



September 29, 2023

Docket Operations, M-30
U.S. Department of Transportation (DOT)
1200 New Jersey Avenue, SE, Room W12-140
West Building Ground Floor
Washington, DC 20590-0001

Submitted via: Federal eRulemaking Portal

Re: Docket # FAA-2023-0855 FAA Request for Comments on Review of Civil Aviation Noise Policy

To Whom It May Concern:

Please accept this comment letter from the Massachusetts Port Authority Community Advisory Committee (MCAC) on the Review of the Federal Aviation Administration's (FAA) Civil Aviation Noise Policy pursuant to the notice published in the Federal Register on May 1, 2023. The MCAC is a legislatively created committee (See 2013 Mass. Acts Ch. 46, §§ 55, 82, as amended) comprised of representatives from thirty-five communities impacted by the Massachusetts Port Authority's (Massport) operations. Our statutory purpose is to provide oversight to Massport in order to minimize and mitigate the impacts that Massport has on our member communities. The MCAC appreciates the opportunity to comment on this important initiative and looks forward to working collaboratively with the Federal Aviation Administration, Massport, local, state, and federal elected officials to ensure that the federal noise regulations appropriately consider and mitigate **the adverse health impacts of aviation noise** on communities across the country.

Noise has been recognized as a public health problem for decades, though even today far too many people remain exposed to harmful levels of aviation noise. The Noise Control Act of 1972 declared that "it is the policy of the United States to promote an environment for all Americans free from noise that jeopardizes their health or welfare."¹ Noise from all transportation sources including air, rail, and surface transportation is rightly covered by this law. The health impacts from each source are linked biologically in how we experience and react to noise. For purposes of this response, however, we are addressing aviation noise specifically. **We agree that the paramount reason for regulating aviation noise must be to protect the health of the people on the ground.** The FAA has recognized in creating flight paths that it has the authority and, in fact, the obligation to do so.² That promise remains unfulfilled to this day.

¹ [Noise Control Act of 1972.pdf \(gsa.gov\)](#)

² The FAA has broad authority and responsibility to regulate the operation of aircraft, the use of the navigable airspace and to establish safety standards for and regulate the certification of airmen, aircraft, and air carriers. ([49 U.S.C. 40104 et seq.](#), 40103(b)). The FAA's authority for this rule is contained in [49 U.S.C. 40103](#) and [44715](#). Under section 40103, the Administrator of the FAA has authority to "prescribe

Though some progress has been made in aircraft technology that has made airplanes quieter over the past several decades, people in communities near airports as well as overflight communities continue to be affected by persistent aviation noise that negatively impacts their health. The FAA represents that one flight by a typical commercial aircraft in the 1950's is roughly equivalent to the noise produced from 30 flights by a typical jet today.³ Unfortunately, the number of aviation operations that occur today and Performance Based Navigation (PBN) flightpaths erase any benefits from this quieter technology. Though the concentration of flight paths by the RNAV system implemented nationally means that fewer people are exposed to aviation noise levels above the current regulatory threshold (**which we assert is inadequate to protect public health**), there remains by the FAA's own estimates over 400,000 people who are experiencing unhealthy aviation noise levels. Those people are also exposed to more flights because the RNAV system also reduces the required horizontal spacing between aircraft.

Despite these facts, even this estimate of the number of people exposed to unhealthy aviation noise masks the truth on the ground. As is clear from the Neighborhood Environmental Survey (NES), many more people are highly annoyed at DNL levels between 45 DNL and 65 DNL than are annoyed (and thus subject to negative health effects) above the current 65 DNL regulatory threshold. Even so, above the FAA's current noise threshold (65 DNL), the adverse noise impacts are borne by far fewer people even as the number of operations particularly at night has increased dramatically. It stands to reason that these people are constantly subjected to the adverse effects of aviation noise from early in the morning until late at night. Indeed, many of our member communities complain of being awakened during the night by flights out of Logan International Airport on a regular basis. So, even if we accept that fewer people are exposed to aviation noise at 65+ DNL today than fifty years ago, the number of flights that they are experiencing at all sound levels is much greater resulting in persistent harmful noise.

The FAA has been regulating noise impacts since the 1970's. The Aviation Safety and Noise Abatement Act of 1979 required FAA to develop a system for analyzing aircraft noise exposure that must have a high degree of correlation between the projected noise exposure levels and the surveyed reactions of people to those noise levels and must account for the intensity, duration, frequency, and tone of noise-producing activity as well as the time of occurrence.⁴ A review of the literature shows that when the FAA initially established 65 DNL as the level at which residential land use was incompatible with airport operations, this noise threshold was not in accordance with the recommendation from the Environmental Protection Agency which served as part of the federal working group researching this issue. In 1974, as mandated by Congress in the Noise Control Act of 1972 and before the implementation of NextGen technologies, the Environmental Protection Agency calculated that the safe noise level to prevent outdoor activity interference and annoyance was Ldn =<55 dB and to prevent indoor activity interference and annoyance in residential areas was only Ldn =< 45 dB (Ldn = DNL).⁵ From the beginning,

air traffic regulations on the flight of aircraft (including regulations on safe altitudes) for * * * (B) protecting individuals and property on the ground. ([49 U.S.C. 40103\(b\)\(2\)](#)). In addition, section 44715(a), provides that to "relieve and protect the public health and welfare from aircraft noise," the Administrator of the FAA, "as he deems necessary, shall prescribe * * * (ii) regulations to control and abate aircraft noise * * *"

From: [Federal Register :: The New York North Shore Helicopter Route](#)

³ Based on an average of approach and takeoff certificated noise levels as defined in 14 CFR part 36.

⁴ 49 U.S.C. 47502 (2).

⁵ EPA, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (1974) <https://www.nonoise.org/library/levels74/levels74.htm>

the 65 DNL level contradicted the best science available (as well as the recommendation of the Environmental Protection Agency) and ignores the health impacts of aviation noise on people on the ground and does so to this day.

