2020 Airport Noise Zone Update

Martin State Airport

December 2020

MARYLAND DEPARTMENT OF TRANSPORTATION

MARYLAND AVIATION ADMINISTRATION

MARTIN STATE AIRPORT

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Executive Summary

Introduction

Martin State Airport (MTN) is owned by the State of Maryland and operated by the Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA). MTN is located in Middle River, Maryland.

Maryland law requires the protection of citizens from the impact of transportation related noise. MDOT MAA is required to adopt an Airport Noise Zone (ANZ) that minimizes the impact of aircraft noise on people living near MTN and prevents incompatible land development around the airport. MTN is also required to implement a Noise Abatement Plan (NAP) if an impacted land use area exists within the noise zone. Although there are no impacted land uses within the MTN noise zone, MTN has adopted a NAP in the past and will continue to do so.

Noise analysis required to complete the ANZ study results in a better understanding of current and future noise conditions at the airport for both MDOT MAA and MTN stakeholders, including communities surrounding MTN. The ANZ update intends to account for changes in total annual aircraft operations, aircraft types, and aircraft flight paths, which may result in changes in overall aircraft noise levels. Updating the ANZ involves studying airport noise and developing noise contours for both existing and future conditions at MTN necessary for local land use planning. The ANZ provides a means for MDOT MAA to identify, control, and prevent incompatible land development around the airport. The study also includes a review of the MTN NAP. The NAP prescribes measures to monitor and reduce or eliminate impacted land use areas to the extent feasible, while maintaining efficient airport operations.

Public Engagement

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

The SAC convened representatives of stakeholder groups affected by airport activities to ensure that these groups were informed of the 2020 MTN ANZ update process and methodology. Members of the SAC were invited to participate throughout the MTN ANZ update process by reviewing study inputs, assumptions, analyses, and documentation. They were also encouraged to provide input, advice, and guidance related to the NAP. They were invited to share pertinent MTN ANZ update information with the groups or any interested citizens that they represent.

The SAC convened twice during the ANZ update process. SAC members served in an advisory role to the MDOT MAA solely for purposes of the MTN ANZ update process. The SAC is composed of stakeholders representing all significant interests at MTN:

- Local government planning staff
- Community organizations
- MTN tenants and users
- Aviation trade associations

As required by Maryland law, a public workshop and hearing were held concerning the 2020 MTN ANZ on January 26, 2021. The public workshop and hearing afforded all interested persons with an opportunity to comment on proposed revisions to the MTN ANZ and NAP.

Airport Noise Zone

The ANZ is an area specified by noise level contours in terms of the Day-Night Average Sound Levels, abbreviated DNL or Ldn. The study process considered existing conditions (2019) and forecast conditions in 2025 and 2030.

This 2020 MTN ANZ document includes the DNL noise contours for the following three conditions:

- Base year 2019 conditions with the current runway layout;
- Five-year post certification, forecast 2025 conditions, with the updated runway layout as identified in the MTN Airport Layout Plan (ALP);
- Ten-year post certification, forecast 2030 conditions, with the updated runway layout as identified in the MTN ALP.

The ANZ, as shown in Figure ES-1 is a composite of the three contours described above. The 2020 ANZ represents the largest extent of the annual DNL contours for each of the three study years (2019, 2025 and 2030) and is defined to provide the largest area of the existing or future noise exposure contours for planning purposes. The noise contours are presented in five-decibel increments, from 65 dB to 75 dB.

The 65 dB DNL contour for the 2020 ANZ is 411 acres in size and remains almost entirely on airport property (approximately 96%). The noise contour extends beyond airport property in three areas:

- An area approximately nine acres in size on the north side of the airport off of the approach end of Runway 15 over compatible land uses including portions of the Amtrak railroad track and Eastern Boulevard due to military maintenance runups of A10 aircraft on the Maryland Air National Guard ramp area;
- An area approximately one acre in size on the northwest side of the airport along Wilson Point Road off of the approach end of Runway 15 due to the Baltimore City Police helipad location and the addition of a civilian aircraft runup location; and
- An area approximately seven acres in size on the south side of the airport over Frog Mortar Creek off of the approach end of Runway 33 due to fixed wing arrival operations and helicopter activity at the Maryland State Police Helipad.

The 2030 forecast year contour dominates the overall extent of the 2020 ANZ contour due to projected higher operations levels. The one exception to this is the area immediately off the departure end of Runway 33 where aircraft operations are projected to shift to the northwest due to the changes in the future configuration of the runway layout for Runway 15/33 that currently is dominated by the 2019 base year contour.

In conjunction with development of the 2020 ANZ DNL contour, land use within the contour boundary as well as land use in the vicinity surrounding MTN was analyzed. Maryland law considers all land uses compatible below 65 dB DNL. The 2020 ANZ represents a 4% increase from the 394 acres contained within the previous ANZ. This increase is attributed in part to increased operations and the future configuration of the runway layout for Runway 15/33, which may reconfigure each end of the existing runway for civilian aircraft. The 2020 ANZ does not include any noise-sensitive land uses (such as residential or educational), as shown in Figure ES-1.

Noise Abatement Plan

MDOT MAA has a long history of noise abatement at MTN. The NAP[1] is designed to minimize the noise of aircraft operations within the constraints of the Federal Air Traffic Control System and ensure aircraft safety. The NAP was developed with the cooperation of Maryland Air National Guard (MDANG), airport users, the aviation industry, and local governments. The NAP was reviewed and updated as part of the 2020 MTN ANZ update process in order to accurately reflect current operating conditions at MTN.

The NAP is formulated to minimize noise disturbance to neighboring communities while maintaining safe and efficient MTN Airport operations. The MDOT MAA Division of MTN Airport Operations is responsible for the overall administration of the MTN NAP.

Per COMAR Section 11.03.02.10C(3)(b), the Maryland Air National Guard, the Maryland State Police, and local law enforcement agencies are exempt from the provisions of this regulation when operational necessity dictates noncompliance, or in the event of a State or national emergency.

The NAP is comprised of two parts; (1) the efforts MDOT MAA is taking to mitigate noise in the areas surrounding MTN, and (2) aircraft operating procedures.

[1] The MTN 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

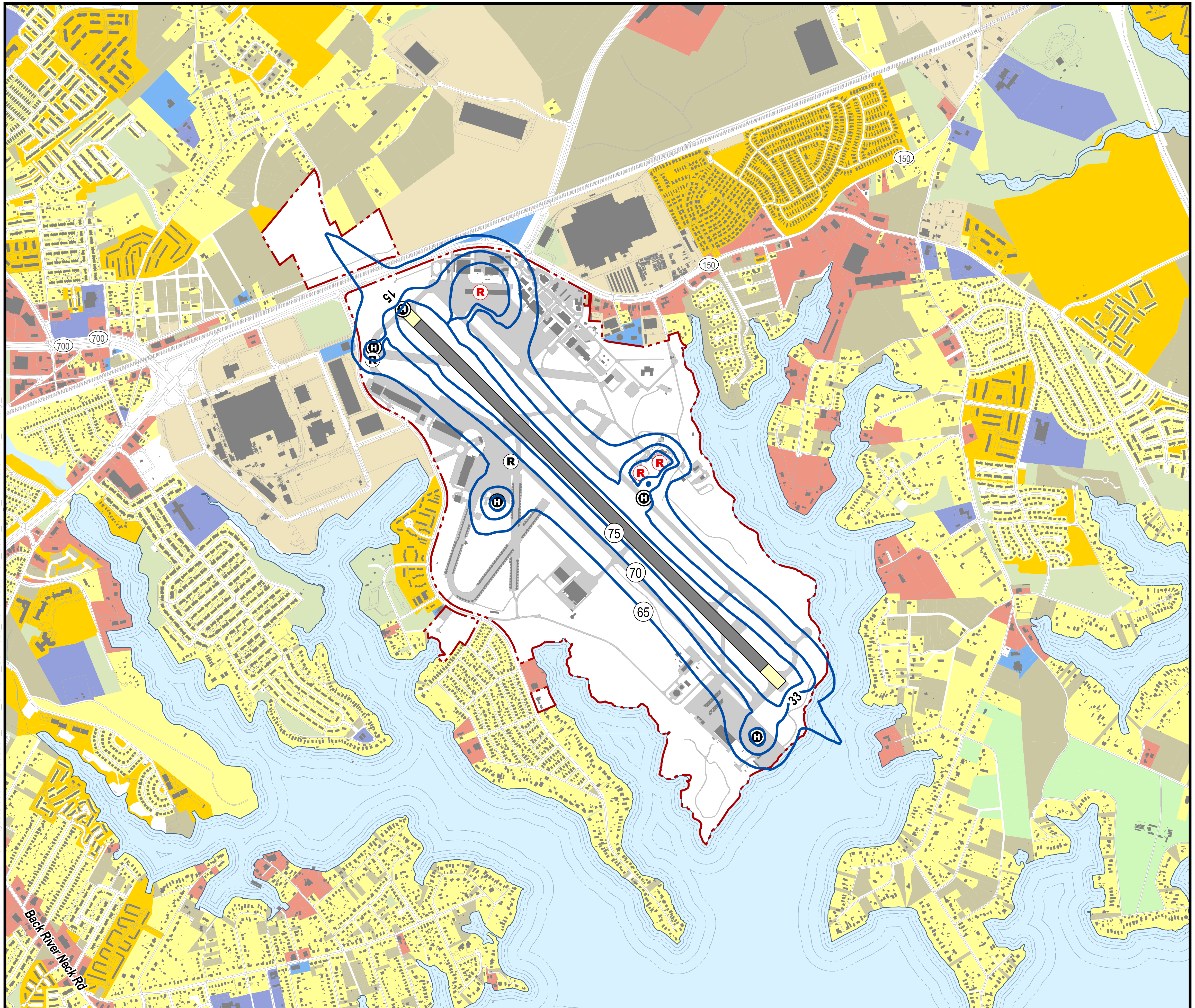

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Figure ES-1

MTN ANZ Update 2020 ANZ Contours

- 2020 Airport Noise Zone DNL Contours
- Airport Boundary
- Helicopter Operation Area
- Military Runup Location
- Civilian Runup Locations
- Civilian Runway (Future)
- Additional Runway Available for Military Operations
- Roads
- Railroad
- Stream / Creek
- Buildings
- Residential Use
- Recreational / Open Space
- Multi-Family Residential Use
- Commercial Use
- Mixed Use
- Manufacturing / Production
- Public Use (Non-Compatible)
- Vacant / Undeveloped
- Public Use (Compatible)
- Transportation / Utility
- Agriculture
- Water
- School
- Library
- Place of Worship
- Hospital / Health Care

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

0 1,500 3,000 Feet

Acronyms

AAD	Average Annual Day
AEDT	Aviation Environmental Design Tool
AFCEC	Air Force Civil Engineer Center
ALP	Airport Layout Plan
ANOMS	Airport Noise and Operations Monitoring System
ANZ	Airport Noise Zone
BAZA	Board of Airport Zoning Appeals
BRAC	Base Realignment and Closure Actions Act
COMAR	Code of Maryland Regulations
dB	Decibel
dBA	A-Weighted Decibel
DNL/Ldn	Day-Night Average Sound Level
FAA	Federal Aviation Administration
GA	General Aviation
HMMH	Harris Miller Miller & Hanson Inc.
HBPD	Baltimore City Police Helipad
HML	Military Helipad
HMU	Multi-Use Helipad
HPC	Practice Helipad
HSPD	Maryland State Police Helipad
IFR	Instrument flight rules
L_{eq}	Equivalent A-Weighted Sound Level
L_{max}	Maximum A-Weighted Sound Level
MDANG	Maryland Air National Guard
MDOT MAA	Maryland Department of Transportation Maryland Aviation Administration

MSL	Mean Sea Level
MTN	Martin State Airport
NAD 83	North American Datum 1983
NAP	Noise Abatement Plan
NCEI	National Centers for Environmental Information
Nm	Nautical Miles
NOAA	National Oceanic and Atmospheric Administration
OES	Office of Environmental Services
SAC	Stakeholder Advisory Committee
SEL	Sound Exposure Level
TA	Time Above
SEL	Sound Exposure Level
SPL	Sound Pressure Level
TAF	Terminal Area Forecast
TFMSC	Traffic Flow Management System Counts
USGS	United States Geological Survey
VFR	Visual flight rules

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Tables

1 Introduction and Background

Maryland law requires the protection of citizens from the impact of transportation related noise. MDOT MAA is required to adopt an ANZ that minimizes the impact of aircraft noise on people living near MTN and prevents incompatible land development around the airport. Noise analysis required to complete the ANZ study results in a better understanding of current and future noise conditions at the airport for both MDOT MAA and MTN stakeholders, including communities surrounding MTN. Specifically, the ANZ provides a means for MDOT MAA to identify, control, and prevent incompatible land development around the airport. The NAP prescribes measures to monitor and reduce or eliminate impacted land use areas to the extent feasible, while maintaining efficient airport operations.

The State of Maryland uses the Day-Night Average Sound Level, abbreviated DNL or Ldn[2], as the measure of cumulative noise exposure required to develop an ANZ. The ANZ, as defined by Maryland law, represents a composite of the 65, 70, and 75 DNL noise level contours for three study years: the base year, five-year, and ten-year forecast contours. The 2020 ANZ, as presented in this document, represents the largest extent of the annual DNL contours for all three years included in this study (2019, 2025, and 2030).

The resulting ANZ contour map designates the greatest extent of the existing and/or future noise exposure contours overprinted on county tax maps, to be utilized for land-use planning purposes. Maryland law requires MDOT MAA to regularly update the ANZ for MTN, in order to ensure it remains an accurate representation of noise conditions at the airport. The ANZ was last updated and certified in 2012. Once certified, the ANZ represents composite noise contours at specified levels of exposure intended to control incompatible land development around MTN. Maryland law dictates that an applicant be denied approval if the proposed land use development is found to be incompatible with the ANZ. An applicant may petition the Board of Airport Zoning Appeals (BAZA) for a variance from the regulations. BAZA may issue conditions such as the addition of sound insulation components to buildings within the certified ANZ.

Work on the 2020 MTN ANZ update began in 2019. MDOT MAA retained Harris Miller Miller & Hanson Inc. (HMMH) to support the Office of Environmental Services (OES) in preparing the 2020 MTN ANZ document. In coordination and collaboration with MDOT 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.

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 year and forecast years, and finally the composite 2020 MTN ANZ contour and land use inventory. The 2020 NAP is presented in Section 5.

[2] For the purposes of this document Day-Night Average Sound Level is referred to as DNL. DNL describes 24-hour exposure, noise from 10 pm to 7 am is considered nighttime, and is factored up by 10 dB, this “penalty” is equal to counting each nighttime event 10 times.

The ANZ update process includes multiple public consultation efforts to ensure that MTN stakeholder input is reflected in the resulting ANZ contour and NAP documentation. This public involvement component includes two major initiatives: voluntarily forming and convening a SAC; and conducting a public workshop and hearing. Section 6 discusses the public consultation process undertaken for the study. Assedo Consulting, LLC assisted with logistics and facilitation of the public participation program, as well as creation and maintenance of the Administrative Record.

The Appendices to this document provide supplemental information. Appendix A includes an overview of aircraft noise terminology. Appendix B includes the ANZ overlaid on Baltimore County tax maps. Appendix C includes the MTN SAC committee roster and materials from both the September 12, 2019 and January 14, 2020 SAC Meetings, including the invitations, sign-in sheets, meeting minutes, and presentations. Appendix D includes Maryland Aviation Commission materials. Appendix E includes information related to the public workshop and hearing, including the invitations, documentation of public notices, attendance information, presentation materials, and hearing transcript. Appendix F includes documentation of public comments.

2 Noise Modeling Methodology

The State of Maryland uses DNL as the measure of cumulative noise exposure required to develop an ANZ. The DNL metric describes the total noise exposure produced by aircraft operations during a 24-hour period. The aircraft operations used to calculate DNL are those of an average day during a particular year, in this case 2019. The DNL measurement includes a 10-decibel (dB) penalty for noise generated between 10:00 p.m. and 7:00 a.m. because studies have shown that human response to sound is intensified during nighttime hours. In other words, DNL accounts for noise exposure in a 24-hour period, with the exception that it treats each aircraft operation occurring in the nighttime (between 10 p.m. and 7 a.m.) as equivalent to ten operations during the daytime.

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 MTN ANZ is depicted by a series of lines (noise contours) surrounding the airport. These lines connect points of equal noise exposure and represent DNL 65 dB, 70 dB, and 75 dB noise contours. The ANZ contours represent the boundaries for determining incompatible activities or land uses with airport operations. The State uses the noise contours adopted in the ANZ to restrict new development that would be incompatible with the cumulative noise exposure level acceptable for an area. The noise compatibility or land use standards are shown in Table 1 below.

Table 1. State of Maryland Noise Compatibility Standards

Land Use	Area of Compatibility (Noise Levels)
Residences, schools, hospitals, libraries, churches, auditoriums, rest homes, nursing homes, concert halls	Up to DNL 65
Transient lodging, hotels, motels, sports arenas, outdoor spectator sports, playgrounds, neighborhood parks, noise sensitive manufacturing and communications	Up to DNL 70
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 DNL 75
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 law requires noise modeling as a prediction method to create ANZ noise contours.[3] As described above, noise modeling software creates computer-generated DNL estimates depicted as equal-exposure noise contours (much like 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, taking into account 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.

