

Questions from Massport CAC Members to FAA Regarding the DNL Alternative Metric Report Presentation on June 11, 2020

- Questions provided to FAA on August 14, 2020
- FAA responses provided to MCAC on October 30, 2020

Arlington

1. The recent FAA noise metric report states "It is important to draw a distinction between a particular noise metric and any accompanying noise threshold values (in decibels) used to inform project or policy determinations. Determinations of threshold values depend on multiple technical and policy considerations that, while related to the choice of noise metric, require separate consideration."

It is highly inappropriate to develop metrics intended to define only thresholds, where dose-response relationships are required to assess impacts.

Why are the words "threshold values" used in this statement?

FAA Response: The determination of appropriate metrics (e.g. DNL) and thresholds (e.g. 65dB) are independent considerations. Different noise metrics may be better suited to provide information relative to specific situations, while thresholds are often used to inform decision making using a given metric. For example DNL has been shown to simultaneously consider noise intensity, duration, frequency, and time of occurrence; but in order to inform a determination under NEPA on significance with respect to noise exposure the DNL 65dB threshold level is used.

2. The CAC received a briefing on the Sec. 189 health/economic impacts on Jan 1, 2020. This briefing raises several issues relevant to the report on Sections 173 and 188.

Is it correct that the Sec 189 report is two years late?

FAA Response: Under Section 189 of the FAA Reauthorization Act of 2018 it states that (emphasis added):

Not later than 180 days after the date of enactment of this Act, the Administrator of the Federal Aviation Administration ***shall enter into an agreement*** with an eligible institution 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. This action was completed on June 14, 2019 when the Secretary of Transportation approved a grant to fund research on this topic at the Boston University School of Public Health and the Massachusetts Institute of Technology through ASCENT – Aviation Sustainability Center – Project 3.

How will the metrics report (Secs 173/188) affect this Sec 189 report? Is the study constrained to use only DNL (a)?

FAA Response: This question is beyond the scope of our Sec 188 briefing.

How is Massport participating in this study, and how has the FAA engaged with affected communities in the context of this study?

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FAA Response: This question is beyond the scope of our Sec 188 briefing.

Will the initial results, due in Aug 2020, be shared with CAC and the public? We are very eager to see how the methodology accounts for the dose (i.e. DNL) -response sensitivity found in many other studies.

FAA Response: This question is beyond the scope of our Sec 188 briefing.

3. DNL metrics require extraordinary increases in daily high-noise overflights to move from 62 or 63 to the DNL 65 dBA threshold, as noted by others --2 or 3 times as many overflights/day as suffered in these locations recently. **This fact alone should make it clear that the FAA's favored metric, DNL, is simply unable to capture the increase in noise pollution effects caused by the flightpath concentration of RNAV, and the increase in capacity and flight frequency caused by flight growth and Wake-RECAT.** No mention is made of DNL's insensitivity to enormous increases in overflights/day on neighborhoods -- which by common sense alone should indicate a serious problem with the metric, regardless of how it is used elsewhere.

FAA Response: The definition of DNL 65dB as the level of significant noise exposure has been validated as an appropriate threshold to inform environmental determinations for land use planning and for the consistent and equitable assessment of federal actions under the National Environmental Policy Act (see FICON 1992 and FICAN 2018, downloadable from www.fican.org). The FAA recognizes that noise levels below this threshold may still be of concern to community members and is supporting research to understand the impacts of aviation noise at all noise levels and is participating in outreach to better understand and address community concerns.

4. As noted by others: no mention is made of the MIT study's proposed new metrics, which do a much better job of capturing the negative impact of flightpath concentration, such as Nabove 60dB day/50 dB night. Because of the MIT methods' ability to identify actual noise impacts, as experienced by people living in the neighborhoods beneath overflights, it should be a superior metric for addressing noise impact. Why is it ignored? Why is the ability of it to accurately reflect massive increases in noise complaints over the past few years ignored?

FAA Response: See response under question 5.

5. There is no recognition in this report that noise complaints by number, and by independent complaint-filers, have increased by **roughly a factor of 10** in locations around the country where RNAV flightpath concentration has occurred. The DNL metric effectively hides this. The MIT study metrics do not, and would have predicted these painful impacts.