The FAA adopted 65 dBA DNL as the threshold for significant aviation noise, below which residential land uses are compatible.⁶ As discussed later in more detail, this was based on the Schultz curve, which showed that 12.3% of the population was “highly annoyed” at this 65 DNL. Subsequent research (the NES)⁷ has shown that many more people are highly annoyed at much lower DNL levels than was estimated in the 1970s by the Schultz curve. If the same logic was to be applied to that research (that 12.3% of the population being highly annoyed is where the regulatory threshold should be set), the regulatory DNL threshold would be set at approximately 45 DNL instead of 65 (a higher percentage of people are “highly annoyed” at that level than were at 65 DNL when the Schultz curve was created). If the FAA were to determine as a result of this noise policy review that DNL will remain the sole metric for regulating noise (which we do not recommend), then 45 DNL would be a more appropriate threshold to protect human health. That level is consistent with the results published in the World Health Organization Europe’s Systematic Review in 2018. That body recommended a level of approximately 45 DNL as the proper regulatory threshold.⁸ We support this conclusion.

For almost fifty years, the FAA has recognized that aviation noise poses a public health problem. The FAA’s 1976 Aviation Noise Abatement Policy states: “Aircraft noise disturbs the normal activities of airport neighbors—their conversation, sleep, and relaxation and degrades their quality of life. Depending on the use of land contiguous to an airport, noise may also affect education, health services, and other public activities.”⁹ Since that time, an enormous body of research suggests just how pervasive are the health effects of aviation noise. Chronic noise, even at low levels, can cause annoyance (as reflected in the Schultz curve and the NES cited above), sleep disruption, and stress that contributes to cardiovascular disease, cerebrovascular disease, metabolic disturbances, exacerbation of psychological disorders, and premature mortality.¹⁰ It is imperative that the FAA’s noise policy protects against these health effects.

Using only the DNL metric has not accurately reflected the lived experience of community members on the ground, particularly those beneath the concentrated flight paths post-RNAV. As an averaging metric, DNL is not appropriate for measuring annoyance or health impacts from noise. As discussed more fully in our response to specific questions, we must approach the noise problem for what it is, a **public health issue**. Using annoyance as an indicator minimizes and trivializes the lived experience of people living near airports and in overflight communities who experience persistent and repetitive noise day and night.¹¹ As former U.S. Surgeon General William H. Stewart said in 1978, “[c]alling noise a nuisance is like calling smog an inconvenience. Noise must be considered a hazard to the health of people everywhere.” In order to fully address this issue, FAA will need to rely on the expertise of the public health, medical, and epidemiological communities in determining the appropriate way(s) to measure aviation noise impacts. Just as a doctor would not rely only on blood pressure to diagnose a patient, so the FAA must

⁶ FAA History of Noise, https://www.faa.gov/regulations_policies/policy_guidance/noise/history#

⁷ Analysis of the Neighborhood Environmental Survey, HMMH Report No. 308520.004.001, January 2021, page xi.

⁸ World Health Organization. Environmental Noise Guidelines for the European Region. Copenhagen: World Health Organization Regional Office for Europe: 2018.

⁹ Aviation Noise Abatement Policy, Department of Transportation, November 18, 1976 (p.12)

¹⁰ [Noise as a Public Health Hazard \(apha.org\)](https://www.apha.org) (accessed August 31, 2023).

¹¹ See letter attached as Appendix 1, Letter from Medford, MA resident

not rely solely on DNL to understand and fix the aviation noise problem. We strongly recommend a National Academies Division of Medicine consensus report on aviation noise effects on public health to provide an independent, scientific, expert opinion. In addition, other metrics, like N-above which indicates the number of noise events above a certain dBA level, and T-above which measure persistent noise must be used to determine significant noise impacts. Additional metrics and risk equations that go with these metrics are required to develop a full understanding of the health implications of aviation noise.

Over the past 50 years significant progress has been made in understanding the correlations between aviation noise and health outcomes. Unfortunately, none of the expertise required to understand and apply this research is represented at the FAA. The FAA should rely on federal agencies with expertise in health to develop a holistic and defensible approach to aviation noise. Toward this end, we support Congressman Steven Lynch's Air Traffic Noise and Pollution Expert Consensus Act, H.R. 2562 which would require such a committee.¹² Health experts are needed to address health problems. We further support a National Academies consensus report on aviation metrics and thresholds that includes the Division of Medicine. Here again, Congressman Lynch's Peer-Reviewed Report on Measuring Metrics and Thresholds, H.R. 2561, mandates such a report.¹³ The research exists to support the use of alternative metrics and lower noise thresholds; the FAA should use this expertise to **develop a more robust and health-protective noise policy.**

Additionally, whatever metric or metrics are chosen as a result of this process, the FAA must ensure that there are some teeth to the regulation. DNL has been used for planning purposes only; enforcement when these levels are "violated" are non-existent. The only outcome is eligibility for sound insulation or other mitigation. The FAA must be willing to adopt remedies like a noise surcharge which will push the industry in the direction of using quieter aircraft. Enforcement of more stringent regulations is a powerful form of communication with the airline industry and should be used by the FAA to protect the health of people on the ground. **In addition, noise must be added to safety and efficiency as measurable stated goals for aircraft operations.** Flights from Logan International Airport to Paris are among the quietest that use the airport precisely because the Paris airports impose a noise-based landing fee. This option should be available at domestic airports around the country.¹⁴ Seattle-Tacoma International Airport recently worked with a carrier, EVA Airlines, to ensure that nighttime flights used the quietest planes in the fleet to reduce noise impact.¹⁵ The FAA must also have increased funding to implement a more robust noise policy. Money must be available to support airports in their efforts to mitigate the health-impacting noise that results from aviation operations. These interventions will help the FAA to truly achieve its mission of protecting the safety of not only the flying public but also the people on the ground who are subject to persistent aviation noise which affects their quality of life and health.