This 2020 MTN ANZ document presents DNL noise contours for the following three conditions:

- Base year 2019 conditions with the current runway layout;
- Five-year post-certification, forecast 2025 conditions, with the updated runway layout as identified in the MTN Airport Layout Plan (ALP); and
- Ten-year post-certification, forecast 2030 conditions, with the updated runway layout as identified in the MTN ALP.

[3] 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

3 Noise Model Inputs

The 2019, 2025, and 2030 DNL contours were developed using Federal Aviation Administration (FAA) Aviation Environmental Design Tool (AEDT) version 2d and HMMH's RealContours software for AEDT™ in a manner consistent with section 11.03.03 of COMAR.

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 vs. 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

This section describes AEDT inputs used in developing the base year and future year noise contours as organized in subsequent sections 3.1 through 3.7.

3.1 Physical Description of the Airport Layout

There is one runway at MTN, Runway 15/33. Figure 1 presents the existing MTN runway layout and notations for the airport property line, helicopter operational areas, as well as civilian and military aircraft run-up locations. Currently, civil aircraft are permitted to use 6,996 feet of the runway for arrival and departure operations; military aircraft use 8,100 feet or the full extent of the runway for all departures and for Runway 33 arrivals; Runway 15 military arrivals have a displaced landing threshold of 1,113 feet.

MTN has five helicopter operational areas at the airport, which serve corporate, law enforcement, and flight training organizations:

- The Baltimore City Police operate at the end of the abandoned runway adjacent to Runway 15.
- The Baltimore County Police and the majority of corporate helicopters operate from a multi-use helipad west of the midpoint of Runway 15.
- The Maryland State Police operate in an area south of the end of Runway 33.

- Transient military helicopters operate at the end of Runway 15 near the Maryland Air National Guard (MDANG) ramp.
- Flight training helicopters operate on the east side of the airport on the taxiway north of the midpoint of Runway 33.

MTN has five maintenance runup locations at the airport, which serve MTN based military and civilian aircraft maintenance operations:

- The MDANG conducts maintenance runups for A10 aircraft at:
  - The MDANG ramp near the end of Runway 15.
  - A trim pad and test cell located northeast of Runway 15/33.
- MTN based civilian operators conduct maintenance runups at:
  - The apron adjacent to the abandoned runway near the end of Runway 15.
  - The main apron area south of Runway 15/33.

Table 2 presents the latitude and longitude inputs and configurations for each runway, helicopter operational area, and runup location used for modeling in AEDT.

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Figure 1
Existing (2019) Runway Layout

- Helicopter Operation Area
- Military Runup Location
- Civilian Runup Locations
- Civilian Runway
- Additional Runway Available for Military Operations
- Airport Boundary
- Roads
- Railroad
- Stream / Creek

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

0 2,000 4,000 Feet

Table 2. Existing (2019) MTN Runway and Helipad Data

Runway	Latitude (deg)	Longitude (deg)	Length (feet)	Modeled Elevation (feet)	Displaced Landing Threshold (feet)	Approach Slope (degrees)	Threshold Crossing Height (feet)	Runway Width (feet)
Fixed-Wing Runways								
15	39.332447	-76.422450	6,996	21.3	0	4.0	37	180
33	39.318848	-76.405047	6,996	9.2	0	2.9	44	180
15 (Military)	39.334642	-76.425272	8,100	23.5	1,113	3.1	55	180
33 (Military)	39.318848	-76.405047	8,100	9.2	0	2.9	44	180
Helicopter Operations Areas								
Baltimore City Police (HBPD)	39.332839	-76.426898	N/A	21.0	N/A	N/A	N/A	N/A
Multi-Use Helipad (HMU)	39.326586	-76.420273	N/A	21.0	N/A	N/A	N/A	N/A
Maryland State Police (HSPD)	39.316714	-76.406410	N/A	21.0	N/A	N/A	N/A	N/A
Practice Pad (HPC)	39.326683	-76.412404	N/A	21.0	N/A	N/A	N/A	N/A
Military Helipad (HML)	39.334642	-76.425272	N/A	23.5	N/A	N/A	N/A	N/A
Runup Locations								
Ramp	39.335324	-76.421102	N/A	21.0	N/A	N/A	N/A	N/A
Trim Pad	39.327734	-76.412556	N/A	21.0	N/A	N/A	N/A	N/A
Test Cell	39.328166	-76.411542	N/A	21.0	N/A	N/A	N/A	N/A
Maintenance Runup 1	39.328256	-76.419532	N/A	21.0	N/A	N/A	N/A	N/A
Maintenance Runup 2	39.332839	-76.426898	N/A	21.0	N/A	N/A	N/A	N/A

Notes:
Latitude and Longitude coordinates reference to North American Datum 1983 (NAD 83)
Elevations referenced to Mean Sea Level (MSL)
Sources:
Runway coordinates: MDOT MAA, 2019
Helicopter Operations Areas: MTN staff and HMMH
Runup Areas: MTN staff, MDANG, HMMH, and MTN Operators

The five-year and ten-year forecast airport layout configurations include proposed improvements to the airfield as identified in the MTN ALP. The MTN ALP identifies Phase I improvements that include changes needed to meet FAA standards and to accommodate anticipated general aviation demand. In the MTN ALP, the Runway 15 end for civilian aircraft would be relocated approximately 291 feet from the existing runway end with a displaced threshold of 225 feet. The Runway 33 end would be relocated approximately 380 feet from the existing runway end with a displaced threshold of 390 feet. Military aircraft would be able to utilize the full 8,100 feet of runway, which is the same as used for the base year configuration. Table 3 presents the latitude and longitude inputs and configurations for each runway for the five-year and ten-year forecast configurations. Helicopter operational areas and runup locations are the same as for the base year as detailed above.

Figure 2 depicts the MTN runway layout that was used to develop the five-year and ten-year forecast contours. It includes notations for the airport property line, helicopter operational areas, as well as civilian and military aircraft run-up locations.

Table 3. Five-year (2025) and Ten-year (2030) Forecast MTN Runway Configuration Inputs

Runway	Latitude (deg)	Longitude (deg)	Length (feet)	Modeled Elevation (feet)	Displaced Landing Threshold (feet)	Approach Slope (degrees)	Threshold Crossing Height (feet)	Runway Width (feet)
15	39.334050	-76.424500	7,430	22.8	225	4.0	37	180
33	39.319583	-76.405986	7,430	9.5	390	2.9	44	180
15 (Military)	39.334642	-76.425272	8,100	23.5	516	3.1	55	180
33 (Military)	39.318848	-76.405047	8,100	9.5	770	2.9	44	180

Notes:
Latitude and Longitude coordinates reference to North American Datum 1983 (NAD 83)
Elevations referenced to Mean Sea Level (MSL)
Sources:
Runway coordinates: MTN ALP, MDOT MAA, March 2011

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Figure 2

Five-year (2025) and Ten-year (2030) Runway Layout

- Helicopter Operation Area
- Military Runup Location
- Civilian Runup Locations
- Civilian Runway (Future)
- Additional Runway Available for Military Operations
- Airport Boundary
- Roads
- Railroad
- Stream / Creek

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

0 2,000 4,000 Feet

3.2 Aircraft Operations and Runups

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

The 2019 base year AAD operations are based on calendar year 2018 radar data as derived from the MDOT MAA Airport Noise and Operations Monitoring System (ANOMS)[4], calendar year 2018 MTN aircraft activity, surveys from airport operators, and the FAA's TAF. The TAF represents the official FAA forecast of aviation activity for U.S. airports. It separates forecasts into categories of major airspace users. As a General Aviation (GA) airport, forecast data related to MTN is available for categories including Air Taxi (AT), Military (ML), and GA.

Itinerant and local operations[5] for 2019 were derived from the 2018 edition of the TAF (released by FAA in February 2019) and are reported in Table 4. AAD operations were developed for the five-year and ten-year forecast contours using the 2018 edition of the TAF based on the TAF forecast years of 2025 and 2030[6]. Itinerant and local operations for the future years are also reported in Table 4.

The detailed breakdown of operations by aircraft type for fixed-wing and helicopter civil aircraft at MTN was determined using a calendar year 2018 sample of radar data that originated from the MDOT MAA ANOMS. The aircraft fleet mix distributions determined from the radar data were then applied to the operational totals shown in Table 4.

Military operations and fleet data were estimated from information validated by the MDANG which was derived from the 2012 MTN ANZ document, along with an analysis of calendar year 2018 FAA Traffic Flow Management System Counts (TFMSC). These operations were then applied to the forecast 2019, five-year and ten-year totals of the military operations identified in Table 4.

Keeping in line with the 2018 TAF, the Air Taxi and Military total operations remain unchanged between the 2019 base year and future years, as shown in Table 4. As illustrated by the general aviation total operations, the five-year modeled average daily aircraft operations are expected to increase from the 2019 base year by 3.4 percent. The general aviation total operations for the ten-year modeled average daily aircraft operations are expected to increase from the 2019 base year by 6.4 percent.

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[4] Data as downloaded by HMMH from MDOT MAA ANOMS on August 29, 2019.

[5] The *Glossary for the 2018 Terminal Area Forecast (TAF),* available at: https://taf.faa.gov/Downloads/Glossaryfor2018TAF.pdf, defines itinerant and local operations. Itinerant operations are performed by an aircraft, using either instrument flight rules (IFR) or visual flight rules (VFR), that land at an airport arriving from outside the airport area, or depart from an airport and leave the airport area. While local operations are performed by an aircraft that remain in the local traffic pattern, execute simulated instrument approaches or low passes at the airport, and operations to or from the same airport within a designated practice area within a 20-mile radius of the airport.

[6] The FAA TAF reports operations relative to the federal fiscal year. Data is available at https://www.faa.gov/data_research/aviation/taf/.

Table 4. Base Year (2019), Five-year (2025), and Ten-year (2030) Forecast Operations Levels

Year	Itinerant Operations				Local Operations		Total
	Air Carrier	Air Taxi	General Aviation	Military	General Aviation	Military	
2019	0	2,173	37,153	1,893	38,756	645	80,620
2025	0	2,173	38,021	1,893	40,506	645	83,238
2030	0	2,173	38,761	1,893	42,023	645	85,495
Source: FAA, 2018 Terminal Area Forecast (TAF)							

The AAD operations are reported in Table 5 through Table 7, for 2019, 2025 and 2030, respectively. The operations are reported by aircraft category and their associated arrivals, departures, and circuits separated by both day and night activity.

Table 5. Modeled Base Year (2019) Average Daily Aircraft Operations

Aircraft Category	Engine	AEDT Type	Aircraft Description	Arrivals		Departures		Circuits		Total
				Day	Night	Day	Night	Day	Night	
Air Taxi	Jet	BD-700-1A10	Bombardier Global Express	0.0131	-	0.0131	-	-	-	0.0262
		CIT3	Cessna 650 Citation III	0.0033	-	0.0033	-	-	-	0.0066
		CL600	Bombardier Challenger 600	0.1953	0.0178	0.2098	0.0033	-	-	0.4262
		CL601	Bombardier Challenger 601	0.0164	-	0.0131	0.0033	-	-	0.0328
		CNA510	Cessna Citation Mustang	0.0131	-	0.0087	0.0044	-	-	0.0262
		CNA525C	Cessna 525 CitationJet	0.0656	-	0.0656	-	-	-	0.1311
		CNA55B	Cessna 550 Citation II	0.1967	0.0066	0.2000	0.0033	-	-	0.4065
		CNA560E	Cessna 560 Citation V	0.0164	-	0.0164	-	-	-	0.0328
		CNA560U	Cessna 560 Citation V	0.3377	0.0033	0.3343	0.0066	-	-	0.6819
		CNA560XL	Cessna 560 Citation XLS	0.0721	-	0.0688	0.0033	-	-	0.1442
		CNA680	Cessna 680 Citation Sovereign	0.1471	0.0070	0.1508	0.0033	-	-	0.3082
		CNA750	Cessna 750 Citation X	0.1377	-	0.1304	0.0072	-	-	0.2754
		GIV	Gulfstream IV	0.0459	-	0.0426	0.0033	-	-	0.0918
		GV	Gulftsream V	0.0098	-	0.0098	-	-	-	0.0197
		IA1125	Gulfstream G150	0.0098	-	0.0098	-	-	-	0.0197
		LEAR35	LearJet 35	0.2065	0.0066	0.2024	0.0107	-	-	0.4262
		MU3001	Raytheon Beechjet 400	0.2065	0.0066	0.2131	-	-	-	0.4262
	Piston Prop	BEC58P	Beechcraft Baron	0.0164	-	0.0164	-	-	-	0.0328
		CNA172	Cessna 172 Skyhawk	0.0361	-	0.0328	0.0033	-	-	0.0721
		CNA182	Cessna 182 Skylane	0.1115	-	0.1115	-	-	-	0.2229
		COMSEP	Generic Composite Single - Engine Piston Propeller General Aviation Aircraft	0.0229	-	0.0229	-	-	-	0.0459
		GASEPF	Generic General Aviation Single- Engine Fixed Pitch Propeller	0.0033	-	0.0033	-	-	-	0.0066
		GASEPV	Generic General Aviation Single- Engine Variable Pitch Propeller	0.1574	0.0066	0.1572	0.0067	-	-	0.3278
		PA28	Piper PA-28 Cherokee	0.0033	-	0.0033	-	-	-	0.0066
	Turboprop	1900D	Raytheon Beech 1900	0.1180	0.0131	0.1208	0.0104	-	-	0.2623
		CNA208	Cessna Caravan	0.1798	0.0038	0.1770	0.0066	-	-	0.3672
		DHC6	DeHaviland Twin Otter	0.5605	0.0033	0.5475	0.0164	-	-	1.1277
Air Taxi Total				**2.9022**	**0.0745**	**2.8849**	**0.0918**	**-**	**-**	**5.9534**
Military	Helicopter	B212	Bell 212 Twin Huey	0.0023	-	0.0023	-	-	-	0.0047
		B429	Bell 429 GlobalRanger	0.0352	-	0.0352	-	-	-	0.0704
		CH47D	Boeing CH-47 Chinook	0.0141	-	0.0141	-	-	-	0.0282
		EC130	Eurocopter EC-130	0.0047	-	0.0047	-	-	-	0.0094
		H500D	MD Helicopters MD 500	0.0047	-	0.0047	-	-	-	0.0094
		S70	Sikorsky UH-60 Black Hawk	0.1033	-	0.1033	-	-	-	0.2066
		SA365N	Eurocopter AS365 Dauphin	0.0023	-	0.0023	-	-	-	0.0047
	Jet	737800	Boeing 737-800 Series	0.0047	-	0.0047	-	-	-	0.0094
		A10A	Fairchild A-10A Thunderbolt II	2.1918	-	2.1918	-	1.7671	-	6.1507

Aircraft Category	Engine	AEDT Type	Aircraft Description	Arrivals		Departures		Circuits		Total
				Day	Night	Day	Night	Day	Night	
		A7D	LTV A-7 Corsair II	0.0023	-	0.0023	-	-	-	0.0047
		C17	Boeing C-17A	0.0282	-	0.0282	-	-	-	0.0563
		CL600	Bombardier Challenger 600	0.0047	-	0.0047	-	-	-	0.0094
		CNA55B	Cessna 550 Citation II	0.0047	-	0.0047	-	-	-	0.0094
		CNA560U	Cessna 560 Citation V	0.0047	-	0.0047	-	-	-	0.0094
		F16A	Lockheed Martin F-16 Fighting Falcon	0.0094	-	0.0094	-	-	-	0.0188
		F-18	Boeing F/A-18 Hornet	0.0117	-	0.0117	-	-	-	0.0235
		LEAR25	Learjet 25	0.0023	-	0.0023	-	-	-	0.0047
		LEAR35	Learjet 35	0.0094	-	0.0094	-	-	-	0.0188
	Piston Prop	CNA172	Cessna 172 Skyhawk	0.0023	-	0.0023	-	-	-	0.0047
		GASEPV	Generic General Aviation Single- Engine Variable Pitch Propeller	0.0047	-	0.0047	-	-	-	0.0094
		PA28	Piper PA-28 Cherokee Series	0.0023	-	0.0023	-	-	-	0.0047
	Turboprop	C130	Lockheed C-130H Hercules	0.0164	-	0.0164	-	-	-	0.0329
		C130AD	Lockheed C-130 Hercules	0.0141	-	0.0141	-	-	-	0.0282
		CNA208	Cessna Caravan	0.0211	-	0.0211	-	-	-	0.0422
		DHC6	DeHaviland Twin Otter	0.0141	-	0.0141	-	-	-	0.0282
		DHC830	DeHaviland Dash 8-300 Series	0.0775	-	0.0775	-	-	-	0.1549
Military Total				**2.5932**	**-**	**2.5932**	**-**	**1.7671**	**-**	**6.9534**
General Aviation	Helicopter	B206L	Bell 206 JetRanger	0.4126	-	0.4126	-	-	-	0.8251
		B407	Bell 407	0.0625	-	0.0625	-	-	-	0.1250
		B429	Bell 429 GlobalRanger	0.1375	0.0500	0.1172	0.0703	-	-	0.3751
		B430	Bell 430	0.1586	0.0227	0.1188	0.0625	-	-	0.3626
		EC130	Eurocopter EC-130	0.1594	0.0656	0.1875	0.0375	-	-	0.4501
		H500D	MD Helicopters MD 500	0.0375	-	0.0281	0.0094	-	-	0.0750
		R22	Robinson R22	0.0802	0.0073	0.0875	-	20.6191	-	20.7941
		R44	Robinson R44 Raven	0.0563	-	0.0563	-	-	-	0.1125
		S61	Sikorsky SH-3 Sea King	0.0188	-	0.0063	0.0125	-	-	0.0375
		S76	Sikorsky S-76 Spirit	0.1113	0.0074	0.1000	0.0188	-	-	0.2375
		SA330J	Aerospatiale SA-330 Puma	3.1129	0.8126	3.3570	0.5685	-	-	7.8511
		SA341G	Aerospatiale SA-341G/342 Gazelle	0.5813	0.2813	0.7564	0.1063	-	-	1.7252
		SA350D	Aerospatiale SA-350D Astar	2.0940	0.2125	2.0818	0.2247	-	-	4.6131
		SA355F	Aerospatiale SA-355F Twin Star	0.0375	-	0.0375	-	-	-	0.0750
		SA365N	Eurocopter AS365 Dauphin	0.0063	0.0063	-	0.0125	-	-	0.0250
	Jet	BD-700-1A10	Bombardier Global Express	0.2285	0.0403	0.2375	0.0313	-	-	0.5376
		BD-700-1A11	Bombardier Global 5000 Business	0.0313	-	0.0313	-	-	-	0.0625
		CIT3	Cessna 650 Citation III	0.0500	-	0.0500	-	-	-	0.1000
		CL600	Bombardier Challenger 600	0.3548	0.0077	0.3375	0.0250	-	-	0.7251
		CL601	Bombardier Challenger 601	0.5245	0.0506	0.5563	0.0188	0.0326	-	1.1827
		CNA500	Cessna 500 Citation I	0.0188	-	-	0.0188	0.0543	-	0.0918
		CNA510	Cessna Citation Mustang	0.2052	0.0073	0.2125	-	-	-	0.4251

