

Aircraft Noise Mitigation Report

(2021 JCR, p. 82)

**A Report to the Maryland General Assembly
Senate Budget and Taxation Committee
and
House Appropriations Committee**

September 2021

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 2021 Joint Chairmen's Report (JCR). The language states:

The budget committees remain interested in efforts that the Maryland Aviation Administration (MAA) is taking to mitigate the impact of aircraft noise on the lives of Marylanders. The budget committees request that MAA submit a report detailing these efforts that are being taken to mitigate the impact of aircraft noise on residents. This report should also include information on how expanded cargo aircraft traffic at Baltimore/Washington International Thurgood Marshall Airport will impact the noise levels being experienced by Marylanders in the area. This report shall be provided by September 1, 2021.

Addressing Community Concerns and Mitigating Aircraft Noise at BWI Marshall

MDOT MAA Noise and Operations Monitoring System

Aircraft noise and the ability to identify changes in noise levels over time is important to both the MDOT MAA and the public. To accomplish this, the MDOT MAA has purchased and installed a permanent noise monitoring system that provides key information to the public about community and aircraft noise levels.

Beginning in the 1980s, the State procured a robust noise and operations monitoring system consisting of software to analyze radar data, permanent noise monitors located throughout the communities surrounding the Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall), and portable noise monitors. In September 2019, the MDOT MAA completed the implementation, construction, and deployment of a new BWI Marshall Noise and Operations Monitoring System (NOMS), consisting of twenty-four (24) permanent noise monitors, three (3) portable noise monitors, and advanced analysis software that integrates noise and aircraft operations. The NOMS exists 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.

The public has 24-hour access to aircraft operations and associated noise levels at each of the noise monitor locations in the surrounding communities. There are twenty (20) noise monitors throughout Anne Arundel County and four (4) noise monitors in Howard County. Interested persons can review aircraft operations and register complaints utilizing MDOT MAA's [WebTrak system](#). Implemented in 2019, WebTrak provides an interactive portal for the viewing of aircraft in the vicinity of BWI Marshall and Martin State Airport and provides the opportunity to file noise complaints directly to MDOT MAA. WebTrak users can geolocate a place of interest (home, work, etc.) and view either current (16-minute delayed) or historical aircraft overflights. WebTrak includes an aircraft's type, altitude, origin & destination airports, and flight identification. WebTrak does not include data on military aircraft flights or operations due to reasons of national security. A map of the permanent noise monitoring locations is contained in **Attachment 1**. The MDOT MAA also uses three portable noise monitors to respond to requests by members of the public for aircraft noise monitoring on their properties to help residents understand both aircraft and community noise levels. Between 2015 and March 2020, the MDOT MAA fulfilled an average of fifteen (15) portable monitor requests per year¹.

¹ Reports and application information are available at <https://maacommunityrelations.com/content/anznoiseupdate/noisemonitoring.php>.

The NOMS is a critical component of the MDOT MAA’s ability to track and respond to noise complaints. The MDOT MAA provides multiple methods to submit aircraft noise complaints, including an on-line form and a 24-hour noise complaint and information hotline (410-859-7021). All noise complaints are logged and reviewed daily. Generally, noise complaints contain requests for information on a specific aircraft overflight, operating conditions, or to register general disapproval of aircraft overflights. The MDOT MAA seeks to provide as much information as possible when researching and responding to noise complaints.

In 2020, 569,649 noise complaints were submitted by 576 complainants, averaging nearly 1,000 noise complaints per complainant. Of the 576 complainants, twenty-five (25) complainants accounted for 83 percent (472,809) of the total 569,649 noise complaints submitted in 2020. The MDOT MAA reviewed the 569,649 noise complaints and determined that 84 percent of the noise complaints could be attributed to an aircraft operation – 16 percent did not correlate with an aircraft noise event and represented other community noise events (i.e. lawn mowing, traffic, etc.). Approximately one million citizens reside within the same zip codes as the 576 complainants.² There were 178,834 aircraft operations (takeoffs and landings) completed at BWI Marshall during the same period as the 569,649 noise complaints were submitted. **Attachment 2** presents the location of all complainants from 2020 in the context of the 2020 Airport Noise Zone (ANZ) (discussed in more detail *infra*).