Thank you for the opportunity to submit these comments on the FAA's Noise Policy. Our answers to the specific questions asked in the Federal Register are enumerated below. If you have any questions, or

¹² [Actions - H.R.2562 - 118th Congress \(2023-2024\): Air Traffic Noise and Pollution Expert Consensus Act of 2023 | Congress.gov | Library of Congress](#)

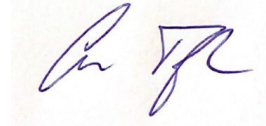
¹³ [Text - H.R.2561 - 118th Congress \(2023-2024\): Peer-Reviewed Report on Measuring Metrics and Thresholds | Congress.gov | Library of Congress](#)

¹⁴ [ADP \(parisaeroport.fr\)](#) (accessed August 15, 2023).

¹⁵ [Why Seattle Asked EVA Air To Change From A Boeing 777 To A 787 For Night Flights \(simpleflying.com\)](#)

would like more information from the Massport Community Advisory Committee, please feel free to contact Aaron Toffler at atoffler@massportcac.org.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'Aaron Toffler', is placed over a light blue rectangular background.

Aaron Toffler, Executive Director
Massport Community Advisory Committee

cc: Senator Edward Markey
Senator Elizabeth Warren
Representative Stephen Lynch
Representative Ayanna Pressley
Representative Katherine Clark
Representative Jake Auchincloss
Representative William R. Keating
Representative Seth Moulton
Representative James McGovern
Representative Lori Trahan
Representative Richard Neal
MCAC Members

Questions:

1. Vehicle Type.

When the FAA published the ANAP in 1976, the impacts of aviation noise were related to commercial jet service at or in the immediate vicinity of airports. What types or elements of current or future air vehicle activity (e.g., unmanned aircraft systems (also known as UAS or drones), advanced air mobility, rotorcraft, subsonic fixed wing, supersonic, or commercial space) should the policy describe and disclose? How should this information be described using noise metrics? Should the FAA use this information to make decisions or for public disclosure only? Please explain your reasoning.

Comment: The MCAC recommends that noise and other impacts of future air vehicle activity be rigorously evaluated regarding noise and regulated by the FAA. Unmanned aircraft systems are already beginning to fly over cities for commercial purposes and their usage is likely to increase dramatically over the next few decades. It is critical that the noise from these systems is measured and regulated. Additionally, eVTOLs are being piloted in airports across the country to travel the final miles to and from the airport. From a safety and noise perspective, these flights must be understood and included in the noise impact analysis by FAA. Without more information, it is difficult to recommend appropriate metric/metrics that would be sufficient to control noise from these systems. At a minimum, the FAA should consult with and distribute the results to the general public for a more robust and informed dialogue. At the present time, there is not enough known about these technologies or how they will be implemented in the future to make specific recommendations. A “future technologies” working group which would include members of communities near airports around the country who bear the disproportionate impact of these new technologies should be created in order to ensure that any new regulations accurately reflect the experience of people on the ground.

The FAA is now contemplating how to integrate EVTOL and other advanced air mobility technologies (power-lift, special-class aircraft) into the fleet of aircraft providing point to point service to the general public. We begin by noting that the FAA is not now successful in addressing the issue of helicopter noise and fails to prevent helicopter traffic from straying off both required and recommended flight paths. This creates great annoyance 24-hours a day for people who live in congested areas with significant helicopter traffic. There is no way for people on the ground to complain about those flights in a way that results in meaningful change; no way to address the nuisance. This does not bode well for adding other forms of air travel to the mix and only serves to reinforce the truism that people on the ground are nobody’s constituents and that the FAA will continue to feed the industry at our expense. In the numerous news reports about these new aircraft, there is no discussion of their wind impact at and around urban vertiports or the sound and emissions that they will generate during arrival, idling and departure. Without transparency on all these issues, the FAA will do a disservice, once again, to people on the ground.

With respect to supersonic flight, we oppose supersonic flight over the land of the United States regardless of any “quiet sonic boom” technology. If, in the future, Congress determines that supersonic flight will be allowed over land, then such flight should be strictly regulated. No takeoff, landing, or overflight of such supersonic aircraft should take place over any portion of the land area of the United States or within 12 nautical miles offshore during the hours of 10:00

p.m. to 7:00 a.m. local time. We also note that although hypersonic technology is not yet available, similar restrictions would likely be appropriate for that type of travel as well.

2. *Operations of Air Vehicles.*

- a. **What elements of aircraft operations (e.g., en-route, takeoff, landing) should the noise metric evaluate and disclose? Should the FAA use this information to make decisions or disclose to the public noise impacts? Please explain your reasoning.**

Comment: The noise metrics should evaluate and measure the impacts of aircraft operations throughout the duration of the entire flight because all aspects of these flights can affect people and/or wildlife. Additionally, the wind associated with arrivals and departures, noise of idling on the ground and the associated emissions that will be associated with the vehicles, particularly at urban vertiports should also be evaluated and disclosed.

Regarding noise impacts, departures and arrivals and the time immediately before landing and immediately after take-off are the most impactful. We recommend that the FAA noise metrics measure from the time of take-off until the aircraft has exited the TRACON boundaries. With landings, noise metrics should also account for any impact from 10,000 feet in altitude to final landing. In this way, impacts to communities on the localizer and glide slope beacons will be included in the analysis.