Aircraft Category	Engine	AEDT Type	Aircraft Description	Arrivals		Departures		Circuits		Total
				Day	Night	Day	Night	Day	Night	
		CNA525C	Cessna 525 CitationJet	1.5877	0.0875	1.5892	0.0861	-	-	3.3505
		CNA55B	Cessna 550 Citation II	2.8297	0.6520	2.8754	0.6063	0.9234	-	7.8869
		CNA560E	Cessna 560 Citation V	0.0125	-	0.0125	-	-	-	0.0250
		CNA560U	Cessna 560 Citation V	0.3438	0.0125	0.3563	-	-	-	0.7126
		CNA560XL	Cessna 560 Citation XLS	0.3063	0.0063	0.3125	-	-	-	0.6251
		CNA680	Cessna 680 Citation Sovereign	0.1813	-	0.1813	-	-	-	0.3626
		CNA750	Cessna 750 Citation X	1.5627	0.0875	1.5596	0.0906	0.1521	-	3.4525
		ECLIPSE500	Eclipse 500	0.0625	-	0.0556	0.0069	-	-	0.1250
		EMB145	Embraer ERJ145	0.0313	-	0.0313	-	-	-	0.0625
		FAL20	Dassault Falcon 20	0.1247	0.0066	0.1188	0.0125	0.0217	-	0.2843
		GIIB	Gulfstream II-B	0.0188	-	0.0188	-	-	-	0.0375
		GIV	Gulfstream IV	0.2749	0.0064	0.2688	0.0125	0.0109	-	0.5734
		GV	Gulfstream V	0.6001	0.1250	0.7001	0.0250	-	-	1.4502
		IA1125	Gulfstream G100	1.0927	0.1137	1.1502	0.0563	0.1412	-	2.5541
		LEAR25	LearJet 25	0.0188	-	0.0188	-	-	-	0.0375
		LEAR35	LearJet 35	2.6394	0.1609	2.6066	0.1938	0.2390	-	5.8398
		MU3001	Mitsubishi MU-300/Raytheon Beechjet 400	0.5126	0.0125	0.4895	0.0356	4.8234	-	5.8736
		BEC58P	Beechcraft Baron	4.7819	0.1188	4.8352	0.0655	20.2497	-	30.0511
		CNA172	Cessna 172 Skyhawk	6.4696	0.1938	6.5717	0.0917	30.9287	-	44.2555
		CNA182	Cessna 182 Skylane	1.4183	0.1194	1.5190	0.0188	1.7056	-	4.7810
		CNA206	Cessna 206 Stationair	0.1235	0.0077	0.1313	-	0.0217	-	0.2843
	Piston Prop	COMSEP	Generic Composite Single - Engine Piston Propeller General Aviation Aircraft	1.6502	0.0438	1.6393	0.0546	0.5432	-	3.9311
		GASEPF	Generic General Aviation Single- Engine Fixed Pitch Propeller	1.0751	0.0063	1.0695	0.0119	9.3644	-	11.5272
		GASEPV	Generic General Aviation Single- Engine Variable Pitch Propeller	5.7820	0.1188	5.7631	0.1377	14.8723	-	26.6739
		PA28	Piper PA-28 Cherokee	1.1689	0.0313	1.1769	0.0232	-	-	2.4003
		PA30	Piper PA-30 Twin Comanche	0.8048	0.0640	0.6563	0.2125	-	-	1.7377
		1900D	Raytheon Beech 1900	0.0938	-	0.0938	-	-	-	0.1875
		CNA208	Cessna Caravan	1.8315	0.0625	1.8433	0.0507	1.1407	-	4.9287
	Turboprop	CNA441	Cessna 441 Conquest	0.1188	-	0.1188	-	0.0760	-	0.3136
		DHC6	DeHaviland Twin Otter	1.2377	0.0250	1.1780	0.0847	0.2607	-	2.7861
		DHC830	DeHaviland Dash 8-300 Series	0.0250	-	0.0250	-	-	-	0.0500
General Aviation Total				**47.2608**	**3.6337**	**47.8008**	**3.0937**	**106.1808**	**-**	**207.9699**
Grand Total				**52.7561**	**3.7083**	**53.2788**	**3.1855**	**107.9479**	**-**	**220.8767**

Notes:
Totals may not match exactly due to rounding
Circuits are counted as two operations

Table 6. Modeled Five-year (2025) Forecast Average Daily Aircraft Operations

Aircraft Category	Engine	AEDT Type	Aircraft Description	Arrivals		Departures		Circuits		Total
				Day	Night	Day	Night	Day	Night	
Air Taxi	Jet	BD-700-1A10	Bombardier Global Express	0.0131	-	0.0131	-	-	-	0.0262
		CIT3	Cessna 650 Citation III	0.0033	-	0.0033	-	-	-	0.0066
		CL600	Bombardier Challenger 600	0.1953	0.0178	0.2098	0.0033	-	-	0.4262
		CL601	Bombardier Challenger 601	0.0164	-	0.0131	0.0033	-	-	0.0328
		CNA510	Cessna Citation Mustang	0.0131	-	0.0087	0.0044	-	-	0.0262
		CNA525C	Cessna 525 CitationJet	0.0656	-	0.0656	-	-	-	0.1311
		CNA55B	Cessna 550 Citation II	0.1967	0.0066	0.2000	0.0033	-	-	0.4065
		CNA560E	Cessna 560 Citation V	0.0164	-	0.0164	-	-	-	0.0328
		CNA560U	Cessna 560 Citation V	0.3377	0.0033	0.3343	0.0066	-	-	0.6819
		CNA560XL	Cessna 560 Citation XLS	0.0721	-	0.0688	0.0033	-	-	0.1442
		CNA680	Cessna 680 Citation Sovereign	0.1471	0.0070	0.1508	0.0033	-	-	0.3082
		CNA750	Cessna 750 Citation X	0.1377	-	0.1304	0.0072	-	-	0.2754
		GIV	Gulfstream IV	0.0459	-	0.0426	0.0033	-	-	0.0918
		GV	Gulftsream V	0.0098	-	0.0098	-	-	-	0.0197
		IA1125	Gulfstream G150	0.0098	-	0.0098	-	-	-	0.0197
		LEAR35	LearJet 35	0.2065	0.0066	0.2024	0.0107	-	-	0.4262
		MU3001	Raytheon Beechjet 400	0.2065	0.0066	0.2131	-	-	-	0.4262
	Piston Prop	BEC58P	Beechcraft Baron	0.0164	-	0.0164	-	-	-	0.0328
		CNA172	Cessna 172 Skyhawk	0.0361	-	0.0328	0.0033	-	-	0.0721
		CNA182	Cessna 182 Skylane	0.1115	-	0.1115	-	-	-	0.2229
		COMSEP	Generic Composite Single - Engine Piston Propeller General Aviation Aircraft	0.0229	-	0.0229	-	-	-	0.0459
		GASEPF	Generic General Aviation Single- Engine Fixed Pitch Propeller	0.0033	-	0.0033	-	-	-	0.0066
		GASEPV	Generic General Aviation Single- Engine Variable Pitch Propeller	0.1574	0.0066	0.1572	0.0067	-	-	0.3278
		PA28	Piper PA-28 Cherokee	0.0033	-	0.0033	-	-	-	0.0066
	Turboprop	1900D	Raytheon Beech 1900	0.1180	0.0131	0.1208	0.0104	-	-	0.2623
		CNA208	Cessna Caravan	0.1798	0.0038	0.1770	0.0066	-	-	0.3672
		DHC6	DeHaviland Twin Otter	0.5605	0.0033	0.5475	0.0164	-	-	1.1277
Air Taxi Total				**2.9022**	**0.0745**	**2.8849**	**0.0918**	**-**	**-**	**5.9534**
Military	Helicopter	B212	Bell 212 Twin Huey	0.0023	-	0.0023	-	-	-	0.0047
		B429	Bell 429 GlobalRanger	0.0352	-	0.0352	-	-	-	0.0704
		CH47D	Boeing CH-47 Chinook	0.0141	-	0.0141	-	-	-	0.0282
		EC130	Eurocopter EC-130	0.0047	-	0.0047	-	-	-	0.0094
		H500D	MD Helicopters MD 500	0.0047	-	0.0047	-	-	-	0.0094
		S70	Sikorsky UH-60 Black Hawk	0.1033	-	0.1033	-	-	-	0.2066
		SA365N	Eurocopter AS365 Dauphin	0.0023	-	0.0023	-	-	-	0.0047
	Jet	737800	Boeing 737-800 Series	0.0047	-	0.0047	-	-	-	0.0094
		A10A	Fairchild A-10A Thunderbolt II	2.1918	-	2.1918	-	1.7671	-	6.1507

Aircraft Category	Engine	AEDT Type	Aircraft Description	Arrivals		Departures		Circuits		Total
				Day	Night	Day	Night	Day	Night	
		A7D	LTV A-7 Corsair II	0.0023	-	0.0023	-	-	-	0.0047
		C17	Boeing C-17A	0.0282	-	0.0282	-	-	-	0.0563
		CL600	Bombardier Challenger 600	0.0047	-	0.0047	-	-	-	0.0094
		CNA55B	Cessna 550 Citation II	0.0047	-	0.0047	-	-	-	0.0094
		CNA560U	Cessna 560 Citation V	0.0047	-	0.0047	-	-	-	0.0094
		F16A	Lockheed Martin F-16 Fighting Falcon	0.0094	-	0.0094	-	-	-	0.0188
		F-18	Boeing F/A-18 Hornet	0.0117	-	0.0117	-	-	-	0.0235
		LEAR25	Learjet 25	0.0023	-	0.0023	-	-	-	0.0047
		LEAR35	Learjet 35	0.0094	-	0.0094	-	-	-	0.0188
	Piston Prop	CNA172	Cessna 172 Skyhawk	0.0023	-	0.0023	-	-	-	0.0047
		GASEPV	Generic General Aviation Single- Engine Variable Pitch Propeller	0.0047	-	0.0047	-	-	-	0.0094
		PA28	Piper PA-28 Cherokee Series	0.0023	-	0.0023	-	-	-	0.0047
	Turboprop	C130	Lockheed C-130H Hercules	0.0164	-	0.0164	-	-	-	0.0329
		C130AD	Lockheed C-130 Hercules	0.0141	-	0.0141	-	-	-	0.0282
		CNA208	Cessna Caravan	0.0211	-	0.0211	-	-	-	0.0422
		DHC6	DeHaviland Twin Otter	0.0141	-	0.0141	-	-	-	0.0282
		DHC830	DeHaviland Dash 8-300 Series	0.0775	-	0.0775	-	-	-	0.1549
Military Total				**2.5932**	**-**	**2.5932**	**-**	**1.7671**	**-**	**6.9534**
General Aviation	Helicopter	B206L	Bell 206 JetRanger	0.4222	-	0.4222	-	-	-	0.8444
		B407	Bell 407	0.0640	-	0.0640	-	-	-	0.1279
		B429	Bell 429 GlobalRanger	0.1407	0.0512	0.1199	0.0720	-	-	0.3838
		B430	Bell 430	0.1623	0.0232	0.1215	0.0640	-	-	0.3710
		EC130	Eurocopter EC-130	0.1631	0.0672	0.1919	0.0384	-	-	0.4606
		H500D	MD Helicopters MD 500	0.0384	-	0.0288	0.0096	-	-	0.0768
		R22	Robinson R22	0.0821	0.0075	0.0896	-	21.5502	-	21.7293
		R44	Robinson R44 Raven	0.0576	-	0.0576	-	-	-	0.1151
		S61	Sikorsky SH-3 Sea King	0.0192	-	0.0064	0.0128	-	-	0.0384
		S76	Sikorsky S-76 Spirit	0.1139	0.0076	0.1024	0.0192	-	-	0.2431
		SA330J	Aerospatiale SA-330 Puma	3.1857	0.8316	3.4354	0.5818	-	-	8.0345
		SA341G	Aerospatiale SA-341G/342 Gazelle	0.5949	0.2879	0.7740	0.1087	-	-	1.7655
		SA350D	Aerospatiale SA-350D Astar	2.1430	0.2175	2.1305	0.2300	-	-	4.7209
		SA355F	Aerospatiale SA-355F Twin Star	0.0384	-	0.0384	-	-	-	0.0768
		SA365N	Eurocopter AS365 Dauphin	0.0064	0.0064	-	0.0128	-	-	0.0256
	Jet	BD-700-1A10	Bombardier Global Express	0.2338	0.0413	0.2431	0.0320	-	-	0.5501
		BD-700-1A11	Bombardier Global 5000 Business	0.0320	-	0.0320	-	-	-	0.0640
		CIT3	Cessna 650 Citation III	0.0512	-	0.0512	-	-	-	0.1024
		CL600	Bombardier Challenger 600	0.3631	0.0079	0.3454	0.0256	-	-	0.7420
		CL601	Bombardier Challenger 601	0.5368	0.0517	0.5693	0.0192	0.0341	-	1.2111
		CNA500	Cessna 500 Citation I	0.0192	-	-	0.0192	0.0568	-	0.0952
		CNA510	Cessna Citation Mustang	0.2100	0.0075	0.2175	-	-	-	0.4350

Aircraft Category	Engine	AEDT Type	Aircraft Description	Arrivals		Departures		Circuits		Total
				Day	Night	Day	Night	Day	Night	
		CNA525C	Cessna 525 CitationJet	1.6248	0.0896	1.6263	0.0881	-	-	3.4287
		CNA55B	Cessna 550 Citation II	2.8958	0.6673	2.9426	0.6205	0.9651	-	8.0912
		CNA560E	Cessna 560 Citation V	0.0128	-	0.0128	-	-	-	0.0256
		CNA560U	Cessna 560 Citation V	0.3518	0.0128	0.3646	-	-	-	0.7292
		CNA560XL	Cessna 560 Citation XLS	0.3134	0.0064	0.3198	-	-	-	0.6397
		CNA680	Cessna 680 Citation Sovereign	0.1855	-	0.1855	-	-	-	0.3710
		CNA750	Cessna 750 Citation X	1.5992	0.0896	1.5961	0.0927	0.1590	-	3.5365
		ECLIPSE500	Eclipse 500	0.0640	-	0.0569	0.0071	-	-	0.1279
		EMB145	Embraer ERJ145	0.0320	-	0.0320	-	-	-	0.0640
		FAL20	Dassault Falcon 20	0.1276	0.0067	0.1215	0.0128	0.0227	-	0.2914
		GIIB	Gulfstream II-B	0.0192	-	0.0192	-	-	-	0.0384
		GIV	Gulfstream IV	0.2813	0.0065	0.2751	0.0128	0.0114	-	0.5871
		GV	Gulfstream V	0.6141	0.1279	0.7165	0.0256	-	-	1.4841
		IA1125	Gulfstream G100	1.1183	0.1163	1.1770	0.0576	0.1476	-	2.6168
		LEAR25	LearJet 25	0.0192	-	0.0192	-	-	-	0.0384
		LEAR35	LearJet 35	2.7011	0.1647	2.6675	0.1983	0.2498	-	5.9814
		MU3001	Mitsubishi MU-300/Raytheon Beechjet 400	0.5245	0.0128	0.5009	0.0364	5.0412	-	6.1159
	Piston Prop	BEC58P	Beechcraft Baron	4.8936	0.1215	4.9482	0.0670	21.1641	-	31.1945
		CNA172	Cessna 172 Skyhawk	6.6208	0.1983	6.7252	0.0939	32.3252	-	45.9634
		CNA182	Cessna 182 Skylane	1.4515	0.1222	1.5544	0.0192	1.7826	-	4.9299
		CNA206	Cessna 206 Stationair	0.1264	0.0079	0.1343	-	0.0227	-	0.2914
		COMSEP	Generic Composite Single - Engine Piston Propeller General Aviation Aircraft	1.6888	0.0448	1.6776	0.0559	0.5677	-	4.0348
		GASEPF	Generic General Aviation Single- Engine Fixed Pitch Propeller	1.1003	0.0064	1.0945	0.0122	9.7873	-	12.0006
		GASEPV	Generic General Aviation Single- Engine Variable Pitch Propeller	5.9171	0.1215	5.8977	0.1410	15.5438	-	27.6212
		PA28	Piper PA-28 Cherokee	1.1962	0.0320	1.2044	0.0238	-	-	2.4564
		PA30	Piper PA-30 Twin Comanche	0.8237	0.0655	0.6717	0.2175	-	-	1.7783
	Turboprop	1900D	Raytheon Beech 1900	0.0960	-	0.0960	-	-	-	0.1919
		CNA208	Cessna Caravan	1.8743	0.0640	1.8864	0.0519	1.1922	-	5.0687
		CNA441	Cessna 441 Conquest	0.1215	-	0.1215	-	0.0795	-	0.3226
		DHC6	DeHaviland Twin Otter	1.2666	0.0256	1.2055	0.0867	0.2725	-	2.8568
		DHC830	DeHaviland Dash 8-300 Series	0.0256	-	0.0256	-	-	-	0.0512
General Aviation Total				**48.3649**	**3.7186**	**48.9176**	**3.1660**	**110.9753**	**-**	**215.1425**
Grand Total				**53.8603**	**3.7932**	**54.3956**	**3.2578**	**112.7425**	**-**	**228.0493**

