Supplementary Report to the Maryland Aviation Commission Annual Report
Written Independently of MDOT MAA and the Maryland Aviation Commission
Transportation Article § 5-201.2
SB 162/Ch. 564, 2023
January 8, 2025

2024 Supplementary Report to the Maryland General Assembly
Executive Summary

The Maryland Aviation Commission was established in 1994. In 2023 the legislature significantly altered the duties of the Commission (SB162) to include consideration of information and advice from Maryland communities that have, or are predicted to have, adverse health or community impacts from airport infrastructure and economic growth decisions.

The legislature also modified the composition of the Commission to include four new community representatives selected by the Anne Arundel and Howard Counties' senate delegations, bringing the total number of commissioners to thirteen.

The legislative change additionally created a requirement for the Commission to annually report feedback related to health or community impact and how the Commission addressed such feedback. As key community advocates and initiators of the legislative initiative that modified the Commission, inaugural community representatives to the Commission, and long-term community representatives working with both federal and state aviation administrations to resolve deleterious aviation impacts at Baltimore/Washington International Thurgood Marshall Airport, we hereby submit this supplementary annual report to the MDOT MAA's report regarding the status of the Commission's consideration of community impacts.

In our 2024 Annual Report we cover the following important updates:

- The current structure of Commission meetings is not conducive to sustained discussion and planning or policy input on the part of the Commissioners.

- MDOT MAA staff have little to no progress incorporating environmental impacts, potentially adverse community health impacts or other community-related impacts into Commission decisions as required by SB162.

- MDOT MAA maintains a culture of resistance to transparency.

- MDOT MAA appears to be planning for "monumental outcomes" for communities surrounding the airport with its new Airport Master Plan.

- MDOT MAA staff have hinted at major capacity changes at BWI Marshall, urging the Commission to consider how BWI Marshall could achieve "competitive capacity" with Dulles International Airport by creating a new air carrier runway that has not been discussed over the decades of current airport plans, which local government have relied on for land use planning.

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SUBJECT: A Supplementary Report to the Maryland General Assembly

INTRODUCTION

The membership of the Maryland Aviation Commission, hereinafter referred to as 'the Commission' or 'Commission', appointed with the additional recommendation of the Anne Arundel County and Howard County senate delegations, hereinafter referred to as 'community representation' or 'community representatives' hereby submits its first annual report pursuant to Transportation Article §5-201.2, the Maryland Aviation Commission is required to submit an annual report. The section states that:

(a) Subject to § 2-1246 of the State Government Article, the Commission shall report by January 15 of each year to the General Assembly on the activities of the Commission during the previous year.

(b) The report shall include:

(1) [...] A summary of Commission feedback related to health or community impact and how the Commission addressed such feedback and any recommendations of the Commission for future changes in legislation, capital funding, or operational flexibility;

This report includes the following topics: History, Commission Meeting Dates, Identified and Unresolved Problems and Risks and Conclusion.

HISTORY

Following the successful passage of Senate Bill 162 into law in 2023, the Maryland General Assembly with the approval of the Governor modified the requirements of the Commission to additionally consider environmental impacts, potentially adverse community health impacts and any other community-related impacts that may result from airport infrastructure and economic growth decisions in carrying out its duties. Additionally, the legislation modified the Commission's membership to include four new members; two each recommended by the Anne Arundel County and Howard County senate delegations to identify and mitigate risks of airport objectives to communities surrounding Baltimore/Washington International Thurgood Marshall Airport.

Prior to the passage of SB162, the legislature considered an initiative in its 2022 regular session that would have created a body responsible for assessing health and environmental impacts of commercial aviation to provide guidance to the Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA) and legislature accordingly (SB658/HB1103). Across the country communities, congressional representatives in the 38-

member Quiet Skies Caucus, scientists and prominent health and environmental experts had also been working diligently to achieve similar citizen representation in the national governing process of aviation infrastructure. Seven of these national experts testified in support of the initiative.[1] MDOT MAA opposed the initiative stating the proposal was duplicative of current policies and that such an effort would "duplicate the work of the [existing] Maryland Aviation Commission which provides direction to the MDOT MAA" (See Attachment). Guided by MDOT MAA feedback, the legislature moved to address the identified needs with a modification to the duties and membership of the MAC in 2023.

The legislature's work to address community needs in the state's aviation planning was largely in response to the state's previous efforts to address deleterious aviation impacts with the creation of the DC Metroplex BWI Community Roundtable ("BWI Roundtable"). The BWI Roundtable was formed in 2017 at the request of the Federal Aviation Administration (FAA) and has been hosted by the MDOT MAA. The BWI Roundtable has worked with the FAA utilizing technical and other support provided by MDOT MAA to seek solutions to harmful effects brought about by the implementation of the D.C. Metroplex project implemented under the federal NextGen program. During the course of the BWI Roundtable's regular meetings, in which it was informed by numerous technical briefs and presentations by both the FAA and MDOT MAA, it was determined that business and infrastructure decisions made by MDOT MAA, independent of the FAA, presented serious health and livability concerns for communities surrounding the state's aviation infrastructure.

Along with the legislative remedies implemented in 2023, the delegations selected new representation to the Commission that clearly reflected the intent of the initiative to include health, environmental and community interests in the regulatory oversight of the state's airports. The nominees' backgrounds and experience ensure they are well-versed in federal and state aviation infrastructure as it may *adversely* affect community priorities in land-use, environmental, health and livability metrics. Work in prevention and mitigation of adverse aviation impacts is a unique skillset not prioritized within the aviation industry and governmental regulatory processes. Historically, commissioners have had little to no background in preventing the negative impacts of aviation. Also, the long-term status quo has been a reactive reliance on federal and state programs to provide billions of dollars nationally in sound-proofing mitigations to adversely impacted communities.

The inaugural community representatives are:

- A representative from Anne Arundel County who served on the BWI Roundtable for six years.
- A representative from Howard County who served on the BWI Roundtable for six years.
- A quantitative outcomes researcher and Associate Professor in the Department of Practice, Sciences, and Health Outcomes Research at the University of Maryland School

[1] Testimony included that of Daniel Fink, MD, Chair, The Quiet Coalition; Rick Neitzel, PhD, MS, CIH, FAIHA, University of Michigan School of Public Health; Neelakshi Hudda, PhD, MS, Tufts University Dept. Civil and Environmental Engineering; Zafar Zafari, M.Sc, PhD, University of Maryland School of Pharmacy; Arline Bronzaft, PhD, Professor Emerita, City University of New York; Jamie Banks, PhD, MSc, Founder and President of Quiet Communities Inc.; and Anne Hollander, President, Montgomery County Quiet Skies Coalition, Ltd.

of Pharmacy who conducted an aviation-related health study for the state in 2021 (See Attachment).
- A former Chief Administrative Officer at BWI Marshall and two-term member of the Maryland House of Delegates.

