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Portable Noise Measurement Report

Glendale Avenue, Glen Burnie, MD 21061

Maryland Aviation Administration

March 2025



Introduction

PURPOSE

The purpose of the *Portable Noise Measurement Report* is to summarize aircraft and community noise levels at a specific location upon request of a homeowner. The program is offered by the Maryland Department of Transportation Maryland Aviation Administration (MAA), with technical support and report preparation provided by Harris Miller Miller & Hanson Inc. (HMMH) and Airport Design Consultants, Inc. (ADCI).

NOISE DATA

It should be noted that the noise data provided in this report represents noise and operating levels only during the period of the measurements. Noise levels associated with aircraft overflights can vary with the number of operations, wind and weather patterns, temperatures, pilot procedures and Air Traffic Control instruction, and other variables.

MONITORING TIME AND LOCATION

This report presents the measured aircraft and community noise levels from November 23, 2024 to January 7, 2025, at Glendale Avenue, Glen Burnie, MD 21061. The monitoring location is approximately 1.1 statute miles from the center of Baltimore/Washington International Thurgood Marshall (BWI Marshall) Airport. **Figure 1** shows the location of the measurement site (marked as BW344) relative to BWI Marshall.

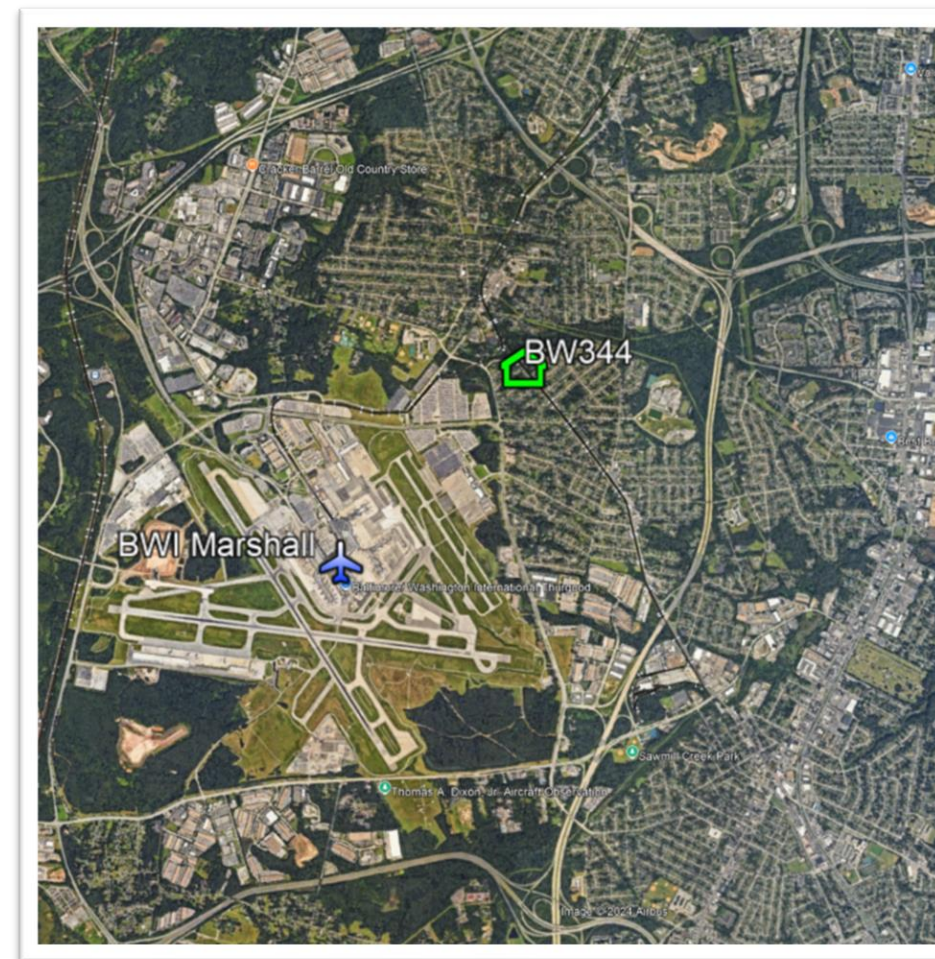


Figure 1. Noise Monitoring Location in Relation to BWI Marshall

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Site BW344 Summary

? WHEN WAS NOISE MEASURED

Saturday, November 23, 2024 to
Tuesday, January 7, 2025

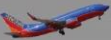
46
DAYS

Nov	S	M	T	W	T	F	S
	17	18	19	20	21	22	23
December	24	25	26	27	28	29	30
	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
Jan	22	23	24	25	26	27	28
	29	30	31	1	2	3	4
	5	6	7	8	9	10	11

