

2025 Airport Noise Zone Update

**Baltimore/Washington International
Thurgood Marshall Airport**

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Baltimore/Washington International Thurgood Marshall Airport

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Executive Summary

Introduction

Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall) is owned by the State of Maryland and operated by the Maryland Department of Transportation Maryland Aviation Administration (MAA). BWI Marshall is located 9 miles south of downtown Baltimore, Maryland, 32 miles northeast of Washington, DC in Linthicum, Maryland, and within unincorporated Anne Arundel County southeast of MD-295, north of MD-100, and west of Interstate 97. The Airport has three runways: Runway 10/28, Runway 15L/33R and Runway 15R/33L.

Maryland law (the Maryland Environmental Noise Act of 1974) requires the protection of citizens from the impact of transportation-related noise. The Code of Maryland Regulations (COMAR) requires the MAA to control incompatible land development in areas where noise levels are Day-Night Average Sound Level (DNL)¹ 65 dBA or more. Therefore, the MAA is required to develop and certify an Airport Noise Zone (ANZ) that controls incompatible land development around BWI Marshall.

Maryland law also requires the MAA to regularly update the ANZ for BWI Marshall to ensure it remains an accurate representation of noise conditions at the Airport. Updating the ANZ is necessary because factors such as the total number of aircraft, operations, aircraft types, and flight paths may change over time, potentially altering overall noise exposure. Updating the ANZ involves modeling airport noise and developing noise contours for both existing and future conditions at BWI Marshall necessary for land use planning.

The ANZ update also includes a review of the BWI Marshall Noise Abatement Plan (NAP). If incompatible land uses exist within a noise zone, the MAA is required to develop an NAP. The NAP prescribes measures to monitor and reduce or eliminate impacted land use areas to the extent feasible, while maintaining efficient airport operations.

The ANZ update provides the MAA and BWI Marshall stakeholders, including surrounding communities, with improved understanding of current and future noise conditions at the airport. The ANZ provides a means for the MAA to identify, control, and prevent incompatible land development around the airport.

Public Engagement

The ANZ update process includes multiple public consultation efforts to ensure that BWI Marshall stakeholder input is reflected in the resulting ANZ contour and NAP documentation. This public involvement component includes two major initiatives: (1) voluntarily forming and convening a Stakeholder Advisory Committee (SAC) and (2) conducting a public workshop and hearing.

¹ For the purposes of this document, Day-Night Average Sound Level is referred to as DNL. DNL describes 24-hour exposure. Noise from 10:00 p.m. to 7:00 a.m. is considered nighttime and is factored up by 10 dB. This “penalty” is equal to counting each nighttime event 10 times.

The SAC was formed to include representatives of community and industry stakeholder groups with an interest in airport activities to ensure they were kept informed of the 2025 BWI Marshall ANZ update process and methodology. The SAC is composed of stakeholders representing significant interests at BWI Marshall, including representatives from:

- Local government planning staff
- Community organizations
- DC Metroplex BWI Community Roundtable
- Federal Aviation Administration (FAA) Air Traffic Control Tower (ATCT) at BWI Marshall
- BWI Marshall tenants, including aircraft operators and airlines

Members of the SAC were asked to review study inputs, assumptions, analyses, and documentation, and were encouraged to provide input, advice, and guidance related to the ANZ and NAP. SAC members were expected to share pertinent BWI Marshall ANZ update information with the groups or any interested citizens that they represent. The SAC convened three times to discuss major milestones in the ANZ update process. SAC members served in an advisory role to the MAA solely to support the BWI Marshall ANZ update.

As required by Maryland law, a public workshop and hearing regarding the 2025 BWI Marshall ANZ was held on March 19, 2026. The public workshop and hearing allowed all interested people an opportunity to comment on the proposed update to the BWI Marshall ANZ and NAP.

Airport Noise Zone

The ANZ is an area specified by noise contours in terms of DNL and is a composite of three different contours. The ANZ study process considered the existing conditions in 2025 (also referred to as the base year) and two forecast years (2030 and 2035). These forecasts were developed using FAA-accepted forecasting methods and the most current data available at the time.

The 2025 BWI Marshall ANZ document includes the DNL noise contours for the following three conditions:

1. Base year 2025 conditions with the current airfield layout
2. Five-year 2030 forecast conditions with the current airfield layout
3. Ten-year 2035 forecast conditions including the Phase II and Phase III improvements to the airfield as depicted in the BWI Marshall Airport Layout Plan²

The ANZ, as shown in Figure ES-1, is a composite of the three contours described above. The 2025 ANZ represents the largest extent of the DNL contours for each of the three study years (2025, 2030, and 2035) and is defined to provide the largest area of the existing or future noise exposure contours. The noise contours are presented in 5-decibel increments for DNL from 65 dB to 75 dB. In conjunction with development of the 2025 ANZ DNL contour, population and households within the ANZ were estimated. The 2025 ANZ 65 dB DNL contour covers 3,802 acres, of which approximately 2,381 acres (63 percent) are

² BWI Marshall Airport Planning Documents, *BWI Marshall Airport Future Airport Layout Plan*, Draft, November 2022, https://marylandaviation.com/wp-content/uploads/2024/06/Final_EA_Appendix_A_Planning_Docs.pdf

located on MAA property and 1,420 acres (37 percent) are located off airport property. Based on the 2020 Census data, this area includes an estimated 1,704 residents living in approximately 636 households.

The 2025 ANZ is smaller than the 2020 ANZ by approximately 31 percent. The 2025 ANZ also contains an approximate 57 percent decrease in estimated population based on the 2020 US Census, and 59 percent decrease in the number of estimated households exposed to noise levels greater than 65 dB DNL relative to the 2020 ANZ.

The decrease in ANZ size is due to several factors, including changes in the aircraft fleet mix and differences in number of operations.

Noise Abatement Plan

The NAP fulfills State requirements under the provisions of Sections 5-805, 5-806, and 5-819 of the Transportation Article, Annotated Code of Maryland.³ These sections require airport operators to develop an NAP, in conjunction with an ANZ, to reduce or eliminate the impacted land use area. In general, impacted land use areas are residential areas, schools, hospitals, rest homes, homes for the aged, nursing homes, libraries, and churches within the ANZ 65 dB DNL contour.

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 an extensive NAP, which the MAA staff have developed over several decades through extensive cooperative efforts with the FAA, aviation stakeholders and the community. The NAP was reviewed with the cooperation of SAC members, the FAA ATCT at BWI Marshall, and industry stakeholders. The goal of the NAP is to minimize noise disturbance to neighboring communities while maintaining safe and efficient airport operations.

The NAP was most recently updated as part of the 2020 ANZ update and was reviewed and updated as part of the 2025 BWI Marshall ANZ update process to accurately reflect current operating conditions at BWI Marshall.

The NAP is comprised of two parts: (1) aircraft operating procedures and (2) the efforts the MAA is taking to mitigate noise in the areas surrounding BWI Marshall. While operational measures receive the most public attention, the program includes compatible land use measures and other measures that focus on program implementation, communication, monitoring, and updating. Notable changes to the NAP identified in this update include removing references to the Interstate Visual procedure, adding references to maintenance run-ups at the midfield cargo facility, and adding a discussion of the MAA's Annual Report.

³ The BWI Marshall NAP is established pursuant to the Maryland Environmental Noise Act of 1974 (Transportation Article, §§ 5-805, 5-806, and 5-819, Annotated Code of Maryland) and COMAR Section 11.03.02.10. <http://mdrules.elaws.us/comar/11.03.02.10>.

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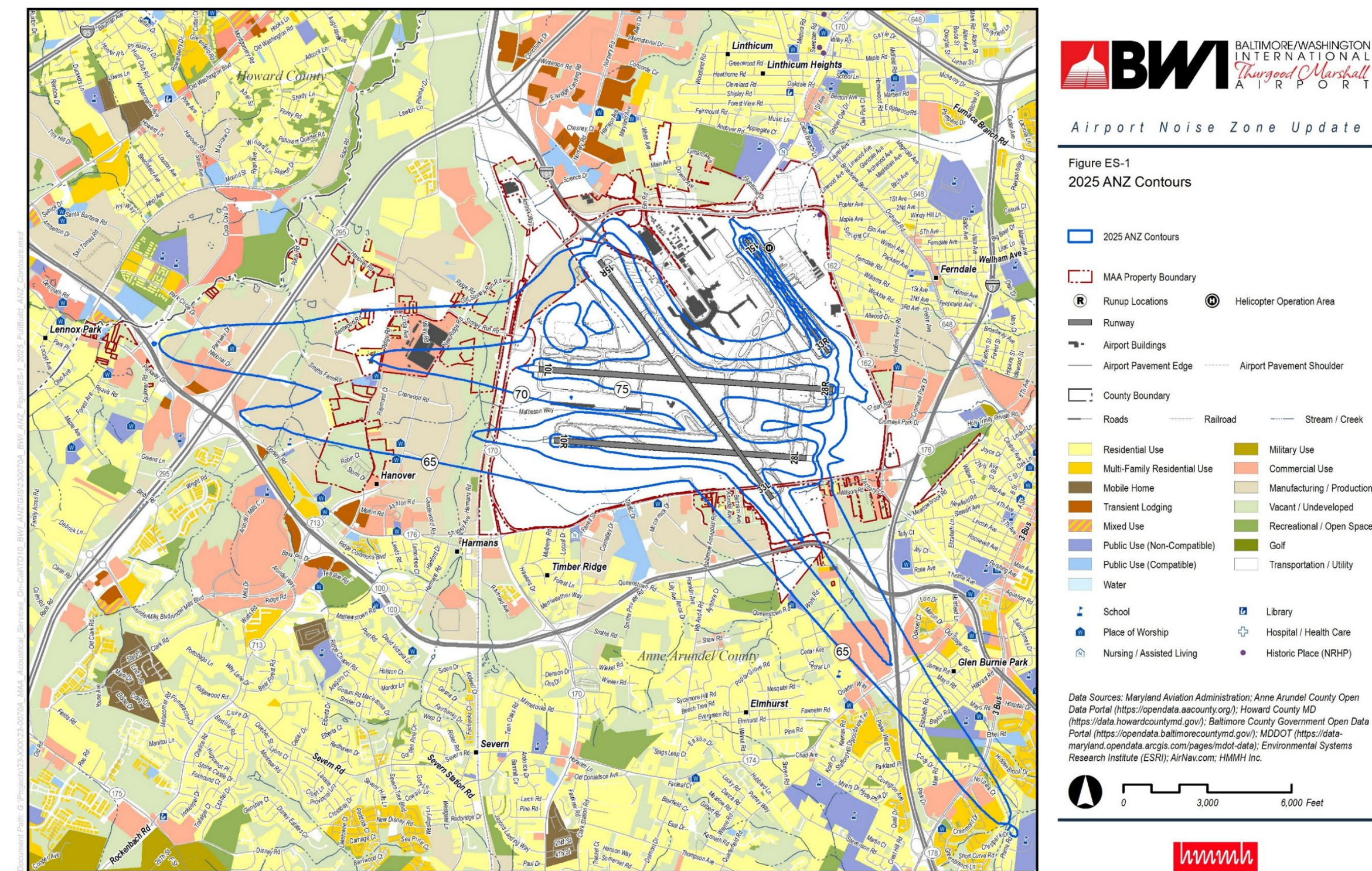


Figure ES-1. 2025 ANZ Contours

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Table of Contents

1.	Introduction and Background	1-1
2.	Noise Modeling Methodology	2-1
3.	Noise Model Inputs	3-1
3.1	Physical Description of the Airport Layout	3-1
3.2	Aircraft Operations and Run-Ups.....	3-9
3.3	Aircraft Noise and Performance Characteristics.....	3-15
3.4	Runway Utilization	3-19
3.5	Flight Track Geometry and Use.....	3-24
3.6	Meteorological Conditions.....	3-73
3.7	Terrain Data	3-73
4.	Study Results.....	4-1
4.1	2025 Base Year Contours	4-1
4.2	2030 Five-Year Forecast Contours	4-5
4.3	2035 Ten-Year Forecast Contours.....	4-9
4.4	2025 ANZ Contours and Land Use Inventory	4-13
5.	Noise Measurements	5-1
6.	Noise Abatement Plan	6-1
6.1	Noise Abatement Elements	6-1
6.1.1	Aircraft Noise Abatement Departure Procedures	6-2
6.1.2	Aircraft Noise Abatement Arrival Procedures	6-3
6.1.3	Preferential Runway Use System.....	6-3
6.1.4	Control of Ground-Based Noise Sources	6-4
6.1.5	Continued Noise Monitoring	6-4
6.2	Land Use Elements.....	6-6
6.2.1	Control of Incompatible Development	6-6
6.2.2	Noise Assistance Programs	6-8
7.	Public Consultation	7-1
7.1	Stakeholder Advisory Committee (SAC).....	7-1
7.2	Public Workshop and Hearing.....	7-2

Figures

Figure 3-1. Existing/Base Year (2025) Airport Layout.....	3-3
Figure 3-2. Five-Year (2030) Forecast Condition Airport Layout.....	3-7
Figure 3-3. Ten-Year (2035) Forecast Condition Airport Layout	3-8
Figure 3-4. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Carrier Passenger Jet Arrivals	3-31

Figure 3-5. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Carrier Cargo Jet Arrivals.....	3-32
Figure 3-6. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Taxi/General Aviation Arrivals	3-33
Figure 3-7. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Propeller Arrivals	3-34
Figure 3-8. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Carrier Passenger Jet Arrivals	3-35
Figure 3-9. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Carrier Cargo Jet Arrivals.....	3-36
Figure 3-10. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Taxi/General Aviation Arrivals	3-37
Figure 3-11. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Propeller Arrivals	3-38
Figure 3-12. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – Helicopter Arrivals	3-39
Figure 3-13. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Carrier Passenger Jet Departures	3-40
Figure 3-14. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Carrier Cargo Jet Departures	3-41
Figure 3-15. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Taxi/General Aviation Departures	3-42
Figure 3-16. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Propeller Departures	3-43
Figure 3-17. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Carrier Passenger Jet Departures	3-44
Figure 3-18. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Carrier Cargo Jet Departures	3-45
Figure 3-19. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Taxi/General Aviation Jet Departures.....	3-46
Figure 3-20. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Propeller Departures	3-47
Figure 3-21. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – Helicopter Departures	3-48
Figure 3-22. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Carrier Passenger Jet Arrivals	3-55
Figure 3-23. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Carrier Cargo Jet Arrivals	3-56
Figure 3-24. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Taxi/General Aviation Jet Arrivals	3-57
Figure 3-25. Ten-Year (2035) Modeled Flight Tracks – East Flow Propeller Arrivals	3-58
Figure 3-26. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Carrier Passenger Jet Arrivals	3-59
Figure 3-27. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Carrier Cargo Jet Arrivals	3-60
Figure 3-28. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Taxi/General Aviation Jet Arrivals...	3-61
Figure 3-29. Ten-Year (2035) Modeled Flight Tracks – West Flow Propeller Arrivals.....	3-62
Figure 3-30. Ten-Year (2035) Modeled Flight Tracks – Helicopter Arrivals.....	3-63
Figure 3-31. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Carrier Passenger Jet Departures	3-64
Figure 3-32. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Carrier Cargo Jet Departures	3-65
Figure 3-33. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Taxi/General Aviation Jet Departures	3-66
Figure 3-34. Ten-Year (2035) Modeled Flight Tracks – East Flow Propeller Departures	3-67
Figure 3-35. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Carrier Passenger Jet Departures ...	3-68

Figure 3-36. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Carrier Cargo Jet Departures	3-69
Figure 3-37. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Taxi/General Aviation Jet Departures....	3-70
Figure 3-38. Ten-Year (2035) Modeled Flight Tracks – West Flow Propeller Departures.....	3-71
Figure 3-39. Ten-Year (2035) Modeled Flight Tracks – Helicopter Departures.....	3-72
Figure 4-1. 2025 Base Year DNL Contours.....	4-3
Figure 4-2. 2030 Five-Year Forecast DNL Contours	4-7
Figure 4-3. 2035 Ten-Year Forecast DNL Contours	4-11
Figure 4-4. BWI Marshall 2025 ANZ Contours	4-15
Figure 4-5. 2025 ANZ Compared to 2020 ANZ	4-16
Figure 5-1. BWI Marshall Permanent Noise Monitor Locations.....	5-3

Tables

Table 2-1. State of Maryland Limits for Cumulative Noise Exposure	2-1
Table 3-1. Existing (2025) BWI Marshall Runway and Helipad Data	3-5
Table 3-2. Five-Year (2030) Forecast Condition BWI Marshall Runway, Helipad, and Run-up Inputs	3-5
Table 3-3. Ten-Year (2035) Forecast Condition BWI Marshall Runway, Helipad, and Run-Up Inputs	3-6
Table 3-4. Anticipated 2025, 2030 and 2035 Forecast Operations Levels	3-10
Table 3-5. Base Year (2025) Modeled Average Daily Aircraft Operations	3-10
Table 3-6. Five-Year (2030) Forecast Modeled Average Daily Aircraft Operations.....	3-11
Table 3-7. Ten-Year (2035) Forecast Modeled Average Daily Aircraft Operations	3-13
Table 3-8. Five- (2030) and Ten-Year (2035) Modeled Average Daily Aircraft Run-Ups	3-14
Table 3-9 Stage Lengths by Trip Distance	3-15
Table 3-10. Base Year (2025) Modeled Departure Stage Length Usage by Aircraft Type.....	3-16
Table 3-11. Five-Year (2030) Forecast Modeled Departure Stage Length Usage by AEDT Aircraft Type	3-16
Table 3-12. Ten-Year (2035) Forecast Modeled Departure Stage Length Usage by AEDT Aircraft Type.....	3-18
Table 3-13. Base Year (2025) Fixed-Wing Overall Runway Utilization Percentages	3-19
Table 3-14. Base Year (2025) Fixed-Wing Runway Utilization Percentages by Aircraft Category.....	3-20
Table 3-15. Helipad Utilization Percentages for All Years	3-20
Table 3-16. Five-Year (2030) Forecast Fixed-Wing Overall Runway Utilization Percentages	3-21
Table 3-17. Five-Year (2030) Forecast Fixed-Wing Runway Utilization Percentages by Aircraft Category..	3-21
Table 3-18. Ten-Year (2035) Forecast Fixed-Wing Overall Runway Utilization Percentages.....	3-23
Table 3-19. Ten-Year (2035) Forecast Fixed Wing Runway Utilization Percentages.....	3-23
Table 3-20. Base Year (2025) and Five-Year Forecast (2030) Air Carrier Fixed-Wing Model Track Utilization Percentages.....	3-25
Table 3-21. Base Year (2025) and Five-Year Forecast (2030) Air Taxi Fixed-Wing Model Track Utilization Percentages.....	3-26
Table 3-22. Base Year (2025) and Five-Year Forecast (2030) General Aviation Fixed-Wing Model Track Utilization Percentages	3-28
Table 3-23. Base Year (2025) and Five-Year Forecast (2030) Helicopter Model Track Utilization Percentages	3-29
Table 3-24. Ten-Year (2035) Air Carrier Fixed-Wing Model Track Utilization Percentages	3-49
Table 3-25. Ten-Year (2035) Air Taxi Fixed-Wing Model Track Utilization Percentages	3-51
Table 3-26. Ten-Year (2035) General Aviation Fixed-Wing Model Track Utilization Percentages.....	3-52
Table 3-27. Ten-Year (2035) Helicopter Model Track Utilization Percentages	3-54
Table 4-1. Households, Population, and Acreage within the 2025 Base Year Contour	4-1

Table 4-2. Households, Population, and Acreage within 2030 Five-Year Forecast DNL Contours.....	4-5
Table 4-3. Households, Population, and Acreage within 2035 Ten-Year Forecast DNL Contours	4-9
Table 4-4. Households, Population, and Acreage within the 2025 ANZ Contour	4-13
Table 4-5. Households, Population, and Acreage within the 2025 ANZ Compared to the 2020 ANZ.....	4-14
Table 5-1. Measured Aircraft DNL Levels for Quarters 3 and 4 of 2024, Quarters 1 and 2 of 2025 at NMTs.....	5-1
Table 5-2. Measured Aircraft DNL Levels at NMTs Compared to 2025 Base Year Modeled DNL Levels at NMTs	5-5
Table 6-1. Aircraft Noise Abatement Departure Procedures	6-3
Table 6-2. Engine Maintenance Run-Up Restrictions	6-4
Table 6-3. Noise Compatibility Standards	6-7

Appendices

Appendix A. Aircraft Noise Terminology	A-1
Appendix B. BWI Marshall 2025 Airport Noise Zone Overlaid on County Tax Maps	B-1
Appendix C. BWI Marshall Stakeholder Advisory Committee (SAC) Meeting Materials	C-1
Appendix D. Maryland Aviation Commission Materials	D-1
Appendix E. Public Workshop and Hearing Materials	E-1
Appendix F. Public Comments	F-1

Acronyms

AAD	Average Annual Day
AEDT	Aviation Environmental Design Tool
AGL	Above Ground Level
ALP	Airport Layout Plan
ANOMS	Airport Noise and Operations Monitoring System
ANZ	Airport Noise Zone
APU	Auxiliary Power Unit
ATADS	Air Traffic Activity Data System
ATC	Air Traffic Control
ATCT	Air Traffic Control Tower
AZD	Airport Zoning District
BAZA	Board of Airport Zoning Appeals
BWI	Baltimore/Washington International Thurgood Marshall Airport
CFR	Code of Federal Regulations
COMAR	Code of Maryland Regulations
dB	Decibel
dBA	A-Weighted Decibel
DME	Distance Measuring Equipment
DNL/Ldn	Day-Night Average Sound Level
FAA	Federal Aviation Administration
GIS	Geographic Information System
HMMH	Harris Miller Miller & Hanson Inc.
IFR	Instrument Flight Rules
ILS	Instrument Landing System
Leq	Equivalent A-Weighted Sound Level
Lmax	Maximum A-Weighted Sound Level
MAA	Maryland Department of Transportation Maryland Aviation Administration
MSL	Mean Sea Level
NAD 83	North American Datum 1983
NAP	Noise Abatement Plan
NCP	Noise Compatibility Program
NEM	Noise Exposure Map
nmi	Nautical Miles
NMT	Noise Monitoring Terminal
NRHP	National Register of Historic Places
PBN	Performance Based Navigation
SAC	Stakeholder Advisory Committee
SEL	Sound Exposure Level
TAF	Terminal Area Forecast
TRACON	Terminal Radar Approach Control
USGS	United States Geological Survey
VASI	Visual Approach Slope Indicator

VFR
VORTAC

Visual Flight Rules
VHF Omni-directional Range Tactical Air Navigation

1. Introduction and Background

The Maryland Environmental Noise Act of 1974 requires the protection of citizens from the impact of transportation-related noise. The Maryland Department of Transportation Maryland Aviation Administration (MAA) is required to develop and certify an Airport Noise Zone (ANZ) that controls incompatible land development around BWI Marshall.

Noise modeling analysis conducted for the ANZ study provides the MAA, BWI Marshall stakeholders, and surrounding communities with a better understanding of current and future noise conditions at the airport. The ANZ serves as a tool for the MAA to identify, control, and prevent incompatible land development around the airport. It also guides the Noise Abatement Plan (NAP), which prescribes measures to reduce or eliminate the impacted land use area. The goal of the NAP is to minimize noise disturbance to neighboring communities while maintaining safe and efficient airport operations.

Maryland regulations requiring the development of an ANZ and NAP were established before the creation of a similar federal program for airports nationwide. The voluntary federal program, codified in Title 14 of the Code of Federal Regulations Part 150 (14 CFR Part 150 or Part 150), includes the development and certification of noise exposure maps (NEMs) and a Noise Compatibility Program (NCP). These steps are necessary for airports to qualify for federal funding for noise mitigation programs and to obtain Federal Aviation Administration (FAA) approval for implementing certain noise abatement procedures. The MAA has participated in the Part 150 program for many years. The NCP for BWI Marshall was last comprehensively updated in 2007, and the FAA issued a Record of Approval on February 26, 2008. The Airport's NEMs were subsequently updated and accepted by the FAA in 2016. The NAP includes the MAA's NCP prepared under Part 150. Any future updates to the NCP would also require corresponding updates to the NAP to maintain consistency between state and federal noise management programs.

The State of Maryland uses the Day-Night Average Sound Level, abbreviated DNL,^{4,5} as the measure of cumulative noise exposure required to develop an ANZ. The ANZ represents a composite of the 65, 70, and 75 decibel (dB) DNL noise level contours for three study years: the base year, five-year, and ten-year forecast contours. The 2025 ANZ, as presented in this document, represents the largest extent of the DNL contours for all three years included in this study (2025, 2030, and 2035). Forecasts for these years were developed using FAA-accepted forecasting methods and the most current data available at the time.

The resulting ANZ is defined as the composite of the largest area of the existing or future noise exposure contours and is overprinted on county tax maps. Maryland law requires the MAA to regularly update the ANZ for BWI Marshall to ensure it accurately reflects current and forecasted noise conditions at the airport. The BWI Marshall ANZ was last updated in 2020 and certified in 2021.⁶ Since that update, several factors that influence the noise environment of the airport have changed, including:

⁴ COMAR defines the term "Annual day-night (average) sound level (Ldn)."

⁵ For the purposes of this document, Day-Night Average Sound Level is referred to as DNL. DNL describes 24-hour exposure. Noise from 10:00 p.m. to 7:00 a.m. is considered nighttime and is factored up by 10 dB. This "penalty" is equal to counting each nighttime event 10 times.

⁶ MAA, *BWI Marshall Airport Noise Zone*, <https://marylandaviation.com/environmental/airport-noise/bwi-marshall-airport-noise-zone/>

- Aircraft fleet mix changes, such as the retirement of some older, noisier aircraft and the introduction of newer, quieter aircraft.
- FAA updates to arrival and departure procedures in July and September 2024.
- Changes in the number of forecast aircraft operations.

The ANZ represents composite noise contours at specified levels of exposure, which are intended to control incompatible land development around BWI Marshall in areas where levels of cumulative aircraft noise exposure equal or exceed the limits established by Maryland regulations.⁷ Restrictions on allowable land use and development within the ANZ are based on established limits for cumulative noise exposure.

Any entity desiring to construct or modify a structure or to establish land use within the ANZ must first apply for and obtain an airport zoning permit from the MAA. Local government approval of development activities within the ANZ is prohibited before an airport zoning permit or variance is obtained. According to State law, the MAA must deny a permit if the proposed land use is incompatible with the established cumulative noise exposure limits or if the proposed land use development is found to be incompatible with the ANZ.

If an airport zoning permit is denied, an applicant may petition the Board of Airport Zoning Appeals (BAZA) for a variance from the regulations. The Board will consider any facts and circumstances relevant to the request for a variance, including testimony or evidence regarding possible impacts of granting or denying the variance on the surrounding community. In granting a variance to the regulations, the Board will require, at a minimum, 1) compliance with all applicable minimum standards of noise attenuation adopted by the MAA and 2) an avigation easement over the property. BAZA may also issue conditions such as the addition of sound insulation components to buildings within the certified ANZ. Since the certification of the previous ANZ in April 2021, the BAZA has granted variances for five applications, including two single-family homes and three public schools.

Additions and modifications to existing residential structures are exempt from the noise zoning permit process if the modification does not increase the number of dwelling units. Permit applications can be obtained from the MAA, the Anne Arundel County Office of Inspections and Permits, or the Howard County Office of License and Permits.

BWI Marshall also has an Airport Zoning District (AZD) defined by a four-mile radius around the airport reference point. To obtain county permits for projects within the AZD, an applicant must obtain an approved airport zoning permit from the MAA. Airport zoning permit applications are reviewed for ANZ land use compatibility, airport and airspace compatibility, and stormwater management and landscaping compatibility.

The 2025 BWI Marshall ANZ update began in January 2025. The MAA retained Harris Miller Miller & Hanson Inc. (HMMH) to support the Office of Environmental Compliance and Sustainability in preparing the 2025 BWI Marshall ANZ document. In coordination and collaboration with the MAA, HMMH designed and conducted the public participation program, developed the DNL contours, compiled the composite ANZ contour, conducted a land-use inventory, reviewed and updated the NAP, and prepared ANZ documentation.

⁷ COMAR, 11.03.03.03, *Limits for Cumulative Noise Exposure*, <http://mdrules.elaws.us/comar/11.03.03.03>

Section 2 of this report describes the methodology used in modeling the noise contours. Section 3 describes the inputs to the noise model in detail for the base year and forecast years. Section 4 presents DNL contours for the base and forecast years, the composite 2025 BWI Marshall ANZ contour, and the land use inventory. Section 5 contains measured versus modeled annual noise data, and Section 6 presents the updated NAP. Section 7 discusses the public consultation process undertaken for the study.

The appendices of this document provide additional relevant information. Appendix A includes an overview of aircraft noise terminology. Appendix B includes the ANZ overlaid on Anne Arundel County tax maps. Appendix C includes the BWI Marshall Stakeholder Advisory Committee (SAC) roster and meeting materials, including meeting invitations, sign-in sheets, meeting minutes, and presentations. Appendix D includes Maryland Aviation Commission materials. Appendix E includes the information related to the Public Workshop and Hearing, including documentation of public notices, meeting invitations, presentation materials, and attendance information. Appendix F contains documentation of and responses to public comments following the public hearing.

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2. Noise Modeling Methodology

The State of Maryland uses the DNL metric as the measure of cumulative aircraft noise exposure for developing an ANZ. DNL represents the total noise exposure from aircraft operations during a 24-hour period, with an additional 10-dB weighting for noise generated during nighttime hours (10:00 p.m. to 7:00 a.m.). This weighting reflects studies showing that people are more sensitive to noise during nighttime hours. In practical terms, each aircraft operation occurring during the defined nighttime period is treated as equivalent to 10 daytime operations when calculating DNL. The aircraft operations used in these calculations represent an average day during a particular year, which for this analysis are 2025, 2030, and 2035. Appendix A includes an overview of aircraft noise terminology.

The noise environment around an airport is described by contours of equal noise exposure, representing the noise that occurs during an average 24-hour day. The BWI Marshall ANZ is depicted as a series of lines (noise contours) surrounding the airport. These lines connect points of equal noise exposure and result in the 65 dB, 70 dB, and 75 dB DNL noise contours. The ANZ contours provide boundaries for determining incompatible activities or land uses with airport operations. The limits for cumulative noise exposure for the State of Maryland are shown in Table 2-1 below.

Table 2-1. State of Maryland Limits for Cumulative Noise Exposure

Land Use	Area of Compatibility (Noise Levels)
Residences, schools, hospitals, libraries, churches, auditoriums, rest homes, nursing homes, concert halls	Up to 65 dB DNL
Transient lodging, hotels, motels, sports arenas, outdoor spectator sports, playgrounds, neighborhood parks, noise sensitive manufacturing and communications	Up to 70 dB DNL
Golf courses, riding stables, water recreation, cemeteries, office buildings, retail and wholesale establishments, movie theaters, restaurants, industry, manufacturing, utilities, livestock farming, animal breeding	Up to 75 dB DNL
Agriculture (except livestock), mining, fishing, aviation related uses	All

Source: COMAR. 11.03.03.03, Limits for Cumulative Noise Exposure, <http://mdrules.elaws.us/comar/11.03.03.03>

Maryland regulations require noise modeling as a prediction method to create ANZ noise contours.⁸ Noise modeling software creates computer-generated DNL estimates depicted as equal-exposure noise contours, similar to topographic maps that indicate contours of equal elevation. DNL contours reflect average annual daily operating conditions, also referred to as an Average Annual Day (AAD) of operations, and account for the type of aircraft, average number of flights each day, time of day, how often each runway is used throughout the year, and where over the surrounding communities the aircraft normally fly.

⁸ COMAR, 11.03.03.02, *Methods for Calculation and Measurement of Levels of Cumulative Noise Exposure*, <http://mdrules.elaws.us/comar/11.03.03.02>

The 2025 BWI Marshall ANZ document presents DNL noise contours for the following conditions:

- Base year 2025 conditions with the current airfield layout
- Five-year 2030 forecast conditions with the current airfield layout
- Ten-year 2035 forecast conditions with the Phase II and Phase III improvements to the airfield as depicted in the BWI Marshall Airport Layout Plan (ALP)⁹

⁹ BWI Marshall Airport Planning Documents, *BWI Marshall Airport Future Airport Layout Plan*, Draft, November 2022, https://marylandaviation.com/wp-content/uploads/2024/04/Draft_BWI_ATCT_EA_Appendix_A_Planning_Docs.pdf

3. Noise Model Inputs

The 2025, 2030, and 2035 DNL contours were developed using the FAA Aviation Environmental Design Tool (AEDT) version 3g consistent with Section 11.03.03 of COMAR. The DNL contours were developed primarily from flight track data from BWI Marshall's Airport Noise and Operations Monitoring System (ANOMS) system.

AEDT requires noise model input data in three categories:

1. Airport physical inputs
 - Runway layout (including displaced landing or takeoff thresholds)
 - Flight track geometry and use
 - Terrain data
 - Meteorological conditions
2. Aircraft noise and performance data
 - Aircraft performance profiles
 - Noise level versus distance curves
3. Aircraft operational inputs
 - Number of aircraft operations
 - Aircraft fleet mix
 - Day-night split of operations
 - Runway utilization
 - Flight track geometry and utilization

AEDT inputs used in developing the base year and future year noise contours are presented in Sections 3.1 through 3.7.

3.1 Physical Description of the Airport Layout

BWI Marshall is located within unincorporated Anne Arundel County southeast of MD-295, north of MD-100 and west of Interstate 97. The Airport has three runways: Runway 10/28, Runway 15L/33R and Runway 15R/33L. Figure 3-1 presents an aerial photograph with the existing runway layout, the airport property line, and the helicopter operational area.

The end of each runway is designated by a number that, with the addition of a trailing "0", reflects the magnetic heading of the runway to the nearest 10 degrees, as seen by the pilot. The two parallel runways, 15R/33L and 15L/33R, are oriented on approximate magnetic headings of 155° and 335°. Runway 15R/33L is 9,501 feet long by 150 feet wide with displaced landing thresholds of 301 feet for Runway 15R and 500 feet for Runway 33L. Runway 15L/33R is 5,000 feet long by 100 feet wide. The parallel runways are distinguished from each other with letter endings "L", meaning left, and "R", meaning right, as seen by the pilot. Runway 10/28 is oriented on an approximate magnetic heading of 105° and 285° and is 10,503 feet

long by 150 feet wide. Runway 10 has a displaced landing threshold of 550 feet, and Runway 28 has a displaced landing threshold of 700 feet.

Aircraft departing on all runways except Runway 28 begin their takeoff roll at the physical end of the runway. Most aircraft departing on Runway 28 begin their takeoff roll at the intersection with Taxiway Uniform 1 (U1), approximately 700 feet west of the physical end of the runway. Aircraft that have a need (based on weight, length of flight, or other conditions) to use the full 10,503 feet of runway may begin their takeoff roll at the physical end of Runway 28.

BWI Marshall has a single helicopter operational area at the Airport, which serves corporate, general aviation, and law enforcement organizations. The helicopter operational area is located near the northeast corner of the airfield near the end of Runway 33R, in close proximity to the general aviation facility.

Available runway length, runway width, and instrumentation may affect which aircraft might use a particular runway and under what conditions, and therefore how often a runway would be used relative to the other runways at the airport. Table 3-1 presents the latitude and longitude inputs and configurations for each runway and helicopter operational area used for modeling in AEDT. No aircraft run-ups were observed at BWI Marshall in 2024, so no run-up locations were modeled for the base year.

Airport Noise Zone Update

Figure 3-1
Existing (2025) Airport Layout

-  Helicopter Operation Area
-  Runway
-  MAA Property Boundary
-  Roads
-  Railroad
-  Stream / Creek

Data Sources: Baltimore County Government Open Data Portal; Maryland Department of Transportation; Maryland Department of Planning; Environmental Systems Research Institute (ESRI); AirNav.com; Nearmap; HMMH Inc.



Figure 3-1. Existing/Base Year (2025) Airport Layout

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Table 3-1. Existing (2025) BWI Marshall Runway and Helipad Data

Runway	Latitude (degrees)	Longitude (degrees)	Length (feet)	Modeled Elevation (feet)	Displaced Landing Threshold (feet)	Approach Slope (degrees)	Threshold Crossing Height (feet)
Fixed-Wing Runways							
10	39.174747	-76.689618	10,503	139.0	550	3.0	71
28	39.172632	-76.652673	10,503	126.4	700	3.0	75
15L	39.187373	-76.663540	5,000	141.4	-	3.0	47
33R	39.176235	-76.653231	5,000	114.0	-	3.0	47
15R	39.185361	-76.681992	9,501	139.0	301	3.0	73
33L	39.164203	-76.662393	9,501	129.6	500	3.0	72
Helicopter Operations Areas							
H1	39.186529	-76.660582	-	141.4	-	-	-

Note: Latitude and longitude coordinates reference to North American Datum 1983 (NAD 83).

Source: FAA 5010, MAA, 2025

For the five-year 2030 forecast condition of the airport layout, no physical changes to the runways or helipads were made. For the ten-year 2035 forecast condition, the airport layout includes the Phase III improvements to the airfield as depicted in the ALP, which consist of a new planned runway parallel to Runway 10/28 and an extension of Runway 15R/33L. The existing Runway 10/28 would be renamed to Runway 10L/28R, and the new proposed runway would be named Runway 10R/28L.

Concerning future run-up locations, the future scenarios reflect changes to the airfield, including the closure of the Runway 10 hold block due to the construction of the airline maintenance facility. Limited run-up operations are permitted at the midfield cargo ramp with concurrence from Airport Operations. Run-ups are therefore permitted at the Runway 33L hold block, at the deice pad located on the north side of Runway 28 near the runway threshold, and at the midfield cargo ramp.

Table 3-2 and Table 3-3 present the latitude and longitude inputs and configurations for each runway for the five-year and ten-year forecast conditions, respectively. Figure 3-2 and Figure 3-3 present the BWI Marshall runway layout for use in developing the five-year and ten-year forecast contours, respectively, and include notations for MAA property boundaries, helicopter operational areas, and aircraft run-up locations.

Table 3-2. Five-Year (2030) Forecast Condition BWI Marshall Runway, Helipad, and Run-up Inputs

Runway	Latitude (degrees)	Longitude (degrees)	Length (feet)	Modeled Elevation (feet)	Displaced Landing Threshold (feet)	Approach Slope (degrees)	Threshold Crossing Height (feet)	Runway Width (feet)
Fixed-Wing Runways								
10	39.174747	-76.689618	10,503	139.0	550	3.0	50	150
28	39.172632	-76.652673	10,503	126.4	700	3.0	50	150
15L	39.187373	-76.663540	5,000	141.4	-	3.0	50	100
33R	39.176235	-76.653231	5,000	114.0	-	3.0	50	100
15R	39.185361	-76.681992	9,501	139.0	301	3.0	50	150
33L	39.164203	-76.662393	9,501	129.6	500	3.0	50	150
Helicopter Operations Areas								
H1	39.186529	-76.660582	-	141.4	-	-	-	-

Runway	Latitude (degrees)	Longitude (degrees)	Length (feet)	Modeled Elevation (feet)	Displaced Landing Threshold (feet)	Approach Slope (degrees)	Threshold Crossing Height (feet)	Runway Width (feet)
Run-Up Locations								
Airline Maintenance Facility	39.178976	-76.686047	-	139.0	-	-	-	-
Midfield Cargo Ramp (Idle)	39.171833	-76.685497	-	135.0	-	-	-	-
Midfield Cargo Ramp	39.172626	-76.686870	-	135.0	-	-	-	-
Runway 28 Deicing Pad	39.175501	-76.659727	-	126.4	-	-	-	-
Runway 33L Hold Block	39.166147	-76.660794	-	129.6	-	-	-	-

Notes:

Latitude and Longitude coordinates reference to North American Datum 1983 (NAD 83).

Elevations referenced to Mean Sea Level (MSL).

Source: MAA, 2025

Table 3-3. Ten-Year (2035) Forecast Condition BWI Marshall Runway, Helipad, and Run-Up Inputs

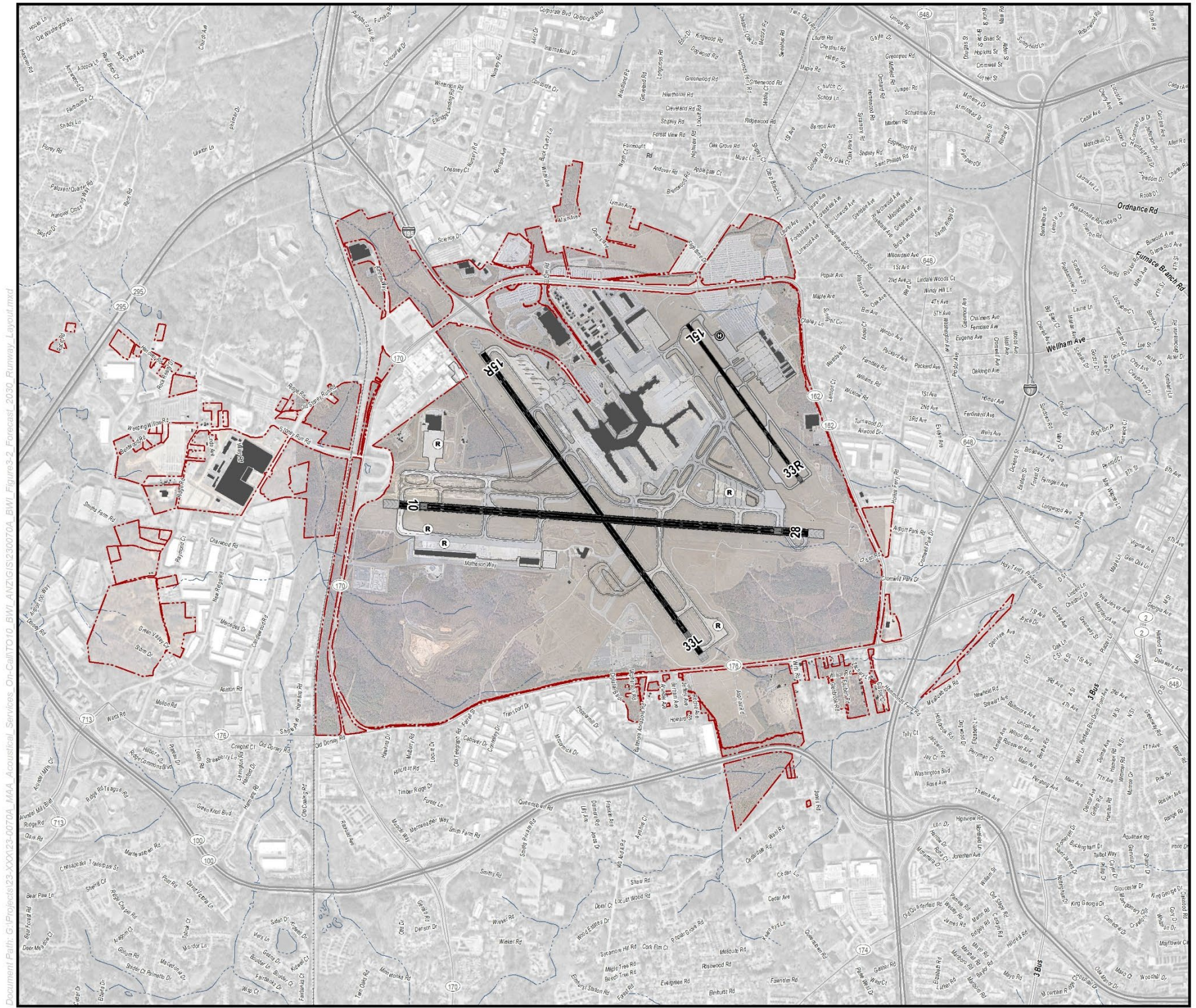
Runway	Latitude (degrees)	Longitude (degrees)	Length (feet)	Modeled Elevation (feet)	Displaced Landing Threshold (feet)	Approach Slope (degrees)	Threshold Crossing Height (feet)	Runway Width (feet)
Fixed-Wing Runways								
10L	39.174747	-76.689618	10,503	139.0	550	3.0	50	150
10R	39.167757	-76.687725	9,000	140.0	500	3.0	50	150
28R	39.172632	-76.652673	10,503	126.4	700	3.0	50	150
28L	39.165944	-76.656068	9,000	130.0	-	3.0	50	150
15L	39.187373	-76.663540	5,000	141.4	-	3.0	50	100
33R	39.176235	-76.653231	5,000	114.0	-	3.0	50	100
15R	39.185361	-76.681992	10,501	139.0	301	3.0	50	150
33L	39.161976	-76.66033	10,501	129.8	-	3.0	50	150
Helicopter Operations Areas								
H1	39.185181	-76.659115	-	129.0	-	-	-	-
Run-up Locations								
Airline Maintenance Facility	39.178976	-76.686047	-	139.0	-	-	-	-
Midfield Cargo Ramp (Idle)	39.171833	-76.685497	-	135.0	-	-	-	-
Midfield Cargo Ramp	39.172626	-76.686870	-	135.0	-	-	-	-
Runway 28 Deicing Pad	39.175501	-76.659727	-	126.4	-	-	-	-
Runway 33L Hold Block	39.165388	-76.660616	-	129.6	-	-	-	-

Notes:

Latitude and Longitude coordinates reference to North American Datum 1983 (NAD 83)

Elevations referenced to Mean Sea Level (MSL)

Source: MAA, 2025



Airport Noise Zone Update

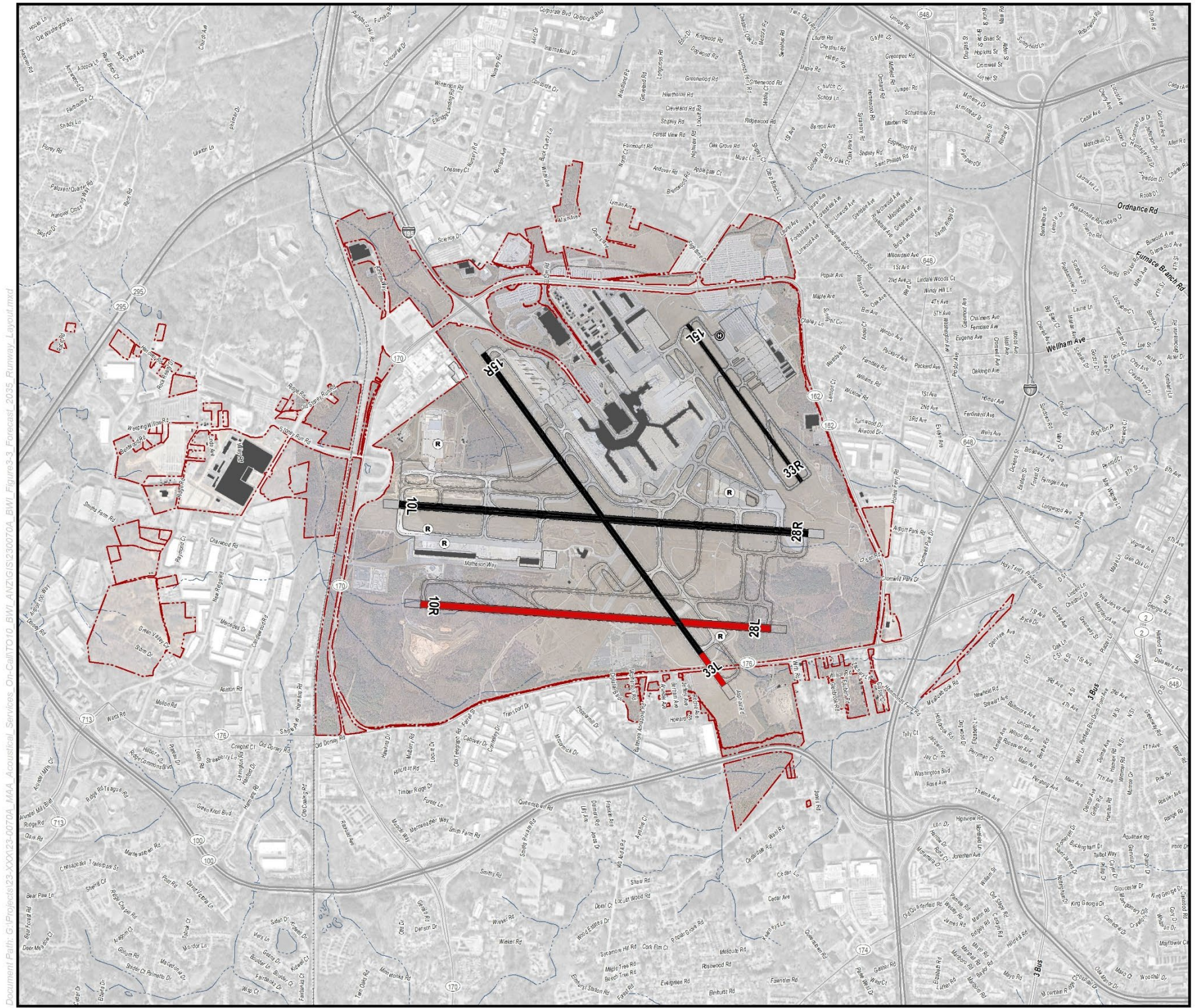
Figure 3-2
Five-Year (2030) Forecast Condition
BWI Marshall Airport Layout

- R Runup Locations
- H Helicopter Operation Area
- Runway
- MAA Property Boundary
- Roads
- Railroad
- Stream / Creek

Data Sources: Baltimore County Government Open Data Portal; Maryland Department of Transportation; Maryland Department of Planning; Environmental Systems Research Institute (ESRI); AirNav.com; Nearmap; HMMH Inc.



