clear, we do not represent every impacted community or interest on this issue. However, our organization's engagement for nearly half a century provides a unique perspective that we believe will give the committee background on meaningful ways that have and can continue to measure the progress of addressing community concerns related to aviation noise.

First, it is clear that there is no silver bullet when it comes to addressing aviation noise impacts. In our experience, Congress and the FAA have made dedicated strides towards focusing on community engagement over the last decade. However, much progress still needs to be made. These efforts include the FAA creating an Office of Community Engagement in the Air Traffic Organization and directly engaging with airport roundtables. It also includes individual Members and this committee responding to constituent concerns through legislative action, funding the study of noise metrics, and by creating the Quiet Skies Caucus.

While these actions are meaningful and extremely important to continue to invest in, many of the most impactful changes to noise have come from the bottom up, or airport level, rather than from top-down policy changes.

Understanding local dynamics is vital towards finding and implementing meaningful solutions. That is to say, when you have seen one airport, you have seen one airport, and a one-sized fix does not fit all.

Early and frequent communication by the FAA, the airport, and other industry stakeholders with the impacted communities through a roundtable or by other public means is, in our experience, key towards community awareness, engagement, and understanding of noise changes. Even changes that do not require environmental review should be paired with robust community outreach, far ahead of any planned changes to the airspace that could impact noise.

In many cases, educating and engaging local elected officials can help provide an important bridge to constituents. In others, where roundtables may be comprised of both elected and non-elected officials, direct engagement and consistent communication with those bodies is key. The engagement of local FAA personnel, who do understand the community and operations, has also proven valuable in many cases.

Where we have seen the most progress, even if seemingly incremental, has been where tailored and transparent engagement has been put into place, and when the community is equipped with knowledge and understanding of what is and is not possible from an operational standpoint.

Outside of the NEPA process, transparent and robust communication can save time and avoid unnecessary hurdles caused by community pushback when unexpected changes occur.

It is important to recognize that there is a relationship between an airport and the surrounding communities, and when each is doing well, they bolster the success of the others. Thriving communities are places where a dependable workforce want to live, and where people want to do business or visit. The airport is an asset

to a community, but a thriving community is also an asset to the airport. Designing tracks that respect the communities they impact and do not unintentionally cause harm will foster this mutually beneficial partnership. Investment in this partnership ahead of any noise changes creates the foundation for sustainable outcomes and long-term success.

Thank you again for the opportunity to be with you today, and I look forward to any questions.

[Ms. Tranter's prepared statement follows:]

Prepared Statement of Emily J. Tranter, Executive Director, National Organization to Insure a Sound-Controlled Environment (N.O.I.S.E.)

Good morning Mr. Chairman and Members of the Committee. Thank you for the opportunity to be with you today and share perspective on progress and tools towards addressing community aviation noise concerns. My name is Emily Tranter and I am the Executive Director of The National Organization to Insure a Sound-Controlled Environment (N.O.I.S.E.).

N.O.I.S.E. is the country's oldest advocacy organization representing a community perspective on aviation noise impacts. Our organization is comprised of elected officials from all over the United States, all directly impacted by aviation noise and operations. Our board alone represents communities adjacent to major airports in Minneapolis, Atlanta, Washington, D.C., Louisville, Kentucky and the Denver area.

N.O.I.S.E. EXECUTIVE BOARD:

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Minneapolis, MN

As you know, the NextGen system puts new tracks into place that are designed not to move or deviate—essentially creating infrastructure in the sky. To successfully address noise impact concerns—it is important to design those tracks to be sustainable so that they will be acceptable to the FAA and community for the long term. Implementation of NextGen and its many technological advancements for the air traffic system, deserves the same due diligence and community input as any other major transportation system on the ground would warrant.

As you know, NextGen establishes flight tracks that become part of a complex and growing network or tracks and procedures. For the efficiency of NextGen implementation, the tracks should be designed to be stable and sustainable long-term. To that end, it's important to design tracks that will be acceptable to the FAA and community. NextGen is a transformational infrastructure investment and deserves the same due diligence and community input as any other major transportation system on the ground would warrant. As well as ensuring that this infrastructure does not cause undue harm.

To be clear, we do not represent every impacted community, interest or perspective on this issue, however our organization's engagement for nearly half a century, provides a unique perspective that we believe will give the Committee background on meaningful ways that have—and can continue to—measure the progress of addressing community concerns related to aviation noise.

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with airport roundtables. It also includes individual Members and this Committee responding to constituent concerns through legislative action, funding the study of noise metrics, and by creating the Quiet Skies Caucus.

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Where we have seen the most progress, even if seemingly incremental, has been in communities where tailored engagement has been put into place.

Outside of the NEPA process, transparent and robust communication can save time and avoid unnecessary hurdles caused by community push back when unexpected changes occur.

AIRPORTS AND THE COMMUNITIES THEY SERVE

It's important to recognize that there is a relationship between an airport and the surrounding and when each is doing well, they bolster the success of the other. Thriving communities are places where a dependable workforce want to live, and where people want to do business or visit. The airport is an asset to a community, but a thriving community is also an asset to the airport. Designing tracks that respect the communities they impact, and do not unintentionally cause harm, will foster this mutually-beneficial partnership.

Investment in this partnership creates the foundation for sustainable outcomes and long-term success.

Mr. LARSEN OF WASHINGTON. Thank you very much, and now the Chair recognizes JoeBen Bevirt of Joby.

You are recognized for 5 minutes.

Mr. BEVIRT. Chairman Larsen, Ranking Member Graves, and the members of the subcommittee, thank you so much for the invitation to be here today. It is an honor for me and for the entire Joby Aviation team.

I founded Joby with a vision of creating a new form of air travel that is clean, quiet, and accessible. My passion for this work began while growing up in the California redwoods. I remember walking home from school, where I experienced the beauty of the land around me. But like any child, I dreamed of a faster way to get there. I pictured myself flying in an aircraft that could take off vertically, but then transition and fly like an airplane, and blend seamlessly into its surroundings.

In 2009, I founded Joby Aviation to bring this vision to life, experimenting with new ways to design aircraft using electric motors and batteries. We were honored to work with NASA on pioneering projects like LEAPTech and the X–57 Maxwell to demonstrate the potential of electric flight.

After years of testing and development, we were ready to commercialize this technology, and started flying full-scale prototype aircraft in 2017. We are now working with the FAA as a formal applicant for type certification. I am pleased to say that we are on track to bring our all-electric piloted aircraft to market in 2024. It

is capable of flying 150 miles on a single charge to move four passengers at a top speed of 200 miles an hour.

Thanks to the foresight shown both by Congress and the FAA when they rewrote part 23 airworthiness standards to encourage innovation, the U.S. is out in front in this global race for aviation leadership. The FAA's decision to apply part 23 to aircraft like ours, and fully leverage the flexibility of the existing rules is critical, as it means no significant new regulation is needed. As a result, the United States leads the world in bringing aviation into the electric age of flight. In the decades to come, electric and hydrogen-electric propulsion systems will allow us to build aircraft that are cheaper to operate, quieter, and bring us much closer to net-zero emissions.

For the sake of the planet and future generations, it is critical that the Government continue to prioritize these technologies. My company is deeply committed to delivering an aircraft and a service that is emissions free, broadly accessible, and quiet.

Making aviation a part of everyday life requires a revolutionary approach to acoustics and aircraft design. And that is exactly what we have done. Our aircraft emits 100 times less noise than a traditional helicopter. During takeoff and landing, the loudest moments of flight, it is about the same volume as a normal conversation. In cruise, we are virtually silent. Thanks to the motors and propellers that we have created in-house, we have been able to eliminate the impulsive "wop wop" sound that defines helicopters. And instead, we have created something that more closely resembles the sound of wind passing through the trees.

Together with NASA, we have conducted a series of test flights in September 2021 to measure and validate the acoustic footprint of our aircraft, and some of the early results of that work are included in my written testimony.

Looking ahead, we must be good citizens and neighbors in the communities we plan to serve. That means engaging early, listening to local stakeholders, and offering a service that is broadly accessible. Our objective is to offer flights at a cost equivalent to taxis or ride-sharing services today.

In the early days, we plan to use existing airports and heliports, many of which today are underutilized. As we demonstrate the benefits of our transportation service, and prove how quiet our aircraft is, we believe early-adopter communities will be interested in permitting new infrastructure that is close to where people live and work. For this reason, we support H.R. 6270, the Advanced Aviation Infrastructure Modernization Act, sponsored by Chairman Larsen, Ranking Member Graves, and Representative Titus, which would allow cities to begin planning for this new type of mobility before it arrives.

Every major advancement in aviation began with a revolution in propulsion technology. And each time our Nation has been at the leading edge of adopting that opportunity, from the early Wright brothers' flights in Kitty Hawk to the jet age. Today, we have the opportunity to lead once more, this time with a technology that not only opens the door to new possibilities, but is also cleaner and quieter than ever before.

Thank you again for the opportunity, and I look forward to your questions.

[Mr. Bevirt's prepared statement follows:]

Prepared Statement of JoeBen Bevirt, Founder and Chief Executive Officer, Joby Aviation

Chairman Larsen, Ranking Member Graves, and Members of the Subcommittee, thank you for the opportunity to be here today. My name is JoeBen Bevirt, and I am the Founder and CEO of Joby Aviation (Joby). It is my privilege to speak to you about topics that are a passion of mine—aviation noise, sustainability, and the work Joby is doing to create a clean, quiet, and accessible form of air travel.

INTRODUCTION AND JOBY BACKGROUND

I founded Joby in 2009 with the vision of saving a billion people an hour a day through sustainable flight. My passion for this began while growing up in the Redwoods of California. I remember walking home from school, where I experienced the beauty of the land around me, but, like any child, I dreamt of a faster way to get there. On these walks, I pictured myself flying in an aircraft that could takeoff vertically and blend into its surroundings, with a sound that mimicked wind rushing through the trees, and producing no emissions harmful to the environment. My dream was not possible back then, as the technologies necessary were not yet commercially viable. In 2009, this technology matured leading me to start Joby.

At the beginning of our journey, we were a team of passionate engineers working day and night at a workshop in the mountains above Santa Cruz, California. We experimented with new ways to design aircraft that could fly like airplanes, take off vertically and powered entirely by batteries and electric motors. This early work set out the path for electric vertical take-off and landing (eVTOL) aircraft.

As we set out to design our aircraft, we had a few key goals in mind. We wanted to build something more efficient and more economical than traditional aircraft thus allowing millions of people to experience routine air travel. We understood from day one that making flight a part of everyday life required a revolutionary approach to acoustics, and this had to be considered in every aspect of the aircraft's design.

In 2009, this was an ambitious set of goals, as the Electric Aviation industry was still in its infancy. However, the federal government has long recognized and been committed to the research and development of electric flight. In 2012, we were fortunate to partner with the National Aeronautics and Space Agency (NASA) on several critical projects to help prove that electric flight was possible. One of the most successful, the LEAPTech project (see Figure 1), led to NASA green-lighting its first-ever electric X-plane project—the X–57 Maxwell—which we helped design and build elements of its propulsion system. This work was critical in showing the world that electric propulsion was ready for flight.

Figure 1

Figure 1 shows the NASA LEAPTech Project which showcased Joby electric aviation powerplant components

Meanwhile, we kept designing and testing our own motors, battery systems, and prototype aircraft. In 2015, we felt confident we had designed an aircraft that accomplished our goals, and we began flying subscale versions of it. The early tests showed enough promise that we proceeded to build a full-scale demonstrator that began flying in 2017.

After several hundred successful flight tests, our team was convinced we had the right aircraft to fulfill our vision, and we have since built two full-size pre-production prototypes and have been flying this platform since 2019. At the same time, we expanded our manufacturing facilities and—with the help of Toyota Motor Corporation, one of our leading investors and strategic partners—built our pilot manufacturing facilities in San Carlos, California, and Marina, California. We are currently building our first "production prototype" aircraft which we intend to fly later this year.

Simultaneously, in 2015, we began to engage with the Federal Aviation Administration (FAA), and in 2018, we formally applied to the FAA as a type certification applicant. We plan to bring to market a piloted electric airplane that seats four passengers, capable of flying 150 miles (plus FAA required 30 minute VFR reserve) on a single charge at speeds up to 200 miles per hour. I am pleased to say that we are currently on track to do this in 2024.

USHERING IN A NEW ERA OF FLIGHT

Our nation's history of aviation leadership is marked by innovation. From the first flight at Kitty Hawk to the dawn of the jet age, aviation has constantly reinvented what's possible, driven by the introduction of new propulsion methods. Today, we're witnessing the next propulsion revolution—the dawn of electric aviation. According to Morgan Stanley, just one segment of the electric aviation industry known as Advanced Air Mobility (AAM) is expected to be a $1 trillion industry by 2040[1] and is projected to add 280,000 jobs to the US economy by 2035.[2] Communities that decide to actively take advantage of this revolutionary technology will gain the societal and economic benefits that accompany this advanced form of transportation.

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[1] See, https://assets.verticalmag.com/wp-content/uploads/2021/05/Morgan-Stanley-URBAN__20210506__0000.pdf.

[2] See, https://www2.deloitte.com/us/en/insights/industry/aerospace-defense/advanced-air-mobility.html?id=us:2el:3pr:4diER6839:5awa:012621:&pkid=1007244#endnote-sup-6.

In this race for global aviation leadership, the FAA is leading the world. It is imperative that the United States not take this for granted and continue to take steps to ensure this leadership continues as Europe and China also seek to lead the emerging AAM industry. This leadership is possible due to the foresight of both Congress and the FAA nearly a decade ago, when they undertook the task of rewriting Part 23 and is furthered by the FAA's approach of using the flexibility of these and other existing regulations to their fullest extent.

On July 18, 2013, the U.S. House of Representatives unanimously approved the Part 23 rewrite, or the "Small Airplane Revitalization Act of 2013" (SARA).[3] The bill, which was signed into law by President Obama later that year, created a new way to certify airplanes that allowed for more flexibility in the design—provided that the aircraft still maintained the rigorous safety standards set by the FAA. The FAA's "Part 23 Rewrite" was created to modernize general aviation with an eye to the future by being durable enough to support and enable the design and certification of an entirely zero-operating emission aircraft like Joby's. It is a credit to the FAA's work and an example of the government maximizing safety while nurturing innovation.

Following the enactment of SARA, in 2020, the FAA decided eVTOL aircraft that fly on the wing and show airplane-like flight characteristics met the criteria to be considered a Part 23 21.17(A), normal category, airplane.[4] The FAA also created a range of special conditions to address items like electric propulsion and vertical performance of the airplane.

This determination also strengthens our global aviation leadership by enabling early eVTOL operations to use today's aviation system—including commercial pilots, air traffic control, and existing bilateral aviation safety agreements[5]—and therefore, no significant new regulations are needed to begin commercializing this technology. By choosing to leverage the new Part 23 for eVTOL aircraft, the FAA has remarkably enhanced manufacturers' ability to innovate and get quiet, sustainable flight to the masses—without compromising safety.

I firmly believe that Joby's aircraft and other companies working in our space are creating the start of a zero-emissions aviation future. Today, the aviation sector has proven to be one of the hardest to decarbonize. The industry is fully committed to creating a zero emissions future and have pledged zero operating emissions by 2050.[6] To meet this goal, companies are hard at work developing a path to in sector net zero emissions.

Electric, and eventually hydrogen, aircraft will power a suite of future aircraft that ultimately cover all potential use cases. Development of this technology will take time and the government must continue to heavily invest in order to decarbonize the industry, lead the world in the next era of aviation, and fully realize the potential benefits of clean aviation for society.

NOISE AS A PRIORITY

Electric aviation has the potential to truly improve our cities and communities—not just by eliminating emissions, but also creating faster, affordable new ways for people to move around increasingly congested areas. But these benefits can only be realized if industry can design planes quiet enough to blend into their surroundings. While replacing noisy combustion engines with electric motors helps to address the acoustics of vertical flight, achieving truly quiet flight requires careful design considerations throughout the aircraft.

At a high level, our airplane measures 65 A-weighted decibels (dBa) during takeoff and landing from a distance of 100 meters, and 40 dBA in overflight. This is roughly 100x less acoustic energy than a traditional rotorcraft, and for comparison, about as loud as a normal conversation at its loudest point.[7] However, noise is inherently complex and it's important that when the aviation industry thinks about it, we consider both the measurable quantity of the noise as well as the quality of the sound. The Joby design addresses both in several ways.

First, we designed electric motors that create very high torque, which enables our propellers to spin powerfully at low revolutions per minute (RPM) while still generating substantial lift and thrust. As a result, the Joby aircraft has double the battery capacity of a Tesla Model 3 Long Range automobile, along with six times the

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[3] See, https://www.congress.gov/113/plaws/publ53/PLAW-113publ53.pdf

[4] See, https://www.youtube.com/watch?v=WEOIe7qTejU&t=2778s

[5] See, https://www.faa.gov/newsroom/joint-faa-and-united-kingdom-caa-statement-evtol-aircraft

[6] See, https://www.aia-aerospace.org/news/net-zero-by-2050/ ; https://ibac.org/posts/ibac-commits-to-net-zero-carbon-emissions-by-2050 ; https://www.airlines.org/news/major-u-s-airlines-commit-to-net-zero-carbon-emissions-by-2050/

[7] See, Joby Dec. '21 Corporate Deck https://ir.jobyaviation.com/about-us/presentations

torque density and three times the total propulsion power.[8] Next, we paired that motor with specially designed lightweight propeller blades optimized for low noise. The progression of our propeller design can be seen in figure 2. High torque motors, combined with a large, purpose designed, propeller capable of spinning at low RPMs has played a critical part in drastically reducing our total sound profile.