Notes:
Totals may not match exactly due to rounding
Circuits are counted as two operations

Table 7. Modeled Ten-year (2030) Forecast Average Daily Aircraft Operations

Aircraft Category	Engine	AEDT Type	Aircraft Description	Arrivals		Departures		Circuits		Total
				Day	Night	Day	Night	Day	Night	
Air Taxi	Jet	BD-700-1A10	Bombardier Global Express	0.0131	-	0.0131	-	-	-	0.0262
		CIT3	Cessna 650 Citation III	0.0033	-	0.0033	-	-	-	0.0066
		CL600	Bombardier Challenger 600	0.1953	0.0178	0.2098	0.0033	-	-	0.4262
		CL601	Bombardier Challenger 601	0.0164	-	0.0131	0.0033	-	-	0.0328
		CNA510	Cessna Citation Mustang	0.0131	-	0.0087	0.0044	-	-	0.0262
		CNA525C	Cessna 525 CitationJet	0.0656	-	0.0656	-	-	-	0.1311
		CNA55B	Cessna 550 Citation II	0.1967	0.0066	0.2000	0.0033	-	-	0.4065
		CNA560E	Cessna 560 Citation V	0.0164	-	0.0164	-	-	-	0.0328
		CNA560U	Cessna 560 Citation V	0.3377	0.0033	0.3343	0.0066	-	-	0.6819
		CNA560XL	Cessna 560 Citation XLS	0.0721	-	0.0688	0.0033	-	-	0.1442
		CNA680	Cessna 680 Citation Sovereign	0.1471	0.0070	0.1508	0.0033	-	-	0.3082
		CNA750	Cessna 750 Citation X	0.1377	-	0.1304	0.0072	-	-	0.2754
		GIV	Gulfstream IV	0.0459	-	0.0426	0.0033	-	-	0.0918
		GV	Gulftsream V	0.0098	-	0.0098	-	-	-	0.0197
		IA1125	Gulfstream G150	0.0098	-	0.0098	-	-	-	0.0197
		LEAR35	LearJet 35	0.2065	0.0066	0.2024	0.0107	-	-	0.4262
		MU3001	Raytheon Beechjet 400	0.2065	0.0066	0.2131	-	-	-	0.4262
	Piston Prop	BEC58P	Beechcraft Baron	0.0164	-	0.0164	-	-	-	0.0328
		CNA172	Cessna 172 Skyhawk	0.0361	-	0.0328	0.0033	-	-	0.0721
		CNA182	Cessna 182 Skylane	0.1115	-	0.1115	-	-	-	0.2229
		COMSEP	Generic Composite Single - Engine Piston Propeller General Aviation Aircraft	0.0229	-	0.0229	-	-	-	0.0459
		GASEPF	Generic General Aviation Single- Engine Fixed Pitch Propeller	0.0033	-	0.0033	-	-	-	0.0066
		GASEPV	Generic General Aviation Single- Engine Variable Pitch Propeller	0.1574	0.0066	0.1572	0.0067	-	-	0.3278
		PA28	Piper PA-28 Cherokee	0.0033	-	0.0033	-	-	-	0.0066
	Turboprop	1900D	Raytheon Beech 1900	0.1180	0.0131	0.1208	0.0104	-	-	0.2623
		CNA208	Cessna Caravan	0.1798	0.0038	0.1770	0.0066	-	-	0.3672
		DHC6	DeHaviland Twin Otter	0.5605	0.0033	0.5475	0.0164	-	-	1.1277
Air Taxi Total				**2.9022**	**0.0745**	**2.8849**	**0.0918**	**-**	**-**	**5.9534**
Military	Helicopter	B212	Bell 212 Twin Huey	0.0023	-	0.0023	-	-	-	0.0047
		B429	Bell 429 GlobalRanger	0.0352	-	0.0352	-	-	-	0.0704
		CH47D	Boeing CH-47 Chinook	0.0141	-	0.0141	-	-	-	0.0282
		EC130	Eurocopter EC-130	0.0047	-	0.0047	-	-	-	0.0094
		H500D	MD Helicopters MD 500	0.0047	-	0.0047	-	-	-	0.0094
		S70	Sikorsky UH-60 Black Hawk	0.1033	-	0.1033	-	-	-	0.2066
		SA365N	Eurocopter AS365 Dauphin	0.0023	-	0.0023	-	-	-	0.0047
	Jet	737800	Boeing 737-800 Series	0.0047	-	0.0047	-	-	-	0.0094
		A10A	Fairchild A-10A Thunderbolt II	2.1918	-	2.1918	-	1.7671	-	6.1507

Aircraft Category	Engine	AEDT Type	Aircraft Description	Arrivals		Departures		Circuits		Total
				Day	Night	Day	Night	Day	Night	
		A7D	LTV A-7 Corsair II	0.0023	-	0.0023	-	-	-	0.0047
		C17	Boeing C-17A	0.0282	-	0.0282	-	-	-	0.0563
		CL600	Bombardier Challenger 600	0.0047	-	0.0047	-	-	-	0.0094
		CNA55B	Cessna 550 Citation II	0.0047	-	0.0047	-	-	-	0.0094
		CNA560U	Cessna 560 Citation V	0.0047	-	0.0047	-	-	-	0.0094
		F16A	Lockheed Martin F-16 Fighting Falcon	0.0094	-	0.0094	-	-	-	0.0188
		F-18	Boeing F/A-18 Hornet	0.0117	-	0.0117	-	-	-	0.0235
		LEAR25	Learjet 25	0.0023	-	0.0023	-	-	-	0.0047
		LEAR35	Learjet 35	0.0094	-	0.0094	-	-	-	0.0188
	Piston Prop	CNA172	Cessna 172 Skyhawk	0.0023	-	0.0023	-	-	-	0.0047
		GASEPV	Generic General Aviation Single- Engine Variable Pitch Propeller	0.0047	-	0.0047	-	-	-	0.0094
		PA28	Piper PA-28 Cherokee Series	0.0023	-	0.0023	-	-	-	0.0047
	Turboprop	C130	Lockheed C-130H Hercules	0.0164	-	0.0164	-	-	-	0.0329
		C130AD	Lockheed C-130 Hercules	0.0141	-	0.0141	-	-	-	0.0282
		CNA208	Cessna Caravan	0.0211	-	0.0211	-	-	-	0.0422
		DHC6	DeHaviland Twin Otter	0.0141	-	0.0141	-	-	-	0.0282
		DHC830	DeHaviland Dash 8-300 Series	0.0775	-	0.0775	-	-	-	0.1549
Military Total				**2.5932**	**-**	**2.5932**	**-**	**1.7671**	**-**	**6.9534**
General Aviation	Helicopter	B206L	Bell 206 JetRanger	0.4304	-	0.4304	-	-	-	0.8608
		B407	Bell 407	0.0652	-	0.0652	-	-	-	0.1304
		B429	Bell 429 GlobalRanger	0.1435	0.0522	0.1223	0.0734	-	-	0.3913
		B430	Bell 430	0.1655	0.0236	0.1239	0.0652	-	-	0.3782
		EC130	Eurocopter EC-130	0.1663	0.0685	0.1956	0.0391	-	-	0.4695
		H500D	MD Helicopters MD 500	0.0391	-	0.0293	0.0098	-	-	0.0783
		R22	Robinson R22	0.0837	0.0076	0.0913	-	22.3572	-	22.5398
		R44	Robinson R44 Raven	0.0587	-	0.0587	-	-	-	0.1174
		S61	Sikorsky SH-3 Sea King	0.0196	-	0.0065	0.0130	-	-	0.0391
		S76	Sikorsky S-76 Spirit	0.1162	0.0077	0.1043	0.0196	-	-	0.2478
		SA330J	Aerospatiale SA-330 Puma	3.2477	0.8478	3.5023	0.5931	-	-	8.1909
		SA341G	Aerospatiale SA-341G/342 Gazelle	0.6065	0.2935	0.7891	0.1109	-	-	1.7999
		SA350D	Aerospatiale SA-350D Astar	2.1847	0.2217	2.1719	0.2345	-	-	4.8128
		SA355F	Aerospatiale SA-355F Twin Star	0.0391	-	0.0391	-	-	-	0.0783
		SA365N	Eurocopter AS365 Dauphin	0.0065	0.0065	-	0.0130	-	-	0.0261
	Jet	BD-700-1A10	Bombardier Global Express	0.2384	0.0421	0.2478	0.0326	-	-	0.5608
		BD-700-1A11	Bombardier Global 5000 Business	0.0326	-	0.0326	-	-	-	0.0652
		CIT3	Cessna 650 Citation III	0.0522	-	0.0522	-	-	-	0.1043
		CL600	Bombardier Challenger 600	0.3702	0.0080	0.3522	0.0261	-	-	0.7565
		CL601	Bombardier Challenger 601	0.5472	0.0527	0.5804	0.0196	0.0353	-	1.2353
		CNA500	Cessna 500 Citation I	0.0196	-	-	0.0196	0.0589	-	0.0980
		CNA510	Cessna Citation Mustang	0.2141	0.0076	0.2217	-	-	-	0.4435

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Aircraft Category	Engine	AEDT Type	Aircraft Description	Arrivals		Departures		Circuits		Total
				Day	Night	Day	Night	Day	Night	
		CNA525C	Cessna 525 CitationJet	1.6564	0.0913	1.6579	0.0898	-	-	3.4955
		CNA55B	Cessna 550 Citation II	2.9522	0.6803	2.9998	0.6326	1.0012	-	8.2661
		CNA560E	Cessna 560 Citation V	0.0130	-	0.0130	-	-	-	0.0261
		CNA560U	Cessna 560 Citation V	0.3587	0.0130	0.3717	-	-	-	0.7434
		CNA560XL	Cessna 560 Citation XLS	0.3195	0.0065	0.3261	-	-	-	0.6521
		CNA680	Cessna 680 Citation Sovereign	0.1891	-	0.1891	-	-	-	0.3782
		CNA750	Cessna 750 Citation X	1.6304	0.0913	1.6271	0.0945	0.1649	-	3.6082
		ECLIPSE500	Eclipse 500	0.0652	-	0.0580	0.0072	-	-	0.1304
		EMB145	Embraer ERJ145	0.0326	-	0.0326	-	-	-	0.0652
		FAL20	Dassault Falcon 20	0.1301	0.0068	0.1239	0.0130	0.0236	-	0.2975
		GIIB	Gulfstream II-B	0.0196	-	0.0196	-	-	-	0.0391
		GIV	Gulfstream IV	0.2868	0.0067	0.2804	0.0130	0.0118	-	0.5987
		GV	Gulfstream V	0.6261	0.1304	0.7304	0.0261	-	-	1.5130
		IA1125	Gulfstream G100	1.1400	0.1186	1.1999	0.0587	0.1531	-	2.6704
		LEAR25	LearJet 25	0.0196	-	0.0196	-	-	-	0.0391
		LEAR35	LearJet 35	2.7537	0.1679	2.7194	0.2022	0.2591	-	6.1023
		MU3001	Mitsubishi MU-300/Raytheon Beechjet 400	0.5348	0.0130	0.5107	0.0371	5.2300	-	6.3256
	Piston Prop	BEC58P	Beechcraft Baron	4.9889	0.1239	5.0445	0.0683	21.9567	-	32.1823
		CNA172	Cessna 172 Skyhawk	6.7497	0.2022	6.8561	0.0957	33.5359	-	47.4395
		CNA182	Cessna 182 Skylane	1.4797	0.1245	1.5847	0.0196	1.8494	-	5.0579
		CNA206	Cessna 206 Stationair	0.1289	0.0081	0.1369	-	0.0236	-	0.2975
		COMSEP	Generic Composite Single - Engine Piston Propeller General Aviation Aircraft	1.7217	0.0456	1.7103	0.0570	0.5890	-	4.1236
		GASEPF	Generic General Aviation Single- Engine Fixed Pitch Propeller	1.1217	0.0065	1.1158	0.0124	10.1538	-	12.4102
		GASEPV	Generic General Aviation Single- Engine Variable Pitch Propeller	6.0323	0.1239	6.0125	0.1437	16.1259	-	28.4384
		PA28	Piper PA-28 Cherokee	1.2195	0.0326	1.2279	0.0242	-	-	2.5042
		PA30	Piper PA-30 Twin Comanche	0.8397	0.0668	0.6847	0.2217	-	-	1.8129
	Turboprop	1900D	Raytheon Beech 1900	0.0978	-	0.0978	-	-	-	0.1956
		CNA208	Cessna Caravan	1.9108	0.0652	1.9231	0.0529	1.2368	-	5.1888
		CNA441	Cessna 441 Conquest	0.1239	-	0.1239	-	0.0825	-	0.3303
		DHC6	DeHaviland Twin Otter	1.2912	0.0261	1.2290	0.0884	0.2827	-	2.9174
		DHC830	DeHaviland Dash 8-300 Series	0.0261	-	0.0261	-	-	-	0.0522
General Aviation Total				**49.3063**	**3.7910**	**49.8697**	**3.2276**	**115.1315**	**-**	**221.3260**
Grand Total				**54.8016**	**3.8655**	**55.3477**	**3.3194**	**116.8986**	**-**	**234.2329**

Notes:
Totals may not match exactly due to rounding
Circuits are counted as two operations

In addition to aircraft flight operations, aircraft maintenance runups occur at MTN. AEDT requires aircraft maintenance runup details be included as inputs, including location, direction, aircraft type, power settings, and frequency of maintenance runups. The detailed breakdown of maintenance runups for civilian operators at MTN was determined based on surveys completed by MTN operators. Military runups were estimated from information supplied and validated by the MDANG. Civilian and military maintenance runup activity at MTN for 2019 are reported in Table 8.

Anticipated five-year and ten-year MTN civilian and military maintenance runup activity is not expected to change from the 2019 base year inputs and future year contours also utilize the values in Table 8.

Table 8. Modeled Average Daily Aircraft Runups for 2019, 2025, and 2030

AEDT Type	Aircraft Description	Site Name	Latitude (degrees)	Longitude (degrees)	Magnetic Heading (degrees)	Number of Runups	Duration per Runup (sec.)	Approximate Power Setting (% of Takeoff Thrust/RPM)
A-10A	Fairchild A-10A Thunderbolt II	Ramp	39.335324	-76.42110	360º	2.9014	150	85%
		Trim pad	39.327734	-76.41256	330º	0.0493	300	94%
		Test cell	39.328166	-76.41154	330º	0.0192	900	100%
CNA172	Cessna 172 Skyhawk	Maintenance Runup 1	39.328256	-76.41953	015º	0.1370	60	80%
CNA172	Cessna 172 Skyhawk	Maintenance Runup 2	39.328256	-76.41953	205º	0.1425	60	80%

Source: MDANG and MTN Operators

3.3 Aircraft Noise and Performance Characteristics

Specific noise and performance data must be entered into AEDT for each aircraft type operating at MTN. 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, that 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, which includes both civilian and military aircraft. AEDT automatically accesses the noise and performance data for takeoff, landing, and circuit operations by aircraft included in the database.