Figure 3-2. Five-Year (2030) Forecast Condition Airport Layout



Airport Noise Zone Update

Figure 3-3
Ten-Year (2035) Forecast Condition
BWI Marshall Airport Layout

- R Runup Locations
- H Helicopter Operation Area
- Runway
- 2035 Runway / Runway Extension
- MAA Property Boundary
- Roads
- Railroad
- Stream / Creek

Data Sources: Baltimore County Government Open Data Portal; Maryland Department of Transportation; Maryland Department of Planning; Environmental Systems Research Institute (ESRI); AirNav.com; Nearmap; HMMH Inc.



Figure 3-3. Ten-Year (2035) Forecast Condition Airport Layout

3.2 Aircraft Operations and Run-Ups

To create noise contours, AEDT requires details related to AAD operations as well as aircraft maintenance run-ups be included as inputs. AAD operations and run-up estimates were developed for the base year and future years.

Operations for 2025 were determined using 12 months of 2024 flight data and the 2024 edition of the FAA's Terminal Area Forecast (TAF), issued in January 2025. The FAA TAF reports operations in terms of the federal fiscal year, which runs from October 1 to September 30, whereas the calendar year runs from January 1 to December 31. Historical monthly data from the FAA Air Traffic Activity Data System (ATADS) for calendar year 2024 was analyzed, and this analysis indicated that adjusting the TAF federal fiscal year to a 2025 calendar year estimate would result in an overall decrease of about 1.4 percent of the total operations. Therefore, the TAF for 2025 was used unadjusted.

The detailed breakdown of operations by aircraft type for fixed-wing and helicopter civil aircraft at BWI Marshall was determined using the 12 months of 2024 flight data obtained from the MAA ANOMS. The flight data provided the primary aircraft fleet mix distributions for civilian aircraft, along with distributions over daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.). Calendar year 2024 FAA Traffic Flow Management System Counts were downloaded and used to check the aircraft types within the flight data and to provide the fleet mix for military aircraft. The data collected for 2024 were scaled to the 2025 operational totals shown in Table 3-4.

A small percentage of arrival operations were re-assigned to nighttime hours to account for new service to and from the western US with arrivals prior to 7:00 a.m. that began in early 2025.

Publicly available information for industry trends and for airlines operating at BWI Marshall¹⁰ was used to scale the 2024 data to develop the 2030 and 2035 forecast operational totals shown in Table 3-6 and Table 3-7. All operations were scaled to the TAF 2030 and 2035 forecast operations totals shown in Table 3-4. The fleet mix in the same FAA operational categories (Air Carrier Cargo, Air Carrier Passenger, Air Taxi, General Aviation, and Military) was scaled to match the proposed operational totals. In the 2030 and 2035 forecast years, an increase in operations is expected to occur for aircraft types that operators plan to add to their fleets and for aircraft currently in production. A decrease in operations is expected to occur for some older aircraft types in the 2030 and 2035 forecast years.

In general, this study assumes that operations during the daytime and nighttime would grow at the same rate. The one exception is with Southwest Airlines and their recent scheduling changes to include additional red-eye flights. Press reports indicate Southwest Airlines may add to this trend after the 2025 calendar year, so the study accounts for adjusted Southwest arrivals to increase such operations.

For the 2030 forecast, total overall operations are forecast to increase by 12 percent over the base year. Air carrier passenger operations are forecast to increase 11 percent from the base year and air carrier cargo operations to increase by 38 percent. Air taxi operations increased by 6 percent and general aviation

¹⁰ This information included Security and Exchange Commission filings, press releases, and aircraft manufacturer order and delivery reports for the top 12 airlines operating at BWI, in addition to general industry trend information.

operations are forecast to increase by 15 percent. Military operations remained unchanged from the base year.

In 2035, total overall operations are forecast to increase by 22 percent from the base year. Military operations remained unchanged from the base year. Air carrier passenger operations increased 21 percent from the base year, and air carrier cargo operations increased 71 percent. Air taxi operations increased 12 percent and general aviation operations increased 16 percent compared to the base year.

Table 3-4. Anticipated 2025, 2030 and 2035 Forecast Operations Levels

Year	Air Carrier	Air Taxi	General Aviation	Military	Total	AAD
2025	211,771	14,752	10,712	920	238,155	652.50
2030	238,385	15,612	12,340	920	267,257	732.12
2035	260,681	16,512	12,437	920	290,550	795.97

Source: FAA TAF issued January 2025; HMMH 2025

The modeled AAD operations are reported in Table 3-5 through Table 3-7 for the 2025 base year, 2030 five-year forecast, and 2035 ten-year forecast, respectively. The fleet mix distributions are reported by aircraft category and their associated arrivals and departures separated by both day and night activity. Representative aircraft profiles may be used if an exact aircraft type is not included in the AEDT database or if several aircraft variants have similar aerodynamic and acoustic characteristics. Analysis of the radar data showed that circuit operations do not occur on any regular basis at BWI Marshall and therefore were not modeled.

Table 3-5. Base Year (2025) Modeled Average Daily Aircraft Operations

Aircraft Category	Engine	AEDT Type	Aircraft Description	Day Arrivals	Night Arrivals	Day Departures	Night Departures	Total
Air Carrier Cargo	Jet	737800	Boeing 737-800	2.27	0.28	1.54	1.01	5.09
Air Carrier Cargo	Jet	7673ER	Boeing 767-300ER	5.33	2.23	5.48	2.08	15.12
Air Carrier Cargo	Jet	767CF6	Boeing 767-200	0.50	-	0.50	-	1.00
Air Carrier Cargo	Jet	A300-622R	Airbus A300-622R	0.10	1.13	0.78	0.46	2.47
Air Carrier Cargo	Jet	MD11GE	McDonnell Douglas MD-11	0.18	0.24	0.28	0.14	0.84
Air Carrier Cargo	Jet	MD11PW	McDonnell Douglas MD-11	0.21	0.35	0.38	0.18	1.14
Air Carrier Passenger	Jet	717200	Boeing 717-200	1.59	0.01	1.58	0.01	3.18
Air Carrier Passenger	Jet	737700	Boeing 737-700	74.15	13.08	76.07	11.16	174.47
Air Carrier Passenger	Jet	737800	Boeing 737-800	59.69	14.16	60.86	12.99	147.71
Air Carrier Passenger	Jet	777200	Boeing 777-200ER	0.39	0.08	0.30	0.17	0.95
Air Carrier Passenger	Jet	7378MAX	Boeing 737 MAX 8	51.91	11.65	52.95	10.61	127.12
Air Carrier Passenger	Jet	757PW	Boeing 757-200	5.09	1.70	5.82	0.98	13.59
Air Carrier Passenger	Jet	7878R	Boeing 787-8 Dreamliner	0.66	0.01	0.52	0.15	1.34
Air Carrier Passenger	Jet	A319-131	Airbus A319-131	1.38	0.53	1.54	0.37	3.82
Air Carrier Passenger	Jet	A320-211	Airbus A320-211	0.81	0.25	0.80	0.26	2.12
Air Carrier Passenger	Jet	A320-232	Airbus A320-232	7.16	1.91	6.59	2.48	18.14
Air Carrier Passenger	Jet	A320-270N	Airbus A320-270 Neo	9.34	2.54	9.54	2.34	23.76
Air Carrier Passenger	Jet	A321-232	Airbus A321-232	7.20	3.31	8.03	2.47	21.01
Air Carrier Passenger	Jet	CRJ9-ER	Bombardier CRJ900	1.20	0.64	1.02	0.82	3.69
Air Carrier Passenger	Jet	EMB170	Embraer ERJ170-100	1.64	0.25	1.74	0.15	3.77
Air Carrier Passenger	Jet	EMB175	Embraer ERJ170-200	3.71	0.43	3.90	0.25	8.30
Air Carrier Passenger	Jet	EMB190	Embraer ERJ190-100	0.77	0.01	0.73	0.05	1.56
Air Carrier Total	-	-	-	235.28	54.79	240.95	49.13	580.19

Aircraft Category	Engine	AEDT Type	Aircraft Description	Day Arrivals	Night Arrivals	Day Departures	Night Departures	Total
Air Taxi	Jet	CL600	Bombardier Challenger 600	3.29	0.21	3.31	0.20	7.00
Air Taxi	Jet	CL601	Bombardier Challenger 601	0.42	0.01	0.37	0.06	0.87
Air Taxi	Jet	CNA525C	Cessna 525 Citationjet	0.57	0.20	0.62	0.16	1.55
Air Taxi	Jet	CNA55B	Cessna 550 Citation Bravo	2.20	0.19	2.17	0.22	4.78
Air Taxi	Jet	CNA560XL	Cessna 560 Citation Excel	1.80	0.10	1.76	0.15	3.81
Air Taxi	Jet	CNA680	Cessna 680 Citation Sovereign	3.51	0.32	3.64	0.19	7.67
Air Taxi	Jet	CNA750	Cessna 750 Citation X	1.04	0.10	1.05	0.09	2.29
Air Taxi	Jet	EMB145	Embraer 145 ER	1.06	0.01	1.07	-	2.14
Air Taxi	Jet	GIV	Gulfstream GIV-SP	0.68	0.08	0.69	0.07	1.51
Air Taxi	Jet	LEAR35	LearJet 36	0.52	0.06	0.51	0.06	1.15
Air Taxi	Jet	MU3001	Mitsubishi MU-300/Raytheon Beechjet 400	0.64	0.02	0.62	0.05	1.33
Air Taxi	Turbo Prop	CNA208	Cessna 208 Caravan	1.49	1.07	1.37	1.19	5.12
Air Taxi	Turbo Prop	DHC6	DeHaviland Twin Otter	0.60	0.01	0.60	0.01	1.21
Air Taxi Total	-	-	-	17.82	2.38	17.78	2.45	40.43
General Aviation	Jet	CNA525C	Cessna 525 Citationjet	0.45	-	0.36	0.08	0.89
General Aviation	Jet	CNA55B	Cessna 550 Citation Bravo	1.07	0.09	1.09	0.08	2.33
General Aviation	Jet	CNA560U	Cessna 560 Citation Ultra	0.36	0.06	0.35	0.07	0.85
General Aviation	Jet	CNA680	Cessna 680 Citation Sovereign	0.16	0.01	0.16	0.01	0.34
General Aviation	Jet	CNA750	Cessna 750 Citation X	2.38	0.20	2.47	0.11	5.15
General Aviation	Jet	FAL900EX	Dassault Falcon 900EX	0.83	0.07	0.84	0.06	1.81
General Aviation	Jet	G650ER	Gulfstream GVI	0.83	0.05	0.77	0.10	1.75
General Aviation	Jet	GV	Gulfstream GVI	0.93	0.12	0.96	0.09	2.10
General Aviation	Jet	LEAR35	LearJet 36	0.39	0.01	0.39	0.01	0.80
General Aviation	Jet	MU3001	Mitsubishi MU-300/Raytheon Beechjet 400	0.40	0.08	0.40	0.08	0.96
General Aviation	Piston Prop	COMSEP	Generic Composite Single - Engine Piston Propeller General Aviation Aircraft	4.50	0.20	4.50	0.20	9.40
General Aviation	Turbo Prop	CNA208	Cessna 208 Caravan	0.79	0.04	0.81	0.03	1.67
General Aviation	Turbo Prop	DHC6	DeHaviland Twin Otter	0.61	0.02	0.57	0.06	1.26
General Aviation	Helicopter	S76	Sikorsky S-76	0.02	-	0.02	-	0.05
General Aviation Total	-	-	-	13.72	0.95	13.69	0.98	29.36
Military	Jet	767CF6	Boeing 767-200	0.17	-	0.17	-	0.35
Military	Jet	CNA560U	Cessna 560 Citation Ultra	0.32	-	0.32	-	0.65
Military	Jet	T-38A	Northrup Talon T-38	0.10	-	0.10	-	0.19
Military	Turbo Prop	DHC6	DeHaviland Twin Otter	0.67	-	0.67	-	1.33
Military Total	-	-	-	1.26	-	1.26	-	2.52
Grand Total	-	-	-	268.08	58.1	273.68	52.56	652.50

Note: Totals may not equal 100% due to rounding.

Table 3-6. Five-Year (2030) Forecast Modeled Average Daily Aircraft Operations

Aircraft Category	Engine	AEDT Type	Aircraft Description	Day Arrivals	Night Arrivals	Day Departures	Night Departures	Total
Air Carrier Cargo	Jet	737800	Boeing 737-800	3.41	0.42	2.39	1.44	7.66
Air Carrier Cargo	Jet	7673ER	Boeing 767-300ER	8.02	3.36	8.41	2.98	22.77
Air Carrier Cargo	Jet	767CF6	Boeing 767-200	0.31	-	0.31	-	0.62
Air Carrier Cargo	Jet	A300-622R	Airbus A300-622R	0.10	1.13	0.80	0.43	2.46
Air Carrier Cargo	Jet	MD11GE	McDonnell Douglas MD-11	0.18	0.24	0.29	0.13	0.84
Air Carrier Cargo	Jet	MD11PW	McDonnell Douglas MD-11	0.21	0.35	0.39	0.18	1.13
Air Carrier Passenger	Jet	717200	Boeing 717-200	0.87	<0.01	0.86	0.01	1.74
Air Carrier Passenger	Jet	737700	Boeing 737-700	42.47	8.58	45.06	5.98	102.09

Aircraft Category	Engine	AEDT Type	Aircraft Description	Day Arrivals	Night Arrivals	Day Departures	Night Departures	Total
Air Carrier Passenger	Jet	737800	Boeing 737-800	11.95	5.92	13.35	4.53	35.75
Air Carrier Passenger	Jet	7378MAX	Boeing 737 MAX 8	140.61	33.97	148.61	25.97	349.16
Air Carrier Passenger	Jet	757PW	Boeing 757-200	4.29	1.43	4.94	0.78	11.44
Air Carrier Passenger	Jet	777200	Boeing 777-200ER	0.39	0.08	0.31	0.16	0.94
Air Carrier Passenger	Jet	7878R	Boeing 787-8 Dreamliner	1.00	0.01	0.79	0.22	2.02
Air Carrier Passenger	Jet	A320-211	Airbus A320-211	0.25	0.02	0.24	0.03	0.54
Air Carrier Passenger	Jet	A320-232	Airbus A320-232	0.74	0.24	0.68	0.30	1.96
Air Carrier Passenger	Jet	A320-270N	Airbus A320-270 Neo	19.45	6.48	20.41	5.51	51.85
Air Carrier Passenger	Jet	A321-232	Airbus A321-232	14.39	6.11	16.15	4.35	41.00
Air Carrier Passenger	Jet	CRJ9-ER	Bombardier CRJ900	1.20	0.64	1.06	0.78	3.68
Air Carrier Passenger	Jet	EMB170	Embraer ERJ170-100	1.63	0.25	1.74	0.14	3.76
Air Carrier Passenger	Jet	EMB175	Embraer ERJ170-200	4.44	0.59	4.75	0.28	10.06
Air Carrier Passenger	Jet	EMB190	Embraer ERJ190-100	0.77	0.01	0.73	0.05	1.56
Air Carrier Total	-	-	-	256.68	69.83	272.27	54.25	653.03
Air Taxi	Jet	CL600	Bombardier Challenger 600	2.98	0.24	3.02	0.20	6.44
Air Taxi	Jet	CL601	Bombardier Challenger 601	0.42	0.01	0.38	0.06	0.87
Air Taxi	Jet	CNA525C	Cessna 525 Citationjet	0.72	0.25	0.79	0.19	1.95
Air Taxi	Jet	CNA55B	Cessna 550 Citation Bravo	2.78	0.24	2.76	0.26	6.04
Air Taxi	Jet	CNA560XL	Cessna 560 Citation Excel	2.28	0.13	2.23	0.18	4.82
Air Taxi	Jet	CNA680	Cessna 680 Citation Sovereign	3.95	0.36	4.08	0.22	8.61
Air Taxi	Jet	CNA750	Cessna 750 Citation X	1.17	0.11	1.18	0.10	2.56
Air Taxi	Jet	EMB145	Embraer 145 ER	1.06	0.01	1.07	-	2.14
Air Taxi	Jet	GIV	Gulfstream GIV-SP	0.68	0.08	0.69	0.07	1.52
Air Taxi	Jet	LEAR35	LearJet 36	0.38	0.04	0.38	0.04	0.84
Air Taxi	Jet	MU3001	Mitsubishi MU-300/Raytheon Beechjet 400	0.57	0.02	0.55	0.04	1.18
Air Taxi	Turbo Prop	CNA208	Cessna 208 Caravan	1.69	1.21	1.61	1.29	5.80
Air Taxi Total	-	-	-	18.68	2.70	18.74	2.65	42.77
General Aviation	Jet	CNA525C	Cessna 525 Citationjet	0.62	-	0.51	0.11	1.24
General Aviation	Jet	CNA55B	Cessna 550 Citation Bravo	1.49	0.13	1.52	0.10	3.24
General Aviation	Jet	CNA560U	Cessna 560 Citation Ultra	0.36	0.06	0.35	0.07	0.84
General Aviation	Jet	CNA750	Cessna 750 Citation X	2.16	0.17	2.23	0.10	4.66
General Aviation	Jet	FAL900EX	Dassault Falcon 900EX	0.83	0.07	0.85	0.06	1.81
General Aviation	Jet	G650ER	Gulfstream GVI	1.15	0.06	1.08	0.14	2.43
General Aviation	Jet	GV	Gulfstream GVI	0.93	0.12	0.96	0.09	2.10
General Aviation	Jet	MU3001	Mitsubishi MU-300/Raytheon Beechjet 400	0.35	0.07	0.36	0.07	0.85
General Aviation	Piston Prop	COMSEP	Generic Composite Single - Engine Piston Propeller General Aviation Aircraft	6.25	0.27	6.26	0.27	13.05
General Aviation	Turbo Prop	CNA208	Cessna 208 Caravan	1.10	0.06	1.13	0.03	2.32
General Aviation	Turbo Prop	DHC6	DeHaviland Twin Otter	0.61	0.02	0.58	0.05	1.26
General Aviation Total	-	-	-	15.85	1.03	15.83	1.09	33.80
Military	Jet	767CF6	Boeing 767-200	0.17	-	0.17	-	0.34
Military	Jet	CNA560U	Cessna 560 Citation Ultra	0.32	-	0.32	-	0.64
Military	Jet	T-38A	Northrup Talon T-38	0.10	-	0.10	-	0.20
Military	Turbo Prop	DHC6	DeHaviland Twin Otter	0.67	-	0.67	-	1.34
Military Total	-	-	-	1.26	-	1.26	-	2.52
Grand Total	-	-	-	292.47	73.56	308.10	57.99	732.12

Note: Totals may not equal 100% due to rounding.

Table 3-7. Ten-Year (2035) Forecast Modeled Average Daily Aircraft Operations

Aircraft Category	Engine	AEDT Type	Aircraft Description	Day Arrivals	Night Arrivals	Day Departures	Night Departures	Total
Air Carrier Cargo	Jet	737800	Boeing 737-800	4.16	0.51	2.94	1.73	9.34
Air Carrier Cargo	Jet	7673ER	Boeing 767-300ER	10.79	5.28	11.72	4.35	32.14
Air Carrier Cargo	Jet	A300-622R	Airbus A300-622R	0.12	1.13	0.82	0.43	2.50
Air Carrier Passenger	Jet	737700	Boeing 737-700	2.40	0.01	2.39	0.02	4.82
Air Carrier Passenger	Jet	737800	Boeing 737-800	6.55	3.88	7.52	2.91	20.86
Air Carrier Passenger	Jet	7378MAX	Boeing 737 MAX 8	211.37	52.95	224.46	39.87	528.65
Air Carrier Passenger	Jet	777200	Boeing 777-200ER	0.40	0.08	0.32	0.16	0.96
Air Carrier Passenger	Jet	7878R	Boeing 787-8 Dreamliner	1.22	0.01	0.96	0.26	2.45
Air Carrier Passenger	Jet	A320-270N	Airbus A320-270 Neo	21.93	7.33	23.04	6.22	58.52
Air Carrier Passenger	Jet	A321-232	Airbus A321-232	12.19	5.07	14.11	3.15	34.52
Air Carrier Passenger	Jet	CRJ9-ER	Bombardier CRJ900	1.23	0.64	1.09	0.78	3.74
Air Carrier Passenger	Jet	EMB170	Embraer ERJ170-100	1.67	0.25	1.77	0.14	3.83
Air Carrier Passenger	Jet	EMB175	Embraer ERJ170-200	4.53	0.59	4.84	0.28	10.24
Air Carrier Passenger	Jet	EMB190	Embraer ERJ190-100	0.78	0.01	0.75	0.05	1.59
Air Carrier Total	-	-	-	279.34	77.74	296.73	60.35	714.16
Air Taxi	Jet	CL600	Bombardier Challenger 600	3.18	0.26	3.22	0.22	6.88
Air Taxi	Jet	CL601	Bombardier Challenger 601	0.42	0.01	0.38	0.06	0.87
Air Taxi	Jet	CNA525C	Cessna 525 Citationjet	0.81	0.28	0.88	0.21	2.18
Air Taxi	Jet	CNA55B	Cessna 550 Citation Bravo	3.10	0.26	3.08	0.29	6.73
Air Taxi	Jet	CNA560XL	Cessna 560 Citation Excel	2.54	0.14	2.49	0.20	5.37
Air Taxi	Jet	CNA680	Cessna 680 Citation Sovereign	4.40	0.40	4.55	0.25	9.60
Air Taxi	Jet	CNA750	Cessna 750 Citation X	1.24	0.12	1.26	0.10	2.72
Air Taxi	Jet	EMB145	Embraer 145 ER	1.06	0.01	1.07	-	2.14
Air Taxi	Jet	GIV	Gulfstream GIV-SP	0.68	0.08	0.69	0.07	1.52
Air Taxi	Jet	MU3001	Mitsubishi MU-300/Raytheon Beechjet 400	0.50	0.02	0.49	0.04	1.05
Air Taxi	Turbo Prop	CNA208	Cessna 208 Caravan	1.81	1.28	1.71	1.38	6.18
Air Taxi Total	-	-	-	19.74	2.86	19.82	2.82	45.24
General Aviation	Jet	CNA525C	Cessna 525 Citationjet	0.63	-	0.52	0.11	1.26
General Aviation	Jet	CNA55B	Cessna 550 Citation Bravo	1.51	0.13	1.54	0.10	3.28
General Aviation	Jet	CNA560U	Cessna 560 Citation Ultra	0.36	0.06	0.35	0.07	0.84
General Aviation	Jet	CNA750	Cessna 750 Citation X	2.16	0.17	2.23	0.10	4.66
General Aviation	Jet	FAL900EX	Dassault Falcon 900EX	0.83	0.07	0.85	0.06	1.81
General Aviation	Jet	G650ER	Gulfstream GVI	1.17	0.06	1.10	0.14	2.47
General Aviation	Jet	GV	Gulfstream GVI	0.93	0.12	0.96	0.09	2.10
General Aviation	Jet	MU3001	Mitsubishi MU-300/Raytheon Beechjet 400	0.31	0.07	0.32	0.06	0.76
General Aviation	Piston Prop	COMSEP	Generic Composite Single - Engine Piston Propeller General Aviation Aircraft	6.36	0.28	6.36	0.27	13.27
General Aviation	Turbo Prop	CNA208	Cessna 208 Caravan	1.11	0.06	1.14	0.03	2.34
General Aviation	Turbo Prop	DHC6	DeHaviland Twin Otter	0.61	0.02	0.58	0.05	1.26
General Aviation Total	-	-	-	15.98	1.04	15.95	1.08	34.05
Military	Jet	767CF6	Boeing 767-200	0.17	-	0.17	-	0.34
Military	Jet	CNA560U	Cessna 560 Citation Ultra	0.32	-	0.32	-	0.64
Military	Jet	T-38A	Northrup Talon T-38	0.10	-	0.10	-	0.20
Military	Turbo Prop	DHC6	DeHaviland Twin Otter	0.67	-	0.67	-	1.34
Military Total	-	-	-	1.26	-	1.26	-	2.52
Grand Total	-	-	-	316.32	81.64	333.76	64.25	795.97

Note: Totals may not equal 100% due to rounding.

In addition to aircraft flight operations, aircraft maintenance run-ups occur at BWI Marshall. To calculate DNL, AEDT requires the inclusion of details related to aircraft maintenance run-ups. Required run-up information includes the location, direction, aircraft type, power settings, and frequency. The detailed breakdown of maintenance run-ups at BWI Marshall was determined based on the most recent data available regarding operations at the new airline maintenance facility,¹¹ per direction from the MAA, run-up activity logs from 2020 through 2024,¹² and information obtained from Air Transport International.¹³

No run-ups were reported in 2024 and thus are not modeled for the 2025 base year. Average daily aircraft run-ups for 2030 and 2035 are reported in Table 3-8. Future year run-up operations for the 2025 ANZ modeling were based on the most current assumptions from airport tenants and historical run-up data, and operations from the MAA's run-up activity logs were used to identify and update the aircraft types expected to conduct run-ups in 2030 and 2035. The run-up activity log also provided typical durations and locations of run-ups.

Table 3-8. Five- (2030) and Ten-Year (2035) Modeled Average Daily Aircraft Run-ups

AEDT Aircraft Type	Site Name	Latitude (degrees)	Longitude (degrees)	Magnetic Heading (degrees)	Day Run-Ups	Night Run-Ups	Duration per Run-Up (seconds)	Approximate Power Setting (% of Takeoff Thrust/RPM)
737700/ Boeing 737-700	Airline Maintenance Facility	39.178976	-76.686047	260	2.0649	1.3766	120	100%
737800/ Boeing 737-800	Airline Maintenance Facility	39.178976	-76.686047	260	1.0592	0.7062	120	100%
737MAX8/ Boeing 737-MAX7 and MAX8	Airline Maintenance Facility	39.178976	-76.686047	260	1.5524	1.0349	120	100%
737700/ Boeing 737-700	Runway 28 De-ice Pad	39.175501	-76.659727	190	0.0008	0.0000	120	100%
	Runway 33L Hold Block	39.165388	-76.660616	240	0.0015	0.0000	120	100%
737800/ Boeing 737-800	Runway 28 De-ice Pad	39.175501	-76.659727	190	0.0003	0.0005	120	100%
	Runway 33L Hold Block	39.165388	-76.660616	240	0.0005	0.0010	120	100%
7673ER/Boeing 767-300ER	Runway 28 De-ice Pad	39.175501	-76.659727	190	0.0010	0.0000	120	100%
	Runway 33L Hold Block	39.165388	-76.660616	240	0.0020	0.0000	120	100%
767CF6/Boeing 767-200	Midfield Cargo Facility	39.171833	-76.685497	235	0.0092	0.0000	300	10%
7673ER/Boeing 767-300ER	Midfield Cargo Facility	39.171833	-76.685497	235	0.1552	0.0000	300	10%

¹¹ Final Environmental Assessment and Draft Section 4(f) Determination, ALP Phase I Improvements at BWI Marshall Airport, November 2020

¹² MAA, email to HMMH, July 21, 2025

¹³ Air Transport International, email to MAA, July 24, 2025

AEDT Aircraft Type	Site Name	Latitude (degrees)	Longitude (degrees)	Magnetic Heading (degrees)	Day Run-Ups	Night Run-Ups	Duration per Run-Up (seconds)	Approximate Power Setting (% of Takeoff Thrust/RPM)
767CF6/Boeing 767-200	Midfield Cargo Ramp	39.172626	-76.68687	105	0.0012	0.0003	20	100%
7673ER/Boeing 767-300ER	Midfield Cargo Ramp	39.172626	-76.68687	105	0.0207	0.0052	20	100%

Sources: MAA, 2025; MAA run-up logs, 2020-2024; Updated Final Environmental Assessment and Draft Section 4(f) Determination, ALP Phase I Improvements at BWI Marshall Airport, November 2020

3.3 Aircraft Noise and Performance Characteristics

AEDT includes a database of specific noise and performance data for most aircraft types operating at BWI Marshall. Noise data are included in the form of Sound Exposure Level (SEL) at a range of distances (from 200 feet to 25,000 feet) from a particular aircraft with engines at a specific thrust level. SEL is a measure of the total “noisiness” of an event and takes duration of the event into account. Performance data includes thrust, speed, and altitude data for takeoff and landing operations, often referred to as aircraft profiles. The AEDT database contains standard noise and performance data for over 300 different aircraft types, including both civilian and military 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. For the BWI Marshall ANZ update, the standard aircraft noise and performance data contained within the AEDT database were utilized.

Within the AEDT database, aircraft takeoff or departure profiles are usually defined by a range of trip distances identified as “stage lengths.” A longer trip distance or higher stage length is associated with a heavier aircraft due to the increase in fuel requirements for the flight. For example, a departure aircraft with a trip distance less than 500 nautical miles (nmi) would be assigned a stage length value of one, where a departure aircraft with a trip distance of 3,000 nmi would be assigned a stage length value of five. For civilian aircraft, stage length determinations were obtained from aircraft departure data obtained from the MAA ANOMS. Military aircraft were assigned a stage length value of one because for homeland security reasons there is no data from military operations in the MAA ANOMS, and thus no way to determine trip distances for military operations. Table 3-9 provides the stage length classifications by their associated trip distances.

Table 3-9. Stage Lengths by Trip Distance

Stage Length	Trip Distance (nmi)
1	0-500
2	501-1,000
3	1,001-1,500
4	1,501-2,500
5	2,501-3,500
6	3,501-4,500
7	4,501-5,500
8	5,501-6,500
9	6,501+

Table 3-10 presents the anticipated modeled stage length use percentages for departures for the 2025 base year. Table 3-11 and Table 3-12 present the anticipated stage length use percentages representing departures for both the five-year (2030) and ten-year (2035) forecast years, respectively.

Table 3-10. Base Year (2025) Modeled Departure Stage Length Usage by Aircraft Type

AEDT Aircraft Type	Stage Length 1 (Day)	Stage Length 2 (Day)	Stage Length 3 (Day)	Stage Length 4 (Day)	Stage Length 5 (Day)	Stage Length 1 (Night)	Stage Length 2 (Night)	Stage Length 3 (Night)	Stage Length 4 (Night)	Stage Length 5 (Night)
717200	90.5%	9.5%	-	-	-	90.8%	9.3%	-	-	-
737700	45.8%	41.3%	10.1%	2.9%	-	39.9%	39.5%	15.7%	4.9%	-
737800	35.2%	34.3%	18.8%	11.7%	-	47.5%	29.4%	12.2%	11.0%	-
777200	4.1%	3.9%	4.1%	2.8%	85.1%	-	-	-	-	100.0%
7378MAX	31.8%	32.5%	20.1%	15.5%	-	43.1%	33.0%	8.4%	15.6%	-
757PW	3.0%	97.0%	-	-	-	13.3%	74.1%	-	12.6%	-
7673ER	35.5%	36.2%	14.2%	13.5%	0.6%	37.0%	51.8%	1.7%	2.8%	6.7%
767CF6	40.1%	-	31.8%	28.1%	-	-	-	-	-	-
7878R	-	-	-	-	100.0%	-	-	-	-	100.0%
A300-622R	93.7%	6.3%	-	-	-	100.0%	-	-	-	-
A319-131	23.4%	57.5%	15.1%	4.0%	-	11.6%	88.4%	-	-	-
A320-211	20.3%	42.6%	28.4%	8.7%	-	22.4%	56.3%	17.3%	4.1%	-
A320-232	20.0%	42.9%	28.6%	8.6%	-	22.4%	56.3%	17.3%	4.1%	-
A320-270N	11.0%	51.5%	14.4%	23.2%	-	6.0%	54.4%	27.9%	11.7%	-
A321-232	15.7%	41.8%	21.9%	20.6%	-	22.6%	56.9%	17.6%	2.9%	-
CL600	50.3%	39.6%	4.7%	5.5%	-	59.8%	29.6%	4.9%	5.8%	-
CL601	62.5%	23.9%	6.7%	6.9%	-	62.8%	22.9%	7.6%	6.7%	-
CNA208	89.5%	10.5%	-	-	-	99.5%	0.6%	-	-	-
CNA525C	78.5%	21.5%	-	-	-	78.6%	21.4%	-	-	-
CNA55B	74.6%	23.9%	1.5%	-	-	93.5%	6.6%	-	-	-
CNA560U	81.1%	18.9%	-	-	-	66.7%	33.3%	-	-	-
CNA560XL	75.3%	24.7%	-	-	-	73.2%	26.8%	-	-	-
CNA680	72.0%	21.1%	4.3%	2.6%	-	70.5%	22.2%	5.0%	2.4%	-
CNA750	55.8%	30.7%	6.5%	6.9%	-	53.8%	31.5%	8.0%	6.8%	-
COMSEP	96.7%	3.3%	-	-	-	94.9%	5.1%	-	-	-
CRJ9-ER	100.0%	-	-	-	-	100.0%	-	-	-	-
DHC6	100.0%	-	-	-	-	100.0%	-	-	-	-
EMB145	4.3%	95.7%	-	-	-	-	-	-	-	-
EMB170	25.5%	74.5%	-	-	-	-	100.0%	-	-	-
EMB175	57.7%	22.3%	20.1%	-	-	56.6%	43.4%	-	-	-
EMB190	100.0%	-	-	-	-	100.0%	-	-	-	-
FAL900EX	57.1%	32.7%	-	10.2%	-	53.8%	37.1%	-	9.1%	-
G650ER	56.8%	43.3%	-	-	-	60.9%	39.1%	-	-	-
GIV	48.0%	30.9%	7.4%	13.8%	-	49.8%	30.0%	7.1%	13.0%	-
GV	62.0%	20.4%	1.0%	16.6%	-	60.3%	18.5%	6.9%	14.4%	-
LEAR35	73.1%	23.9%	3.0%	-	-	73.2%	22.5%	4.3%	-	-
MD11GE	100.0%	-	-	-	-	100.0%	-	-	-	-
MD11PW	100.0%	-	-	-	-	100.0%	-	-	-	-
MU3001	79.2%	20.8%	-	-	-	82.3%	17.7%	-	-	-
S76	100.0%	-	-	-	-	-	-	-	-	-
T-38A	100.0%	-	-	-	-	-	-	-	-	-

Note: Totals may not equal 100% due to rounding.

Table 3-11. Five-Year (2030) Forecast Modeled Departure Stage Length Usage by AEDT Aircraft Type

AEDT Aircraft Type	Stage Length 1 (Day)	Stage Length 2 (Day)	Stage Length 3 (Day)	Stage Length 4 (Day)	Stage Length 5 (Day)	Stage Length 1 (Night)	Stage Length 2 (Night)	Stage Length 3 (Night)	Stage Length 4 (Night)	Stage Length 5 (Night)
717200	90.5%	9.5%	-	-	-	90.8%	9.3%	-	-	-
737700	47.2%	40.4%	9.6%	2.8%	-	40.5%	39.3%	5.0%	-	-
737800	27.9%	26.8%	21.6%	23.8%	-	38.7%	37.4%	10.0%	-	-
777200	3.1%	4.0%	3.7%	3.1%	86.2%	-	-	-	100.0%	-
7378MAX	36.4%	35.5%	17.0%	11.1%	-	42.2%	35.3%	12.7%	-	-
757PW	0.4%	99.6%	-	-	-	10.3%	89.7%	-	-	-
7673ER	33.0%	37.9%	14.7%	13.6%	0.7%	38.5%	51.3%	1.8%	7.2%	-
767CF6	56.7%	-	0.6%	42.7%	-	-	-	-	-	-
7878R	-	-	-	-	100.0%	-	-	-	100.0%	-
A300-622R	94.8%	5.2%	-	-	-	99.9%	0.1%	-	-	-
A320-211	18.9%	66.5%	14.7%	-	-	17.3%	64.2%	-	-	-
A320-232	13.7%	42.8%	29.5%	14.1%	-	12.7%	61.4%	5.3%	-	-
A320-270N	9.8%	45.9%	15.3%	29.0%	-	5.0%	52.1%	13.3%	-	-
A321-232	24.2%	37.5%	20.2%	18.1%	-	35.6%	46.1%	7.4%	-	-
CL600	100.0%	-	-	-	-	100.0%	-	-	-	-
CL601	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA208	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA525C	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA55B	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA560U	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA560XL	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA680	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA750	100.0%	-	-	-	-	100.0%	-	-	-	-
COMSEP	100.0%	-	-	-	-	100.0%	-	-	-	-
CRJ9-ER	100.0%	-	-	-	-	100.0%	-	-	-	-
DHC6	100.0%	-	-	-	-	100.0%	-	-	-	-
EMB145	1.8%	98.2%	-	-	-	-	-	-	-	-
EMB170	17.5%	82.5%	-	-	-	-	100.0%	-	-	-
EMB175	47.7%	27.1%	25.2%	-	-	46.4%	53.6%	-	-	-
EMB190	100.0%	-	-	-	-	100.0%	-	-	-	-
FAL900EX	100.0%	-	-	-	-	100.0%	-	-	-	-
G650ER	100.0%	-	-	-	-	100.0%	-	-	-	-
GIV	100.0%	-	-	-	-	100.0%	-	-	-	-
GV	100.0%	-	-	-	-	100.0%	-	-	-	-
LEAR35	100.0%	-	-	-	-	100.0%	-	-	-	-
MD11GE	100.0%	-	-	-	-	100.0%	-	-	-	-
MD11PW	100.0%	-	-	-	-	100.0%	-	-	-	-
MU3001	100.0%	-	-	-	-	100.0%	-	-	-	-
T-38A	100.0%	-	-	-	-	-	-	-	-	-

Note: Totals may not equal 100% due to rounding.

Table 3-12. Ten-Year (2035) Forecast Modeled Departure Stage Length Usage by AEDT Aircraft Type

AEDT Aircraft Type	Stage Length 1 (Day)	Stage Length 2 (Day)	Stage Length 3 (Day)	Stage Length 4 (Day)	Stage Length 5 (Day)	Stage Length 1 (Night)	Stage Length 2 (Night)	Stage Length 3 (Night)	Stage Length 4 (Night)	Stage Length 5 (Night)
737700	90.5%	9.5%	-	-	-	90.8%	9.3%	-	-	-
737800	15.1%	27.7%	19.6%	37.6%	-	28.7%	45.8%	13.1%	-	-
777200	3.1%	4.0%	3.7%	3.1%	86.0%	-	-	-	100.0%	-
7378MAX	37.2%	38.5%	15.1%	9.2%	-	37.6%	42.4%	10.2%	-	-
7673ER	40.7%	33.5%	13.0%	12.1%	0.7%	48.1%	42.3%	1.6%	7.1%	-
767CF6	100.0%	-	-	-	-	-	-	-	-	-
7878R	-	-	-	-	100.0%	-	-	-	100.0%	-
A300-622R	94.6%	5.4%	-	-	-	99.9%	0.1%	-	-	-
A320-270N	9.6%	44.7%	15.4%	30.3%	-	4.9%	51.7%	13.5%	-	-
A321-232	12.7%	34.2%	27.9%	25.2%	-	21.9%	45.7%	14.7%	-	-
CL600	100.0%	-	-	-	-	100.0%	-	-	-	-
CL601	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA208	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA525C	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA55B	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA560U	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA560XL	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA680	100.0%	-	-	-	-	100.0%	-	-	-	-
CNA750	100.0%	-	-	-	-	100.0%	-	-	-	-
COMSEP	100.0%	-	-	-	-	100.0%	-	-	-	-
CRJ9-ER	100.0%	-	-	-	-	100.0%	-	-	-	-
DHC6	100.0%	-	-	-	-	100.0%	-	-	-	-
EMB145	1.8%	98.2%	-	-	-	-	-	-	-	-
EMB170	17.5%	82.6%	-	-	-	-	100.0%	-	-	-
EMB175	47.7%	27.1%	25.2%	-	-	46.4%	53.6%	-	-	-
EMB190	100.00%	-	-	-	-	100.00%	-	-	-	-
FAL900EX	100.00%	-	-	-	-	100.00%	-	-	-	-
G650ER	100.00%	-	-	-	-	100.00%	-	-	-	-
GIV	100.00%	-	-	-	-	100.00%	-	-	-	-
GV	100.00%	-	-	-	-	100.00%	-	-	-	-
MU3001	100.00%	-	-	-	-	100.00%	-	-	-	-
T-38A	100.00%	-	-	-	-	-	-	-	-	-

Note: Totals may not equal 100% due to rounding.

3.4 Runway Utilization

The primary factor affecting runway use at airports is weather, specifically wind direction and wind speed. Additional factors that may affect runway use include the position of the facilities or ramps relative to the runways and length of the runways for aircraft performance considerations.

At BWI Marshall, the airport operates in two predominant operational flows referred to as east flow and west flow. Under west flow, aircraft primarily depart from Runway 28 but may also depart from Runways 33L or 33R, and primarily arrive on Runway 33L but may also arrive on Runways 28 or 33R. Likewise, under east flow, aircraft primarily depart from Runway 15R but may also depart from Runways 15L or 10, and primarily arrive on Runway 10 but may also arrive on Runways 15L or 15R. Historically, at BWI Marshall approximately 70 percent of operations occur under a west flow configuration, and approximately 30 percent of operations occur under east flow. In 2024, BWI Marshall operated in west flow approximately 62 percent of the time and 38 percent in east flow, which is a slightly lower percentage in west flow than in 2023 (66 percent west flow) and 2022 (67 percent west flow).