Figure 2

Figure 2 shows the range of propellor designs Joby tested to determine the optimal solution

The amplitude, or loudness, of a sound is just one piece of the noise equation; sound quality is also critical to how noise is perceived. We focused extensively on both aspects of noise and designed our aircraft to avoid the "wop wop" of a traditional helicopter. We instead created a sound that closely resembles nature by limiting the impulsive sound coming off the aircraft.

Taken together, we believe our design approach resulted in an aircraft that is extremely quiet and more pleasing to the ear than today's aircraft. To validate this, it was critical for us to work with a respected third party and, for that reason, we were fortunate to partner once again with NASA as part of their Advanced Air Mobility National Campaign. Together, we conducted a series of test flights over two weeks in September 2021, using NASA's Mobile Acoustics Facility[9] to analyze the noise footprint of the Joby aircraft.

Since completing that testing, we have gained valuable insights into the noise signature of our aircraft, and figures 3 and 4 show some of the results. In sum, it showed that our aircraft met our acoustic design targets and emits a small noise signature compared to existing helicopters.

[8] See, Joby Aviation Analyst Day Deck https://ir.jobyaviation.com/about-us/presentations
[9] See, https://www.nasa.gov/press-release/nasa-begins-air-taxi-flight-testing-with-joby

Figure 3

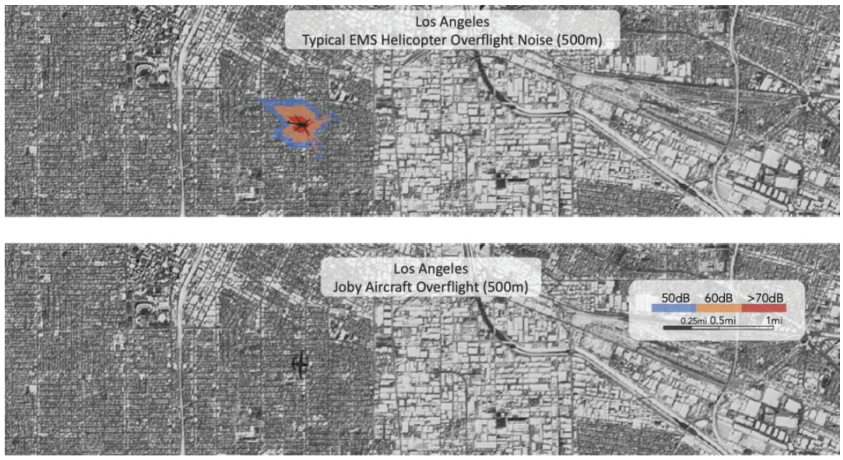

Figure 3 compares the noise signature of a typical EMS Helicopter in Overflight at 500 meters with the noise signature of the Joby Aircraft in overflight at 500 meters

Figure 4

Figure 4 compares the noise signature of a traditional airliner as it is landing at LAX with the noise signature of the Joby Aircraft as it is landing at LAX.

COMMUNITY ENGAGEMENT IS VITAL TO THE FUTURE OF EVTOL

Creating a fast, sustainable and quiet aircraft are essential steps, but we must also be good citizens and neighbors in the communities whom we plan to serve. As Los Angeles Mayor Eric Garcetti noted before this Committee in his April 2021 testimony: "Angelenos are no stranger to noise from aircraft, particularly from daily helicopter flights over urban neighborhoods and the broader noise issues faced by people who live near our various airports. OEMs, like Joby . . . are targeting noise levels less than 70 decibels at cruising altitude. This is comparable to the higher range of a normal conversation. Joby Aircraft, for example, has publicly made it known that its aircraft's acoustical characteristics are just as important as other

performance characteristics. Communities demand quieter vehicles, and the industry is responding." [10]

Joby intends to not only design and build our aircraft, but to also serve as the commercial operator as well. We are on track to receive our Part 135 certification from the FAA later this year.[11]

Historically, most people have been unable to use air transportation for short, routine trips given costs and other factors. The objective of AAM is to create a new democratized, accessible form of air travel. My long-term goal is for the cost of a Joby flight to be lower than the cost of personal car ownership, but I recognize that will take some time. This new form of accessible, sustainable air travel will create a new paradigm in aviation where millions of people can afford to travel on our service daily or weekly.

In the early days of our service, we plan on operating out of today's existing aviation infrastructure. The United States leads the world with 5,080 airports and many more heliports located throughout the country.[12] Built in the aftermath of World War II, these airports triggered massive economic growth as they connected the U.S. in ways that had never been possible. Today, many of these airports are underutilized.

Congress, and specifically this Subcommittee, has devoted substantial time and resources to foster air services among underserved communities with underutilized airports around the country. We intend to revitalize many of these airports by providing a new sustainable service.

Due to the substantially reduced noise profile of our aircraft, along with its enhanced affordability, we believe there will be interest in and opportunities to permit new infrastructure closer to where people live and work, commonly referred to as "Vertiports" or "Skyports." Industry is actively working with the FAA to define this new class of infrastructure, but they are largely envisioned as similar in size to a heliport with electric charging and water available. In the future, I believe that we could consider incorporating noise standards into how we permit infrastructure. Quiet aviation is coming, and cities should be able to work with industry to make it a part of their transportation networks—but only with the promise that it won't be disruptive to their citizens.

This future will only be possible if industry engages early and often with local communities and can deliver a service that is both broadly affordable and a welcome addition to everyday life. We are already working with numerous cities to design a service that meets their specific needs and requirements. I believe more local communities will want to construct Vertiports to integrate quiet, accessible aircraft into their transportation networks.

To help cities begin to plan for Advanced Air Mobility, Joby and others in the industry have been pleased to support H.R. 6270, the Advanced Aviation Infrastructure Modernization Act sponsored by Chairman Larsen, Ranking Member Graves, and Representative Titus.[13] This legislation would enable one year planning studies for cities to study how Advanced Air Mobility will integrate into their specific community. To paraphrase something that Chair Larsen and I have talked about before, "the most important person may soon become the local city planner". I firmly believe that this piece of legislation is critical to give that local planner the resources necessary to understand how Advanced Air Mobility will benefit their local community.

CONCLUSION

The electric age of aviation is the most exciting time for the aviation industry since the dawn of the jet age, and the coming decades will be defined by quiet, sustainable, and accessible flight. We appreciate that both Congress and the FAA are doing their part to ensure that the United States continues to lead the world in the future of sustainable flight. Joby is committed to doing our best to ensure that we are providing them a service that is affordable, accessible, sustainable, and quiet.

Thank you again for the opportunity to be here today, and I look forward to your questions.

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[10] See, https://transportation.house.gov/imo/media/doc/Garcetti%20Testimony.pdf

[11] See, https://www.jobyaviation.com/news/joby-nears-completion-part-135-air-carrier-certification/

[12] See, https://www.statista.com/statistics/183496/number-of-airports-in-the-united-states-since-1990/

[13] See, https://www.congress.gov/bill/117th-congress/house-bill/6270?q=%7B%22search%22%3A%5B%22H.R.+6270%22%2C%22H.R.%22%2C%226270%22%5D%7D&s=1&r=2

Mr. LARSEN OF WASHINGTON. Thank you very much. Thank you to the panel. And we will now go to Members for questions. I will recognize myself for 5 minutes. The first question is for Ms. Tranter.

As part of the 2018 FAA reauthorization law, Congress required FAA to appoint regional aviation noise ombudsmen. In your view, how would you assess the role that the ombudsman process has played?

Has it improved communication?

And what improvements can be made to the use of ombudsmen?

Ms. TRANTER. Thank you for the question.

I know that the creation of ombudsmen was much anticipated by communities across the country, and the impact and investment of that position has made significant changes to, as I spoke to, the local presence of the FAA and engagement.

I think there is some room for improvement, in terms of ombudsmen's awareness of certain community dynamics, and of a nonpartial role—not that the FAA is partial, but that ombudsmen tend, and by definition, to have that background.

But I do think that it is exceedingly important that the FAA continues to try. They are trying, they are putting these things into place, and there is a lot of trial and error as they go, but the most important factor is that these policies and positions are put into place to build on and to learn from.

Mr. LARSEN OF WASHINGTON. Thank you. Are there specific changes to the law as we prepare for 2023 that you think we should consider?

Ms. TRANTER. I think the law changes should continue to invest and allow the FAA to invest in local community engagement, so subject matter experts on the ground for and on behalf of communities, whether that is through the FAA, through outside consultants or contractors. That, in, I think, our organization's opinion, is one of the strongest tools towards giving communities that sense that they are well represented and have the same footing as these new tracks go into place, the new procedures go into place.

So, that investment for the FAA would be critical for them to have those tools at individual airports to respond to the individual needs.

Mr. LARSEN OF WASHINGTON. Yes, thanks.

Mr. Miller, your description of the Hollywood Burbank experience sounded very sunny, and I am sure a lot of hard work went into that. Do you have any advice for us on any hiccups or challenges that you faced and, as well, how this would apply—how your experience would apply to other airports?

Mr. MILLER. Mr. Chairman, you are right, it wasn't all sunny.

The purpose of the task force was really to identify issues that have been raised before, that there are certain things that we can and cannot do to provide an opportunity for the community to understand the role of the airport. And as we went through the process, we worked very closely with the FAA to ensure that the task force would be able to accomplish what we wanted. And the FAA was very instrumental in helping us convene this task force.

We also made it clear that not everything that was contained in the recommendations we could commit to undertaking. There were some things that, obviously, can't be done.

So, I think it helped us at least to get out there. I know that the community wasn't always very happy with the idea that it wasn't an easy fix. And as was stated once before, we are not really eliminating noise, it is how you relocate the noise impact.

So, there are issues that have to be discussed. Certainly, we know that we weren't making everybody happy. But I think most airports around the country want to be good neighbors. We certainly want to be a good neighbor here in Burbank. And the task force is, I think, a very important way of conveying that to the community and giving them an opportunity to participate in discussions with us. And I think it was very important to have the elected officials represented on that task force to also understand how their constituents could be affected either by getting noise that they hadn't experienced before, or being able to move the noise to a different area where it had provided the least impact.

Mr. LARSEN OF WASHINGTON. Thank you. I will have questions for the record for the other witnesses around new technologies and their impact on noise.

With that I will turn to the ranking member, Representative Graves of Louisiana, for 5 minutes.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Chairman.

Ms. Tranter, I was asking the FAA and the GAO in the first panel about some of the distortions about noise complaints, going over the helicopter analysis done with the Department of Defense, as well as some of the complaints coming in to National Airport, and just showing the incredible distortion of numbers with the majority of complaints. For example, for the helicopter analysis, 89 percent of the complaints were lodged by the same 10 folks. The outliers can obscure a goal of trying to truly mitigate noise complaints or noise issues.

How can we work together to help to make sure that we are doing an accurate analysis, and truly working to address the complaints collectively?

Ms. TRANTER. Thank you for the question. Yes, noise complaints are an interesting beast, in that the FAA, the United States does not measure noise impact by complaints; it is measured by the metric.

I would go back to my testimony that the engagement with the roundtables who have been endorsed by the community or who have been developed by the community, whether those be put together by or comprised of elected officials and/or residents, and also other subject matter experts: those bodies, those public processes give, in our experience, the most accurate picture of the impacts on the ground and what folks are hearing. Because, yes, maybe one person gives a much more of an unbalanced set of complaints in a process.

However, folks who are engaged, who are well educated on the issue and impacts tend to engage with their local elected officials and with anybody that is present. In Minneapolis, there is the Noise Oversight Committee. Those are elected officials and city

staff and residents. They are known to interact with them, and also with their elected officials in Congress, and things like that.

So, that gives you a much more accurate picture to then respond to and address where the issues lie.

Mr. GRAVES OF LOUISIANA. Thank you.

Mr. Bevirt, you win the prize for the best background. I think I would like one of those.

But I wanted to ask, so I asked Ms. Krause on the first panel from the Government Accountability Office about how we need to be thinking about noise moving forward, considering the evolution of technology and some of the innovation that you and others are carrying out. We are going to be looking at, potentially, aircraft that are much closer to residential and commercial areas, potentially flying at different elevations.

Could you talk a little bit about how Joby is approaching it, perhaps give us some advice on what we should be thinking about as we consider the number of flights, when we consider the different altitudes, meaning the lower altitudes of some of the aircraft that will be flying, with newer technologies, and some of the flightpaths, and that we are going to be potentially having vertiports and others closer to residential areas, and things along those lines?

Mr. BEVIRT. Congressman Graves, thank you so much for the question.

So, I think the key element here is, if you care about aviation noise, if you care about acoustics, the best thing you could do is invest in electric propulsion. Electric propulsion is a game changer. It allows you to radically rethink the design of aircraft in a really holistic way.

As I spoke about, we have been able to reduce the acoustic signature of aircraft in hover by 100-fold, compared to helicopters. That is unprecedented.

We have also been able to substantially reduce the noise in overflight.

The reason we have invested in this, we have spent more than a decade very, very focused on this, and the reason is, we want to be able to serve communities. We want to be able to land in a community. I am somebody who cares very deeply about the tranquility of the place that I live, and yet I want access to the next generation of transportation. And so, I want to be able to take off from where I live without disturbing my neighbors. And to do that, we have developed an aircraft which is really a game changer in its acoustic signature.

To follow on, electric propulsion can enable those benefits in aircraft of all shapes and sizes, and will be really transformational as we look to the future of reducing aircraft noise across the country.

Thank you again.

Mr. GRAVES OF LOUISIANA. Thank you very much.

Madam Chair, I yield back.

Ms. NORTON [presiding]. I recognize myself for 5 minutes. A question for Ms. Tranter.

One of the most consistent complaints we hear from residents who experienced elevated levels of noise is their inability to speak or direct their complaints directly to the FAA. In response, this committee included a provision in the FAA Reauthorization Act of

2018 to create a formal process for addressing community concerns by establishing ombudsmen in each FAA office to serve as community engagement officers.

How effective have these new ombudsmen been at addressing community concerns regarding aviation noise?

Ms. TRANTER. Thank you for the question. I do think that it was a point of progress to have an FAA personnel at each airport, at each regional—not at each airport, but at each region of the FAA that can engage and be responsive.

I think that the key—and what we have seen as an organization is the key—is to have that person have continuity, have engagement with whatever the other stakeholders are, and understand the dynamics there. The FAA is a very large agency. They have a lot on their plate to deal with, safety and efficiency, and safety being—we all understand that we fly safely because of how hard everyone at the FAA works.

But having the dedicated person on the ground is a great step, but we do see room for improvement in just elevating all levels of communication in terms of reading the room for each scenario, each airport, and then responding back up to headquarters, and using all of the tools that headquarters has, and has put in place to then respond to the community concerns.

Ms. NORTON. In your view, are there more changes that need to be made to create a more effective engagement with local communities?

Ms. TRANTER. Yes, I think that continued investment by Congress and the FAA into on-the-ground Government, FAA, industry, and airport engagement, more investment in terms of policy that you all would put into place, and positions that are funded. An emphasis on the need for local understanding and engagement is key because, again, all of these long-term investments into looking at metrics, into the study of noise, into new aircraft, which is all extremely vital and important, that is very long term. And so, the investment into how the FAA and Congress can support the individual local engagement, I think, would be a great focus for the next reauthorization.

Ms. NORTON. Mr. Miller, many airports that participate in the part 150 program and receive Airport Improvement Program funding for noise mitigation projects find that the demand for these funds often outstrips supply. However, with the passage of the Infrastructure Investment and Jobs Act—and we have just done that—airports will receive a record amount of funding for all types of airport development projects, including noise mitigation.

Can you explain how critical this law will be in helping airports fund additional noise mitigation projects for their local communities?

And can you specifically describe how your airport plans to use this new funding to address your community's aviation noise concerns?

Mr. MILLER. Madam Chairman, certainly, the funding that has been approved will be very welcomed by airports around the country, as well as here in Burbank. We rely upon it very much to be able to do the noise mitigation efforts that we know will be very

crucial to our efforts to be that good neighbor, to help noise-insulate homes around the airport.

We will continue a program that we have had in place for some time. There has been a lapse in our efforts only because of the COVID pandemic and the lack of available funding for us. So, as the funding becomes available, and as we can draw down on that money, we have already set aside the matching grant dollars that we will need in order to move forward.

So, I thank Congress for approving that bill. I thank you for the ability to have more funding available to ensure that we can move as quickly as possible to complete the programs that we have had in place for quite some time.

Ms. NORTON. Thank you very much.

Mr. Burchett, you are recognized.

Mr. BURCHETT. Thank you, Chairlady, I appreciate the opportunity to be here.

JoeBen, I am a flagrant inventor myself, I guess, and I appreciate everything that you have got going. I wish you were close to Knoxville, Tennessee, brother. I would love to crawl all over one of those airplanes. That just fascinates me.

And I brought a picture of my mama. She actually flew an airplane during the Second World War, which is pretty cool. She was—my daddy was off fighting the Japanese, she was doing her part for the war effort. And she lost a brother fighting the Nazis, and she was about 18 years old and flying an airplane. They were truly the greatest generation.