FAA Response to Questions 4 and 5: The MIT study utilizes a refinement of the Number-Above noise metric described in Section 4.3 of the 188 Report. While information on complaints can be a useful indicator to inform research initiatives such as that being

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conducted by MIT as well as a guide to specific areas of community concern they are not a direct indicator for noise exposure and therefore not suitable for informing environmental determinations.

6. Multiple paragraphs discuss concern over the administrative and cost burden of using a metric other than DNL. But these paragraphs ignore the reason that the conversation occurred in the first place Citizens' complaints over the dramatic increase in aircraft noise, caused by this behavior, are what have prompted the request. **The point of discussing new metrics is to identify those that fairly reflect the harm caused to neighborhoods** as a consequence of the FAA's concentration of flightpaths, and lowering of altitudes. DNL fails as a good metric here, as its use has permitted the changes that have caused the harm. DNL does not reflect, and could not predict, the massive increase in complaints brought about by RNAV and other changes.

FAA Response: The definition of DNL 65dB as the level of significant noise exposure has been validated as an appropriate threshold to inform environmental determinations for land use planning and for the consistent and equitable assessment of federal actions under the National Environmental Policy Act (see FICON 1992 and FICAN 2018, downloadable from www.fican.org). Additionally, an evaluation of the level of change in noise resulting from a proposed FAA Federal action under the National Environmental Policy Act, must consider a range of factors including but limited to any increases in operations associated to the action. Use of a 1.5dB increase resulting in a DNL 65dB or greater noise exposure as the definition of a significant impact provides an effective and consistent way to assess proposed actions nationally, across all types of proposed actions. The FAA recognizes that noise levels below the DNL 65 dB threshold, and that different types of changes in aircraft operations, may still be of concern to community members and is committed to participating in both research and outreach to better understand and address these concerns.

7. No mention is made of the financial value provided by FAA's implementation of RNAV and Wake-RECAT to the airline industry and to airport operators (fuel savings, increases in use fees, and the financial benefits airlines derive from concentrating operations at specific airports away from regional airports). This information is important and relevant in arguments about noise metrics: citizens can reasonably fear that the FAA may have acted largely to benefit these groups, and that it wishes to retain a noise metric that allows them to ignore the noise pollution impacts of these changes.

FAA Response: This question is beyond the scope of our Sec 188 briefing.

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Brookline

1. It would take 80 aviation noise events per day, every day, with SEL 90 dBA each to move a DNL of 63.5 to 65, thus making it a significant noise increase according to the FAA. Parts of East Boston, Chelsea and Winthrop have DNLs around 63.5. Residents in these areas suffer greatly from aviation noise and pollution. Please explain how the DNL metric is sensitive to residents' current exposure if it takes 80 additional aviation events per day, every day, before the FAA considers it a significant impact. Doesn't this example show that DNL is not a valid metric for assessing aviation noise burden? If not, why not?

FAA Response: The definition of DNL 65dB as the level of significant noise exposure has been validated as an appropriate threshold to inform environmental determinations for land use planning and for the consistent and equitable assessment of federal actions under the National Environmental Policy Act (see FICON 1992 and FICAN 2018, downloadable from www.fican.org). Additionally, an evaluation of the level of change in noise resulting from a proposed FAA Federal action under the National Environmental Policy Act, must consider a range of factors including but limited to any increases in operations associated to the action. Use of a 1.5dB increase resulting in a DNL 65dB or greater noise exposure as the definition of a significant impact provides an effective and consistent way to assess proposed actions nationally, across all types of proposed actions. The FAA recognizes that noise levels below the DNL 65 dB threshold, and that different types of changes in aircraft operations, may still be of concern to community members and is committed to participating in both research and outreach to better understand and address these concerns.

2. Has there been a finding of significant noise impact for any Environmental Assessment (that uses DNL) in the last 10 years? If yes, for what procedure(s) and airport(s)?

FAA Response: The FAA seeks to incorporate consideration of environmental impacts into its planning for proposed actions. As part of the NEPA process, the FAA will consider whether a proposed action can be modified or mitigated to avoid significant impacts; these modifications or mitigation measures can then support a Finding of No Significant Impact for an Environmental Assessment. If significant noise impacts are projected to occur and cannot be avoided or mitigated below the level of significance, a project must be assessed through an Environmental Impact Statement (EIS). Through experience, FAA has developed its ability to avoid or mitigate significant impacts and thus has been able to make Findings of No Significant Impacts in an increasing percentage of its NEPA reviews. In the past 10 years, only a handful of projects have required an EIS and these were for large airport improvement related or commercial space projects. No FAA federal actions to assess airspace changes have required an EIS in this period.