Based on 2024 data derived from the MAA ANOMS, the overall runway usage tables for BWI Marshall were compiled by operation types: arrival, departure, time of day (day or night), and category of operation (Air Carrier Cargo, Air Carrier Passenger, Air Taxi, General Aviation, and Military). For fixed-wing Runway 28 departures, most aircraft depart from Runway 28 at the U1 Taxiway intersection. However, a small percentage of aircraft have a need (based on weight, length of flight, or other conditions) to use the full 10,503 feet of runway and may begin their takeoff roll at the physical end of Runway 28. Full length departures from Runway 28 represent 0.4 percent of all Runway 28 departures, or an average of roughly one departure per day. For each respective aircraft category, full length departures are included in the overall runway utilization percentages for Runway 28 departures. For the other runways, it is assumed departure aircraft will utilize the full runway length for all departures. For helicopter operations, it is assumed all categories of operations will operate from Helipad H1.

For military fixed-wing operations, there was no data from the MAA ANOMS to determine runway usage. However, the military operations fleet mix is largely representative of that of fixed-wing air taxi operations derived from the MAA ANOMS. As such, this study used the runway utilization rate for fixed-wing air taxi operations and applied these rates to a majority of military operations. For KC-46 and T-38 military aircraft that require a runway longer than Runway 15L/33R, the runway utilization rate for fixed-wing air carrier operations was used. Table 3-13 through Table 3-15 present the runway and helipad utilization rates that were used for modeling the DNL contours for 2025 base year operations.

Table 3-13. Base Year (2025) Fixed-Wing Overall Runway Utilization Percentages

Runway	Day Arrivals	Night Arrivals	Day Departures	Night Departures
10	34.6%	34.1%	0.3%	0.6%
15L	2.2%	1.9%	3.0%	2.3%
15R	0.8%	4.5%	33.5%	35.3%
28	6.0%	4.0%	57.0%	57.6%
33L	51.9%	52.9%	1.2%	0.9%
33R	4.5%	2.6%	4.9%	3.3%
Total	100.0%	100.0%	100.0%	100.0%

Notes:

For modeling purposes, all departure aircraft with a stage length greater than 4 utilized the full length of Runway 28 for departure. Totals may not equal 100% due to rounding.

Table 3-14. Base Year (2025) Fixed-Wing Runway Utilization Percentages by Aircraft Category

Category	Propulsion Class	Operation Type	Time of Day	Runway 10	Runway 15L	Runway 15R	Runway 28 ¹	Runway 33L	Runway 33R	Total
Air Carrier Cargo	Jet	Arrivals	Day	38.1%	0.0%	0.8%	6.3%	54.7%	0.0%	100.0%
Air Carrier Cargo	Jet	Arrivals	Night	31.1%	0.0%	6.8%	4.4%	57.7%	0.0%	100.0%
Air Carrier Cargo	Jet	Departures	Day	1.9%	0.0%	33.8%	62.7%	1.6%	0.0%	100.0%
Air Carrier Cargo	Jet	Departures	Night	1.7%	0.0%	42.3%	53.6%	2.4%	0.0%	100.0%
Air Carrier Passenger	Jet	Arrivals	Day	36.7%	0.0%	0.8%	6.2%	56.3%	0.0%	100.0%
Air Carrier Passenger	Jet	Arrivals	Night	36.0%	0.0%	4.5%	4.0%	55.5%	0.0%	100.0%
Air Carrier Passenger	Jet	Departures	Day	0.3%	0.0%	36.7%	61.8%	1.3%	0.0%	100.0%
Air Carrier Passenger	Jet	Departures	Night	0.5%	0.0%	37.1%	61.6%	0.8%	0.0%	100.0%
Air Taxi	Jet	Arrivals	Day	19.4%	17.7%	0.3%	4.6%	18.1%	39.9%	100.0%
Air Taxi	Jet	Arrivals	Night	17.3%	26.7%	2.3%	2.3%	12.5%	39.0%	100.0%
Air Taxi	Jet	Departures	Day	0.1%	27.3%	9.6%	19.7%	0.4%	43.0%	100.0%
Air Taxi	Jet	Departures	Night	0.0%	36.6%	4.9%	11.0%	0.2%	47.4%	100.0%
Air Taxi	Non-Jet	Arrivals	Day	4.5%	35.3%	0.3%	1.8%	1.9%	56.1%	100.0%
Air Taxi	Non-Jet	Arrivals	Night	4.6%	44.3%	0.7%	0.9%	1.4%	48.2%	100.0%
Air Taxi	Non-Jet	Departures	Day	0.2%	37.6%	1.9%	3.5%	0.0%	56.8%	100.0%
Air Taxi	Non-Jet	Departures	Night	0.4%	39.3%	0.4%	3.1%	0.2%	56.5%	100.0%
General Aviation	Jet	Arrivals	Day	22.5%	15.5%	0.7%	4.4%	24.3%	32.6%	100.0%
General Aviation	Jet	Arrivals	Night	21.8%	8.4%	3.4%	7.8%	34.1%	24.6%	100.0%
General Aviation	Jet	Departures	Day	0.3%	27.8%	7.9%	21.1%	0.7%	42.2%	100.0%
General Aviation	Jet	Departures	Night	0.5%	27.7%	7.3%	21.8%	0.0%	42.7%	100.0%
General Aviation	Non-Jet	Arrivals	Day	2.3%	34.6%	0.2%	2.3%	1.7%	58.9%	100.0%
General Aviation	Non-Jet	Arrivals	Night	6.7%	36.0%	0.0%	0.0%	1.3%	56.0%	100.0%
General Aviation	Non-Jet	Departures	Day	0.1%	32.5%	1.9%	2.1%	0.0%	63.5%	100.0%
General Aviation	Non-Jet	Departures	Night	1.1%	32.6%	2.2%	2.2%	0.0%	61.8%	100.0%
Military ²	Jet	Arrivals	Day	19.4%	17.7%	0.3%	4.6%	18.1%	39.9%	100.0%
Military ²	Jet	Arrivals	Night	17.3%	26.7%	2.3%	2.3%	12.5%	39.0%	100.0%
Military ²	Jet	Departures	Day	0.1%	27.3%	9.6%	19.7%	0.4%	43.0%	100.0%
Military ²	Jet	Departures	Night	0.0%	36.6%	4.9%	11.0%	0.2%	47.4%	100.0%
Military ²	Non-Jet	Arrivals	Day	4.5%	35.3%	0.3%	1.8%	1.9%	56.1%	100.0%
Military ²	Non-Jet	Arrivals	Night	4.6%	44.3%	0.7%	0.9%	1.4%	48.2%	100.0%
Military ²	Non-Jet	Departures	Day	0.2%	37.6%	1.9%	3.5%	0.0%	56.8%	100.0%
Military ²	Non-Jet	Departures	Night	0.4%	39.3%	0.4%	3.1%	0.2%	56.5%	100.0%

Notes:

¹ For modeling purposes, all departure aircraft with a stage length greater than 4 utilized the full length of Runway 28 for departure.² Military runway utilization rates assumed to be identical to that of Air Taxi operations.

Totals may not equal 100% due to rounding.

Table 3-15. Helipad Utilization Percentages for All Years

Helicopter Category	Helipad	Day Arrivals	Night Arrivals	Day Departures	Night Departures
All Helicopters	H1	100.0%	100.0%	100.0%	100.0%

For the five-year forecast runway utilization, the overall runway usage tables for BWI Marshall are the same as the base year runway usage. Runway usage was compiled by aircraft operation type (arrivals and departures), time of day (day and night), and category of operation (Air Carrier, Air Taxi, General Aviation, and Military). As was the case for the 2025 base year, most fixed-wing aircraft departing from Runway 28 depart from the U1 Taxiway intersection, with a small percentage of aircraft requiring full length use. For the five-year forecast, the same percentage of aircraft conducting full length departures was the same as in

the base year, and these are included in the overall runway utilization percentages for Runway 28 departures for each respective aircraft category. For the five-year forecast runway utilization for all other runways, all departures utilized the full runway length. For helicopter operations, all categories of operations occurred from Helipad H1, and the helipad utilization remained the same as the 2025 base year.

For military fixed-wing operations, no data was available from the MAA ANOMS to determine runway usage. However, the military operations fleet mix is largely representative of that of fixed-wing air taxi operations derived from the MAA ANOMS. As such, the runway utilization rate for fixed-wing air taxi operations was applied to a majority of military operations. For KC-46 and T-38 military aircraft that require a runway longer than Runway 15L/33R, this study utilized the runway utilization rate for fixed-wing air carrier operations.

Table 3-16 and Table 3-17 present the runway utilization rates used to model the DNL contours for the 2030 forecast operations.

Table 3-16. Five-Year (2030) Forecast Fixed-Wing Overall Runway Utilization Percentages

Runway	Day Arrivals	Night Arrivals	Day Departures	Night Departures
10	34.6%	34.1%	0.3%	0.6%
15L	2.2%	1.9%	3.0%	2.3%
15R	0.8%	4.5%	33.5%	35.3%
28	6.0%	4.0%	57.0%	57.6%
33L	51.9%	52.9%	1.2%	0.9%
33R	4.5%	2.6%	4.9%	3.3%
Total	100.0%	100.0%	100.0%	100.0%

Notes:

Totals may not equal 100% due to rounding.

For modeling purposes, all departure aircraft with a stage length greater than 4 utilized the full length of Runway 28 for departure.

Table 3-17. Five-Year (2030) Forecast Fixed-Wing Runway Utilization Percentages by Aircraft Category

Category	Propulsion Class	Operation Type	Time of Day	Runway 10	Runway 15L	Runway 15R	Runway 28 [†]	Runway 33L	Runway 33R	Total
Air Carrier Cargo	Jet	Arrivals	Day	38.1%	0.0%	0.8%	6.3%	54.7%	0.0%	100.0%
Air Carrier Cargo	Jet	Arrivals	Night	31.1%	0.0%	6.8%	4.4%	57.7%	0.0%	100.0%
Air Carrier Cargo	Jet	Departures	Day	1.9%	0.0%	33.8%	62.7%	1.6%	0.0%	100.0%
Air Carrier Cargo	Jet	Departures	Night	1.7%	0.0%	42.3%	53.6%	2.4%	0.0%	100.0%
Air Carrier Passenger	Jet	Arrivals	Day	36.7%	0.0%	0.8%	6.2%	56.3%	0.0%	100.0%
Air Carrier Passenger	Jet	Arrivals	Night	36.0%	0.0%	4.5%	4.0%	55.5%	0.0%	100.0%
Air Carrier Passenger	Jet	Departures	Day	0.3%	0.0%	36.7%	61.8%	1.3%	0.0%	100.0%
Air Carrier Passenger	Jet	Departures	Night	0.5%	0.0%	37.1%	61.6%	0.8%	0.0%	100.0%
Air Taxi	Jet	Arrivals	Day	19.4%	17.7%	0.3%	4.6%	18.1%	39.9%	100.0%
Air Taxi	Jet	Arrivals	Night	17.3%	26.7%	2.3%	2.3%	12.5%	39.0%	100.0%
Air Taxi	Jet	Departures	Day	0.1%	27.3%	9.6%	19.7%	0.4%	43.0%	100.0%
Air Taxi	Jet	Departures	Night	0.0%	36.6%	4.9%	11.0%	0.2%	47.4%	100.0%
Air Taxi	Non-Jet	Arrivals	Day	4.5%	35.3%	0.3%	1.8%	1.9%	56.1%	100.0%
Air Taxi	Non-Jet	Arrivals	Night	4.6%	44.3%	0.7%	0.9%	1.4%	48.2%	100.0%
Air Taxi	Non-Jet	Departures	Day	0.2%	37.6%	1.9%	3.5%	0.0%	56.8%	100.0%
Air Taxi	Non-Jet	Departures	Night	0.4%	39.3%	0.4%	3.1%	0.2%	56.5%	100.0%
General Aviation	Jet	Arrivals	Day	22.5%	15.5%	0.7%	4.4%	24.3%	32.6%	100.0%
General Aviation	Jet	Arrivals	Night	21.8%	8.4%	3.4%	7.8%	34.1%	24.6%	100.0%
General Aviation	Jet	Departures	Day	0.3%	27.8%	7.9%	21.1%	0.7%	42.2%	100.0%
General Aviation	Jet	Departures	Night	0.5%	27.7%	7.3%	21.8%	0.0%	42.7%	100.0%

Category	Propulsion Class	Operation Type	Time of Day	Runway 10	Runway 15L	Runway 15R	Runway 28 ¹	Runway 33L	Runway 33R	Total
General Aviation	Non-Jet	Arrivals	Day	2.3%	34.6%	0.2%	2.3%	1.7%	58.9%	100.0%
General Aviation	Non-Jet	Arrivals	Night	6.7%	36.0%	0.0%	0.0%	1.3%	56.0%	100.0%
General Aviation	Non-Jet	Departures	Day	0.1%	32.5%	1.9%	2.1%	0.0%	63.5%	100.0%
General Aviation	Non-Jet	Departures	Night	1.1%	32.6%	2.2%	2.2%	0.0%	61.8%	100.0%
Military ²	Jet	Arrivals	Day	19.4%	17.7%	0.3%	4.6%	18.1%	39.9%	100.0%
Military ²	Jet	Arrivals	Night	17.3%	26.7%	2.3%	2.3%	12.5%	39.0%	100.0%
Military ²	Jet	Departures	Day	0.1%	27.3%	9.6%	19.7%	0.4%	43.0%	100.0%
Military ²	Jet	Departures	Night	0.0%	36.6%	4.9%	11.0%	0.2%	47.4%	100.0%
Military ²	Non-Jet	Arrivals	Day	4.5%	35.3%	0.3%	1.8%	1.9%	56.1%	100.0%
Military ²	Non-Jet	Arrivals	Night	4.6%	44.3%	0.7%	0.9%	1.4%	48.2%	100.0%
Military ²	Non-Jet	Departures	Day	0.2%	37.6%	1.9%	3.5%	0.0%	56.8%	100.0%
Military ²	Non-Jet	Departures	Night	0.4%	39.3%	0.4%	3.1%	0.2%	56.5%	100.0%

Notes:

Totals may not equal 100% due to rounding.

¹ For modeling purposes, all departure aircraft with a stage length greater than 4 utilized the full length of Runway 28 for departure.

² Military runway utilization rates assumed to be identical to that of Air Taxi operations.

For the ten-year forecast conditions, which includes the planned parallel Runway 10R/28L and the planned extension of Runway 15R/33L, the runway utilization for BWI Marshall was derived from consultation with MAA. Anticipated changes to runway use include:

- Distributing operations between existing Runways 10/28 (future 10L/28R) and proposed parallel Runway 10R/28L,
- Shifting some daytime Air Carrier and Air Taxi departure operations associated with existing Runway 15R to utilize parallel Runways 10L and 10R,
- Shifting some nighttime Air Carrier and Air Taxi departure operations associated with existing Runway 15R to utilize parallel Runways 28L and 28R, and
- Making minor adjustments to the distribution of operations to the other runways based on anticipated changes in fleet mix for the 2035 ten-year forecast and aircraft performance requirements.

For the purposes of the ten-year 2035 forecast conditions, model tracks and operations from the existing Runway 10/28 (future Runways 10L/28R) were replicated to the planned Runway 10R/28L. It is assumed the flight tracks for 2035 operations will remain consistent with the assumptions and analysis of how the new runway will be utilized. These assumptions include the following:

- During busy periods, both the existing Runway 10/28 (future Runway 10L/28R) and the planned Runway 10R/28L could be used for departing aircraft at the same time and flight tracks would not cross.
- The existing Runway 28 (future Runway 28R) would be used for aircraft departing west and making right turns to the north and east, while the planned Runway 28L would be used for aircraft departing and making left turns for destinations to the south, east, and west.
- The existing Runway 10 (future Runway 10L) would be used for aircraft departing straight east and making left turns to the north and west, while the planned Runway 10R would be used for aircraft making right turns for destinations to the east, south, and west.
- If necessary, due to aircraft performance requirements, all departures that require extra runway length will continue to utilize the existing Runway 10/28 (future Runway 10L/28R) regardless of destination.

Table 3-18 and Table 3-19 present the runway utilization rates that were used to model DNL contours for the ten-year 2035 forecast operations based on these assumptions. For helicopter operations, all categories of operations were assumed to continue to operate from Helipad H1, and the helipad utilization remained the same as the 2025 base year.

Table 3-18. Ten-Year (2035) Forecast Fixed-Wing Overall Runway Utilization Percentages

Runway	Day Arrivals	Night Arrivals	Day Departures	Night Departures
10L	3.95%	19.83%	22.41%	1.02%
10R	26.34%	13.21%	3.68%	0.68%
15L	2.47%	1.33%	3.47%	1.88%
15R	1.90%	1.17%	5.82%	18.95%
28L	2.91%	2.62%	33.61%	43.38%
28R	0.97%	1.75%	23.61%	28.92%
33L	56.07%	57.34%	1.85%	1.77%
33R	5.39%	2.74%	5.56%	3.40%
Total	100.00%	100.00%	100.00%	100.00%

Notes:

Totals may not equal 100% due to rounding.

For modeling purposes, all departure aircraft with a stage length greater than 4 utilized the full length of Runway 28 for departure. Based on analysis of BWI Marshall 2024 ANOMS operations data, this consists of a total of 0.4% of total Runway 28 departure operations.

Table 3-19. Ten-Year (2035) Forecast Fixed Wing Runway Utilization Percentages

Aircraft Category	Runway	Day Arrivals	Night Arrivals	Day Departures	Night Departures
Air Carrier	10L	4.00%	20.55%	24.50%	1.09%
Air Carrier	10R	28.50%	13.70%	4.00%	0.72%
Air Carrier	15L	-	-	-	-
Air Carrier	15R	2.00%	1.22%	6.00%	19.91%
Air Carrier	28L	3.00%	2.68%	37.30%	45.84%
Air Carrier	28R	1.00%	1.79%	26.20%	30.56%
Air Carrier	33L	61.50%	60.07%	2.00%	1.87%
Air Carrier	33R	-	-	-	-
Total	-	100.00%	100.00%	100.00%	100.00%
Air Taxi	10L	3.20%	7.89%	14.19%	0.19%
Air Taxi	10R	13.61%	5.26%	2.50%	0.13%
Air Taxi	15L	17.08%	23.60%	22.14%	24.49%
Air Taxi	15R	1.60%	0.29%	2.61%	6.64%
Air Taxi	28L	2.40%	1.87%	12.63%	14.87%
Air Taxi	28R	0.80%	1.25%	8.87%	9.91%
Air Taxi	33L	27.88%	16.91%	1.25%	0.49%
Air Taxi	33R	33.44%	42.94%	35.80%	43.28%
Total	-	100.00%	100.00%	100.00%	100.00%
General Aviation	10L	3.36%	9.79%	0.18%	0.14%
General Aviation	10R	14.04%	6.53%	0.03%	0.10%
General Aviation	15L	18.04%	19.04%	28.71%	29.59%
General Aviation	15R	0.69%	0.83%	8.58%	5.63%
General Aviation	28L	2.33%	1.63%	6.96%	4.75%
General Aviation	28R	0.78%	1.08%	4.89%	3.17%
General Aviation	33L	14.37%	12.62%	0.20%	0.11%
General Aviation	33R	46.39%	48.49%	50.45%	56.51%
Total	-	100.00%	100.00%	100.00%	100.00%
Military	10L	17.13%	17.04%	0.33%	0.31%
Military	10R	8.56%	8.52%	0.06%	0.06%
Military	15L	7.78%	7.94%	43.96%	44.39%
Military	15R	0.89%	0.95%	11.81%	11.89%
Military	28L	1.38%	1.47%	13.36%	13.28%

Aircraft Category	Runway	Day Arrivals	Night Arrivals	Day Departures	Night Departures
Military	28R	0.46%	0.49%	8.91%	8.85%
Military	33L	33.68%	33.42%	0.04%	0.04%
Military	33R	30.13%	30.16%	21.52%	21.18%
Total	-	100.00%	100.00%	100.00%	100.00%

Notes:

Totals may not equal 100% due to rounding.

For modeling purposes, all departure aircraft with a stage length greater than 4 utilized the full length of Runway 28 for departure. Based on analysis of BWI Marshall 2024 ANOMS operations data, this consists of a total of 0.4% of total Runway 28 departure operations.

3.5 Flight Track Geometry and Use

Representative AEDT model tracks were developed using a method which entailed analyzing flight data from the MAA ANOMS system for BWI Marshall and splitting the flight tracks into similar and manageable groups. This was done by first separating tracks by phase of flight (e.g., arrival or departure) and then by runway end. Following this step, the flights were separated by destination direction, such as north, east, south, or west. Finally, flight tracks were analyzed and split into groups according to their degree of similar geometry.

Model tracks were developed for each geometrically similar group. For example, Runway 28 air carrier passenger jet departures with a west destination were split into five geometrically similar groups, and then backbone tracks¹⁴ with sub-tracks were developed for each group. Each backbone track is assigned one or two sub-tracks on either side of the backbone, for a total of three or five tracks (one backbone and two or four dispersion) for each geometrically similar group.

In 2024, the FAA published new Performance Based Navigation (PBN) arrival and departure procedures at BWI Marshall. The representative AEDT model tracks were developed using the flight data for the periods following the implementation of the new PBN flight procedures: from July 11, 2024 through December 31, 2024 for departure operations, and from September 5, 2024 through December 31, 2024 for arrival operations.

For military fixed-wing operations, the MAA ANOMS does not contain data from to develop acceptable flight tracks for modeling. However, the military operations fleet mix is largely representative of that of fixed-wing air carrier and air taxi operations obtained from the MAA ANOMS. As such, the model tracks and track utilization developed for fixed-wing air carriers were used for military aircraft types KC-46 (767CF6) and T-38A and air taxi operations for C-35 (CNA560U) and DHC-6 military operations. Likewise, for helicopter operations, all helicopters utilized a common set of helicopter model tracks and utilization percentages regardless of category of operation. The location of model flight tracks and associated track utilization percentages are the same for both 2025 base year operations and 2030 five-year forecast operations.

For the five-year forecast scenario, the location of flight tracks and associated track utilization percentages are the same as those developed for 2025 base year operations and all categories of operations use the model flight tracks and utilization percentages as the 2025 base year.

¹⁴ A backbone track is a representative model track depicting how an aircraft or group of aircraft assigned to that model track would operate as an arrival or departure from an airport; sub-tracks or dispersed tracks represent a modeled dispersion from the backbone.

Figure 3-4 through Figure 3-15 show the developed model flight tracks layered over the airport base map for fixed-wing jet, propeller, and helicopter operations, respectively, for the base and five-year scenarios. Figures are organized by operation status, tower category, and destination direction. Table 3-20 through Table 3-23 present the utilization rates for each of the developed model tracks. The relative ratio of flight track usage was preserved according to those ratios in the entire flight track dataset for fixed-wing and helicopter operations.

Table 3-20. Base Year (2025) and Five-Year Forecast (2030) Air Carrier Fixed-Wing Model Track Utilization Percentages

Runway	Engine	Category	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
10	Jets	Cargo	A10ACCJ01	7%	D10ACCJ01	14%
10	Jets	Cargo	A10ACCJ02	17%	D10ACCJ02	29%
10	Jets	Cargo	A10ACCJ03	15%	D10ACCJ03	20%
10	Jets	Cargo	A10ACCJ04	45%	D10ACCJ04	37%
10	Jets	Cargo	A10ACCJ05	6%	Subtotal	100%
10	Jets	Cargo	A10ACCJ06	2%	-	-
10	Jets	Cargo	A10ACCJ07	7%	-	-
10	Jets	Cargo	Subtotal	100%	-	-
10	Jets	Passenger	A10ACPJ01	3%	D10ACPJ01	3%
10	Jets	Passenger	A10ACPJ02	9%	D10ACPJ02	14%
10	Jets	Passenger	A10ACPJ03	<1%	D10ACPJ03	11%
10	Jets	Passenger	A10ACPJ04	16%	D10ACPJ04	13%
10	Jets	Passenger	A10ACPJ05	2%	D10ACPJ05	36%
10	Jets	Passenger	A10ACPJ06	2%	D10ACPJ06	11%
10	Jets	Passenger	A10ACPJ07	7%	D10ACPJ07	12%
10	Jets	Passenger	A10ACPJ08	<1%	Subtotal	100%
10	Jets	Passenger	A10ACPJ09	<1%	-	-
10	Jets	Passenger	A10ACPJ10	<1%	-	-
10	Jets	Passenger	A10ACPJ11	45%	-	-
10	Jets	Passenger	A10ACPJ12	5%	-	-
10	Jets	Passenger	A10ACPJ13	8%	-	-
10	Jets	Passenger	A10ACPJ14	1%	-	-
10	Jets	Passenger	Subtotal	100%	-	-
15R	Jets	Cargo	A15RACCJ01	12%	D15RACCJ01	11%
15R	Jets	Cargo	A15RACCJ02	27%	D15RACCJ02	60%
15R	Jets	Cargo	A15RACCJ03	29%	D15RACCJ03	12%
15R	Jets	Cargo	A15RACCJ04	24%	D15RACCJ04	8%
15R	Jets	Cargo	A15RACCJ05	7%	D15RACCJ05	1%
15R	Jets	Cargo	Subtotal	100%	D15RACCJ06	7%
15R	Jets	Cargo	-	-	Subtotal	100%
15R	Jets	Passenger	A15RACPJ01	5%	D15RACPJ01	10%
15R	Jets	Passenger	A15RACPJ02	29%	D15RACPJ02	3%
15R	Jets	Passenger	A15RACPJ03	4%	D15RACPJ03	14%
15R	Jets	Passenger	A15RACPJ04	3%	D15RACPJ04	26%
15R	Jets	Passenger	A15RACPJ05	12%	D15RACPJ05	9%
15R	Jets	Passenger	A15RACPJ06	46%	D15RACPJ06	5%
15R	Jets	Passenger	Subtotal	100%	D15RACPJ07	3%
15R	Jets	Passenger	-	-	D15RACPJ08	<1%
15R	Jets	Passenger	-	-	D15RACPJ09	2%
15R	Jets	Passenger	-	-	D15RACPJ10	10%
15R	Jets	Passenger	-	-	D15RACPJ11	3%
15R	Jets	Passenger	-	-	D15RACPJ12	5%
15R	Jets	Passenger	-	-	D15RACPJ13	11%
15R	Jets	Passenger	-	-	Subtotal	100%

Runway	Engine	Category	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
28	Jets	Cargo	A28ACCJ01	41%	D28ACCJ01	2%
28	Jets	Cargo	A28ACCJ02	14%	D28ACCJ02	71%
28	Jets	Cargo	A28ACCJ03	33%	D28ACCJ03	8%
28	Jets	Cargo	A28ACCJ04	12%	D28ACCJ04	6%
28	Jets	Cargo	Subtotal	100%	D28ACCJ05	1%
28	Jets	Cargo	-	-	D28ACCJ06	2%
28	Jets	Cargo	-	-	D28ACCJ07	9%
28	Jets	Cargo	-	-	D28ACCJ08	1%
28	Jets	Cargo	-	-	Subtotal	100%
28	Jets	Passenger	A28ACPJ01	5%	D28ACPJ01	<1%
28	Jets	Passenger	A28ACPJ02	9%	D28ACPJ02	<1%
28	Jets	Passenger	A28ACPJ03	9%	D28ACPJ03	53%
28	Jets	Passenger	A28ACPJ04	12%	D28ACPJ04	14%
28	Jets	Passenger	A28ACPJ05	4%	D28ACPJ05	13%
28	Jets	Passenger	A28ACPJ06	20%	D28ACPJ06	4%
28	Jets	Passenger	A28ACPJ07	38%	D28ACPJ07	3%
28	Jets	Passenger	A28ACPJ08	2%	D28ACPJ08	11%
28	Jets	Passenger	Subtotal	100%	Subtotal	100%
33L	Jets	Cargo	A33LACCJ01	8%	D33LACCJ01	92%
33L	Jets	Cargo	A33LACCJ02	10%	D33LACCJ02	8%
33L	Jets	Cargo	A33LACCJ03	24%	Subtotal	100%
33L	Jets	Cargo	A33LACCJ04	9%	-	-
33L	Jets	Cargo	A33LACCJ05	41%	-	-
33L	Jets	Cargo	A33LACCJ06	7%	-	-
33L	Jets	Cargo	A33LACCJ07	1%	-	-
33L	Jets	Cargo	Subtotal	100%	-	-
33L	Jets	Passenger	A33LACPJ01	5%	D33LACPJ01	46%
33L	Jets	Passenger	A33LACPJ02	15%	D33LACPJ02	20%
33L	Jets	Passenger	A33LACPJ03	6%	D33LACPJ03	14%
33L	Jets	Passenger	A33LACPJ04	11%	D33LACPJ04	4%
33L	Jets	Passenger	A33LACPJ05	3%	D33LACPJ05	5%
33L	Jets	Passenger	A33LACPJ06	11%	D33LACPJ06	11%
33L	Jets	Passenger	A33LACPJ07	45%	Subtotal	100%
33L	Jets	Passenger	A33LACPJ08	5%	-	-
33L	Jets	Passenger	A33LACPJ09	<1%	-	-
33L	Jets	Passenger	Subtotal	100%	-	-

Note: Totals may not equal 100% due to rounding.

Table 3-21. Base Year (2025) and Five-Year Forecast (2030) Air Taxi Fixed-Wing Model Track Utilization Percentages

Runway	Engine	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
10	Jets	A10ATJ01	48%	D10ATJ01	100%
10	Jets	A10ATJ02	4%	Subtotal	100%
10	Jets	A10ATJ03	11%	-	-
10	Jets	A10ATJ04	14%	-	-
10	Jets	A10ATJ05	9%	-	-
10	Jets	A10ATJ06	14%	-	-
10	Jets	Subtotal	100%	-	-
10	Non-Jets	A10ATNJ01	32%	D10ATNJ01	100%
10	Non-Jets	A10ATNJ02	21%	Subtotal	100%
10	Non-Jets	A10ATNJ03	47%	-	-
10	Non-Jets	Subtotal	100%	-	-

Runway	Engine	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
15L	Jets	A15LATJ01	24%	D15LATJ01	25%
15L	Jets	A15LATJ02	24%	D15LATJ02	12%
15L	Jets	A15LATJ03	13%	D15LATJ03	21%
15L	Jets	A15LATJ04	24%	D15LATJ04	8%
15L	Jets	A15LATJ05	8%	D15LATJ05	5%
15L	Jets	A15LATJ06	8%	D15LATJ06	2%
15L	Jets	Subtotal	100%	D15LATJ07	4%
15L	Jets	-	-	D15LATJ08	5%
15L	Jets	-	-	D15LATJ09	17%
15L	Jets	-	-	D15LATJ10	1%
15L	Jets	-	-	Subtotal	100%
15L	Non-Jets	A15LATNJ01	21%	D15LATNJ01	49%
15L	Non-Jets	A15LATNJ02	24%	D15LATNJ02	23%
15L	Non-Jets	A15LATNJ03	31%	D15LATNJ03	15%
15L	Non-Jets	A15LATNJ04	18%	D15LATNJ04	11%
15L	Non-Jets	A15LATNJ05	6%	D15LATNJ05	1%
15L	Non-Jets	Subtotal	100%	Subtotal	100%
15R	Jets	A15RATJ01	100%	D15RATJ01	56%
15R	Jets	Subtotal	100%	D15RATJ02	10%
15R	Jets	-	-	D15RATJ03	5%
15R	Jets	-	-	D15RATJ04	17%
15R	Jets	-	-	D15RATJ05	3%
15R	Jets	-	-	D15RATJ06	10%
15R	Jets	-	-	Subtotal	100%
15R	Non-Jets	A15RATNJ01	100%	D15RATNJ01	40%
15R	Non-Jets	Subtotal	100%	D15RATNJ02	60%
15R	Non-Jets	-	-	Subtotal	100%
28	Jets	A28ATJ01	22%	D28ATJ01	2%
28	Jets	A28ATJ02	27%	D28ATJ02	60%
28	Jets	A28ATJ03	16%	D28ATJ03	12%
28	Jets	A28ATJ04	22%	D28ATJ04	7%
28	Jets	A28ATJ05	13%	D28ATJ05	2%
28	Jets	Subtotal	100%	D28ATJ06	3%
28	Jets	-	-	D28ATJ07	14%
28	Jets	-	-	Subtotal	100%
28	Non-Jets	A28ATNJ01	100%	D28ATNJ01	42%
28	Non-Jets	Subtotal	100%	D28ATNJ02	58%
28	Non-Jets	-	-	Subtotal	100%
33L	Jets	A33LATJ01	5%	D33LATJ01	100%
33L	Jets	A33LATJ02	13%	Subtotal	100%
33L	Jets	A33LATJ03	19%	-	-
33L	Jets	A33LATJ04	5%	-	-
33L	Jets	A33LATJ05	11%	-	-
33L	Jets	A33LATJ06	42%	-	-
33L	Jets	A33LATJ07	1%	-	-
33L	Jets	A33LATJ08	2%	-	-
33L	Jets	A33LATJ09	2%	-	-
33L	Jets	Subtotal	100%	-	-
33L	Non-Jets	A33LATNJ01	100%	D33LATNJ01	100%
33L	Non-Jets	Subtotal	100%	Subtotal	100%
33R	Jets	A33RATJ01	14%	D33RATJ01	4%
33R	Jets	A33RATJ02	14%	D33RATJ02	3%
33R	Jets	A33RATJ03	10%	D33RATJ03	28%

Runway	Engine	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
33R	Jets	A33RATJ04	19%	D33RATJ04	15%
33R	Jets	A33RATJ05	8%	D33RATJ05	4%
33R	Jets	A33RATJ06	20%	D33RATJ06	9%
33R	Jets	A33RATJ07	12%	D33RATJ07	8%
33R	Jets	A33RATJ08	2%	D33RATJ08	19%
33R	Jets	A33RATJ09	1%	D33RATJ09	6%
33R	Jets	Subtotal	100%	D33RATJ10	2%
33R	Jets	-	-	D33RATJ11	3%
33R	Jets	-	-	Subtotal	100%
33R	Non-Jets	A33RATNJ01	12%	D33RATNJ01	12%
33R	Non-Jets	A33RATNJ02	28%	D33RATNJ02	8%
33R	Non-Jets	A33RATNJ03	20%	D33RATNJ03	43%
33R	Non-Jets	A33RATNJ04	5%	D33RATNJ04	17%
33R	Non-Jets	A33RATNJ05	26%	D33RATNJ05	20%
33R	Non-Jets	A33RATNJ06	9%	Subtotal	100%
33R	Non-Jets	Subtotal	100%	-	-

Note: Totals may not equal 100% due to rounding.

Table 3-22. Base Year (2025) and Five-Year Forecast (2030) General Aviation Fixed-Wing Model Track Utilization Percentages

Runway	Engine	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
10	Jets	A10GAJ01	34%	D10GAJ01	100%
10	Jets	A10GAJ02	10%	Subtotal	100%
10	Jets	A10GAJ03	27%	-	-
10	Jets	A10GAJ04	7%	-	-
10	Jets	A10GAJ05	22%	-	-
10	Jets	Subtotal	100%	-	-
10	Non-Jets	A10GANJ01	31%	D10GANJ01	100%
10	Non-Jets	A10GANJ02	69%	Subtotal	100%
10	Non-Jets	Subtotal	100%	-	-
15L	Jets	A15LGAJ01	30%	D15LGAJ01	4%
15L	Jets	A15LGAJ02	43%	D15LGAJ02	8%
15L	Jets	A15LGAJ03	26%	D15LGAJ03	39%
15L	Jets	Subtotal	100%	D15LGAJ04	12%
15L	Jets	-	-	D15LGAJ05	8%
15L	Jets	-	-	D15LGAJ06	8%
15L	Jets	-	-	D15LGAJ07	4%
15L	Jets	-	-	D15LGAJ08	9%
15L	Jets	-	-	D15LGAJ09	9%
15L	Jets	-	-	Subtotal	100%
15L	Non-Jets	A15LGANJ01	11%	D15LGANJ01	24%
15L	Non-Jets	A15LGANJ02	20%	D15LGANJ02	11%
15L	Non-Jets	A15LGANJ03	9%	D15LGANJ03	19%
15L	Non-Jets	A15LGANJ04	42%	D15LGANJ04	36%
15L	Non-Jets	A15LGANJ05	19%	D15LGANJ05	11%
15L	Non-Jets	Subtotal	100%	Subtotal	100%
15R	Jets	A15RGAJ01	100%	D15RGAJ01	17%
15R	Jets	Subtotal	100%	D15RGAJ02	25%
15R	Jets	-	-	D15RGAJ03	58%
15R	Jets	-	-	Subtotal	100%
15R	Non-Jets	A15RGANJ01	100%	D15RGANJ01	100%
15R	Non-Jets	Subtotal	100%	Subtotal	100%

Runway	Engine	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
28	Jets	A28GAJ01	59%	D28GAJ01	5%
28	Jets	A28GAJ02	41%	D28GAJ02	52%
28	Jets	Subtotal	100%	D28GAJ03	15%
28	Jets	-	-	D28GAJ04	9%
28	Jets	-	-	D28GAJ05	18%
28	Jets	-	-	Subtotal	100%
28	Non-Jets	A28GANJ01	100%	D28GANJ01	63%
28	Non-Jets	Subtotal	100%	D28GANJ02	38%
28	Non-Jets	-	-	Subtotal	100%
33L	Jets	A33LGAJ01	32%	D33LGAJ01	100%
33L	Jets	A33LGAJ02	26%	Subtotal	100%
33L	Jets	A33LGAJ03	6%	-	-
33L	Jets	A33LGAJ04	35%	-	-
33L	Jets	Subtotal	100%	-	-
33L	Non-Jets	A33LGANJ01	100%	Subtotal	0%
33L	Non-Jets	Subtotal	100%	-	-
33R	Jets	A33RGAJ01	27%	D33RGAJ01	6%
33R	Jets	A33RGAJ02	13%	D33RGAJ02	36%
33R	Jets	A33RGAJ03	14%	D33RGAJ03	16%
33R	Jets	A33RGAJ04	10%	D33RGAJ04	15%
33R	Jets	A33RGAJ05	24%	D33RGAJ05	6%
33R	Jets	A33RGAJ06	13%	D33RGAJ06	17%
33R	Jets	Subtotal	100%	D33RGAJ07	4%
33R	Jets	-	-	Subtotal	100%
33R	Non-Jets	A33RGANJ01	28%	D33RGANJ01	15%
33R	Non-Jets	A33RGANJ02	27%	D33RGANJ02	18%
33R	Non-Jets	A33RGANJ03	7%	D33RGANJ03	11%
33R	Non-Jets	A33RGANJ04	12%	D33RGANJ04	5%
33R	Non-Jets	A33RGANJ05	26%	D33RGANJ05	12%
33R	Non-Jets	Subtotal	100%	D33RGANJ06	24%
33R	Non-Jets	-	-	D33RGANJ07	9%
33R	Non-Jets	-	-	D33RGANJ08	6%
33R	Non-Jets	-	-	Subtotal	100%

Note: Totals may not equal 100% due to rounding.

Table 3-23. Base Year (2025) and Five-Year Forecast (2030) Helicopter Model Track Utilization Percentages

Runway	Engine	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
H1	Helicopter	AH1H01	24%	DH1H01	53%
H1	Helicopter	AH1H02	24%	DH1H02	33%
H1	Helicopter	AH1H03	21%	DH1H03	14%
H1	Helicopter	AH1H04	21%	Subtotal	100%
H1	Helicopter	AH1H05	10%	-	-
H1	Helicopter	Subtotal	100%	-	-

Note: Totals may not equal 100% due to rounding.