And I guess my question, just for anybody out there who wants to answer it, do you all think that the U.S. can realistically achieve the net-zero greenhouse gas emissions in the aviation sector by 2050 without phasing out a majority of the planes currently in the U.S. fleet? Because I know that they are older planes, and probably not as efficient.

And of course, Mr. JoeBen is chomping at the bit, because he knows they are not electric. So, I am wondering if you all think that is a possibility.

Mr. BEVIRT. So, I am incredibly excited about the opportunity to utilize solar and wind and hydropower, hydropower from places like Tennessee, to deliver energy independence for our country, and to power our aviation and our planes with electric and hydrogen-electric propulsion systems to drive the economic value into our country, into our communities.

If you have an airport, and you put in solar panels, all of the revenue from that energy generation accrues to the local community. If you are in Kansas, and you have got wind turbines, and you power your planes, all of that revenue is accruing to your community. I think that is really, really powerful.

I think that, as you rightly point out, we need to drive to a zero-emissions aviation future. We need to do that as aggressively as we possibly can. The best way to do that is with electric propulsion. And so, we should be investing in research and development. We should be investing in manufacturing. We should be investing in things like H.R. 6270 to drive community planning.

All of this will leave the country much stronger. Investments made today will pay dividends for decades.

Mr. SILVER. If I might, as well, there is no doubt that we are currently being outspent by our European compatriots—competitor mates, as we like to call them—in terms of these technologies.

We, AIA, has made the commitment. We are the ones who are required to design these aircraft to meet the goals of 2050. We would not lightly make that commitment unless we thought we could get there. However, it is going to take extraordinary effort on all of our parts and putting in the necessary time, research, and dollars to help us accomplish that, including, but not limited to, the engine technology, the airframe technology, but also sustainable aviation fuels, which are going to be critical for us in helping us achieve these goals.

Ms. PINKERTON. Congressman, I will just jump in here, as representing the airlines today.

Well, first of all, the story about your mom was amazing. What an inspiring story, but——

Mr. BURCHETT [interrupting]. She was pretty cool.

Ms. PINKERTON. That is awesome.

Mr. BURCHETT. I am an unrepentant mama's boy, and I miss her and my daddy every day.

Ms. PINKERTON. I did want to say, carriers also are very excited about the potential for electric and hydrogen. In fact, some of our carriers have invested in those technologies. I think they are critical, but they are more of a medium or longer term solution.

And as you know, carriers came together last year and announced our net-zero goal by 2050. We do think we can meet that, but we do think, in the short and medium term, we need to be making these investments in sustainable aviation fuel. I know we have got some leaders on this committee in that space. It is very exciting, the work that is being done, but it is a public-private partnership.

Airlines are committed to making that happen. Having 3 billion gallons of sustainable aviation fuel available by 2030 is no easy task. But there is funding and incentives in the Build Back Better bill that we are all very supportive of, and I am looking forward to working with you and your colleagues to make it happen.

With respect to the planes, I don't know if you heard my oral testimony, but essentially what I said was, if there is a silver lining on COVID, it is the fact that we not only parked planes, but we retired a lot of our older and noisier fleet. And we have spent $60 billion in the last 5 years on buying newer planes. Those new planes that we bought in the last couple of years are 50 percent more efficient and quieter than the planes that we bought just 10 years ago. So, I think we are off to a good start, but we will look forward to working together——

Mr. BURCHETT [interrupting]. Sharon, do you think my flight bill will come down 50 percent?

[Laughter.]

Ms. PINKERTON. It is already pretty low, I have to tell you. It is already pretty low.

Mr. BURCHETT. All right. I don't know. My parents were Depression-era. It could always go a little lower.

Thank you all so much. And Madam Chair, I yield back the remainder of my time. It has been a pleasure with you all today.

Ms. NORTON. I thank the gentleman.

That concludes our hearing. I would like to thank our witnesses for their testimony today. Your comments have been very informative and helpful.

I ask unanimous consent that the record of today's hearing remain open until such time as our witnesses have provided answers to any questions that may be submitted to them in writing.

I also ask unanimous consent that the record remain open for 15 days for any additional comments or information submitted by the Members or the witnesses to be included in the record of today's hearing.

Without objection, so ordered.

The subcommittee stands adjourned.

[Whereupon, at 12:25 p.m., the subcommittee was adjourned.]

SUBMISSIONS FOR THE RECORD

Prepared Statement of Hon. Sam Graves, a Representative in Congress from the State of Missouri, and Ranking Member, Committee on Transportation and Infrastructure

Thank you, Chair Larsen and Ranking Member Graves, and thank you to today's witnesses.

Ensuring that airports and the aviation community work together with nearby communities and the general public is critical to the growth of the aviation industry.

Obviously, aircraft noise at airports can negatively affect surrounding communities.

That is why over the years this Committee has given the FAA a number of tools to help mitigate the impacts of aircraft noise.

However, it is important to remember that the FAA is an aviation safety regulator, responsible for the safe, efficient operation of the National Airspace System.

We also have to ensure that unfounded noise concerns are not used as a weapon against our general aviation airport infrastructure.

Most general aviation airports have been around for decades, and the noise from airport operations isn't new.

A robust network of GA airports will help drive the next few decades of aviation growth and development, including with new technologies like advanced air mobility vehicles.

I look forward to hearing from our witnesses today about how we can work to mitigate the effects of aviation noise without compromising the American leadership in aviation safety, operations, and technology.

Thanks again, Mr. Chairman, and I yield back.

Prepared Statement of Hon. Eddie Bernice Johnson, a Representative in Congress from the State of Texas

Thank you, Chairman Larsen and Ranking Member Graves for holding today's hearing. I would also like to thank our outstanding witnesses for testifying before us today.

As a Member of Congress with two airports, Love Field and Dallas-Ft. Worth, and two large airline hubs, American Air and Southwest, based in and just outside my congressional district in Dallas, the issue of aviation noise is a matter of great concern to me and to many of my constituents living near these airports. As we've learned, aviation noise isn't just an annoyance, but can lead to a host of long-term health and behavior problems for those subjected to high decibels of noise.

Dallas Love Field is a vital hub serving Dallas and North Texas. In 2020, Dallas Love Field was the busiest medium-sized airport in the United States. Because of its central location within the city, it is uniquely convenient for travelers, however, this also places the airport near densely populated neighborhoods. According to FAA's 2021 analysis, roughly 300,000 residents live within 5 miles of the airport, a statistic that ranks it in the top 25 of all airports surveyed.

In response to the noise, Love Field has created an Environmental Committee which facilitates meetings with the community and airport stakeholders, has installed monitors that collect noise data, and launched a Noise Lab website that allows residents to submit noise complaints for investigation, and provides live flight tracking and other helpful airport information.

As airports continue to see more flights every day, addressing aviation noise must be a priority for all our government leaders and aviation stakeholders, and should continue to be a multi-pronged approach utilizing new technology, innovative building materials, new take-off and landing patterns, and strong community engagement.

I look forward to hearing from our witnesses on the latest actions being taken to address aviation noise and what we can be doing better.

Statement of Hon. Karen Bass, a Representative in Congress from the State of California, Submitted for the Record by Hon. Rick Larsen

Chair Larsen, Ranking Member Graves, and members of the Subcommittee on Aviation, thank you for the opportunity to provide written testimony on today's hearing on aviation noise.

This is a timely hearing given that air traffic is rebounding to pre-pandemic levels. In the 37th Congressional District of California, aviation noise has had a devastating effect on many of my constituents. The Federal Aviation Administration's (FAA) implementation of the Southern California Metroplex project narrowed the North Downwind Arrival flight path into Los Angeles International Airport (LAX), resulting in concentrated noise over parts of my district where aviation noise had never been a large issue before. Even moderate exposure to noise has been shown to have harmful effects on human health, and excessive levels of noise like those afflicting parts of my district can have serious health effects including exacerbating hypertension and heart disease; and disrupting sleep, with all the harms that come from that, including learning loss among school children.

In addition to the human cost, aviation noise has direct economic impacts in my district, which is home to several motion picture studios, one of which lies directly under the North Downwind flight procedure. The frequency of overflights has increased dramatically, back to, and sometimes exceeding, pre-pandemic levels. There may be a plane overhead every two to three minutes. Studios working outside of a soundstage can find it difficult to have a stretch of time long enough to film a whole scene without airplane noise interrupting the filming. And those scenes filmed outdoors, including off of the studio lot, can provide income to the city, to local residents and businesses, and of course, to the workers who make all of the magic happen behind the scenes. This has already resulted in production moving away from my district, posing a significant financial loss for the 37th District.

Additionally, as Urban Air Mobility and Advanced Air Mobility technology continues to develop, we must prioritize residents' health and well-being. Large scale use of drones to deliver packages to consumers, for example, will further increase noise exposure given the low altitude of drone flight. While there are merits to this new technology, there has been virtually no public discussion about the noise annoyance accompanying delivery drones, air taxis and other low-altitude flight technologies. We must plan to prevent those harms. Rather than repeat past mistakes, implementation of new technologies should take strong measures *before* implementation to assure that a company's bottom line does not come at the expense of residents across the country.

I strongly urge the FAA and Congress to do more to address the problems faced by communities currently struggling with excessive noise, and to engage in meaningful outreach and mitigation during the *planning phase* of any changes to flight procedures moving forward. One of the biggest problems with the NextGen implementation was that, by the time FAA began outreach, millions of dollars had already been invested in planning to re-construct the highways in the sky in a particular way. Any input from terrestrial communities at that point could have little effect on the outcome of that planning process.

As a former community organizer, I know that there is wisdom in the community that can often result in solutions the planners had not thought to explore. Including those on the ground in planning for proposed changes affecting aviation noise could well result in much more workable solutions, and at the very least help the community understand the reasons why choices are being made. I look forward to working with my colleagues to advocate for solutions to provide relief to communities across the nation and prevent these problems in the future.

Once again, thank you Chair Larsen, Ranking Member Graves, and Members of the House Subcommittee on Aviation for the opportunity to provide written testimony. I appreciate your time and attention.

Statement of Hon. Donald S. Beyer, Jr., a Representative in Congress from the Commonwealth of Virginia, Submitted for the Record by Hon. Rick Larsen

Thank you for providing me the opportunity to provide testimony for the Transportation and Infrastructure's Subcommittee on Aviation hearing on "Aviation Noise: Measuring Progress in Addressing Community Concerns."

Aviation noise is something that impacts my constituents daily because of the location of National Airport within Virginia's 8th District. While I applaud the Federal Aviation Administration's (FAA) recent efforts to modernize their air traffic system, this has led to flights being concentrated over specific neighborhoods, instead of the scattered flight paths that spread the noise across several neighborhoods. Aircraft noise is known to cause community annoyance, disrupt sleep, and negatively impact overall health of impacted residents.

Hundreds of my constituents have expressed to me their frustrations with the slow pace of change following their input to government authorities about aircraft noise. This problem isn't getting better quickly enough. Northern Virginians have been patient, but there is more that can be done to reduce the toll taken by noisy aircraft in our community. It is my strong belief and that of my constituents that airplanes should fly over the Potomac River for as long as possible before turning east or west.

During my time in Congress, I have taken several measures to try to mitigate the impacts of airplane noise. Every year, I join colleagues in our annual appropriations cycles to push for mitigation measures in the Transportation-Housing and Urban Development Appropriations Bills. I have offered amendments to FAA Reauthorizations, National Defense Authorizations, and sought every opportunity possible to engage with relevant stakeholders in the community and across government to help mitigate the noise. While I remain committed to finding strategies to help constituents, I think it is time the FAA engage in a more robust way on these issues. We need an Administrator who is committed to conducting detailed environmental impact assessment before flight path changes over residential areas and who understands people under flights are as important as those on flights. That is why I encouraged President Biden to nominate a new FAA Administrator who is focused on mitigating the impact of airplane noise on local communities.

While I know that my district is situated in such a way that heightens the noise impacts of aircraft on people, I believe it is imperative that we continue to work together to find ways to lessen these impacts.

Additionally, attached to this testimony, please find a letter from one of my constituents regarding his thoughts and concerns on the issue.

ATTACHMENT

[Editor's note—The letter from Mark and Leanna McEnearney, Rep. Beyer's constituents, is retained in committee files.]

Statement of Hon. Jim Cooper, a Representative in Congress from the State of Tennessee, Submitted for the Record by Hon. Rick Larsen

I proudly represent Middle Tennessee, including the Nashville International Airport (BNA), the best small-city airport in the world. Nashville is one of the hottest cities in America. It's easy to get to or from Nashville to anywhere in the country. Travelers from all over the world visit Nashville to experience our live music, award-winning restaurants, and southern hospitality. Last year, nearly 16 million passengers traveled through BNA, and that number is estimated to grow to more than 23 million over the next decade and a half.

Nashville is a welcoming city, but all these visitors are hurting the quality of life of community members who live near the airport. My office regularly receives complaints about aviation noise caused by commercial flights at BNA.

Constituents who live up to ten miles from BNA routinely complain of aviation noise starting from before 6:00am and lasting until after 11:00pm. One neighborhood association president reported, "The neighbors are growing increasingly upset about the disturbance to their sleep and quality of life." A nationally-known musician in Nashville says aviation noise from BNA frequently disrupts work at his home studio. He often measures the exact decibel level of the noise with his recording equipment.

I mostly hear from constituents who live outside of the FAA's designated boundary for significant aircraft noise exposure, known as the DNL contour. Thus, offi-

cially, the FAA does not have to address their noise complaints. The current noise mitigation strategies are not working and there must be a solution for Nashville residents who live outside of this FAA boundary but who still experience high levels of noise pollution.

Nashvillians also need greater clarity about reporting aviation noise. One constituent who lives outside the DNL contour went to great lengths to report the problem and find a solution, but he got nowhere in the process. The Metro Nashville Airport Authority, which owns and operates BNA, told this constituent the FAA has exclusive control over all aircraft in the air and determines the appropriate routing and altitude of arriving and departing aircraft according to wind direction and BNA's runway configuration. Meanwhile, the FAA told the same constituent that it "does not control the time of day for aircraft operations, airline schedules, or the type of aircraft airlines choose to fly," and that it "has no control over airport operations, local airport noise abatement programs, or voluntary noise abatement procedures." According to the FAA, BNA is best suited to address noise impact. We still don't know who has control, but we do know that when everyone passes the buck, nothing gets resolved.

BNA claims there have been no changes to flight patterns in the past few years and that Nashville residents had grown accustomed to the low air traffic levels of 2020 when fewer flights took place. But my constituents insist this is not the case. Regardless, there is an abysmal failure of communication and a total lack of leadership here. We need to make it clear to members of our communities to whom to report aviation noise issues and what remedies are available when their quality of life is genuinely disrupted. They deserve nothing less.

Statement of Hon. Anna G. Eshoo, a Representative in Congress from the State of California, Submitted for the Record by Hon. Rick Larsen

Mr. Chairman, thank you for holding this important hearing on an issue that has substantially impacted the quality of life of my constituents: aviation noise.

The Federal Aviation Administration's (FAA's) NextGen program includes the use of Performance Based Navigation which allows aircraft to fly along more precise flight paths. This technology also has the unfortunate side effect of concentrating jet noise over communities under these flight paths. Since 2015, noise complaints at San Francisco International Airport increased by over 1,000 percent, and I continue to hear from so many constituents who experience elevated levels of noise.

I asked my constituents to participate in this hearing by submitting their comments to me about how aviation noise has impacted their lives. I received responses from 127 constituents; the Cities of Mountain View, Palo Alto, and Saratoga; and the Chairman of the Santa Cruz County Board of Supervisors demonstrating the ongoing frustration of so many about the FAA not being able to resolve this issue. I've enclosed each of the comments I received so that these important concerns are included in the record of this hearing.

As the Subcommittee prepares to consider FAA reauthorization legislation in 2023, I encourage you to consider the following policies to help address aviation noise:

NOISE METRICS

The FAA relies on the 65 decibel day-night average metric (DNL) to determine noise impacts, but community surveys have consistently demonstrated that this metric does not accurately measure how our constituents living under flight paths perceive aviation noise. The FAA has failed to adequately consider alternative metrics such as the Cumulative Noise Equivalency Level, which is used by the State of California, and the day-evening-night level metric (DENL) used in Europe. The upcoming FAA reauthorization bill should direct the FAA to develop a metric that properly reflects the burden of aviation noise on impacted communities.

CONSIDERATION OF COMMUNITY IMPACT

The FAA has a statutory mandate to prioritize safety and efficiency when designing flight paths. While safety should always be the FAA's top priority, efficiency should be balanced against the environmental impacts of changes to flight paths, including noise impacts. I've supported legislative efforts to require the FAA to elevate the importance of noise when designing flight paths, including introducing H.R. 4925, the F–AIR Act with Congresswoman Jackie Speier, and I will continue to support this policy.

Aviation noise is not merely a nuisance but substantially diminishes the quality of life of so many of my constituents, including many who live dozens of miles from San Francisco International Airport. Thank you for the opportunity to participate in this hearing and for reviewing my testimony and the views of my constituents as you consider legislation to mitigate aviation noise.

ATTACHMENT

[Editor's note—Comments from 127 of Rep. Eshoo's constituents; the Cities of Mountain View, Palo Alto, and Saratoga; and the chairman of the Santa Cruz County Board of Supervisors are retained in committee files.]

Statement of Hon. Ruben Gallego, a Representative in Congress from the State of Arizona, Submitted for the Record by Hon. Rick Larsen

I would like to thank Chairman Larsen for holding this important hearing on aviation noise.