Voluntary Residential Sound Insulation Program and Voluntary Acquisition Program

To help mitigate the effects of aircraft noise within areas surrounding BWI Marshall, the MDOT MAA, in collaboration with the Federal Aviation Administration (FAA), initiated a Homeowner Assistance Program in 1987. This voluntary program included a Residential Sound Insulation Program (RSIP) and a Resale Assurance Program (which concluded in 2008). More than 750 homeowners have participated in these programs at a cost of over \$52.4 million (adjusted to 2020 dollars), through 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 units³ 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.

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 (16) multi-family structures (apartment, duplex and condominium) including 344 units, at an estimated cost of \$34.4 million. These properties are potentially eligible for sound insulation based on the Airport’s FAA-approved forecast Noise Exposure Map (NEM) for the year 2019 and additional consultation with FAA. The first set of insulation packages is anticipated to begin construction in the 2022/2023 timeframe.

² By comparison, the 2010 Census for the Baltimore–Columbia–Towson Metropolitan Statistical Area, which includes the Counties of Anne Arundel, Baltimore, Carroll, Harford, Howard, Queen Anne’s and Baltimore City, reports a population of over 2.7 million residents.

³ Potential eligibility is based on the location of a residence in relation to the 65 Day-Night Average Sound Level (DNL) noise contour from an FAA-accepted Noise Exposure Map prepared under a Part 150 study.

The Voluntary Residential Property Acquisition program applies to eligible properties that have been zoned non-residential by local government. The MDOT MAA offers voluntary purchase and relocation to expedite transition to a compatible land use. To date, 204 parcels have been acquired at a cost of over \$61 million (adjusted to 2020 dollars), of which 80 percent was provided via Federal funding and 20 percent via State funding.

DC Metroplex BWI Community Roundtable/NextGen Implementation

The DC Metroplex BWI Community Roundtable (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 Roundtable, active since March 2017, is comprised of appointees by State and County elected officials who reside under the approach and departure paths at BWI Marshall.

The FAA's modernization efforts of the Next Generation Air Transportation System (NextGen) was mandated by Congress and reflects the FAA's mission of safety and efficiency. However, the FAA's implementation of NextGen and new flight procedures at BWI Marshall has been problematic for the State and communities surrounding BWI Marshall. The MDOT MAA has invested considerable technical and financial resources in excess of \$1 million in support of the Roundtable. Under the Roundtable's charter, the MDOT MAA and members of the airline industry (Industry) serve as technical advisors and the MDOT MAA remains committed to working with the FAA, Industry, and the Roundtable to advance a series of proposed revisions to the FAA's published flight procedures. These were submitted to the FAA by the MDOT MAA in December of 2019 and the MDOT MAA expects the FAA to begin their formal review of those procedures in 2021. The FAA projects their formal review process, including completing an environmental review with public meetings, will run into 2023 before implementation of any feasible changes can occur.

BWI Marshall Airport Noise Zone & Airport Noise Zone Development Permit Review

The Maryland Environmental Noise Act of 1974 provides for the protection of citizens from the impact of transportation related noise. The aviation portion of the Act requires the MDOT MAA to create an 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 initial ANZ and NAP for BWI Marshall were established in 1976 and are required to be updated every five years. In 2019, the MDOT MAA initiated an update to the BWI Marshall ANZ.⁴ The ANZ is determined by a composite of three noise contours: existing conditions (2020) and two forecast years (2025 and 2030) that include consideration for forecast growth and planned facility improvements. The largest of the three contours in any area around the Airport determines the Noise Zone, thereby offering protection within the largest of the existing or future noise exposure contours. The noise environment is described by contours of equal noise exposure, representing the noise that occurs during an average 24-hour day, in terms of the DNL metric. Compatible land use standards are outlined in COMAR Section 11.03.03.03, Limits for Cumulative Noise Exposure, and indicate that 65 DNL is the typical threshold for residential and other noise-sensitive land uses.