✈ HOW MANY AIRCRAFT NOISE EVENTS OCCURRED AND WHAT WERE THEY



TOP 3 MOST FREQUENT AIRCRAFT DURING THE MEASUREMENT PERIOD

Rank	Aircraft Type	Operation Type and Runway
1	Boeing 737-700 	Departure, 28
2	Boeing 737-800 	Departure, 28
3	Boeing 737-800 MAX 	Departure, 28

🔍 CONCLUSION

During the 46-day measurement period, the Day Night Average Noise Level (DNL) from aircraft noise events was 47 decibels (dB), while the DNL from community noise was 57 dB.

FAA's threshold for land use compatibility is an aircraft-only DNL of 65 dB based on annual average daily aircraft operations.

Aircraft DNL	Community DNL	Total DNL	FAA Threshold
47 dB	57 dB	58 dB	65 dB

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Aircraft Operations

FLIGHTS DURING MEASUREMENT PERIOD

Operations at BWI Marshall fluctuate on a daily basis. During the measurement period, there were 28,247 flights in and out of BWI Marshall (14,127 arrivals, 14,120 departures), in addition to overflights to other airports.

FIXED-WING OPERATIONS

The number of flights per day ranged from 261 to 754. Flights in the vicinity of this site are primarily departures from BWI Marshall Runway 28 and arrivals to Runway 33R. BWI Marshall has three runways, designated as Runway 10/28, Runway 15R/33L, and Runway 15L/33R. Runway 10/28 is 10,502 feet in length, while Runway 15R/33L is 9,500 feet in length. Runway 15L/33R is 5,000 feet in length and is only used by certain aircraft. As aircraft cannot arrive and depart from the same runway, BWI Marshall generally operates in two configurations: west flow (primarily departures from Runway 28 and arrivals to Runway 33L) and east flow (primarily departures from Runway 15R and arrivals to Runway 10). On an annual basis, west flow is used approximately 70% of the time, while east flow is used approximately 30% of the time. During west flow, aircraft operations primarily consist of arrivals to BWI Marshall Runway 33L and departures from Runway 28. During east flow, aircraft operations primarily consist of departures from BWI Marshall Runway 15R and arrivals to Runway 10. Arrivals to BWI Marshall were generally 0 to 2,300 feet above ground level at their point of closest approach to the measurement site (0 feet meaning the aircraft breaking triggered the noise monitor). Departures from BWI Marshall were generally 0 to 1,300 feet above ground level at their point of closest approach to the measurement site (0 feet meaning the aircraft takeoff roll triggered the noise monitor). During the measurement period, the west flow runway use was 77% (**Figure 2**), and the east flow runway use was 23% (**Figure 3**).

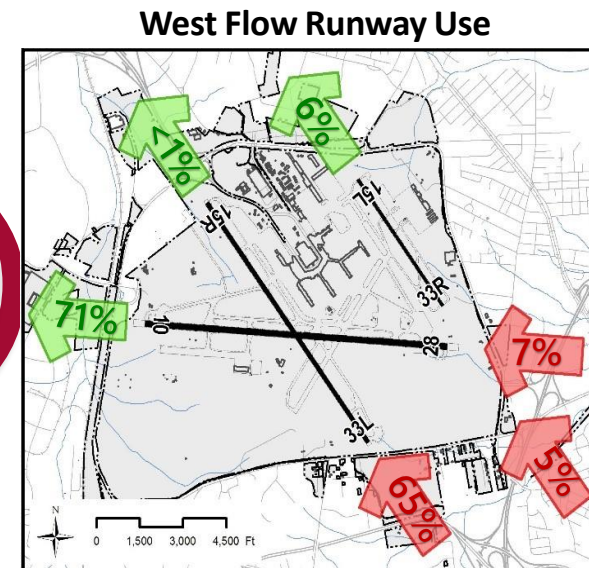
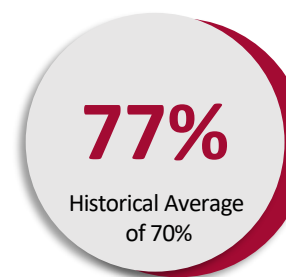