COMMISSION MEETING DATES

The community representatives met as a part of the working body on the following dates: November 15, 2023, February 21, 2024, June 11, 2024, August 21, 2024 and October 23, 2024.

The Commission's full meeting agendas, recorded presentations and minutes are available on the MDOT MAA website.

IDENTIFIED AND UNRESOLVED PROBLEMS AND RISKS

The Structure of Commission meetings are not conducive to sustained, in-depth discussion and policy-making

The meetings of the Commission are primarily designed as presentations delivered by MDOT MAA staff, after which there is little time for deliberations that delve deeply into issues raised by the presentations. There also is a tendency toward impatience on the part of some commissioners for issues raised by the recent nominees concerning the environmental impacts, potentially adverse community health impacts and any other community-related impacts raised by MDOT MAA actions. This disconnect is probably due to the approach taken by MDOT MAA in designing the Orientation sessions for all commissioners as required by SB162, which contrary to the spirit of the legislation, did not contain information on the new areas of Commission responsibilities. Thus, all commissioners are not equally informed about the full breath of revised Commission responsibilities and are largely unaware of the important issues involved. The Chair of the Commission has stated his desire to create a committee structure within the Commission, which may partially mitigate the deliberation problem.

MDOT MAA staff have made little to no progress in systematically incorporating environmental impacts, potentially adverse community health impacts and any other community-related impacts into Commission decisions as required by SB 162

Commission decisions and votes continue to be taken without due regard for the above-stated considerations. In fairness, to our knowledge there are no airport authorities in the nation that are required to incorporate these important considerations into its decision-making. So, MDOT MAA staff have been tasked with designing a decision-making model that has few, if any, precedents.

In consideration of the novelty, and potential national model implications of this, Commission members Zafari and Chancellor have been assisting MDOT MAA staff by working on a Policy Framework consisting of a series of linked forecasting models that will produce a holistic view of the likely and predictable effects of policy, regulatory, or major capital project decisions taken

by the Commission. This Policy Framework has the potential to provide a systematic way to review decisions against the "full" list of required Commission considerations. At this writing, the Chair of the Commission has given his full support to this effort, which is currently in the design stage. It is the hope of Commissioners Chancellor and Zafar that the Policy Framework model will be completed and fully incorporated into Commission decision-making as a standard operating procedure by the third anniversary of SB 162, or October 1, 2026.

MDOT MAA Maintains a Culture of Resistance to Transparency

A part of the role the new commissioners, as embodied in SB 162, is to bring the perspective, and represent the concerns, of affected communities to Commission discussions and decisions. In order to do so effectively, the new commissioners are required to seek all available information concerning airport plans, operations and priorities. The following case study involves the current and past long-range planning at the airport and is an example of how the Commission's reform, as embodied in SB 162, is made more difficult by the existing culture of MDOT MAA.

To begin, it is only fair to say that it is not uncommon for well-versed airport planners to strategically avoid contentious topics, such as changes aircraft operations and expansions of airport infrastructure, for good reason. Community opposition to aircraft noise has existed since the introduction of commercial jet service in the 1950's and airport changes often prove to be controversial.

Often airport leadership will respond to planning criticisms by citing their full compliance with the National Environmental Policy Act (NEPA) and other FAA regulatory policies, a rationale developed in an era when the charter of the FAA included active promotion of civil aviation, a responsibility rescinded by Congress in 1996.

Considered in this light, most current national noise policies are holdovers, written before 1996 and not yet revised to reflect the FAA's new charter. Many of these policies are based on antiquated technical information and obsolete goals. They were written to facilitate the growth of aviation and to suppress robust discourse among the potentially objectionable public.

Serious problems occur when these outmoded policies continue to inform assumptions made by airport planners and leadership and in their willingness, or unwillingness, to communicate long-term planning decisions that affect land use, health and livability of the communities the airport purportedly serves. This lack of transparency is highly detrimental to the success of any airport's long-term relationship with the community it serves and to the state's responsibilities in its planning. What follows is a commentary on MDOT MAA's cultural resistance to critical transparency as exemplified in its long-term planning process at BWI Marshall.

…

At its November 15, 2023 Maryland Aviation Commission meeting, the MDOT MAA director responded to a query from Commissioner Reese about the airport's existing master plan and whether or not MDOT MAA intended to follow through with its published, long-term plan to

build a new primary carrier runway parallel to the existing Runway 10-28. Mr. Smith avoided answering the question stating, "You're going to notice that I am very cautious when we talk about new runways", and then added that the airport would engage in "a process" to determine if it needed a new runway. What the MDOT MAA process would entail remains unclear.

Mr. Smith then explained that the airport was no longer adhering to its most recent published BWI Airport Master Plan saying, "As far as we're concerned we've pretty much declared victory on that master plan. That master plan isn't necessarily guiding us today."

It is unclear when MDOT MAA deviated from its 2011 Master Plan. Adherence to a published master plan is essential for transparency in land use, financial and other essential planning. It is also essential for residents in affected communities to understand future impacts.

When presented with follow-on concerns by Commissioners Reese and Chancellor, the Director said a new master plan was in the course of being generated by the MDOT MAA.

As the result of a growing suspicion among community representatives on the BWI Community Roundtable that the MDOT MAA was not intending to adhere to its published airport master plan, the Maryland General Assembly Senate Budget and Taxation Committee in 2022 requested a special report from MDOT MAA depicting five and ten-year noise projections for BWI Marshall without the still-unbuilt parallel primary carrier Runway 10R-28L. MDOT MAA provided five- and ten-year noise projections that included a fully constructed parallel runway to Runway 10-28 (See Attachment for Special Report). Even when deliberately prompted to provide transparent, if alternative, noise zone predictions for a runway configuration without the parallel runway, MDOT MAA inexplicably did not do so.