Public Participation: The 2020 BWI Marshall ANZ Update included opportunities for public involvement and participation. A Stakeholder Advisory Committee was convened at the onset of the study, which included representatives of stakeholder groups such as tenants, local planning and zoning officials, and representation from communities most affected by airport noise, including

⁴ The Final ANZ as well as materials from the Stakeholder Advisory Committee meetings, can be viewed at <https://maacommunityrelations.com/content/anznoiseupdate/bwianz.php>.

those that have historically been part of the BWI Neighbors Committee. The Stakeholder Advisory Committee was convened three times during the ANZ update process, in January, August, and September 2020, to solicit input, review materials, and provide a means to disseminate study findings. On January 28, 2021, a virtual public workshop and public hearing was held following publication of the Draft study. None of the comments received affected the results of the ANZ.

Results: The 2020 ANZ encompasses approximately 5,543 acres within the composite 65 DNL noise contour, 53 percent of which remains on the MDOT MAA's property and is approximately 1,030 acres larger than the previous ANZ contour certified in 2014 (an increase of 23 percent). The 2020 ANZ also represents an increase in estimated population of 10 percent and in estimated households of 5 percent relative to the 2014 ANZ. Notable factors that result in the increased size of the 2020 ANZ include the hourly distribution of operations (with a higher percentage of operations occurring between 10:00 p.m. and 7:00 a.m.), changes in the aircraft fleet mix, differences in number of operations and assumed aircraft maintenance runups, and differences in the anticipated utilization of the runways associated with the future layout of the airport.

Review of the Noise Abatement Plan: The MDOT MAA is required to implement a NAP at BWI Marshall if noncompatible land uses exist within the ANZ. The NAP prescribes measures to monitor and reduce or eliminate noncompatible land use areas around BWI Marshall to the extent feasible, while maintaining safe and efficient airport operations. The NAP is designed to minimize the noise of aircraft operations within the constraints of the Federal Air Traffic Control System and ensure aircraft safety.

BWI Marshall has a comprehensive NAP which has been developed over several decades, through extensive cooperative efforts with citizens and users of BWI Marshall. The program includes noise abatement measures, compatible land use measures, and measures that focus on program implementation, communication, monitoring, and updating. This cooperative MDOT MAA, citizen and airport operator and tenant effort has been, and will continue to be, the key to the success of the noise abatement program. The review of the NAP as part of this process included a review and analysis of compliance with the historic noise abatement procedures, a refinement of the description of current NAP procedures to conform with NextGen terminology and procedures, and a refinement and update of the NAP to reflect the airfield layout and ongoing programs (i.e. closure of Runway 4/22, land use mitigation, MDOT MAA noise complaint procedures).

The study process and results were presented and approved by the Maryland Aviation Commission on November 18, 2020 and again on March 17, 2021. The new 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. Anyone desiring to construct or modify a structure or establish land use within the ANZ is required to first obtain an airport zoning permit from the MDOT MAA. The MDOT MAA is required by law to approve or deny zoning permits based on the location relative to the BWI Marshall ANZ. If an airport zoning permit is denied, the applicant may appeal to the Board of Airport Zoning Appeals for a variance from the noise regulations. If the Board of Airport Zoning Appeals elects to grant a variance, the Board will require the applicant to comply with all applicable minimum standards of noise attenuation adopted by the MDOT MAA and give an aviation easement over the property to MDOT MAA.

FAA Part 150 Noise Compatibility Study

Title 14 Code of Federal Regulations Part 150, "Airport Noise Compatibility Planning," (Part 150) provides the methodology and procedures to be used in preparing aircraft noise exposure maps and developing noise compatibility programs⁵. Conducting a voluntary Part 150 study qualifies airport

⁵ Part 150 was preceded by Maryland law that requires MDOT MAA to prepare an ANZ and NAP for State-

operators for the FAA grant funding such as for homeowner assistance programs like a sound insulation program. The MDOT MAA's past participation in this program has been used to determine the boundary of eligibility for the RSIP and the voluntary acquisition program.