Figure 2. West Flow Runway Use During Measurement Period

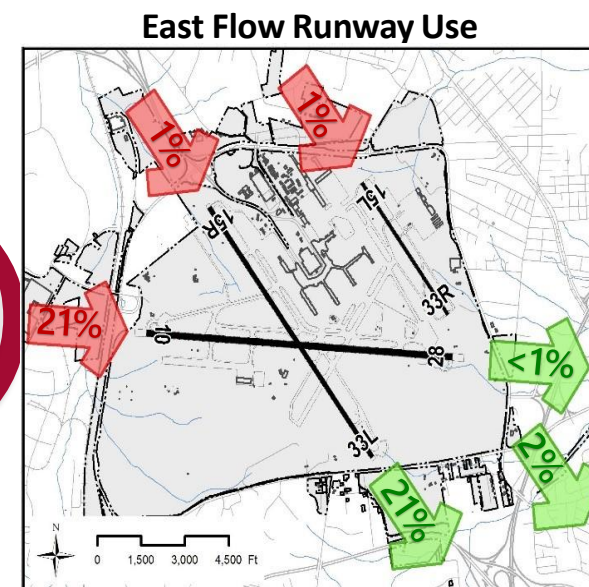
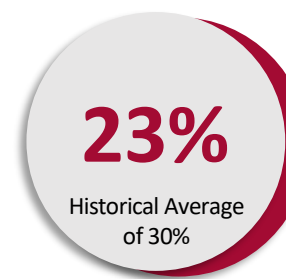


Figure 3. East Flow Runway Use During Measurement Period

Methodology and Location

MEASUREMENT LOCATION AND SETUP

Aircraft noise levels were measured from November 23, 2024 to January 7, 2025, at Glendale Avenue, Glen Burnie, MD 21061.

The noise monitor is a Type I sound level meter and was regularly calibrated. Additionally, the system was checked every two to four days during the measurements to ensure proper operation. During setup, a baseline threshold was established for the noise monitor. Once the sound level exceeded the baseline threshold for 5 seconds, a noise event was recorded. For each noise event, the sound level meter recorded date, time, duration, and noise levels.

The noise monitor was placed in the backyard of the residence. Notable noise sources at this site included aircraft overflights to and from BWI Marshall as well as overflights to and from other airports, and other typical suburban sounds such as local vehicle traffic.

DATA COLLECTION

Once the temporary noise monitoring period was complete, the noise event data was collected from MAA's Noise and Operating Monitoring System (NOMS) to analyze the times of noise events at the site to its database of aircraft radar flight paths. The NOMS conservatively attributes any noise event to an aircraft if the aircraft is within 8,000 feet of the measurement site at an altitude no greater than 10,000 feet. Noise events which occurred while aircraft were passing within the vicinity were associated with an actual aircraft flight and therefore assigned as aircraft noise events. Noise events that did not correlate with an aircraft overflight were assigned as community noise events. Using this methodology, some noise events that are correlated with aircraft overflights may include other community noise, which may or may not exceed the noise level from the aircraft overflight. **Figure 4** on the next page displays all arrivals and departures to and from BWI Marshall during the measurement period. **Figure 5** displays all arrivals and departures to and from BWI Marshall that were correlated with aircraft noise events.