As a member of the Quiet Skies Caucus, I have worked with my colleagues and my community for many years to mitigate the impact of aircraft noise in Arizona's 7th District.

This advocacy began largely with the implementation of new flight paths in 2014 at Phoenix Sky Harbor Airport.

These changes had the effect of exposing homes and businesses in our community to unacceptably high levels of noise, disrupting the daily lives of countless Phoenix residents.

They were also decided on and implemented without adequate input from the community.

Fortunately, in 2018, the U.S. Court of Appeals sided with a coalition of Phoenix neighborhoods in a lawsuit claiming the FAA inadequately analyzed the impact of the flight path changes before they took effect.

This decision was a key development in the national discussion around mitigating airplane noise and addressing community concerns, which is why I would like to enter into the record of this hearing the affidavits of my constituents that were first submitted to the FAA in 2015 as part of an Administrative Petition and then part of the Historic Neighborhoods Petitioners' Opening Brief in 2016 for a Petition for Review filed with the U.S. Court of Appeals/DC Circuit.

Thank you.

ATTACHMENT

[Editor's note—Retained in committee files are the following: Part of the Historic Neighborhoods Petitioners' Opening Brief in 2016 for a Petition for Review filed with the U.S. Court of Appeals for the District of Columbia Circuit, followed by affidavits of Rep. Gallego's constituents that were first submitted to the Federal Aviation Administration in 2015 as part of an Administrative Petition.]

Letter of April 1, 2022, from Hon. Stephen F. Lynch, a Representative in Congress from the Commonwealth of Massachusetts, Submitted for the Record by Hon. Rick Larsen

APRIL 1, 2022.

The Honorable RICK LARSEN,
Chair,
Subcommittee on Aviation, House Committee on Transportation and Infrastructure, Washington, DC 20515.

The Honorable GARRET GRAVES,
Ranking Member,
Subcommittee on Aviation, House Committee on Transportation and Infrastructure, Washington, DC 20515.

DEAR CHAIRMAN LARSEN AND RANKING MEMBER GRAVES,

Thank you for hosting the Aviation Subcommittee hearing on March 17th, 2022, addressing community concerns surrounding aviation noise. I appreciate your effort in asking for House wide insight on this topic and I welcome the opportunity to provide extended remarks on this issue.

Aviation noise pollution remains a top concern for a number of communities in my district. As I mentioned in my comments during the hearing, towns in my district, such as Milton, Massachusetts, have endured airplane noise levels far beyond comfortable levels for years. My constituents are unable to enjoy outdoor areas or, in some cases, are impacted by the noise levels that permeate the walls of their home. This problem persists in districts like mine, and in communities across the country, due to the lack of response from the FAA. Congress has repeatedly called for increased community engagement efforts to address aviation noise levels, but the FAA appears to be unwilling to properly address the issue. To better handle the issue of aviation noise on the federal level, my top priorities include *developing more efficient community engagement systems* that will provide proper communication between community members and the FAA, *requirements for improved transparency and interaction* on research efforts related to aviation noise, *and the passage of my legislation, H.R. 712, specifically addressing issues related to the current noise level metric*.

From my conversations with my constituents, airport officials, local communities, *there are new systems that can be used to improve the way the FAA gather information*. It would be helpful if the FAA models and implements a procedure for a set of dispersed RNAV paths used in rotation rather than a single RNAV for each arrival and departure for a given runway. Doing that would help restore the equitable dispersion of overflights across communities rather than continued daily use of a single concentrated path over the same victim communities that FAA imposed its RNAVs on. The concentrated RNAV paths are the single biggest contributor to overflight noise. Yet, the prior FAA dispersed paths were safely flown and equitably shared overflight effects. Further, military combat aircraft equipped with RNAV capability do not rely on single RNAV approach paths because they would be too easily intercepted approaching in a straight line. The technology to disperse and rotate paths' use is available. We would urge the FAA to provide a report on the availability of requisite technology for dispersed RNAV path rotational use. If the FAA were to include a more inclusive system, our communities would be better served.

Community members across my district have made their displeasure with the FAA known throughout my time in Congress, specifically their lengthy response times. Several years ago, the last time FAA representatives came to my district, eight hundred of my constituents showed up to express their anger with the lack of response from the FAA. One of the most common concerns from community members is overflight noise concentration due to the FAA's imposition of narrowly concentrated GPS departure and arrival flight paths. FAA's substitution of those narrow GPS overflight paths for its previously dispersed air traffic controller administered paths has shifted all the noise onto communities that previously shared that impact with other communities. On multiple occasions I have called on the FAA to shift away from this system that results in an unequal noise burden by utilizing over-water takeoffs and landings.

At the local level, airport organizations, like Massport, operates airports and a seaport in my district, focus much of their efforts on direct community engagement. Massport relies on a wide community network, as well as a complaint hotline available to community members to report high levels of airplane noise in their neighborhood. Specifically, we want the FAA to pledge publicly to document hard-deadlines for each step of its process to change its noise policy. Ensuring public documents will keep the FAA in the public space allowing for our communities to properly interact with this agency. Further, we would request that FAA community roundtable meetings are recorded and posted publicly. Efforts like these by local airport groups to effectively engage and interact with community members should provide an example to the FAA on best practices for addressing community concerns.

To further address the issue of aircraft noise pollution, *my legislation, H.R. 712, would address this by evaluating health impacts of air traffic noise and pollution and issue the Expert Consensus Report on findings by the National Academies*. There is a clear demand from our constituents that we investigate the impacts of new flight paths across the country. It is imperative that we understand and remedy any health effects caused by aircraft flying over residential areas, and the onus is on the FAA to produce this information. Evidence from the Neighborhood Environmental Survey (NES) [1] study that more people than previously thought report "high annoyance" from aviation noise, even for DNL (day-night average sound level) estimates well-below 50 dB makes it clear the current metric needs to be adjusted. Scientific evidence from this study, as well as consistent feedback from community

[1] "Neighborhood Environmental Survey" https://www.faa.gov/regulations__policies/policy__guidance/noise/survey

members tells us that constituents are being harmed by these numerous, repetitive, and persistent aviation noise events forced upon them without their consent.

In response to myself and my colleagues' commentary at the March 17th subcommittee hearing, I hope the FAA will work cooperatively with Congress and local advocacy groups to continue proactively addressing community concerns regarding aviation noise. With the upcoming retirement of Administrator Dickson, there is an opportunity for growth and rededication to community concerns. I am hopeful the new Administrator will take seriously the FAA's responsibility to better communities across the country impacted by noise and air pollution.

Attached are two statements from constituents, Amy McCoy and Cindy Christiansen, on the matter. These correspondences are their own views and pertinent to the topic at hand.

Thank you for your time and consideration. If you have any questions, please contact my staff, William Seabrook.

Sincerely,

STEPHEN F. LYNCH,
Member of Congress.

ATTACHMENT

[Editor's note—Statements from Amy McCoy and Cindy Christiansen, Rep. Lynch's constituents, are retained in committee files.]

Statement of Hon. Carolyn B. Maloney, a Representative in Congress from the State of New York, Submitted for the Record by Hon. Rick Larsen

Thank you so much for the opportunity to submit testimony for the House Committee on Transportation and Infrastructure's Subcommittee on Aviation hearing on "Aviation Noise: Measuring Progress in Addressing Community Concerns." Aviation noise is something I hear about from my constituents constantly. In fact, my constituents in Queens tell me that at peak times of day, they have helicopters flying directly over their homes every six minutes.

Helicopter traffic in New York City is on the rise. Between October 2019 and October 2020, complaints about helicopter noise increased 130%.[1] And this only became worse during the pandemic. According to the city's 311 hotline, through the end of September 2021, New York City received more than 17,000 calls about helicopter noise, which eclipsed the helicopter-noise complaints made in 2019 and in 2020.[2]

To put it simply, New Yorkers are being inundated with helicopters and helicopter noise pollution, and it is negatively affecting their quality of life, and potentially their physical and psychological health.[3]

Any New Yorker can tell you how deafening and disruptive helicopters are. Helicopter noise during the pandemic has been particularly disruptive. Over the last two years, New Yorkers have spent time at home like never before, where they have been subjected to the nerve-wracking sights and sounds of low-flying helicopters swooping over their neighborhoods or hovering at dangerously low altitudes over parks or open spaces.

There are many different possibilities for why New Yorkers have experienced an increase in helicopter noise pollution during the past two years: an increased number of unregulated helicopter tour flights coming in from outside the city, the proliferation of helicopter charter companies like Uber Copter and Blade, and residential buildings having less soundproofing than commercial buildings.

How can you expect anyone to work from home in those conditions? How can you expect someone to help their child with virtual classes especially when studies have

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[1] Jose Martinez, *Helicopter Noise Complaints Sky High, as Anxious, Cooped-Up New Yorkers Feel Buzzed*, The City (Nov. 15, 2020), https://www.thecity.nyc/2020/11/15/21566204/helicopter-noise-complaints-sky-high-new-york-city.

[1] Patrick McGeehan & Michael Gold, *As Helicopters Fill the Skies, Some New Yorkers Just Want Some Peace*, N.Y. Times (Oct. 21, 2021), https://www.nytimes.com/2021/10/21/nyregion/nyc-helicopter-noise-complaints.html.

[3] Arline L. Bronzaft, *Impact of Noise on Health: The Divide between Policy and Science*, 5 Open Journal of Social Sciences 108 (May 2017), https://www.scirp.org/journal/paperinformation.aspx?paperid=76120.

shown the negative effects of noise pollution on educational outcomes?[4] We are seeing a very small number of people joyriding, or shaving time off their commute to the airport, at the steep expense of the vast majority of New Yorkers.

Pandemic aside, New York City has one of the highest rates of helicopter traffic in the world, and more and more helicopters are flying over our city every year, including helicopter tours, commuter helicopters that run between downtown and nearby airports, and private helicopters.

In addition to the extreme quality-of-life concerns that helicopters pose, they also pose an inordinate and unjustifiable amount of risk to the safety of New Yorkers. Our city is the most densely populated major city in the nation, meaning there is no place more dangerous to fly a helicopter than New York City.

If a helicopter flying over New York City needs to make an emergency landing, there is virtually nowhere in the city it can land that doesn't endanger the lives of New Yorkers. Not even the parks and open spaces are safe.

At the end of the day, what matters is that there are far too many non-essential helicopters in our city's airspace, period. Between the safety concerns and the quality-of-life concerns, I sincerely believe that the number of non-essential helicopters in our city's airspace should be zero.

That is why last year, I introduced the Improving Helicopter Safety Act of 2021 with Reps. Jerrold Nadler and Nydia Velázquez. This bill directs the Federal Aviation Administration to prohibit non-essential helicopters—namely private, charter, commuter, or tourist flights—from flying in New York City airspace. That includes any of the five boroughs, Roosevelt Island and Governors Island, and the parts of the rivers that are within city limits.

This ban won't apply to military, government, or law enforcement, or to essential public services such as emergency response or news teams. What it will do is drastically cut back on helicopter traffic and reduce noise pollution in New York City by limiting the helicopters in our airspace to those that actually need to and should be there.

The risks and the disruptions that commuter, charter, and tourism helicopter flights pose to New Yorkers far outweigh the benefit to the very small number of people who use them. Yet our city is unable to regulate New York City airspace, and therefore is unable to reduce the number of non-essential helicopters in the sky.

There is absolutely no margin for error when you fly over somewhere as densely populated as New York City, and on any given flight, you will be disrupting the lives of hundreds of thousands of people. I believe that if the benefits don't outweigh the costs, you shouldn't be flying at all.

Thank you so much for the opportunity to submit this testimony, and I look forward to working with the Committee to reduce aviation noise both in New York City and across the country.

Letter of April 1, 2022, from Hon. Grace Meng, a Representative in Congress from the State of New York, Submitted for the Record by Hon. Rick Larsen

APRIL 1, 2022.

The Honorable RICK LARSEN,
Chair,
Aviation Subcommittee, House Committee on Transportation and Infrastructure, 2165 Rayburn House Office Building, Washington, DC 20515.

The Honorable GARRET GRAVES,
Ranking Member,
Aviation Subcommittee, House Committee on Transportation and Infrastructure, 592 Ford House Office Building, Washington, DC 20515.

DEAR CHAIR LARSEN, RANKING MEMBER GRAVES, AND DISTINGUISHED MEMBERS OF THE HOUSE TRANSPORTATION AND INFRASTRUCTURE SUBCOMMITTEE ON AVIATION,

I am pleased to transmit public comments from my constituents of New York's Sixth Congressional District in response to the March 17th, 2022, subcommittee hearing on aviation noise. Thank you.

[4] Stephen A. Stansfeld, *Aircraft and Road Traffic Noise and Children's Cognition and Health: A Cross-National Study*, 365 The Lancet 1942 (Jun. 4, 2005), https://pubmed.ncbi.nlm.nih.gov/15936421/.

Sincerely,

GRACE MENG,
Member of Congress.

ATTACHMENT

[Editor's note—Public comments from Rep. Meng's constituents are retained in committee files.]

Letter of April 1, 2022, from Hon. Jimmy Panetta, a Representative in Congress from the State of California, Submitted for the Record by Hon. Rick Larsen

APRIL 1, 2022.

The Honorable RICK LARSEN,
Chair,
Subcommittee on Aviation, Committee on Transportation and Infrastructure.
The Honorable GARRET GRAVES,
Ranking Member,
Subcommittee on Aviation, Committee on Transportation and Infrastructure.

DEAR CHAIR LARSEN, RANKING MEMBER GRAVES, AND MEMBERS OF THE SUBCOMMITTEE:

As the Committee on Transportation and Infrastructure Subcommittee on Aviation holds its hearing on "Aviation Noise: Measuring Progress in Addressing Community Concerns," I write to share concerns from the communities I represent regarding airplane noise, and request your consideration in future Federal Aviation Administration (FAA) reauthorization. My constituents have endured more than seven years of unprecedented commercial aviation noise following NextGen implementation. They have worked in good faith with the FAA to find an alternative that works for all parties. Unfortunately, they continue to experience unacceptable levels of noise, and often feel overlooked by the FAA decision making process.

The establishment of the Northern California Metroplex as part of FAA NextGen implementation shifted approach routes crossing my district. This led to a concentration of flights into San Francisco (SFO) along the new SERFR arrival route and to San Jose (SJC) under the BRIXX route. These flights approach at a lower altitude than the historic Big Sur (BSR) ground track, flying over communities in Santa Cruz County that previously experienced minimal commercial jet noise.

My constituents are not alone, as dozens of communities nationwide have expressed concerns with the sudden and concentrated noise generated by NextGen flight paths. I applaud the subcommittee for listening to these concerns and implementing reforms and additional research as part of the FAA Reauthorization Act of 2018. I also thank the FAA for its ongoing engagement with the communities I represent. However, many of my constituents continue to experience unprecedented and unacceptable noise levels caused by ahistorical flight paths.

While the FAA has made itself available to discuss the issue, little was done to consult my constituents before NextGen was implemented and, to date, the FAA and the communities I represent have been unable to find a reasonable solution to this unprecedented disturbance. In addition, many of my constituents have found it difficult to engage on airport community forums because they are located far from the airports generating flights over their community.

As the subcommittee considers the impact of aircraft noise, especially in the context of future FAA reauthorization, I urge you to build on the foundation of the 2018 reauthorization by expanding resources for community input at the FAA, working to include input from communities outside the immediate geographic footprint of an airport, and formally adopting the New National Curve when evaluating noise impacts. Specifically, I request the subcommittee:

- Consider increasing FAA resources for ombuds serving NextGen metroplexes so communities, including those far from an airport geographic footprint but still impacted by noise, have a consistent resource in the FAA to address community concerns.
- Formally adopt the New National Curve when evaluating noise metrics and lower the decibel threshold when determining acceptable Day Night Level (DNL) standards.
- Increase funds where necessary to ensure thorough noise monitoring in communities which have contacted the FAA to report noise outside acceptable new DNL standards.

- Continue to explore additional metrics beyond DNL to better understand and address the impact of aviation noise on various communities.
- Direct the FAA to contact impacted communities proactively before deciding to change historic approach and departure routes and continue rolling out new outreach tools.

I believe your strong leadership and dedication to constituent input can help resolve this ongoing nightmare for Santa Cruz County residents. I firmly believe that through listening to the people we serve, the committee can ensure FAA has the tools to ensure safe, environmentally-conscious procedures without adversely impacting communities on the ground.

Sincerely,

JIMMY PANETTA,
Member of Congress.

Statement of Hon. Katie Porter, a Representative in Congress from the State of California, Submitted for the Record by Hon. Rick Larsen

Thank you, Chairman Larsen and Ranking Member Graves, for holding this hearing regarding aviation noise and for allowing me to submit testimony about the concerns of Orange County families. My district is adjacent to John Wayne Airport (SNA) in Santa Ana, California, and my constituents have expressed concern and frustration with the noise levels for years.

SNA is an asset to Orange County, providing easy travel access for businesses and families, and creating many jobs throughout the community. However, its central location means aircraft fly directly over residential communities during departure and arrival. My staff and I have been in communication with constituents who have been frustrated by loud aviation noise. These constituents have shared their personal experiences and their efforts to communicate with the Federal Aviation Authority (FAA).