The MDOT MAA most recently completed and submitted a Part 150 study in 2016. Typically, due to the technical similarities and to realize cost efficiencies, the MDOT MAA undertakes both the ANZ and Part 150 studies simultaneously. However, due to the FAA's consideration of potential changes to flight procedures, the MDOT MAA, after consultation with the FAA, elected to delay initiating a Part 150 study. The MDOT MAA intends to move forward with a Part 150 study once the FAA has implemented changes to the aircraft arrival and departure procedures presently under consideration by the FAA. The MDOT MAA remains in close coordination with the FAA and has developed a detailed scope of work. It should be noted that a Part 150 study evaluates noise exposure for an existing condition and a condition five years into the future, while the ANZ study evaluates existing and future operations for both a five year and more conservative ten year condition. If the future Part 150 forecasts an increase in the size of noise contours, the MDOT MAA will seek to expand eligibility in the RSIP.

Environmental Review under the National Environmental Policy Act

The MDOT MAA is constantly evaluating the facilities at BWI Marshall and programming improvements to accommodate existing and forecast activity levels, meet the latest industry safety and design standards, and ensure a high level of service to the passengers, tenants, and users of the airport. These improvements are typically identified during a master planning effort that prioritizes improvements across a 20-year horizon and gives strategic consideration to conceptual developments that may be needed in the longer term. These planning efforts include activity level projections such as the number of passengers and number and type of aircraft that will fly into and out of the airport. The MDOT MAA procedure is to directly align these planning projections to the FAA's Terminal Area Forecast, which is developed annually for each specific commercial service airport in the context of both regional and national airspace demand. The proposed improvements are then depicted on an FAA-approved Airport Layout Plan.

Under the National Environmental Policy Act and implementing guidelines, the MDOT MAA and the FAA are required to identify and disclose the potential environmental impacts associated with any proposed development. In late 2020, the MDOT MAA and the FAA concluded efforts on the *Final Environmental Assessment and Section 4(f) Determination for Airport Layout Plan) Phase I Improvements at BWI Marshall Airport*.⁶ As part of the Environmental Assessment (EA), aircraft activity forecasts were validated using the latest FAA Terminal Area Forecast and potential environmental impacts, including those associated with aircraft noise, were evaluated. Notably, the development alternatives evaluated in the EA will have no effect upon aircraft operations when compared to the No Action Alternative – meaning these improvements will not generate new operations, but rather meet current design standards and provide better customer service and more efficient facilities for existing tenants and users of the airport.

Relative to noise exposure in the community, noise modeling performed for the EA identified that, compared to the No Action Alternative, implementation of these projects would result in an additional 0.5 acres of residential land use, spread across multiple parcels located west of the airport, falling within the future 65 DNL contour. Upon closer inspection, it was determined that no residential structures are located within these areas. As such, following the FAA's guidelines for determining significant impacts, the proposed improvements included in the EA would have no

owned facilities, as discussed *infra*.

⁶ Information about the Final Environmental Assessment can be found at <https://marylandaviation.com/environmental/environmental-planning/>.

significant noise impact and no mitigation would be required.

Based on the analysis contained in the EA and required interagency and public engagement, including two virtual public workshops held in March 2020, the FAA issued a “Finding of No Significant Impact / Record of Decision” for the proposed improvements. This allows MDOT MAA to move forward on important projects such as taxiway and runway pavement work, obstruction removal on-and-off airport for safety purposes, vehicle service road improvements, fire training facility improvements, construction of an airline maintenance facility, and other various improvements at BWI Marshall.