Prior to 2022, MDOT MAA published Airport Noise Zone (ANZ) studies in 2014 and 2020, each providing projected noise impacts in accordance with long-term planning objectives described in its approved 2011 Airport Master Plan. Publishing long-term projections for noise with an additional arbitrary primary air carrier runway in the depiction will have the immediate effect of skewing the projections, artificially dispersing traffic and producing artificially lower projections for noise. Providing such published depictions of noise for long-term planning purposes undermines the airport authority's credibility and may have, or will have, contributed to harm due to a continued reliance on their use.

When specifically pressed by Commissioner Reese on what a monumentally devastating impact such a lack of transparency in airport planning could cause to surrounding communities in the August 21, 2024 Commission meeting, the MDOT MAA Director stated, "Any master plan that an airport does will likely result in monumental outcomes. And so that's going to happen. We just can't get ahead of the process before we determine or publish to the public what the outcome of the master planning process is going to be."

If the expected outcome of airport planning is public outrage, then it follows that airport planners would find obfuscation a necessary tool for the betterment of the airport. This is unfortunately, a dangerous view that has been embraced to the detriment of incorporating innovative and novel

solutions developed by diverse expertise in health and livability interests throughout the MDOT MAA's planning process.

At the October 23, 2024 Commission meeting, MDOT MAA stated it has concerns with the intersection of Runways 10-28 and 15R-33L. MDOT MAA cited concerns of safety and maintenance regarding this intersection and suggested a major construction for runway lengthening of 15L-33R, to bring it into FAA standards as a new primary air carrier runway at BWI Marshall, which would then make it available as an alternative runway in the event that Runway 10-28 and 15R-33L would be temporarily disabled.

While the probability of a runway closure caused by an unplanned aircraft event at the intersection is not zero, it is extremely low and further mitigated by current continuing and maturing precision guidance technologies implemented by the FAA. Runway closures for maintenance needs, the second concern cited, can be mitigated through deliberate scheduling with the added benefit that nighttime work could also provide quiet hours for local communities. Thus, this case for a new primary air carrier runway at BWI Marshall just does not hold water.

What is more plausibly informing the costly plan for new runway development at BWI Marshall is less a concern for safety, the current runway configuration is very safe, and more likely an interest in runway capacity. But why are we, as commissioners, guessing at this?! The MDOT MAA's unwillingness to clearly state that runway capacity is an identified priority makes planning to achieve capacity with consideration of community health and livability interests impossible. Increases in runway capacity, if that becomes a public priority, can likely be achieved without building a new primary air carrier runway at BWI Marshall. Alternatives need to be identified, developed and considered and due diligence completed on these alternatives. But this will not be possible if a plan for a new runway is developed in an opaque environment and presented to the Commission as the answer to potential crises, rather than the desire of airport managers and planners for more capacity. The latter desire can be debated based on public priorities, while safety and operational concerns are often (and rightly so) the province of aviation professionals, and therefore beyond public debate.

Most concerningly, in the same October 2024 MDOT MAA presentation to the Commission, an explanation of what the airport engineer called BWI Marshall's "competitive capacity" was provided. Mr. Shank explained that BWI Marshall is currently limited to 340,000 operations compared to that of Washington Dulles International Airport which has four primary air carrier runways and can handle 600,000 operations per year. Mr. Shank told the commissioners this was "food for thought".

Creating a new primary air carrier runway in a previously unplanned location will irrevocably change the deleterious footprint of BWI Marshall as well as undermine decades of existing and planned municipal and residential infrastructure. A change to runway design will also create a requirement for the FAA to redesign the regional airspace, a process of which the state has no oversight or guarantee to influence. Lastly, a redesign of the DC Metroplex Airspace to accommodate changes at BWI Marshall will undo the important post-NextGen mitigations that took the state, the DC Metroplex BWI Community Roundtable and MDOT MAA over seven years, from 2017 to the present, to accomplish with the FAA. Note that this achievement was

difficult to accomplish and required the support of several governors, attorneys general, multiple county executives, local governments, state senators and the Maryland Congressional Delegation.

Such a drastic deviation from airport infrastructure plans must be given robust community, local and state dialogue and scrutiny. A new third air carrier runway will pave the way for BWI Marshall to morph from its current enviable position as a convenient, robust airport whose majority of operations are in the regional market to, according to MDOT MAA's own presentation, an airport attempting to compete with the likes of Washington Dulles while saddled with the weighty, indelible opposition of historic and established communities surrounding it. Food for thought, indeed.

And, unfortunately, MDOT MAA has previously moved forward without adequately considering the impacts of its runway capacity planning. The last major expansion at MDOT MAA took place in the early 1980's when MDOT MAA then altered the configuration of runways and built a new primary carrier runway. The state unsuccessfully defended a civil lawsuit brought by affected residents[2].

It is true that even a temporary runway closure due to unforeseen circumstances at BWI Marshall is a valid concern and one a majority of similarly situated airports throughout the country actively work to mitigate. Similar to a crash on a highway, robust emergency response and other enhanced training and response techniques can facilitate faster, safer resolutions to restore runway operations. Prioritizing a safety climate and culture that encourages airport and airline employees to report safety concerns and violations free from retaliation as well to identify and implement best practices can further decrease the probability of airport accidents.

CONCLUSION

The Maryland Aviation Commission remains unstructured to facilitate the evaluation of MDOT MAA initiatives with consideration of health, environmental and livability factors. This deficiency places communities at an unnecessary risk in the Commission's approval process.

While the state's changes to the body and duties of the Commission was a critical step in addressing health and livability deficiencies in airport infrastructure planning, the current MDOT MAA culture of resistance and obfuscation is additionally thwarting the intended incorporation of new health and livability data and community expertise in its planning process.

Just as considerable national support was exemplified for the state's initiative to change its airport planning process, a considerable body of research and expertise exists to support the Commission in its duty to consider health and livability impacts. It will be the responsibility of MDOT MAA to appropriately facilitate the Commission's review and consideration of the available information.

[2] Associated Press, "Neighbors of BWI Sue Over Noise," *The Washington Post*, Sept. 27, 1991, Real Estate. https://www.washingtonpost.com/archive/realestate/1991/09/28/neighbors-of-bwi-sue-over-noise/ae0b5cae-e647-4d2d-815d-aada89cee4ab/

As detailed in the Case Study above, the MDOT MAA long-term master plan currently in development for BWI Marshall should be developed with health and livability considerations that go beyond the NEPA and FAA's requirements, as SB 162 was intended to ensure additional considerations would be included in airport planning. MDOT MAA has absolute control over the way in which it executes its planning process and it should immediately adjust its process to accommodate community concerns. This will prevent rework, after the fact remediation costs, and provide a useful tool moving forward that will make the airport more compatible with the surrounding communities.

