Airport Noise Report

A weekly update on litigation, regulations, and technological developments

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ICAO

GROWTH IN CONTOURS DEPENDS ON HOW QUICKLY NEW TECH EMPLOYED, ICAO SAYS

In 2045, the total area around airports exposed to a yearly average day-night noise level (DNL) above 55 dB will be 1.1 to 2.2 times larger than it was in 2015, depending on how quickly the aviation industry employs new quieter technologies, the International Civil Aviation Organization predicts.

ICAO's prediction is made in a working paper (*ICAO Global Environmental Trends – Present and Future Aircraft Noise and Emissions*) that will be presented to the 40th ICAO Assembly to be held on Sept. 24 to Oct. 4 in Montreal.

The current Working Paper updates an earlier paper presented to the 39th ICAO Assembly held in October 2016.

The Environmental Trends working papers are intended to serve "as the single, robust information basis for decision-making on environmental matters."

The total population exposed to average DNL noise levels above 55 dB DNL in 2015 was approximately 30 million people, according to ICAO. That number is based on data from 315 airports representing approximately 80 percent of global traffic.

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Annoyance

NON-ACOUSTIC FACTORS GOVERN RESPONSE TO AIRCRAFT NOISE, ICAO SYMPOSIUM TOLD

Annoyance to aircraft noise is assumed to be correlated with total noise exposure (DNL) but it is mainly determined by non-acoustic factors, a Norwegian noise effects expert told participants at ICAO's recent Environmental Symposium in Montreal.

Only one-third of the annoyance response of communities to aircraft noise is governed by noise level; while two-thirds of the annoyance response is governed by non-acoustic factors, Truls Gjestland, a senior research scientist at the Norwegian independent research institute SINTIF, explained.

Non-acoustic factors governing community annoyance to aircraft noise include things such as sensitivity to noise, fear of accidents, mistrust or feelings of misfeasance, large changes in operations and the rate of such changes, whether quiet periods occur, and controversial airport expansion plans, Gjestland said.

A better understanding of these factors may improve the annoyance situation, he told the sumposium. Some non-acoustic factors can be managed or controlled by airport authorities,which means annoyance could be reduced without reducing noise exposure.

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"As with previous trends results," the ICAO working paper explains, "a decoupling of growth in yearly average DNL from air traffic growth can be observed. Of note is that under an advanced aircraft technology scenario, from about 2030, the total yearly average DNL may no longer increase with an increase in air traffic."

However, "a number of ambitious actions would need to be carried out on the part of Members States for that scenario to be realized," the paper stressed.

The long-term total DNL 55 dB contour area in the current trend paper, was lower by about 10 percent compared to prior trend projections. This lower contour are can be attributed to a combination of quieter aircraft entering the fleet, as well as a reduction in forecasted long-term traffic demand.

Trends in Aircraft Fuel Burn, CO2 Emissions

International aviation consumed approximately 160 megatons (Mt) of fuel in 2015. By 2045, with an anticipated 3.3 times growth in international air traffic (expressed in revenue ton kilometers), aviation fuel consumption is projected to increase by 2.2 to 3 times compared to 2015, depending on the technology and Air Traffic Management (ATM) scenario.

Regarding sustainable aviation fuel, a number of near-term scenarios evaluated by CAEP indicate that up to 2.6 percent of fuel consumption could potentially consist of sustainable aviation fuels by 2025. It should be noted that CAEP did not consider lower carbon aviation fuels as part of its work on fuel burn trends and that further work to consider such fuels in part of CAEP's current work program.

Trends in Emissions Affecting Local Air Quality

In 2015, landing and take-off (LTO) NOx emissions were approximately 0.18 Mt. In 2045, they are projected to range from 0.44 to 0.80 Mt depending on the technology and ATM scenarios. This represents a growth of between 2.4 and 4.4 times over the period and can be compared with the forecasted 3.3 times growth in international air traffic.

Litigation

FAA WILL CONSIDER MD PETITION REGARDING BWI FLIGHT PATHS

Since last fall, the FAA has refused to respond to an administrative petition filed by the State of Maryland requesting that the agency conduct supplemental environmental analysis of flight path changes at Baltimore-Washington International Airport and make revisions to area navigation routes and procedures to reduce their noise impact.