All civilian fixed-wing aircraft, helicopter arrivals and departures, and military arrivals and departures modeled for the MTN ANZ update utilized the standard aircraft noise and performance data contained within the AEDT database. For helicopter circuit operations, a custom profile for the R22 helicopter type was developed because the AEDT database does not contain a standard profile for R22 circuit operations. The custom profile combines the standard AEDT R22 arrival and departure profiles. For military circuit operations, the A-10 aircraft circuit profile as developed by the Air Force Civil Engineer Center (AFCEC) was utilized. This profile was originally developed using a different noise modeling software, NOISEMAP, for the 2005 MTN Base Realignment and Closure Actions Act (BRAC) Study. The 2005 BRAC study was also used as the basis for modeling A-10 circuit operations in the prior 2012 MTN ANZ update. After validation by MDANG, the same inputs were derived from the NOISEMAP standard A-10 circuit profiles from the 2012 MTN ANZ update. These inputs were then used in AEDT to model A-10 circuit operations for this MTN ANZ update.

Within the AEDT database, aircraft takeoff or departure profiles are usually defined by a range of trip distances identified as "stagelengths." A longer trip distance or higher stagelength 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 (Nm) would be assigned a stagelength value of one, where a departure aircraft with a trip distance of 3,000 Nm would be assigned a stagelength value of five. Stagelength determinations were obtained from aircraft departure data obtained from the MDOT MAA ANOMS. Table 9 gives the stagelength classifications by their associated trip distances. Stagelength distributions are only applied to General Aviation and Air Taxi aircraft. Military aircraft were assigned a stagelength value of one, as there was insufficient data to determine trip distances for military operations and these operations were not included in data obtained from the MDOT MAA ANOMS. Table 10 presents the modeled stagelength use percentages for departures for the 2019 base year. Anticipated five-year and ten-year MTN civilian and military performance characteristics are not expected to change from the 2019 base year and therefore also reflect the values listed in Table 10.

Table 9. Stagelengths by Trip Distance

Stagelength	Trip Distance (Nm)
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 10. Modeled Air Taxi and General Aviation Departure Stagelength Usage by Aircraft Type

AEDT Type	Aircraft Description	Stagelength						
		Day				Night		
		1	2	4	5	1	2	4
1900D	Raytheon Beech 1900	100.0%	-	-	-	100.0%	-	-
BD-700-1A10	Bombardier Global Express	58.5%	9.8%	17.1%	14.6%	83.3%	-	16.7%
BD-700-1A11	Bombardier Global 5000 Business	60.0%	20.0%	-	20.0%	-	-	-
BEC58P	Beechcraft Baron	100.0%	-	-	-	100.0%	-	-
CIT3	Cessna 650 Citation III	100.0%	-	-	-	-	-	-
CL600	Bombardier Challenger 600	100.0%	-	-	-	100.0%	-	-
CL601	Bombardier Challenger 601	100.0%	-	-	-	100.0%	-	-
CNA172	Cessna 172 Skyhawk	100.0%	-	-	-	100.0%	-	-

AEDT Type	Aircraft Description	Stagelength						
		Day				Night		
		1	2	4	5	1	2	4
CNA182	Cessna 182 Skylane	100.0%	-	-	-	100.0%	-	-
CNA206	Cessna 206 Stationair	100.0%	-	-	-	100.0%	-	-
CNA208	Cessna Caravan	100.0%	-	-	-	100.0%	-	-
CNA441	Cessna 441 Conquest	100.0%	-	-	-	100.0%	-	-
CNA500	Cessna 500 Citation I	-	-	-	-	100.0%	-	-
CNA510	Cessna Citation Mustang	100.0%	-	-	-	100.0%	-	-
CNA525C	Cessna 525 CitationJet	100.0%	-	-	-	100.0%	-	-
CNA55B	Cessna 550 Citation II	100.0%	-	-	-	100.0%	-	-
CNA560E	Cessna 560 Citation V	100.0%	-	-	-	-	-	-
CNA560U	Cessna 560 Citation V	100.0%	-	-	-	100.0%	-	-
CNA560XL	Cessna 560 Citation XLS	100.0%	-	-	-	100.0%	-	-
CNA680	Cessna 680 Citation Sovereign	100.0%	-	-	-	100.0%	-	-
CNA750	Cessna 750 Citation X	100.0%	-	-	-	100.0%	-	-
COMSEP	Generic Composite Single - Engine Piston Propeller General Aviation Aircraft	100.0%	-	-	-	100.0%	-	-
DHC6	DeHaviland Twin Otter	100.0%	-	-	-	100.0%	-	-
DHC830	DeHaviland Dash 8-300 Series	100.0%	-	-	-	-	-	-
ECLIPSE500	Eclipse 500	100.0%	-	-	-	50.0%	50.0%	-
EMB145	Embraer ERJ145	100.0%	-	-	-	-	-	-
FAL20	Dassault Falcon 20	100.0%	-	-	-	100.0%	-	-
GASEPF	Generic General Aviation Single-Engine Fixed Pitch Propeller	100.0%	-	-	-	100.0%	-	-
GASEPV	Generic General Aviation Single-Engine Variable Pitch Propeller	100.0%	-	-	-	100.0%	-	-
GIIB	Gulfstream II-B	100.0%	-	-	-	-	-	-
GIV	Gulfstream IV	100.0%	-	-	-	100.0%	-	-
GV	Gulfstream V	100.0%	-	-	-	100.0%	-	-
IA1125	Gulfstream G100	100.0%	-	-	-	100.0%	-	-
LEAR25	LearJet 25	100.0%	-	-	-	-	-	-
LEAR35	LearJet 35	100.0%	-	-	-	100.0%	-	-
MU3001	Mitsubishi MU-300/Raytheon Beechjet 400	100.0%	-	-	-	100.0%	-	-

AEDT Type	Aircraft Description	Stagelength						
		Day				Night		
		1	2	4	5	1	2	4
PA28	Piper PA-28 Cherokee Series	100.0%	-	-	-	100.0%	-	-
PA30	Piper PA-30 Twin Comanche	100.0%	-	-	-	100.0%	-	-

3.4 Runway Utilization

The primary factor affecting runway and helipad use at airports is weather, in particular, the wind direction and wind speed. Additional factors that may affect runway use include the position of the facility or ramp relative to the runways or operational proficiency training for military units.

Based on calendar year 2018 data derived from the MDOT MAA ANOMS and information supplied by the MDANG, the overall runway usage tables for MTN were compiled by operation types: arrival, departure, or circuit; and time of day: day or night. Since actual radar tracks are used in the modeling process, these utilization rates were adapted and applied in the AEDT modeling process. Table 11 and Table **12** present the runway and helipad utilization rates used for modeling the 2019 base year operations. Military helicopters exclusively use the HML helipad. Anticipated five-year and ten-year MTN civilian and military runway or helipad utilization are not expected to change from the 2019 base year percentages as shown in Table 11 and Table 12.

Table 11. Fixed Wing Runway Utilization Percentages

Aircraft Category	Operation Mode	Runway	
		15	33
Air Taxi	Arrivals	44.8%	55.2%
	Departures	42.1%	57.9%
General Aviation	Arrivals	46.5%	53.5%
	Departures	42.4%	57.6%
	Circuits	47.8%	52.2%
Military	Arrivals	44.4%	55.6%
	Departures	44.4%	55.6%
	Circuits	100.0%	0.0%

Table 12. Helipad Utilization Percentages

Aircraft Category	Operation Mode	Helipad				
		HBP	HCP	HSP	HPC	HML
General Aviation	Arrivals	10.3%	42.7%	47.0%	0.0%	0.0%
	Departures	14.8%	38.7%	46.6%	0.0%	0.0%
	Circuits	0.0%	0.0%	0.0%	100.0%	0.0%
Military	All	0.0%	0.0%	0.0%	0.0%	100.0%

3.5 Flight Track Geometry and Use

To develop the MTN ANZ update flight tracks a preprocessor, RealContours software for AEDT™, was used to convert radar flight tracks to AEDT flight tracks. RealContours software for AEDT™ used individual flight tracks taken directly from the MDOT MAA ANOMS rather than relying on consolidated, representative flight track data like common modeling methodologies do. The RealContours software for AEDT™ approach essentially eliminated the approximation associated with the use of a limited set of prototypical modeling tracks by applying the AEDT's modeling capabilities on a flight-by-flight basis. This provides the advantage of modeling each aircraft operation on the specific runway it used and at the actual time of day of the arrival or departure. RealContours software for AEDT™ created an AEDT study using the AEDT standard data in combination with operations to produce an AAD DNL contour. The methodology followed for the MTN ANZ update, including the use of RealContours software for AEDT™, has been used for a variety of FAA-funded and reviewed airport noise studies.

Figure 3 and Figure 4 provide density plots of all modeled fixed-wing arrival and departure flight tracks. Flight track density plots represent generalized depictions of the flight tracks and operations used to develop both the base year and future year contours. The plots demonstrate where the majority of aircraft typically fly when arriving or departing MTN. They also allow for the presentation of comparative information over an extended period of time by using thousands of actual aircraft flight tracks. Rather than presenting every individual track, the plots use color gradations to depict the frequency of aircraft operations over extended time periods. The figures summarize the flight track geometry, dispersion, and the frequency of aircraft operations by using a uniform color gradient scheme based on the relative density of the traffic. The "warmer" red colors indicate areas where the most aircraft operations occurred and the "cooler" blue colors indicate the areas where the fewest aircraft operations occurred given the flight track data described above.

For all helicopter and fixed-wing circuit operations at MTN, model tracks were developed using a standard method. Model tracks were developed due to an insufficient amount of radar data available for these aircraft types in the MDOT MAA ANOMS and inconsistency in the track data nearby the airport at low altitudes due to limited radar coverage. The method requires analysis of calendar year 2018 radar data, as derived from the MDOT MAA ANOMS, in order to split the flight tracks into similar and manageable groups. Model tracks were created by first separating radar 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 northeast, south, or west. Finally, radar flight tracks were analyzed and split into groups according to their degree of similar geometry.

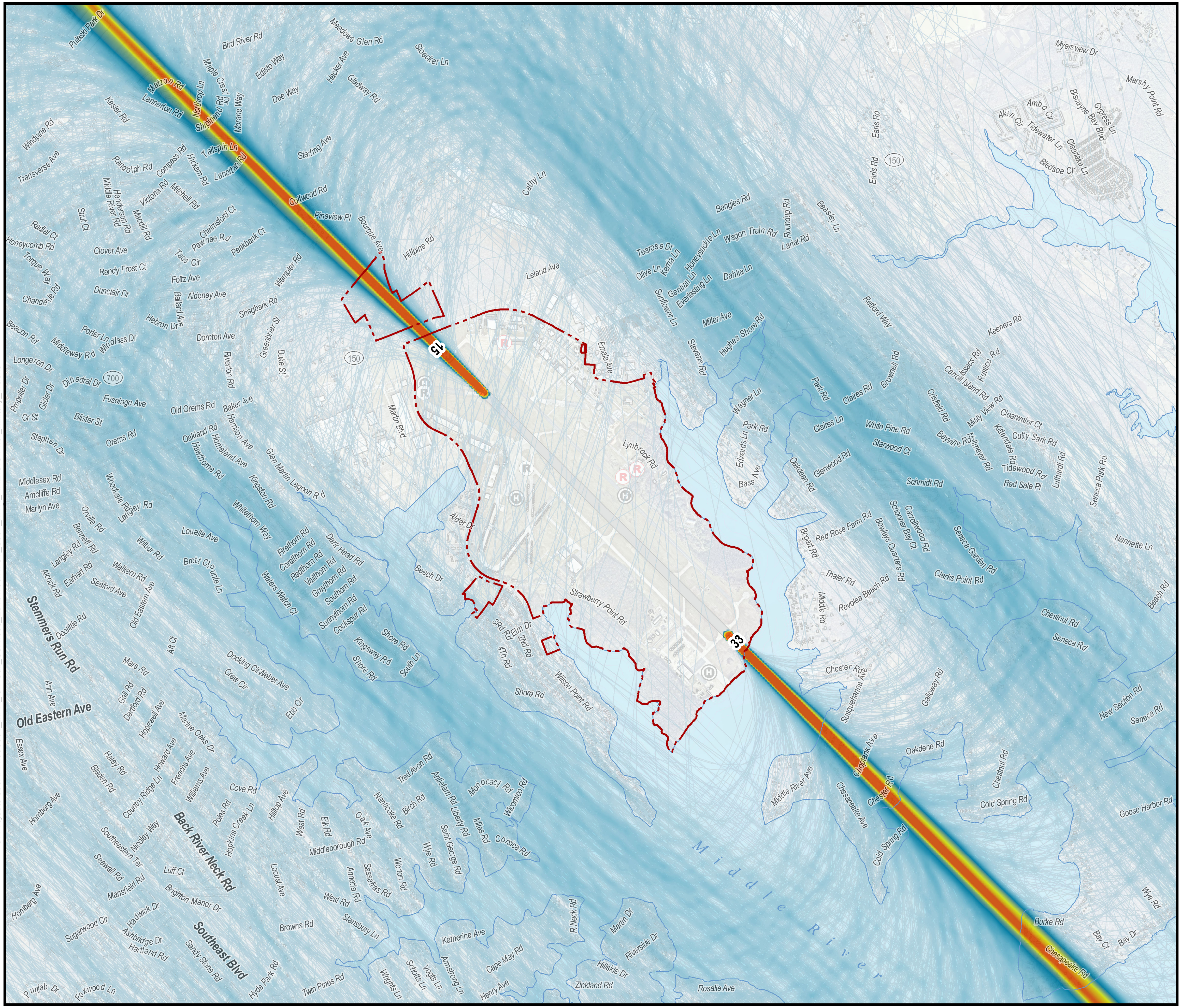
For military operations at MTN, model tracks were estimated from information supplied and validated by the MDANG. Figure 5 through Figure 11 show the developed model tracks layered over the airport base map for fixed-wing circuit, all helicopter, and all military operations, respectively.

Each model track was assigned a unique name based on the associated runway or helipad, aircraft type, type of operation, and direction associated with each model track. The relative ratio of flight track usage was preserved according to those ratios in the entire radar dataset for fixed-wing circuit and helicopter operations. For military operations, track utilization was estimated from information validated by the MDANG. Anticipated five-year and ten-year MTN civilian and military flight track geometry and utilization are not expected to change from the 2019 base year.

MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 3
Modeled Civilian Fixed-Wing Arrival Flight Tracks



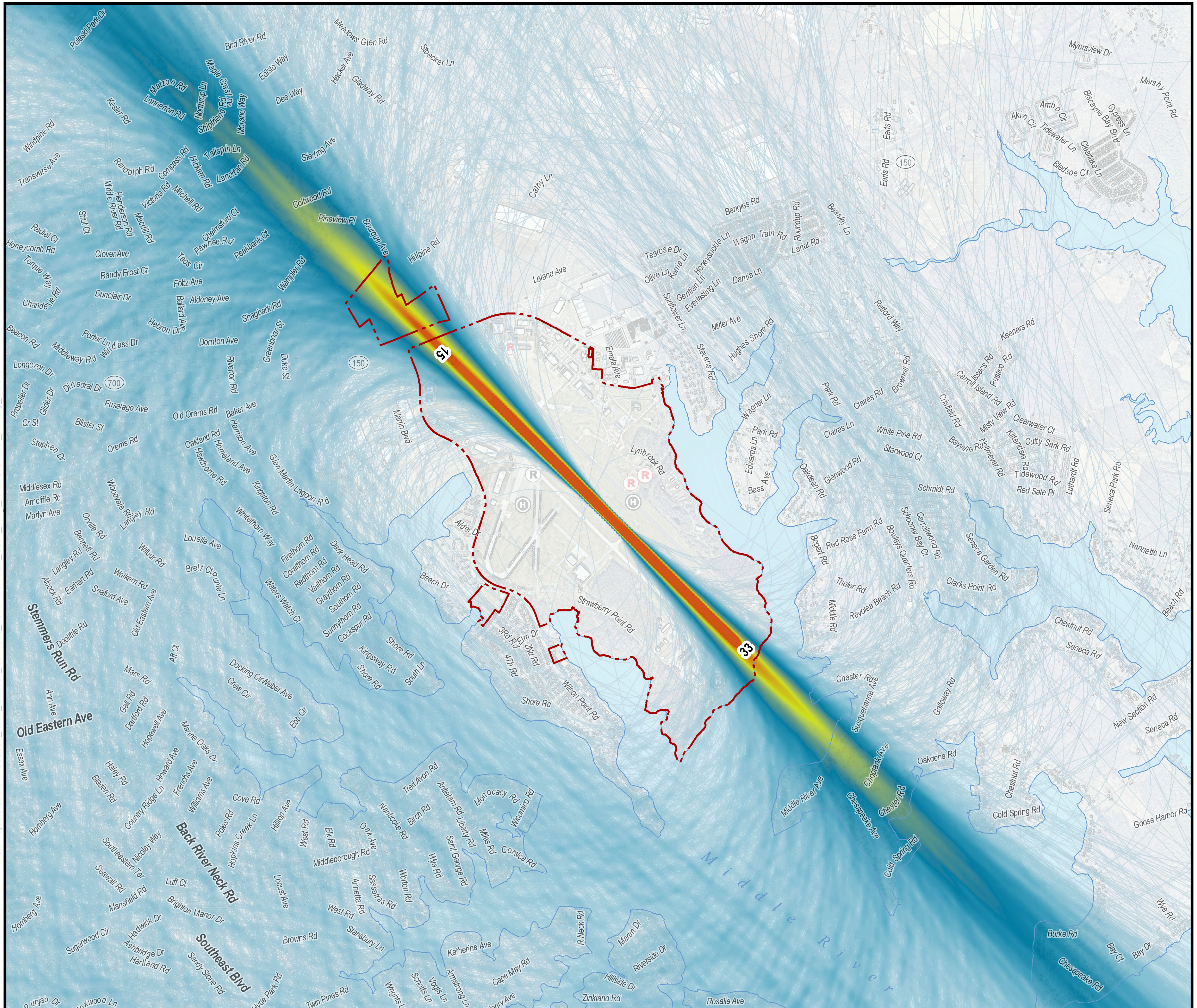
Helicopter Operation Area
Civilian Runup Locations
Civilian Runway
Airport Boundary
Roads
Buildings
Military Runup Location
Additional Runway Available for Military Operations
Railroad
Stream / Creek