To assess these concerns, the FAA needs additional data about aviation noise levels along departure and arrival flight paths. The installation of noise monitoring stations is essential to acquire this data; my constituents have specifically requested additional stations. I urge the FAA to seriously consider these requests and to engage in transparent conversations with the public regarding their decisions.

I appreciate that the Next General Air Transportation System and Performance-Based Navigation can improve safety and efficiency. Modern technology can advance the goal of a cleaner, quieter, and safer air industry. I also applaud the FAA for implementing public liaisons to establish a dialogue about aviation noise with Orange County residents. I urge the FAA to share all relevant information and increase its communication with the public. In Orange County, I have seen how this communication has led to successful noise abatement programs. I encourage the FAA to build upon such successes.

Finally, I'd like to emphasize the importance of the Continuous Lower Energy, Emissions and Noise (CLEEN) program and its goals. In conversations with my constituents, I have heard many requests for a greater emphasis on quieter aircraft technology. The CLEEN program will help domestic businesses develop products that reduce both aircraft noise and emissions.

Thank you for considering these suggestions and feedback. I look forward to the implementation and expansion of a cleaner, quieter aviation system.

Statement of Hon. Jamie Raskin, a Representative in Congress from the State of Maryland, Submitted for the Record by Hon. Rick Larsen

Chairs DeFazio and Larsen and Ranking Members Sam Graves and Garret Graves,

Thank you for you holding this hearing focused on addressing aviation noise, which has profoundly affected the quality of life of many constituents. I appreciate the opportunity to share with the committee my constituents' concerns about noise pollution from concentrated flight paths over our district. Thank you again for the opportunity to share these concerns with the committee, and I look forward to working with you to effectively address this pressing issue.

ATTACHMENT

[Editor's note—The noise pollution concerns of Rep. Raskin's constituents are retained in committee files.]

Statement of Hon. Adam B. Schiff, a Representative in Congress from the State of California, Submitted for the Record by Hon. Rick Larsen

Madam Speaker, I rise today to applaud the leadership of the Hollywood Burbank Airport, the Southern San Fernando Valley Airplane Noise Task Force, and the Committee on Transportation and Infrastructure Subcommittee on Aviation for their efforts to listen to communities and find and enact solutions to alleviate the impacts of aviation noise across our nation.

Like many communities, my constituents live with a disruptive amount of aviation noise—which has steadily increased in recent years. My district is home to some of the most unique cultural and entertainment sites in Southern California, as well as the Hollywood Burbank Airport. I have been committed to community-led efforts to mitigate disruptive airplane and helicopter noise for communities living along flight paths near these attractions.

My colleagues and I have exhaustively studied these issues and have diligently listened to community input. Aircraft noise continues to pose a threat to quality of life issues for many of our constituents. I have supported and championed legislation to allow airports to impose community-driven recommendations for noise control, such as nighttime curfews that would allow residents to sleep peacefully. In March 2019, I joined Representative Brad Sherman, Senator Dianne Feinstein, and now-Vice President Kamala Harris in formally asking the FAA to lead community roundtables to address noise issues. Community engagement programming is the most appropriate path forward in addressing mitigation strategies. Communities have asked for the FAA to establish and sustain effective methods to measure, track, and investigate aircraft noise, aircraft noise complaints, and the environmental impact of aircraft noise and noise pollution.

I applaud the work and legislative recommendations from my constituents and community organizations, such as the Los Angeles Area Helicopter Noise Coalition (LAAHNC). Our communities should not have to face the burden of bothersome aviation noise. Their experiences are concerning and we cannot continue to ignore this issue. Urgent action must be taken. I will continue to work together with affected communities, the Hollywood Burbank Airport, the FAA, and the U.S. Government Accountability Office (GAO) to achieve meaningful relief for San Fernando Valley. Thank you, and I urge the Committee and my fellow Members of Congress to work on solutions to this problem that put our communities first.

Letter of March 31, 2022, from Hon. Brad Sherman, a Representative in Congress from the State of California, Submitted for the Record by Hon. Rick Larsen

MARCH 31, 2022.

Hon. RICK LARSEN,
Chairman,
House Subcommittee on Aviation.

Hon. GARRET GRAVES,
Ranking Member,
House Subcommittee on Aviation.

Re: Constituent Testimony for the Aviation Subcommittee regarding the March 17th hearing on "Aviation Noise: Measuring Progress in Addressing Community Concerns"

DEAR MEMBERS OF THE HOUSE SUBCOMMITTEE ON AVIATION,

Attached to this letter are the voices of several of my constituents from the San Fernando Valley whose quality of life has suffered under newly concentrated low-flying air traffic above their neighborhoods.

The great many of these constituents will rightly identify the roll-out of the FAA's NextGen program as the moment when the sustained injury of repeated flights over their homes began.

Please know that these few hundred letters represent the voices of thousands that have been adversely impacted by the FAA's NextGen program.

There have been public forums, multiple pieces of legislation introduced in Congress, numerous formal requests from Members of Congress, a lawsuit filed by the City of Los Angeles, and still the FAA refuses to act.

I thank the Members of the Aviation Subcommittee for taking the time to read their stories and I look forward to working with you to find an immediate solution that will reduce unacceptable aircraft noise and other aviation impacts in our communities.

Sincerely,

BRAD SHERMAN,
Member of Congress.

ATTACHMENT

[Editor's note—Testimony from Rep. Sherman's constituents is retained in committee files.]

Statement of Hon. Adam Smith, a Representative in Congress from the State of Washington, Submitted for the Record by Hon. Rick Larsen

Chairman DeFazio, Ranking Member Graves, and distinguished Members of the Committee:

Thank you for the opportunity to share some of the key issues facing communities impacted by aviation noise and emissions in my district. I appreciate the attention to this issue by the Committee. Aviation noise and emissions continue to have a significant impact on communities near airports and airflight pathways. As a Member of Congress whose district is home to one of the busiest and fastest-growing hub airports in the country, Sea-Tac International Airport, I have seen first-hand the impacts of aviation noise and emissions on the environment, health, and quality of life of these communities.

I believe that we should treat the impact of aviation noise and emissions as environmental justice and health issues. The impact of noise and emissions disproportionally impacts low-income communities, communities of color, and vulnerable populations. These communities are often already facing greater risks and impacts from poor air quality and other environmental and health hazards. I continue to encourage the FAA to reevaluate its selection of noise measurement methodologies, health impact thresholds, and abatement program effectiveness and requiring them to consider the impact on human health and environment when determining airport capacity and approving new flight routes.

Community engagement should be the centerpiece of our response to aviation noise and emissions. While meaningful changes were included in the FAA Reauthorization Act of 2018, many of these changes of not been implemented in a timely fashion or at all. And some of the changes that have been implemented, such as the FAA's Ombudsman Office, have not taken meaningful action in addressing constituent and community concerns. FAA engagement with community members has been woefully insufficient. I believe we can and must do more to ensure that the FAA's approach to community engagement on these issues is more robust, inclusive, and responsive to all community members.

I will be reintroducing legislation that I first offered in the 115th Congress to improve the manner in which the FAA engages with noise-affected areas. The Aviation Impacted Communities Act seeks to help cities, localities, and neighborhoods to better and more productively engage with the FAA. The legislation is geared particularly towards communities that have not been recognized as "impacted" by the FAA's noise standard. It would require that the FAA interface directly with and be responsive to residents and locally nominated leaders on issues of aviation noise and environmental impacts. Through the creation of local community boards, affected areas will be empowered to more effectively work toward achieving relief from the impacts of civil and commercial aviation.

More work needs to be done to ensure greater access to the FAA's Airport Improvement Program (AIP). Many airports have opted to use the AIP fund to pay for noise mitigation, however, there are many limits on the program, including barring the use of AIP funds on the same home or structure twice. This regulation prevents airports from ever replacing or repairing sound insulation if the products become defective or cause problems for the homeowner. Airports, including Sea-Tac, that started in the 1980's and 1990's often did not have access to high quality materials, and in some cases, contractors installed sound insulation without proper ventilation

or structural supports, causing structural damage, mold, and other problems. It is incredibly expensive for homeowners to replace or repair the sound insulation, especially for lower income homeowners, leaving many individuals and families living with deteriorating or molded structures. I introduced the Noise Mitigation Repair and Replacement Act to help address this issue. It would establish a process by which airports may apply for additional AIP funding to repair or replace noise mitigation packages.

In addition to noise impacts from aviation, particulate matter, ultrafine particles (UFPs), and other pollutants pose an outsize threat to those living near airports and under flight pathways. UFP pollutants are miniscule particles of less than one hundred nanometers in size that are emitted as byproducts of petroleum fuel combustion in engines, such as those used on vehicles and aircraft. Studies have demonstrated that communities near airports and airflight pathways are exposed to higher proportions of pollution and harmful particles from aviation emissions. This can lead to increased risks of breast cancer, heart disease, birth defects, asthma, and a variety of other lung and cardiovascular conditions that impact adults and children. These additional risks are on top of the many other environmental and health hazards disproportionately impacting low-income communities and communities of color.

I believe a fundamental problem with our current response to aviation noise and emissions at the federal level is that it is almost entirely led by the FAA. The Environmental Protection Agency (EPA) and Department of Health and Human Service (HHS) should play a much more active role in addressing this challenge as an environmental and health issue. That is why I strongly support the reestablishment of the EPA's Office of Noise Abatement and Control and additional actions by the EPA and HHS to increase their engagement in affected communities.

I recently worked with impacted community members and organizations in my district to introduce the Aviation Noise and Emissions Mitigation Act. This legislation creates two new pilot grant programs at the EPA for studies of air quality and noise and for mitigation projects in communities, focused on communities of color and low-income communities. The bill will help us to better understand the effects of noise and emissions and fund initiatives driven by impacted communities to mitigate the effects on the environment, public health, and quality of life of residents living near airports and airflight pathways.

As the aviation sector has grown, with more people flying more frequently, significant investments have been put toward airport infrastructure. We need to make similar investments in communities that feel the negative effects of aviation. This means not only investing in new technologies to reduce air travel emissions and expanding other forms of zero-emissions travel, but also directing funding to the communities disproportionately impacted by aviation.

Residents living in aviation-impacted communities cannot wait any longer for relief from the public-health consequences of exposure to high concentrations of pollutants and high levels of aviation noise. Congress and the federal government must establish new programs to better measure the environmental and public-health consequences of exposure to high levels of noise and emissions and invest in resources to reduce those impacts on these communities. Millions of Americans who live near aviation hubs—like my constituents in the 9th District—deserve nothing less.

I appreciate the Committee's consideration of these priorities and its ongoing work to improve our nation's environment and make our infrastructure more sustainable.

Statement of Hon. Jackie Speier, a Representative in Congress from the State of California, Submitted for the Record by Hon. Rick Larsen

Thank you, Chairman Larsen and Ranking Member Graves, for holding a hearing on the issue of aviation noise and progress made on addressing community concerns. Conveyed with this statement are comments from my constituents that I wish to have included in the record of this hearing. I also support comments previously submitted by the San Francisco Airport Community Roundtable (Roundtable). I work closely with the Roundtable on this important matter.

I have long been concerned about the serious public health issue of aviation noise.

The government's measurement of annoying noise was found by the FAA's own research to be deficient. Noise contours, a benchmark tool for federal noise policy, are identified using this deficient metric. In the recent hearing, several committee members and witnesses noted that the official tally of those heavily impacted by noise had decreased by 94% over several decades to about 400,000 today. There's no question that aircraft engines and airframes have improved over the past dec-

ades, but the 94% reduction that the FAA touts is largely smoke and mirrors because of the flawed nature of the metric.

As the FAA's Neighborhood Environmental Survey (NES) indicated, annoyance occurs much more frequently and at much lower levels than previously appreciated.[1] Because the noise standard is deficient, tens of thousands of affected households exist *outside the official boundary formed by the deficient standard*. I understand the FAA is reviewing the current noise metric, and I would urge it to adopt a far more nuanced and holistic measurement or sets of measurements that actually reflect the experiences of local communities. It does not do the cause of noise reduction any favor by using faulty official measurements to guide policy.

Aside from the deficient metric of annoying noise, our law is also broken in part because statutory language creates an inadequate prioritization of airspace management. No one takes issue with safety as the FAA's first priority. However, efficiency is the only other stated priority. In my district and surrounding areas, efficiency trumps noise mitigation around the clock and in areas far removed from the airport.

My first recommendation for the Committee's consideration is to change the FAA's prioritization of airspace management to include the reduction of aviation noise and environmental impacts. Adverse health impacts from intrusive noise and environmental pollution fall on households of all income levels, but often disproportionately impact marginalized communities My bill, HR 4925, the F–AIR Act, would make noise and environmental impacts secondary priorities, below safety but on par with efficiency. I suggest this measure as a starting point for the Committee to consider.

The second recommendation, related to the first, is that the definition of annoyance from airport and aircraft noise be significantly improved. For example, low frequency noise—such as occurs with the backblast of an airplane taking off—is overlooked as a problem using the current methodology. While efforts are already underway to make changes in the wake of the publication of the NES, we are now some seven years after authorization of that study, and the FAA has still not taken any substantive *action* on the results. I also hope that the FAA will inform its work by evaluating noise measurement techniques from around the globe.

Third, and in my judgment, the FAA is not sufficiently resourced to reduce noise. It seems to take an inordinate amount of time to implement beneficial changes to flight paths. For example, after five years of dialogue with the community, the FAA recently agreed to send planes taking off from SFO and Oakland airports up the Bay and out over the Golden Gate Bridge, largely skipping populated areas, from the time of 1 a.m. to 5 a.m.

I want to thank the FAA for the accommodation that it made. Allowing planes to avoid populated areas from 1 a.m. to 5 a.m. will provide meaningful relief to my constituents, at least for those hours of the night. However, and as noted, this accommodation to human health occurred five years after the community first identified this choice as one way to reduce noise. Two of these years were impacted by the pandemic, but three were not within the pandemic time period.

Fourth, the FAA's regulation that permits an airport to petition to establish a noise-sensitive flight path puts the FAA in the position of determining, in essence, if the requested accommodation would cost the airlines more money by increasing fuel burn or would otherwise place a burden on interstate commerce. Noise reduction as a public benefit itself is not officially a priority of airspace management, so it isn't surprising that efficiency-related factors override public health benefits of noise reduction. It should be easier for an airport to obtain approval for a flight path change.

My fifth recommendation is that the Committee amend our statutes to again allow airports to create and enforce curfews. I acknowledge that mine is a minority viewpoint in the context of current federal aviation policy, but many airports around the globe have some version or another of curfew policies. Few in the United States are permitted this tool of public health.

I acknowledge the point made by some during the hearing that a disproportionate number of complaints about noise are sometimes generated by a tiny fraction of individuals. The number of complaints about aircraft operations is, at best, an imperfect indicator of annoyance in a community. On the other hand, I wish to point out that most of my constituents concerned about noise tell me that they complained a few times, and nothing happened, so they gave up. Many residents simply don't have the time to submit complaints. The absence of complaints is not a signal that all is well. In fact, it might be a signal that our democracy is failing to provide resolution for a significant public health issue.

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[1] https://www.faa.gov/regulations__policies/policy__guidance/noise/survey/#results

Noise is a problem. I believe that we can have a comfortable community and a thriving economy. I hope that the Committee will support significant changes in the FAA's noise practices when it considers the FAA reauthorization.

ATTACHMENT

[Editor's note—Comments of Rep. Speier's constituents are retained in committee files.]

Letter of March 31, 2022, from Hon. Thomas R. Suozzi, a Representative in Congress from the State of New York, Submitted for the Record by Hon. Rick Larsen

MARCH 31, 2022.

Chairman PETER DEFAZIO,
Committee on Transportation and Infrastructure,
2134 Rayburn Office Building, Washington, DC 20515.

DEAR CHAIRMAN DEFAZIO,

Below are comments and concerns raised by Plane Sense 4 Long Island in response to the March 17, 2022, Aviation Subcommittee Hearing: *Aviation Noise: Measuring Progress in Addressing Community Concerns*. These concerns are the views of the individual and do not represent my own.

Thank you for your attention to this matter.

Sincerely,

THOMAS R. SUOZZI,
Member of Congress.

ATTACHMENT

[Editor's note—A letter from Elaine Miller, a constituent of Rep. Suozzi's, is retained in committee files.]

Letter of March 31, 2022, from Georges C. Benjamin, M.D., Executive Director, American Public Health Association, Submitted for the Record by Hon. Rick Larsen

MARCH 31, 2022.

The Honorable RICK LARSEN,
Chair,
Subcommittee on Aviation, House Committee on Transportation and Infrastructure, Washington, DC 20515.

DEAR CHAIRMAN LARSEN:

On behalf of the American Public Health Association, a diverse community of public health professionals that champions the health of all people and communities, I write to share APHA's policy statement *Noise as a Public Health Issue* [https://apha.org/Policies-and-Advocacy/Public-Health-Policy-Statements/Policy-Database/2022/01/07/Noise-as-a-Public-Health-Hazard] which was adopted by the association in 2021. We ask that this letter and policy statement be submitted to the subcommittee's hearing record for the March 17 hearing *Aviation Noise: Measuring Progress in Addressing Community Concerns*. We appreciate the subcommittee's efforts to explore this public health issue.