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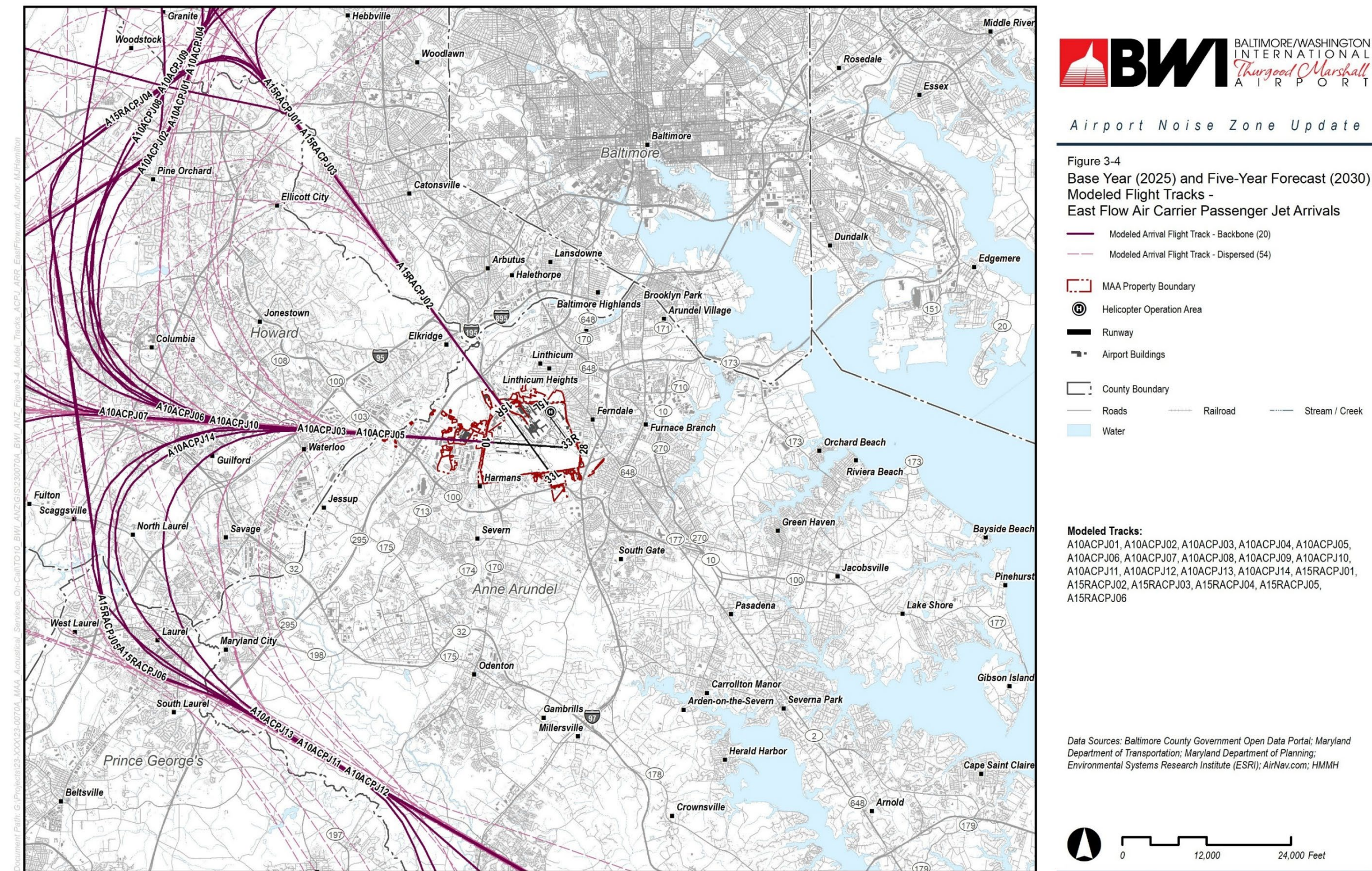


Figure 3-4. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Carrier Passenger Jet Arrivals

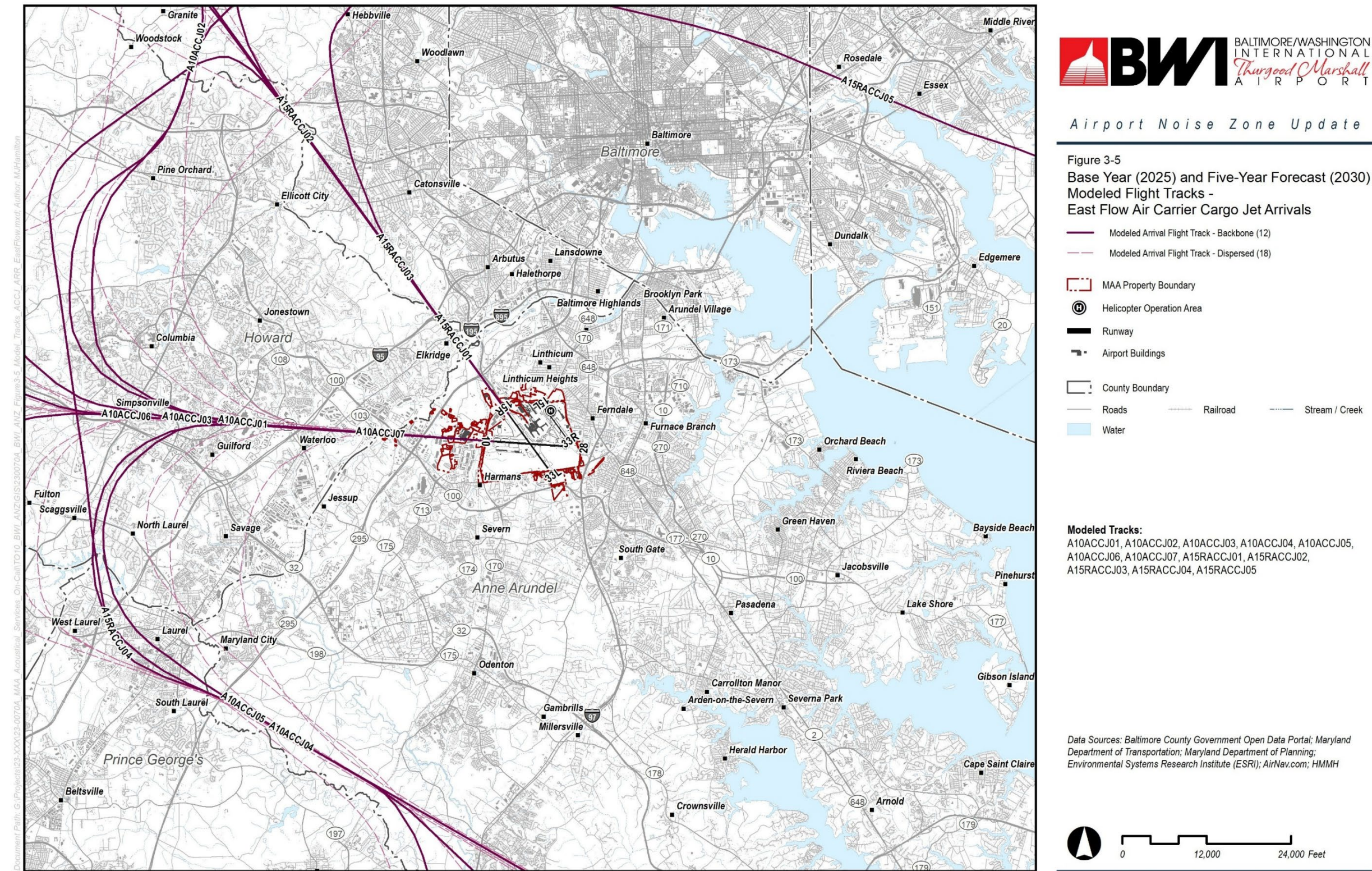


Figure 3-5. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Carrier Cargo Jet Arrivals

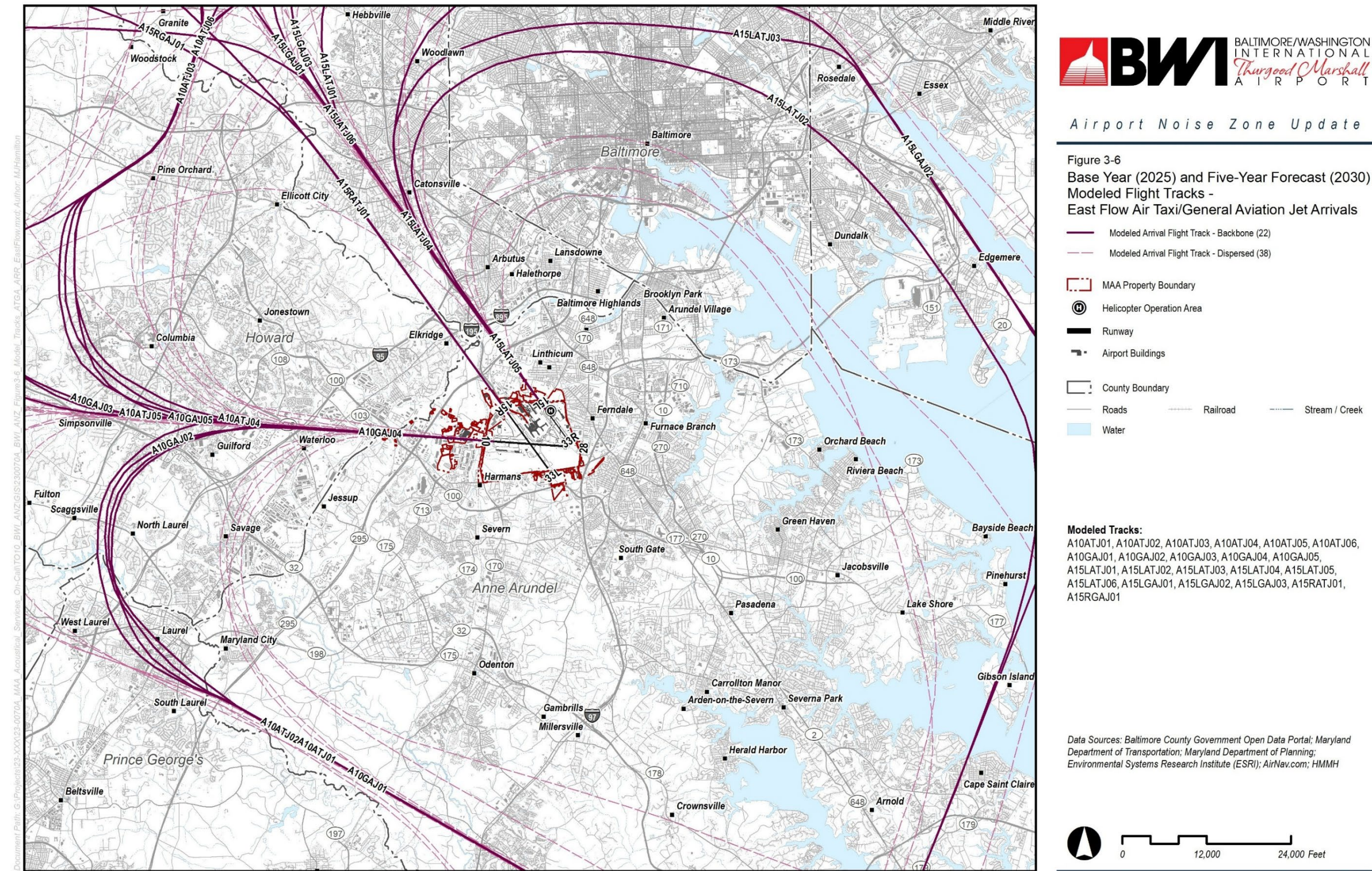


Figure 3-6. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Taxi/General Aviation Arrivals

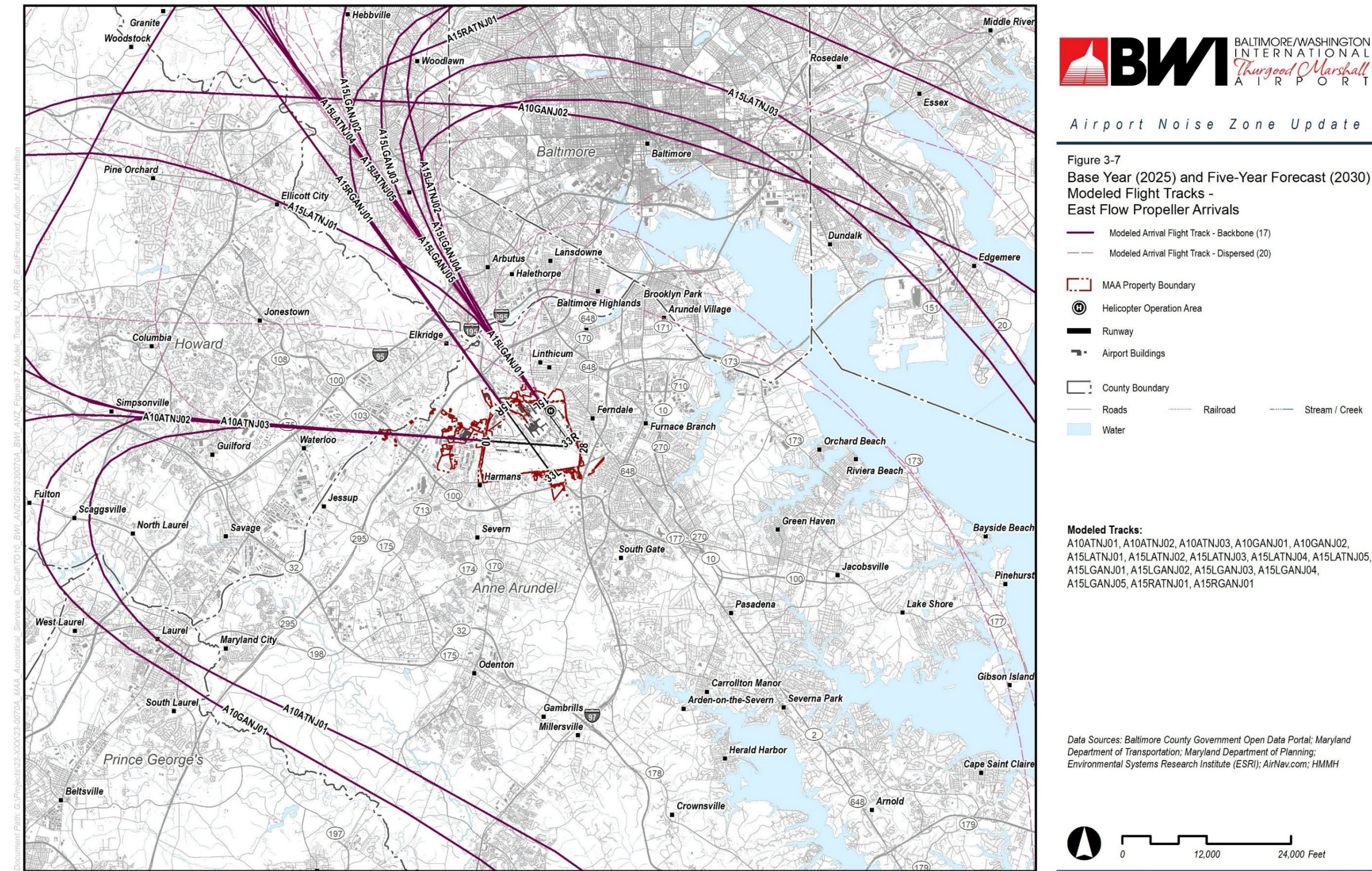


Figure 3-7. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Propeller Arrivals

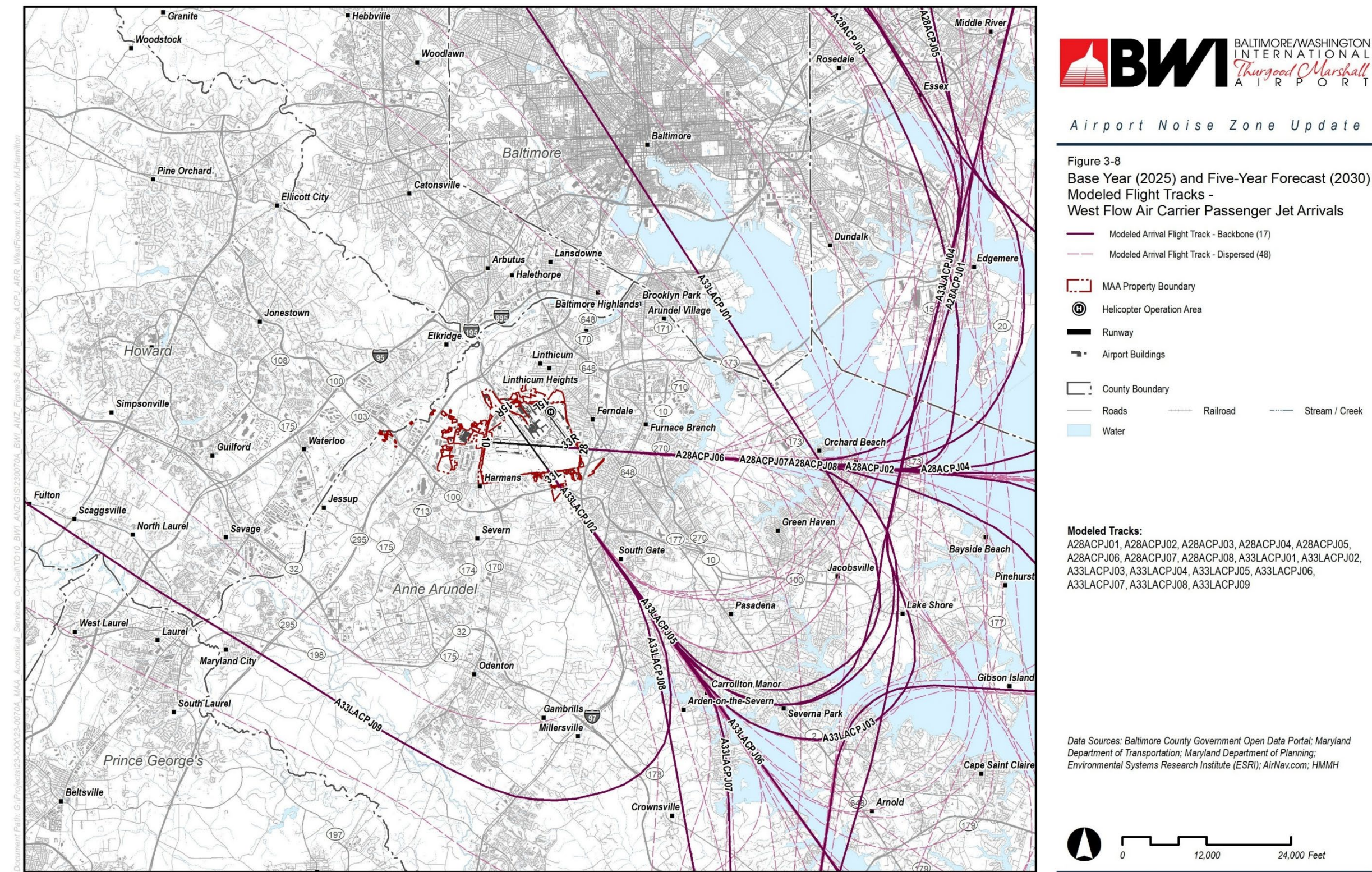


Figure 3-8. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Carrier Passenger Jet Arrivals

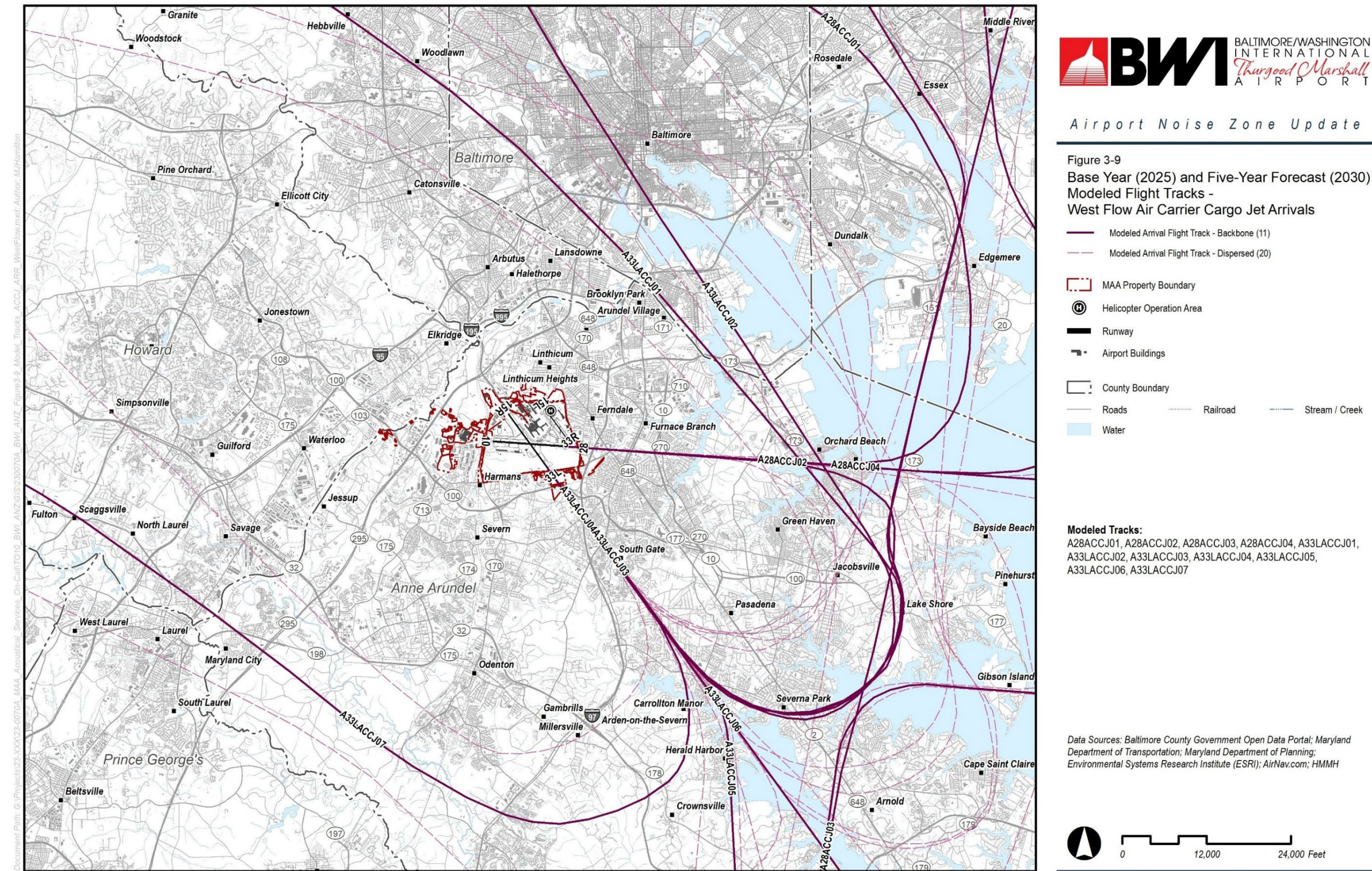


Figure 3-9. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Carrier Cargo Jet Arrivals

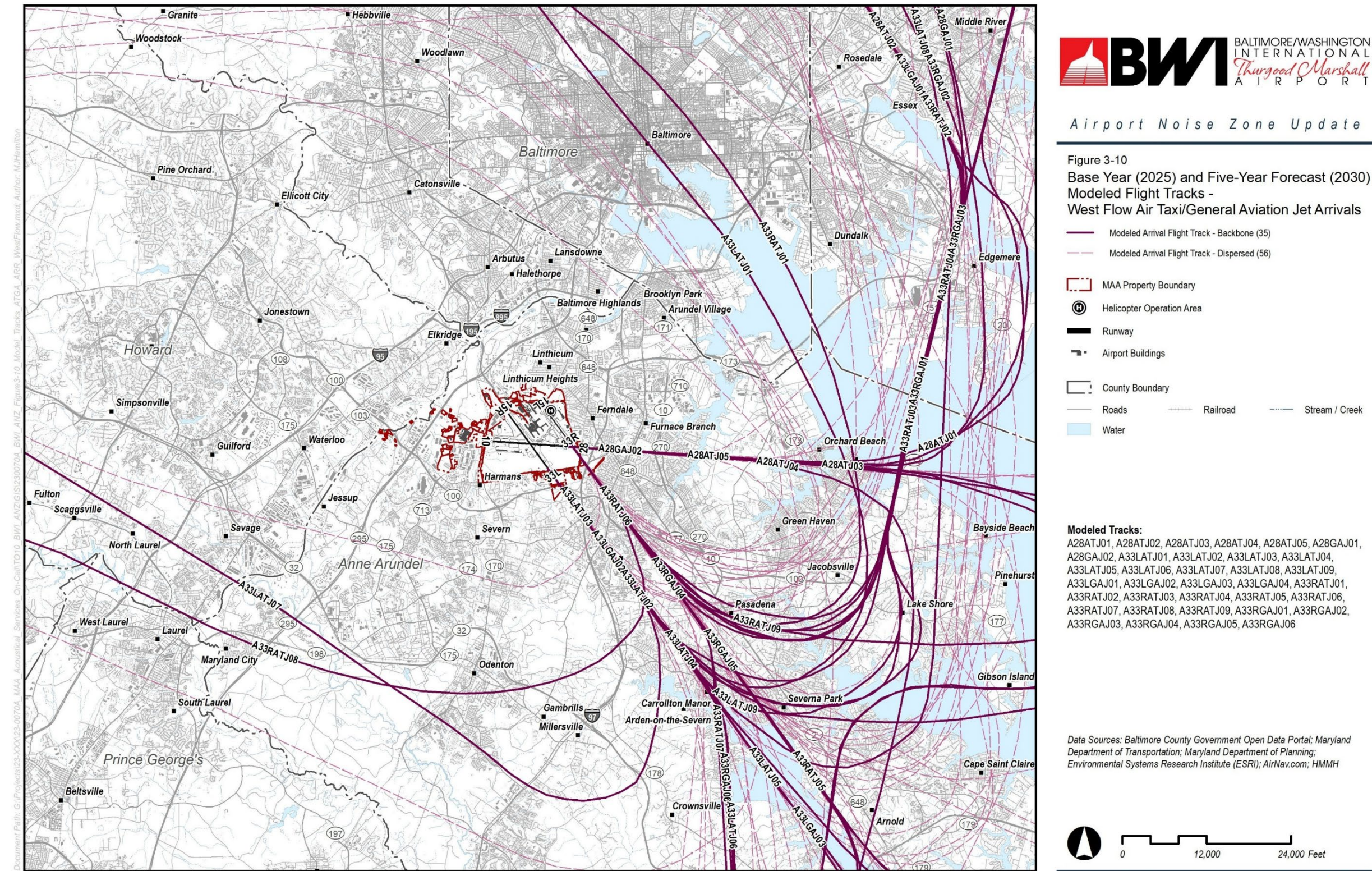


Figure 3-10. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Taxi/General Aviation Arrivals

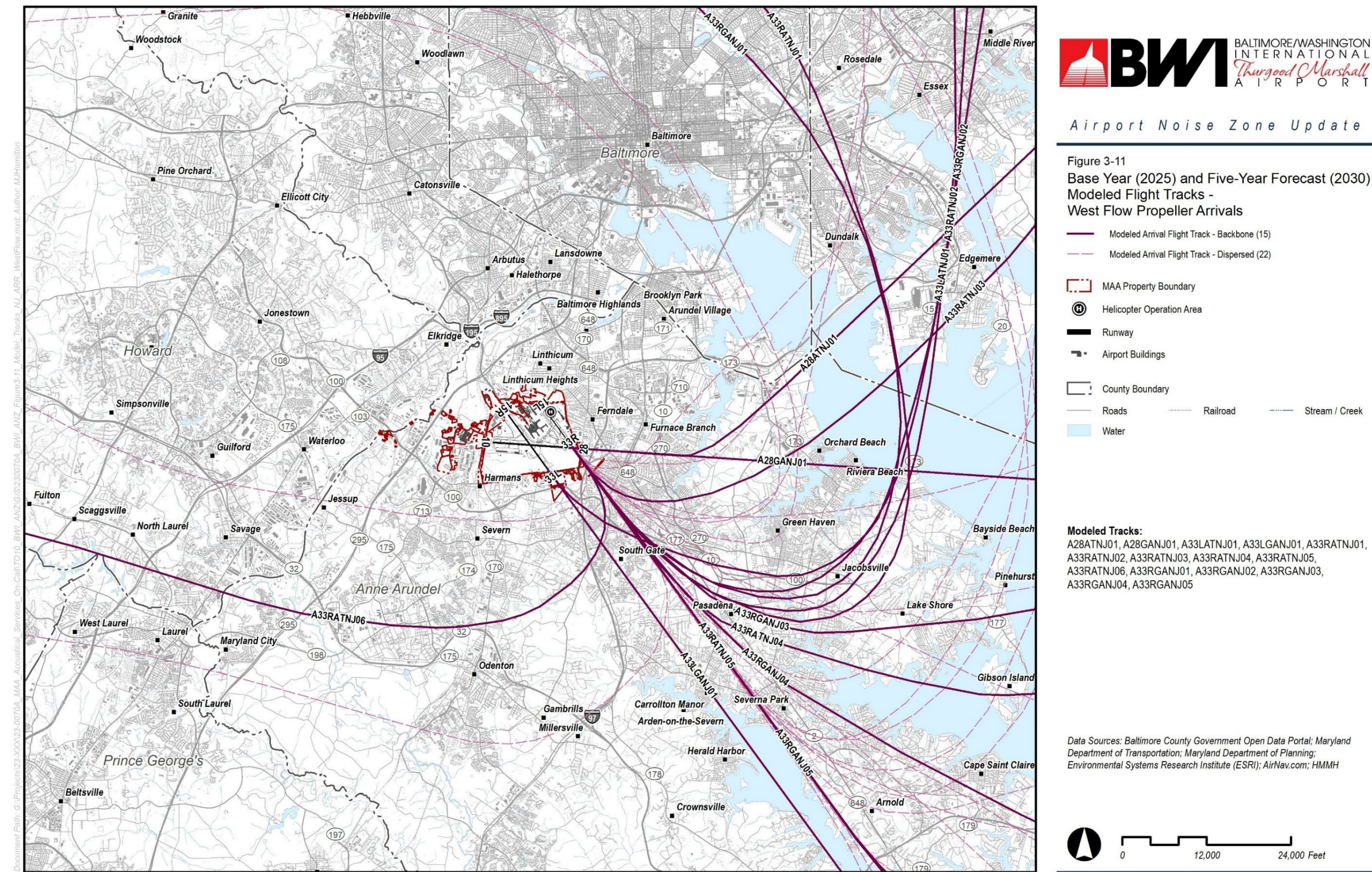


Figure 3-11. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Propeller Arrivals

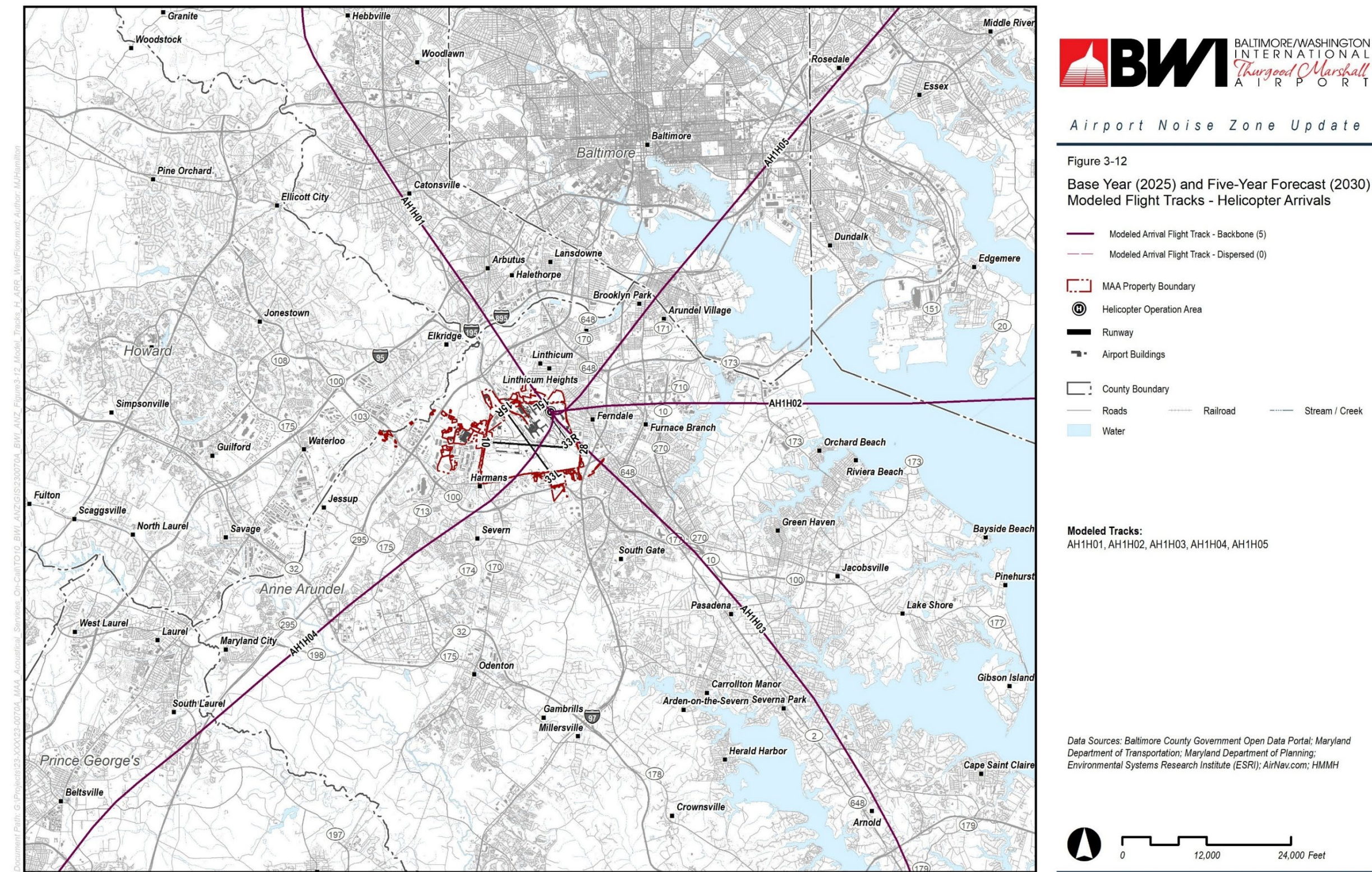


Figure 3-12. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – Helicopter Arrivals

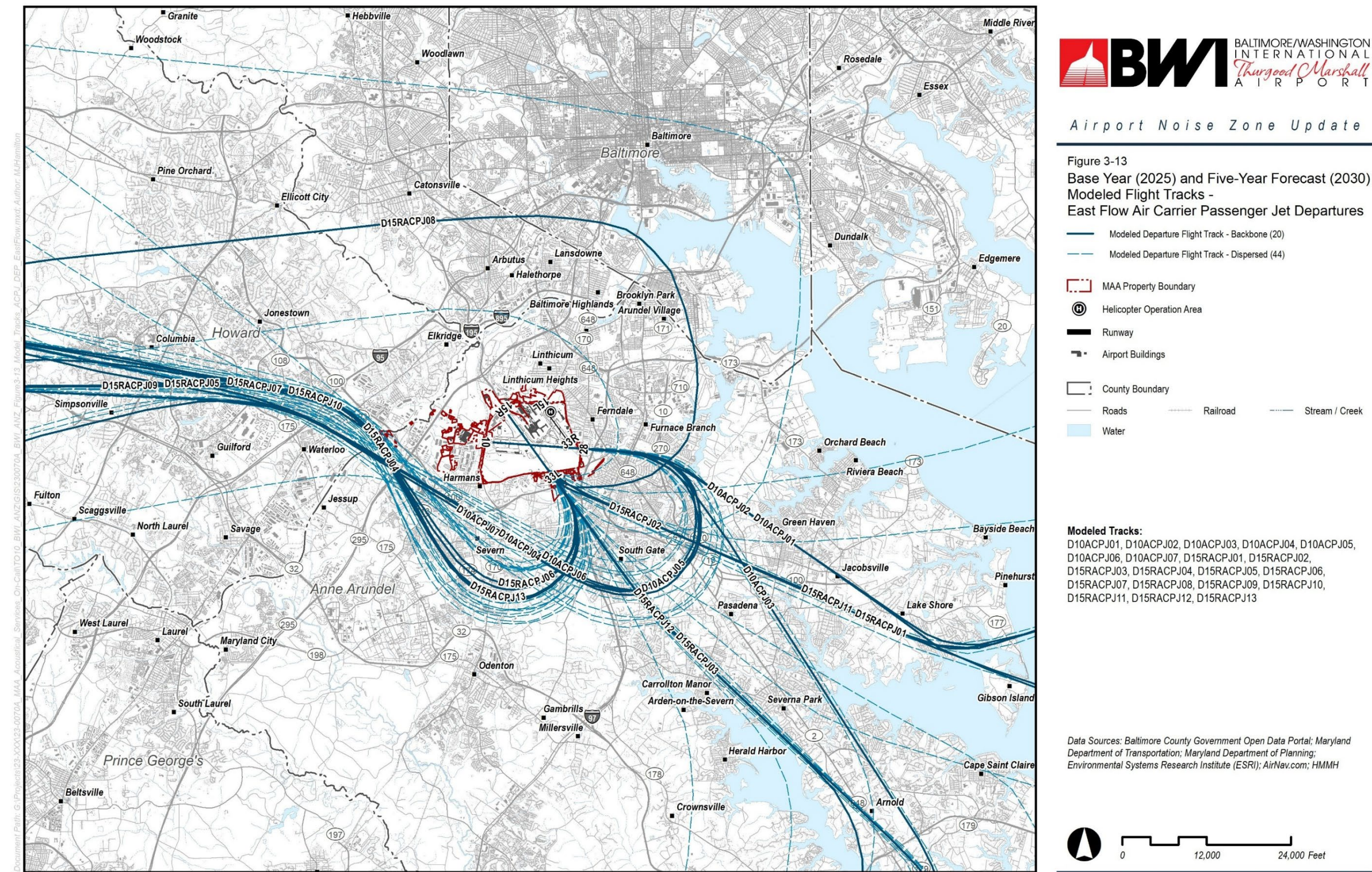


Figure 3-13. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Carrier Passenger Jet Departures

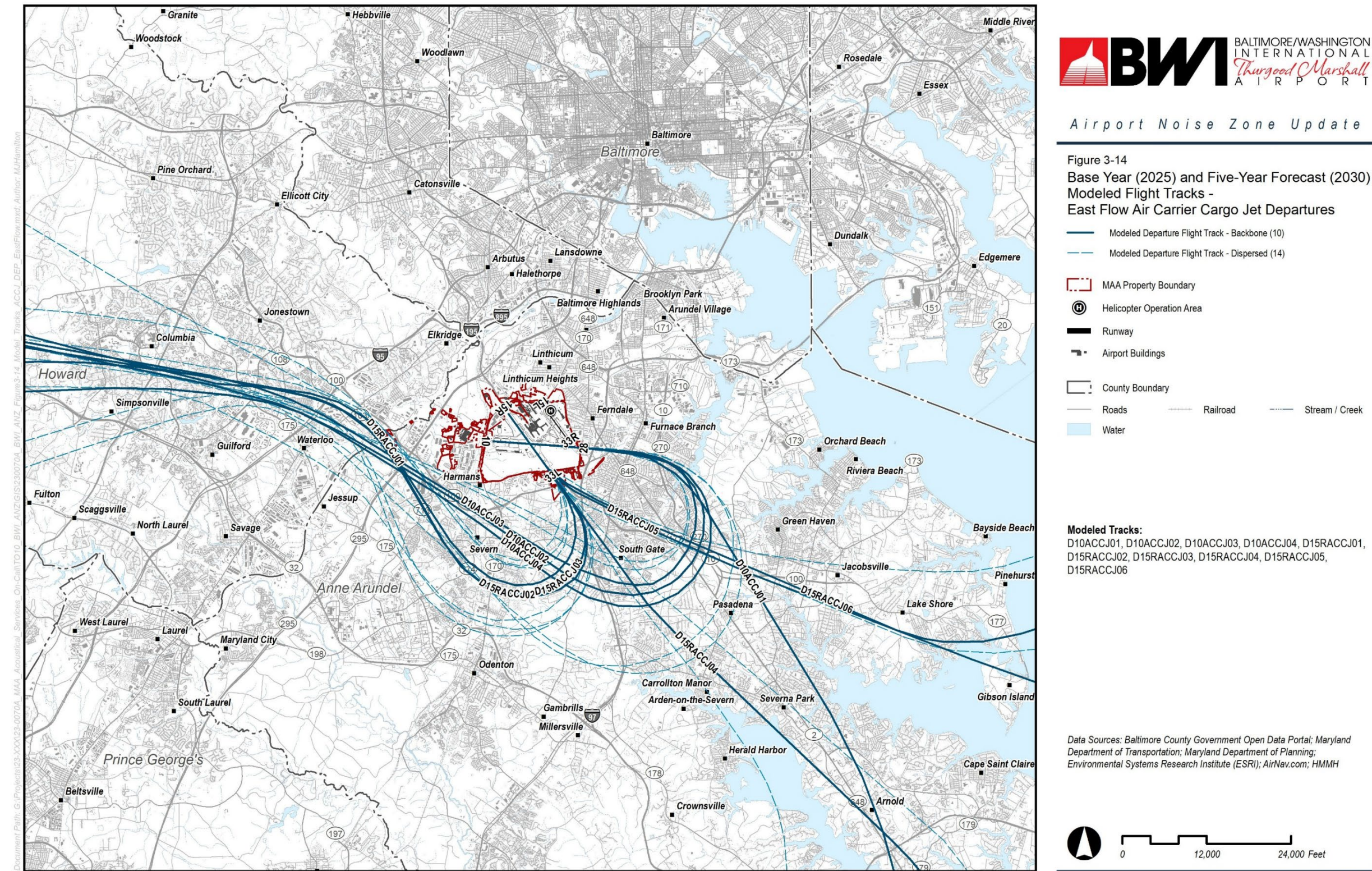


Figure 3-14. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Carrier Cargo Jet Departures

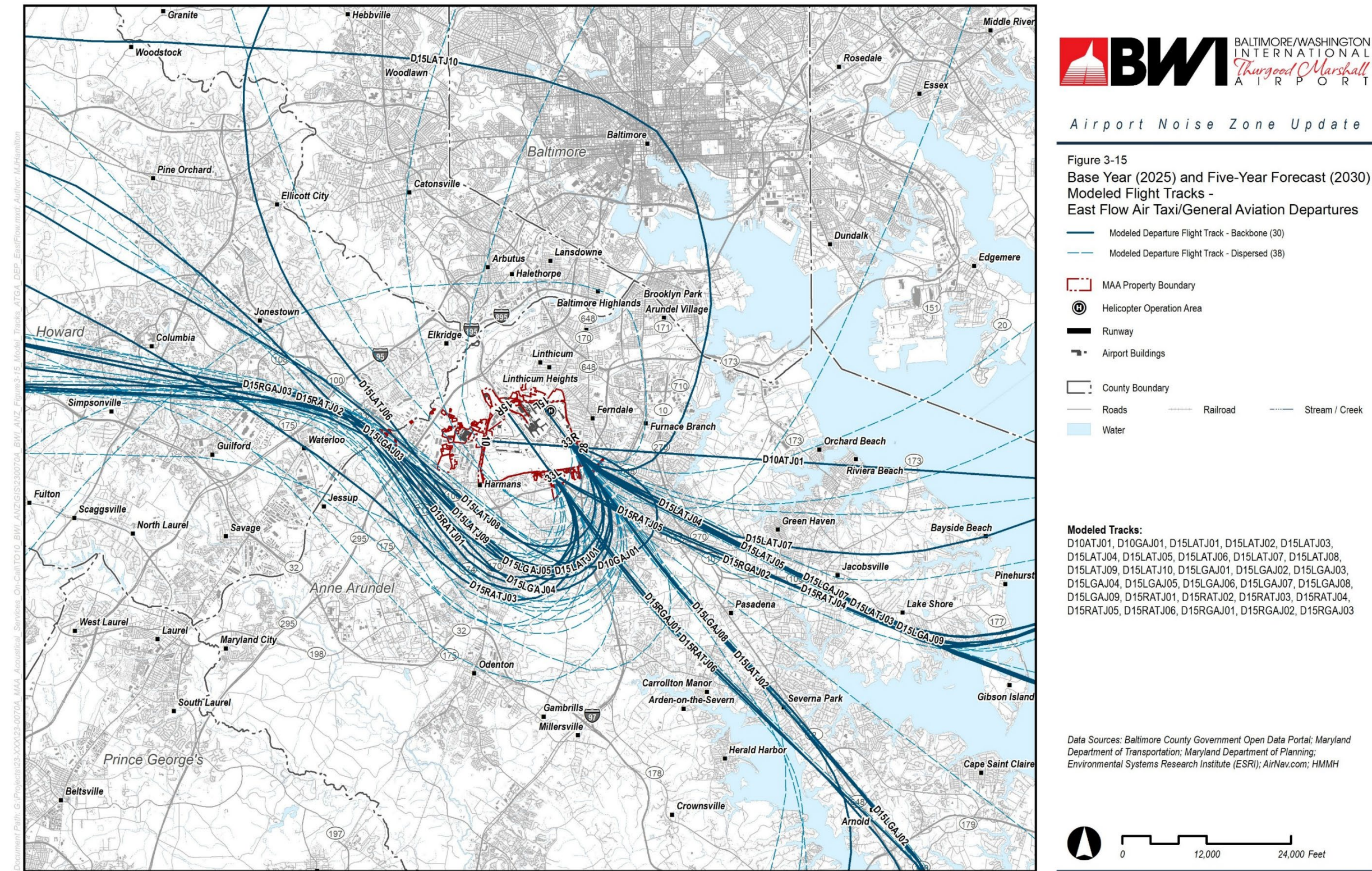


Figure 3-15. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Air Taxi/General Aviation Departures

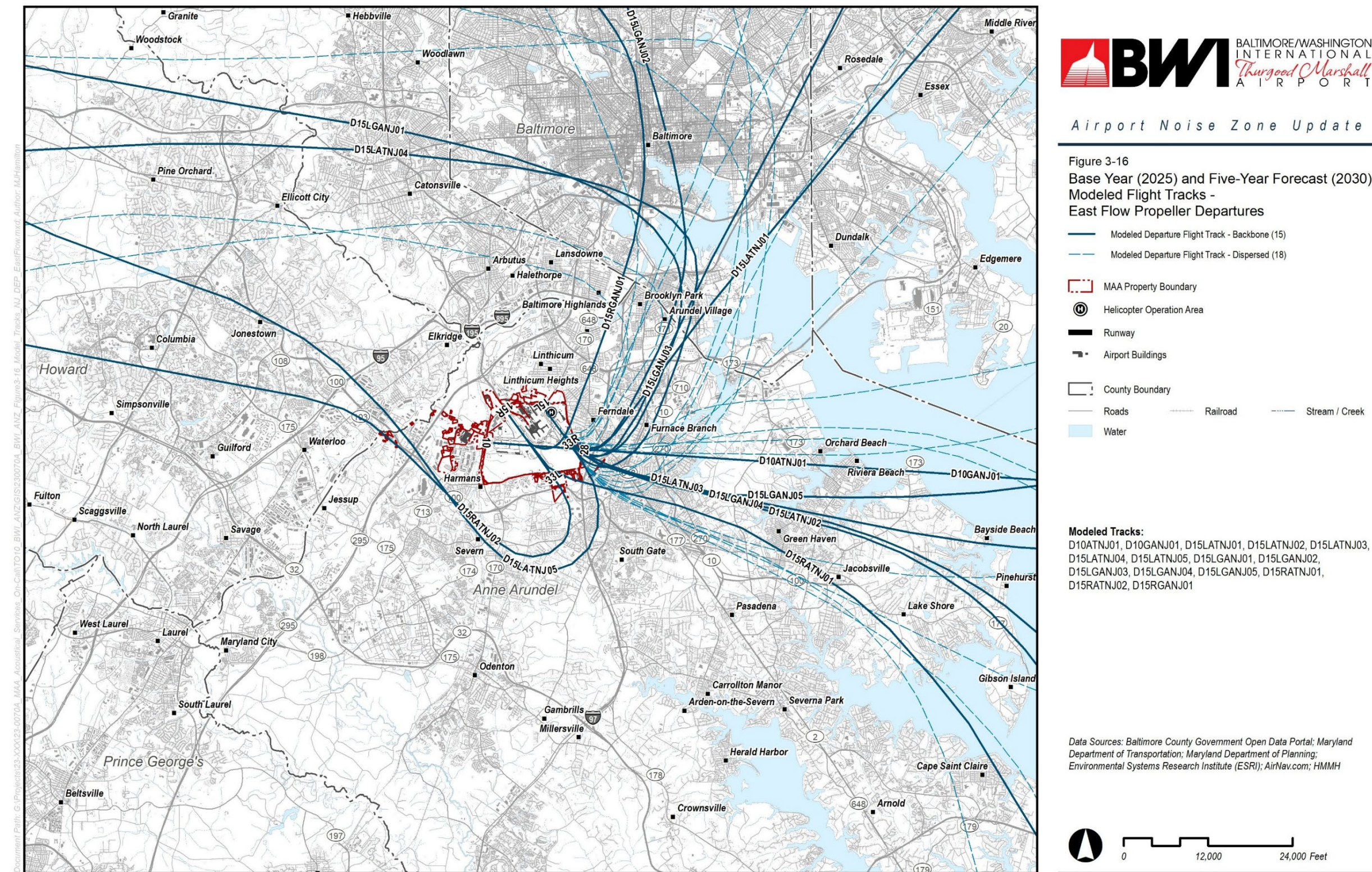


Figure 3-16. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – East Flow Propeller Departures