Jesse Chancellor
Commissioner
Maryland Aviation Commission

Mary Reese
Commissioner
Maryland Aviation Commission

Documents attached (2)

March 9, 2022

The Honorable Dolores G. Kelley
Chair, Senate Finance Committee
3 East Miller Senate Office Building
Annapolis, MD 21401

Re: Letter of Opposition – Senate Bill 658 – Transportation – Maryland Aviation Infrastructure Impacts Commission

Dear Chair Kelley and Committee Members:

The Maryland Department of Transportation (MDOT) respectfully opposes Senate Bill 658 as it is duplicative of current federal and State laws, regulations, and policies.

Senate Bill 658 would create the Maryland Aviation Infrastructure Impacts Commission (the Commission) to study the public health, medical, and environmental impacts of commercial aviation in communities surrounding airports, with a primary focus on the Baltimore/Washington International Thurgood Marshall (BWI Marshall) Airport; this Commission would then provide policy recommendations to the General Assembly.

The Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA) undertakes an environmental review process, under the National Environmental Protection Act (NEPA), whenever a federal action is required, such as changing the Airport Layout Plan, or following regulations and orders published by the White House Council on Environmental Quality (CEQ), the U.S. Department of Transportation, and the Federal Aviation Administration (FAA). The NEPA process provides a consistent criterion and publicly identifies and discloses potential environmental impacts; all project reviews are coordinated with State and local agencies and officials, as well as other interested stakeholders. It is unclear what additional environmental analysis would be provided by the proposed commission that is not already accounted for in the federal NEPA process.

In addition, the proposed Commission would be tasked with offering recommendations on public policy implications of its studies, the content of aviation infrastructure plans and local land-use plans, and the competing needs of aviation infrastructure and the quality of life in communities near airports. These efforts duplicate the work of the Maryland Aviation Commission, which provides direction to the MDOT MAA in developing and implementing airport management policy for all State-owned airports, as well as approval of major capital projects at State-owned airports. The MDOT MAA is also required to coordinate with local jurisdictions, including local zoning boards, on airport projects that might impact their land use plans or requirements.

The proposed Commission is permitted to contract with a vendor to maintain a system of virtual noise monitors; however, the MDOT MAA already employs a robust noise monitoring program for the communities surrounding BWI Marshall which is federally funded and exists as part of a comprehensive FAA-authorized aircraft noise mitigation plan. In September 2019, the MDOT MAA completed the implementation, construction, and deployment of a replacement BWI Marshall Noise and Operations Monitoring System (NOMS), consisting of 24 permanent noise monitors, three portable noise monitors, and advanced analysis software that integrates noise and aircraft operations. The NOMS analyzes and correlates aircraft noise, aircraft flight tracks, and aircraft noise complaint data and provides support to the MDOT MAA's Noise Abatement Program. Information derived from these monitors is readily available to the public online or upon request.

The proposed Commission would be directed to study hard infrastructure, such as construction projects, as well as and soft infrastructure, such as flight procedures. The FAA has exclusive jurisdiction of airspace and is the sole organization in the United States responsible for the development, review, and implementation of flight procedures. An airport owner may identify and advocate for flight procedures that would reduce noise or may challenge the FAA's environmental review, as the State has done previously, but cannot prohibit or require their implementation. No finding or recommendation by the proposed Commission or State policy resulting from the Commission would interfere with the FAA's implementation of new or revised flight procedures.

Lastly, the proposed Commission is required to consult with the DC Metroplex BWI Community Roundtable (Roundtable). The Roundtable was formed by the MDOT MAA at the request of the FAA following a significant increase in community noise complaints about FAA's implementation of revised flight procedures into and out of BWI Marshall. The MDOT MAA, serving as a technical advisor, has invested considerable technical and financial resources in excess of $1 million in support of the Roundtable. A series of revised procedures were submitted to the FAA by the MDOT MAA on behalf of the Roundtable in December of 2019 and the FAA is actively considering these changes. Senate Bill 658 would require an ongoing role for the Roundtable in the evaluation of nominees for the proposed Commission, which would obligate the State to continue providing resources and advice beyond the intended scope of the Roundtable.

For these reasons, the Maryland Department of Transportation respectfully requests the Committee grant Senate Bill 658 an unfavorable report.

Respectfully Submitted,

Ricky D. Smith, Sr.
Executive Director
Maryland Aviation Administration
859-7060

Pilar Helm
Director of Government Affairs
Maryland Department of Transportation 410-
410-865-1090

Updates on the Baltimore/Washington International Thurgood Marshall Airport Noise Zone

(2022 JCR, p. 80)

A Report to the Maryland General Assembly

Senate Budget and Taxation Committee

and

House Appropriations Committee

August 2022

Maryland Department of Transportation
Maryland Aviation Administration

The Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA) offers this report in response to committee narrative contained in the 2022 Joint Chairmen's Report (JCR). The language states:

> *Add the following language to the special fund appropriation:*
>
> *provided that $150,000 of this appropriation may not be expended until the Maryland Aviation Administration (MAA) submits a report that provides updates on the Airport Noise Zone with current contours for 60 decibels (dBA), 55 dBA, 50 dBA, 45 dBA, and 40 dBA Day-Night Average Sound Levels (DNL) and 5-year and 10-year forecast DNL contours. This report should include the following:*
>
> 1. *the process MAA uses to validate its noise modeling;*
> 2. *the physical validation of the noise model for 65, 60, 55, 50, 45 and 40 dBA DNL; and*
> 3. *the process used to physically validate the 65 to 40 dBA DNL contours.*
>
> *This report shall be submitted by September 1, 2022, and the budget committees shall have 45 days from the date of the receipt of the report to review and comment. Funds restricted for this report may not be transferred by budget amendment or otherwise to any other purpose and shall be canceled if the report is not submitted.*

The JCR includes additional explanation, stating: "*The budget committees remain interested in efforts that MAA is taking to mitigate the impact of aircraft noise on the lives of Marylanders. MAA has never been required to show any contours except the 65 dBA DNL. Many of the complaints received by MAA have been between DNL 65 and 40 dBA. The only available data is due to portable noise monitor studies requested by members of the public. This language restricts funds pending receipt of a report from MAA evaluating noise levels among contours for 40 to 65 dBA DNL.*"

Executive Summary

The MDOT MAA recognizes that noise from aircrafts remains an issue for some residents, both in communities surrounding the Baltimore Washington International Thurgood Marshall Airport (BWI Marshall) and nationwide. The Maryland Environmental Noise Act of 1974 provides for the protection of citizens from the impact of transportation related noise and includes the requirement that the MDOT MAA create an Airport Noise Zone (ANZ) to control incompatible land development around BWI Marshall and a Noise Abatement Plan (NAP) to minimize the impact of aircraft noise on people living near the Airport. The MDOT MAA has upheld this requirement since 1976.