Flight Track Density - 7,531 Flight Tracks

Low | Medium | High

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

0 | 2,000 | 4,000 Feet



MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 4

Modeled Civilian Fixed-Wing Departure Flight-Tracks

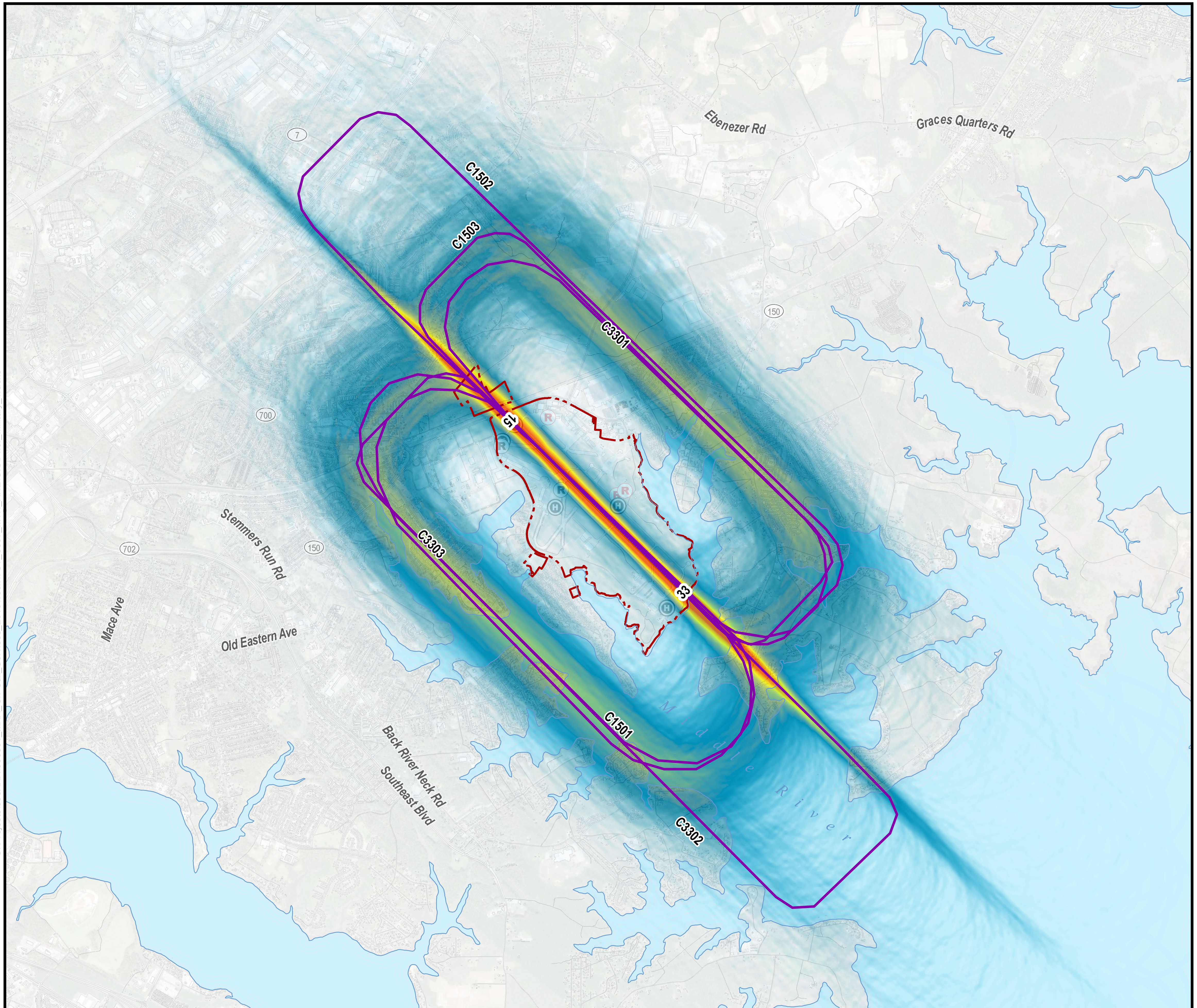
- Helicopter Operation Area
- Military Runup Location
- Civilian Runup Locations
- Civilian Runway
- Additional Runway Available for Military Operations
- Airport Boundary
- Roads
- Railroad
- Stream / Creek
- Buildings

Flight Track Density - 6,768 Flight Tracks

Low | Medium | High

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

0 | 2,000 | 4,000 Feet



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MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 5

Modeled Civilian Fixed-Wing Circuit Flight Tracks

- Modeled Civilian Fixed-Wing Circuit Flight Tracks
- Airport Boundary
- Helicopter Operation Area
- Military Runup Location
- Civilian Runup Locations
- Civilian Runway
- Additional Runway Available for Military Operations
- Roads
- Railroad
- Stream / Creek
- Buildings

Flight Track Density - 10,098 Flight Tracks

Low | Medium | High

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

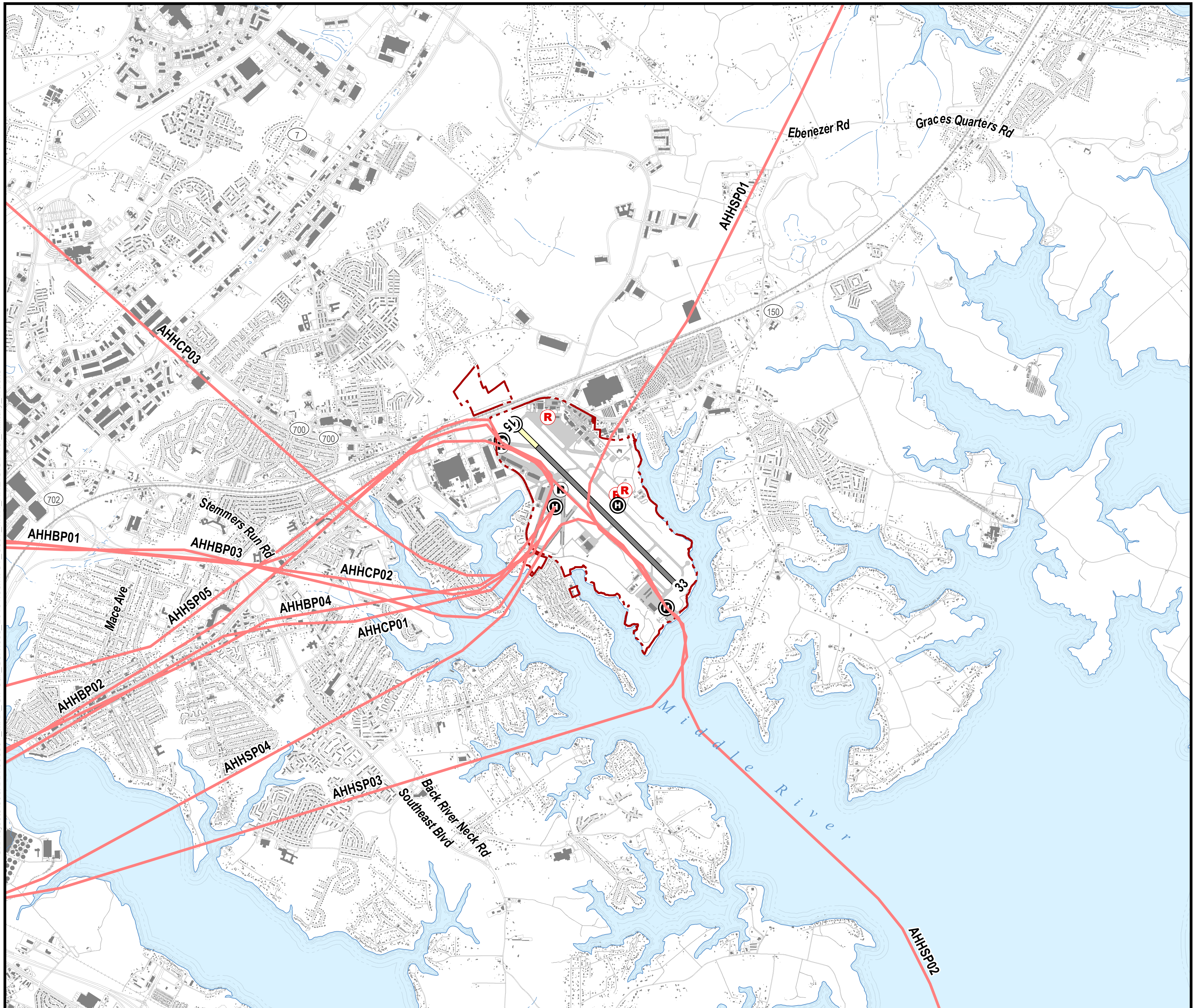
0 | 4,000 | 8,000 Feet

MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 6

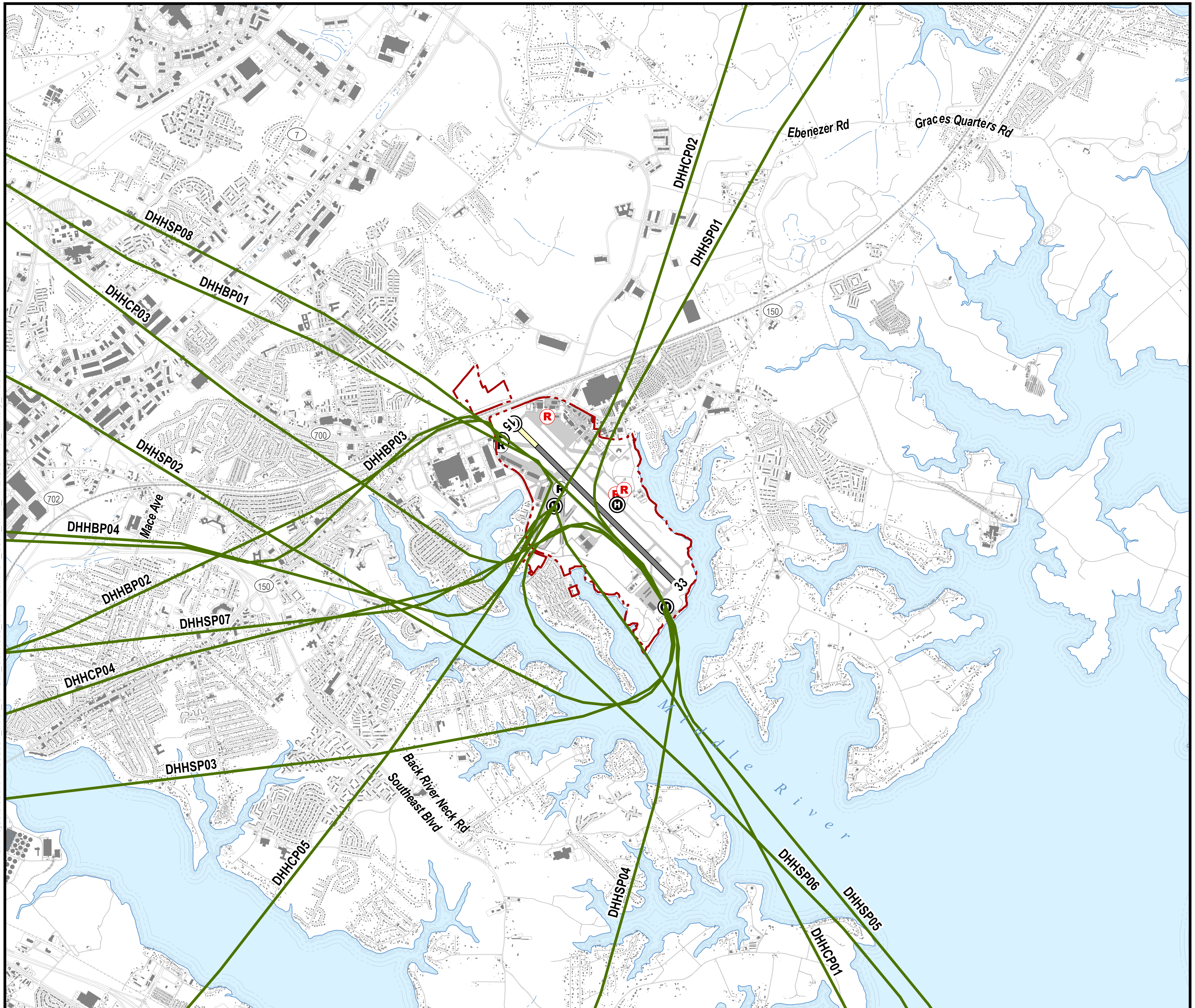
Modeled Civilian Helicopter Arrival Flight Tracks



- Modeled Civilian Helicopter Arrival Flight Tracks
- Airport Boundary
- Helicopter Operation Area
- Military Runup Location
- Civilian Runup Locations
- Civilian Runway
- Additional Runway Available for Military Operations
- Roads
- Railroad
- Stream / Creek
- Buildings

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

0 4,000 8,000 Feet



MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 7
Modeled Civilian Helicopter Departure Flight Tracks

Modeled Civilian Helicopter Departure Flight Tracks

Airport Boundary

Helicopter Operation Area

Military Runup Location

Civilian Runup Locations

Civilian Runway

Additional Runway Available for Military Operations

Roads

Railroad

Stream / Creek

Buildings

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

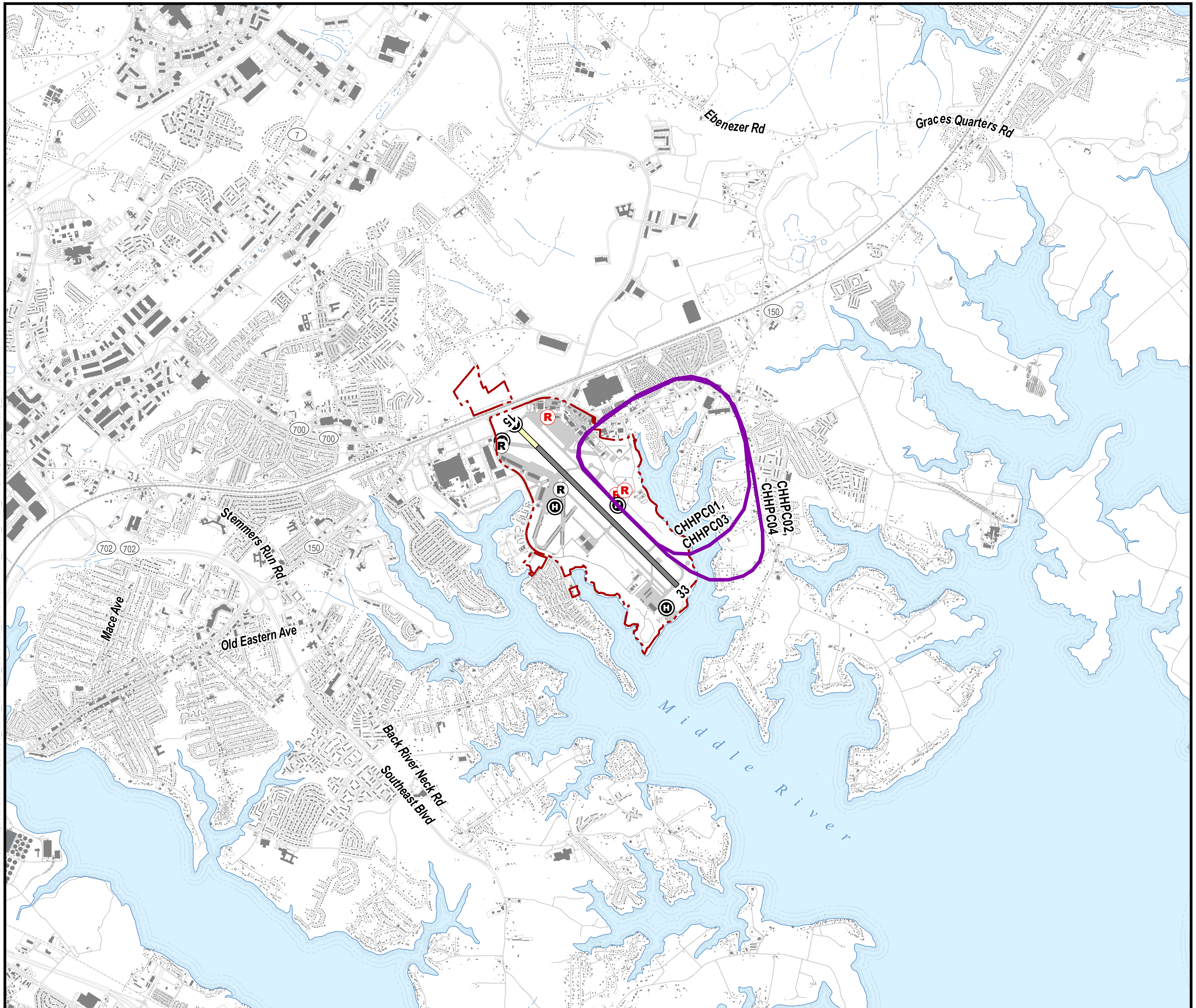
0 4,000 8,000 Feet

MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 8

Modeled Civilian Helicopter Circuit Flight Tracks



- Modeled Civilian Helicopter Circuit Flight Tracks
- Airport Boundary
- Helicopter Operation Area
- Military Runup Location
- Civilian Runup Locations
- Civilian Runway
- Additional Runway Available for Military Operations
- Roads
- Railroad
- Stream / Creek
- Buildings