3. The FAA's report on Alternative Noise Metrics makes no mention of NextGen. Please explain how DNL captures reasons for complaints made by sacrificial neighborhoods due to NextGen implementation including, but not limited to, concentrated flight paths due to Performance Based Navigation, reduced separation due to Wake ReCat with noise events often less than 2 minutes apart, and lower altitudes to increase distances between aircraft for safety reasons.

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Why is NextGen not mentioned in the FAA's alternative metrics report? Is a set of noise metrics, along with DNL, required to capture the complexity of the noise burden due to the implementation of NextGen?

FAA Response: As directed by Congress under Section 188 of the FAA Reauthorization Act of 2018, the FAA conducted a study reviewing the general applicability of alternative metrics to consider aircraft noise. While Section 188 was not specifically directed at consideration of FAA actions related to NextGen the supplemental metrics detailed in the report may have applicability to NextGen related actions where warranted.

The FAA Reauthorization Act of 2018 additionally directed the agency to conduct additional assessments related to proposed changes in flight tracks, including Sections 175: Addressing Community Noise Concerns and Section 176: Community Involvement in FAA NextGen Projects Located in Metroplexes. The FAA is examining the potential use of supplemental metrics to assist in evaluations associated with Section 175 and the report on section 176 is available to the public (see https://www.faa.gov/about/plans_reports/congress/media/Community_Involvement_in_Next_Gen_Projects_PL_115-254_Sec176.pdf).

4. In an August 2019 comment by Boom Technology Inc to Docket ID: FAA-2019-0451 on proposed rule, Special Flight Authorizations for Supersonic Aircraft, Boom correctly stated that

it would take 80 daytime Concorde-level booms per day in a single location to raise ambient DNL from 63.5 to 65. Therefore, even an action that exposed a test area to 28,835 daytime Concorde-level booms per year would fail to be significant under this standard.

FAA Response: See response under question 5.

5. The standard they are referring to is the FAA's requirement that a location have at least a 1.5 dBA increase in noise that causes the yearly DNL to rise to 65 or higher for the change to be significant Please explain how the FAA could conclude that, say, 79 daytime sonic booms/day would not be a significant impact when common sense tells us with certainty that residents exposed to 79 sonic booms/day would have significant negative impacts on their health, quality of life, and property values. Similarly for non-sonic aviation events, wouldn't the count, the metric Number-Above provide a common sense metric for how much is too much aviation noise?

FAA Response to Questions 4 and 5: Regarding the Part 91 rule on special flight authorizations for supersonic airplanes: The comment period for that proposed rule closed August 27, 2019. The FAA will respond to the comments filed in the docket before that time as part of its regular activity on the proposed rule. No comments will be addressed before the comment disposition

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is published.

Regarding the Part 36 rule on noise limits for a new category of supersonic airplanes: The proposed rule was published on April 13, 2020 and the comment period closed on July 13, 2020. The FAA will respond to the comments filed in the docket before that time as part of its regular activity on the proposed rule. No comments will be addressed before the comment disposition is published.

6. Has there been a finding of significant noise impact for any Environmental Assessment (that uses DNL) in the last 10 years? If yes, for what procedure(s) and airport(s)?

FAA Response: Repeat of question 2.

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Cambridge

1. What is the FAA's latest/recent research work regarding the equity of airport community noise impact?
2. Would the FAA consider implementing a noise equity metric based on population density and N_{above}?
3. Would the FAA consider optimizing the routing of flight path according to the population's transit throughout the day and evening (i.e. residential versus working areas)? Reference: ACRP Project 02-84 *Evaluating the Use of Spatially Precise Diurnal Population Data in Aviation Noise Studies*

FAA Response: [Theses questions are beyond the scope of our Sec 188 briefing.](#)

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Marblehead

1. According to Massport's 2017 ESPR, the noise monitor at Hull recorded a 2017 measured DNL of 59.0 dBA. It would take 4 times the 2017 number of aviation events for that location to reach a 65 DNL. Chelsea's monitor at Admiral's Hill recorded aviation events that measured a 2017 DNL of 62.3 dBA. It would require 1.9 times the aviation events picked up by that monitor in 2017 before the location reached a DNL of 65. Logan is not able to handle this high of a demand and so these locations likely will never have significant noise according to the FAA. However, residents in Hull and Chelsea are highly affected by their current exposure to aviation events. How do you reconcile these 2 truths?