The 2020 ANZ study process and results were presented and approved by the Maryland Aviation Commission on November 18, 2020, and again on March 17, 2021. The 2020 ANZ became effective on April 19, 2021, following certification by the MDOT MAA's Executive Director. The resulting ANZ serves as an important land use planning tool used by the Counties containing and surrounding BWI Marshall Airport.

Compatible land use standards are outlined in COMAR Section 11.03.03.03, Limits for Cumulative Noise Exposure, and indicate that a noise level of 65 Day Night Average Sound Level (DNL) is the threshold for residential and many other noise-sensitive land uses. The following information presents noise contours at levels below the current land use compatibility standards in response to the Committees' request. The report also provides information about the quality control process used by MDOT MAA's technical acoustic services consultant, as well as an analysis of noise levels measured by MDOT MAA's comprehensive Airport Noise and Operations Monitoring System (which includes 24 permanent noise monitors located in Anne Arundel and Howard Counties).

The MDOT MAA is continuing the initiatives referenced in the 2021 Report, including working with the DC Metroplex BWI Community Roundtable and Federal Aviation Administration on the potential implementation of revised flight procedures proposed by the Roundtable Technical Committee. The MDOT MAA has also restarted the Voluntary Residential Sound Insulation Program, the objective of which is to reduce the interior noise levels within eligible residential dwelling units by installing new acoustically rated windows, doors, ventilation, insulation, and other customized treatments approved by the FAA. This program defines potentially eligible homes as those within the 65 DNL noise contour. Mitigation costs to provide sound insulation treatments in a manner consistent with the FAA's current guidelines for Residential Sound Insulation Programs would be over $32 billion dollars, which is not eligible for federal funding.

Notably, the MDOT MAA continues to monitor the FAA's ongoing research on the applicability of the 65 DNL as a threshold for land use compatibility, work the FAA completed under its Neighborhood Environmental Survey. It is within the scope of the State of Maryland's federal representatives in Congress to compel the FAA to accelerate their efforts to address the findings that demonstrated considerably higher annoyance to aircraft noise exposure than current regulations reflect.

In 2021, BWI Marshall received complaints from 520 individuals, most of whom reside beyond the 65 DNL noise contour, out of a population of 2.8 million in the metropolitan statistical area. According to the most recent economic impact study, BWI Marshall is responsible for over 100,000 jobs and $10 billion in annual economic impact. This results in over $500 million in State and local taxes annually. Prior to the COVID-19 pandemic, nearly 28 million passengers relied on BWI Marshall Airport each year. During this same period, over 100 small and minority-owned businesses called the Airport its place of business and nearly 12,000 employees its place of employment. BWI Marshall has been called one of the 'economic engines' that drives the State's economy and the MDOT MAA remains committed to noise mitigation around BWI Marshall and Martin State Airports.

The MDOT MAA has completed a technical analysis showing noise levels for the 2020 Airport Noise Zone (ANZ) study. This report provides graphics and estimated impacts associated with noise levels between 40 Day Night Average Sound Level (DNL) and 75 DNL, as well as information about the process the MDOT MAA and its technical consultant use to provide quality control and validation of the technical analysis, including information about MDOT MAA's permanent noise monitoring system.

2020 Airport Noise Zone and 40 and above DNL Contours

To present noise exposure at lower noise levels, the MDOT MAA increased the size of the study area and associated noise model input and modeled noise contours from the BWI Marshall 2020 ANZ Study[1] to identify cumulative noise exposure ranging from 40 to 75 DNL. DNL contours were developed using the same noise model as used in the 2020 ANZ Update in a manner consistent with section 11.03.03 of COMAR, which lists the methods for calculation and measurement of levels of cumulative noise exposure. The results are shown in Attachment 1, and include noise contours representing 40, 45, 50, 55, and 60 DNL, in addition to the noise exposure contours that comprise the official ANZ (65 DNL, 70 DNL and 75 DNL). Attachment 1 also includes the location of BWI Marshall's 24 permanent noise monitors.

The resulting noise contours encompass approximately 306,843 acres, an estimated 798,627 people (based on the 2010 US Census), and an estimated 337,157 households, as presented in the table below.

Estimated Households, Population, and Acreage within the 2020 ANZ and Additional Contours

DNL Contour Interval	Estimated Residential Population	Estimated Residential Housing Units	Area (acres)
40-45 dB	332,932	164,885	140,269
45-50 dB	179,811	63,324	84,366
50-55 dB	159,779	59,647	45,321
55-60 dB	97,410	37,806	23,328
60-65 dB	24,724	9,042	8,017
65-70 dB (Official ANZ)	**3,856**	**2,395**	**3,048**
70-75 dB (Official ANZ)	**113**	**55**	**1,404**
>75 dB (Official ANZ)	**2**	**3**	**1,091**
Total	**798,627**	**337,157**	**306,843**

Sources: HMMH 2022; 2010 U.S. Census

Mitigation

Historically, to help mitigate the effects of aircraft noise within areas surrounding BWI Marshall, the MDOT MAA, in collaboration with the FAA, initiated a Homeowner Assistance Program in 1987. This voluntary program included a Residential Sound Insulation Program (RSIP) and a

[1] The ANZ, incorporated by reference within COMAR 11.03.01.01-1B(5) was finalized in April 2021. Information about the ANZ, including the technical analysis, public involvement, report, and technical appendices, is available at https://marylandaviation.com/environmental/environmental-compliance-sustainability/bwi-marshall-airport-noise-zone/.