Human exposure to harmful noise levels is widespread. Some major sources of noise include transportation, military aircraft and combat operations, noisy recreational vehicles, industrial machinery, outdoor power equipment and some consumer products. Loud noise can cause hearing loss and tinnitus and can contribute to other non-auditory health problems. Chronic noise, even at low levels, can cause annoyance, sleep disruption, and stress that contribute to cardiovascular disease, cerebrovascular disease, metabolic disturbances, exacerbation of psychological disorders and even premature mortality. Noise can also interfere with cognition and learning, contributes to behavior problems and can reduce achievement and productivity. It is estimated that more than 100 million Americans are at risk from the health impacts of noise, with children among the most vulnerable. Additionally, noise-related costs range in the hundreds of billions of dollars per year.

We hope our policy statement will be helpful and informative as you and members of the subcommittee continue to explore the issue of noise and its impacts on our communities.

Sincerely,

GEORGES C. BENJAMIN, M.D.
Executive Director, American Public Health Association.

Statement of Ed Bolen, President and Chief Executive Officer, National Business Aviation Association, Submitted for the Record by Hon. Rick Larsen

Chairman DeFazio, Ranking Member Graves and members of the Subcommittee on Aviation, thank you for holding this hearing to focus on the importance of addressing community concerns related to aviation noise. On behalf of the National Business Aviation Association's (NBAA's) 11,000-members, we are pleased to provide this statement for the record.

NBAA's members rely on business aircraft to meet a significant portion of their transportation needs. The majority of business aircraft are operated by small businesses and are primarily used to provide access to airports supporting communities that aren't served by the commercial airlines. While the airlines serve only around 500 airports, business aviation can reach 5,000 public use airports across the United States. These facilities are also economic engines for the cities and towns that they serve and our members and the general aviation industry have a great stake in the airports being good neighbors to the surrounding communities and in ensuring their viability and accessibility.

The United States leads the world in having the most robust and diverse airport infrastructure capabilities, providing a critical foundation for general aviation to thrive. In transporting people and equipment, responding to natural disasters, providing air medical flights for organs and patients, offering a place for flight training and a base for the inspiration and inception of career paths essential for all sectors of aviation—general aviation relies on the national network of airports. To fulfill these roles, our airports rely on unimpeded access by aircraft of all types and sizes. Operations of these aircraft also support a vast variety of jobs at a broad range of income levels across the country. Additionally, these operations are a vital source of local revenue and thus help our general aviation airports be self-sustaining. Continued federal support of airports, and in particular protecting access, is critical so that airports can not only fulfill today's demands, but also handle tomorrow's requirements as well.

NBAA places great emphasis on Fly Neighborly initiatives and community engagement, recognizing the importance of mitigating aviation noise impacts to those on the ground. Through the collaborative efforts of its Access Committee, NBAA has developed Noise Abatement Procedures (www.nbaa.org/noise) that can be used by aircraft operators at all airports that do not have a specific local procedure. NBAA partners with local and regional aviation organizations and works closely with a number of airports and surrounding communities around the country to develop and promote voluntary noise abatement programs and procedures to mitigate impacts of aviation noise.

The industry has a long history of working with airports and the communities to develop and implement voluntary noise abatement programs specific to individual airports around the country. These fly neighborly programs embrace procedures for all types of aircraft and include mitigations such as flying at higher altitudes and maximizing flight paths over water and least populated areas as much as possible and reducing operations during night hours. The programs are designed to be evaluated and enhanced through continued collaboration on a regular basis and consistently demonstrate very high participation from the operators. We continue to be engaged in fly-neighborly efforts at Van Nuys Airport (VNY), Santa Monica Airport (SMO) and John Wayne Orange County Airport (SNA) in Southern California, Rocky Mountain Metropolitan Airport (BJC) in the Denver, Colorado area, Teterboro Airport (TEB) in New Jersey, Brookhaven Calabro Airport (HWV) as well as East Hampton Airport (HTO) on Long Island and Montgomery County Airpark (GAI) in Maryland to highlight a few.

The Next Generation Air Transportation System (NextGen), the FAA-led modernization of America's air transportation system, has become another tool to manage impacts of aviation noise on the communities. NextGen leverages new technologies and procedures to increase the safety, efficiency, capacity, access, flexibility, predictability, and resilience of the National Airspace System (NAS) while reducing

the environmental effect of aviation. Business aviation operators have embraced these technologies and procedures and have invested in equipping their aircraft with the avionics necessary to take advantage of the benefits NextGen offers and to enhance their ability to fly neighborly. Teterboro Airport (TEB) in New Jersey is a great example. TEB has recently developed and is in the process of implementing a NextGen instrument approach procedure that is an alternative to the traditional Instrument Landing System (ILS) straight-in approach path. The procedure can be used during certain times and in appropriate weather conditions to offset the flight paths and offer noise relief to the communities as the result.

Additionally, the general aviation industry has invested significantly in developing quieter aircraft yielding substantial accomplishments. Aircraft that are currently being manufactured are quieter and more efficient than those in operation, as the industry consistently has made strides in continued development and implementation of noise reduction technologies.

Unfortunately, despite these efforts by the industry and operators, a small number of communities have made attempts to impose restrictions limiting access, such as curfews, weight and noise limits, on their airports. Your continued support of federal grant-based and deed-based obligations and compliance with the Airport Noise and Capacity Act of 1990 (ANCA), and of other aviation statutes and regulations, play an important role in preventing these local patch-quilt operational restrictions and even complete airport closures.

Notably, by enacting ANCA, Congress affirmed that aviation should be federally regulated, and stopped the wide-spread of local noise restrictions that had begun to threaten the efficiency and safety of our nation's airports and airspace. ANCA provides an effective process for scrutinizing noise and other access restrictions that is managed by the FAA. ANCA and other laws and regulations currently in place have proven successful over the last 30 years, allowing for public input and for airports, air carriers and general aviation operators to thrive in the safest and most efficient NAS in the world. Further, ANCA and the extensive aircraft noise regulation and policy regime of which it is a part, have resulted in tremendous noise reduction, with the number of people exposed to significant levels of aircraft noise in the United States dropping by 94 percent since the late 1970s, even as activity has increased. In addition to voluntary efforts mentioned above, ANCA provides a framework for communities to work with the aviation industry and the FAA to develop additional relief for noise impacted airports. It is essential to the success of our entire National Transportation System that these regulations are not allowed to be circumvented and that the FAA continues to enforce ANCA and other requirements, protecting access.

Today you have the opportunity to hear from Joby Aviation, one of a number of new entrant manufacturers developing aircraft that will usher in the era of electric and hybrid propulsion giving rise to new types of quiet, on demand air transportation. Advanced Air Mobility (AAM) will allow communities around existing airports to further take advantage of this valuable aviation infrastructure, as well as create opportunities to build more facilities to support aircraft with vertical takeoff and landing capabilities. Aviation stakeholders recognize that continued community education and engagement are critical in facilitating acceptance and success of AAM.

NBAA supports continuing the commitment to working collaboratively with the airport sponsors, communities surrounding airports and aviation tenants and users in promoting fly neighborly initiatives and voluntary noise abatement programs and procedures. We encourage engagement from local, regional and national elected officials in these initiatives as we all must ensure continued, unhindered access to our national system of airports to meet the current needs and projected growth.

We commend the Subcommittee for recognizing the importance of our airports and look forward to collaboratively working to address the aviation noise challenges to protect access to our Nation's greatest assets—its airports—and ensure their accessibility and viability. Protecting access and investment in general aviation airports, the backbone of our air transportation system, is critical in ensuring success of general aviation in the near term and for future generations.

Thank you again for holding this important hearing.

Letter of April 1, 2022, from Jamie Banks, Ph.D., M.Sc., President, Quiet Communities Inc., Submitted for the Record by Hon. Rick Larsen

APRIL 1, 2022.

The Honorable RICK LARSEN,
Chair,
Subcommittee on Aviation, House Committee on Transportation and Infrastructure, Washington, DC.

DEAR CHAIRMAN LARSEN AND MEMBERS OF THE HOUSE AVIATION SUBCOMMITTEE,

On behalf of Quiet Communities and its Quiet American Skies program, I am submitting the following statement in regards to the March 17, 2022 hearing on *Aviation Noise: Measuring Progress in Addressing Community Concerns*.

I am the Founder and President of Quiet Communities Inc. (QCi), an independent non-profit organization of medical, scientific, and legal professionals dedicated to helping communities reduce health and environmental harm from noise and pollution—our Quiet American Skies program focuses on aviation noise and pollution. I also Chair the American Public Health Association's (APHA) Noise and Health Committee and was principal author of the APHA's recent policy statement, Noise as a Public Health Hazard (2021) [https://apha.org/Policies-and-Advocacy/Public-Health-Policy-Statements/Policy-Database/2022/01/07/Noise-as-a-Public-Health-Hazard].

The Federal Aviation Administration (FAA) invests considerable efforts into safety, efficiency, and economic well-being of the country's aviation operations but has not matched this with investments into protecting communities on the ground.

- It is up to Congress to rectify this imbalance and protect the health and well-being of the American people.

Noise and pollution from commercial, general, cargo, flight school, commuting, and tourism operations cause suffering, impairments, cardiovascular disease including hypertension, heart attacks, stroke, and even early death. Aircraft noise impairs children's learning and decreases workers' productivity. (*These impacts are discussed in detail in the APHA policy*).

- The external costs of hospitalizations, death, lower educational achievement, and decreased productivity associated with noise in the United States are estimated to range up to the *hundreds of billions of dollars every year*.

Anger and frustration with the FAA and public officials are running high, with economics prioritized over health, unresponsiveness on the part of the FAA (which appears to be "captured" by the same industry it is supposed to regulate), and elected officials who are well-funded by campaign contributions from airlines and other vested interests.

Last year, we submitted a letter (dated March 2, 2021) to Chairman Larsen, Department of Transportation Secretary Buttigieg, Congresswoman Eleanor Holmes Norton, and Congressman Tom Suozzi signed by forty-three (43) local groups and five (5) national groups, calling on Congress to create a safe, healthy, and quiet aviation system as former EPA Administrator Russell Train so eloquently articulated in 1976. Subsequently, we presented to Congressional staffers on the issue of aviation noise. The letter and statement are attached as *Appendix A* and *Appendix B*. (*Please read them as they contain detail not repeated in this statement*).

I do not want to repeat what has already been stated in our previous communications. Rather, I want to provide additional observations and recent updates.

1. *The FAA's 65 decibel (dB) Day-Night Noise Level DNL* metric is widely criticized and is also *dangerously high*. It is twice as loud (10 dB) as the 55 dB that the Environmental Protection Agency (EPA) considers safe for protecting health [1] and is *at least 4-times louder* than the daytime (45 dB) and nighttime aircraft noise thresholds (40 dB) recommended by the 2018 World Health Organization based on an exhaustive review of scientific evidence [2]. Heart attack risk may start to increase at aircraft noise levels of 45 A-weighted dB [3].

US EPA "Levels" Document, 1974: Excerpt on Community Noise Levels to Protect Human Health

Table 4

Yearly Average Equivalent Sound Levels Identified as Requisite To Protect the Public Health and Welfare With an Adequate Margin of Safety

	Measure	Indoor			Outdoor		
		Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects [b]	Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects [b]
Residential with Outside Space and Farm Residences.	L_{dn}	45		45	55		55
	$L_{eq}(24)$		70			70	

[b] Based on lowest level.

Source: Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Washington, DC: U.S. Environmental Protection Agency, March 1974, Publication 550/9–74–004.

WHO Guidelines 2018: Recommendation and Strength of Evidence on Aviation Noise

Aircraft Noise

Recommendation	Strength
For average noise exposure, the GDG strongly recommends reducing noise levels produced by aircraft below 45 dBL_{den}, as aircraft noise above this level is associated with adverse health effects.	Strong.
For night noise exposure, the GDG strongly recommends reducing noise levels produced by aircraft during night time below 40 dBL_{night}, as night-time aircraft noise above this level is associated with adverse effects on sleep.	Strong.
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.	Strong.

Source: World Health Organization. Environmental Noise Guidelines for the European Region. Copenhagen, Denmark: World Health Organization Regional Office for Europe: 2018

2. *The strong low frequency components* present in most aircraft noise [4] are underweighted by the 65 DNL. Strong low frequency components allow harmful levels of noise to travel long distances and penetrate walls and windows [5]. Low frequency noise is known to be especially harmful to health, causing damage to blood vessels and a decrease of 5-decibels for safety thresholds is recommended for sources with strong low frequency components [6, 7].
3. *Nighttime aircraft noise* is now understood to be especially hazardous when it comes to cardiovascular health. This is related to sleep disturbance, increased stress hormone levels, and damage to blood vessels. The damage to blood vessels incurred by noise exposure predisposes individuals to ischemic heart disease, stroke, and death [8, 9]. One large study found the risks of cardiovascular death from nighttime aviation noise increased by 33% for noise levels between 40 and 50 decibels and by 44% for levels above 50 decibels [10].
4. *Repeat exposure to noise*—like that experienced by communities subjected to up to *hundreds of flights per day* over their homes—also appears to be especially hazardous to health. Research has shown a "*priming effect*" in which prior exposure to harmful levels of noise make blood vessels even more susceptible to damage [11, 12].
5. *By reducing noise, we can decrease adverse impacts* of aviation noise on health. This was shown by the quiet period in aviation we experienced in the recent

COVID pandemic [13] and by measures taken to reduce impacts of aircraft noise in schools in the case of children's learning [14].

Aircraft noise and air pollution are also negatively affecting American competitiveness. At the risk of repeating myself, I want to re-state a critical point covered in the open letter alluded to earlier (*Appendix A*). We have lost our global aviation leadership. We need to implement multifaceted approaches involving but not limited to accelerated adoption of new technologies, modified flight patterns and runways, greater local control of operations, adoption of meaningful metrics (e.g., N above), on the ground remediation, and more. We urge Congress to work with the FAA and stimulate innovation by enforcing the FAA Reauthorization Act of 2018 and by including additional provisions in the 2023 Reauthorization Act to incentivize responsible behavior by manufacturers, airlines and airport operators and accelerate the adoption of quieter, fuel efficient technology like US-based Pratt & Whitney's Geared Turbofan 1100 and alternative energy aircraft, like that described in testimony from JoeBen Bevirt, CEO of Joby Aviation. Above all, airport sponsors must be granted explicit authority to adopt noise regulations, including limits on the number, type, and timing of operations, to protect the health and well-being of their communities and hold operators responsible.

Congress needs to act. We need to face the serious problem of aviation noise and address it head-on, bringing in independent engineers, health care professionals, innovators, federal health agencies, etc. who can help develop and evolve effective solutions.

We recognize the intricacies and complexities of the aviation system. At the same time, we live in a great country. We have the means, the brain power, and resources to mitigate the health impacts of aviation noise and pollution and support a vigorous national aviation system that is safe, quieter, and healthier.

Thank you for your consideration.

Sincerely,

JAMIE BANKS, PH.D., M.SC.,
President, Quiet Communities Inc.

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APPENDIX A

OPEN LETTER FROM QUIET COMMUNITIES INC. TO U.S. SECRETARY OF TRANSPORTATION, HOUSE SUBCOMMITTEE ON AVIATION, CONGRESSIONAL QUIET SKIES CAUCUS, MARCH 2, 2021, UPDATED APRIL 28, 2021

[Editor's note—Appendix A is retained in committee files and is available online at https://quietcommunities.org/wp-content/uploads/2021/04/QCi-CQS__Open-letter-DOT-Congress__2021.03.04__update-2-2021.04.28.pdf.]

APPENDIX B

QUIET COMMUNITIES INC. CONGRESSIONAL STAFF BRIEFING, MAY 6, 2021

CONGRESSIONAL QUIET SKIES CAUCUS: STAFF BRIEFING
MAY 6, 2021

JAMIE BANKS, PH.D., M.S.
JAMIE@QUIETCOMMUNITIES.ORG; 781–259–1717
PRESIDENT, QUIET COMMUNITIES, INC.
CHAIR, NOISE & HEALTH COMMITTEE, AMERICAN PUBLIC HEALTH ASSOCIATION

Good afternoon. Thanks to Representative Lynch's office for inviting me to speak.

Quiet Communities is a national non-profit organization of medical, scientific, and legal professionals. We focus on economic sectors where noise and pollution adversely affect human and environmental health. Our goal is to create enduring change that results in quieter, healthier, more sustainable communities.

Our aviation program, Quiet American Skies, recently sent an open letter, signed by forty-eight national and local citizens' groups, to Secretary Buttigieg, this Caucus, and the House Aviation Subcommittee, on the public health hazards of aviation noise. It covers NextGen; helicopters; seaplanes; single engine, turbo prop, and cargo planes; and Advanced Air Mobility—meaning drones and air taxis. All affect the health of Americans in urban, suburban, rural, and remote areas.

Aviation is a major source of harmful emissions and noise. Both affect human health, but today my focus is on noise. I want give special thanks to Dr. Arline Bronzaft, honorary chair of our Quiet American Skies program, for her five decades of research on noise and health, including aviation noise. I also want to thank other program advisors: David Sykes (QAS); Dr. Daniel Fink (Quiet Coalition); Warren Schreiber (NYCAR), Barbara Brown, Maria Becce (NYCAR); Melissa Elstein (Stop the Chop NY–NJ), Tracy Williams (resident, AL), and Kimberly Gibbs (CQS) for their help with this statement.