Arrivals and Departures

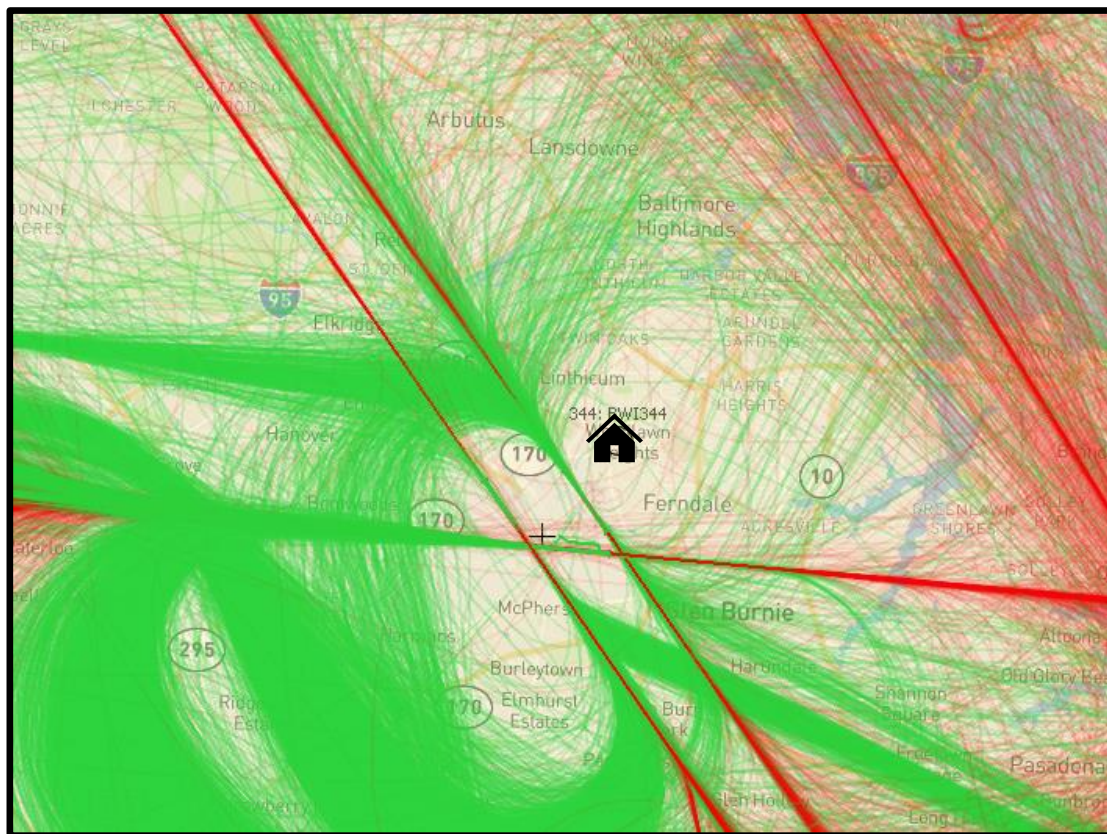


Figure 4. All BWI Marshall Arrivals and Departures During the Measurement Period

Note: Green = Departures, Red = Arrivals

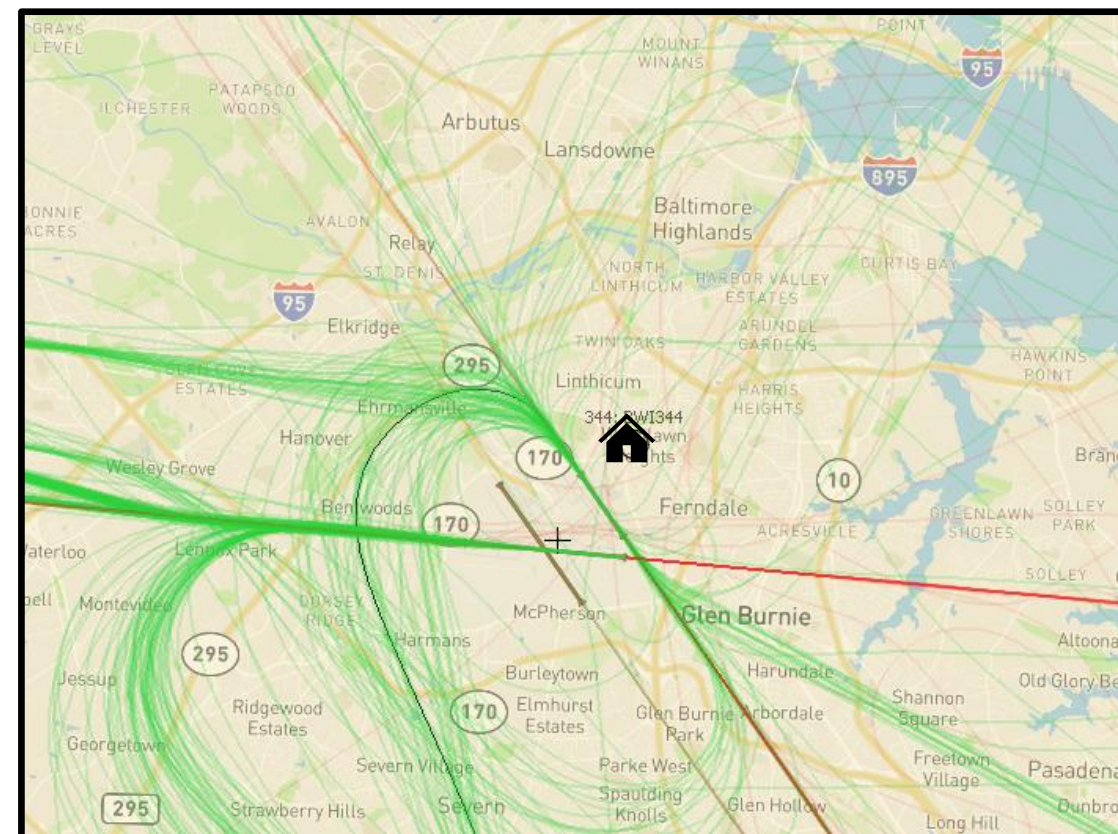


Figure 5. BWI Marshall Arrivals and Departures Correlated to Aircraft Noise Events During the Measurement Period

Note: Green = Departures, Red = Arrivals

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Measured Noise Levels

NOISE METRICS

There are several key metrics that are used to describe aircraft and community noise on a single-event and cumulative basis. The appendix titled “How Do We Describe Aircraft Noise” provides a more detailed overview of the metrics which are discussed in this section. Single-event metrics such as Maximum A-Weighted Sound Level (Lmax) are indicators of the intrusiveness, loudness, or noisiness of individual noise events while cumulative metrics like Day-Night Average Sound Level (DNL) are generally used to measure long-term noise and are indicators of community annoyance and land use compatibility.