Additional Activities, Efforts, and Programs

The MDOT MAA undertakes various additional outreach efforts with the local communities and elected officials, as well as coordination with local government. These efforts include:

- Community/HOA Meetings: Upon request, the MDOT MAA attends, presents, and answers questions by community organizations, homeowners’ associations, and other special interest groups.
- Elected Official Briefings: As requested, the MDOT MAA presents to Federal, State, and local elected officials on a wide range of topics, including aircraft noise impacts.
- Coordination with Anne Arundel and Howard Counties: The MDOT MAA, as well as all of MDOT’s transportation business units, coordinate with both Anne Arundel and Howard County annually on the State’s six-year Consolidated Transportation Program which identifies key transportation improvement projects and associated budgets to be pursued within each jurisdiction. The MDOT MAA also collaborates with both counties, by invitation, on their comprehensive land use planning initiatives, including the current Anne Arundel County General Development Plan 2040, and ongoing transit-oriented development projects which strive to optimize mixed-use development near transit facilities such as the BWI Amtrak Station.
- Quarterly Noise Reports: The [Quarterly Noise Report](#) provides a review of the aviation noise abatement program at BWI Marshall, and includes updates on the level of aircraft operations, noise levels at the permanent noise monitoring sites, a summary of complaints received about aircraft noise, and updated community involvement activities.
- MAA Community Relations Website: The MDOT MAA maintains a [website](#) dedicated to noise and community relations. The website contains frequently asked questions, links to relevant noise studies, information about the Roundtable, Quarterly Noise Reports, near-real time flight tracking information, and means to submit noise complaints.
- BWI Neighbors Committee: The BWI Neighbors Committee has historically served as a liaison between BWI Marshall and the surrounding communities to ensure continuing and timely discussion of mutual airport and community interests. Such interests include, but are not limited to, ground (highway) access, long-range plans, operational changes, noise, parking and land use. This committee serves as a forum for exchanging information, ideas and suggestions. Although activity and interest in the BWI Neighbors Committee has fluctuated in the past, the MDOT MAA is taking steps to reinvigorate this group.
- Transportation Community Enhancement Grant Program: The MDOT MAA manages this program that provides benefits to those citizens living in the communities impacted by the daily operations of BWI Marshall, by allowing communities the opportunity to apply for grants for transportation related projects. Typical projects include speed humps, streetscapes, bus shelters, sidewalk repairs, etc. These communities must be located within the 1998 Airport Noise Zone or within two miles of the outermost noise contour.

Additional Initiatives Outside of the MDOT MAA

Although not under the jurisdiction of the MDOT MAA, a number of important research and policy discussions are ongoing and have the potential to be relevant. These include:

- FAA Research and Policy: The DNL metric measures the level of annoyance from aircraft noise exposure, and the FAA and State of Maryland have adopted a threshold of 65 DNL for compatible land use. In January 2021, the FAA released the results of an extensive multi-year nationwide study on public perception of unacceptable noise levels as compared with the current federal policy of 65 DNL (which has been in use by policy makers since the early to mid-1970s)⁷. This FAA-led study drew from a candidate list of nearly 100 commercial service airports across the country, including BWI Marshall, and surveyed 20 deemed as most representative of the nation. With the encouragement of the MDOT MAA, the Roundtable requested a briefing from the FAA on the results of this study. As a result, the Roundtable was one of the first airport community roundtables in the country to be briefed. FAA requested national feedback on its research. Current regulations in COMAR are consistent with Federal guidelines, and as such, MDOT MAA will monitor the research and feedback and follow any relevant national policy changes implemented by FAA.
- Health and Economic Effects Study by the University of Maryland, Baltimore County (UMBC): As a result of State legislation, the Secretary's Office of MDOT provided a grant to UMBC to conduct a study to model the health and medical economic burden of airplane noise pollution as a result of NextGen around BWI Marshall.

Trends in BWI Marshall Air Cargo Aircraft Operations

Although BWI Marshall predominantly offers passenger service, a number of dedicated cargo operators provide service at BWI Marshall. According to statistics reported by the FAA, BWI Marshall ranked 24th nationally in 2020 in terms of total weight of cargo. Over the last ten years, cargo operations average between 3 percent and 4 percent of all BWI Marshall aircraft operations.⁸ However, cargo operations and the total weight associated with cargo has increased steadily since 2017. This growth in air cargo, which is in direct response to changing consumer shopping habits, has spurred additional regional development and employment related to logistics, warehousing, and last-mile delivery including multiple facilities in the commercial/industrial zoned areas near BWI Marshall. The MDOT MAA recently saw the completion of a midfield air cargo expansion project that resulted in a new 200,000 square foot cargo building and the addition of approximately 2,000 new jobs.