- b. **What interests or concerns do communities in the vicinity of airports have? How can these concerns be addressed using noise metrics? What noise metrics would address these concerns? Please explain your reasoning.**

Comment: Communities in the vicinity of airports have the same concerns as any community; that they live free from unnecessary and excessive health hazards. The MCAC member communities near Logan International Airport (and airports across the country) experience all the aviation noise from departures and arrivals, as well as the noise generated by ground service equipment and generators operated on the airport's property. They are particularly impacted by nighttime take-offs and arrivals, which disrupt sleep patterns and lead to adverse health effects such as hypertension and stress hormone release.¹⁶ We believe that night-time operations should be analyzed separately from daytime operations given their disparate health effects. FAA's noise metrics for decision-making should seek to mitigate the impacts of noise on both "near-in" communities and overflight communities for the purpose of reducing the risk of adverse health effects related to aviation. Solely relying on DNL as a policy metric does not achieve this goal. Instead, a combination of metrics including T-above and N-above, among others, should be analyzed to accurately reflect the burdens placed on near-in communities and to reduce the negative health impacts associated with these burdens through their use in policy and decision-making. The FAA should evaluate and propose noise metrics to give the public a full understanding of their own noise profile and to support regulations that protect the health of all communities on the ground. For example, A-weighting defeats approximately 30% of low-frequency sound energy and is therefore an inadequate measure of the impact of jet noise on near-in communities. C-weighting would be a better metric for these communities as commercial aircraft noise

¹⁶ [Acute effects of night-time noise exposure on blood pressure in populations living near airports | European Heart Journal | Oxford Academic \(oup.com\)](#)
[\(99+\) Effect of nighttime aircraft noise exposure on endothelial function and stress hormone release in healthy adults | Murat Sariyar - Academia.edu](#)

cannot be fairly assessed using A-weighting. Both measures should be made, understood, and communicated by the FAA to the public.

Additionally, around Logan International Airport, and, we suspect, around many of the airports across the country, the populations that live closest to the airport are classified as Environmental Justice communities. This places an increased burden on the FAA to analyze the impact of any rule change that may result from this policy review. In fact, such an analysis should have already been done in accordance with the 2012 Department of Transportation's Environmental Justice Strategy.¹⁷ We recommend that such an analysis be done and that the result of any noise policy change not involve simply reshuffling which communities experience unhealthy levels of noise.

MCAC communities in the vicinity of airports are very concerned about the constant expansion of flights and facilities at Logan and Hanscom airports and the effects of this on their quality of life, air quality, and health.

c. What interests or concerns do overflight communities have? How can these concerns be addressed using noise metrics? What noise metrics would address these concerns? Please explain your reasoning.

Comment: Overflight communities share an interest in protecting their residents' health from unnecessary and excessive health hazards. In addition to the annoyance and health problems experienced by these overflight communities, their neighborhoods have been sacrificed, without their consent, by unjust noise from concentrated flight paths and persistent noise. They are concerned that the current metric and noise levels that are "compatible with airport operations" do not adequately reflect their lived experiences. In fact, these are the people who are most failed by a reliance on the current 65 DNL metric and threshold. None of the residents of these communities are within the 65 DNL noise contour, yet many are being awakened during the night by aviation noise and being unable to enjoy the use of their property outdoors during the day because of frequent, noisy overflights.¹⁸ As a result of the Next Gen concentration of flight paths above their homes, the residents of overflight communities can experience upwards of 400 flights above their properties per day. These are the people for whom a different metric or combination of metrics would make the most difference. Any such system would have to account for the number of events per day that they experience, as well as the maximum noise levels to which they are subjected. Potential metrics that could help to address the health impacts experienced in these communities by virtue of the extreme number of overflights per day to which they are subjected include N-above, T-above, and Sound Exposure Level (SEL) of individual noise events. The frequency and persistence of intermittent aviation noise is the greatest contributor to community annoyance. We recommend using NAbove Ambient (day/night) +10 with a threshold of 50 noise events per 24 hours. If ambient noise cannot be estimated, use NAbove 55/40 (day/night from measurement Lmax dBA) with a threshold of 50 noise events per 24 hours.

In addition to the annoyance experienced by these overflight communities, they are also subject to the adverse health effects of persistent and intermittent noise.

Overflight communities are especially concerned about the damage to their health and quality of life from the FAA's implementation of NextGen and from the unjust noise

¹⁷ [Environmental Justice Strategy | US Department of Transportation](#)

¹⁸ See letter attached as Appendix 1 – Letter from Medford, MA resident

exposure forced on some of their residents from concentrated flight paths over their homes and schools, decisions that were made without their consent.

- d. **What interests or concerns do communities in the vicinity of commercial space transportation operations have? How can these concerns be addressed using noise metrics? What noise metrics would address these concerns? Please explain your reasoning.**

Comment: Not currently applicable to MCAC communities.

- e. **What interests or concerns do communities in the vicinity of UAS (drone) package delivery or other newly emerging technology operations have? How can these concerns be addressed using noise metrics? What noise metrics would address these concerns? Please explain your reasoning.**

Comment: The timing and frequency of use will be of concern to communities in the vicinity of UAS package delivery facilities not only because of the wind, noise, and emissions that will be generated by the newly emerging technologies but by the surface vehicles that will be arriving and departing the facilities with passengers and goods. Enforcement of flight paths and any other regulations will also be important, particularly given the total lack of existing enforcement of helicopter flight paths and regulations. Additionally, it seems likely that these operations will be sited in the vicinity of airports and/or in densely populated urban areas and thus have a disproportionate impact on environmental justice communities. Therefore, in addition to measuring and analyzing the noise impacts of these operations, the FAA should analyze the impact of any rule/threshold change to result from this analysis on these communities.

3. **DNL.**

What views or comments do you have about the FAA's core decision-making metric, DNL? How would these views regarding DNL be resolved if the FAA employed another noise metric (either in addition to, or to replace DNL) or if the FAA calculated DNL differently? Please explain your reasoning.