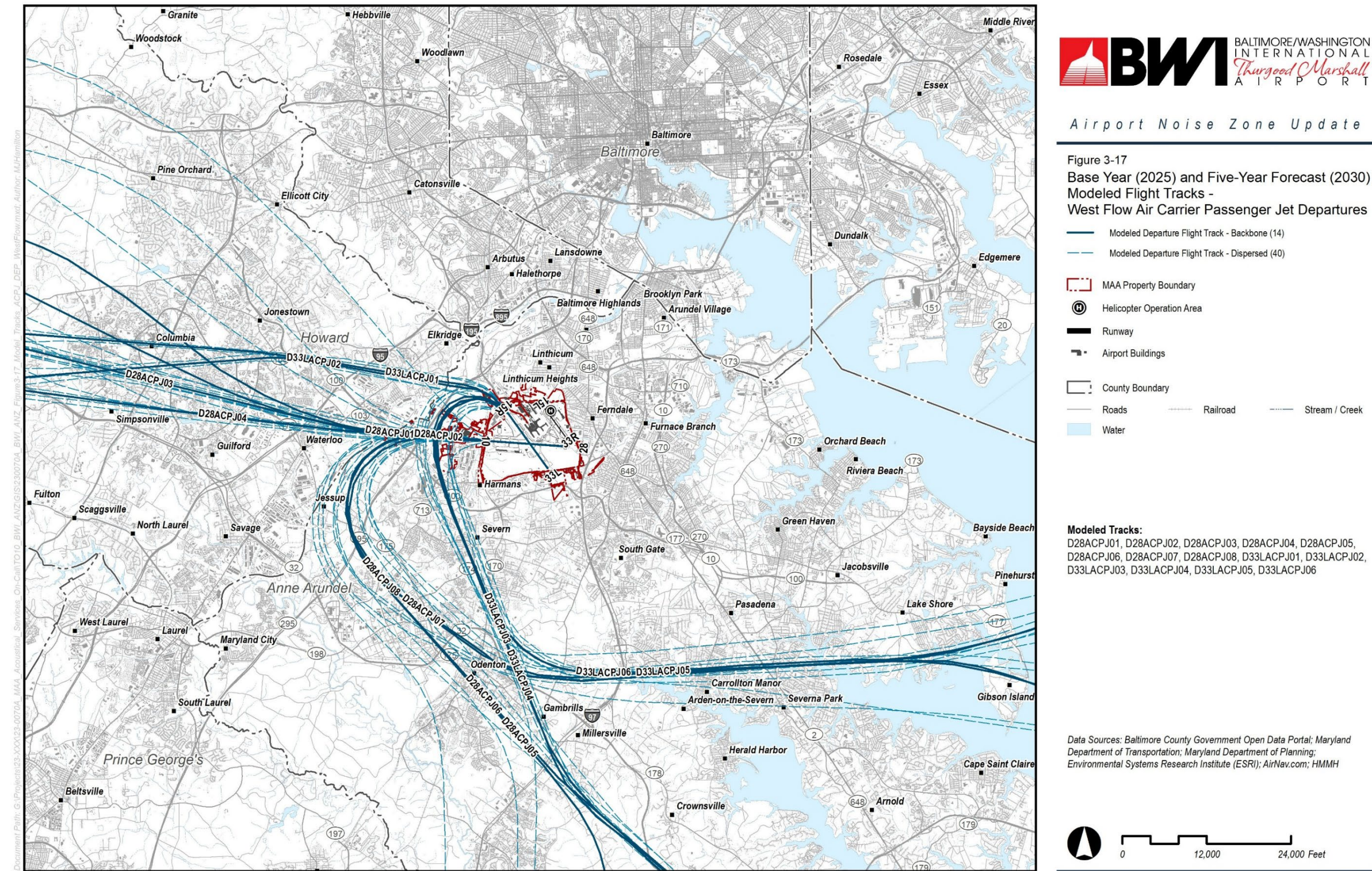


Figure 3-17. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Carrier Passenger Jet Departures

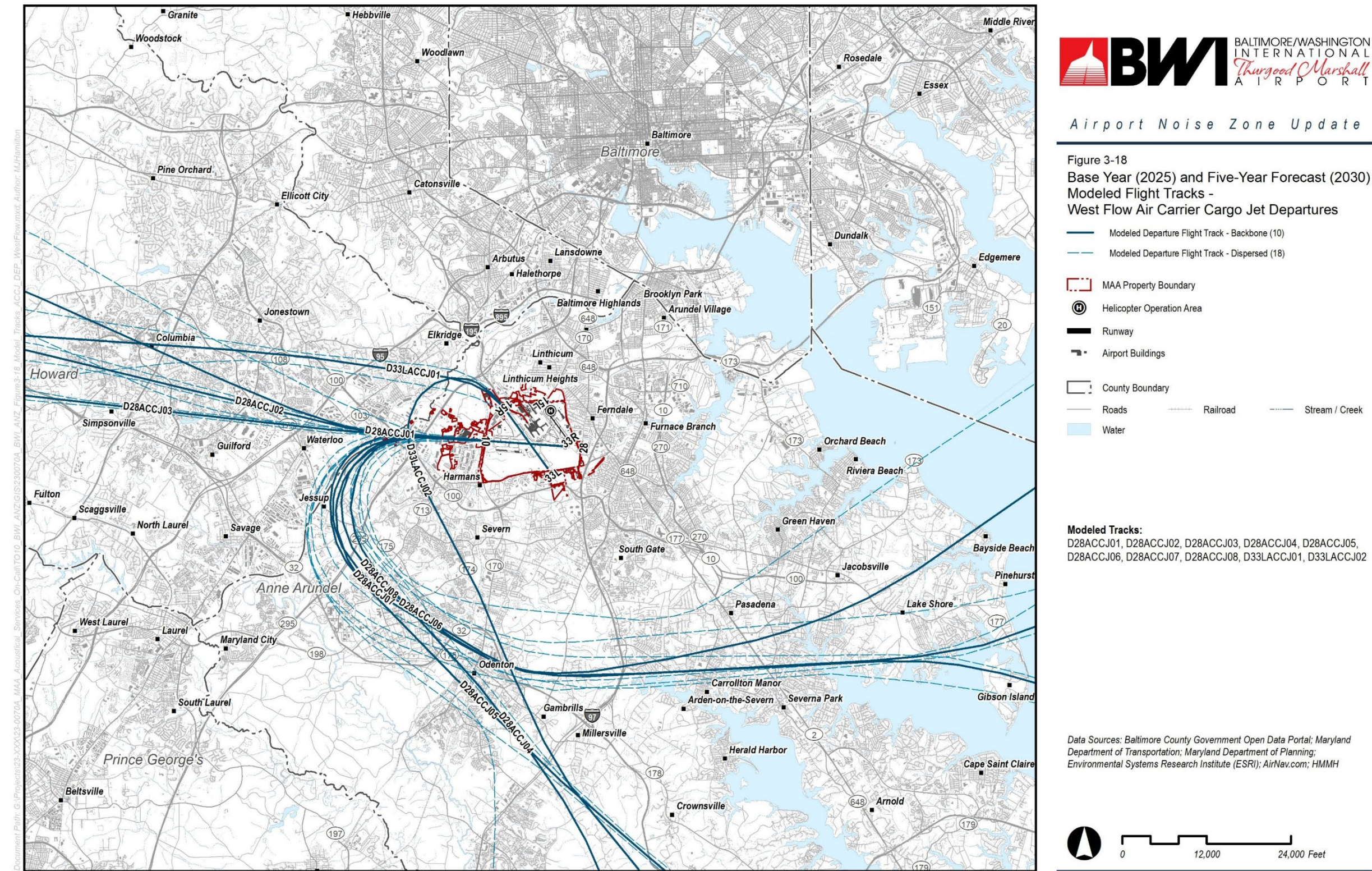


Figure 3-18. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Carrier Cargo Jet Departures

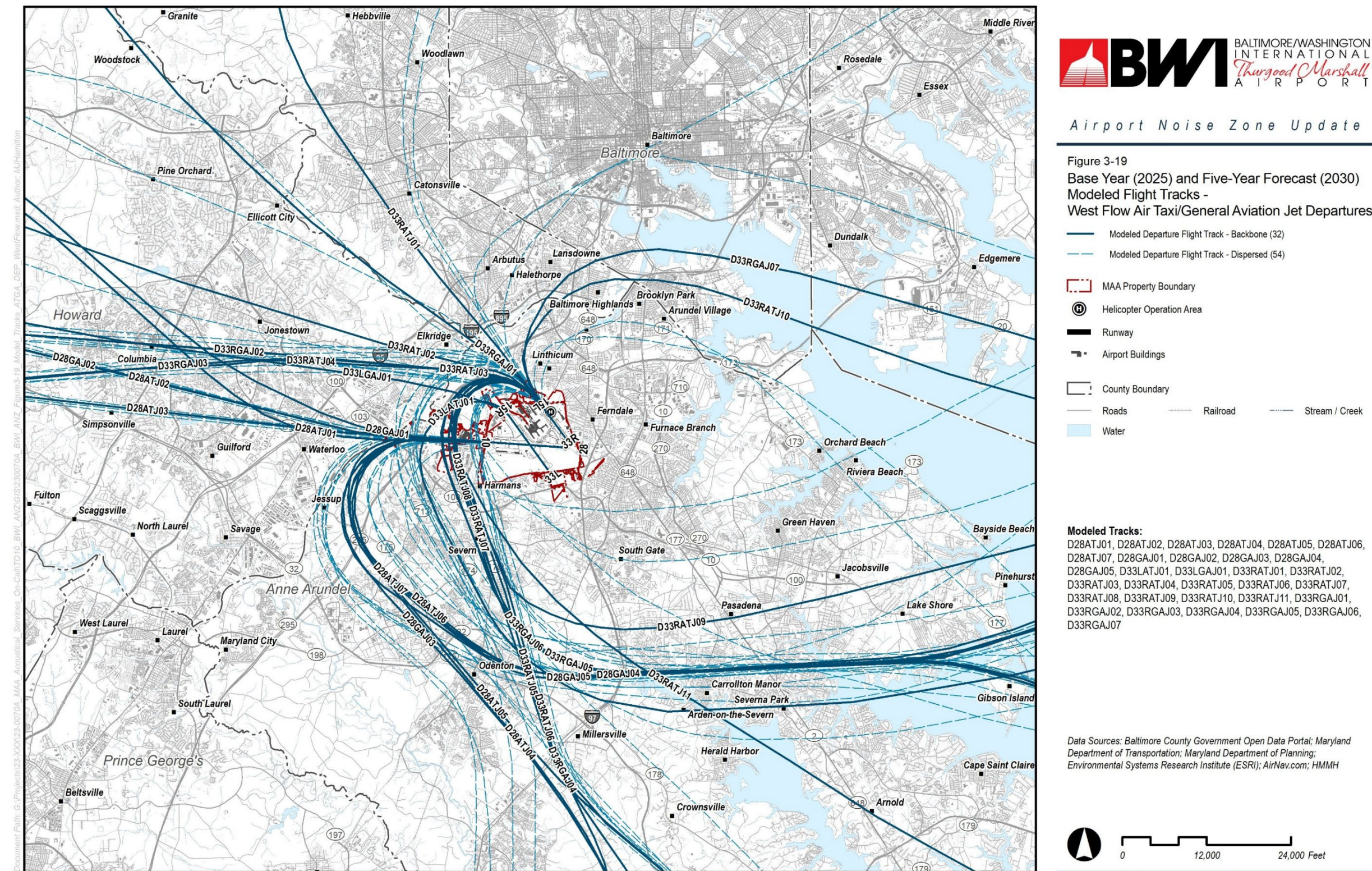
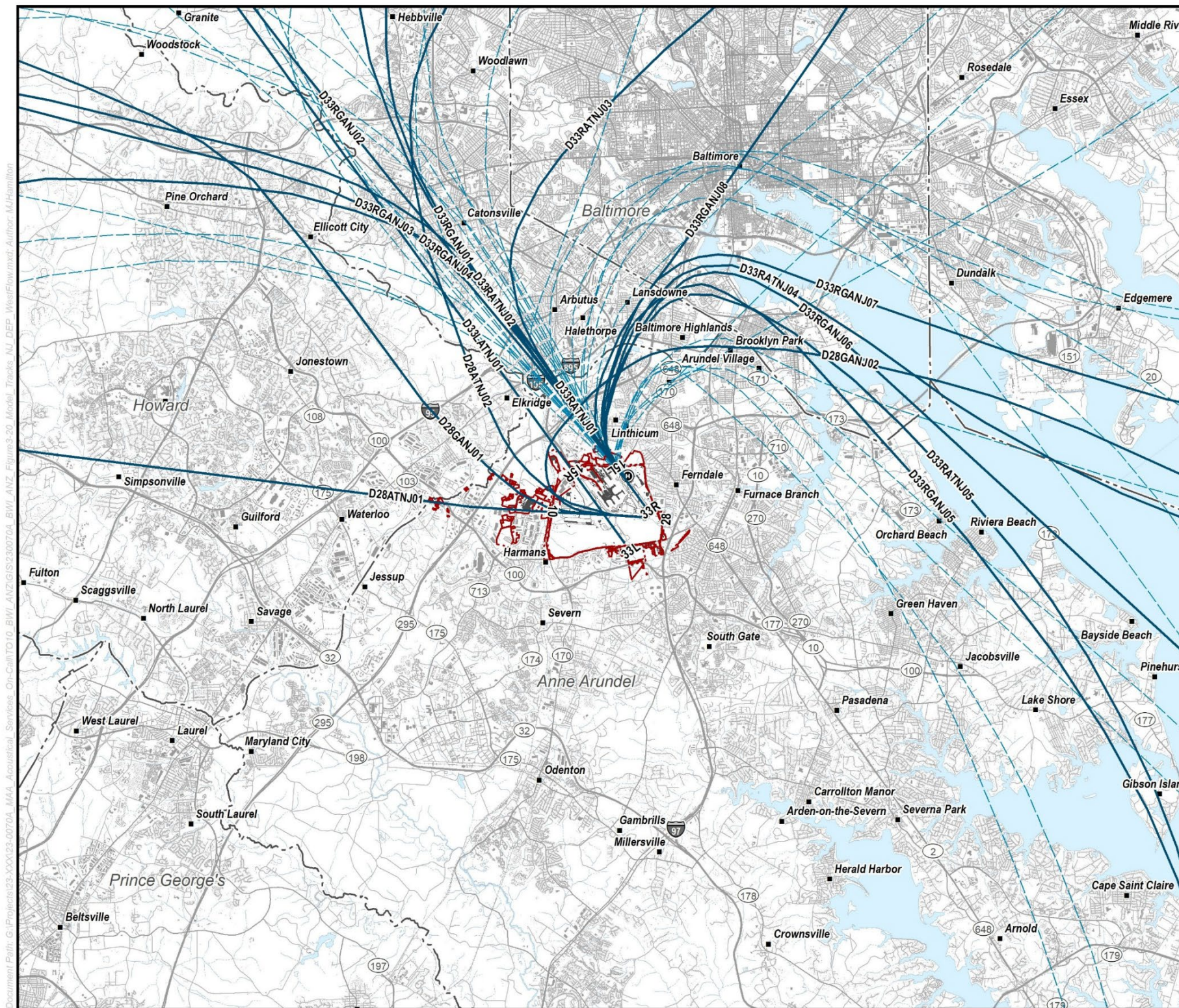


Figure 3-19. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Air Taxi/General Aviation Jet Departures



Airport Noise Zone Update

Figure 3-20
Base Year (2025) and Five-Year Forecast (2030)
Modeled Flight Tracks -
West Flow Propeller Departures

- Modeled Departure Flight Track - Backbone (18)
- - - Modeled Departure Flight Track - Dispersed (28)
- MAA Property Boundary
- Helicopter Operation Area
- Runway
- Airport Buildings
- County Boundary
- Roads
- Railroad
- Stream / Creek
- Water

Modeled Tracks:
D28ATNJ01, D28ATNJ02, D28GANJ01, D28GANJ02, D33LATNJ01,
D33RATNJ01, D33RATNJ02, D33RATNJ03, D33RATNJ04,
D33RATNJ05, D33RGANJ01, D33RGANJ02, D33RGANJ03,
D33RGANJ04, D33RGANJ05, D33RGANJ06, D33RGANJ07,
D33RGANJ08

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



Figure 3-20. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – West Flow Propeller Departures

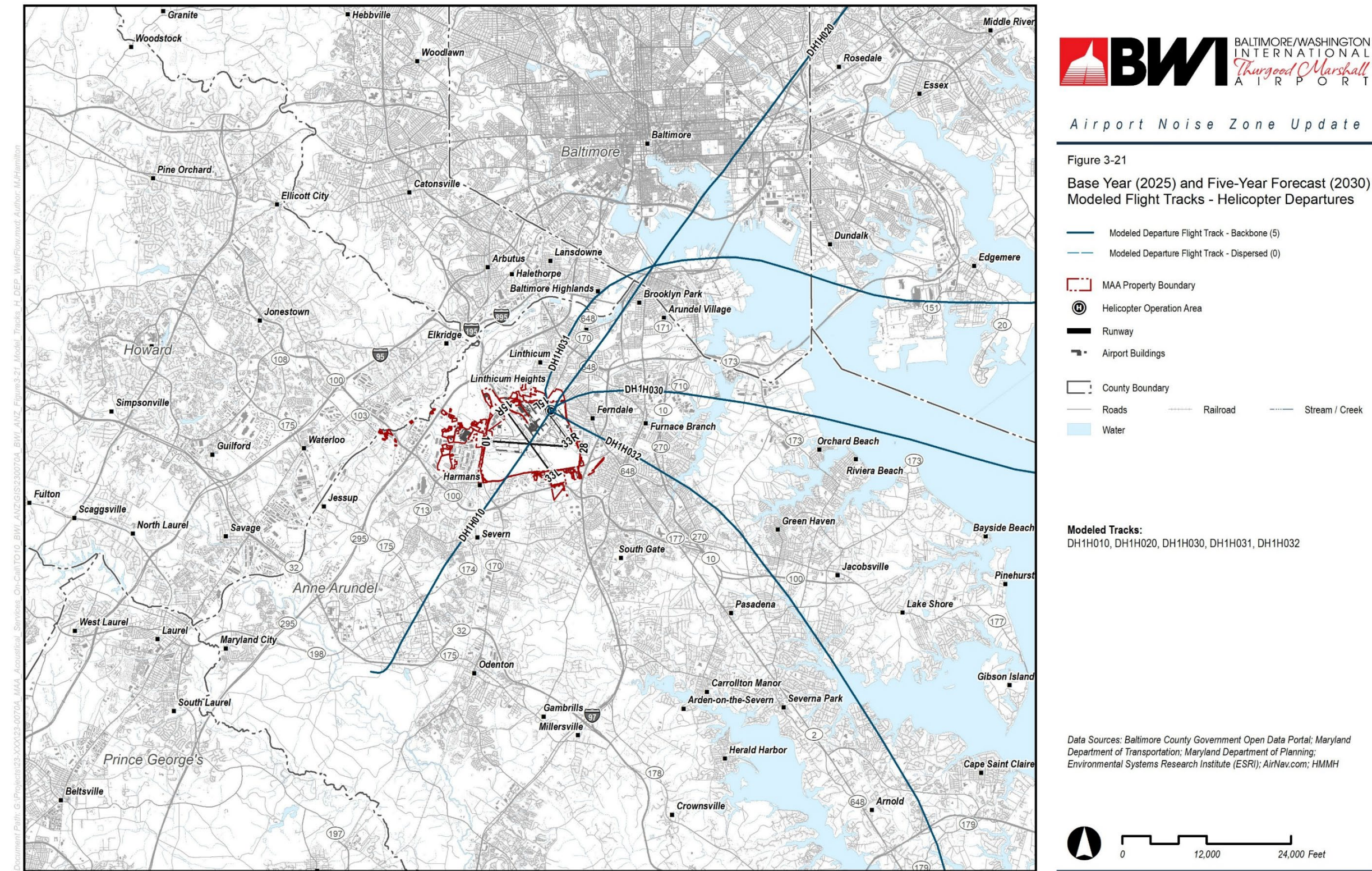


Figure 3-21. Base Year (2025) and Five-Year Forecast (2030) Modeled Flight Tracks – Helicopter Departures

For the purposes of the ten-year 2035 scenario, model tracks from the existing Runway 10/28 (future Runway 10L/28R) were replicated to the planned Runway 10R/28L consistent with the assumptions detailed in Section 3.4. Model tracks for Runway 15R/33L were also lengthened or shortened accordingly to reflect the planned extension to Runway 15R/33L consistent with changes to the airport layout for the ten-year 2035 scenario as detailed in Section 3.1. It is not anticipated there will be any changes to flight paths associated with Runways 15L/33R, and those flight tracks remain unchanged relative to the base year 2025 conditions.

Figure 3-22 through Figure 3-39 show the ten-year 2035 forecast model tracks layered over the airport base map for fixed-wing jet, propeller, and helicopter operations, respectively. Table 3-24 through Table 3-27 present the ten-year 2035 forecast utilization rates of each of the developed model tracks for fixed-wing Air Carrier, Air Taxi, and General Aviation aircraft, respectively. The relative ratio of flight track usage was preserved according to those ratios in the entire radar dataset for fixed-wing operations. For the helicopter flight tracks, the utilization percentages are not expected to vary from those identified in the 2025 base year.

Table 3-24. Ten-Year (2035) Air Carrier Fixed-Wing Model Track Utilization Percentages

Runway	Engine	Category	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
10	Jets	Cargo	A10ACCJ01	7%	D10ACCJ01	14%
10	Jets	Cargo	A10ACCJ02	17%	D10ACCJ02	29%
10	Jets	Cargo	A10ACCJ03	15%	D10ACCJ03	20%
10	Jets	Cargo	A10ACCJ04	45%	D10ACCJ04	37%
10	Jets	Cargo	A10ACCJ05	6%	Subtotal	100%
10	Jets	Cargo	A10ACCJ06	2%	-	-
10	Jets	Cargo	A10ACCJ07	7%	-	-
10	Jets	Cargo	Subtotal	100%	-	-
10	Jets	Passenger	A10ACPJ01	3%	D10ACPJ01	3%
10	Jets	Passenger	A10ACPJ02	9%	D10ACPJ02	14%
10	Jets	Passenger	A10ACPJ03	<1%	D10ACPJ03	11%
10	Jets	Passenger	A10ACPJ04	16%	D10ACPJ04	13%
10	Jets	Passenger	A10ACPJ05	2%	D10ACPJ05	36%
10	Jets	Passenger	A10ACPJ06	2%	D10ACPJ06	11%
10	Jets	Passenger	A10ACPJ07	7%	D10ACPJ07	12%
10	Jets	Passenger	A10ACPJ08	<1%	Subtotal	100%
10	Jets	Passenger	A10ACPJ09	<1%	-	-
10	Jets	Passenger	A10ACPJ10	<1%	-	-
10	Jets	Passenger	A10ACPJ11	45%	-	-
10	Jets	Passenger	A10ACPJ12	5%	-	-
10	Jets	Passenger	A10ACPJ13	8%	-	-
10	Jets	Passenger	A10ACPJ14	1%	-	-
10	Jets	Passenger	Subtotal	100%	-	-
15R	Jets	Cargo	A15RACCJ01	12%	D15RACCJ01	11%
15R	Jets	Cargo	A15RACCJ02	27%	D15RACCJ02	60%
15R	Jets	Cargo	A15RACCJ03	29%	D15RACCJ03	12%
15R	Jets	Cargo	A15RACCJ04	24%	D15RACCJ04	8%
15R	Jets	Cargo	A15RACCJ05	7%	D15RACCJ05	1%
15R	Jets	Cargo	Subtotal	100%	D15RACCJ06	7%
15R	Jets	Cargo	-	-	Subtotal	100%
15R	Jets	Passenger	A15RACPJ01	5%	D15RACPJ01	10%
15R	Jets	Passenger	A15RACPJ02	29%	D15RACPJ02	3%
15R	Jets	Passenger	A15RACPJ03	4%	D15RACPJ03	14%
15R	Jets	Passenger	A15RACPJ04	3%	D15RACPJ04	26%

Runway	Engine	Category	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
15R	Jets	Passenger	A15RACPJ05	12%	D15RACPJ05	9%
15R	Jets	Passenger	A15RACPJ06	46%	D15RACPJ06	5%
15R	Jets	Passenger	Subtotal	100%	D15RACPJ07	3%
15R	Jets	Passenger	-	-	D15RACPJ08	<1%
15R	Jets	Passenger	-	-	D15RACPJ09	2%
15R	Jets	Passenger	-	-	D15RACPJ10	10%
15R	Jets	Passenger	-	-	D15RACPJ11	3%
15R	Jets	Passenger	-	-	D15RACPJ12	5%
15R	Jets	Passenger	-	-	D15RACPJ13	11%
15R	Jets	Passenger	-	-	Subtotal	100%
28	Jets	Cargo	A28ACCJ01	41%	D28ACCJ01	2%
28	Jets	Cargo	A28ACCJ02	14%	D28ACCJ02	71%
28	Jets	Cargo	A28ACCJ03	33%	D28ACCJ03	8%
28	Jets	Cargo	A28ACCJ04	12%	D28ACCJ04	6%
28	Jets	Cargo	Subtotal	100%	D28ACCJ05	1%
28	Jets	Cargo	-	-	D28ACCJ06	2%
28	Jets	Cargo	-	-	D28ACCJ07	9%
28	Jets	Cargo	-	-	D28ACCJ08	1%
28	Jets	Cargo	-	-	Subtotal	100%
28	Jets	Passenger	A28ACPJ01	5%	D28ACPJ01	<1%
28	Jets	Passenger	A28ACPJ02	9%	D28ACPJ02	<1%
28	Jets	Passenger	A28ACPJ03	9%	D28ACPJ03	53%
28	Jets	Passenger	A28ACPJ04	12%	D28ACPJ04	14%
28	Jets	Passenger	A28ACPJ05	4%	D28ACPJ05	13%
28	Jets	Passenger	A28ACPJ06	20%	D28ACPJ06	4%
28	Jets	Passenger	A28ACPJ07	38%	D28ACPJ07	3%
28	Jets	Passenger	A28ACPJ08	2%	D28ACPJ08	11%
28	Jets	Passenger	Subtotal	100%	Subtotal	100%
33L	Jets	Cargo	A33LACCJ01	8%	D33LACCJ01	92%
33L	Jets	Cargo	A33LACCJ02	10%	D33LACCJ02	8%
33L	Jets	Cargo	A33LACCJ03	24%	Subtotal	100%
33L	Jets	Cargo	A33LACCJ04	9%	-	-
33L	Jets	Cargo	A33LACCJ05	41%	-	-
33L	Jets	Cargo	A33LACCJ06	7%	-	-
33L	Jets	Cargo	A33LACCJ07	1%	-	-
33L	Jets	Cargo	Subtotal	100%	-	-
33L	Jets	Passenger	A33LACPJ01	5%	D33LACPJ01	46%
33L	Jets	Passenger	A33LACPJ02	15%	D33LACPJ02	20%
33L	Jets	Passenger	A33LACPJ03	6%	D33LACPJ03	14%
33L	Jets	Passenger	A33LACPJ04	11%	D33LACPJ04	4%
33L	Jets	Passenger	A33LACPJ05	3%	D33LACPJ05	5%
33L	Jets	Passenger	A33LACPJ06	11%	D33LACPJ06	11%
33L	Jets	Passenger	A33LACPJ07	45%	Subtotal	100%
33L	Jets	Passenger	A33LACPJ08	5%	-	-
33L	Jets	Passenger	A33LACPJ09	<1%	-	-
33L	Jets	Passenger	Subtotal	100%	-	-

Note: Totals may not equal 100% due to rounding.

Table 3-25. Ten-Year (2035) Air Taxi Fixed-Wing Model Track Utilization Percentages

Runway	Engine	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
10	Jets	A10ATJ01	48%	D10ATJ01	100%
10	Jets	A10ATJ02	4%	Subtotal	100%
10	Jets	A10ATJ03	11%	-	-
10	Jets	A10ATJ04	14%	-	-
10	Jets	A10ATJ05	9%	-	-
10	Jets	A10ATJ06	14%	-	-
10	Jets	Subtotal	100%	-	-
10	Non-Jets	A10ATNJ01	32%	D10ATNJ01	100%
10	Non-Jets	A10ATNJ02	21%	Subtotal	100%
10	Non-Jets	A10ATNJ03	47%	-	-
10	Non-Jets	Subtotal	100%	-	-
15L	Jets	A15LATJ01	24%	D15LATJ01	25%
15L	Jets	A15LATJ02	24%	D15LATJ02	12%
15L	Jets	A15LATJ03	13%	D15LATJ03	21%
15L	Jets	A15LATJ04	24%	D15LATJ04	8%
15L	Jets	A15LATJ05	8%	D15LATJ05	5%
15L	Jets	A15LATJ06	8%	D15LATJ06	2%
15L	Jets	Subtotal	100%	D15LATJ07	4%
15L	Jets	-	-	D15LATJ08	5%
15L	Jets	-	-	D15LATJ09	17%
15L	Jets	-	-	D15LATJ10	1%
15L	Jets	-	-	Subtotal	100%
15L	Non-Jets	A15LATNJ01	21%	D15LATNJ01	49%
15L	Non-Jets	A15LATNJ02	24%	D15LATNJ02	23%
15L	Non-Jets	A15LATNJ03	31%	D15LATNJ03	15%
15L	Non-Jets	A15LATNJ04	18%	D15LATNJ04	11%
15L	Non-Jets	A15LATNJ05	6%	D15LATNJ05	1%
15L	Non-Jets	Subtotal	100%	Subtotal	100%
15R	Jets	A15RATJ01	100%	D15RATJ01	56%
15R	Jets	Subtotal	100%	D15RATJ02	10%
15R	Jets	-	-	D15RATJ03	5%
15R	Jets	-	-	D15RATJ04	17%
15R	Jets	-	-	D15RATJ05	3%
15R	Jets	-	-	D15RATJ06	10%
15R	Jets	-	-	Subtotal	100%
15R	Non-Jets	A15RATNJ01	100%	D15RATNJ01	40%
15R	Non-Jets	Subtotal	100%	D15RATNJ02	60%
15R	Non-Jets	-	-	Subtotal	100%
28	Jets	A28ATJ01	22%	D28ATJ01	2%
28	Jets	A28ATJ02	27%	D28ATJ02	60%
28	Jets	A28ATJ03	16%	D28ATJ03	12%
28	Jets	A28ATJ04	22%	D28ATJ04	7%
28	Jets	A28ATJ05	13%	D28ATJ05	2%
28	Jets	Subtotal	100%	D28ATJ06	3%
28	Jets	-	-	D28ATJ07	14%
28	Jets	-	-	Subtotal	100%
28	Non-Jets	A28ATNJ01	100%	D28ATNJ01	42%
28	Non-Jets	Subtotal	100%	D28ATNJ02	58%
28	Non-Jets	-	-	Subtotal	100%
33L	Jets	A33LATJ01	5%	D33LATJ01	100%
33L	Jets	A33LATJ02	13%	Subtotal	100%
33L	Jets	A33LATJ03	19%	-	-

Runway	Engine	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
33L	Jets	A33LATJ04	5%	-	-
33L	Jets	A33LATJ05	11%	-	-
33L	Jets	A33LATJ06	42%	-	-
33L	Jets	A33LATJ07	1%	-	-
33L	Jets	A33LATJ08	2%	-	-
33L	Jets	A33LATJ09	2%	-	-
33L	Jets	Subtotal	100%	-	-
33L	Non-Jets	A33LATNJ01	100%	D33LATNJ01	100%
33L	Non-Jets	Subtotal	100%	Subtotal	100%
33R	Jets	A33RATJ01	14%	D33RATJ01	4%
33R	Jets	A33RATJ02	14%	D33RATJ02	3%
33R	Jets	A33RATJ03	10%	D33RATJ03	28%
33R	Jets	A33RATJ04	19%	D33RATJ04	15%
33R	Jets	A33RATJ05	8%	D33RATJ05	4%
33R	Jets	A33RATJ06	20%	D33RATJ06	9%
33R	Jets	A33RATJ07	12%	D33RATJ07	8%
33R	Jets	A33RATJ08	2%	D33RATJ08	19%
33R	Jets	A33RATJ09	1%	D33RATJ09	6%
33R	Jets	Subtotal	100%	D33RATJ10	2%
33R	Jets	-	-	D33RATJ11	3%
33R	Jets	-	-	Subtotal	100%
33R	Non-Jets	A33RATNJ01	12%	D33RATNJ01	12%
33R	Non-Jets	A33RATNJ02	28%	D33RATNJ02	8%
33R	Non-Jets	A33RATNJ03	20%	D33RATNJ03	43%
33R	Non-Jets	A33RATNJ04	5%	D33RATNJ04	17%
33R	Non-Jets	A33RATNJ05	26%	D33RATNJ05	20%
33R	Non-Jets	A33RATNJ06	9%	Subtotal	100%
33R	Non-Jets	Subtotal	100%	-	-

Note: Totals may not equal 100% due to rounding.

Table 3-26. Ten-Year (2035) General Aviation Fixed-Wing Model Track Utilization Percentages

Runway	Engine	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
10	Jets	A10GAJ01	34%	D10GAJ01	100%
10	Jets	A10GAJ02	10%	Subtotal	100%
10	Jets	A10GAJ03	27%	-	-
10	Jets	A10GAJ04	7%	-	-
10	Jets	A10GAJ05	22%	-	-
10	Jets	Subtotal	100%	-	-
10	Non-Jets	A10GANJ01	31%	D10GANJ01	100%
10	Non-Jets	A10GANJ02	69%	Subtotal	100%
10	Non-Jets	Subtotal	100%	-	-
15L	Jets	A15LGAJ01	30%	D15LGAJ01	4%
15L	Jets	A15LGAJ02	43%	D15LGAJ02	8%
15L	Jets	A15LGAJ03	26%	D15LGAJ03	39%
15L	Jets	Subtotal	100%	D15LGAJ04	12%
15L	Jets	-	-	D15LGAJ05	8%
15L	Jets	-	-	D15LGAJ06	8%
15L	Jets	-	-	D15LGAJ07	4%
15L	Jets	-	-	D15LGAJ08	9%
15L	Jets	-	-	D15LGAJ09	9%
15L	Jets	-	-	Subtotal	100%

Runway	Engine	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
15L	Non-Jets	A15LGANJ01	11%	D15LGANJ01	24%
15L	Non-Jets	A15LGANJ02	20%	D15LGANJ02	11%
15L	Non-Jets	A15LGANJ03	9%	D15LGANJ03	19%
15L	Non-Jets	A15LGANJ04	42%	D15LGANJ04	36%
15L	Non-Jets	A15LGANJ05	19%	D15LGANJ05	11%
15L	Non-Jets	Subtotal	100%	Subtotal	100%
15R	Jets	A15RGAJ01	100%	D15RGAJ01	17%
15R	Jets	Subtotal	100%	D15RGAJ02	25%
15R	Jets	-	-	D15RGAJ03	58%
15R	Jets	-	-	Subtotal	100%
15R	Non-Jets	A15RGANJ01	100%	D15RGANJ01	100%
15R	Non-Jets	Subtotal	100%	Subtotal	100%
28	Jets	A28GAJ01	59%	D28GAJ01	5%
28	Jets	A28GAJ02	41%	D28GAJ02	52%
28	Jets	Subtotal	100%	D28GAJ03	15%
28	Jets	-	-	D28GAJ04	9%
28	Jets	-	-	D28GAJ05	18%
28	Jets	-	-	Subtotal	100%
28	Non-Jets	A28GANJ01	100%	D28GANJ01	63%
28	Non-Jets	Subtotal	100%	D28GANJ02	38%
28	Non-Jets	-	-	Subtotal	100%
33L	Jets	A33LGAJ01	32%	D33LGAJ01	100%
33L	Jets	A33LGAJ02	26%	Subtotal	100%
33L	Jets	A33LGAJ03	6%	-	-
33L	Jets	A33LGAJ04	35%	-	-
33L	Jets	Subtotal	100%	-	-
33L	Non-Jets	A33LGANJ01	100%	Subtotal	0%
33L	Non-Jets	Subtotal	100%	-	-
33R	Jets	A33RGAJ01	27%	D33RGAJ01	6%
33R	Jets	A33RGAJ02	13%	D33RGAJ02	36%
33R	Jets	A33RGAJ03	14%	D33RGAJ03	16%
33R	Jets	A33RGAJ04	10%	D33RGAJ04	15%
33R	Jets	A33RGAJ05	24%	D33RGAJ05	6%
33R	Jets	A33RGAJ06	13%	D33RGAJ06	17%
33R	Jets	Subtotal	100%	D33RGAJ07	4%
33R	Jets	-	-	Subtotal	100%
33R	Non-Jets	A33RGANJ01	28%	D33RGANJ01	15%
33R	Non-Jets	A33RGANJ02	27%	D33RGANJ02	18%
33R	Non-Jets	A33RGANJ03	7%	D33RGANJ03	11%
33R	Non-Jets	A33RGANJ04	12%	D33RGANJ04	5%
33R	Non-Jets	A33RGANJ05	26%	D33RGANJ05	12%
33R	Non-Jets	Subtotal	100%	D33RGANJ06	24%
33R	Non-Jets	-	-	D33RGANJ07	9%
33R	Non-Jets	-	-	D33RGANJ08	6%
33R	Non-Jets	-	-	Subtotal	100%

Note: Totals may not equal 100% due to rounding.

Table 3-27. Ten-Year (2035) Helicopter Model Track Utilization Percentages

Runway	Engine	Bundle Name (Arrivals)	Percent (Arrivals)	Bundle Name (Departures)	Percent (Departures)
H1	Helicopter	AH1H01	24%	DH1H01	53%
H1	Helicopter	AH1H02	24%	DH1H02	33%
H1	Helicopter	AH1H03	21%	DH1H03	14%
H1	Helicopter	AH1H04	21%	Subtotal	100%
H1	Helicopter	AH1H05	10%	-	-
H1	Helicopter	Subtotal	100%	-	-

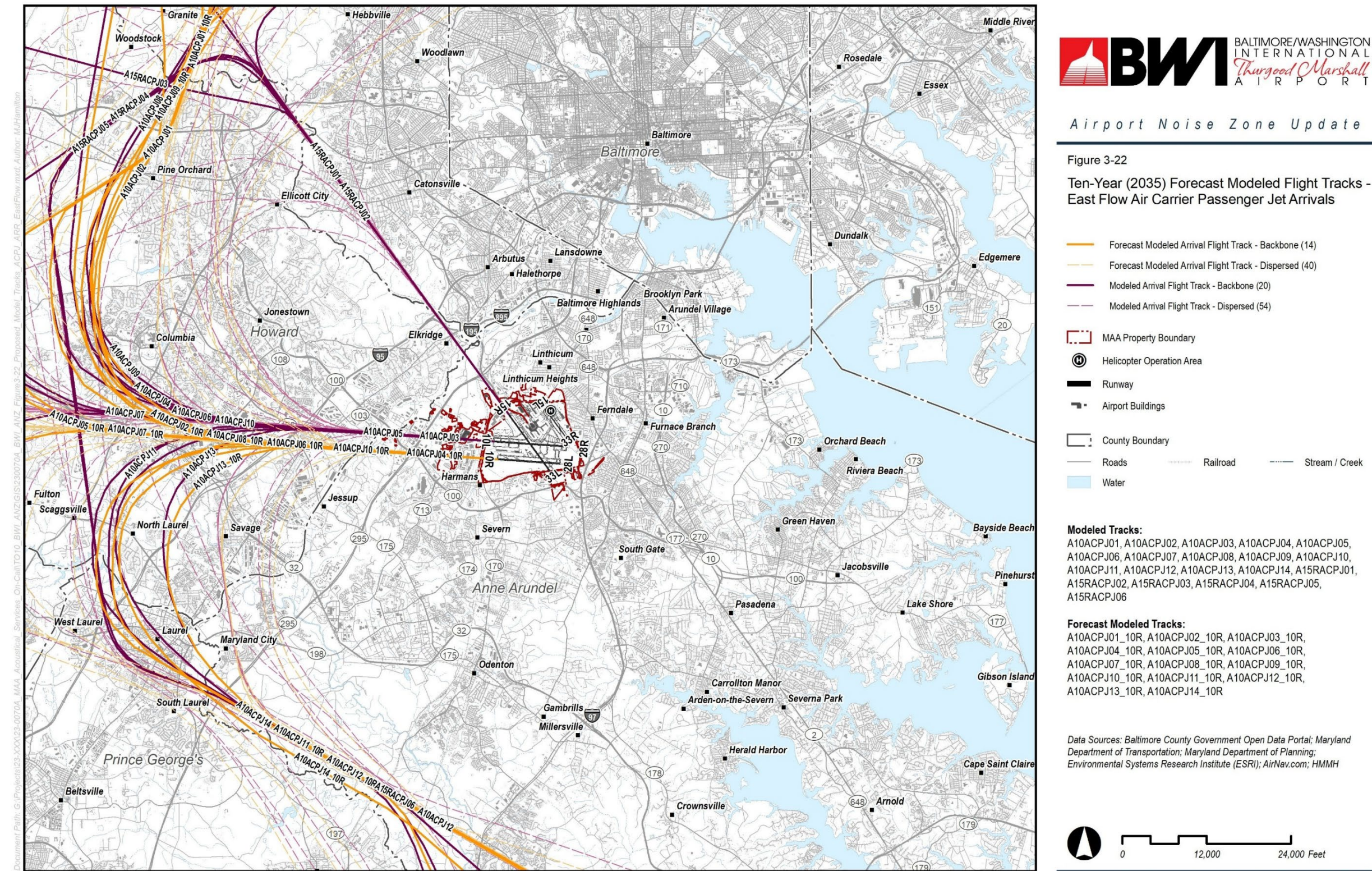


Figure 3-22. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Carrier Passenger Jet Arrivals

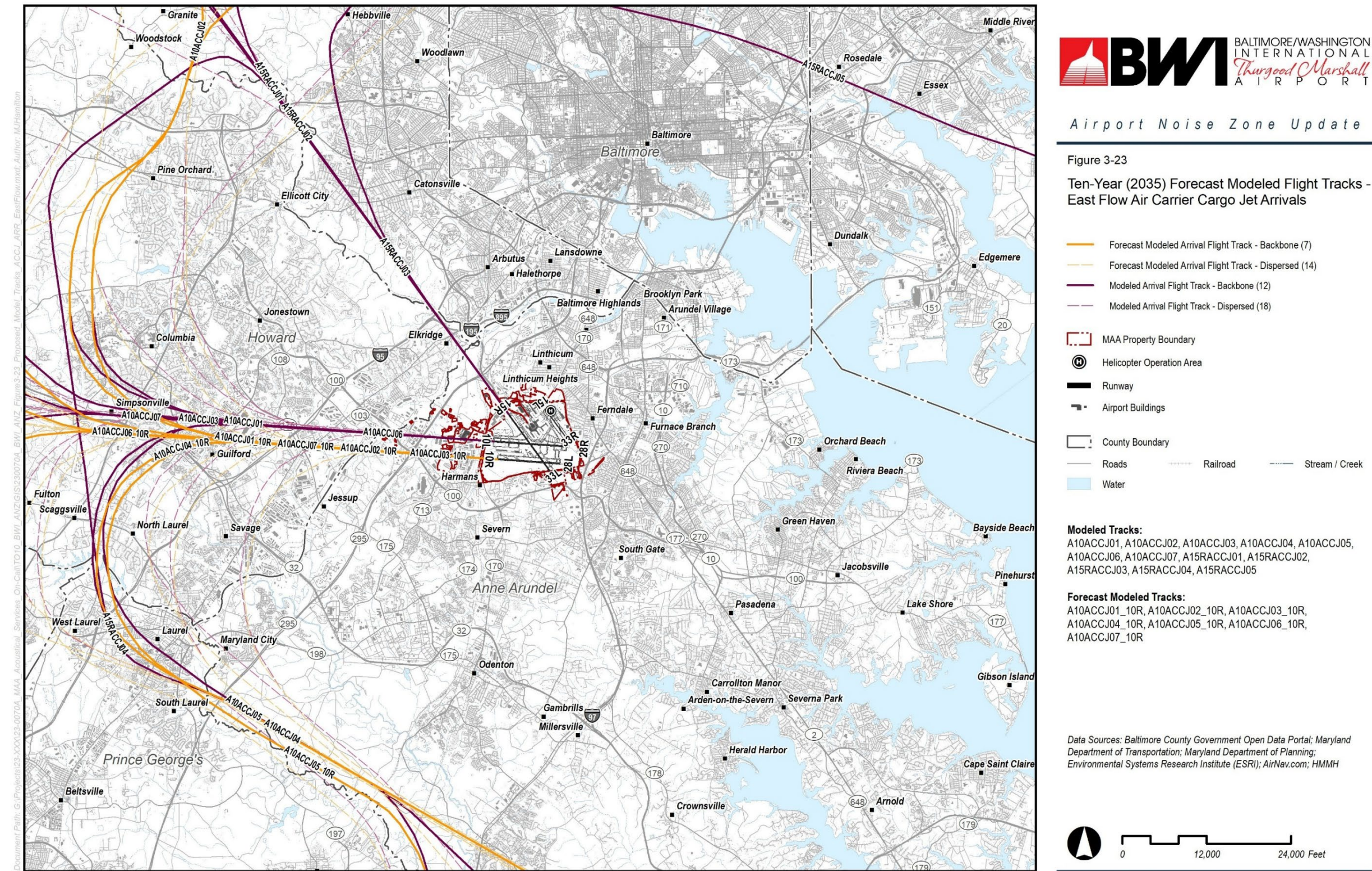


Figure 3-23. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Carrier Cargo Jet Arrivals