Air cargo operations are often perceived to be more intrusive than passenger aircraft due to a number of factors. The traditional cargo schedule of operations typically occurs during overnight hours at many airports; however, in 2020, nearly 60 percent of all cargo operations at BWI Marshall occurred during daytime hours (considered 7:00 a.m. to 10:00 p.m.). The aircraft fleet used by cargo operators tend to be older generation aircraft, some of which may include former passenger aircraft. However, all the aircraft operated by the cargo carriers meet Federal regulations regarding aircraft noise levels.

As a public use facility that accepts Federal funding, the MDOT MAA does not have the ability to regulate or dictate the aircraft that use BWI Marshall, nor the times in which operators can use the

⁷ Information about the FAA's Neighborhood Environmental Survey can be found at https://www.faa.gov/regulations_policies/policy_guidance/noise/survey/.

⁸ Cargo operations have accounted for a larger percentage of operations in 2020 and 2021 to date, on account of reduced passenger traffic.

airport. The FAA regulates the maximum noise level that an individual civil aircraft can emit through requiring aircraft to meet certain noise certification standards, which are defined in the Code of Federal Regulations (CFR) Title 14 Part 36 – Noise Standards: Aircraft Type and Airworthiness Certification (14 CFR Part 36).

In the recently completed EA for proposed development at BWI Marshall, which received a Finding of No Significant Impact / Record of Decision from the FAA in September 2020, the forecast of aircraft activity was validated to be consistent with the latest FAA Terminal Area Forecast. The forecast anticipates that cargo operations at BWI Marshall would increase approximately 2-3 percent by 2027, resulting in an increase of approximately one operation on an average annual day. Consistent with Federal and State requirements, and as discussed above, aircraft noise at BWI Marshall is modeled using the DNL metric, which is a cumulative noise metric (rather than a single-event metric) that accounts for the increased annoyance of nighttime (defined as 10:00 p.m. to 7:00 a.m.) operations by factoring them by 10. The resulting change of noise exposure, including changes to the cargo operations and fleet mix, is below the threshold for significant noise impacts according to the FAA.