However, last month the FAA decided unexpectedly to consider the state's petition.

It is unclear what prompted FAA to move off its position, expressed in a Sept. 10, 2018, letter from Assistant FAA Chief Council for Airports & Environmental Law James Lofton, that no formal right exists in the applicable statutes, regulations, or guidance to petition the FAA Administrator for additional environmental analysis as the State of Maryland had done.

FAA's change of heart may have been the result of meetings with members of Maryland's congressional delegation, including its two senators, held earlier this summer where the delegation strongly urged FAA to take action to reduce the noise impact of NextGen flight path changes made at BWI.

Lofton asserted last fall that "FAA's actions with respect to the DC Metroplex Environmental Assessment and the identified procedures at BWI are fully implemented and were complete years ago. There is no major federal action associated with these actions, and FAA does not have a legal duty to supplement the reviews associated with those documents."

While FAA declined to respond to Maryland's administrative petition last fall, Lofton noted that the agency did agree in July 2018 to reengage on noise issues with the DC Metroplex BWI Community Roundtable but will limit its involvement "to issues outside the scope of administrative petitions filed by the State of Maryland and Howard County, MD."

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

Maryland did not withdraw its administrative petition and FAA has now decided to respond to it.

FAA Comments

Asked why the FAA changed its mind and will now respond to the State of Maryland's administrative petition, FAA told ANR:

"We had been seeking consensus from the community through our work with the DC Metroplex BWI Community Roundtable. Thus, when we received the letter from Maryland Attorney General Brian Frosh outside of that process we wrote back and said we'd like to continue using the consensus approach through the roundtable.

"Mr. Frosh filed a lawsuit seeking the court to order us to provide a more direct answer.

"We will now consider the Frosh petition. This does not mean that we're reconsidering past decisions. The court is holding the suit in abeyance in the meantime."

Maryland's Lawsuit

The lawsuit now in abeyance was filed in June 2019 by the State of Maryland in the U.S. Court of Appeals for the District of Columbia Circuit. It asks the Court "to review FAA's failure and/or refusal to take the following actions":

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

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

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

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ICAO understands that much more needs to be learned about the non-acoustic factors governing community annoyance to aircraft noise in order to better predict them and possibly reduce the degree of annoyance to aircraft noise that occurs in communities around airports.

So, the international aircraft governing body invited Gjestland and Professor Paul Hooper, chair of Environmental Management & Sustainability at Manchester Metropolitan University in the UK, another expert in the field, to make presentations at its Environmental Symposium.

Gjestland presented a slide showing the dramatic range in the degree of annoyance to aircraft noise that individual communities surveyed over the past few decades have demonstrated.

For instance, at a level of 60 dB DNL, the percentage of people highly annoyed ranged in these surveys from 0% to 90%.

Likewise, the point in these annoyance surveys where 10% of participants were highly annoyed by aircraft noise ranged from 40 DNL to 75 DNL.

There was no obvious trend in the data on Gjestland's slide relating noise level in DNL to degree of aircraft noise annoyance. The scattered cloud of data on the slide was visually striking evidence that non-acoustic factors govern community annoyance to aircraft noise.

Environmental restrictions could eventually be specified in terms of annoyance, Gjestland said.

Airports Must Be Studied Individually

In terms of community annoyance, airports must be studied individually, Gjestland stressed.

He recommended the use of a relatively new metric called the Community Tolerance Level (CTL) that is not yet in wide use.

CTL shows that the shape of the dose-response curve for community annoyance with aircraft noise is fixed but the starting point on the noise axis where annoyance begins to grow is governed by non-acoustic factors.

U.S. airports have been opposed to the idea of adopting separate thresholds of high annoyance for individual airports and it is unclear whether ICAO would support such practice.

But Gjestland said that the effect of some non-acoustic factors – such as the number of aircraft movements and the rate of change of aircraft operations – have been identified and can be addressed.