This may surprise you. Noise was actually declared a public health hazard fifty-three years ago. In 1968, Surgeon General William Stewart stated "noise is indeed a public health hazard, a matter of public health concern" noting that "aside from hearing loss, it has been demonstrated that noise from aircraft and other sources causes physiological changes, including cardiovascular, glandular, and respiratory effects reflective of a generalized stress reaction." These sentiments were echoed in 1976 by EPA Administrator, Russell Train regarding aviation noise. In 1972, Congress passed the Noise Control Act and the Office of Noise Abatement and Control was established within EPA to fund research, education, product labelling, regulation, and technical assistance. The defunding of that Office by the Reagan Administration in 1981 halted federal progress on noise, while the evidence on its health

hazards continued to grow. Today, we lag far behind other industrialized nations on noise to the detriment of public health and global competitiveness.

In part due to that history, the FAA's decades-long reference to aviation noise as simply (quote) "an annoyance," (unquote) has gone largely unchallenged. Describing aviation noise as "an annoyance" without reference to its serious health consequences trivializes the problem, adding insult to injury to those affected. *No one* affected by aviation noise describes it as "annoyance." Rather, they use nouns like "assault," "bombardment," "onslaught", and "torture," and adjectives like "unbearable" and "intolerable." They describe impacts like deteriorating mental and physical health, anxiety, depression, anger, exhaustion, fear; disrupted sleep, work, concentration, and communication; and an inability to bear being in one's own home. One person describes aviation noise as having turned his home into a "living hell" (santaclaritaforquietskies.org; sounddefensealliance.org).

What makes aviation noise such a problem?

- First, it is loud and intermittent, and has strong low frequency components that carry it long distances and through walls and windows—much like a boom box.
- Second, it can be unrelenting in its intensity. Tens to hundreds of daily flights may affect neighborhoods day and night, minute after minute.
- Lastly, those affected have no meaningful recourse, leading to frustration, stress, anger, and a sense of powerlessness, hopelessness, or despondency.

Of all sources of transportation noise, aviation noise is ranked the worst.

For the public, the major concern is not hearing health. It is cardiovascular disease and mortality. People living in affected areas are more likely to have heart disease and be hospitalized (Correia 2013). Those probabilities increase as noise increases.

In thinking about aviation noise as a public health problem, there are five important dimensions.

- First, decades of research have dramatically strengthened the evidence on what was already known in 1968—that noise is hazardous to mental and physical health. Aircraft noise disrupts and fragments sleep, and causes stress and annoyance. These responses activate the autonomic nervous system and the endocrine system, causing the release of stress hormones and neurotransmitters that lead to inflammation and oxidative stress. The result is damage to the blood vessels and increased risk of ischemic heart disease, stroke, mortality, and possibly even accelerated aging (Tawakol 2017; Daiber 2019; Hahad 2021). This cascade of physiological events has been shown to apply specifically to aviation noise (Osborne 2021) and is now understood down to cellular, subcellular, and molecular levels (Steven 2020; Kröller-Schön 2018). Nighttime aviation noise is especially hazardous (Munzel 2021).
- Second, aircraft noise negatively affects children's learning and cognitive development (Basner 2017; Bronzaft 2000). A ten-year study of students from 6000 schools near 46 major US airports by the National Academies of Science, Engineering and Medicine found that aircraft noise was responsible for lower standardized test scores. Installing sound insulation in a subset of those schools reversed the effect (NASEM 2014). Similarly, a large study of children in schools near the airport in Munich, Germany (Hygge 2002) showed that exposure to high noise levels was associated with cognitive impairments, including poorer long-term memory and reading comprehension. Similar to the US study, those effects disappeared once the airport was closed and re-located.

The evidence for health and education effects meets the Bradford-Hill criteria for causation. Based on the strength of this evidence, the World Health Organization in 2018 issued stringent new safety guidelines specifically for aviation noise.

- Third, aviation noise is costly. Cardiovascular disease and stroke cost the nation $350 billion annually in direct medical costs and work productivity losses [1] (Virani 2020). While not all of these costs can be attributed to noise, lowering environmental noise just 5-decibels generates annual savings of $4 billion in medical costs by reducing the prevalence of hypertension and coronary artery disease (Swinburn 2015).
- Fourth, although aviation noise is in many ways an equal opportunity offender, a good portion of the burden is borne by low income and minority communities who have no influence over policy.
- Finally, many options exist for creating a safer, quieter, healthier aviation system. We just need the political will to do so.

[1] CVD and stroke, as of 2015: $350 billion/yr—$214 direct; $138 lost productivity/mortality; Virani 2020).

Urgent action is needed. The harms from aviation noise and pollution must be acknowledged and stakeholders convened to develop creative solutions. The yawning gap between research knowledge and aviation policy in America must be closed (Bronzaft 2017). Public health must be the top priority, *not* subjugated to vested interests. We *do not* need more research to know that aviation noise is dangerous for human health. As previously mentioned, a former Surgeon General and a former (Republican) EPA Administrator both agreed there was sufficient proof over four decades ago.

What should Congress do? Here are our suggestions.

- Pass introduced legislation on aircraft noise—HR 389, 712, 1643, 5423
- Re-examine federal preemption clauses that shield the FAA and industry and prevent state and local action at the cost of public health.
- Use the $25 billion specified for airports in the Infrastructure Act to accelerate the transition to fuel-efficient engines and development of new technologies, like electric and hydrogen. Many are already available from American sources.
- Promote high speed rail for short commutes and allow curfews on night flights.
- Establish "Buy Quiet" programs (pioneered by EPA and NASA) to encourage purchase or lease of cleaner, quieter aircraft.
- As spelled out in past laws, insist on interagency cooperation between the FAA and agencies like CDC, EPA, DOE, and HUD.
- Demand that *independent* research form the basis of decision making, not research funded by the FAA and vested interests.
- Mandate Health Impact Assessments to ensure that aviation policies, expansion plans, and other programs protect public health.
- Insist that the FAA's next strategic plan (2023–2026) addresses community concerns.

President Biden understands America has fallen behind in international competitiveness. His appointment of five Secretaries to the Jobs Cabinet shows that NOW is the time to act. We recommend the Jobs Cabinet confer with the Secretary of Health and Human Services on aviation policy. It's time to pivot toward policies that promote health, jobs creation, and cleaner, quieter communities.

I would like to conclude by quoting the Honorable Russell A. Train, President Nixon's EPA Administrator, who said this in regard to America's aviation system: "the present situation . . . does not protect the interest of the general public, the homeowner, the community at large, or the taxpayer. Most assuredly, it does not promote the long-term interest of the nation in a healthy, vigorous air transport system. We really know what needs to be done. We have simply lacked the will to do it. Let's get on with the job."

That was 1976. It is time to act!

Thank you.

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Letter of April 1, 2022, from Sam Hindi, City of Foster City, Roundtable Chairperson, and Al Royse, City of Hillsborough, Roundtable Vice-Chair, San Francisco International Airport/Community Roundtable, Submitted for the Record by Hon. Rick Larsen

APRIL 1, 2022.

The Honorable RICK LARSEN,
House Aviation Subcommittee Chairperson,
Committee on Transportation and Infrastructure, U.S. House of Representatives.

Re: Aviation Noise: Measuring Progress in Addressing Community Concerns Testimony

DEAR CONGRESSMAN LARSEN:

Thank you for allowing the San Francisco Airport/Community Roundtable (SFORT) to enter written testimony into the record for the Aviation Noise: Measuring Progress in Addressing Community Concerns hearing. The SFORT is in its 40th year of providing community noise reduction recommendations related to air-

craft and airport operations from the San Francisco International Airport (SFO) to airport management, FAA staff, and airline representatives. The Roundtable Membership consists of 24 appointed and elected officials from the City and County of San Francisco, the County of San Mateo, and most cities in San Mateo County representing nearly 2,000,000 people. As the Chair and Vice-Chair of the Roundtable, we submit this information that we feel represents the group to the best of our ability.

The topics listed below are only some of the items that are very important to the members of the SFORT and the constituents that they represent.

The reduction of nighttime noise exposure is a critical component to the health of communities around the airport. Undisturbed sleep of sufficient length is essential for daytime alertness and performance, quality of life, and health. As aircraft noise is intermittent noise, its effects on sleep are primarily determined by single event noise levels. Repeated noise-induced awakenings can impair sleep quality through changes in sleep quality including delayed sleep onset, early awakenings, less deep sleep, and more time spent awake and in superficial sleep stages. There are numerous studies discussing the effect of sleep deprivation on health and on communities. During the existence of the SFORT, and particularly in recent years since the introduction of the Next Gen procedures, we have heard repeated and numerous examples of residents impacted by aviation noise, and in particular that of nighttime noise. These comments have increased significantly in recent years. These comments include not just the annoyance of being unable to sleep uninterrupted through the night but of the effects on mental health, physical health, especially impacts on children and their ability to function in school and elsewhere, and just the enjoyment of life in general. We recognize and appreciate the necessity of some nighttime aviation but would strongly suggest that it be limited outside of defined hours, we would recommend 11:00 p.m. to 5:00 a.m., and be limited to that of necessity, e.g., medical, emergency, and needed cargo flights. There is also an increased public awareness of aviation noise, evidenced in part by both the creation of numerous citizen groups that formed due to the concern over this issue and of our legislator's failure to adequately act. More and more citizens are becoming concerned over aviation noise and their perception of a failure to address. There is an increased public concern, which will likely only be more pronounced as passenger and cargo flights increase as we return to normalcy post-pandemic. We desire to have flight paths be more over water and less over land, consistent with the mission around safety, efficiency (AND noise reduction). With the advent of Next Gen, the paths changed and now are increasingly over land versus water, at least around SFO, due to the efficiency standard and reduced attention to noise impacts. However, if noise is added to the considerations, higher use of water paths would likely be the natural result. More opportunities are needed to work with the FAA and airports to limit nighttime operations. As an example, through ongoing advocacy by the SFORT, changes were recently made to the hours of operation and the required path of the NIITE/HUSSH departures from San Francisco International Airport and Oakland International Airport that will benefit the residents of San Francisco and the Bay Area Peninsula. But these changes do not go far enough. We urge Congress to reinstate the ability for airports to institute a nighttime curfew to provide quiet hours for communities.

The metrics used by the FAA to measure the impacts of aviation noise do not accurately portray the effects of noise on communities. The Day-Night Average Sound Level (DNL) metric is currently used by the FAA. The DNL measures the average sound generated by aircraft operations over the course of 24-hours. Given the cumulative nature of this metric, having a small number of loud aircraft flying overhead through the course of a day can have the same DNL as multiple quieter aircraft. Congress should require the FAA to use additional metrics to account for the frequency of noise exposure, not just the daily average. The FAA should replace agency-wide use of the CNEL/DNL metric with a supplemental metric such as NA (Number Above) number of events above a certain decibel level such as in NEPA, Part 150, and AIP/PFC Funding of Noise Mitigation, consider duration within the agency approved metric(s). Using a supplemental metric that factors in duration, such as TA (Time Above), and break out noise metric standards in terms of frequency (such as low and high frequencies) would give a more accurate picture of what communities around the airport are being subjected to. Priority should also be given to establishing a new policy to employ the NES, rather than the FICON/Schultz Curve, to better represent aircraft noise impacts to communities.

Congress should require the FAA to incorporate ground-based noise metrics and standards into the overall analysis of aviation noise impacts. Ground-based noise may have a greater impact than in-flight noise on the quality of life for certain communities, especially those located close to airports. Requirements such as all electric

ground equipment and time limitations on auxiliary power units used by aircraft at the gates could lessen the impacts on the nearby communities. The FAA needs to look at all noise from airport operations including those from alternate flow operations and maintenance run ups. The FAA needs to include low frequency noise measurements, the duration of the noise and the fact that all departures add to low frequency noise to close in communities. Failure to include low frequency departure noise results in the FAA statistics on numbers of people impacted by airport noise to be inaccurate and misleading and undermines the impact of aviation noise on many who are the most affected. The impact is not only noise caused by flight, but the cumulation of every flight creating noise for greater duration and in greater decibels due to the additive function of multiple noise events happening at the same time.

Policymakers should pay particular attention to underrepresented and underserved neighborhoods and communities throughout the country. A disproportionate number of communities that are negatively impacted by aviation noise are historically disadvantaged communities. Often, aviation noise is exacerbated by environmental impacts of air travel and can have a significant impact on quality of life particularly in under-resourced communities. The underrepresented and underserved neighborhoods and communities are generally the least able to mitigate aviation noise and are often forced by circumstances to live closest to airports and aviation noise sources. Even if not living within an airport contour, they are often directly under flight routes. They often don't have the resources to minimize the noise. Accordingly, we recommend that in addition to the other noise measurement and reduction recommendations, noise insulation programs should be significantly expanded with federal funding to airports to accommodate added sound insulation treatments on properties outside the 65 CNEL/DNL contours but underneath a flight path.

NEPA needs to consider environmental noise as well as the environment. Environmental noise is defined as unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport, road traffic, rail traffic, air traffic, and from sites of industrial activity. The National Environmental Policy Act (NEPA) establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and it provides a process for implementing these goals within the federal agencies. NEPA requires federal agencies to consider the potential environmental consequences of their proposals, to consult with other interested agencies, to document the analysis, and to make this information available to the public for comment before the implementation of the proposals. Failure to consider noise as an equal factor at least to that of efficiency does irreparable harm to public health and fails to recognize that noise in and of itself is a form of pollution that needs attention. We recommend that the FAA Office of Environment and Energy be reinstituted to address community noise impacts as part of the FAA process. Additionally, allowing the use of Categorical Exclusions for projects that will have negative noise implications for the public should be limited. NEPA should be followed and should require all federal agencies, including the FAA, to assess, consider, and disclose noise impacts and other environmental effects when considering federal approval or funding of airport development projects and airspace redesign. What and who is underneath a flight path is just as important and crucial as the efficiency of that path.

FAA Community Engagement Officers (CEO) should be given greater responsibility/authority to make decisions. While having a FAA representative at public meeting is appreciated, the public deserves more than just someone who listens. The FAA established the CEO position within each of FAA's nine regional offices to serve as a regional ombudsman and coordinate public outreach with the appropriate FAA officials. These officials are required to make recommendations to the Regional Administrator to address concerns raised by the public and improve the consideration of public comments in the decision-making process, among other responsibilities. In practice, though, the CEO is merely the go-between for the community roundtables and the FAA. CEOs only take information down and must rely on other departments and branches within the FAA to get questions answered. This process takes months, as questions asked at one public meeting will not be answered until the next one. If CEOs were subject matter experts, *or* subject matter experts were made available on a more timely or real time basis (easier to do because most of our meetings are virtual or likely to be hybrid meetings in which virtual attendance is available), public questions would be able to be answered in a more real time way which would make for a more productive interaction with the FAA.

Our SFO Airport/Community Roundtable again appreciates the opportunity to enter our aviation noise concerns into the official record.

Regards,

SAM HINDI,
City of Foster City, Roundtable Chairperson,
San Francisco International Airport/Community Roundtable.

AL ROYSE,
City of Hillsborough, Roundtable Vice-Chair,
San Francisco International Airport/Community Roundtable.

cc: Congresswoman Jackie Speier

Statement of Melissa Elstein, Coalition Organizer, Board Chair, and Secretary, Stop the Chop NYNJ, Submitted on Behalf of Hon. Jerrold Nadler and Hon. Carolyn B. Maloney, Representatives in Congress from the State of New York, Submitted for the Record by Hon. Rick Larsen

Dear Chairman DeFazio, Ranking Member Graves, and Congressmembers of the Aviation Subcommittee, House Committee on Transportation and Infrastructure, U.S. House of Representatives:

I am writing to offer our public comments regarding the *March 17, 2022, Aviation Subcommittee Hearing: "Aviation Noise: Measuring Progress in Addressing Community Concerns."*

Progress in reducing aviation noise, especially from helicopters, has NOT been made in our community.

Stop the Chop NY/NJ is an all-volunteer grassroots organization and coalition formed in 2014. We represent community members, community boards, coops, condos, rental associations, environmental groups, parks associations, electeds, businesses and other groups and individuals being negatively affected by helicopter noise and pollution over New York City and the New York metropolitan area (including New Jersey, Westchester and Long Island). Our website is below, and we list our members (list in formation) on the "About" tab. We are also members of the Quiet Communities Inc.'s "Quiet American Skies" committee as well as the American Public Health Association's Noise Pollution committee.

I joined the Stop the Chop NY/NJ Board in early 2020 in order to help seek a solution to the growing problem of nonessential helicopters (tourist, sightseeing, photography, commuter and charter) ruining the lives of too many people, including my own, in this region due to their loud and low flights over residential neighborhoods, parks, schools and waterways.

Except on days with inclement weather, there are non-stop helicopters roaring throughout the city and metropolitan area. Our beloved urban parks that should be places of rest and peace, such as Riverside Park, Hudson River Park, Central Park, Prospect Park, Brooklyn Botanic Garden, Brooklyn Bridge Park, Battery Park, and Governors Island (to name a few) sound like war zones due to all the helicopter traffic. Commuter helicopters tend to be large Sikorskys and they roar at all hours of the day and night as they fly across NYC on their way to the international airports or the Hamptons, among other destinations. The tourist sightseeing helicopters tend to fly slower, and they also hover and circle over their photographic targets. Such photography hot spots are the Statue of Liberty/Ellis Island, Empire State Building, World Trade Center and 9/11 Memorial, Central Park, and the Brooklyn Bridge—historic landmarks that are being destroyed for residents and visitors alike due to all the helicopter noise. (Many are the infamous doors off "shoe selfie" tours conducted by the NJ-based FlyNyon company. I say "infamous" because in 2018, a Flynyon helicopter lost power and 5 tourists drowned in the East River as they were strapped into their seats so they would not fall out the doorless helicopter. Outrageously, these doors off helicopter tours continue to this day, 7 days per week, over NYC and northern NJ even though the NTSB has recommended that the FAA end such flights). NYC-based tourist helicopters have a different sightseeing path due to an industry-NYC Mayoral agreement signed in 2016. 30,000 helicopter tours are allowed from the sightseeing heliport based at the South Street Seaport (DMH) and those flights are limited to the NY Harbor and the Hudson River. Sound carries long distances over water, and unfortunately those who live and/or recreate near the Hudson River, East River, NY Harbor, Long Island Sound are subjected to endless helicopter sounds—often hearing the stressful thwack-thwack of the blades long before the helicopters are even visible to the viewers.