Comment: DNL is a statistically invalid metric for assessing aviation noise annoyance. A measurement system is **valid** if it measures what it claims to measure (e.g., "significant noise"), and the **results closely correspond to real-world values** (e.g., "survey reactions of people to noise"). In statistics [a measurement system](#) is *valid* if it is both *accurate* and *precise*, i.e., unbiased with small estimation error. The NES shows that DNL does not correspond well to survey reactions of people to aviation noise. DNL estimates are imprecise. According to Vincent Mestre, February 26, 2021 (ANE Symposium) the AEDT software with good data, produces DNL estimates with the margin of errors about ± 1.5 dB @ 65 DNL, ± 3 dB @ 60 DNL, ± 5 dB around 55 DNL, and ± 10 dB at ≤ 50 DNL. Therefore, the estimates cannot be used to determine significant or reportable increases in noise as FAA's 1050.1F requires.

Also, the metric does not capture the variation in noise, which is what people react to. It does not report the frequency of events nor the change from ambient levels.

As noted in the introduction to this response, the use of DNL as the primary decision-making metric has been flawed from the beginning. When the FAA initially sought to establish a standard, the Environmental Protection Agency's (now non-existent) Office of Noise Abatement and Control was part of the Federal working group convened to advise the FAA. Despite the calculation from that office that the safe noise level to prevent outdoor activity and annoyance was $L_{dn} < 55$ dB and to prevent indoor activity interference and annoyance in residential areas

was only $L_{dn} = <45$ dB, the FAA set the level at 65 DNL.¹⁹ If the FAA insists on continuing to use only DNL as their decision-making metric, the level which is set for residential incompatibility must be lowered to 45 DNL or thereabouts. This would be consistent with the research on health effects of aviation noise²⁰ and the FAA's Neighborhood Environmental Survey²¹ as noted above. Further, even though the FAA applies a nighttime "penalty" of 10 dB for flights occurring between the hours of 10:00 p.m. and 7:00 a.m., this is not sufficient compensation for the effects of nighttime noise on peoples' health. Residents of overflight communities are often awakened multiple times during the night and struggle to get even seven hours of sleep per night when exposed to airplane noise at levels as low as 45 dB.²²

The primary flaw with using DNL as the core decision-making metric is its inability to accurately portray the lived experience of overflight communities. DNL is an average, which ignores the impacts of intermittent and repetitive noise that put people in a state of chronic stress. In order to address this issue, the FAA must involve health experts in choosing appropriate metrics and setting regulatory thresholds. The metrics that are ultimately chosen must support predictions of health and impacts on the biological communities (non-human) which are also impacted by aviation noise. As noted above, living in an area that is within the 45, 50, or 55 DNL noise contours, especially if the area includes loud nighttime operations, exposes the on-the-ground population to chronic stress and limits residents' amount of health-restoring sleep, increases their susceptibility to serious disease, and results in very high levels of annoyance.²³ As evidenced by the results of the NES, there are far more people exposed to, and negatively impacted by, noise levels between 45 and 65 DNL than there are above 65 DNL. These people are experiencing negative health effects and it should be within the scope of this noise policy review to get them some relief. We incorporate by reference all the recommendations from the American Public Health Association regarding the health effects of noise as well as the proposed solutions.²⁴

In order to understand the impact of aviation noise on these communities, data on factors such as noise pattern and duration, frequency band distribution, frequency of exposure, and time of exposure that bear on human response are needed. Furthermore, reliance on A-weighted decibels to reflect the impacts of sound involving strong low-frequency components (e.g., aircraft, outdoor power equipment) is widely criticized as inadequate, because A-weighting underrepresents those components and their potential harms. The importance of meaningful metrics is well understood by the European Commission, which convened a working group to study and recommend indicators to describe noise from all outdoor sources for the purposes of assessment, mapping, planning, control, and implementation. Metrics other than A-weighted decibels that account for characteristics such as frequency, tonality, and intermittency would allow decision makers to more accurately assess the harmful effects that noise may have on communities.

By relying solely on DNL as a decision-making metric, the FAA continues to operate in contradiction to its mission. The FAA is charged with providing "the **safest**, most efficient

¹⁹ EPA. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (1974). <https://www.nonoise.org/library/levels74/levels74.htm>.

²⁰ The Executive Summary of the "Environmental Noise Guidelines for the European Region" can be found here: [WHO-EURO-2018-3287-43046-60243-eng.pdf](https://www.faa.gov/regulations_policies/policy_guidance/noise/survey)

²¹ https://www.faa.gov/regulations_policies/policy_guidance/noise/survey

²² <https://ehp.niehs.nih.gov/doi/10.1289/EHP10959>

²³ [Noise as a Public Health Hazard \(apha.org\)](https://www.apha.org)

²⁴ Id.

aerospace system in the world.” This mission MUST include protecting the safety of those living near airports or under aircraft flight paths from dangerous aviation noise exposure. Currently, this is only partially recognized in the statement that “[t]he FAA is charged with controlling aircraft noise by regulating source emissions, and managing the air traffic control system and navigable airspace in ways that minimize, **where appropriate**, noise impacts on the ground consistent with the highest standards of safety.”²⁵ The MCAC believes that minimizing the noise impacts on the ground is **always appropriate**, and encourages the FAA to adopt this posture as well. If the FAA does not agree that it is always appropriate to minimize noise impacts on the ground, the MCAC requests that the FAA clearly and specifically define when it is inappropriate.

4. *Averaging.*

DNL provides a cumulative description of the noise events expected to occur over the course of an entire year averaged into a representative day, described as an Average Annual Day (AAD).

- a. **Do you believe an AAD is an appropriate way to describe noise impacts? Please explain why or why not.**

Comment: No, AAD fails to adequately represent the lived experience of overflight communities, as discussed above. Instead, it flattens the variations in impact and duration of noise events to a “representative day.” There are metrics that would reflect their experience, like N-above or T-above, which would do a better job of expressing the impact of aviation noise on their daily lives, including being subject to intermittent and repetitive noise. The FAA must justify to the public in an understandable format each how these will protect human health.

- b. **If not, what alternative averaging schemes to AAD should be considered and why? What information would the use of an alternative averaging scheme capture that AAD does not?**

Comment: We do not believe that averaging is in any way appropriate for measuring the impact of noise on the general public.