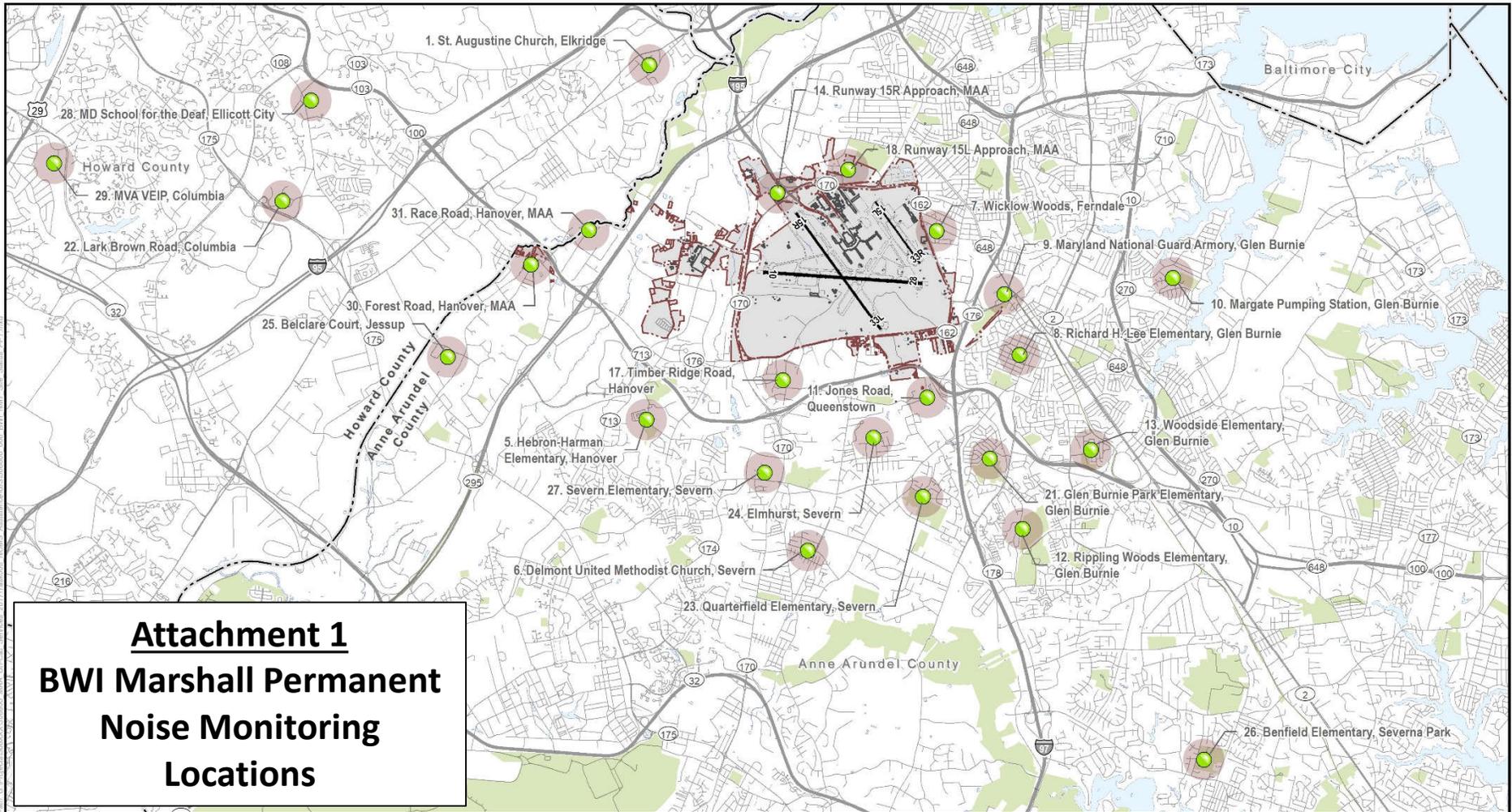
Conclusion

Using the NOMS and through modeling noise exposure for both ANZ studies and 14 CFR Part 150 studies, the MDOT MAA will continue to identify existing and forecast noise exposure due to cargo and all other operations at BWI Marshall. As necessary, the MDOT MAA will work to minimize the potential for future incompatible development and offer mitigation to residents who may be newly impacted by noise levels that the State and Federal government use to identify impacts. Furthermore, the MDOT MAA will seek to expand efforts to interact with surrounding communities through efforts like the reformed BWI Neighbors Committee.

Attachments

Attachment 1: Map of Permanent Noise Monitoring Locations

Attachment 2: Map showing the location of 2020 Noise Complaints and the 2020 BWI Marshall ANZ