Regarding the number of aircraft movements, Gjestland said that, at equal noise levels, annoyance increases with increasing numbers of movements.

Regarding the rate of change in aircraft operations, he said there is a 9 dB difference in the Community Tolerance Level of communities around airports with a low rate of change in operations and communities with a high rate of change or controversial high rates of changes planned.

The Community Tolerance Level is defined as the level of DNL where 50 percent of the people in a particular community are predicted to be highly annoyed by noise exposure.

Gjestland also weighed in on the new guidelines for environmental noise issued by the European office of the World Health Organization last year, which he has criticized (30 ANR 135, 177).

He stressed that dose/response curves for aircraft annoyance are highly dependent on the selection of annoyance surveys that form the basis of such curves.

For instance, the well-regarded Miedema & Vos dose-response estimates of annoyance to aircraft noise done in 1998 are based on annoyance surveys done around 18 airports with a low rate of change in operations (a non-acoustic factor that does not increase annoyance) and include only two airports with a high rate of change in operations, a non-acoustic factor which does increase the degree of annoyance in communtiies.

WHO's analyses, on the other hand, was based on annoyance surveys done around four airports with a low rate of change in operations and eight airports with a high rate of change, which Gjestland said is not representative of airports in general.

So, given that the WHO data base included more high rate of change airports, it is no surprise that the WHO analysis showed a greater degree of community annoyance to aircraft noise than the earlier Miedema & Vos curve.

Gjestland also said that one of the studies included in the WHO data base included non-standardized annoyance surveys. WHO contends the inclusion of these surveys does not matter, Gjestland said, but he calculated that removing the non-standardized surveys would drop the WHO dose-response curve by 6 dB.

Who Europe calculated that some 45.5% of the population will be highly annoyed by aircraft noise at a level of 65 dB Lden (day-evening-night level).

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

Hooper Presentation

Professor Paul Hooper stressed in his presentation to the ICAO Environmental Symposium that non-acoustic factors of aircraft noise annoyance need to be addressed as part of a

comprehensive response to noise impact mitigation.

Unlike Gjestland, Hooper said that trends in exposure-response relationships suggest increasing sensitivity to aircraft noise. He also stressed that reducing noise levels around airports may not reduce annoyance.

Hooper provided a list of non-acoustic factors that influence annoyance to aircraft noise and said some can be modified.

Non-acoustic factors related to annoyance with aircraft noise that have a "strong" chance of being modified include community members' attitude toward the noise source, choice in insulation, choice in compensation, ability to influence the situation, perceived control of the situation, having their concerns be recognized, and trust in who they are dealing with.

Non-acoustic factors influencing annoyance with aircraft noise that have an "intermediate" chance of being modified include avoidability of the situtation, expectations regarding future of the noise source, accessibility and transparency of information, predictability of the noise situation, and procedural fairness.

Non-acoustic factors with a "weak" chance of being modified include media coverage, heightened awareness to noise, and social status.

Non-acoustic factors that cannot be modified, according to Professor Hooper, include age, income, individual sensitivity to noise, past experience with the noise source, duration of residency near airport, fear related to soure of noise, fear of devaluaton of home value, and awareness of negative consequences regarding health and learning.

The most influential and modifiable non-acoustic factors related to aircraft noise annoyance require effective communication and engagement with the community, Prof. Hooper told the symposium.

Community engagement must be meaningful, consistent, and comprehensive (cover both positive and negative airport contributions to quality of life), he said.

Effective engagement with communities must be based on competence and fairness and any comprehensive approach to noise impact mitigation must address sleep disturbance and annoyance directly, he stressed

ANIMA Study.

Prof. Hooper is participaing in a large project funded by the European Union called ANIMA (Aviation Noise Impact Management through novel Approaches), which seeks to better understand the non-acoustic factors in aircraft annoyance and to develop a toolkit to help airports address them.

The study, currently ongoing, is explained at it website https://anima-project.eu/what-is-anima/

ANIMA has over 20 partners across Europe including Heathrow and Schiphol airports; Airbus; several universities; and Dutch, German, and French aerospace centers and technology companies.

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