5. *Decision-making Noise Metrics.*

The FAA currently uses DNL as its primary decision-making metric for actions subject to NEPA and airport noise compatibility planning studies prepared pursuant to 14 CFR part 150.

- a. **Should different noise metrics be used in different circumstances for decision-making?**

Comment: Yes. Different decision-making metrics and thresholds are needed for NEPA and land-use decisions as well as for communities in the vicinity of airports and overflight communities. Also, given the lower noise levels of AAM and general aviation, and the less frequent but very noisy helicopter noise events, the FAA cannot expect a single decision-making metric to work for all aircraft type. The FAA knows this and even made this statement to Congress “As will be discussed in this report, **no single metric can cover all situations** due to the dynamic acoustical and operational characteristics of aviation noise.” (page 3 of 4/14/20 [Report to Congress FAA Reauthorization Act of 2018 \(Pub. L. 115-254\) Section 188 and Sec 173](#)). DNL can continue to inform FAA’s decision making, but it should not be the sole metric upon which the FAA relies in making determinations. Other metrics and thresholds should be developed and used to inform the FAA’s decision making.

²⁵ Federal Register/Vol. 88, No. 83/Monday, May 1, 2023/Notices, p.26642

More information would also be useful for air traffic controllers which could reduce noise impacts on overflight communities. Air traffic controllers could be given population density information which could help them to vector aircraft differently to avoid overburdening densely populated areas.

- b. If the answer to Question 5.a. is “yes,” please identify: the metric, the information it provides that DNL does not, and explain when and how it should be employed by the FAA in its system (e.g., should the FAA use a noise metric other than DNL to evaluate noise exposure in quiet settings, such as national parks, national wildlife and waterfowl refuges, etc.)? Should this metric be used when the FAA is making decisions that affect noise in these settings? Should this metric be used alone or in combination with another metric?**

Comment: As noted above, DNL has been a flawed metric from the start. It is imperative that the metric or metrics chosen accurately represent the lived experience of people who are impacted by persistent and repetitive aviation noise. There are several metrics that could be analyzed that would give a more accurate representation of noise impacts (L_{max} , T-above, and N-above could all contribute to this understanding of noise impacts). Additionally, the FAA should tie these metrics to DNL to serve as proxies for health effects. The goal of any system of noise measurement and regulation is to minimize (or eliminate) the deleterious health effects that noise has on people. There is ample evidence in the research to suggest that exposure to aviation noise impacts that autonomic system, annoyance, and sleep disturbance. Noise exposure, particularly at night, has negative impacts on cardiovascular health, especially hypertension, as well as metabolic disturbances and exacerbation of anxiety and depression.

We note that this information was largely provided by the Government Accountability Office in their September 2021 report “Aircraft Noise: FAA Could Improve Outreach through Enhanced Noise Metrics, Communication, and Support to Communities, GAO-21-103933.” The recommendations that emerged from that report remain relevant today:

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. (Recommendation 1) Note: we believe that the GAO’s use of the term “supplemental noise metrics” is used differently here than the FAA’s meaning. The GAO is using it to mean decision-making metrics. In its second Recommendation, where it writes about “communication tools” it is referring to what the FAA calls supplemental metrics.

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. (Recommendation 2)

The Administrator of the Federal Aviation Administration should, related to post-implementation outreach, provide

clearer information to airports and communities on what communities can expect from FAA, including the technical assistance FAA can provide. (Recommendation 3)

- c. If the metric should be used in combination with another metric, please describe how they should be used together for decision-making.**

Comment: See above.

- d. If the answer to Question 5.a is “no,” should DNL remain the core decision-making metric or should another metric be substituted in all circumstances?**

Comment: See above.

- e. How would the use of the metrics that you recommend support better agency decision-making? Please explain and illustrate with specific examples how the use of the recommended metric(s) would benefit agency decision-making.**

Comment: See above.

6. Communication.

- a. Please identify whether and how the FAA can improve communication regarding changes in noise exposure (e.g., what information FAA communicates, where and with whom FAA communicates, what information methods FAA uses to communicate and the venues at which FAA shares this information). Please explain your reasoning.**

Comment: Communication is key to keeping the public informed and engaged. There must be frequent updates from the FAA on the development of new metrics and impacts of noise on the public. The FAA can make use of the many regional groups that exist throughout the country to share information. People have a right to know the type of environment that they live in as well as what negative health impacts result from the noise to which they are subject. Additionally, the Community Engagement Officers at the FAA should be able to provide consistent communication with regional groups through periodic updates and consistent attendance at meetings.

Because the results of this noise policy review are so important, we would also recommend that the FAA report back on the responses, once tabulated, to each question in table format. Additionally, as noted above, the Government Accountability Office had several recommendations, including how the FAA can improve communication with communities, that the MCAC supports.

Perhaps more importantly, the FAA should involve the public in their decision-making earlier in the process and at every point along the way. An Impacted Communities National Advisory Committee to advise the FAA on current and future noise pollution issues, among others. In the GAO report referenced earlier, it was stated that the FAA “collaborates with airports and airlines in mitigating aviation noise, designing PBN procedures, and implementing PBN.” It is essential that impacted communities have a voice in this process. Again, Congressman Lynch’s Impacted Communities Advisory Committee, H.R. 2565, mandates a national committee to provide a community voice on these issues.

Finally, the FAA needs to consider how it will enforce whatever changes to its noise policy are adopted through this process. Enforcement is a powerful form of communication that indicates a seriousness of purpose and has the potential to change behavior and force technological changes that could benefit communities. We recommend that any noise policy include a robust and clear enforcement mechanism to achieve these goals.

- b. **Should the FAA consider revisions to its policy on the use of supplemental noise metrics in the FAA’s NEPA procedures? Please explain how this policy should be modified to improve FAA communication of noise changes when the FAA is making decisions that affect noise. Please explain your reasoning.**

Comment: More information in the form of supplemental noise metrics should be given to the public in order to help facilitate their understanding of their own noise profiles.