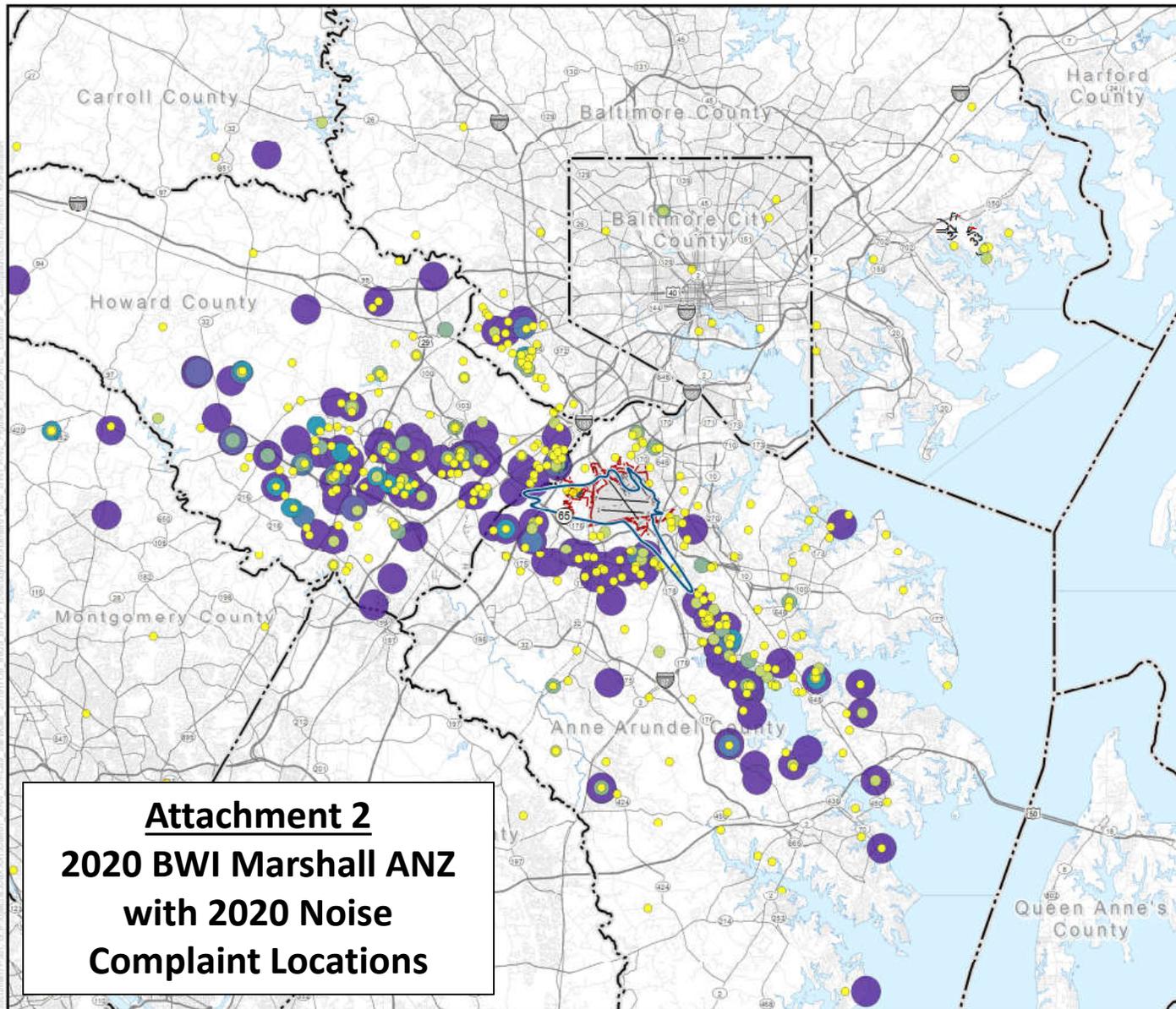
Attachment 1
BWI Marshall Permanent
Noise Monitoring
Locations

-  NMT Location (Active)
-  BWI Airport Property
-  County Boundary
-  Roads

BWI Marshall Permanent Noise Monitor Locations

Revised on 10/8/2019



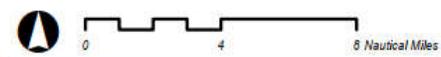


Airport Noise Zone Update

**Attachment 2:
2020 Noise Complaints and 2020 BWI Marshall ANZ**

- 2020 ANZ DNL Contour
- Number of Complaints per Address Location
 - 1-5
 - 6-15
 - 16-25
 - 26-35
 - 36-45
 - 46-60
 - 61-80
- MDOT MAA Property Boundary
- Runway
- Airport Buildings
- County Boundary
- Roads
- Railroad

Data Sources: MDOT MAA; Anne Arundel County; Howard County; Baltimore County Government Open Data Portal; National Register of Historic Places (NRHP); Environmental Systems Research Institute (ESRI); AirNav.com; HMMH



Attachment 2
2020 BWI Marshall ANZ
with 2020 Noise
Complaint Locations