Figure 6 presents the range of maximum single-event sound levels for 438 aircraft overflights at the measurement site for the complete measurement period. For a particular noise event, such as an aircraft overflight, the loudest level at any instant during the event is the Lmax. For typical conversational speech at approximately 3 feet, speech is interrupted by noise levels at or above 65 dB. Any noise events shown in this figure with a maximum level at or above 65 dB would interrupt typical conversations outdoors (briefly for quieter events and longer for louder events). **Figure 7** shows common environmental A-weighted noise levels for typical outdoor sounds.

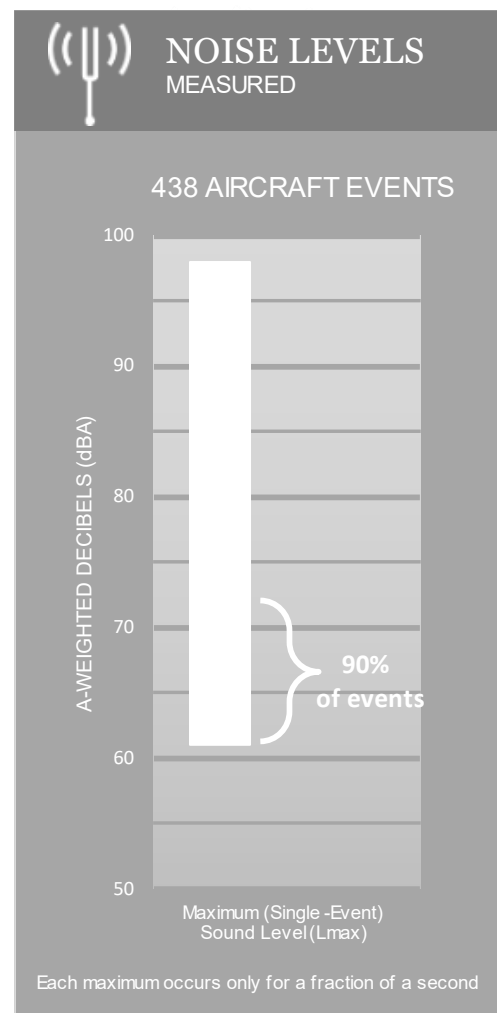


Figure 6. Maximum Single Event Aircraft Noise Levels

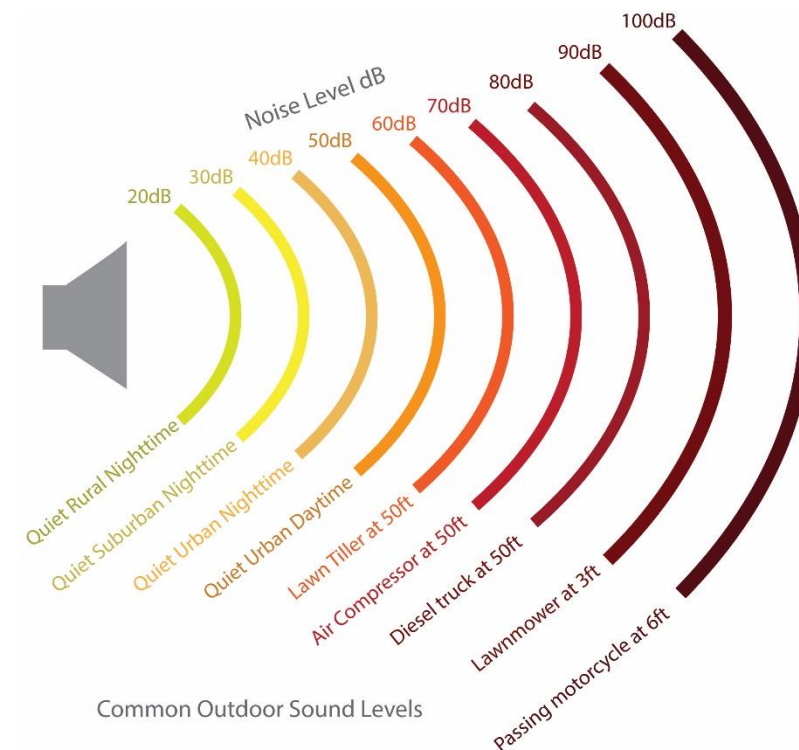


Figure 7. Common Environmental Noise Levels

Loudest Aircraft Events

Table 1 shows the top 15 loudest aircraft events that occurred during the measurement period including details about the date and time the event occurred, aircraft type, operation type, runway, and slant range (the line-of-sight distance between the receptor and the aircraft). Note that these events only represent the noisiest aircraft events at the measurement site, and the majority of aircraft overflights at the measurement site were less noisy than those shown in **Table 1**. A majority of events have altitudes of 0 feet, meaning noise from the aircraft's takeoff or breaking was the loudest part of the arrival or departure.