In emails, on Twitter, and in community meetings, our members communicate the misery and angst all this helicopter noise pollution causes. Their homes have be-

come uninhabitable due to the noise. Backyards, gardens and apartment terraces have become unusable.

The NY metro area has become over run with the loud and stress-inducing sounds of incessant, low-flying helicopters (fyi, they must fly below 2,000 feet so they do not interfere with the jet and airplane traffic from our three international airports). For many long-time residents, this noise pollution situation did not exist to this extent in previous decades. It has exploded in volume as new companies have begun offering helicopter tours and commutes. The community has suffered at the expense of a niche industry that is unnecessary given there are so many other cleaner and quieter commuting options. Additionally, helicopter joyrides for sightseeing are dangerous, noisy and polluting, as well as unnecessary—several tall observation decks throughout NYC offer similar birds eye views!

Finally, we must add a comment regarding the climate issue in addition to the noise problem caused by helicopter traffic. The unchecked proliferation of gas-guzzling nonessential helicopters contributes to our air pollution problem, increased carbon emissions in the atmosphere, and a reliance on fossil fuels. As we face looming climate change caused catastrophes, like super storms and coastal flooding, we should be reducing (not expanding) our reliance on fossil-fuel based modes of transportation—especially those that also contribute to excessive noise pollution such as these nonessential helicopters described above.

Community representation at the March 17 Hearing was inadequate.

Aviation-impacted communities around the country were not adequately represented at the March 17 Hearing. The only speaker (one of eight) who was there to speak for communities was from the organization N.O.I.S.E. which does not represent the myriad of communities negatively impacted by aviation noise pollution around the United States.

Aviation noise pollution caused by helicopters is a serious public health issue.

Studies have shown that repeated exposure to aviation noise pollution is a public health hazard. Aircraft noise pollution has negative health impacts on the cardiovascular system, including increased risk of strokes and heart attack. It also harms the endocrine and nervous systems, impairs cognition, and causes sleep disruption, anxiety, and depression.

Congress must take meaningful action to address and curtail aviation-caused noise pollution, including from helicopters.

For all the above reasons, we urge the Members of the Aviation Subcommittee to take meaningful action to address the serious health impacts of aviation noise pollution, especially nonessential (tourist/sightseeing/amateur photographer and commuter/charter) helicopters, on communities such as mine. As you know, the *Airport Noise and Capacity Act of 1990* ("ANCA") stripped away most local control over aircraft and aviation noise. ANCA needs to be amended to return control over aviation-related noise pollution to local governments and to integrate community concerns into the FAA decision-making process in a meaningful way.

Members of the Aviation Subcommittee should cosponsor the below Congressional bills introduced to address helicopter noise pollution.

We urge the Aviation Subcommittee Members to cosponsor the following important bills:

- *H.R. 1643: "The Improving Helicopter Safety Act"*—https://www.govtrack.us/congress/bills/117/hr1643 (We thank our NY Congressmembers Maloney, Nadler and Velasquez for introducing this Bill, and for inviting us to speak at their press conferences and Town Hall).
- *H.R. 389: "The Safe and Quiet Skies Act"*—https://www.govtrack.us/congress/bills/117/hr389#

I thank you for this opportunity to offer these public comments via email in response to your March 17th Hearing on aviation noise pollution and community concerns.

APPENDIX

QUESTIONS FROM HON. EDDIE BERNICE JOHNSON TO HEATHER KRAUSE, DIRECTOR, PHYSICAL INFRASTRUCTURE, U.S. GOVERNMENT ACCOUNTABILITY OFFICE

Question 1. The GAO and other witnesses recommended that the FAA identify additional metrics for assessing the noise impact of new flight paths. Can you discuss some of these potential additional metrics?

ANSWER. As we reported in 2021 [1], using additional metrics to assess the potential noise impacts of proposed Performance Based Navigation (PBN) flight path changes may provide FAA with a better understanding of such impacts. FAA currently uses the Day-Night Average Sound Level (DNL)—which combines the effects of several components of noise into a single metric—to account for the noise intensity, duration, frequency, and time of occurrence for flights above a particular location over an average day. However, we found that it does not provide a clear picture of the flight activity or noise levels at a given location. Since no single metric can convey different noise effects, we recommended that using additional metrics in designing proposed flight paths could help FAA identify and address potential noise concerns. Similarly, we recommended that FAA use additional communication tools, including other noise metrics, to better convey potential noise impacts during public outreach.

In a 2020 report, FAA identified a number of alternative metrics for assessing the impact of aircraft noise, including: [2]

- *Sound exposure level (SEL)*, which FAA already uses as one of the components of DNL, provides information on the total noise caused by a single flight overhead.
- *Number above* describes the number of events above a selected sound-level threshold over a given period of time, such as the number of overhead flights that cause more than 60 decibels (dB) of noise at a given location over a 24-hour period.
- *Time above* describes the total time or percentage of time that the aircraft noise level exceeds an indicated level, such as the amount of time a given location is exposed to noise above 60 dB.

These metrics may provide insights that could assist FAA in identifying community noise concerns prior to PBN implementation, and communities in understanding the potential impacts of planned changes. For example, considering the "number above" metric during the design process or environmental reviews could help FAA identify areas likely to experience a large increase in the number of flights overhead. In some cases, even if the impact does not rise to the level of a significant change in terms of DNL, FAA may be able to identify changes to proposed flight paths that could mitigate potential noise impacts while still supporting safety and efficiency goals. As of March 2022, FAA said it is conducting a noise policy review and plans to consider whether and under what circumstances supplemental, companion, or alternative noise metrics are appropriate to inform research and policy considerations. FAA plans to complete their initial noise policy review by the end of 2022.

Question 2. The FAA collects a large amount of data on aviation noise. Do you think they are effectively using this information?

ANSWER. In recent reports, we have identified several ways in which FAA could better leverage data on aviation noise.

First, in our September 2021 report, we note that FAA policy permits the use of supplemental noise metrics in addition to the current metric—the Day-Night Aver-

[1] GAO, *AIRCRAFT NOISE: FAA Could Improve Outreach through Enhanced Noise Metrics, Communication, and Support to Communities*, GAO–21–103933 (Washington, D.C.: Sept. 28, 2021).

[2] Federal Aviation Administration, *Report to Congress: FAA Reauthorization Act of 2018* (Pub. L. 115–254) Section 188 and Sec 173, (Washington, D.C.: Apr. 14, 2020).

age Sound Level (DNL)—and that FAA's current tool for analyzing noise impacts (the Aviation Environmental Design Tool) has the capability necessary to incorporate such metrics. However, FAA officials told us that the agency generally does not use supplemental metrics in its analysis of noise impacts because the DNL metric meets the legal requirement that FAA use a metric that incorporates noise intensity, duration, and time of occurrence.

In our report, we found that using one or more supplemental metrics in concert with DNL may provide FAA with a more holistic picture of the potential noise impacts of Performance-Based Navigation projects. We recommended that FAA should identify appropriate supplemental noise metrics, as the use of such metrics could provide additional insights on potential community noise concerns and offer opportunities to adjust PBN flight paths prior to implementation. Further, we recommended that FAA should update guidance to incorporate additional communication tools that more clearly convey expected impacts. For example, using supplemental metrics in outreach materials in addition to DNL to convey information on potential noise impacts during pre-implementation outreach for proposed PBN changes may help provide the public with more understandable or meaningful information. In turn, such information may improve communities' ability to communicate their particular noise concerns during outreach. As of March 2022, FAA said it is conducting a noise policy review and plans to consider whether and under what circumstances supplemental, companion, or alternative noise metrics are appropriate to inform research and policy considerations. FAA plans to complete their initial noise policy review by the end of 2022. FAA also said it plans to update guidance on community outreach by the end of 2022.

Second, in our January 2021 report, we found that FAA was impeded in addressing helicopter noise issues in the Washington, D.C. area because FAA and helicopter operators do not consistently or fully share the information needed to do so.[3] For instance, FAA does not typically forward complaints about helicopter noise to operators, and operators do not typically share complaints with FAA. As a result, we found that operators have not consistently responded to residents' inquiries about helicopter noise and activities.

We recommended that FAA develop a mechanism to exchange helicopter noise information with operators in the D.C. area. Such a mechanism could help FAA improve responses to individual helicopter noise concerns and determine what additional strategies, if any, are needed to further address helicopter noise. As of March 2022, FAA officials said they were working to identify a mechanism to share complaint data with helicopter operators in the area. FAA officials also stated that they plan to conduct quarterly meetings in the area with local helicopter operators to examine trends in helicopter complaint data and discuss helicopter noise mitigation efforts. FAA officials said they plan to begin holding and facilitating these meetings in spring 2022.

QUESTIONS FROM HON. EDDIE BERNICE JOHNSON TO FRANK R. MILLER, EXECUTIVE DIRECTOR, HOLLYWOOD BURBANK AIRPORT, ON BEHALF OF AIRPORTS COUNCIL INTERNATIONAL–NORTH AMERICA

Question 1. The Bipartisan Infrastructure Bill allocated $15 billion towards Airport Infrastructure Improvements, which supplements the $3.35 billion in Airport Improvement grants. What types of airport infrastructure projects at airports might address noise concerns?

ANSWER. Hollywood Burbank Airport will continue its successful noise mitigation program that is a residential acoustical treatment program (RATP). Prior to, and then during the pandemic, federal funding for the RATP was discontinued causing the airport to suspend the program. The Bipartisan Infrastructure Bill contains funding that will allow the program to be re-engaged. due to financial constraints and the BIL will allow you to complete projects in process.

Question 2. You stated that airports need more dedicated funds to implement additional noise abatement initiatives. Do you need any additional flexibility in the AIP or PFC programs to more easily fund these types of projects?

ANSWER. Additional regulatory flexibility with AIP and PFC to ease the FAA approval of noise abatement programs would be helpful to airports. Ultimately, though, the project needs around the country far exceed the available funding through federal grants or local user fees. We need to find additional resources

[3] GAO, *AIRCRAFT NOISE*: *Better Information Sharing Could Improve Responses to Washington, D.C. Area Helicopter Noise Concerns*, GAO–21–200 (Washington, D.C.: Jan. 7, 2021).

through a combination of increased funding for AIP and modernizing the outdated federal cap on the PFC in the next FAA reauthorization bill.

Also, as I mentioned in my written testimony, it is imperative that the FAA define the goal of its aircraft noise policy to appropriately direct further research and frame solutions that are appropriate to actual societal problems. Any changes to the FAA's noise significance and compatibility threshold will affect a suite of different financial, legal, and policy areas with noise programs at airports throughout the country.

QUESTION FROM HON. EDDIE BERNICE JOHNSON TO DAVID SILVER, VICE PRESIDENT FOR CIVIL AVIATION, AEROSPACE INDUSTRIES ASSOCIATION

Question 1. What other R&D initiatives on engine technology are on the horizon that can further reduce aircraft noise?

ANSWER. Thank you for the question. Reduction in noise generated by aircraft engines has been a fundamental part of the overall reduction in aircraft noise over the last 50 years. Increases in bypass ratio and more efficient designs, combined with improvements in noise reducing treatments has greatly contributed to the reduced noise footprint of aviation.

However, there is still progress in engine technology to be made, some of which is in the plans for the NASA Continuous Lower Energy, Emissions, and Noise (CLEEN) Phase III Flight Demonstration. Improvements in efficiency and aerodynamic design of fan blades, internal compressor and turbine designs along with new and innovative noise reduction treatments in the inlet and exhaust of the engine offer noise reduction opportunities.

Similar improvements in efficiency, increased bypass ratio, and improved noise reduction treatments are in continuous development by AIA members. These concepts will continue to develop and find their way into future flight demonstrators and/or new engine designs for the next generation of aircraft. Examples of R&D initiatives in current development by AIA members include:

- Pratt and Whitney Gen2 Geared TurboFan noise reduction technologies targeting additional 3 EPNdB cumulative noise reduction relative to current engines. New technologies include:
  - Additively Manufactured Acoustic Liners
  - Low-Loss Intra-Stage Liners
  - Low-Count / Low-Noise Guide Vanes
  - Noise Robust Swirler
- GE Aviation advanced acoustic technologies including:
  - Novel Liner targeting 2 EPNdB cumulative noise reduction relative to SDOF with neutral performance impactor
  - Fan Source Strength Reduction Concept targeting 1 EPNdB cumulative noise reduction with performance neutral impact
- Honeywell advanced technologies including:
  - Highly Efficient Fan Module targeting 1.5 EPNdB noise reduction
  - Efficient Green High-Pressure Core targeting 3 EPNdB noise reduction
  - High Work High Lift Low Pressure Turbine (LPT) targeting 0.5 EPNdB noise reduction
- Collins Aerospace advanced acoustic exhaust technology targeting 0.9–1.5 EPNdB cumulative noise reduction
- Safran-Nacelles LeAD project proposes an additional acoustic surface in D-Duct area while supporting de-icing functionality

Many of these developments are focused on improved fuel efficiency and reducing climate impacts of aviation. There are also significant investments in engine design and supporting infrastructure around novel power sources, such as full or partial electrification and hydrogen fuel cells, which promise significant reductions in both noise and engine emissions.

QUESTION FROM HON. JOHN GARAMENDI TO DAVID SILVER, VICE PRESIDENT FOR CIVIL AVIATION, AEROSPACE INDUSTRIES ASSOCIATION

Question 1. Myself and other Members of the Committee have noticed that global investment in developing technologies that decrease the noise footprint of airports and commercial aircraft is increasing. Do you feel like we are making adequate investments? If yes, please elaborate. If not, please explain what more needs to be done.

ANSWER. Thank you for the question. AIA's member companies are most appreciative of the investments in the Continuous Lower Energy, Emissions, and Noise (CLEEN) Program, the Center of Excellence for Alternative Jet Fuels and Environ-

ment (ASCENT), the Airport Cooperative Research Program (ACRP), NASA Sustainable Flight Partnership, and other similar programs. These programs represent a significant investment in improving the environmental performance of aviation in the future.

While we've made significant progress in decreasing the noise footprint of airports and commercial aircraft, there is more to be done to ensure we can meet U.S. and industry climate goals.

Improvements in operational procedures that reduce noise and local emissions provide the most immediate relief, however that is mostly incremental and often involves displacing noise from one community to another. Technology demonstrators, such as those funded through programs like CLEEN, offer the opportunity to quickly develop, test, and prove technologies that can be applied to products and the move into marketplace. Both CLEEN and ASCENT program funding increased substantially in Fiscal Year 2022, providing more opportunities to develop important near-term technologies to reduce the environmental impact of aviation. This is an important step; but it is too early to say whether this increase is adequate.

Substantial and growing investment in step-change technologies has the potential to significantly reduce both noise and emissions from aviation. While a substantial investment through ASCENT and NASA sustainable flight programs has been made in step-change technologies, there is more that can be done. Discovering and initially developing step-change technologies that offer real reductions in both noise and climate emissions is the first step. The existence of technology is essential, but not nearly sufficient to bring it into a commercial reality. Technology must continue to develop to the point it is economically and commercially viable to manufacture and operate with the highest level of safety and reliability. This is a key area for additional investment—not only to discover a technology and build a one-off demonstrator, but also to continuing to develop necessary infrastructure to support emerging technologies, like electric or hydrogen power, as well as new aircraft architectures and materials.

QUESTION FROM HON. TROY BALDERSON TO JOEBEN BEVIRT, FOUNDER AND CHIEF EXECUTIVE OFFICER, JOBY AVIATION

Question 1. I believe it's important we work to expand our nation's Advanced Air Mobility infrastructure. Nearly 100 companies are considering concepts in this space. One of the concerns that has been raised regarding AAM concepts is increased noise in urban environments. Could you talk about what work Joby has done with government stakeholders, especially NASA, and others on noise abatement in the AAM industry?

Are there opportunities for the government, in consultation with companies like yours, to do more basic research on AAM noise minimization?

ANSWER. Thank you for that question. As I mentioned in my testimony, electric propulsion is a game changer when it comes to the way companies are able to design aircraft to prioritize noise at every phase of the development process. This will allow our aircraft to take off and land closer to where people want to live and work, but we must also ensure that we are working with those communities early and often so that this is a service that they believe will benefit their community.

To that end, we were very fortunate to partner with NASA this past summer on a two week test campaign which resulted in critical noise data that we can then use with those communities to provide them a true vision of our aircraft. With this data in mind, the government should also look at how we can rethink permitting new aviation infrastructure with more modern noise criteria. We are looking forward to working with all levels of government to help provide a service that is affordable, accessible and community friendly to the public.

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