Resale Assurance Program (which concluded in 2008). Participation in these programs is based on FAA eligibility as determined by existing FAA policy, and location within a Federal 14 CFR Part 150 Noise Compatibility Study (which differs from an ANZ study). More than 750 homeowners have participated in these programs at a cost of over $52.4 million (adjusted to 2020 dollars), through both federal and State funding, including the sound insulation of four schools. The objective of the RSIP is to reduce the interior noise levels within eligible residential dwelling units to at or below 45 decibels (dB), with a minimum 5 dB reduction, by installing new acoustically rated windows, doors, ventilation, insulation, and other customized treatments approved by the FAA. All work is performed at no cost to the homeowners, and in exchange for participation, homeowners provide the MDOT MAA with an avigation easement allowing for the passage of aircraft over their property and relinquishing any right to receive remuneration or other compensation or benefit under any program of the State designed to allay, abate, or compensate for the effects of aircraft noise and emissions in connection with the operations at BWI Marshall.

Current eligibility for sound insulation is based on the Airport's FAA-approved forecast Noise Exposure Map (NEM) for the year 2019 and additional consultation with the FAA. Although slowed by the financial impacts of the COVID-19 pandemic, the current phase of the MDOT MAA RSIP is continuing to move towards initiating sound insulation of approximately 136 individual single-family residential properties and sixteen multi-family structures (apartment, duplex and condominium) including 344 units, at an estimated cost of $34.4 million. The first set of insulation packages is anticipated to begin construction in the 2022/2023 timeframe.

Mitigation beyond 65 DNL

Based on preliminary 2022 estimated costs for sound insulation of single-family homes ($118,000) and multi-family units ($57,000 per unit), the MDOT MAA determined the initial cost to provide sound insulation treatments in a manner consistent with FAA's current guidelines for Residential Sound Insulation Programs would be over $32 billion dollars.

Estimated Mitigation Costs

DNL Contour Interval	Estimated Residential Housing Units	Estimated Costs
40-45 dB	164,885	$15,014,959,000
45-50 dB	63,324	$6,872,968,000
50-55 dB	59,647	$5,558,364,000
55-60 dB	37,806	$3,580,512,000
60-65 dB	9,042	$790,626,000
65-70 dB (Official ANZ)	**2,395**	**$180,923,000**
70-75 dB (Official ANZ)	**55**	**$5,331,000**
>75 dB (Official ANZ)	**3**	**$232,000**
Total	**337,157**	**$32,003,915,000**

Sources: HMMH 2022; 2010 U.S. Census

Estimated costs per unit include several factors: design, construction, construction oversight, program management, and pre/post-acoustic testing. The cumulative cost assumes 100 percent participation, including 337,157 residences, and does not account for past and current program expenses. According to federal guidelines, only residences that fall within an FAA-approved Noise Exposure Map of 65 DNL or above, and have existing interior levels less than 45 DNL, are potentially eligible for participation. The FAA funding would not be available to mitigate at these lower levels unless federal policy were to change.

Noise Model Validation

Highly regarded in the aviation noise industry and recognized as an expert user of the FAA's noise model, the MDOT MAA's technical consultant undertakes various methods for quality control and to validate model results. The accuracy of cumulative DNL noise contours is based on two factors: the quality and characteristics of the noise model and the quality and accuracy of airport and aircraft specific operational input.

The MDOT MAA uses the FAA's Aviation Environmental Design Tool (AEDT) to develop noise contours. AEDT is a FAA software system first introduced in 2015, which replaced long-standing legacy models for both noise and air quality analysis. AEDT models aircraft performance in space and time to estimate fuel consumption, emissions, noise, and air quality consequences. It is the responsibility of the FAA to provide a noise model that accurately and consistently models the propagation of noise by aircraft. The FAA has undertaken extensive verification and validation efforts of the model, continually updates and improves the model, and it is recognized as the industry standard, in addition to being required for use in federal aviation noise analysis. ANZ noise contours are determined using prediction methods in accordance with COMAR Sec.11.03.03.02, and Maryland law requires noise modeling as a prediction method to create ANZ noise contours from 65 dBA DNL and above.

AEDT includes an extensive database of noise and performance data for over 300 civilian and military aircraft types. Actual acoustic measurements are included in the form of Sound Exposure Level (SEL) at a range of distances from 200 feet to nearly five miles from a particular aircraft type with engines at a specific thrust level. Specific performance data includes thrust, speed, and altitude data for takeoff and landing operations (often referred to as aircraft profiles), which include profiles that account for the weight of the aircraft. AEDT automatically accesses the noise and performance data for takeoff, landing, and touch-and-go or circuit operations by aircraft included in the database.

Accurate noise modeling also requires airport-specific information. It is the responsibility of the MDOT MAA to ensure that the noise model uses the most accurate representation of actual and forecast conditions at BWI Marshall. AEDT requires noise model input data in three categories: airport physical inputs (runway layout, terrain data, meteorological conditions), aircraft noise and performance data (including aircraft performance profiles, noise level versus distance curves, (as discussed above), and aircraft operational inputs (including number of aircraft operations, aircraft

fleet mix/type of aircraft, day-night split of operations, runway utilization, and flight track geometry and utilization).

The 2020 ANZ was developed from actual operations collected by the MDOT MAA's Airport Noise and Operations Monitoring System (ANOMS). The ANOMS system provides information about specific aircraft activity at BWI Marshall, as provided by the FAA, including the type of aircraft, the runway used, the time of the operation, the specific location of the aircraft during flight, aircraft altitude, and weather information. This precise dataset is supplemented as needed by the MDOT MAA and the FAA forecasts and potential long-range airport development[2] to model future conditions. Information about the specific input data to the noise model is available in the 2020 ANZ. Modeling noise contours between 40 and 60 DNL required an adjustment and extension of the flight profiles used to develop the 2020 ANZ. All other input data remains consistent.

Quality control checks are undertaken at each step of the noise modeling process. DNL contours reflect average annual daily operating conditions, referred to as an Average Annual Day (AAD). Quality control/validation steps include ensuring that the AAD operations modeled are representative of the period being modeled, and that each aircraft type being modeled is available in the model, or that a FAA-approved substitution is used. Quality control steps review all data input into AEDT ensuring that the runways assigned match expected runway use, operations data, time of day splits and stage length (profiles that account for the weight of the aircraft) distribution is correct. Modeled flight track data and track use distribution percentage is visually reviewed ensuring the noise model parameters are of an appropriate refinement to capture small changes in noise exposure, ensuring noise model output data reflects the fidelity of the input data. The MDOT MAA and its technical consultant engaged in multiple reviews of input data throughout the ANZ study process.