Note: In some cases, community events may occur simultaneously with aircraft overflights, causing aircraft overflights to have higher recorded sound levels.

Table 1. Top Fifteen Loudest Aircraft Events During the Measurement Period

Rank	Flight Time	Airline	Aircraft Type	Operation Type	Runway	Altitude (ft. AGL)	Slant Range (ft.)	Maximum Sound Level (dBA)
1	12/22/2024 15:39	N/A	Cessna Citation 550	Arrival	33R	0	4,265	98
2	12/22/2024 15:41	N/A	Cessna Citation 560X Excel	Departure	33R	0	4,304	85
3	11/27/2024 8:07	N/A	Cessna Citation 560	Arrival	33R	0	4,298	81
4	12/31/2024 6:34	Southwest	Boeing 737-800	Departure	28	0	7,405	79
5	1/2/2025 14:39	Southwest	Boeing 737-800	Arrival	28	0	7,680	78
6	12/1/2024 7:24	DELTA	Airbus A321	Departure	28	0	7,411	77
7	12/1/2024 16:55		AgustaWestland AW139 Helicopter	Overflight	N/A	832	1,847	77
8	1/3/2025 8:59	Southwest	Boeing 737-700	Departure	28	0	7,346	76
9	12/8/2024 14:30		Cessna Citation 560X Excel	Arrival	33R	0	4,416	76
10	11/30/2024 14:39	UP	AgustaWestland AW139 Helicopter	Overflight	N/A	842	1,089	76
11	12/29/2024 0:01	Southwest	Boeing 737-800	Departure	28	0	7,405	76
12	12/28/2024 18:00	Copa Airlines	Boeing 737-800	Departure	28	0	7,582	76
13	12/21/2024 20:26	N/A	AgustaWestland AW139 Helicopter	Departure	H	661	866	76
14	12/29/2024 21:34	UNITED	Boeing 737-900	Arrival	10	1,797	2,851	76
15	12/6/2024 8:03		Gulfstream GV	Arrival	33R	0	4,347	76

Conclusion

DAY-NIGHT AVERAGE SOUND LEVEL

Figure 8 on the following page presents the cumulative DNL at the measurement site for the 46 complete days of the measurement period for community, aircraft, and total noise exposure. **Figures 9a and 9b** on the following page present the daily DNL at the site for aircraft noise exposure. DNL sums the noise from every noise event over the day. The formula for DNL gives an extra 10 decibel weighting to nighttime noise events to account for the intrusive nature of these events. The aircraft DNL ranged from 0 to 60 dB during the measurement period. The total aircraft DNL for the measurement period was 47 dB. The DNL for all recorded community noise events (wildlife, landscaping, weather, etc.) during the measurement period was 57 dB. The total DNL at the measurement site, which includes both aircraft and community noise events, was 58 dB.

AIRCRAFT OPERATIONS

Aircraft noise levels at this site are higher when BWI Marshall operates in west flow. During the measurement period, BWI Marshall operated in east flow 23% of the time and in west flow 77% of the time, which is a higher usage of west flow than the annual average of 70% west flow operations and 30% east flow operations.

MONITORING RESULTS

The results of the portable noise monitoring are for informational purposes only and capture the aircraft noise environment for a snapshot in time. The conditions during a monitoring period can vary greatly due to wind and weather (atmospheric conditions), the runway(s) in use at the time for arrivals and departures, and the number and type of operations occurring during the monitoring period. From the data collected, aircraft noise levels in terms of the DNL were calculated and resulted in a 46-day average of 47 dB.

GUIDELINES AND REGULATIONS

In Appendix A of 14 CFR Part 150, the Federal Aviation Administration provides guidelines for the compatibility of land uses with various annual DNL values. Code of Maryland Regulations (COMAR) 11.03.03.03 establishes limits for cumulative noise exposure for certain land uses around BWI Marshall. These guidelines consider residential land use to be noncompatible when the DNL is 75 dB or greater. For noise levels between 65 dB and 75 dB DNL, residential land use is considered noncompatible, but where the community determines that this land use must be allowed, measures to achieve greater than typical outdoor to indoor noise level reduction should be incorporated into building codes. The guidelines designate all land uses, including residential, as compatible for DNL values below 65 dB.