FAA Response: The definition of DNL 65dB as the level of significant noise exposure has been validated as an appropriate threshold to inform environmental determinations for land use planning and for the consistent and equitable assessment of federal actions under the National Environmental Policy Act (see FICON 1992 and FICAN 2018, downloadable from www.fican.org). The FAA recognizes that noise levels below this threshold may still be of concern to community members and is supporting research to understand the impacts of aviation noise at all noise levels and to participating in outreach to better understand and address community concerns.

2. Regulations require a single system for measuring noise, not a single metric. What is needed/required for the FAA to begin to use a single system for measuring noise that includes Time-Above, Number-Above, as well as DNL?

FAA Response: As discussed in the FAA Reauthorization Section 188 report to Congress, the Aviation Safety and Noise Abatement Act (ASNA) of 1979 directed the FAA to:

Establish a single system of measuring noise, for which there is a highly reliable relationship between projected noise exposure and surveyed reactions of people to noise, to be uniformly applied in measuring the noise at airports and the areas surrounding such airports.

ASNA also required FAA to establish a single system for determining the exposure of individuals to noise which results from the operations of an airport and which includes, but is not limited to, noise intensity, duration, frequency, and time of occurrence;

The obligations were met through the definition of the Day-Night Level (DNL) metric, which is an equivalent sound level noise metric with acoustic A-weighting, 24 hour averaging, and a nighttime noise penalty. While the DNL metric is FAA's primary decision-making noise metric, other supplemental metrics can be used where warranted to support further disclosure and to aid in the public understanding of community noise effects.

Changes to the noise metric and thresholds used to assess land use compatibility and noise impacts under the National Environmental Policy Act (NEPA), would require sufficient technical justification. If supported, FAA would need to revise its NEPA procedures in Order 1050.1, which involves review by the Department of Transportation, Office of Management and

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Budget, and the White House Council on Environmental Quality, and publication of the proposed changes in the Federal Register for public notice and comment. Adding an additional standard metric and threshold for NEPA review would require the same process. Changes to federal land use compatibility guidelines would require FAA to undertake a rulemaking effort.

3. What is the margin of error associated with the DNL estimates given the FAA models these values? Is the margin-of-error small enough that the FAA can accurately classify locations into 65+ DNL with reasonable certainty?

FAA Response: The Aviation Environmental Design Tool (AEDT) serves as the FAA's required noise, emissions and fuel burn modeling application for environmental assessment of all FAA Federal Actions. AEDT models the average annual day DNL noise exposure using validated aircraft specific noise and performance information to produce highly accurate and repeatable environmental outcomes. While all numerical models produce some level of error, AEDT has been designed to produce accurate results exceeding the requirements to identify noise impacts for DNL at or above 65dB. Where uncertainties in the model do exist, conservative assumptions are made to ensure that results do not under predict noise exposure. In their 2018 report, FICAN found that, "Modern aircraft noise models are able to predict noise exposure with acceptable accuracy whether above or below 65 dB DNL (under most conditions); absolute accuracy has not been quantified, but depends on the accuracy of input, internal databases, and user proficiency, rather than on the model itself." (see www.fican.org) For further information on AEDT and model validation please see the AEDT Uncertainty Quantification Reports available at: <https://aedt.faa.gov>.

To help the FAA's continued efforts to improve the accuracy of AEDT modeling at noise levels well below DNL 65 dB, the FAA is also supporting researchers at Stanford University, Georgia Tech, and Penn State to compare AEDT modeling outputs to noise monitor measurements at a wide range of noise levels (e.g., <https://ascent.aero/project/validation-of-low-exposure-noise-modeling-by-open-source-data-management-and-visualization-systems-integrated-with-aedt/>). The results of these studies will be used to direct future AEDT development efforts to ensure the tool is accurate as possible at all DNL levels.