The noise modeling software creates DNL estimates of aircraft noise exposure at over 160,000 individual locations (approximately every 600 feet) throughout the study area. Equal-exposure noise contours (like topographic maps that indicate contours of equal elevation) are presented by connecting points of equal aircraft noise exposure. Once developed, the resulting noise contours are compared against other scenarios (for example, previous ANZ studies, environmental studies that include noise contours, or noise contours prepared under the Federal 14 CFR Part 150 Noise Compatibility Program). The MDOT MAA ensures that changes in long term cumulative noise exposure can be rationally explained, whether those changes are a result of changes to the number of operations, fleet mix (such as the retirement of older, louder aircraft), runway use, airfield configuration, or other factors, such as the distribution of operations during the day and night.

Comparison of Modeled versus Measured Noise Exposure (2. the physical validation of the noise model for 65, 60, 55, 50, 45 and 40 dBA DNL; and 3. the process used to physically validate the 65 to 40 dBA DNL contours.")

[2] For the purposes of compatible land use planning, the ANZ assumed that by 2030, construction of a parallel Runway 10R/28L and a 1,000-foot extension of existing Runway 15R/33L to the southeast, both detailed under Phase III of the Airport Layout Plan (ALP), would be constructed. This assumption presents a more conservative approach to compatible land use planning.

AEDT was designed such that field verification and validation of the resulting noise contours would not be necessary, and the FAA states that noise monitoring shall not be used to adjust AEDT results. In fact, comparing noise model results and data from permanent noise monitors is only feasible in limited cases where noise monitors exist. Noise monitor data cannot be a true comparison to modeled results as noise monitors are influenced by the ambient noise environment where they are located whereas noise modeling only represents noise from aviation activity. Beginning in the 1980s, the State of Maryland procured a robust noise and operations monitoring system consisting of software to analyze radar data, permanent noise monitors located throughout the communities surrounding BWI Marshall, and portable noise monitors. In September 2019, the MDOT MAA completed the deployment of a new BWI Marshall Noise and Operations Monitoring System, consisting of twenty-four permanent noise monitors, three portable noise monitors, and advanced analysis software that integrates field noise measurements and aircraft operations data from the FAA. The primary purpose of the system is to analyze and correlate aircraft noise, aircraft flight tracks and aircraft noise complaint data, and provide support to the MDOT MAA's Noise Abatement Program, such as investigating specific aircraft overflights that resulted in noise complaints. Results from the permanent noise monitors are also used to identify long term increases or decreases in noise exposure, which may indicate the need to update noise studies. The location of permanent noise monitors has been driven by the MDOT MAA's previous noise studies in response to community input. The permanent noise monitoring locations are shown in Attachment 1.

The MDOT MAA compared the measured values from the permanent noise monitors to the 2020 ANZ's existing conditions scenario. Noise monitors capture actual noise level data only in real time and they cannot be used to compare future scenarios; the two future scenarios, taken together, comprise the ANZ boundary. The noise model presents only aircraft noise, while permanent noise monitors capture noise levels from aircraft and other sources[3]. The permanent noise monitors present an aircraft DNL, a community DNL, and a total DNL, while the model only presents aircraft DNL.

The comparison presented in the 2020 ANZ was updated and is shown in the following table. The table presents the measured aircraft DNL levels for Quarters 3 and 4 of 2019 and Quarters 1 and 2 of 2020[4], as well as both the annual average aircraft DNL level and the annual average non-aircraft (community) DNL.

[3] Noise monitors capture the noise level every second and rely on sophisticated flight tracking software to match corresponding aircraft overflights with noise events that exceed a given threshold. As such, noise monitors can approximate noise levels associated with aircraft overflights as well as noise levels associated with non-aviation sources, such as automotive traffic, lawn care, wildlife, etc. While noise modeling can calculate noise exposure down to lower levels, real-world conditions show that an aircraft noise event often recedes to levels lower than community noise sources.

[4] MDOT MAA publishes a Quarterly Noise Report, which includes the quarterly aircraft and community DNL levels at each of the permanent noise monitors. The report is available at https://marylandaviation.com/environmental/environmental-compliance-sustainability/quarterly-noise-reports/.

Comparison of 2020 Modeled and Measured Data

NMT #[1]	Location	Q3 2019 Measured Aircraft DNL	Q4 2019 Measured Aircraft DNL	Q1 2020 Measured Aircraft DNL	Q2 2020 Measured Aircraft DNL	2020 Modeled Aircraft DNL	12 Month Measured Aircraft DNL	12 Month Measured Community DNL
1	St. Augustine Church, Elkridge	43	49	43	40	49	45	58
5	Hebron-Harman Elementary, Hanover	53	52	51	47	56	52	58
6	Delmont United Methodist, Severn	55	53	51	48	54	53	58
7	Wicklow Woods, Ferndale	55	55	55	50	60	55	59
8	Richard H. Lee Elementary School, Glen Burnie	50	52	51	49	56	51	64
9	Maryland National Guard Armory, Glen Burnie	55	58	57	54	58	57	63
10	Margate Pumping Station, Glen Burnie	48	50	49	45	48	49	64
11	Jones Rd., Queenstown	70	69	68	64	71	69	63
12	Rippling Woods Elementary, Glen Burnie	62	63	61	58	65	62	60
13	Woodside Elementary, Glen Burnie	49	49	48	45	54	48	60
14	Runway 15R Approach	58	65	58	54	61	61	66
17	Timber Ridge Rd., Hanover	40	42	44	41	57	43	59
18	Runway 15L Approach	56	56	55	53	63	56	60
21	Glen Burnie Park Elementary, Glen Burnie	61	62	60	56	67	61	61
22	Lark Brown Road, Columbia	57	55	54	51	56	55	60
23	Quarterfield Elementary, Severn	59	57	56	52	58	57	59
24	Poplar Grove HOA, Elmhurst, Severn	55	54	56	53	59	56	58
25	Belclare Court, Jessup	53	63	52	48	56	53	59

NMT #[1]	Location	Q3 2019 Measured Aircraft DNL	Q4 2019 Measured Aircraft DNL	Q1 2020 Measured Aircraft DNL	Q2 2020 Measured Aircraft DNL	2020 Modeled Aircraft DNL	12 Month Measured Aircraft DNL	12 Month Measured Community DNL
26	Benfield Elementary, Severna Park	56	64	56	52	57	56	56
27	Severn Elementary School	53	49	54	50	56	53	60
28[2]	Maryland School for the Deaf, Ellicott City	-	55	54	49	54	54	59
29[3]	MDOT Motor Vehicle Administration, Columbia	-	50	49	44	53	48	58
30	Forest Ave, Hanover	64	52	62	58	64	63	64
31	Race Road, Hanover	64	53	63	58	63	63	60

Notes:

[1]NMT's 2, 3, 4, 15, 16, 19, and 20 have been permanently decommissioned at various points in time.