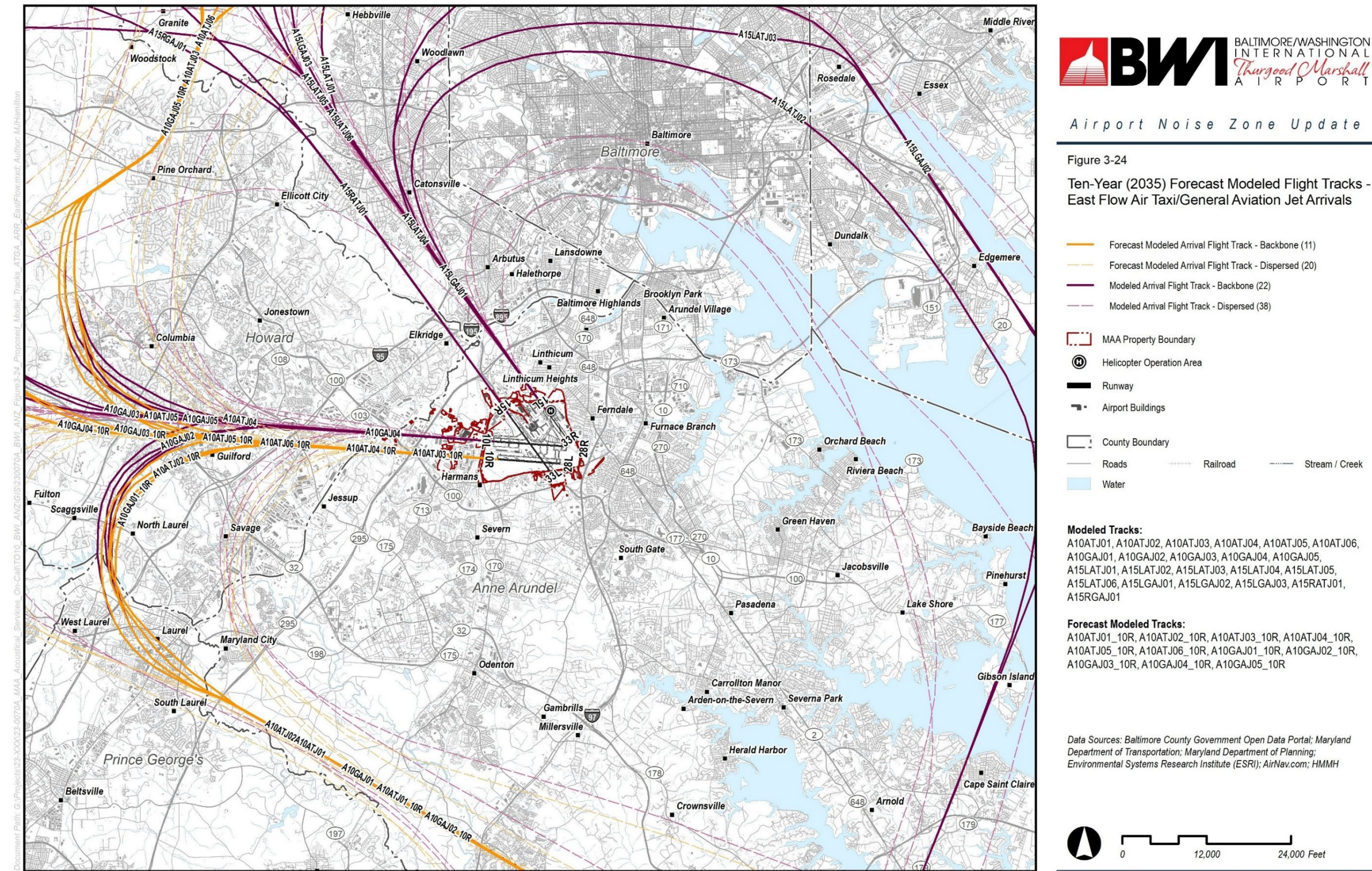


Figure 3-24. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Taxi/General Aviation Jet Arrivals

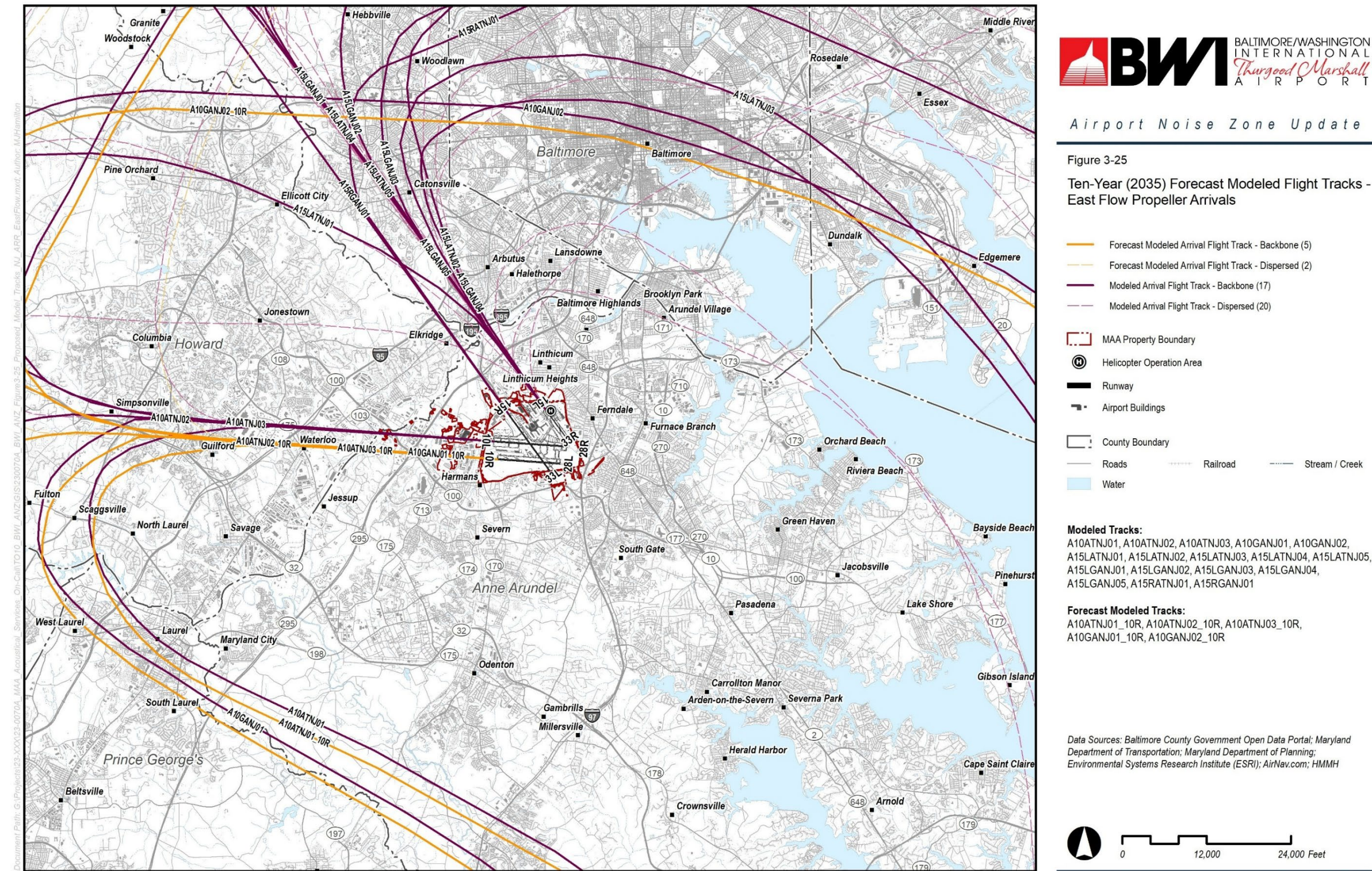


Figure 3-25. Ten-Year (2035) Modeled Flight Tracks – East Flow Propeller Arrivals

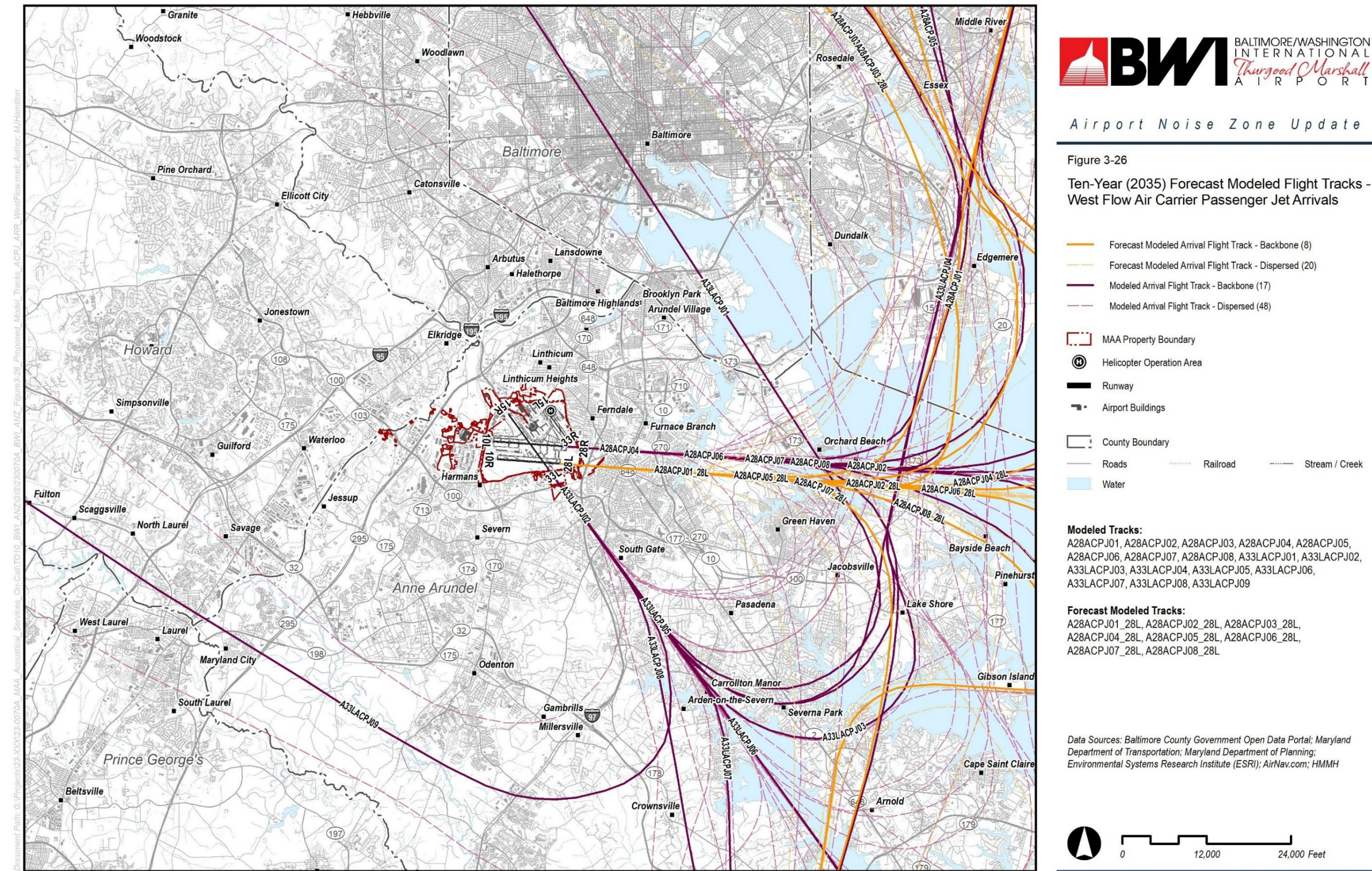


Figure 3-26. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Carrier Passenger Jet Arrivals

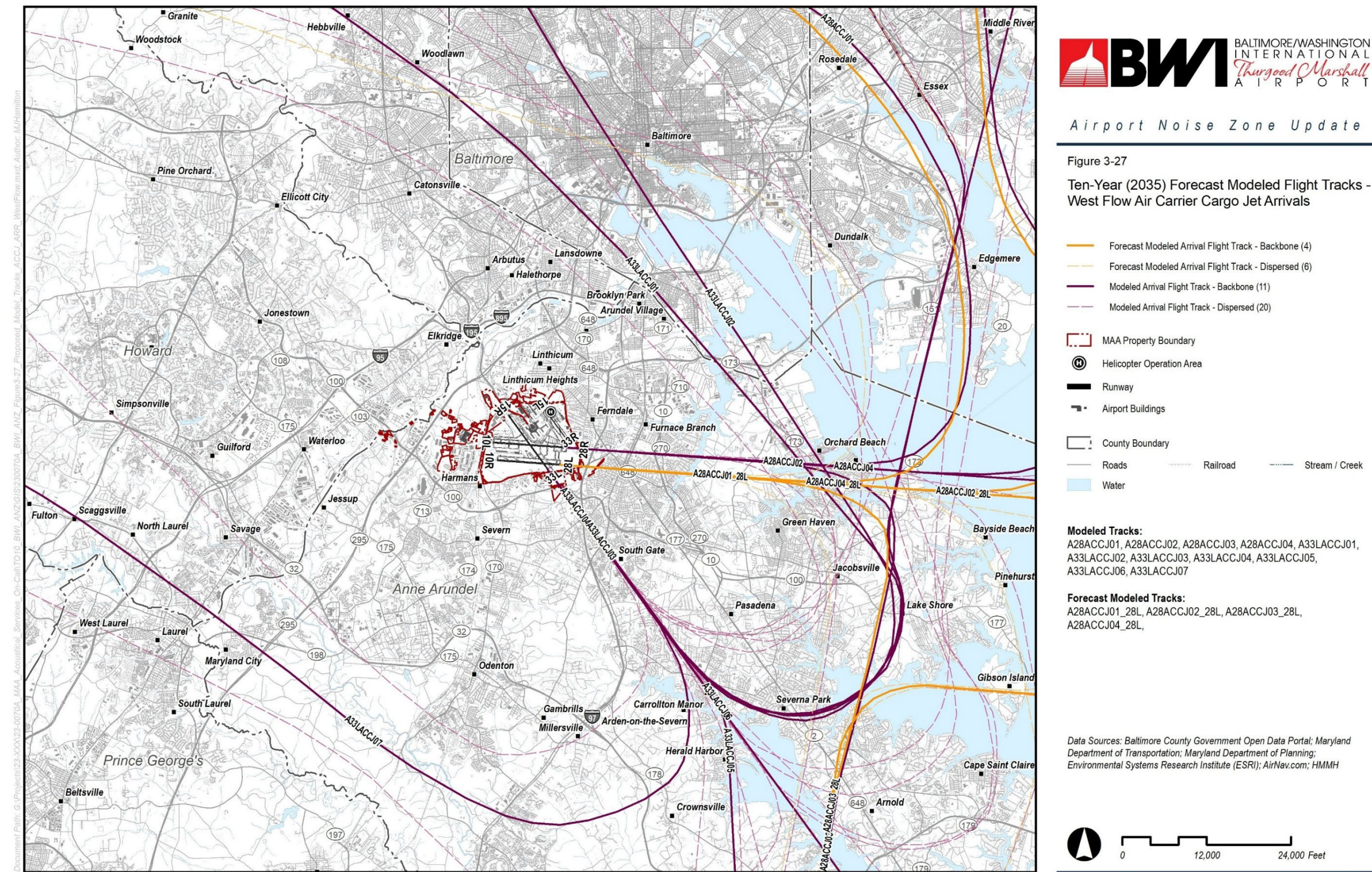


Figure 3-27. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Carrier Cargo Jet Arrivals

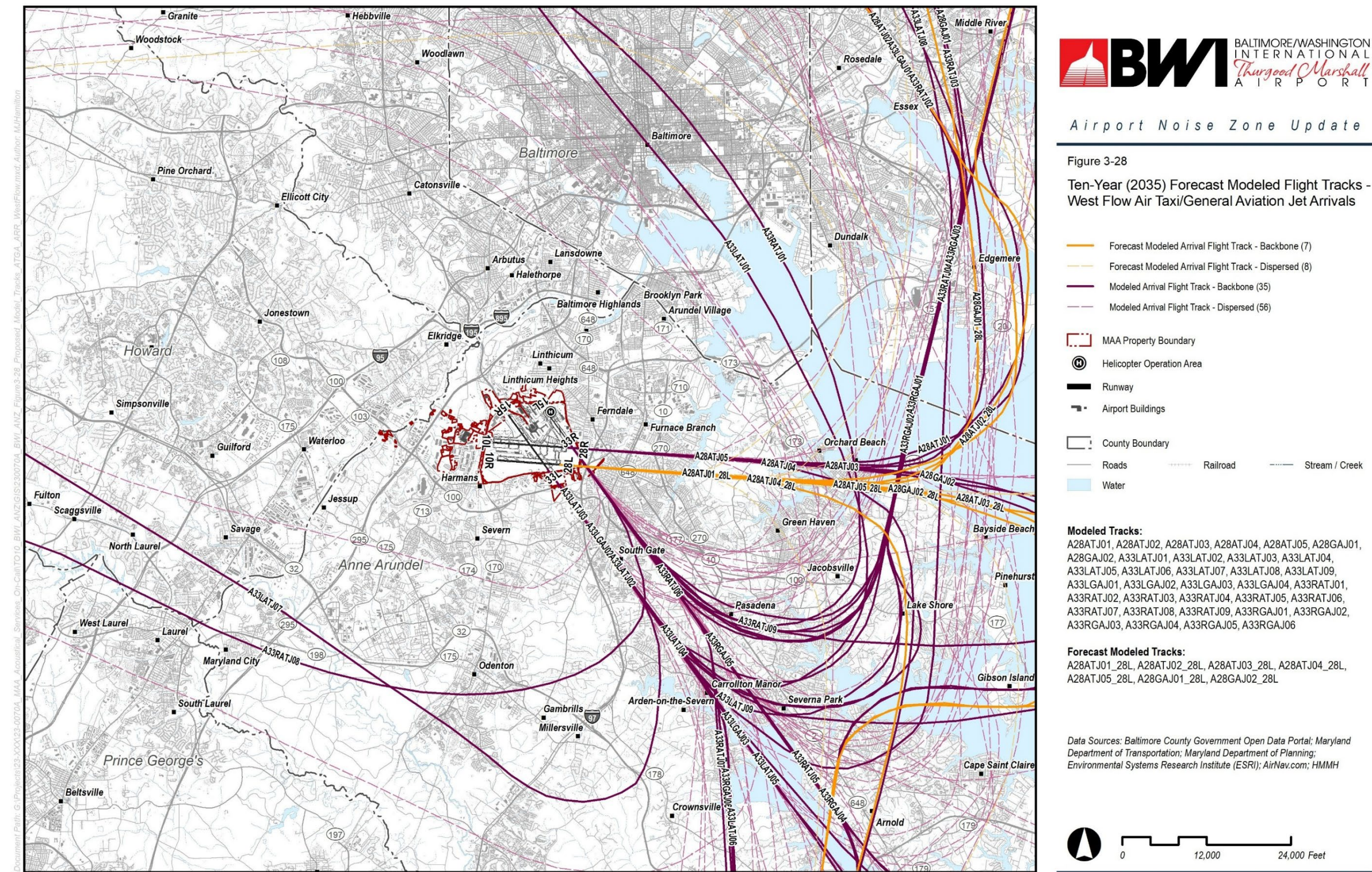


Figure 3-28. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Taxi/General Aviation Jet Arrivals

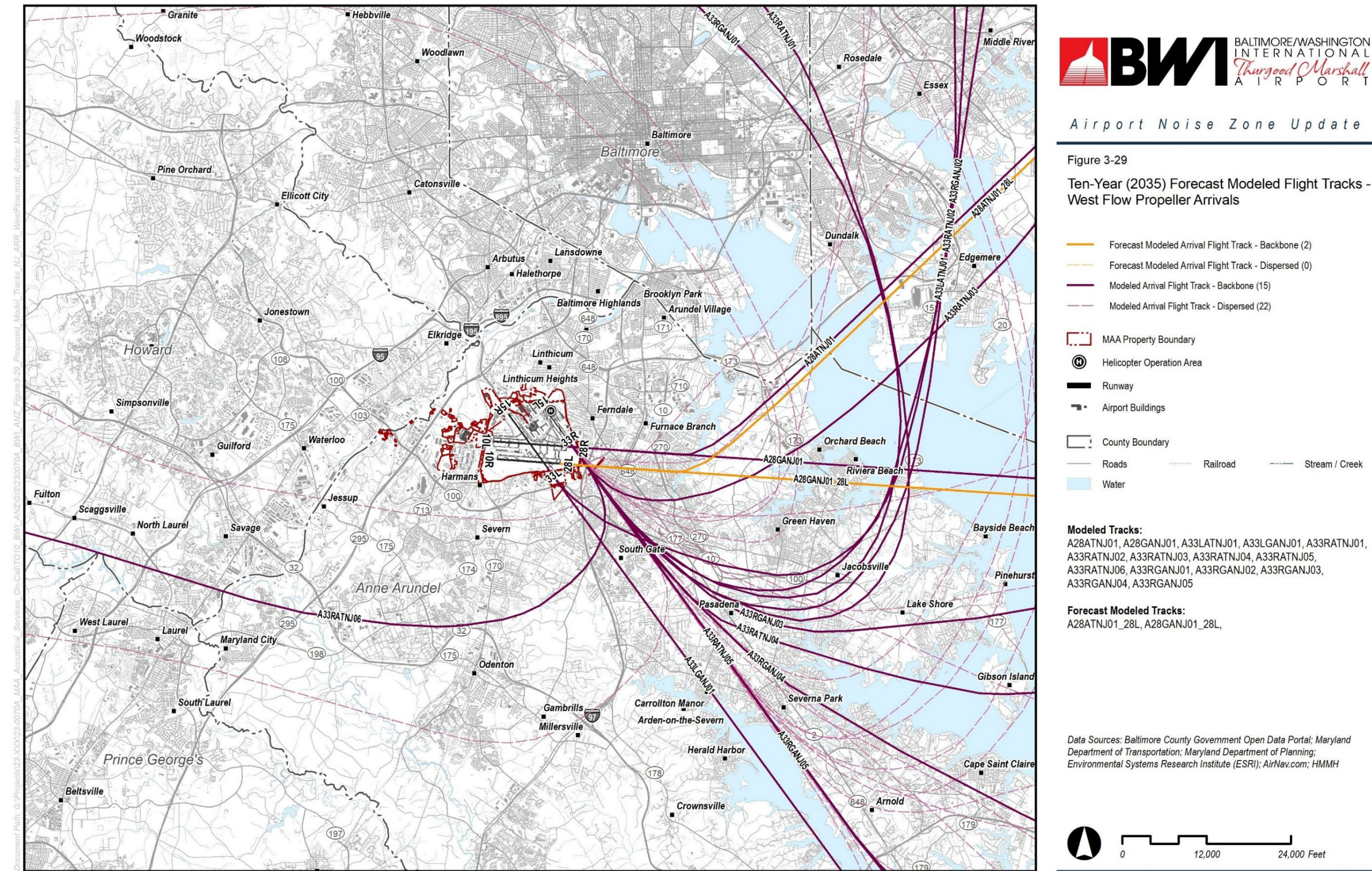


Figure 3-29. Ten-Year (2035) Modeled Flight Tracks – West Flow Propeller Arrivals

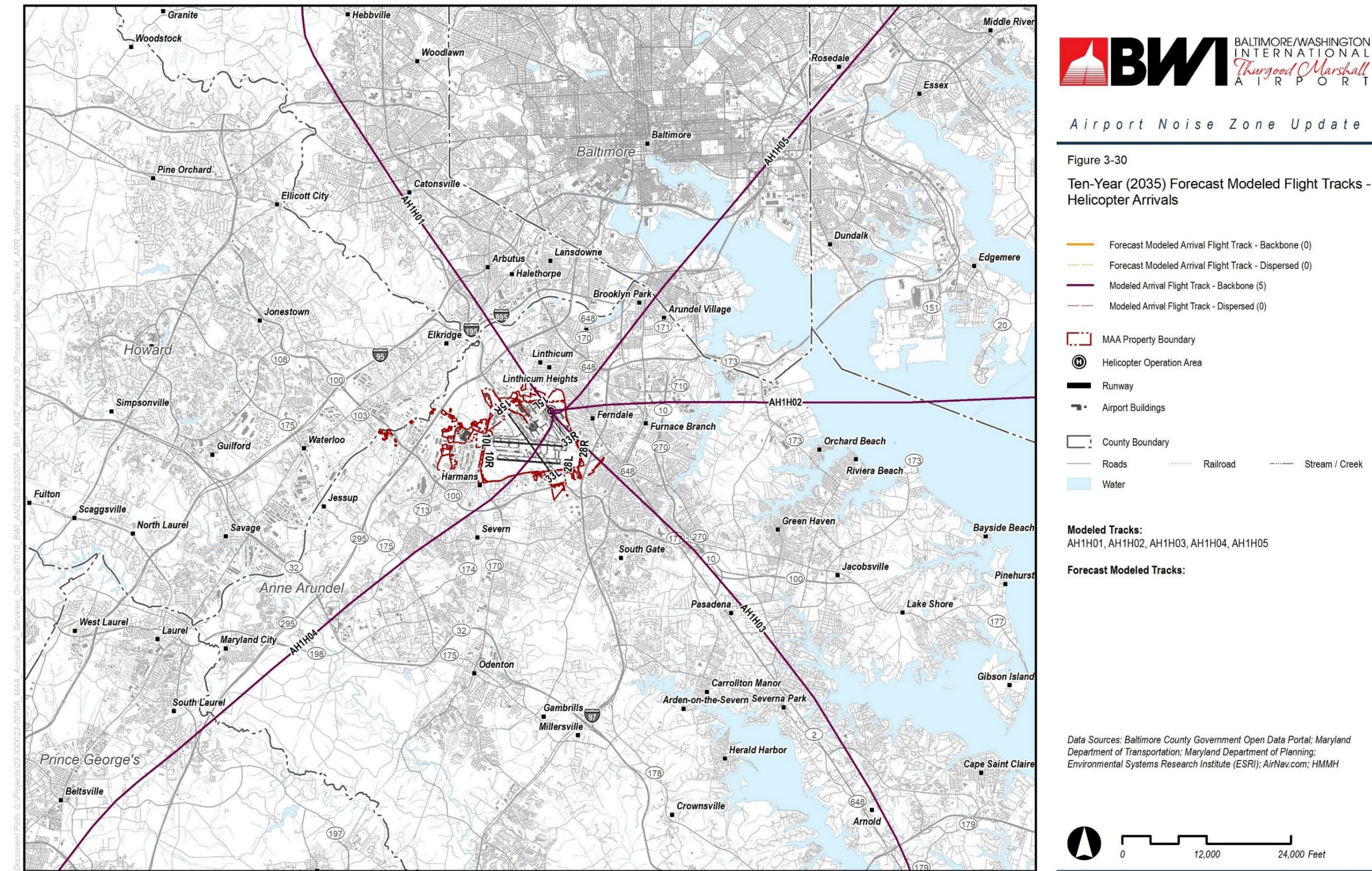


Figure 3-30. Ten-Year (2035) Modeled Flight Tracks – Helicopter Arrivals

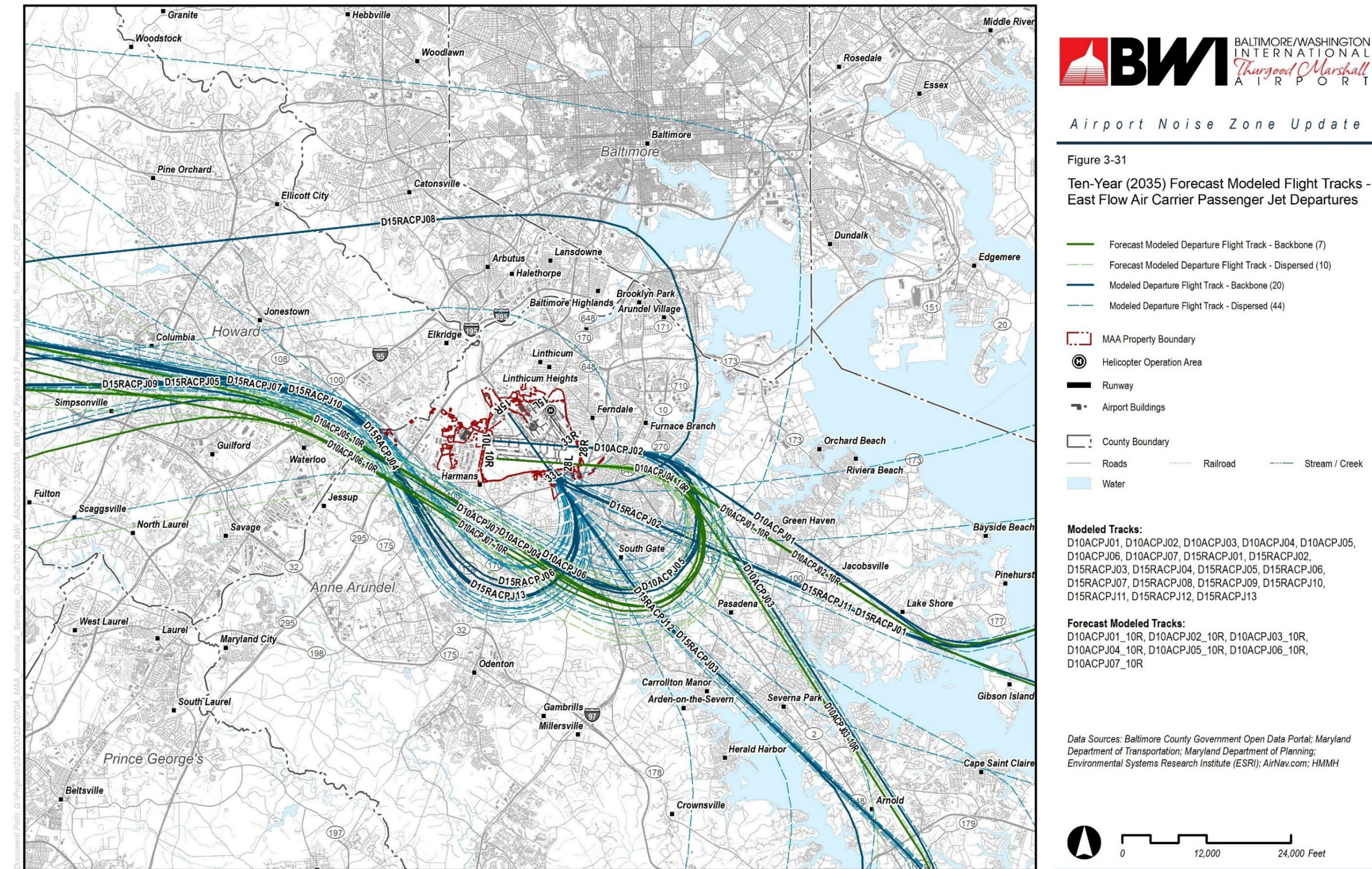


Figure 3-31. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Carrier Passenger Jet Departures

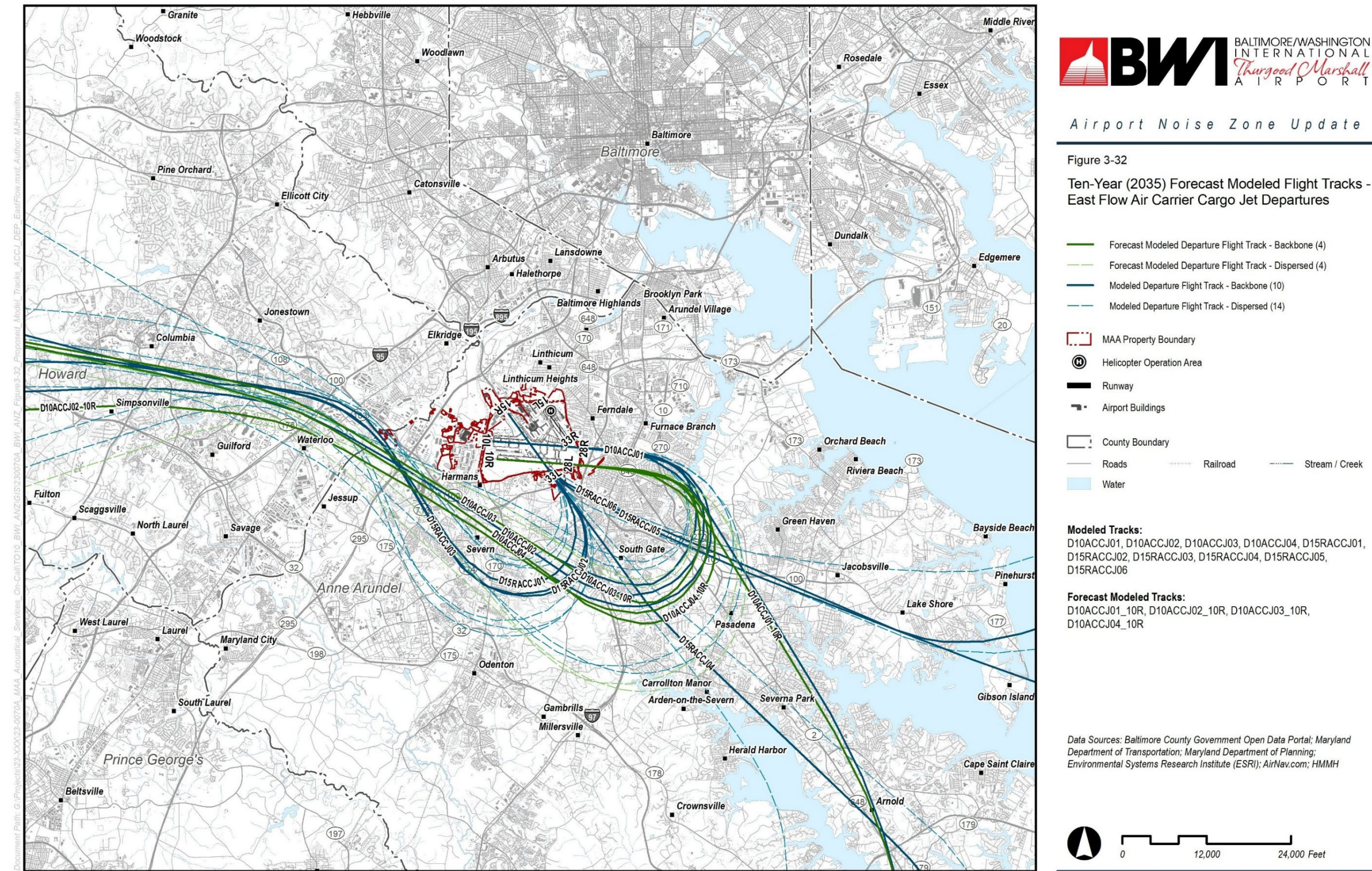


Figure 3-32. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Carrier Cargo Jet Departures

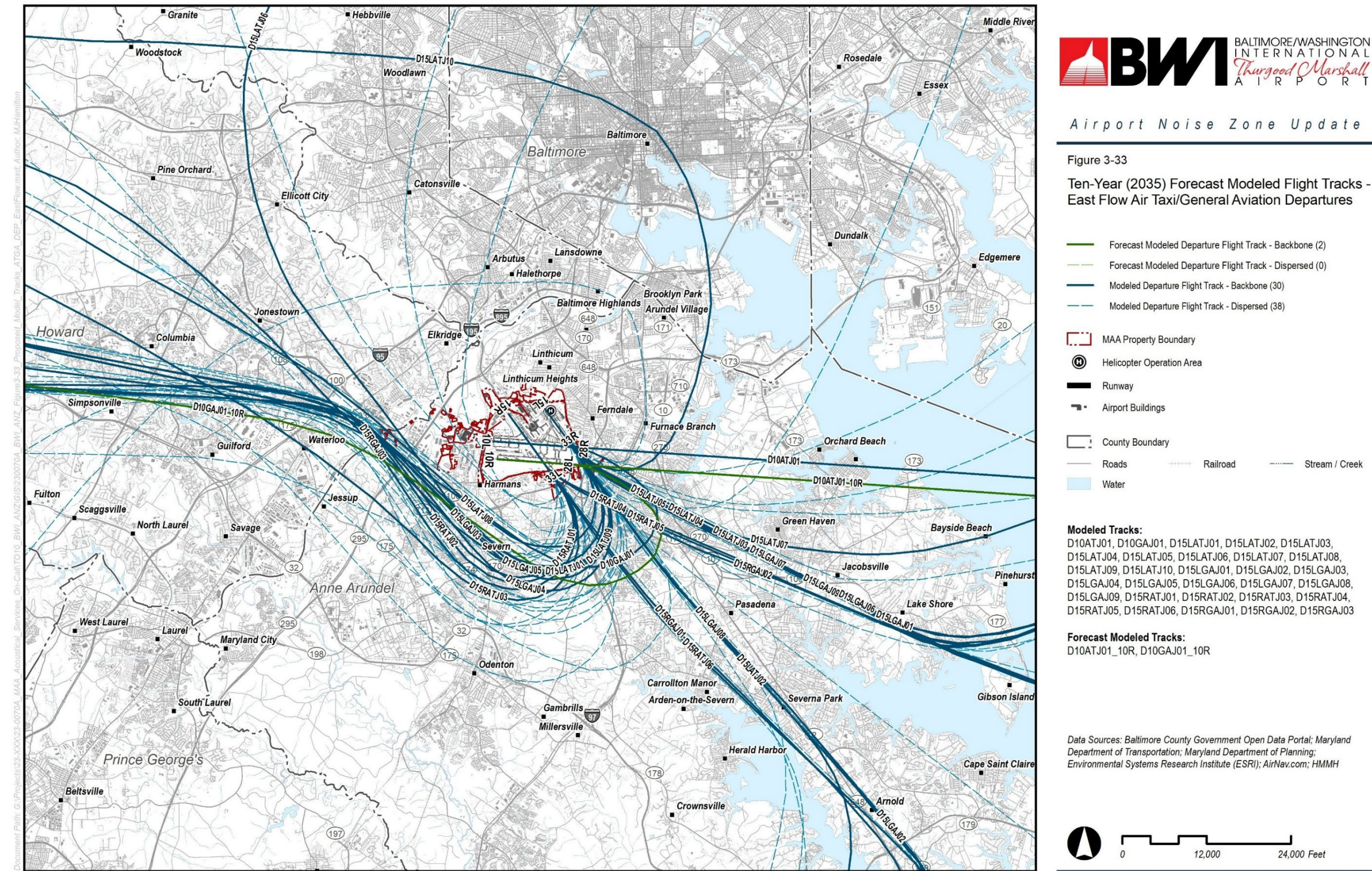


Figure 3-33. Ten-Year (2035) Modeled Flight Tracks – East Flow Air Taxi/General Aviation Jet Departures

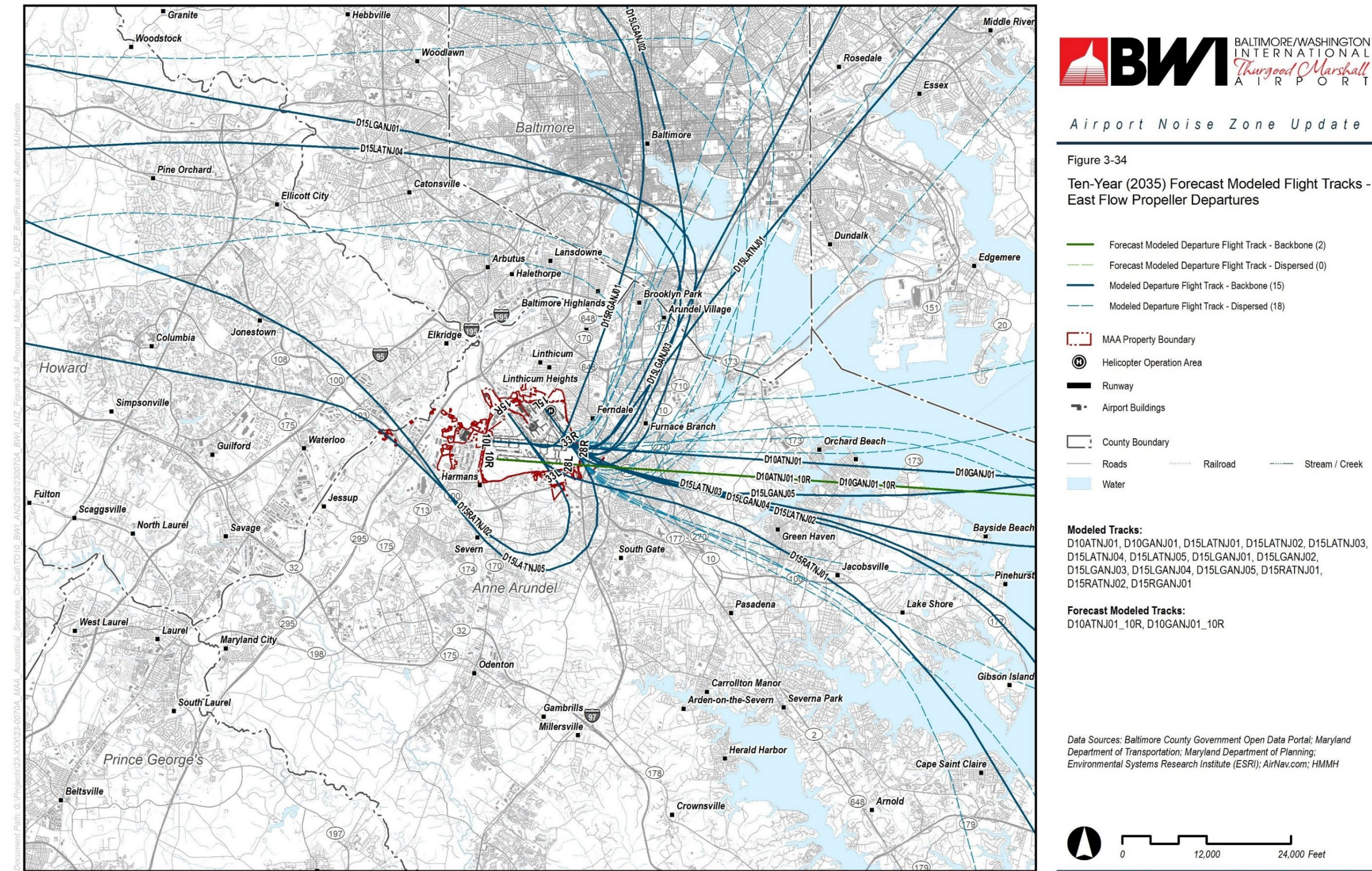


Figure 3-34. Ten-Year (2035) Modeled Flight Tracks – East Flow Propeller Departures

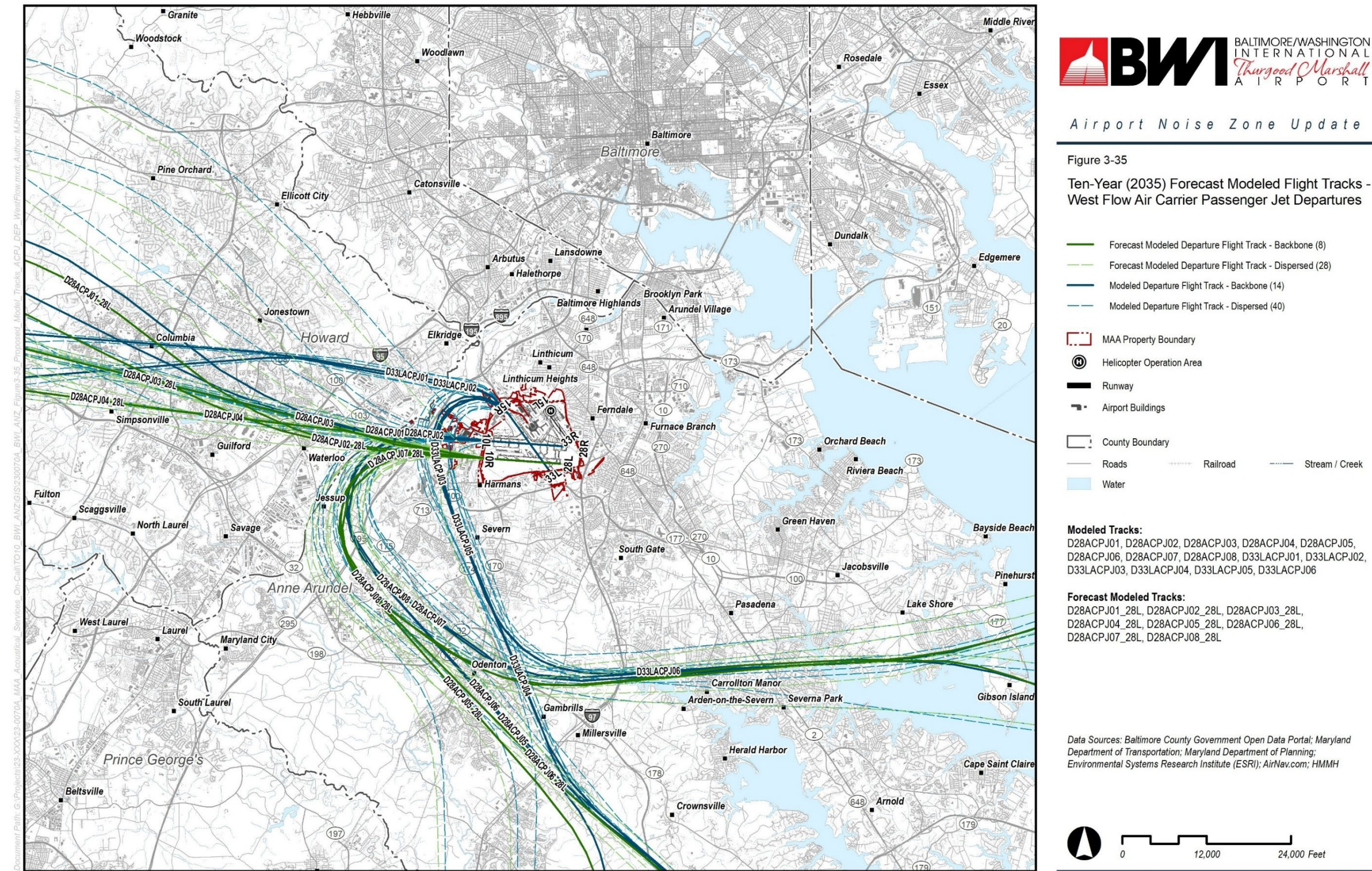


Figure 3-35. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Carrier Passenger Jet Departures