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

0 4,000 8,000 Feet

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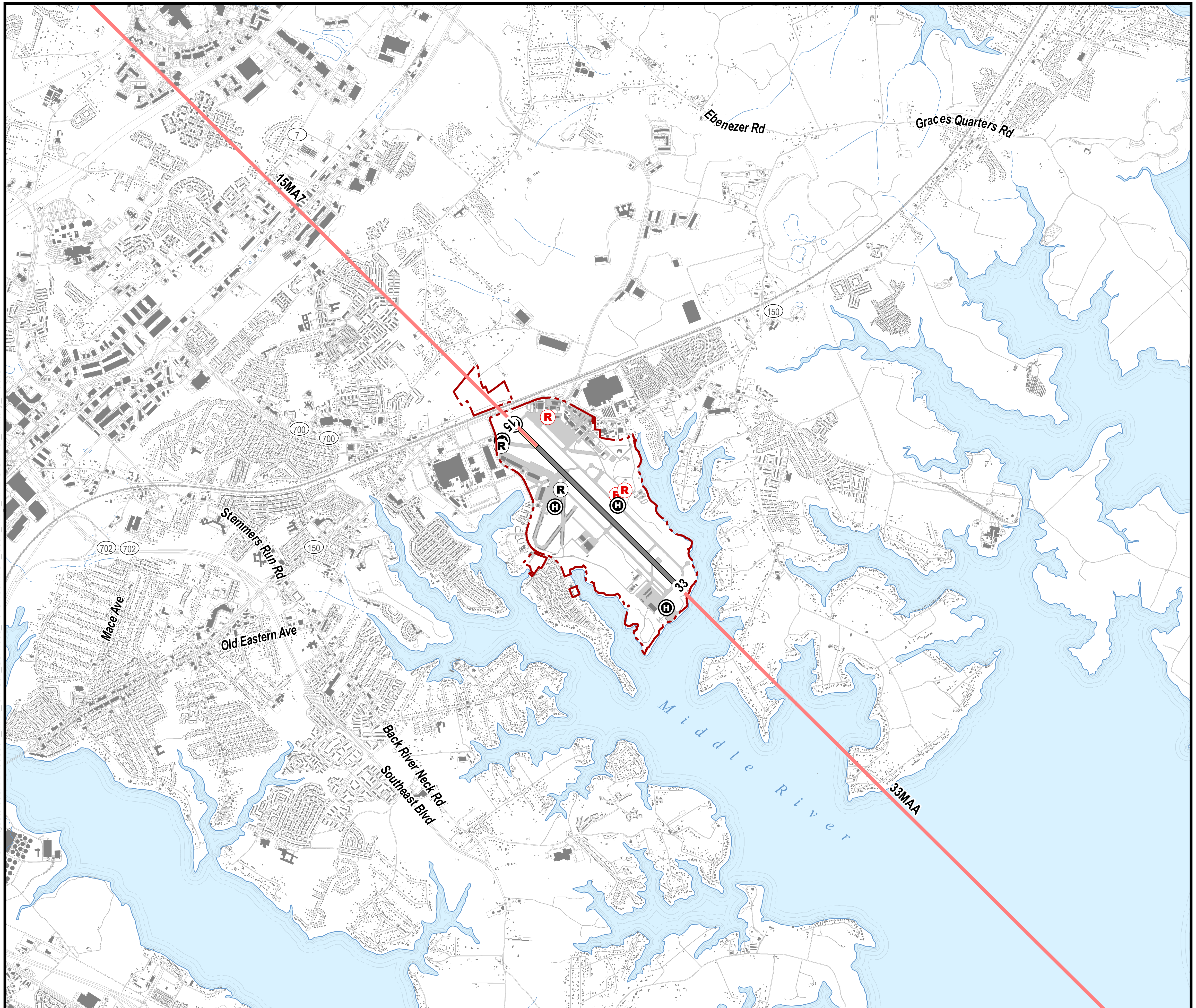


MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 9

Modeled Military Fixed-Wing and Helicopter Arrival Flight Tracks

Modeled Military Fixed-Wing and Helicopter Arrival Flight Tracks

Airport Boundary

Helicopter Operation Area

Military Runup Location

Civilian Runup Locations

Civilian Runway

Additional Runway Available for Military Operations

Roads

Railroad

Stream / Creek

Buildings

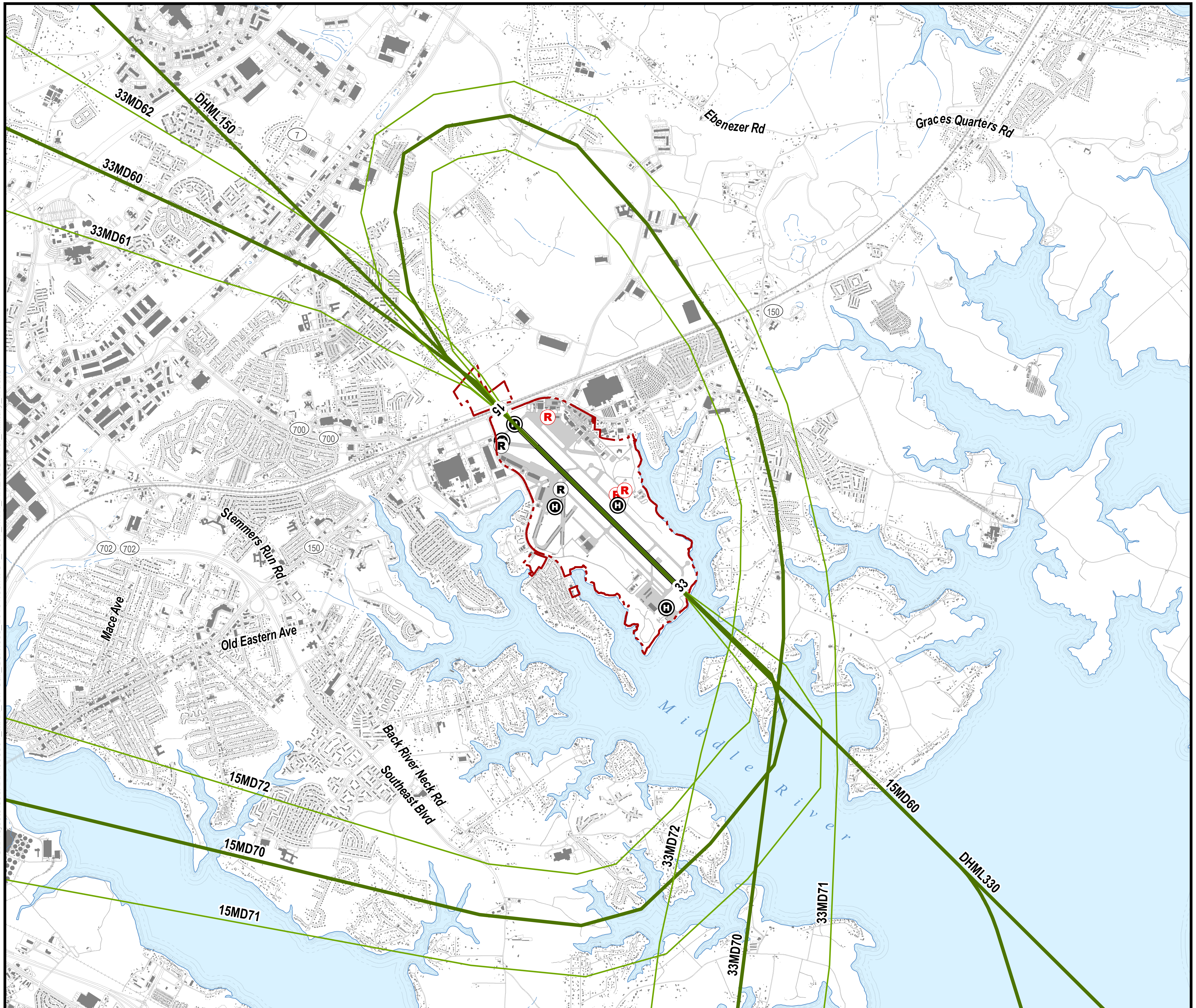
Data Sources: Baltimore County Government Open Data Portal; Environmental Systems Research Institute (ESRI); AirNav.com; HMMH

0 4,000 8,000 Feet

MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 10
Modeled Military Fixed-Wing and Helicopter Departure Flight Tracks



- Modeled Military Fixed-Wing and Helicopter Departure Flight Tracks (Backbone)
- Modeled Military Fixed-Wing and Helicopter Departure Flight Tracks (Dispersed)
- Airport Boundary
- Helicopter Operation Area
- Military Runup Location
- Civilian Runup Locations
- Civilian Runway
- Additional Runway Available for Military Operations
- Roads
- Railroad
- Stream / Creek
- Buildings

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

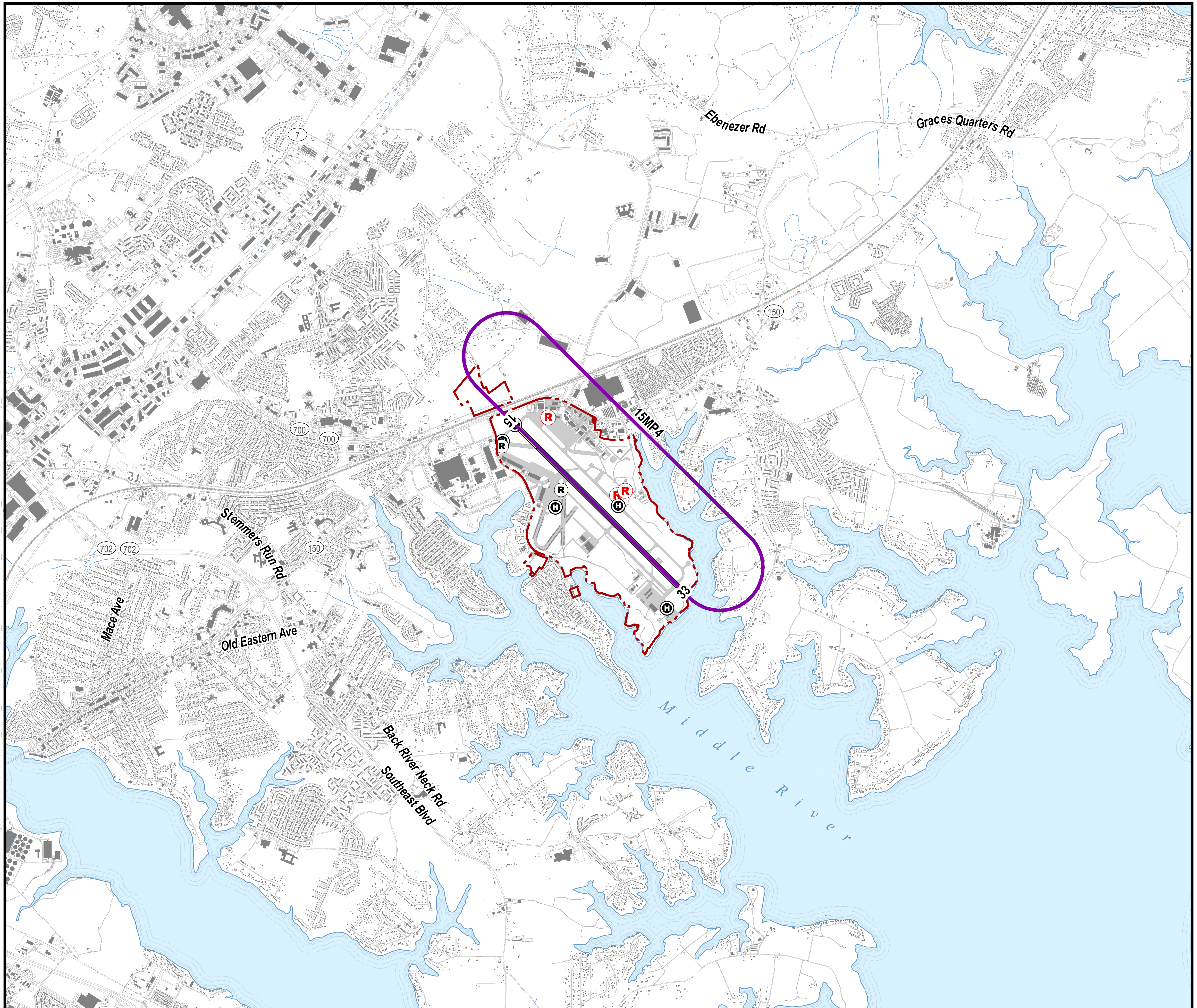
0 4,000 8,000 Feet

MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 11

Modeled Military Fixed-Wing Circuit Flight Tracks



Modeled Military Fixed-Wing Circuit Flight Tracks

Airport Boundary

Helicopter Operation Area

Military Runup Location

Civilian Runup Locations

Civilian Runway

Additional Runway Available for Military Operations

Roads

Railroad

Stream / Creek

Buildings

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

0 4,000 8,000 Feet

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 utilizes the following values for annual average weather conditions at MTN which are based on a 30-year average from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI)[7]:

- Temperature: 55° F
- Sea-level Pressure: 1017.75 millibars
- Relative Humidity 66.76%
- Dew Point: 45.82° F
- Wind Speed: 5.87 Knots

The AEDT annual average weather conditions values detailed above were used in AEDT for generating the base year noise contours for MTN. Since meteorological conditions are based on a 30-year average, the same values were used for the 2025 and 2030 inputs.

3.7 Terrain Data

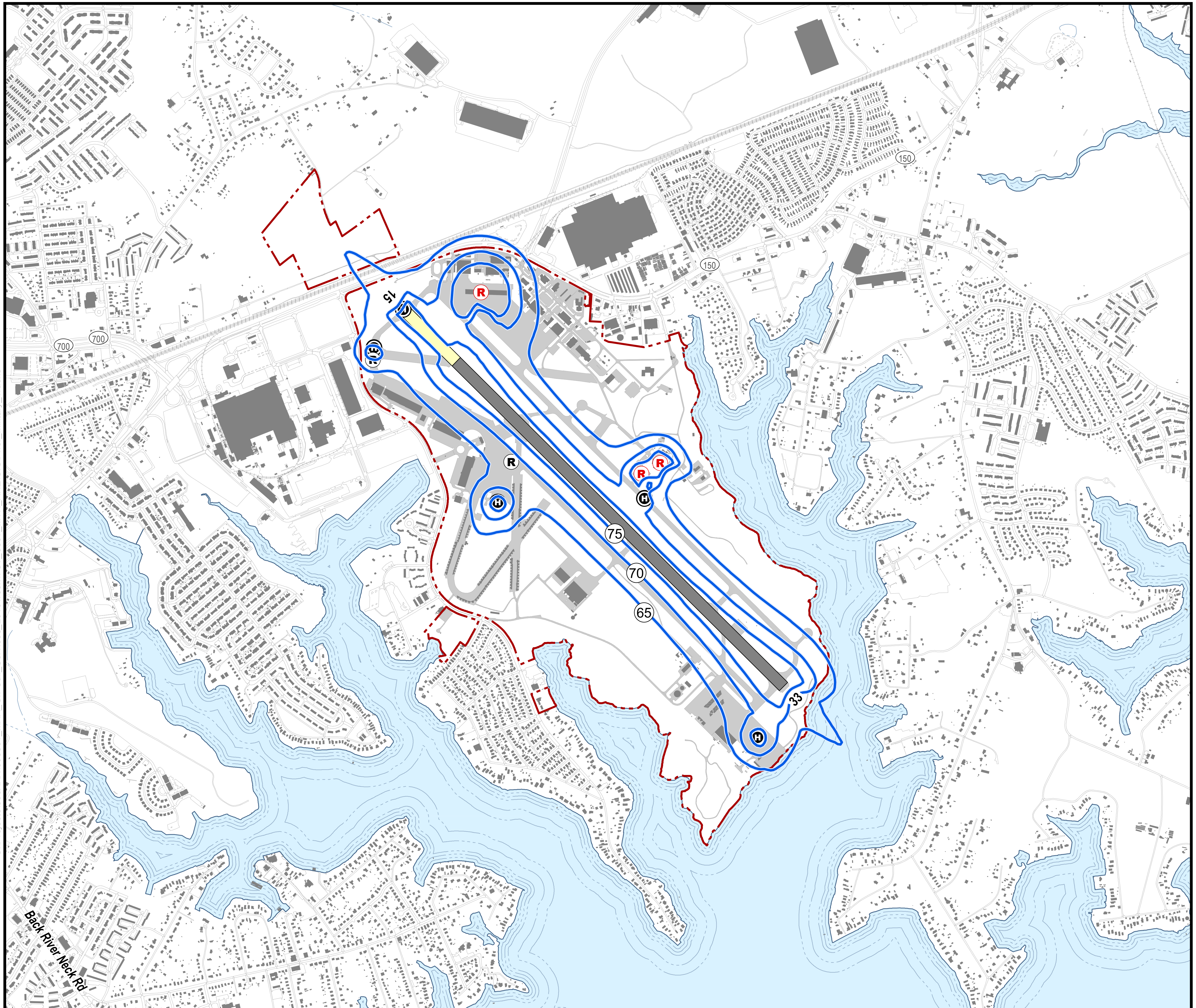
Terrain data describes the elevation of the ground surrounding the airport and on airport property. AEDT uses terrain data to set the ground level under the flight paths. The terrain data does not affect the aircraft's performance or noise levels, but it does affect the vertical distance between the 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 Viewer and were used in conjunction with the terrain feature of AEDT to generate the base year and future year noise contours for MTN.