[2]NMT 28 was not in service during Q3 2019 and was out of service between May 30, 2020 and June 7, 2020.

[3]NMT 29 was not in service during Q3 2019.

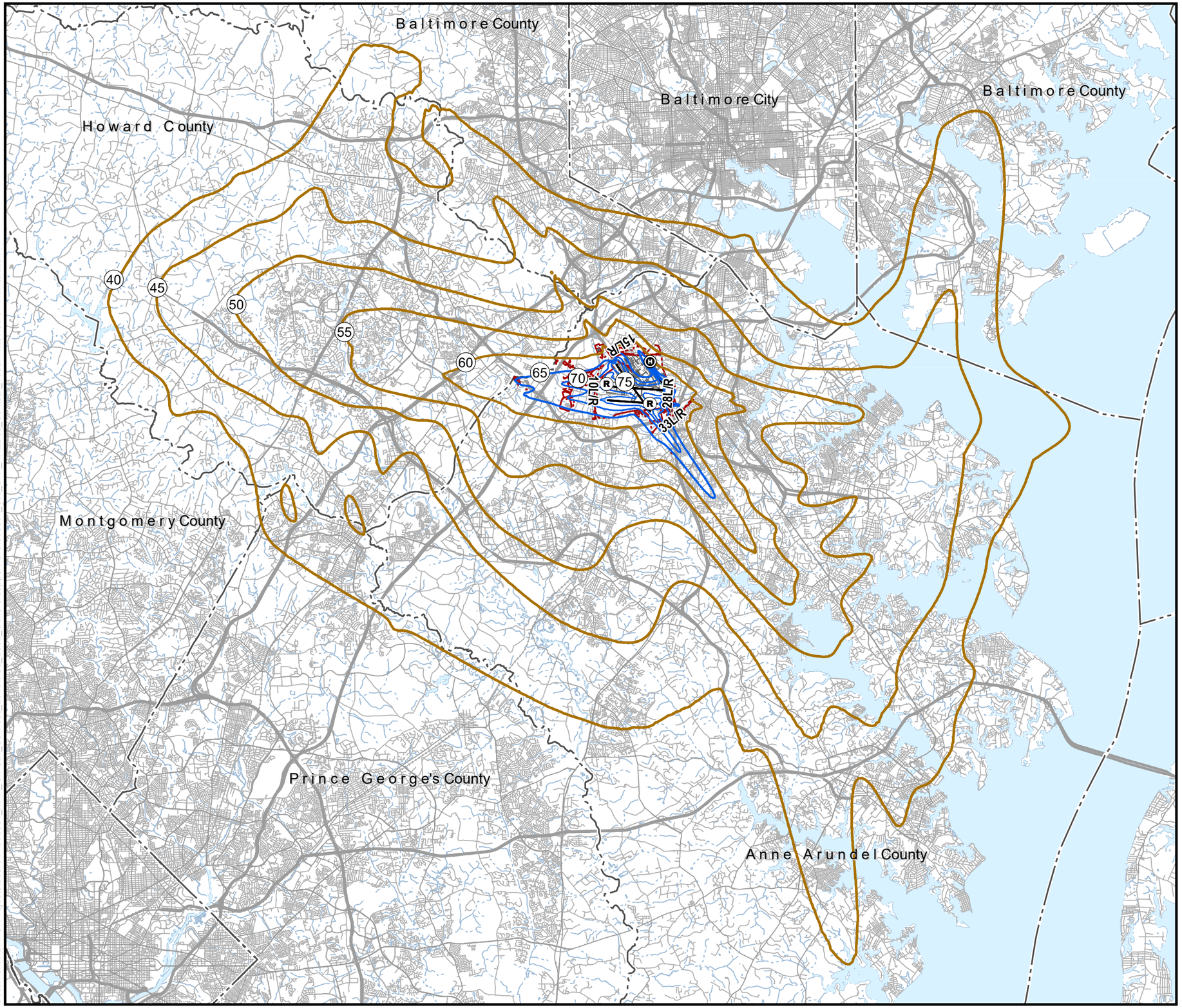
Sources: HMMH 2019, 2020 MDOT MAA ANOMS 2019, 2020

As indicated in the table, the MDOT MAA's permanent noise monitors show aircraft noise exposure ranging from the 43 DNL to 69 DNL. It is critical to understand that measurements are historical and only document what has occurred; they are not predictive. Modeled values are estimates generated by the AEDT and reflect average annual daily operating conditions. Measured values may have non-aircraft noise source influences. For 19 out of 24 noise monitors, ambient and non-aircraft noise sources are greater than aviation noise. For 5 out of 24 noise monitors, aviation noise is greater than or equal to ambient and non-aircraft noise sources. The modeled existing conditions DNL is representative of the modeled annual average day and is not representative of any individual day, or other measured period.

Generally, modeled noise levels are higher than measured noise level data, which produces a conservative ANZ for land use planning purposes. For example, the permanent noise monitor that typically records the loudest quarterly aircraft DNL, NMT #11, shows a 12-month monitored DNL of 69 and a modeled DNL of 71. Nearly all the modeled aircraft DNL values are higher than measured, with one exception. Noise monitors that are averaging below the 65 dB DNL range are more easily influenced by community noise levels due to aircraft noise levels being relatively low. As stated above, due to the impact of other non-aviation noise sources, this variance is expected, and the MDOT MAA considers the data to be in good agreement.

Attachments

Attachment 1: 2020 BWI ANZ Contours to 40 dB DNL



BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

Airport Noise Zone Update

Attachment 1

2020 BWI ANZ Contours to 40 dB DNL

- Original 2020 BWI ANZ Contours
- Extended 2020 BWI ANZ Contours
- MDOT MAA Property Boundary
- Helicopter Operation Area
- Runup Locations
- Runway
- Airport Buildings
- County Boundary
- Roads
- Railroad
- Stream / Creek
- Water

Data Sources: Baltimore County Government Open Data Portal; Environmental Systems Research Institute (ESRI); AirNav.com; HMMH

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