- c. **What information about the change in noise resulting from civil aviation operations (e.g., UAS or drones, helicopters, fixed wing aircraft, rockets/ commercial space transportation vehicles, and new entrant technologies) should the noise metric communicate to the public? Please explain your reasoning.**

Comment: The public should be kept informed of new studies, information regarding these new technologies. The FAA should sponsor research into the impacts of these new technologies on noise pollution and exposure and share with the public in the same way mentioned above. Some emerging research already indicates that negative health impacts will flow from the expected increased usage (especially in urban environments) of drones and other UAV’s. The public must be kept apprised of the most recent research on these topics.

- d. **Please explain how the public will benefit if the FAA implements your proposal in response to Questions 6.a and 6.b.**

Comment: Transparency and dialog are key to good communication.

7. *NEPA and Land Use Noise Thresholds Established Using DNL or for Another Cumulative Noise Metric.*

The FAA has several noise thresholds that are informed by a dose-response curve (Schultz Curve), which historically provided a useful method for representing the community response to aircraft noise. Two of the noise thresholds informed by the Schultz Curve are the FAA’s significant noise impact threshold for actions being reviewed under the National Environmental Policy Act and the land use compatibility standards established in 14 CFR part 150, Appendix A. Both of these rely on the cumulative noise metric DNL and are referred to collectively in this question and questions 8–10 as “the FAA noise thresholds.” On January 11, 2021, the FAA published the results of the Neighborhood Environmental Survey, a nationally representative dataset on community annoyance in response to aircraft noise. The Neighborhood Environmental Survey results show higher percentage of people who self-identify as “highly annoyed” by aircraft noise across all DNL levels studied in comparison to the Schultz Curve.

- a. **How should the FAA consider this information (i.e., the Schultz Curve and Neighborhood Environmental Survey findings) when deciding whether to retain or modify the FAA noise thresholds established using the DNL metric or to establish new FAA noise thresholds using other cumulative noise metrics? Please explain your reasoning.**

Comment: The results from the Neighborhood Environmental Survey show that a much higher percentage of the population is highly annoyed and subject to negative health effects at every decibel level, including those below 65 DNL. These results must make the FAA lower its “noise thresholds” to closer to 45 DNL, as supported by the NES results, research on the negative health effects of aviation noise, and the World Health Organization’s Systematic review referenced earlier. Additionally, such a noise threshold would be more consistent with the American Public Health Association’s work on the health effects of aviation (and other transportation) noise (see footnote 8 above). It has

been unclear from the very beginning how the Schultz curve was used to establish 65 DNL as the FAA's "noise threshold." This was the level at which 12.3% of the population identified as "highly annoyed" by aviation noise. We are not clear as to why 12.3% was the acceptable level at which to set this threshold. In order to more fully understand why this level was chosen, the FAA should explain to the public the significance of this level of annoyance.

However, as noted above, if the "acceptable" level of annoyance is 12.3% of the population, then the Neighborhood Environmental Survey results would dictate a noise threshold of approximately 45 DNL. Subjective comments and complaints from the public who experience DNL 45 (and lower) aviation noise levels are consistent with the finding. If the FAA continues to rely on DNL as the sole decision-making metric, the noise threshold should be set at 45 DNL. This level has the advantage of being supported by years of health research on the impacts of noise as well as the determination of the World Health Organization Europe's Systematic Review 2018.²⁶

As noted above, however, we urge the FAA to incorporate other metrics to represent and understand the impact of aviation noise on our member communities and others across the country more accurately. DNL cannot continue to be the sole metric used by the FAA. For locations adjacent to commercial airports, a lower DNL level than 65 DNL would be appropriate. We recommend 45 DNL for the reasons stated above. For overflight communities, N-above should be used in addition to DNL to understand aviation impacts.

- b. Should the FAA consider other or additional information when deciding whether to retain or modify the FAA noise thresholds that were established using the DNL metric or to establish new FAA noise thresholds using other cumulative noise metrics? Please describe the reason for the recommendation and identify the data, information, or evidence that supports the recommendation.**

Comment: As discussed above, there are several additional metrics that should be considered in establishing new noise thresholds that are rooted in science and research. Avoiding the negative health impacts of aviation (which include noise) on the public is paramount to the FAA's mission (or should be).

- c. How should research findings on auditory or non-auditory effects (e.g., speech interference, sleep disturbance, cardiovascular health effects) of noise exposure caused by civil aircraft and vehicles be considered by the FAA when it decides whether to retain or modify the FAA noise thresholds that were established using the DNL metric? How should the FAA consider this same research when deciding whether to establish new FAA noise thresholds using other cumulative noise metrics? Please explain your response.**

Comment: There is voluminous research indicating that health effects occur as a result of transportation noise at levels much lower than the FAA's current noise threshold of 65 DNL. Much of this research is appended to this comment letter as Appendix 2.

Epidemiological studies generally report statistically significant associations between aircraft noise and adverse cardiovascular outcomes. Sleep disturbance, associated with nighttime noise, has been shown to be a risk factor for cardiovascular disease given

²⁶ The Executive Summary of the "Environmental Noise Guidelines for the European Region" can be found here: [WHO-EURO-2018-3287-43046-60243-eng.pdf](https://www.who.int/publications/item/WHO-EURO-2018-3287-43046-60243-eng.pdf)

associations with inflammatory markers and metabolic changes.²⁷ Aircraft noise has been shown to impair reading comprehension in children ages 9-10.²⁸ Chronic aircraft noise exposure in children is associated with impairment of reading and long-term memory.²⁹ There is a statistically significant association between exposure to aircraft noise and risk of hospitalization for cardiovascular diseases among older people living near airports.³⁰ The FAA must examine all of this research to determine at what threshold the adverse health impacts of noise will be mitigated. Any new metric(s) that emerge from this noise policy review must mitigate the negative health impacts of aviation noise. Annoyance, as noted earlier, is simply a proxy for negative health impacts. The goal of this noise policy review must be to avoid negative health outcomes as well as to reduce annoyance.