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Medford

1. In the Boston area communities most affected by RNAV-induced concentration from runway 33L departures, we are seeing unprecedented increases in complaint levels since the introduction of the 33L RNAV SID in 2013. In towns like Medford, which are well outside the 65DNL threshold, complaint data reflect *orders-of-magnitude* changes, in both complaints and individual compliant sources (see Massport historical complaint data). This expressed level of annoyance cannot be explained only by changes in DNL - although DNL *has* also increased significantly in these areas - but is related to the dramatically increased number of noise events and the increased number of noise events during sleep time. **Why is there no research provided to illustrate the correlation between any metric discussed, against any actual complaint data, specifically recent complaint data?**

FAA Response: The report focuses on an evaluation of metrics and not the establishment of a threshold level for a given metric as a means of capturing noise complaints. A comparison between different noise metrics and complaint data only makes sense if one is considering both a metric and a level. While information on complaints can be a useful indicator to inform research initiatives such as that being conducted by MIT as well as a guide to specific areas of community concern, complaint data are not a direct indicator for noise exposure and therefore are not suitable for use as a metric to inform environmental determinations.

2. The N Above 60dB LAmax Day, 50dB LAmax night metric is currently being used in noise modeling done by the MIT RNAV Study in Boston. **If this metric is valid for use in the MIT Study, why is it not used, or even referred to in this paper?**

FAA Response: Section 4.3 of the 188 report discusses the Number-Above metric, which is being used in the MIT research study.

3. In the summary conclusion of the FAA report, FAA leans strongly on FICAN work but overlooks ASCENT's many projects in the noise metric research area. In fact, ASCENT projects do not appear to feature anywhere in FAA's report, yet ASCENT is responsible for cutting edge academic research by leading Universities, it should not be discounted. Numerous papers were produced under ASCENT project 23, one of them was ICAT-2019-07 which delved deeply into the noise metric and actual complaint data relationship in Boston. In that paper, chapter 5 rigorously explored the quality of noise metrics against actual complaint data. We reviewed the FICAN 2018 report and found that it did not assess the ASCENT work, instead the FICAN Committee Report dealt with general noise issues and explained why DNL is used. **Was ASCENT work used in formulating the FAA report which was recently delivered?**

FAA Response: Yes, the FAA used ASCENT work in formulating the FAA report. As the primary sponsor for ASCENT, the FAA follows all of the work of ASCENT closely and is using the results to inform decision-making. However, the FAA's goal in responding to Section 188

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of the FAA Reauthorization Act of 2018 was to provide a balanced discussion of the applicable metrics evaluating aircraft noise including those metrics which are under active evaluation through ASCENT research, including MIT's research at BOS.

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Milton

1. I would ask whether the FAA understood that the Reauthorization Act of 2018 required it to review and present a summary and analysis of recent research into more suitable measures than DNL, rather than merely recap FAA's view of why it prefers DNL over certain other types of measures.

FAA Response: Under Section 188 of the FAA Reauthorization Act of 2018, the FAA was directed to evaluate alternative metrics to current average day-night level standard, such as use of actual noise sampling to address community airplane noise concerns. As provided in the report to Congress, a description of the established noise metrics including examples and comparison for their use was provided. While the FAA is engaged in research to assess emerging evidence for the potential use and application of new noise metrics, the use of DNL for consideration of aircraft noise exposure remains validated as the most appropriate metric to inform environmental determinations for land use planning and for the consistent and equitable assessment of federal actions under the National Environmental Policy Act (see FICON 1992 and FICAN 2018, downloadable from www.fican.org).

2. For example, the MIT website includes recent research comparing DNL unfavorably to another measure that more effectively reflects human annoyance with overflight sounds. Why wasn't there a section in the FAA Report on such studies?

FAA Response: The use of DNL for consideration of aircraft noise exposure has been validated as an appropriate metric to inform environmental determinations for land use planning and for the consistent and equitable assessment of federal actions under the National Environmental Policy Act (see FICON 1992 and FICAN 2018, downloadable from www.fican.org). As detailed in the Section 188 report to Congress, use of supplemental noise metrics where applicable can provide additional information on community noise exposure; however DNL remains the most appropriate metric to equitably assess the noise intensity, duration, frequency, and time of occurrence for aircraft activity. Section 4.3 of the 188 report address the Number-Above metrics used in the MIT research study.