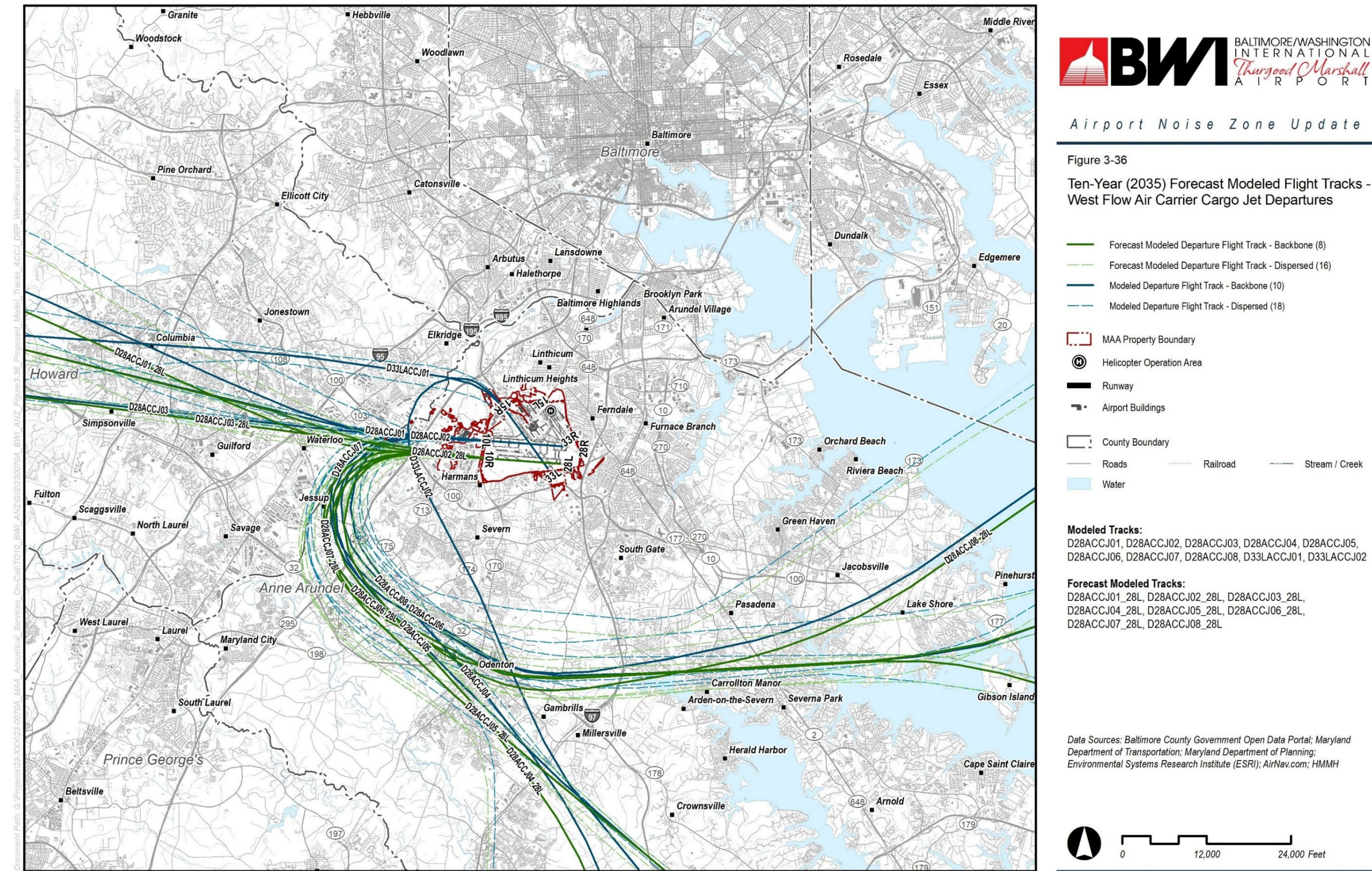


Figure 3-36. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Carrier Cargo Jet Departures

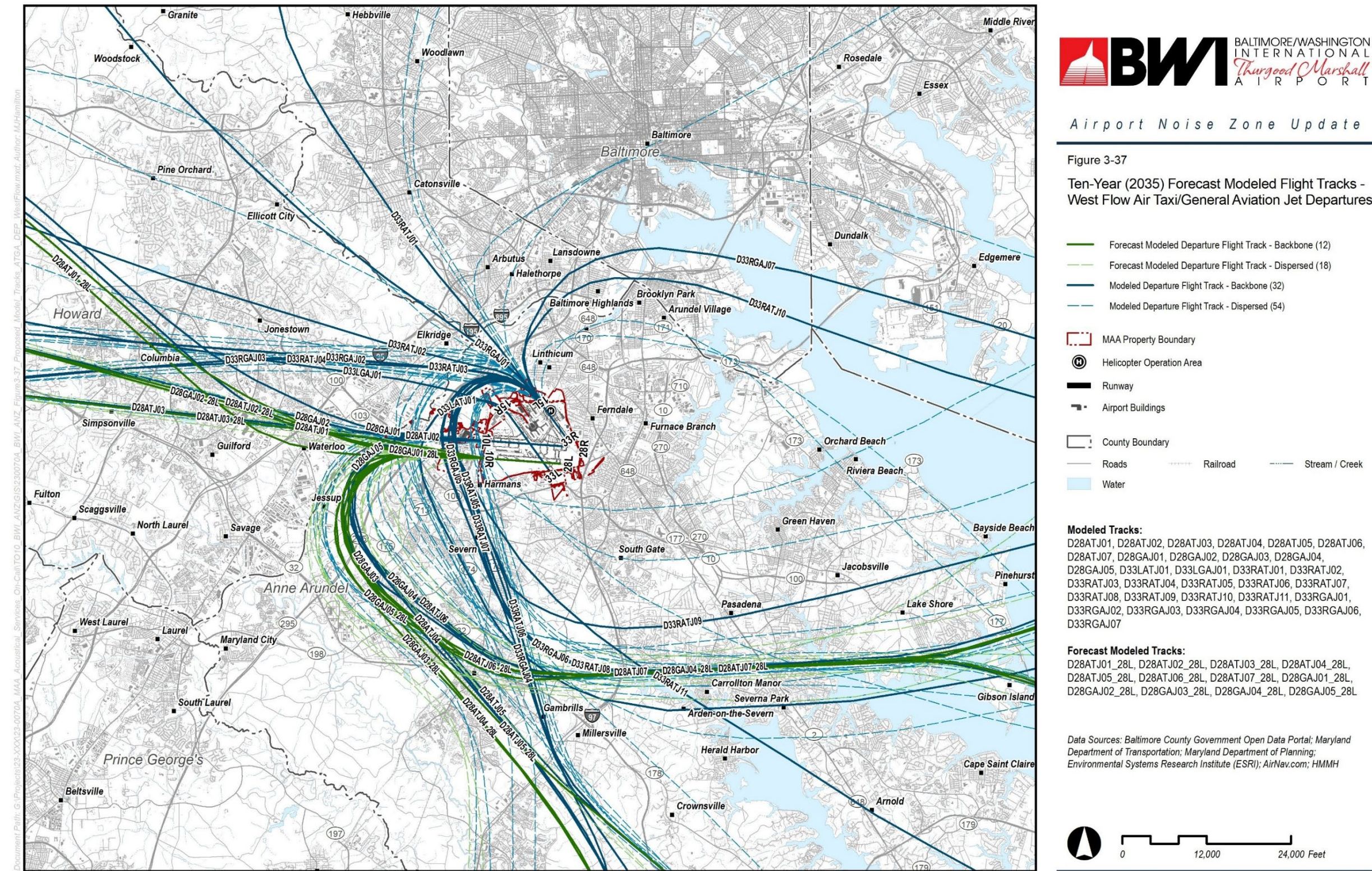


Figure 3-37. Ten-Year (2035) Modeled Flight Tracks – West Flow Air Taxi/General Aviation Jet Departures

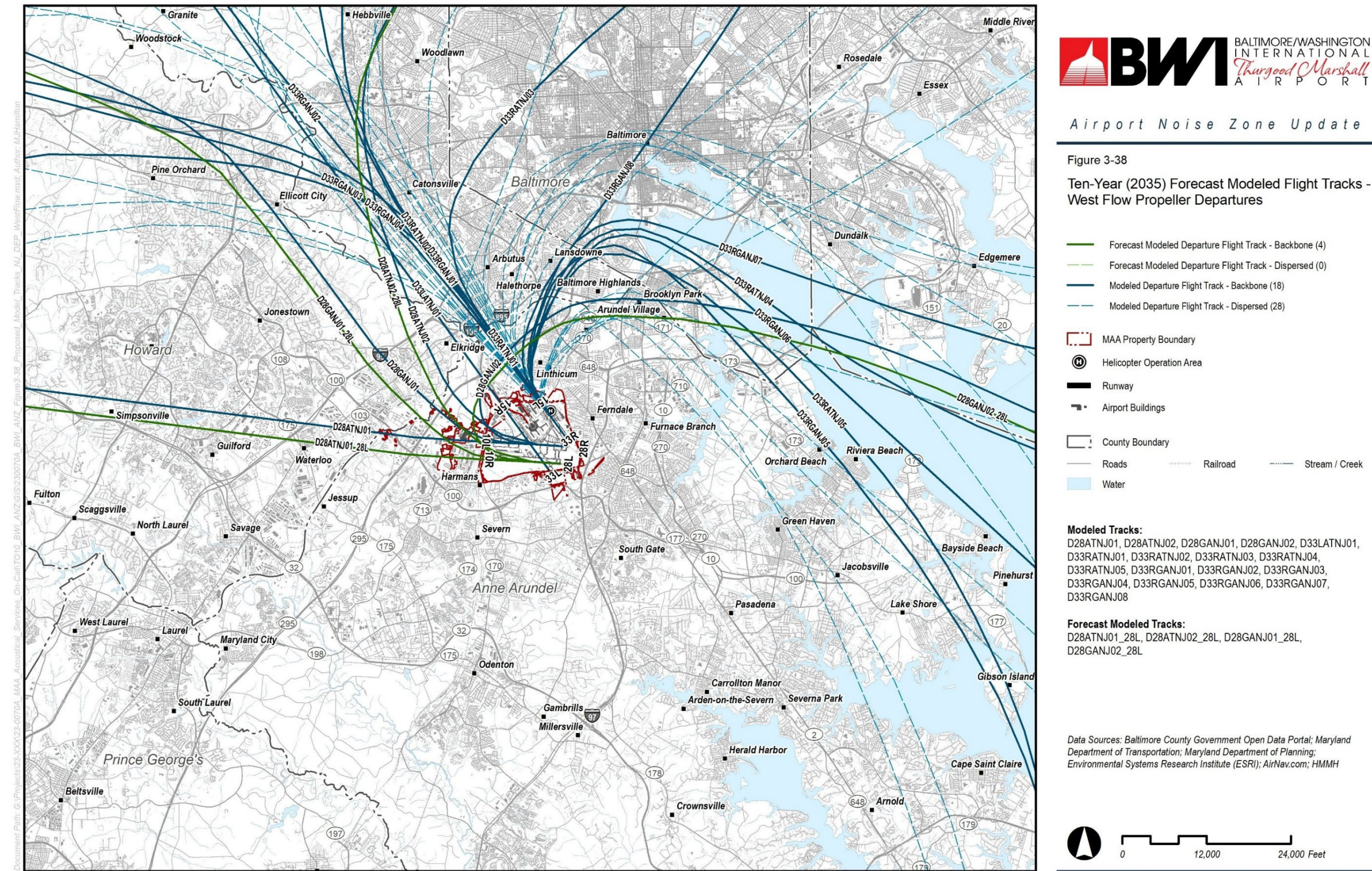


Figure 3-38. Ten-Year (2035) Modeled Flight Tracks – West Flow Propeller Departures

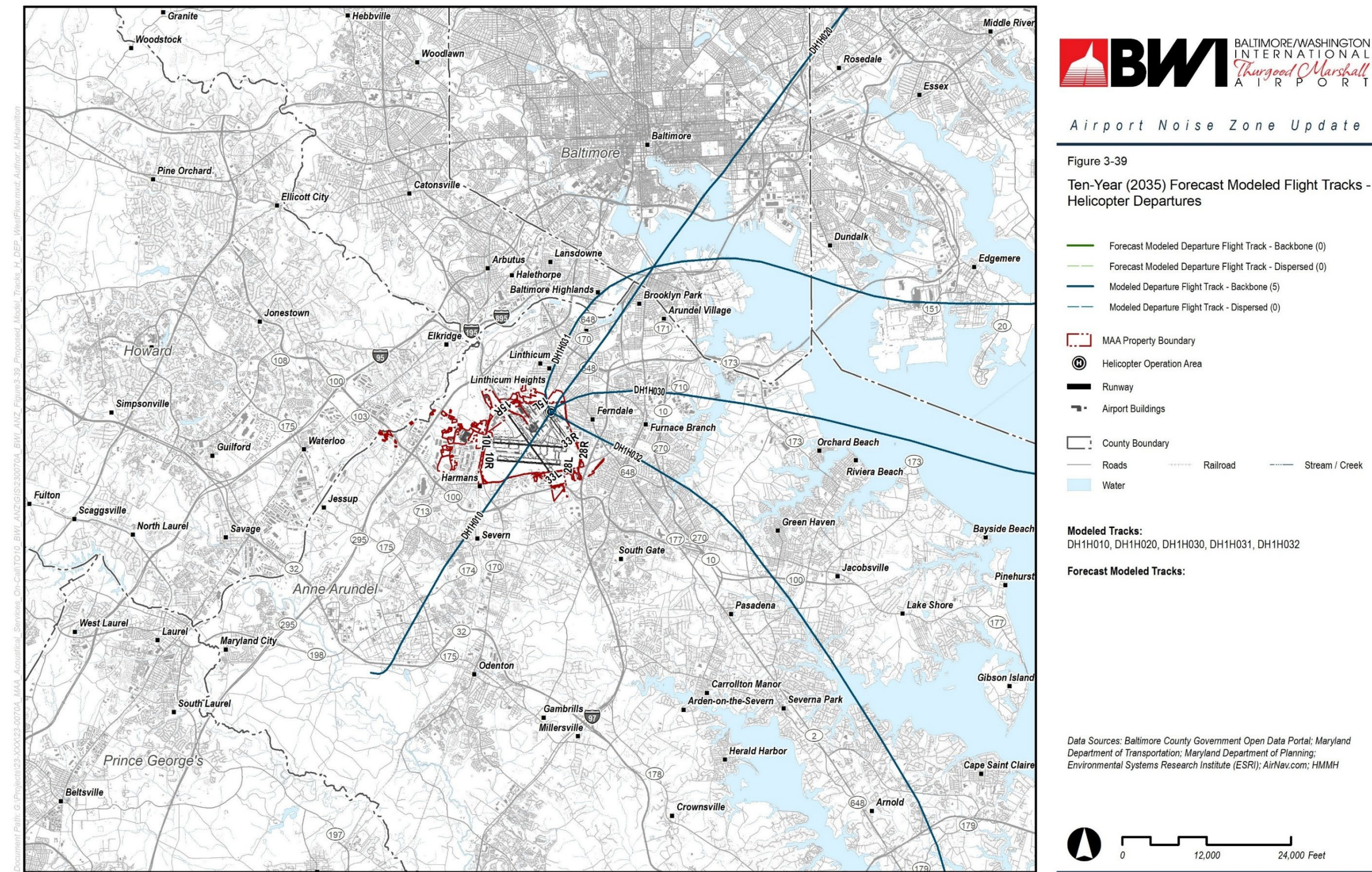


Figure 3-39. Ten-Year (2035) Modeled Flight Tracks – Helicopter Departures

3.6 Meteorological Conditions

AEDT has several settings that affect aircraft performance profiles and sound propagation based on meteorological data. Meteorological settings include average annual temperature, barometric pressure, and relative humidity at the airport. AEDT utilized the following values for annual average weather conditions at BWI Marshall, which are based on a 10-year average from 2014-2023:

- Temperature: 57.3° F
- Pressure: 1011.15 millibars
- Sea-level Pressure: 1017.38 millibars
- Relative Humidity 66.19%
- Dew Point: 46.1° F
- Wind Speed: 5.69 Knots

The AEDT annual average weather condition values detailed above were used in AEDT for generating the 2025 base year and 2030 and 2035 forecast noise contours for the BWI Marshall ANZ update.

3.7 Terrain Data

Terrain data describes the elevation of the ground surrounding the airport and on airport property. AEDT uses terrain data to set the ground level under the flight paths. The terrain data does not affect the aircraft's performance or noise levels, but it does affect the vertical distance between the aircraft and a noise "receiver" on the ground. This in turn affects noise propagation assumptions about how noise propagates over ground. The terrain data were obtained from the United States Geological Survey (USGS) National Map Data Download Application¹⁵ on May 8, 2025. Elevation Dataset with one-third arc second (approximately 33 feet) resolution was selected. Terrain data was utilized in conjunction with the terrain feature of AEDT to generate the base, five-year, and ten-year noise contours for the BWI Marshall ANZ update.

¹⁵ USGS, *National Map Data Download Application*, <https://www.usgs.gov/tools/download-data-maps-national-map>

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4. Study Results

This section describes the contours for each of the input years and for the 2025 ANZ and includes information on the people and area affected. Factors contributing to the differences in the individual contours and to the shape of the ANZ are also identified and discussed.

Land use data, which was used in the creation of the land use base map, was generated using multiple sources of data and graphics including aerial photography, airport layout and property boundaries, and identification of undeveloped land acquired by the MAA. Land use data was also obtained from Baltimore, Howard, and Anne Arundel counties, as well as the National Register of Historic Places (NRHP), and was validated during an inventory of the land use in the vicinity of the BWI Marshall contours in July 2025.

4.1 2025 Base Year Contours

Figure 4-1 presents the BWI Marshall 65, 70, and 75 dB DNL contours for the 2025 base year.

The 2025 base year 65 dB DNL contour reflects the following:

- The 65 dB DNL contour to the west of BWI Marshall extends approximately 2.6 miles west of the Runway 10 end. This contour lobe is primarily due to air carrier departures from Runway 28 and air carrier arrivals onto Runway 10.
- The 65 dB DNL contour to the southeast of the airport extends approximately 2.6 miles southeast of the Runway 33L end. This contour lobe is primarily due to air carrier arrivals to Runway 33L and air carrier departures from Runway 15R.
- The use of Runway 15L/33R for arrivals and departures by air taxi and general aviation jets and propeller aircraft is represented as an extended lobe to the northwest of the runway.
- The bulges in the contours off the Runway 15R end and Runway 28 end are generated by start-of-takeoff-roll noise.

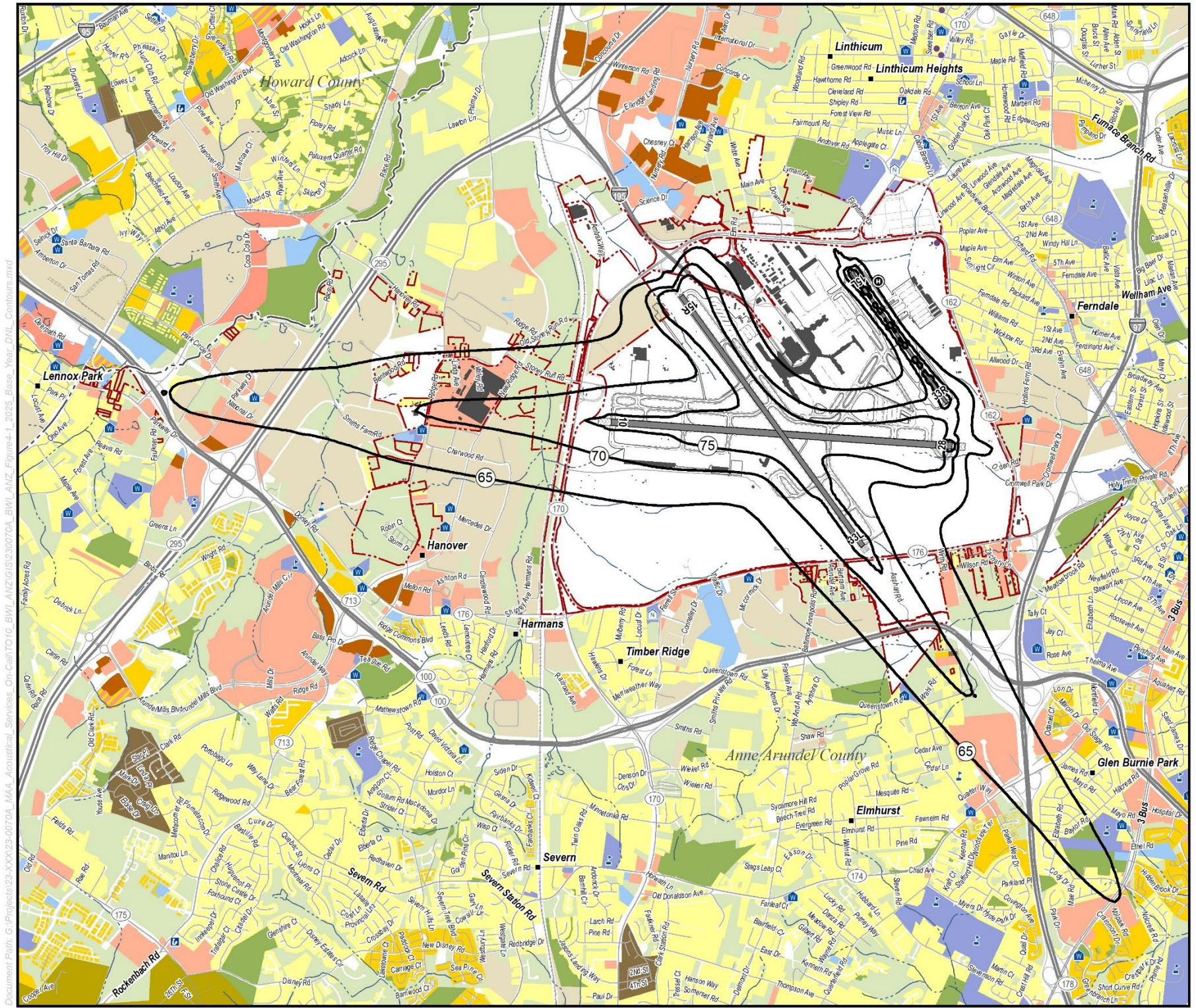
The 2025 base year contour exposes approximately 3,178 acres, 2,056 (64.7 percent) of which are on airport property, and, based on the 2020 US Census, an estimated 1,035 people and 361 estimated households to noise levels 65 dB DNL or greater as presented in Table 4-1.

Table 4-1. Households, Population, and Acreage within the 2025 Base Year Contour

DNL Contour Interval	Estimated Residential Population ¹	Estimated Residential Housing Units ¹	Area (acres)	On Airport (acres)	On Airport (%)	Off Airport (acres)	Off Airport (%)
65-70 dB	1,017	354	1,970	939	47.7%	1,031	52.3%
70-75 dB	18	7	770	681	88.4%	89	11.6%
>75 dB	0	0	438	436	99.5%	2	0.5%
Total	1,035	361	3,178	2,056	64.7%	1,122	35.3%

Sources: HMMH 2025, 2020 US Census

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Airport Noise Zone Update

Figure 4-1
2025 Base Year DNL Contours

- 2025 Base Year DNL Contours
- MAA Property Boundary
- Runup Locations
- Runway
- Airport Buildings
- Airport Pavement Edge
- Airport Pavement Shoulder
- County Boundary
- Roads
- Railroad
- Stream / Creek
- Residential Use
- Multi-Family Residential Use
- Mobile Home
- Transient Lodging
- Mixed Use
- Public Use (Non-Compatible)
- Public Use (Compatible)
- Water
- Military Use
- Commercial Use
- Manufacturing / Production
- Vacant / Undeveloped
- Recreational / Open Space
- Golf
- Transportation / Utility
- School
- Place of Worship
- Nursing / Assisted Living
- Library
- Hospital / Health Care
- Historic Place (NRHP)

Data Sources: Maryland Aviation Administration; Anne Arundel County Open Data Portal (<https://opendata.aacounty.org/>); Howard County MD (<https://data.howardcountymd.gov/>); Baltimore County Government Open Data Portal (<https://opendata.baltimorecountymd.gov/>); MDDOT (<https://data-maryland.opendata.arcgis.com/pages/mdot-data>); Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.



Figure 4-1. 2025 Base Year DNL Contours



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4.2 2030 Five-Year Forecast Contours

Figure 4-2 presents the 2030 five-year 65, 70, and 75 dB DNL contours at BWI Marshall.

The 2030 five-year forecast contours retain largely the same shape as the 2025 base year contours except for changes in two primary areas:

- Slight bulges in the 70-dB contour at the midfield cargo ramp, the southern end of Runway 15R/33L, and the eastern end of Runway 10/28 resulting from aircraft run-ups as described by ATI and estimated from MAA run-up records from 2020 through 2024.
- A 75-dB “island” within the 70-dB contour area and increases in the 70- and 65-dB contours west of the intersection of Runways 10/28 and 15R/33L due to aircraft run-ups that are expected to occur at the airline maintenance facility.

Though the 2030 five-year forecast contours retain the same overall shape as the 2025 base year, the 2030 contours are approximately 10 percent smaller in overall area than the 2025 base year due to the changes in fleet mix that are forecasted to occur during the 2030 five-year forecast period. Approximately 4 percent fewer households and 2 percent fewer people fall within the five-year contours compared to the base year contours.

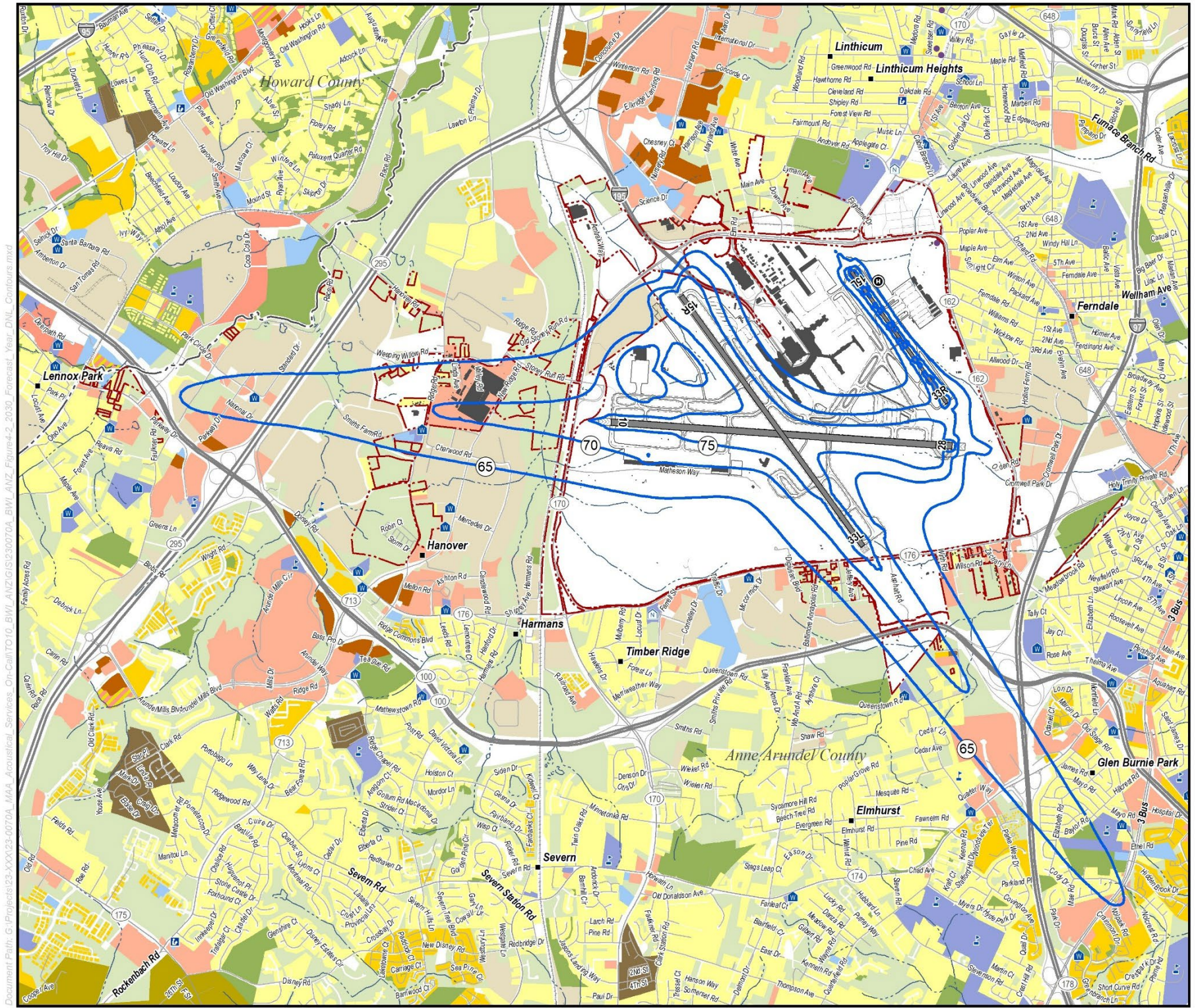
The 2030 five-year forecast contours expose approximately 2,866 acres, 1,904 (66.4 percent) of which are on airport property, and, based on the 2020 US Census, an estimated 1,011 people and 347 estimated households are exposed to noise levels greater than 65 dB DNL as presented in Table 4-2.

Table 4-2. Households, Population, and Acreage within 2030 Five-Year Forecast DNL Contours

DNL Contour Interval	Estimated Residential Population	Estimated Residential Housing Units	Area (acres)	On Airport (acres)	On Airport (%)	Off Airport (acres)	Off Airport (%)
65-70 dB	995	340	1,732	855	49.3%	878	50.7%
70-75 dB	16	7	702	618	88.1%	83	11.9%
>75 dB	0	0	432	431	99.8%	1	0.2%
Total	1,011	347	2,866	1,904	66.4%	962	33.6%

Sources: HMMH 2025; 2020 US Census

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Airport Noise Zone Update

Figure 4-2
2030 Five-Year Forecast DNL Contours

- 2030 Five-Year Forecast DNL Contours
- MAA Property Boundary
- Runup Locations
- Runway
- Airport Buildings
- Airport Pavement Edge
- Airport Pavement Shoulder
- County Boundary
- Roads
- Railroad
- Stream / Creek
- Residential Use
- Multi-Family Residential Use
- Mobile Home
- Transient Lodging
- Mixed Use
- Public Use (Non-Compatible)
- Public Use (Compatible)
- Water
- Military Use
- Commercial Use
- Manufacturing / Production
- Vacant / Undeveloped
- Recreational / Open Space
- Golf
- Transportation / Utility
- School
- Place of Worship
- Nursing / Assisted Living
- Library
- Hospital / Health Care
- Historic Place (NRHP)

Data Sources: Maryland Aviation Administration; Anne Arundel County Open Data Portal (<https://opendata.aacounty.org/>); Howard County MD (<https://data.howardcountymd.gov/>); Baltimore County Government Open Data Portal (<https://opendata.baltimorecountymd.gov/>); MDDOT (<https://data-maryland.opendata.arcgis.com/pages/mdot-data>); Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.

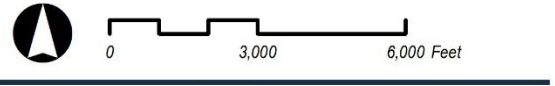


Figure 4-2. 2030 Five-Year Forecast DNL Contours

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4.3 2035 Ten-Year Forecast Contours

Figure 4-3 presents the 2035 ten-year 65, 70, and 75 dB DNL contours at BWI Marshall. The 2035 ten-year forecast contours expose approximately 3,101 acres, 2,122 (68.4 percent) of which are on airport property, and, based on the 2020 US Census, an estimated 1,616 people and 597 estimated households to noise levels greater than 65 dB DNL as presented in Table 4-3.

Table 4-3. Households, Population, and Acreage within 2035 Ten-Year Forecast DNL Contours

DNL Contour Interval	Estimated Residential Population	Estimated Residential Housing Units	Area (acres)	On Airport (acres)	On Airport (%)	Off Airport (acres)	Off Airport (%)
65-70 dB	1,598	589	1,854	963	51.9%	891	48.1%
70-75 dB	18	8	764	677	88.6%	87	11.4%
>75 dB	0	0	483	482	99.8%	1	0.2%
Total	1,616	597	3,101	2,122	68.4%	979	31.6%

Sources: HMMH 2025, 2020 US Census

Note: Inconsistencies in totals are due to rounding.

The 2035 ten-year forecast contours shift relative to the 2025 base year and 2030 five-year forecasts. The 2035 ten-year contours reflect anticipated changes in the future condition of the runway layout that are based on airport layout changes detailed in current BWI Marshall ALP. These changes include:

- The planned construction of parallel Runway 10R/28L, and
- The extension of the existing Runway 15R/33L from 9,501 feet to 10,501 feet, with the extension occurring on the southeast end of the runway.

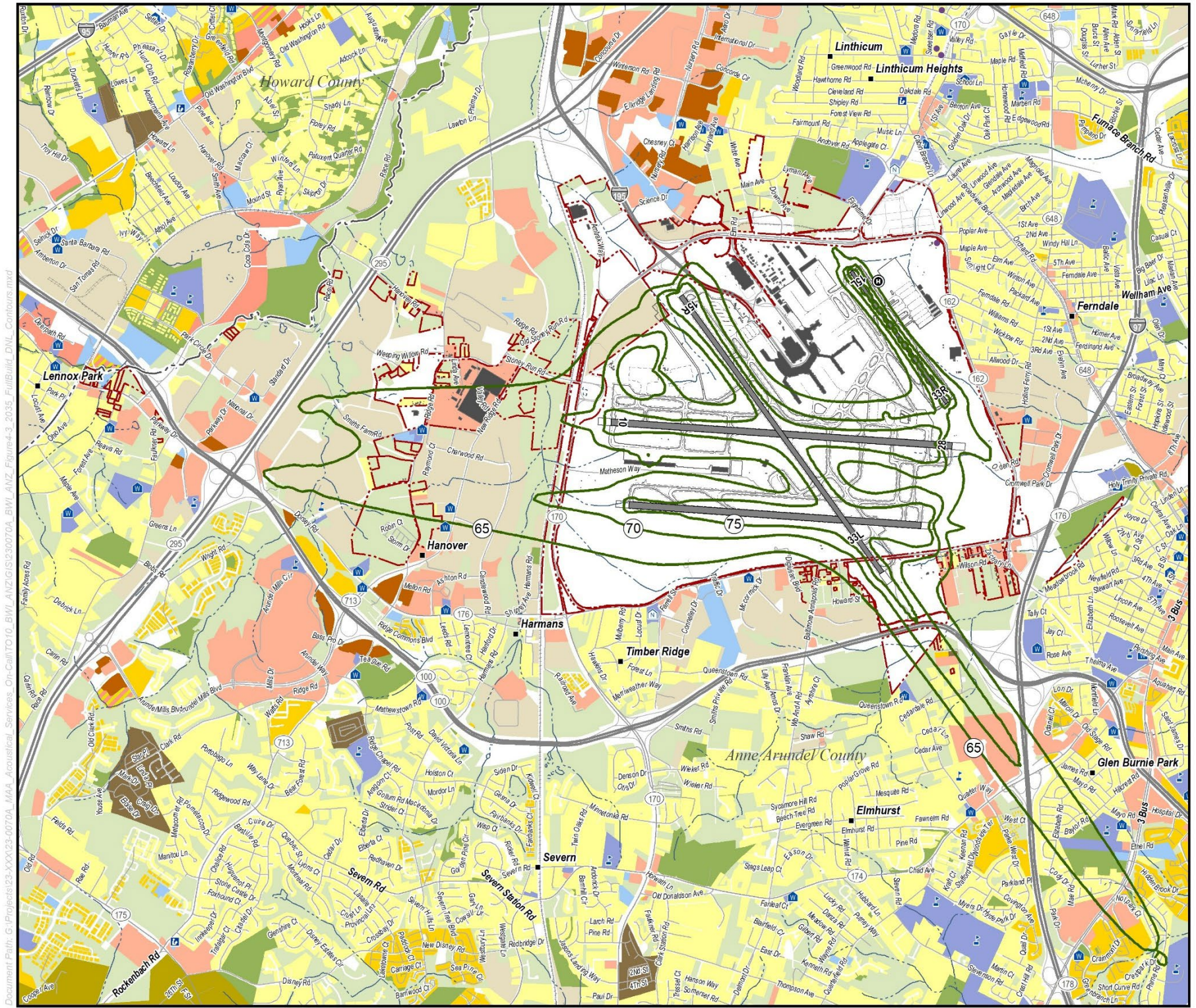
With the construction of parallel Runway 10R/28L, the 2035 ten-year forecast contours also reflect anticipated changes in the usage of the runways relative to the 2025 base year and 2030 five-year forecast. These changes in runway use include:

- Distributing operations between existing Runways 10/28 (future 10L/28R) and proposed parallel Runway 10R/28L.
- Shifting some daytime Air Carrier and Air Taxi departure operations associated with existing Runway 15R to utilize parallel Runways 10L and 10R.
- Shifting some nighttime Air Carrier and Air Taxi departure operations associated with existing Runway 15R to utilize parallel Runways 28L and 28R.
- Minor adjustments to the distribution of operations to the other runways based on anticipated changes in fleet mix for the 2035 ten-year forecast and aircraft performance requirements.

The 2035 ten-year forecast contours are approximately 2 percent smaller in overall area relative to the 2025 base year contours, primarily resulting from the changes in fleet mix during the 2035 ten-year forecast period. Specifically, the 2035 ten-year forecast contours differ from the 2025 base year forecast in the following primary areas:

- An extension of the contours south of Runway 15R/33L due to the planned runway extension and elimination of the displaced threshold.
- A narrowing of the contours around Runway 10/28 (future Runway 10L/28R) and Runway 15R/33L associated with the shift in operations to reflect the utilization of the future parallel Runways 10/28.
- New lobes to the south of Runway 10/28 (future Runway 10L/28R) associated with the planned construction of the parallel Runway 10R/28L.
- A reduction of the contours west of Runway 10/28 (future Runway 10L/28R) associated with the distribution of arrival and departure operations between the parallel runways.
- Slight bulges in the 70-dB contour at the midfield cargo ramp and the eastern end of Runway 10/28 resulting from aircraft run-ups as described by Air Transport International and estimated from MAA run-up records from 2020 through 2024.
- A 75-dB “island” within the 70-dB contour area and a protrusion in the 70- and 65-dB contours west of the intersection of Runways 10/28 (future Runway 10L/28R) and 15R/33L due to aircraft run-ups that are expected to occur at the airline maintenance facility.
- A slight extension of the 65-dB contours at the east ends of the parallel Runways 10/28 associated with the shift of operations resulting from the additional runway.

Relative to the 2030 five-year forecast contours, the 2035 ten-year forecast contours contain an approximate 8 percent increase in acreage, 60 percent increase in estimated population, and 72 percent increase in estimated households exposed to noise levels greater than 65 dB DNL.



Airport Noise Zone Update

Figure 4-3
 2035 Ten-Year Forecast DNL Contours

- 2035 Ten-Year Forecast DNL Contours
- MAA Property Boundary
- R Runup Locations
- H Helicopter Operation Area
- Runway
- Airport Buildings
- Airport Pavement Edge
- Airport Pavement Shoulder
- County Boundary
- Roads
- Railroad
- Stream / Creek
- Residential Use
- Multi-Family Residential Use
- Mobile Home
- Transient Lodging
- Mixed Use
- Public Use (Non-Compatible)
- Public Use (Compatible)
- Water
- Military Use
- Commercial Use
- Manufacturing / Production
- Vacant / Undeveloped
- Recreational / Open Space
- Golf
- Transportation / Utility
- School
- Library
- Place of Worship
- Hospital / Health Care
- Nursing / Assisted Living
- Historic Place (NRHP)

Data Sources: Maryland Aviation Administration; Anne Arundel County Open Data Portal (<https://opendata.aacounty.org/>); Howard County MD (<https://data.howardcountymd.gov/>); Baltimore County Government Open Data Portal (<https://opendata.baltimorecountymd.gov/>); MDDOT (<https://data-maryland.opendata.arcgis.com/pages/mdot-data>); Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.

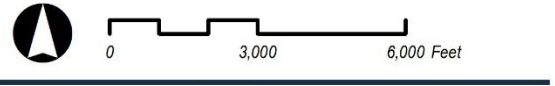


Figure 4-3. 2035 Ten-Year Forecast DNL Contours

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4.4 2025 ANZ Contours and Land Use Inventory

The 2025 BWI Marshall ANZ represents a composite of the 65, 70, and 75 dB DNL noise contours for three study years: the base year (2025) and two forecast years (2030 and 2035). The ANZ represents the outermost extent of the annual DNL contours for each of the three study years. As described in Section 1, the ANZ defines the largest area of the existing or future noise exposure contours for planning purposes.

The 2025 ANZ update process included an inventory of the latest land use within the ANZ DNL contour boundary as well as in the vicinity of BWI Marshall. Land use was evaluated using geographic information system (GIS) analysis. Maryland law considers all land uses compatible below 65 dB DNL.

Land use data was generated using multiple sources of data and graphics including aerial photography, airport layout and property boundaries, and identification of undeveloped land acquired by the MAA. Land use data was also obtained from Baltimore, Howard, and Anne Arundel counties and the NRHP and used in creation of the land use base map. The BWI Marshall 2025 ANZ contours were overlaid on the land use data within the study boundary to ensure accuracy. The total acreage within each noise contour interval was then calculated based on this information.

Figure 4-4 presents the 65, 70, and 75 decibel (dB) contours for the 2025 base year, 2030 five-year, and 2035 ten-year forecast DNL contours used to generate the 2025 ANZ.

The shape of the 2025 ANZ composite contours is driven by the 2025 base year contours and the 2035 ten-year contours. The resulting 2025 ANZ contours expose approximately 3,802 acres, an estimated 1,704 people based on the 2020 US Census, and 636 estimated households to noise levels greater than 65 dB DNL as presented in Table 4-4.

Table 4-4. Households, Population, and Acreage within the 2025 ANZ Contour

DNL Contour Interval	Estimated Residential Population	Estimated Residential Housing Units	Area (acres)	On Airport (acres)	On Airport (%)	Off Airport (acres)	Off Airport (%)
65-70 dB	1,685	628	2,152	875	40.7%	1,277	59.3%
70-75 dB	19	8	993	852	85.8%	140	14.2%
>75 dB	0	0	657	654	99.6%	2	0.4%
Total	1,704	636	3,802	2,381	62.6%	1,419	37.4%

Sources: HMMH 2025, 2020 US Census

Note: Inconsistencies in totals are due to rounding.

Figure 4-5 presents the 65, 70, and 75 dB DNL contours for the 2025 ANZ compared to the 2020 ANZ. The 2025 ANZ covers an overall smaller area than the 2020 ANZ. The 2025 ANZ encompasses a total of 3,802 acres exposed to noise levels greater than 65 dB DNL, a decrease of 31 percent compared to the size of the 2020 ANZ. The 2025 ANZ also contains an approximate 57 percent decrease in estimated population,¹⁶ and a 59 percent decrease in the number of estimated households exposed to noise levels greater than 65 dB DNL relative to the 2020 ANZ, as presented in Table 4-5.

¹⁶ The 2020 ANZ population and housing counts were based on the 2010 census, while the 2025 population and housing counts were based on the 2020 census.

On- and off-airport areas were not calculated for the 2020 ANZ; thus, no comparison against the 2025 ANZ contours is available.