This question also points to the FAA's need to use a National Academies Division of Medicine consensus committee to guide its noise policy making. Public comments will not and should not be the solution for this question. The public and the FAA do not have the required expertise to effectively assess aviation noise and pollution on auditory and non-auditory impacts. If the FAA plans to implement policy to protect the public without a medical/health independent expert consensus report to guide it, the new noise policy will fail to protect the health of the public.

- d. **In examining whether to change its metrics and thresholds for noise, the FAA needs reliable information to support any changes. One type of information that the FAA can rely on is epidemiological evidence. This means the study (scientific, systematic, and data-driven) of the distribution (frequency, pattern) and determinants (causes, risk factors) of health-related states and events (not just diseases) in specified populations (neighborhood, school, city, state, country, global). What amount of epidemiological evidence is sufficient to provide the FAA with a sound basis for establishing or modifying the FAA noise thresholds either using the DNL metric or another cumulative noise metric? Please explain your response.**

Comment: We recommend that the FAA consult with experts in the areas of using health data in policy-making decisions. This is an area in which having the ability to consult with public health, medical, epidemiological, and statistical experts would be beneficial to the FAA in moving forward with this potential policy change. As we have noted previously, the FAA staff is currently not equipped to make these determinations unilaterally. They must rely on experts from other federal agencies as well as consultants in the above-mentioned fields.

We do note, however, that there are several potential principles upon which these decisions can be made. The first is the Precautionary Principle, which would require that airlines or airports prove that the level of noise that they create is safe instead of placing the burden on the public to prove that it is not. This should be a guiding principle in how the FAA moves forward.

²⁷ [Aviation Noise and Cardiovascular Health in the United States: a Review of the Evidence and Recommendations for Research Direction - PubMed \(nih.gov\)](#)

²⁸ [Exposure-effect relations between aircraft and road traffic noise exposure at school and reading comprehension: the RANCH project - PubMed \(nih.gov\)](#)

²⁹ [Night time aircraft noise exposure and children's cognitive performance - PubMed \(nih.gov\)](#)

³⁰ [Residential exposure to aircraft noise and hospital admissions for cardiovascular diseases: multi-airport retrospective study | The BMJ](#)

Additionally, there is the Bradford Hill criteria whose application would allow an independent expert committee, e.g., from the National Academies Division of Medicine, to determine the sufficiency of the existing epidemiologic evidence to support a policy change.³¹

- e. **Should the FAA consider using factors other than annoyance to establish FAA noise thresholds using the DNL metric or other cumulative noise metrics? What revisions to existing FAA noise thresholds or new noise thresholds do you recommend be established and why? Please explain your response.**

Comment: See above. Annoyance is a proxy for health impacts, including all of those listed in the American Public Health Association's statement on the health effects of noise referenced above. It (annoyance) trivializes the experience of communities underneath concentrated flight paths which are subject to intermittent and persistent noise throughout the day and night.

Instead of relying on a measure of annoyance, we recommend starting from the adverse health effects of noise and creating a policy that mitigates these impacts.

8. *FAA Noise Thresholds Using Single-Event or Operational Metrics.*

As the FAA learned from the results of the NES, people are bothered by individual aircraft noise events, but their sense of annoyance increases with the number of those noise events. Should the FAA consider employing new FAA noise thresholds using single-event or operational metrics? If the answer is "yes," which metrics should be used to establish the FAA noise thresholds? What should be the relevant noise exposure level for the new noise thresholds you propose? Please explain your reasoning. If the answer is "no," please explain your reasoning.

Comment: See above.

9. *FAA Noise Thresholds for Low-Frequency Events.*

Should FAA establish noise thresholds for low-frequency events, such as those associated with the launch and reentry of commercial space transportation vehicles authorized by the FAA Office of Commercial Space Transportation? If the answer is "yes," which metrics should be used to establish the noise thresholds? What should be the relevant noise exposure level for the new noise thresholds you propose? Please explain your reasoning. If the answer is "no," please explain your reasoning.

Comment: See above.

10. *Miscellaneous.*

What other issues or topics should the FAA consider in this review regarding noise metrics, the method of calculating them, the establishment of noise thresholds, or FAA's method of communicating the change in noise exposure? Please explain your response.

Comment: In addition to the recommendations from the GAO which we referenced previously, we urge the FAA to consider how it will enforce any system of noise metrics that it ultimately adopts as a result of this process. Specifically, the FAA must consider the use of noise-based landing fees to address nighttime noise, enforce the nighttime "curfew" for flights between 10:00 p.m. and 7:00 a.m., determine appropriate enforcement measures when noise thresholds

³¹ [Applying the Bradford Hill criteria in the 21st century: how data integration has changed causal inference in molecular epidemiology - PMC \(nih.gov\)](#)

are exceeded, and provide more funding for noise abatement/mitigation at airports throughout the country.

11. Literature Review.

In this review, the FAA will examine the body of scientific and economic literature to understand how aviation noise correlates with annoyance as well as environmental, economic, and health impacts. The FAA also will evaluate whether any of these impacts are statistically significant and the metrics that may be best suited to disclose these impacts. A bibliography of this body of research is available for review in the Background Materials tab in the Docket and as Appendix 1 to the FAA framing paper entitled, *The Foundational Elements of the Federal Aviation Administration Civil Aircraft Noise Policy: The Noise Measurement System, its Component Noise Metrics, and Noise Thresholds*. This framing paper is available at: <https://www.faa.gov/noisepolicyreview/NPR-framing>. Please identify any studies or data regarding civil aviation noise not already identified by the FAA in the bibliography that you believe the FAA should evaluate. Please explain the relevance and significance of the study or evidence and how it should inform FAA decisions regarding the policy.

Comment: See Appendix 2.