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Quincy

1. Please explain how the DNL metric accounts for duration of the noise and how this compares to Time-above.

FAA Response: DNL is based on the equivalent sound level (LEQ) metric, which considers the acoustic energy over a period of time. Because of this, DNL accounts for the cumulative effect of multiple noise events and the sound energy that is produced over time. While DNL does not explicitly quantify the duration of any individual aircraft noise event, the cumulative acoustic contribution of all aircraft events is captured.

2. Although DNL is modeled, the foundation of the calculations is based on single-event estimates of Sound Exposure Levels (SEL). SEL uses mathematical principles of “instantaneous” noise, thus combining the decibels of an aviation event as if all of the sound pressure occurred in 1-second. It doesn't. Consider the example of 500 aviation events/day every day over a location. The underlying mathematics for the DNL metric has an implicit assumption that $500 \times 365 = 182,500$ seconds of aviation noise disturbance and $31,536,000 - 175,000 = 31,353,500$ seconds of no aviation noise/year. This translates to an assumption that only 0.58% of the time, residents living in that location experienced aviation noise, even though they had 500 planes/day overhead. Please explain the validity of the DNL metric given this implicit assumption.

FAA Response: DNL is based on a day/night weighted equivalent sound level (LEQ) average over a 24-hour period; it is not based on SEL. For additional information on the definition of noise metrics, please see the examples provided in Fundamentals of Noise and Sound at: www.faa.gov/go/aviationnoise.

4. Table 1 on page 19 of the Alternative Metrics Report reports that Number-Above (NA) does not account for nighttime noise, but isn't Dr. Hansman's use of NA in his contract work for the FAA accounting for nighttime noise using NA? Time-Above also could easily be adjusted to penalize for nighttime events, much like is done now for DNL where there is a 10dB penalty. If DNL gets a check-mark for time of day due to the nighttime penalty, shouldn't NA and TA also have check-marks because they, too, could account for “time of day” by using Dr. Hansman's method and/or by adding a penalty for nighttime events?

FAA Response: While use of night time weightings for Number-Above based metrics may be appropriate, further work is needed to validate appropriate weighting factors. DNL as a pure acoustic metric applies a 10dB night time weighting which is equivalent to considering every night time flight as being equivalent to ten day time flights. For operational-acoustic metrics such as Number-Above, different approaches to applying night time weighting may be warranted. Research such as that being conducted MIT will help provide FAA with the data needed to support and define new supplemental metrics best matched to specific situations.

5. In the same Table, DNL gets credit for accounting for the number of events but Time-Above

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does not. How can one calculate Time-Above without accounting for the number of events?

FAA Response: By definition, the time above metric does not account for the number of events, only the time in which the cumulative noise level exceeds a threshold. For example if two events cumulatively result in a noise level exceeding the threshold only the time in which there is an exceedance of the threshold is recorded and not the number of events which produced the exceedance.

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Somerville

1. How are Cumulative Environmental Effects taken into account? To start with, Somerville has the greatest population per square mile in the Commonwealth of Massachusetts as well as the greatest amount of both regional traffic related air pollution per square mile and of regional commuter rail air pollution per square mile. This is an unfortunate juxtaposition which causes the greatest amount of transportation related air pollution per person per square mile in the Commonwealth, with large population health effects documented by the CAFEH studies which have shown a statistically significant relationship between transportation ultrafine particles and cardiovascular inflammation as measured by inflammatory markers C Reactive Protein, Interleukin 6 and Tumor Necrosis Factor Alpha Receptor II.

2. To this heavy burden from surface air pollution is added both jet noise related to Runway 33 Left Departures and I93 Corridor Highway Noise. With regard to the latter, many housing units as well as other sensitive receptors in the I93 corridor have median traffic related noise ranging from the high 60s in dBA, before a DNL penalty, all the way up to mid-70s dBA before a DNL Penalty. These regional surface transportation exposures are fully two orders of magnitude greater than anyone in Somerville, or further out, has from jet related noise. As many competent environmental health scientists have shown, the health impacts of multiple transport related noise sources that overlap in space and time also work together to create a much greater environmental health burden than the sources considered in isolation.

How are these relative and combined impacts from different transportation air and noise pollution sources going to be taken into account?

FAA Response: [Theses questions are beyond the scope of our Sec 188 briefing.](#)