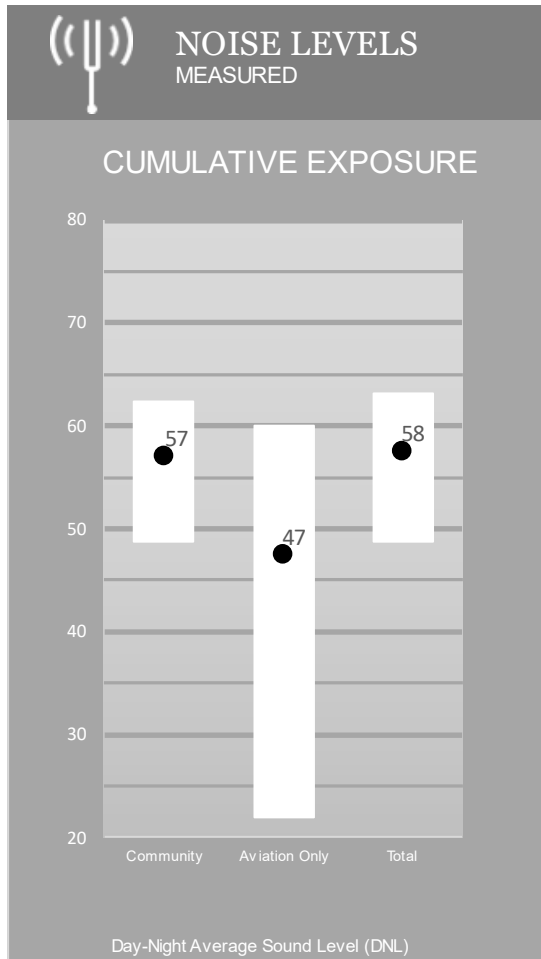


Figure 8. Cumulative Noise Exposure from Aircraft and Community Sources

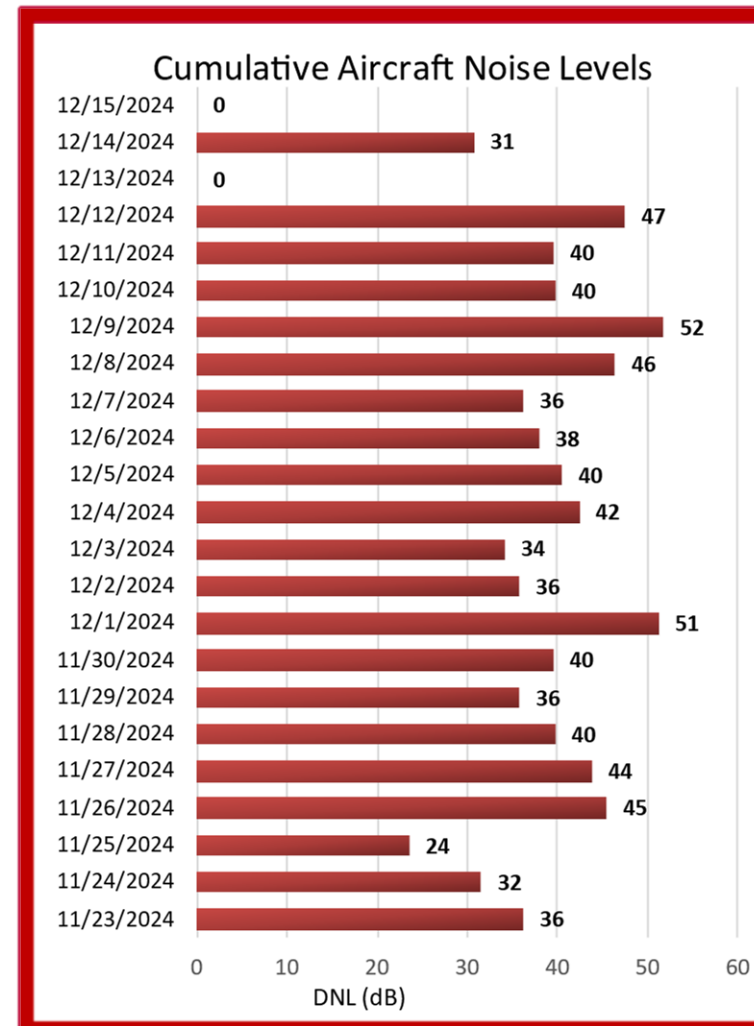


Figure 9a. Measured Daily Aircraft Noise Levels 11/23/24 – 12/15/24

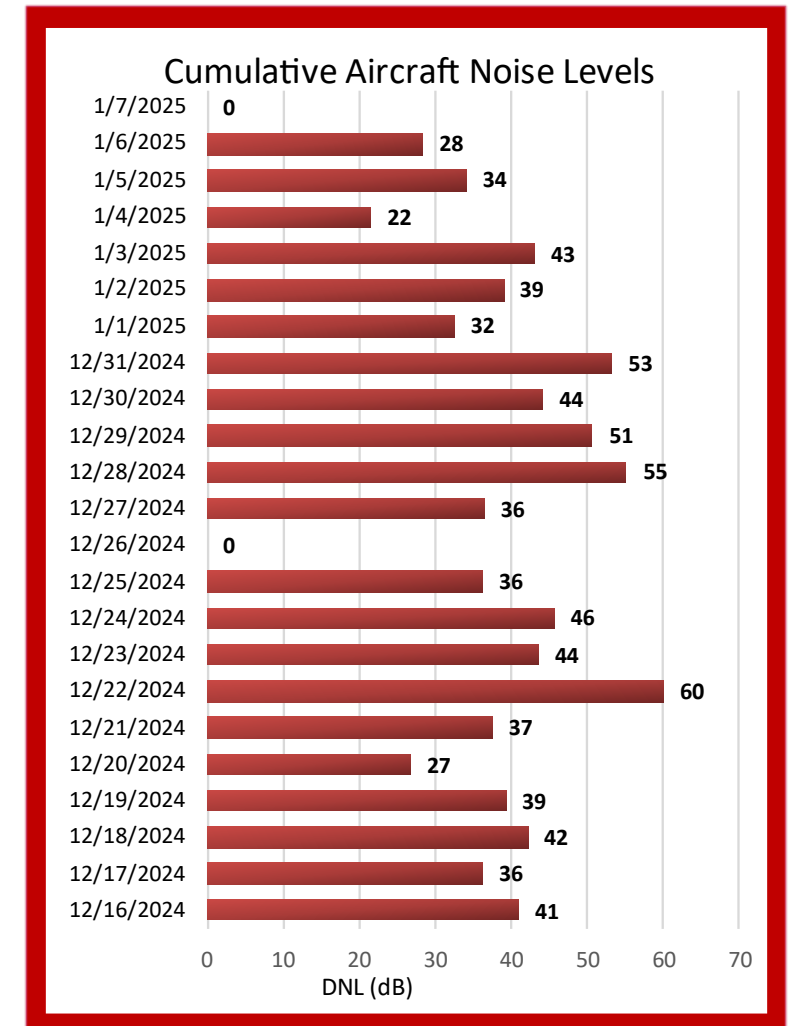


Figure 9b. Measured Daily Aircraft Noise Levels 12/16/24 – 1/7/25

More Information

ADDITIONAL RESOURCES

Website: www.bwiairport.com

Twitter: @BWI_Airport

MAA'S NOISE PROGRAM

Information about Maryland Department of Transportation Maryland Aviation Administration's (MAA's) Noise Program activities can be found at marylandaviation.com. Frequent topics of interest include:

NOISE COMPLAINTS

MAA provides multiple methods to submit aircraft noise complaints, including an on-line form or 24-hour noise complaint and information hotline at 410-859-7021. MAA reviews noise complaints daily, and logs, reviews, and analyzes all noise complaints on a regular basis.

<https://marylandaviation.com/environmental/airport-noise/noise-complaints/>

QUARTERLY NOISE REPORTS

Each quarter, MAA prepares and publishes a quarterly noise report. The report provides information on operational trends (including the number of jet and cargo operations, and the number of nighttime operations), runway use, flight corridors/flight density maps, noise complaints received, outreach efforts, permanent noise monitoring data and MAA's noise assistance programs.

ENEWS EXPRESS

Stay up-to-date on planned runway closures, as well as other important aviation topics, by subscribing to the BWI Marshall eNews Express at <https://marylandaviation.com/environmental/airport-noise/enews-express-signup/>.

AIRPORT NOISE ZONE

The BWI Noise Abatement Plan and Airport Noise Zone, first established in 1976, includes a wide variety of strategies that are intended to reduce noise impacts for communities around the Airport while maintaining efficient airport operations. Noise abatement at BWI includes operational procedures such as aircraft arrival and departure procedures and a preferential runway use system intended to direct aircraft operations over less populated areas, where and when possible. Other elements of the Noise Abatement Plan include land use restrictions and programs such as land acquisition and soundproofing.