Table 4-5. Households, Population, and Acreage within the 2025 ANZ Compared to the 2020 ANZ

	Estimated Residential Population	Estimated Residential Housing Units	Area (acres)
2025 ANZ	1,704	636	3,802
2020 ANZ	3,971	1,563	5,543
Difference	-2,267	-927	-1,742

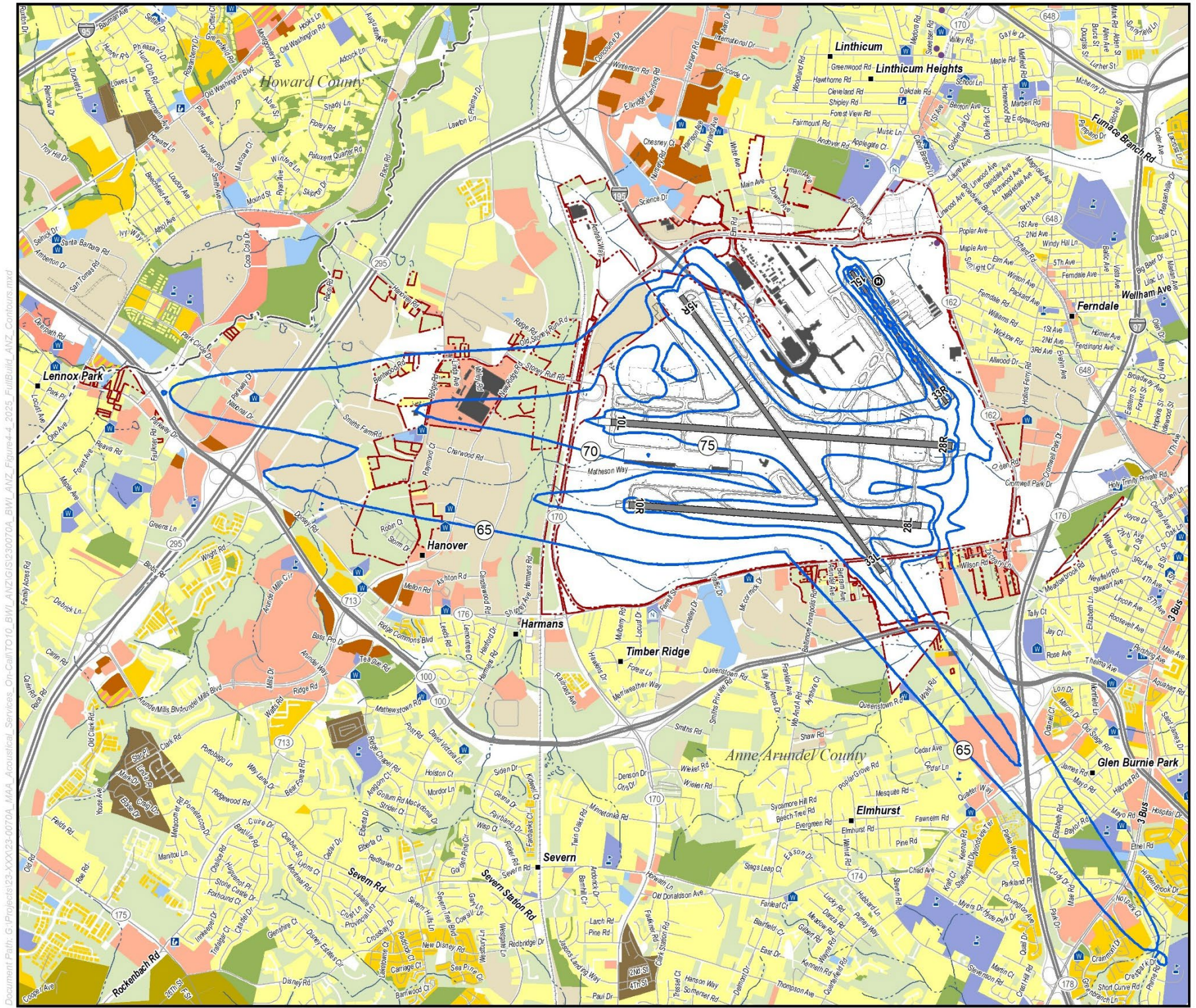
Sources: HMMH 2025; 2010 and 2020 US Census

As shown, the contours are similar in shape, but the 2025 ANZ covers a smaller area than the 2020 ANZ. The decrease in size, households, and population is due to a smaller number of operations relative to the 2020 ANZ, the implementation of new arrival and departure procedures in 2024, and changes to the fleet mix forecast for 2030 and 2035.

Some factors that help explain the differences between the 2020 and 2025 ANZ contours include:

- A reduced number of operations for the 2025 ANZ base year and the five- and ten-year forecasts compared to the 2020 ANZ and a forecasted shift in fleet mix towards quieter next generation aircraft types in 2030 and 2035, resulting in an overall decrease in contour area despite an overall increase in forecasted operations between 2025 and 2035.
- The implementation of new arrival and departure procedures in 2024. The FAA implemented new and updated arrival and departure procedures at BWI Marshall in July and September 2024 with new flight paths and altitudes, resulting in a reduction in the contour on the west side of the Runway 33L arrival lobe, north of Elmhurst and south of Route 100 and Runway 33L. This change is due to a southward shift in where Runway 33R departures begin the turn to the northwest.
- A change in the area of the contours northwest of the intersection of Runway 15R/33L and existing Runway 10/28 associated with a change in the numbers of aircraft maintenance run-ups due to the construction of the proposed airline maintenance facility, as well as the shift in fleet mix, compared to the 2020 ANZ.

Appendix B provides the 2025 ANZ contours overlaid on the county tax maps.



Airport Noise Zone Update

Figure 4-4
2025 ANZ Contours

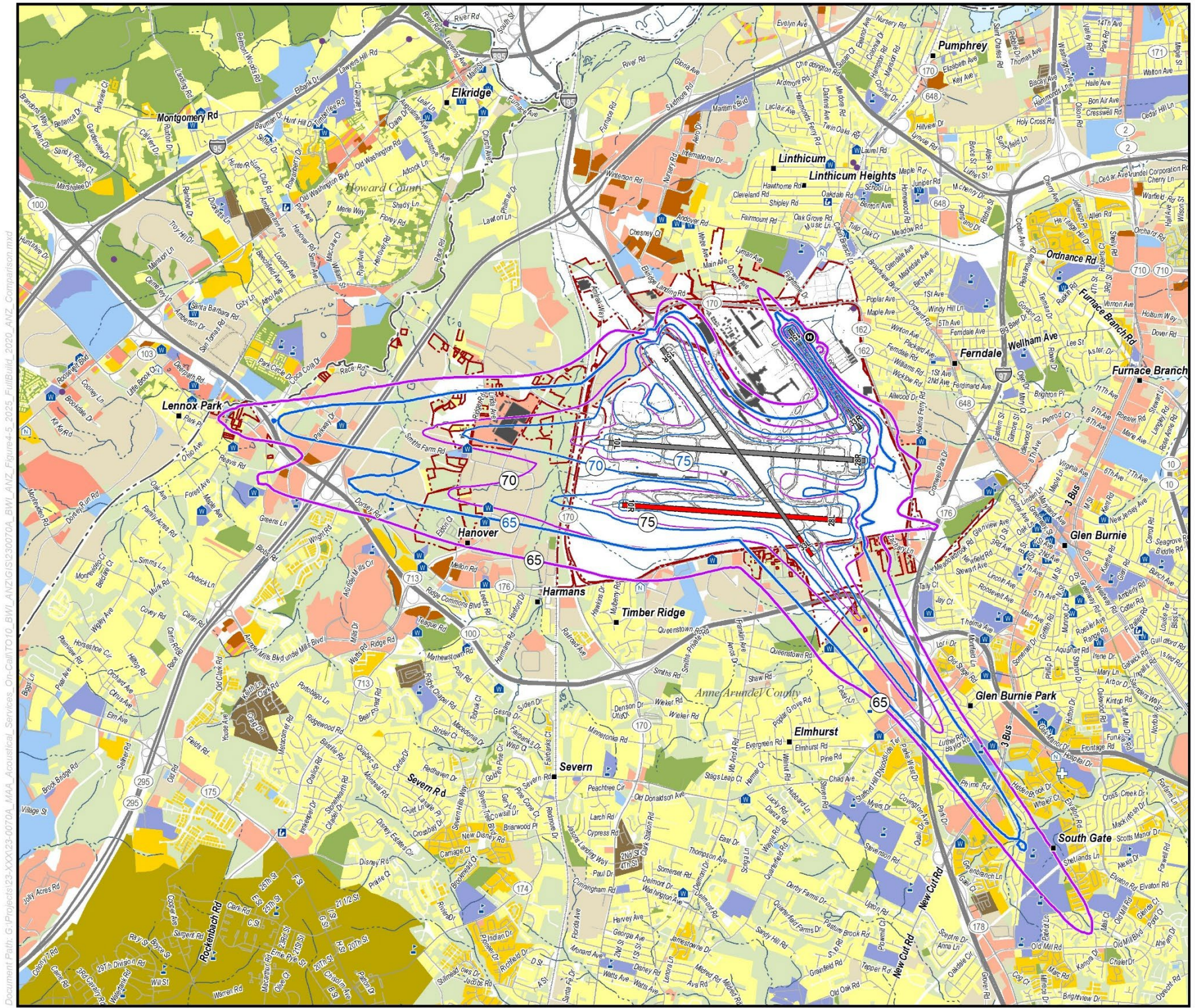
- 2025 ANZ Contours
- MAA Property Boundary
- Runup Locations
- Runway
- Airport Buildings
- Airport Pavement Edge
- County Boundary
- Roads
- Railroad
- Stream / Creek
- Residential Use
- Multi-Family Residential Use
- Mobile Home
- Transient Lodging
- Mixed Use
- Public Use (Non-Compatible)
- Public Use (Compatible)
- Water
- Military Use
- Commercial Use
- Manufacturing / Production
- Vacant / Undeveloped
- Recreational / Open Space
- Golf
- Transportation / Utility
- School
- Place of Worship
- Nursing / Assisted Living
- Library
- Hospital / Health Care
- Historic Place (NRHP)

Data Sources: Maryland Aviation Administration; Anne Arundel County Open Data Portal (<https://opendata.aacounty.org/>); Howard County MD (<https://data.howardcountymd.gov/>); Baltimore County Government Open Data Portal (<https://opendata.baltimorecountymd.gov/>); MDDOT (<https://data-maryland.opendata.arcgis.com/pages/mdot-data>); Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.



Figure 4-4. BWI Marshall 2025 ANZ Contours





Airport Noise Zone Update

Figure 4-5
2025 ANZ Compared to 2020 ANZ

- 2025 ANZ Contours
- 2020 ANZ Contours
- MAA Property Boundary
- Runup Locations
- Runway
- Airport Buildings
- Airport Pavement Edge
- County Boundary
- Roads
- Railroad
- Stream / Creek
- Residential Use
- Multi-Family Residential Use
- Mobile Home
- Transient Lodging
- Mixed Use
- Public Use (Non-Compatible)
- Public Use (Compatible)
- Water
- Military Use
- Commercial Use
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- Hospital / Health Care
- Historic Place (NRHP)

Data Sources: Maryland Aviation Administration; Anne Arundel County Open Data Portal (<https://opendata.aacounty.org/>); Howard County MD (<https://data.howardcountymd.gov/>); Baltimore County Government Open Data Portal (<https://opendata.baltimorecountymd.gov/>); MDDOT (<https://data-maryland.opendata.arcgis.com/pages/mdot-data>); Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.

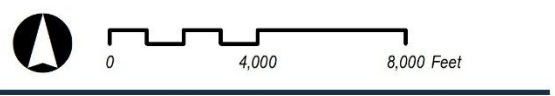


Figure 4-5. 2025 ANZ Compared to 2020 ANZ



5. Noise Measurements

BWI Marshall ANOMS includes 24 permanent noise monitoring terminals (NMTs), weather sensors, flight tracking, noise complaint handling, and system integration software. The monitoring system collects flight track data to provide the MAA with information on historical flight paths and facilitate aircraft identification. The system collects noise measurements, determines noise events, and matches events with flight track data. The BWI Marshall ANOMS provides information on single noise events and calculates cumulative noise exposure from aircraft operations in the vicinity of BWI Marshall. MAA staff utilize the operations data to respond to noise complaints. The system also has an interactive web portal, WebTrak, for use by community members to view information about the MAA's permanent noise monitors and to file noise complaints, among other features.¹⁷

All noise monitors are certified as Type 1 Sound Level Meters, which implies that the noise monitors accurately measure noise to within ± 1.5 dB.¹⁸ Table 5-1 presents historical measured aircraft DNL levels for third and fourth quarters of 2024 and the first and second quarters of 2025.

Table 5-1. Measured Aircraft DNL Levels for Quarters 3 and 4 of 2024, Quarters 1 and 2 of 2025 at NMTs

NMT # ¹	Location	Q3 2024 Aircraft DNL	Q4 2024 Aircraft DNL	Q1 2025 Aircraft DNL	Q2 2025 Aircraft DNL
1	St. Augustine Church, Elkridge	45	44	46	51
5	Hebron-Harman Elementary, Hanover	50	47	46	50
6	Delmont United Methodist, Severn	53	52	51	54
7	Wicklow Woods, Ferndale	52	55	56	55
8	Richard H. Lee Elementary School, Glen Burnie	50	48	47	50
9	Maryland National Guard Armory, Glen Burnie	56	57	59	56
10	Margate Pumping Station, Glen Burnie	49	49	51	47
11	Jones Rd., Queenstown	69	69	68	70
12	Rippling Woods Elementary, Glen Burnie	61	63	62	62
13	Woodside Elementary, Glen Burnie	52	48	48	52
14	Runway 15R Approach	63	60	62	68
17	Timber Ridge Rd., Hanover	40	37	39	39
18	Runway 15L Approach	56	58	56	57
21	Glen Burnie Park Elementary, Glen Burnie	61	61	60	62
22	Lark Brown Road, Columbia	56	56	54	55
23	Quarterfield Elementary, Severn	60	58	57	60
24	Poplar Grove HOA, Elmhurst, Severn	49	47	46	47

¹⁷ MAA, *Aircraft Noise – Webtrack*, <https://www.bwiairport.com/WebTrak>

¹⁸ Type 1 or Class 1 Sound Level Meters are designed to meet the requirements of the ANSI standards S1.4 and S1.43 and their equivalents of IEC 60651 and IEC 60804. The IEC 60651 and IEC 60804 have been superseded by IEC 61672-1:2002.

NMT # ¹	Location	Q3 2024 Aircraft DNL	Q4 2024 Aircraft DNL	Q1 2025 Aircraft DNL	Q2 2025 Aircraft DNL
25	Belclare Court, Jessup	52	54	52	53
26	Benfield Elementary, Severna Park	55	57	57	57
27	Severn Elementary School	48	43	51	48
28	Maryland School for the Deaf, Ellicott City	48	44	43	49
29	MDOT Motor Vehicle Administration, Columbia	52	52	49	49
30	Forest Ave, Hanover	64	64	62	63
31	Race Road, Hanover	61	62	60	60

Note:

¹ NMTs 2, 3, 4, 15, 16, 19, and 20 have been permanently decommissioned.

Source: MAA ANOMS 2024, 2025

Figure 5-1 shows the location of the existing NMT sites. Noise measurements are provided for informational purposes only. Noise measurements are not used to calibrate or verify the noise model.

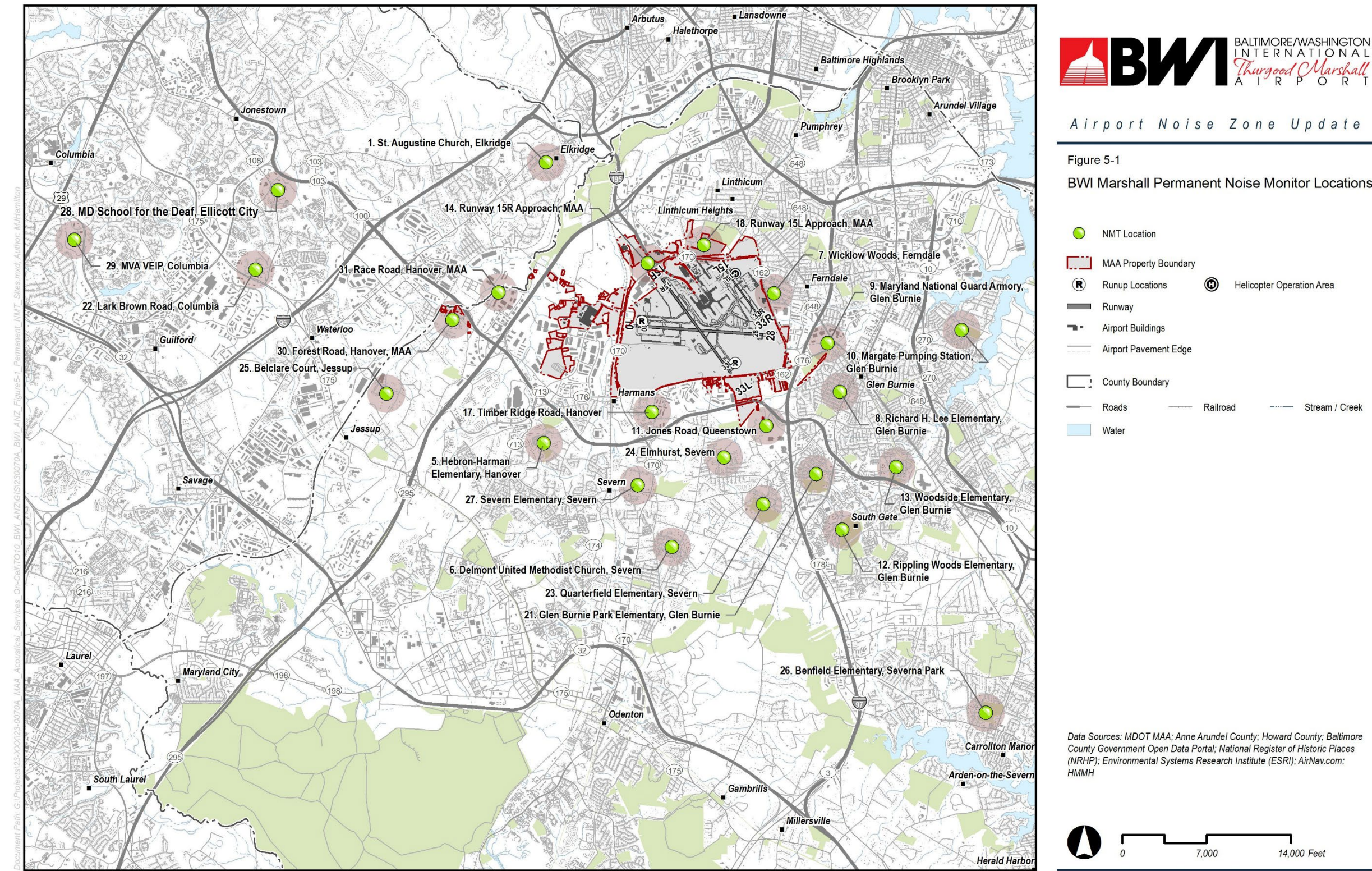


Figure 5-1. BWI Marshall Permanent Noise Monitor Locations

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Table 5-2 presents modeled annual data for the 2025 base year compared to the measured aircraft DNL levels for third and fourth quarters of 2024 and first and second quarters of 2025. Measured quarterly noise levels are unique to that three-month period and are not expected to result in an equivalent representation of the average of the events that would occur on an annual basis. The reasons for variations between measured and modeled values can include different percentages of aircraft flow (east or west) in each quarter when compared to the annual average. Additionally, noise monitors that average below the 65 dB DNL range are more easily influenced by community noise levels due to aircraft noise levels being relatively low.

It is critical to understand that measurements are historical and only document what has occurred; they are not predictive of future or expected noise levels. Modeled values are estimates generated by AEDT and reflect average annual daily operating conditions. Measured values may have non-aircraft noise source influence. The modeled base year DNL is representative of the modeled annual average day, not of any individual day or other measured time period.

Historical measured values and modeled results generally have good (within 3 dB) agreement with each other. NMTs that have historical measured levels close to 60 DNL and higher have the most similarity to the modeled levels. In general, modeled levels are higher than measured levels, indicating that the modeled noise levels provide a conservative estimate of actual noise.

Table 5-2. Measured Aircraft DNL Levels at NMTs Compared to 2025 Base Year Modeled DNL Levels at NMTs

NMT # ¹	Location	Q3 2024 Measured Aircraft DNL	Q4 2024 Measured Aircraft DNL	Q1 2025 Measured Aircraft DNL	Q2 2025 Measured Aircraft DNL	2025 Base Year Modeled Aircraft DNL
1	St. Augustine Church, Elkridge	45	44	46	51	49
5	Hebron-Harman Elementary, Hanover	50	47	46	50	53
6	Delmont United Methodist, Severn	53	52	51	54	54
7	Wicklow Woods, Ferndale	52	55	56	55	58
8	Richard H. Lee Elementary School, Glen Burnie	50	48	47	50	55
9	Maryland National Guard Armory, Glen Burnie	56	57	59	56	58
10	Margate Pumping Station, Glen Burnie	49	49	51	47	49
11	Jones Rd., Queenstown	69	69	68	70	70
12	Rippling Woods Elementary, Glen Burnie	61	63	62	62	64
13	Woodside Elementary, Glen Burnie	52	48	48	52	53
14	Runway 15R Approach	63	60	62	68	62
17	Timber Ridge Rd., Hanover	40	37	39	39	55
18	Runway 15L Approach	56	58	56	57	61
21	Glen Burnie Park Elementary, Glen Burnie	61	61	60	62	66
22	Lark Brown Road, Columbia	56	56	54	55	57
23	Quarterfield Elementary, Severn	60	58	57	60	59
24	Poplar Grove HOA, Elmhurst, Severn	49	47	46	47	56
25	Belclare Court, Jessup	52	54	52	53	55
26	Benfield Elementary, Severna Park	55	57	57	57	57
27	Severn Elementary School	48	43	51	48	52
28	Maryland School for the Deaf, Ellicott City	48	44	43	49	51

NMT # ¹	Location	Q3 2024 Measured Aircraft DNL	Q4 2024 Measured Aircraft DNL	Q1 2025 Measured Aircraft DNL	Q2 2025 Measured Aircraft DNL	2025 Base Year Modeled Aircraft DNL
29	MDOT Motor Vehicle Administration, Columbia	52	52	49	49	54
30	Forest Ave, Hanover	64	64	62	63	64
31	Race Road, Hanover	61	62	60	60	62

Sources: HMMH 2024, 2025; MAA ANOMS 2024, 2025

6. Noise Abatement Plan

Maryland state regulations regarding the ANZ process indicate that if an impacted land use area exists within a noise zone, the airport operator shall develop a noise abatement plan (NAP) to reduce the size of or eliminate the impacted land use area by altering the coverage of the noise zone through the application of the best available technology, at a reasonable cost, and without impairing safety of flight.¹⁹

In 1976, BWI Marshall adopted the first NAP, which was designed to minimize the noise of aircraft operations within the constraints of the Federal Air Traffic Control System and aircraft safety. The NAP was developed with the cooperation of airport users, the aviation industry, and local governments and is updated periodically. The NAP was reviewed and updated as part of the 2025 BWI Marshall ANZ update process to accurately reflect current operating conditions at BWI Marshall.

The NAP, which is developed by the MAA, includes the federal Noise Compatibility Program (NCP) voluntarily prepared by the MAA under Title 14 of the Code of Federal Regulations Part 150 (14 CFR Part 150, or Part 150) in 2006. The MAA submitted the NCP update to the FAA in August 2007, and the FAA provided a Record of Approval for the NCP on February 26, 2008. The 2007 NCP changes, as they affected the NAP, were discussed in the 2007 ANZ and reviewed in the 2020 ANZ. To secure federal funding for noise mitigation programs and to gain federal approval to implement certain noise abatement procedures, U.S. airports must develop a noise compatibility program under Part 150. Part 150 has two components: the Noise Exposure Maps (NEMs) and the NCP. In many areas, the NAP and the NCP overlap, though there are some differences due to different state and federal requirements.

In this update, notable changes to the NAP include the removal of references to the Interstate Visual 33L procedure, the addition of references to run-up authorization at the midfield cargo ramp and the MAA's Annual Noise and Operations Report, and additional detail on noise assistance programs. Other changes include the addition of a description of the preferential runway use program and discussions of the need for the preferential runway use, land use, and control of ground-based noise programs.

The BWI Marshall NAP is organized in two sections, noise abatement elements and land use elements, as explained in the subsections below.

6.1 Noise Abatement Elements

Noise abatement at BWI Marshall includes a wide variety of strategies that are intended to reduce noise impacts for communities around the Airport. Operational procedures, such as arrival and departure flight procedures and a preferential runway use system, are voluntary and are intended to direct aircraft operations over less populated areas when possible. The FAA Air Traffic Control Tower at BWI Marshall and Potomac Consolidated Terminal Radar Approach Control (TRACON) have primary responsibility for implementation of flight procedures and the preferential runway use system. Although encouraged to do

¹⁹ Code of Maryland Regulations (COMAR) Title 11 Sections 03.03.04 and 03.01.12 and Sections 5-805, 5-806, and 5-819 of the Transportation Article, Annotated Code of Maryland.

so, aircraft may not follow noise abatement procedures if deemed necessary by air traffic control (ATC) or flight crews to maintain operational safety.

The MAA manages ground noise generated by aircraft to reduce and minimize noise sources from airfield ramps and from maintenance operations, especially at night when ambient noise levels are lower in nearby communities. Additionally, the MAA has an established noise monitoring program using fixed and portable monitors, an online noise complaint portal, web-based flight tracking system known as “WebTrak”, an email address, and a noise complaint hotline.

The following voluntary aircraft noise abatement procedures have been implemented by the MAA through the issuance of BWI Marshall Tenant Directives.²⁰

6.1.1 Aircraft Noise Abatement Departure Procedures

Unless otherwise instructed by air traffic control or deviation is necessary to maintain operational safety or comply with published departure flight procedures, aircraft are to follow the noise abatement departure procedures detailed below:

- a) Jet aircraft should commence departure turns for noise abatement utilizing specific distances based on either Distance Measuring Equipment (DME) from the BWI VHF Omni-directional Range Tactical Air Navigation (VORTAC), if equipped, or a distance from the departure end of the runway to reduce overflights over noise sensitive areas:
 - a. Runway 15R - Two (2) DME or 1.7 nmi from the departure end of the runway when turning left, and one (1) DME or 0.7 nmi from the departure end of the runway when turning right.
 - b. Runway 28 - Three (3) DME or 1.7 nmi from the departure end of the runway for all turns.
 - c. Runway 10 - Two (2) DME or 1.6 nmi from the departure end of the runway for all turns.
- b) Jet aircraft departures from Runway 33L will begin turns immediately upon becoming safely airborne, but not below 300 feet Above Ground Level (AGL) during Visual Flight Rules (VFR) conditions and not below 400 feet AGL during Instrument Flight Rules (IFR) conditions.
- c) All aircraft departing Runway 33R to the north or east will maintain runway heading until one (1) nmi from the departure end of the runway before turning.
- d) Multi-engine aircraft departing Runway 15L will maintain runway heading until 0.5 nmi from the departure end of the runway before turning.

The Aircraft Noise Abatement Departure Procedures are summarized in Table 6-1.

²⁰ <https://marylandaviation.com/tenants/bwi-tenant-directives/>

Table 6-1. Aircraft Noise Abatement Departure Procedures

Runway	Aircraft Type	Turn Direction	Distance	Notes
15R	Jet	Left	2 DME or 1.7 nmi from runway departure end	-
15R	Jet	Right	1 DME or 0.7 nmi from runway departure end	-
28	Jet	All	3 DME or 1.7 nmi from runway departure end	-
10	Jet	All	2 DME or 1.6 nmi from runway departure end	-
33L	Jet	ALL	Immediate Turns	VFR: Not below 300 feet AGL IFR: Not below 400 feet AGL
33R	All	North or East	Runway heading to 1 nmi from runway departure end	-
15L	Multi-Engine		Runway heading to 0.5 nmi from runway departure end	-

Definitions: AGL = Above Ground Level; DME = Distance Measuring Equipment; IFR = Instrument Flight Rules; nmi = nautical miles; VFR = Visual Flight Rules

6.1.2 Aircraft Noise Abatement Arrival Procedures

Unless instructed otherwise by air traffic control or if deviation is necessary to maintain operational safety or comply with published arrival flight procedures, aircraft are to follow the noise abatement arrival procedures detailed below:

- Jet aircraft conducting visual approaches will turn onto final approach a minimum of four (4) nmi from the approach end of the runway.
- All jet aircraft conducting visual approaches are expected to maintain 3,000 feet or above until 10 DME from the BWI VORTAC and, to the maximum extent possible, should remain at or above the Instrument Landing System (ILS) or Visual Approach Slope Indicator (VASI) for the landing runway, consistent with safe flight procedures.

6.1.3 Preferential Runway Use System

Preferential runways are designated runways used under specific conditions, such as during periods of low wind or when multiple runways are available, to minimize noise exposure to surrounding communities, enhance operational efficiency, or meet ATC requirements. By directing departures and arrivals over less populated areas, preferential runways help limit the number of people exposed to high noise levels. Since wind conditions usually dictate which runways are used, when winds are light, ATC can assign preferential runways to support noise abatement programs without compromising safety.

BWI Marshall's preferential runway use program is described below.

- West operations, which concentrate jet departures on Runway 28, are preferred for noise abatement.
- Runways 28 and 33L are the preferred runways for noise abatement between the hours of 2300 and 0500 local time. Traffic and weather permitting, aircraft should depart Runway 28 and arrive Runway 33L.

- c) Runway 33R should not be assigned to departing aircraft from 2300 to 0500 local time. During these hours, Runway 15L should not be assigned to arriving aircraft except for unusual weather conditions, emergencies or medical flights requiring its use.
- d) No touch-and-go and/or practice approaches are permitted on all runways by jet or turboprop aircraft between 2200 and 0700 local time unless approved by BWI Marshall Operations staff.
- e) Noise Rule for Runway 15L/33R: Certain aircraft types, based on 14 CFR Part 36 certified noise levels or international equivalent, are restricted from use of Runway 15L/33R, except for emergencies or medical flights.²¹ Prohibited aircraft are permitted and encouraged to use Runways 10/28 or 15R/33L.

6.1.4 Control of Ground-Based Noise Sources

Ground-based aircraft noise refers to noise generated while the aircraft is on the ground, as opposed to during takeoff, climb, or landing. It includes engine noise during idle and taxi, reverse thrust and aircraft braking, engine run-ups, and the use of Auxiliary Power Units (APUs) and other ground support equipment while parked.

BWI Marshall's measures to control ground-based noise are:

- a) **Power-back Restrictions:** Reverse thrust power-back operations are limited to military aircraft on remote parking spots and are approved on a case-by-case basis by Airport Operations consistent with Tenant Directive 203.1.²²
- b) **Engine Maintenance Run-up Restrictions:** Maintenance engine run-up reporting procedures, locations, durations and prohibitions are restricted as described in Tenant Directive 501.1:²³

Prior permission must be obtained from the BWI Marshall Airport Operations Center. Permission shall be denied unless it can be shown that failure to conduct the run-up will delay departure of a scheduled passenger flight. A summary of engine maintenance run-up restrictions is contained in Table 6-2.

Table 6-2. Engine Maintenance Run-Up Restrictions

Location	Heading (degrees)	Duration
RWY 33L Hold Block	140-160	60 seconds or less
Runway 28 De-Ice Pad	190-220	60 seconds or less
Midfield Cargo Facility ¹	235 or 105	60 seconds or less

Notes:

Exempted run-ups must not exceed a total of five (5) minutes duration in intervals of 60 seconds or less. Unless specifically exempted, run-ups are not authorized between 2300 and 0700.

¹ Midfield Cargo Facility use limited to Amazon contract carriers only.

²¹ Any aircraft producing a value of 87.0 Effective Perceived Noise Level in decibels that is determined by averaging the take-off and sideline 14 CFR Part 36 certification measurements, is prohibited from operating on Runway 15L/33R, except for emergencies or medical flights. These certification values may be found in FAA AC 36-1H (or latest revision), the airplane's flight manual, or other suitable sources of the aircraft's 14 CFR Part 36 noise level certification measurements. Prohibited aircraft are listed in BWI Marshall Tenant Directive 501.1.

²² <https://marylandaviation.com/wp-content/uploads/2020/07/TD-BWI-203.1.pdf>

²³ <https://marylandaviation.com/wp-content/uploads/2020/07/TD-BWI-501.1-BWI-Noise-Abatement-Plan-1.pdf>

6.1.5 Continued Noise Monitoring

The MAA Office of Environmental Compliance and Sustainability, Noise Section, uses the following methods to provide continuous monitoring of BWI Marshall operations and noise concerns.

6.1.5.1 Noise Concerns

The MAA maintains a telephone service to enable citizens to register noise-related complaints regarding BWI Marshall aircraft operations at any time 24 hours per day, 7 days a week. The telephone number is 410-859-7021. Complaints are investigated if appropriate, and the complainant is provided with any relevant information. Complaints may also be provided via email to maanoiseabatement@bwiairport.com and via a noise complaint form available at <https://complaint-us.emsbk.com/bwi6>.

Additionally, citizens can monitor BWI Marshall aircraft operations and register complaints utilizing the MAA's WebTrak system (<https://webtrak.emsbk.com/bwi3>). WebTrak provides an interactive portal to view aircraft in the vicinity of BWI Marshall and Martin State Airport and provides the opportunity to submit noise complaints directly to the MAA. WebTrak includes aircraft type, altitude, origin and destination airports, and flight identification. WebTrak users can geolocate a place of interest (home, work, etc.) and view either current (16-minute delayed) or historical aircraft overflights. Complaints are investigated if appropriate and the complainant is provided with any relevant information following the investigation. Note: WebTrak does not include data on military aircraft flights or operations due to reasons of national security.

6.1.5.2 Airport Noise and Operations Monitoring System

The MAA has 24 permanent Noise Monitoring Terminals (NMTs) located within the communities surrounding BWI Marshall. The NMTs provide near real-time data on aircraft and community noise levels and NMT data is accessible through the WebTrak system.

The MAA also offers a residential portable monitoring program to interested homeowners. Upon request of a homeowner, the MAA provides noise monitoring equipment to measure noise levels in selected areas on a temporary basis (typically for a two-week period). The collected measurements are used to develop a report providing aircraft noise levels for each day, the percentage of east/west operations, and general information about noise measurements and airport operations. Portable Noise Monitoring Reports and applications for residential portable noise monitoring can be found online at the MAA's Aviation Noise website: <https://marylandaviation.com/application-for-portable-noise-monitoring-form/>.

6.1.5.3 Quarterly Report

The MAA prepares and publishes noise-related data for each quarter of the year. The report includes quarterly noise levels recorded by BWI Marshall's permanent NMT sites, aircraft operations levels, flight tracks, compliance with noise abatement procedures, runway utilization, and information regarding the numbers and locations of noise complaints. The quarterly report also includes details on the MAA's public outreach activities that were completed during each quarter, as well as information on the BWI Marshall ANZ and online resources available to residents for filing aircraft noise complaints and tracking BWI Marshall aircraft operations. BWI Marshall Quarterly Reports can be found online at the MAA's Aviation Noise website: <https://marylandaviation.com/environmental/airport-noise/quarterly-noise-reports>.

6.1.5.4 Annual Report

Beginning in 2025, the MAA prepares and publishes noise-related data for the previous year. The report includes annual data for noise levels recorded by BWI Marshall's permanent NMT sites, aircraft operations levels, flight tracks, compliance with noise abatement procedures, runway utilization, and information regarding the numbers and locations of noise complaints. The report also includes annual noise contours and flight track information. The Annual Reports can be found online at the MAA's Aviation Noise website: <https://marylandaviation.com/environmental/airport-noise/quarterly-noise-reports>.

6.2 Land Use Elements

Land use planning is a critical component of effective noise abatement strategies. Reductions in long-term exposure to disruptive or harmful sound levels can be achieved by locating homes, schools, hospitals, and other noise-sensitive land uses away from high-noise zones. Informed land use decisions not only help protect public health and well-being but also support regulatory compliance and minimize future conflicts.

6.2.1 Control of Incompatible Development

The State of Maryland established land use control programs to provide noise mitigation to known incompatible development areas and to prevent future incompatible development around BWI Marshall. These land use elements include the establishment of an ANZ and the provision of Noise Assistance Programs.

6.2.1.1 Airport Noise Zone (ANZ)

Maryland law requires the protection of citizens from the impact of transportation-related noise. COMAR requires the MAA to control incompatible land development in areas where noise levels are 65 dB DNL or more. To accomplish this, the MAA is required to develop and certify an ANZ that controls incompatible land development around BWI Marshall.

The BWI Marshall ANZ is depicted by noise contours surrounding BWI Marshall. These lines connect points of equal noise exposure and represent 65 dB, 70 dB, and 75 dB DNL noise contours up to 10 years in the future. These contours represent the boundaries for determining incompatible activities or land uses under Maryland regulations.²⁴ The State uses the noise contours adopted in the BWI Marshall ANZ to limit new development that would be incompatible with the cumulative noise exposure level acceptable for an area.

6.2.1.2 Board of Airport Zoning Appeals (BAZA)

The State of Maryland regulates land use within the BWI Marshall ANZ. Any person seeking to construct or modify a structure or land use within the ANZ is required to obtain an airport zoning permit. An application can be obtained from the MAA Office of Planning.²⁵ The MAA is required by law to approve or deny zoning permits based on the location relative to the BWI Marshall ANZ and the compatibility standards listed in Table 6-3.

²⁴ The applicable regulations governing control of incompatible land use at BWI can be found in Sections 11.03.03, 11.03.05, and 11.03.06 of Title 11, Transportation, Code of Maryland Regulations.

²⁵ <https://www.marylandaviation.com/content/permitsandforms/constructionzoning/index.html>

Table 6-3. Noise Compatibility Standards

Land Use	Areas Of Noise Compatibility (Noise Levels)
Residences, schools, hospitals, libraries, churches, auditoriums, rest homes, nursing homes, concert halls.	Up to 65 DNL
Transient lodging, hotels, motels, sports arenas, outdoor spectator sports, playgrounds, neighborhood parks, noise sensitive manufacturing.	Up to 70 DNL
Golf courses, riding stables, water recreation, cemeteries, office buildings, retail and wholesale establishments, movie theaters, restaurants, industry, manufacturing, utilities, livestock farming, animal breeding.	Up to 75 DNL
Agriculture (except livestock), mining, fishing, aviation related uses.	All

Source: Code of Maryland Regulations, Title 11. Department of Transportation, Subtitle 03. Maryland Aviation Administration, Chapter 11.03.03. Airport Noise Control Program, Sec. 11.03.03.03. Limits for Cumulative Noise Exposure:
<https://dsd.maryland.gov/regulations/Pages/11.03.03.03.aspx>

For example, a person may wish to build a new housing development within the 65 dB DNL noise contour (i.e., within the ANZ). As the maximum limit for new residential land use is 65 dB DNL, the MAA would deny the permit application. In the event a permit application is denied by the MAA, the applicant may appeal to the Board of Airport Zoning Appeals (BAZA) for a variance. The BAZA was created in 1974 by the Maryland General Assembly and is composed of 10 citizen members appointed by the Governor. The BAZA may deny an appeal or grant a variance that would require the use of construction standards designed to reduce noise exposure to future occupants.

Under the current procedures, a house built within the ANZ would require a variance from BAZA. If the Board approves a variance, the applicant is typically required to meet the following conditions:

- Provide a report from an acoustical engineer demonstrating that the proposed construction will provide adequate sound insulation and achieve an interior noise level of 45 dB DNL.
- Agree to complete a post-construction noise test to demonstrate that the house meets the required interior noise level of 45 dB DNL.
- Agree not to apply for a Use and Occupancy Permit until BAZA approves the results of the post construction test.
- Agree to grant an avigation easement to the MAA that includes a provision relinquishing any right to receive remuneration or any other compensation or benefit under any program designed to allay, abate, or compensate for the effects of aircraft noise and emissions in connection with the operation of BWI Marshall.

Since the certification of the previous ANZ in April 2021, the BAZA has granted variances for five applications, including two single family homes and three public schools.

6.2.1.3 Noise Zone Notification in Real Estate Transactions

The MAA has undertaken efforts to help inform prospective homebuyers of a property's location within the BWI Marshall ANZ. An addendum form with required notices provided by the Anne Arundel County Association of Realtors includes language that provides notice that the subject property may be located within an ANZ and provides contact information for the MAA. The Howard County Notice and Disclosure

Addendum directs those that may be concerned about the existence of airports or heliports in the vicinity of the subject property to contact the Howard County Zoning Office.

6.2.2 Noise Assistance Programs

The MAA has established and administered noise assistance programs for residents and schools located in the BWI Marshall ANZ. These programs are intended to reduce the numbers of affected properties and the noise impacts for individuals, homes, and schools adversely affected by aircraft noise.

6.2.2.1 Voluntary Residential Property Acquisition Program

In 1985, the MAA instituted a program to voluntarily acquire residential properties with cumulative noise levels of 75 dB DNL and greater. The Voluntary Residential Property Acquisition program applies to eligible properties that have been zoned non-residential by local government. This program was expanded in 1988 to select properties that are exposed to cumulative noise levels of 70-75 dB DNL, provided the area has been zoned by local government to transition from residential to a noise compatible use; the MAA offers voluntary purchase and relocation to expedite transition to a compatible land use. Further expansion occurred in 2008 to include cumulative noise levels of 65 dB DNL as defined by the current FAA-accepted Part 150 NEM contour. Large residential properties where the owners have reasonable opportunities for non-residential resale without state or federal assistance are excluded from the program. Property owners who elect to participate are paid full market value for their property at its highest and best use and provided relocation assistance in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. This program is subject to other federal laws, regulations, and guidelines.

As of 2025, 211 properties have been voluntarily acquired.

6.2.2.2 Homeowners Assistance Program

In 1988, the MAA began the Homeowners Assistance Program to offer sound insulation or resale assurance to homeowners residing in communities that are exposed to cumulative noise of 70-75 dB DNL and who are not eligible for the Voluntary Residential Property Acquisition Program. This voluntary program includes a Residential Sound Insulation Program and a Resale Assurance Program. Eligibility is determined by the location of the home with respect to the FAA-accepted NEM prepared under the 14 CFR Part 150 program, as well as other determinations such as the existing noise level reduction of the home and funding availability. In 2008, this program was further expanded to cumulative noise levels of 65 dB DNL as defined by the current FAA-accepted Part 150 NEM contour.

Under the Homeowners Assistance Program, the MAA assists eligible homeowners by making modifications to their houses with a goal of reducing interior noise levels to an average of 45 dB DNL. The type and extent of the improvements depend upon the noise reduction capabilities of the existing structure.

Participation in the Homeowners Assistance Program is contingent upon the homeowner entering into a contract and granting the State an aviation easement per state law. The easement permits aircraft operations, noise and other effects of flight over and on a property and is binding upon future owners of the property. Participating properties are ineligible for participation in other assistance programs. This program is also subject to other federal laws, regulations, grant requirements and guidelines.

The Resale Assurance Program has been discontinued as of 2008.

7. Public Consultation

The ANZ update process included multiple public consultation efforts to ensure that BWI Marshall stakeholder input is reflected in the resulting ANZ contour and NAP documentation. This public involvement component included two major initiatives: (1) voluntarily forming and convening a Stakeholder Advisory Committee (SAC) and (2) conducting a public workshop and hearing.

7.1 Stakeholder Advisory Committee (SAC)

The SAC was formed to include representatives of community and industry stakeholder groups with an interest in airport activities to ensure they were kept informed of the 2025 BWI Marshall ANZ update process and methodology. Members of the SAC were invited to participate throughout the BWI Marshall ANZ update process by attending meetings and providing input on the process. SAC members were expected to share pertinent BWI Marshall ANZ update information with the groups or any interested citizens that they represent.

The SAC served in an advisory role to the MAA solely for purposes of the BWI Marshall ANZ update process. The SAC was composed of stakeholders representing all significant interests at BWI Marshall, including representatives from:

- Local government planning staff
- Community organizations
- DC Metroplex BWI Community Roundtable
- FAA Air Traffic Control Tower at BWI Marshall
- BWI Marshall tenants, including aircraft operators and airlines

The MAA encouraged SAC members to review study inputs, assumptions, analyses, and documentation. They were also encouraged to provide input, advice, and guidance related to the ANZ and NAP. SAC members were asked to review the land use inventory and planning considerations.

The SAC was convened three times to discuss major milestones in the ANZ update process. The first meeting of the BWI Marshall ANZ SAC was held on April 3, 2025 from 6 to 8 p.m. The meeting was held at the MAA offices located at 991 Corporate Boulevard, Linthicum, Maryland. During the first meeting, the MAA presented the purpose and objectives of the update process, roles and responsibilities of SAC members, and an overview of noise fundamentals and noise modeling inputs.

The second SAC meeting was held on June 25, 2025 from 6 to 8 p.m. at the same location. During the second meeting, the noise inputs were reviewed in detail and the existing NAP was reviewed and discussed. Prior to the second meeting, technical inputs to the noise model were shared with all SAC members for review.

The third SAC meeting was held on September 24, 2025, again at MAA offices. The presentation covered the results of the study, including a review of the contours and a summary of proposed updates to the BWI Marshall NAP, as well as an overview of the process to incorporate the ANZ update into COMAR.

All meeting materials, including the SAC committee roster, meeting invitations, sign-in sheets, meeting minutes, and presentations, are included in Appendix C.

7.2 Public Workshop and Hearing

As required by Maryland law, a public workshop and hearing concerning the 2025 BWI Marshall ANZ was held on March 19, 2026. The public workshop and hearing offered all interested people an opportunity to comment on proposed revisions to the BWI Marshall ANZ and NAP.

Two public workshops and hearings were held on March 19, 2026, from 3 p.m. to 5 p.m. and 6 p.m. to 8 p.m. at 991 Corporate Boulevard, Linthicum, Maryland. During the workshop, MAA and HMMH staff were available to discuss the BWI Marshall ANZ update process and outcomes, and public comments on the MAA's 2025 BWI Marshall ANZ and NAP were accepted during the hearing via a court reporter. Additional public comments were accepted via email or postal mail until April 20, 2026. Information concerning the public workshop and hearing is available at the MAA's Aviation Noise website:

<https://marylandaviation.com/environmental/airport-noise/bwi-marshall-airport-noise-zone>.

Public Hearing and Workshop Information			
Date: March 19, 2026	Time: 3:00 – 5:00 p.m. EST 6:00 – 8:00 p.m. EST	Location: 991 Corporate Boulevard Linthicum, MD	

The MAA considered all oral and written comments received during the public comment period. Notification in the Maryland Register formally adopted the 2025 ANZ and NAP. The MAA certified and submitted the adopted ANZ to the Baltimore County Land Record Officer for use in land use planning and development.

The public workshop materials are provided in Appendix E, including documentation of public notices, invitations, attendance information, and presentation materials. Appendix F contains documentation of and the MAA's response to public comments received during the public meetings and during the comment period.