[7] 1981-2010 U.S. Climate Normals, National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI), https://www.ncdc.noaa.gov/data-access/land-based-station-data/land-based-datasets/climate-normals/1981-2010-normals-data

4 Study Results

4.1 2019 Contours

Figure 12 presents the MTN 65, 70, and 75 dB DNL contours for the 2019 base year.



MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 12

2019 Base Year DNL Contours

2019 Base Year DNL Contours

Airport Boundary

Helicopter Operation Area

Military Runup Location

Civilian Runup Locations

Civilian Runway

Additional Runway Available for Military Operations

Roads

Railroad

Stream / Creek

Buildings

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

0 1,500 3,000 Feet

4.2 2025 and 2030 Forecast Contours

The MTN five-year (2025) and ten-year (2030) forecast contour sets were generated using AEDT 2d based on the input parameters detailed in Section 3, Noise Model Inputs. Figure 13 presents the 65, 70, and 75 dB DNL contours for the 2025 five-year forecast. Figure 14 presents the 65, 70, and 75 dB DNL contours for the 2030 ten-year forecast.

The 2025 and 2030 forecast contours shift to the northwest due to the changes in the future configuration of the Runway layout for Runway 15/33. The 65 dB DNL contour for the 2025 and 2030 forecast years continue to remain mostly on airport property consistent with the 2019 base-year.

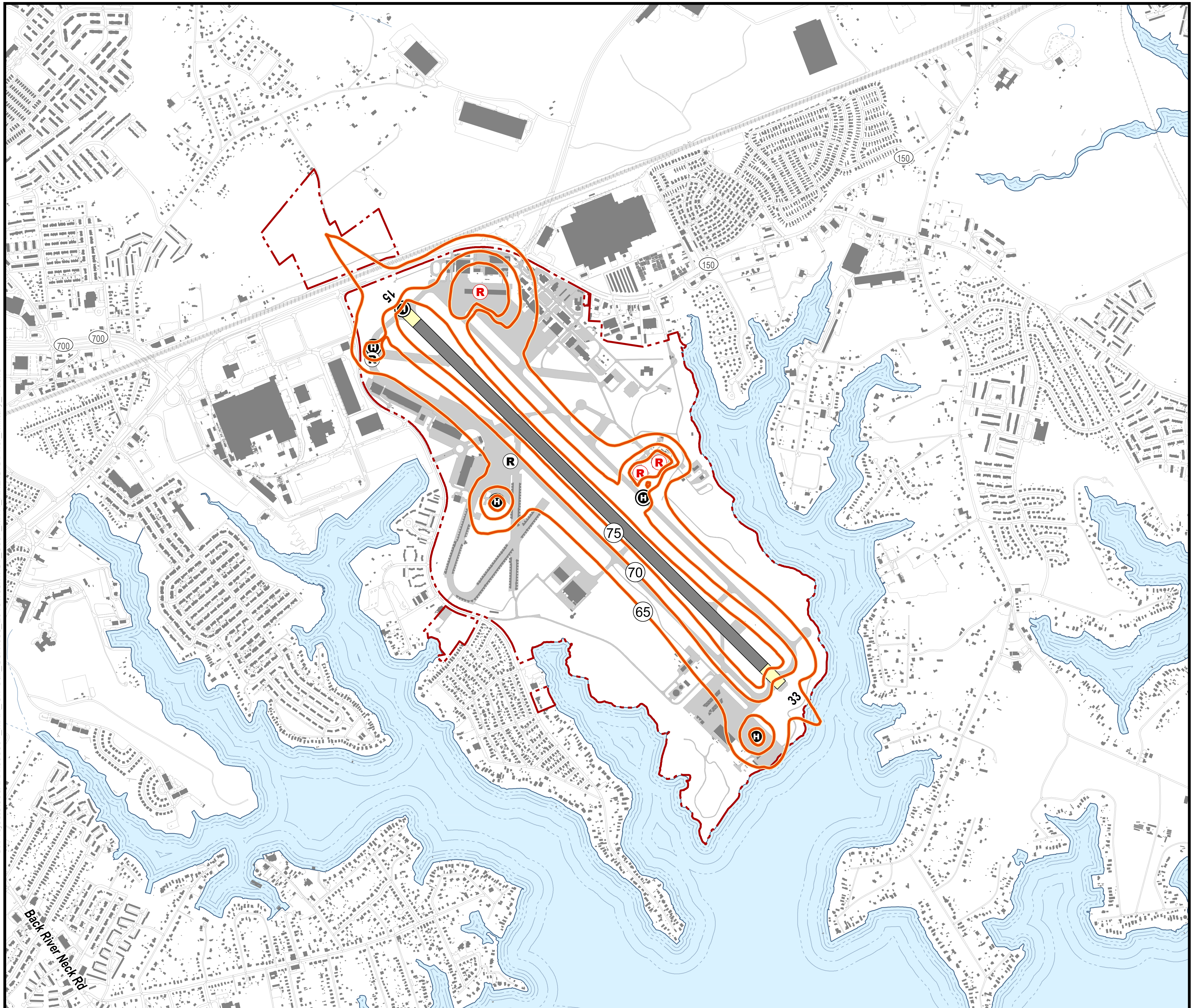
As described in Section 3.2, the operations and fleet mix are comparable between the 2025 and 2030 forecast years with the 2030 forecast year having approximately six more AAD operations than 2025, respectively. As such, the resulting contours appear similar for both forecast years.

MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 13

2025 Five-Year Forecast DNL Contours



2025 Five-Year Forecast DNL Contours

Airport Boundary

Helicopter Operation Area

Military Runup Location

Civilian Runup Locations

Civilian Runway (Future)

Additional Runway Available for Military Operations

Roads

Railroad

Stream / Creek

Buildings

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

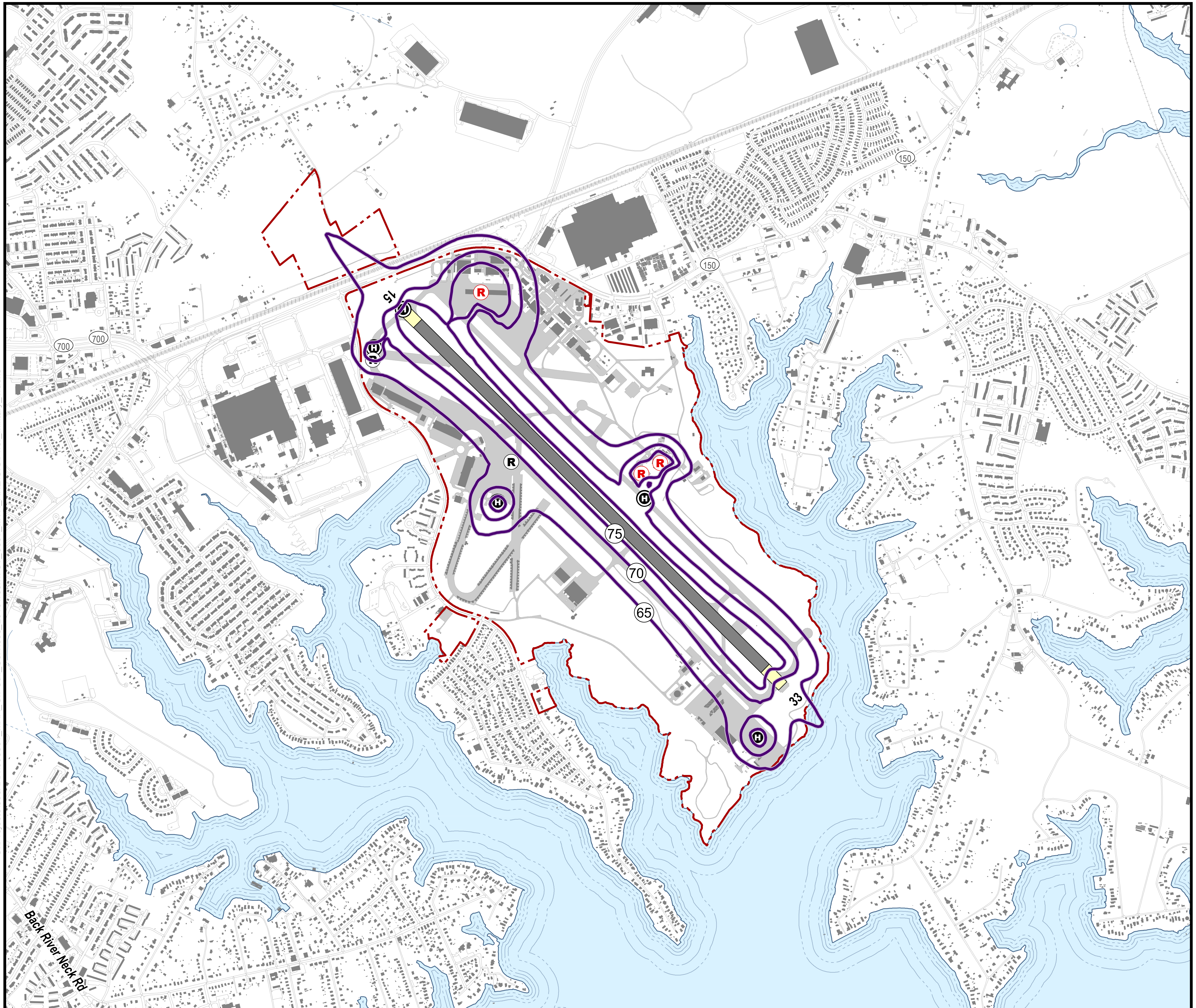
0 1,500 3,000 Feet

MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 14

2030 Ten-Year Forecast DNL Contours



2030 Ten-Year Forecast DNL Contours

Airport Boundary

Helicopter Operation Area

Military Runup Location

Civilian Runup Locations

Civilian Runway (Future)

Additional Runway Available for Military Operations

Roads

Railroad

Stream / Creek

Buildings

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

0 1,500 3,000 Feet

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4.3 2020 ANZ Contours

The 2020 MTN ANZ represents a composite of the 65, 70, and 75 dB DNL noise contours for three study years: the base year (2019) and two future years (2025 and 2030). 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.

Figure 15 presents the 65, 70, and 75 dB DNL contours for the 2020 ANZ DNL contour.

As was the case with the base and forecast contours, the 65 dB DNL contour for the 2020 ANZ continues to remain almost entirely on airport property (approximately 96%). The entire 411 acres of the 65 dB DNL contour for the 2020 ANZ remain over compatible land uses. The noise contour extends beyond airport property in three areas:

- An area approximately nine acres in size on the north side of the airport off of the approach end of Runway 15 over compatible land uses including portions of the Amtrak railroad track and Eastern Boulevard due to military maintenance runups of A10 aircraft on the Maryland Air National Guard ramp area,
- An area approximately one acre in size on the northwest side of the airport along Wilson Point Road off of the approach end of Runway 15 due to the Baltimore city Police helipad location and the addition of a civilian aircraft runup location; and
- An area approximately seven acres in size on the south side of the airport over Frog Mortar Creek off of the approach end of Runway 33 due to fixed wing arrival operations and helicopter activity at the Maryland State Police Helipad.

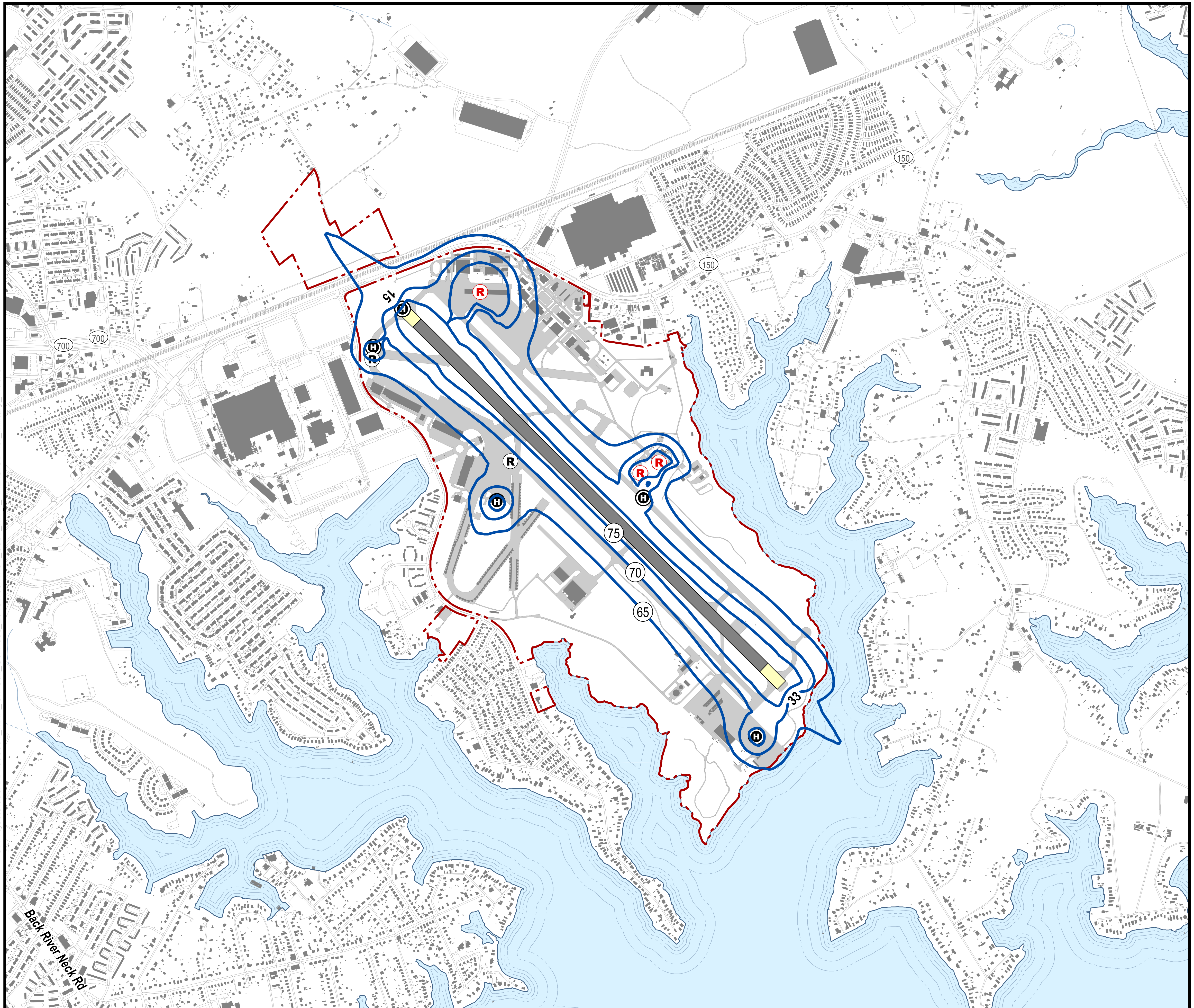
The 2030 forecast year contour dominates the overall extent of the 2020 ANZ contour due to projected higher operations levels. The one exception to this is the area immediately off the departure end of Runway 33 where aircraft operations are projected to shift to the northwest due to the changes in the future configuration of the runway layout for Runway 15/33 that currently is dominated by the 2019 base year contour.

MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 15

MTN ANZ Update 2020 ANZ Contours



- 2020 Airport Noise Zone DNL Contours
- Airport Boundary
- Helicopter Operation Area
- Military Runup Location
- Civilian Runup Locations
- Civilian Runway (Future)
- Additional Runway Available for Military Operations
- Roads
- Railroad
- Stream / Creek
- Buildings

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

0 1,500 3,000 Feet

4.4 Land Use Inventory

Land use within the 2020 ANZ DNL contour boundary as well as land use in the vicinity surrounding MTN was evaluated using geographic information system (GIS) analysis. Maryland law considers all land uses compatible below 65 dB DNL.

Land use analysis was based on data and graphics including, aerial photography, airport layout and property boundaries, and identification of undeveloped land acquired by MDOT MAA. Land use and zoning data was obtained from Baltimore County. HMMH overlaid the 2020 ANZ contours 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 16 presents the 2020 ANZ DNL contour in relation to land use surrounding MTN. The 2020 ANZ contour does not expose any residential population or acreage to noise levels at or greater than 65 dB DNL as presented in Table 13. The 2020 ANZ contains 411 acres, a 4% increase from the 394 acres contained within the 2012 ANZ. This can be attributed in part to increased operations and the future configuration of the Runway layout for Runway 15/33.

Table 13. Residential Population and Acreage within 2020 ANZ contour

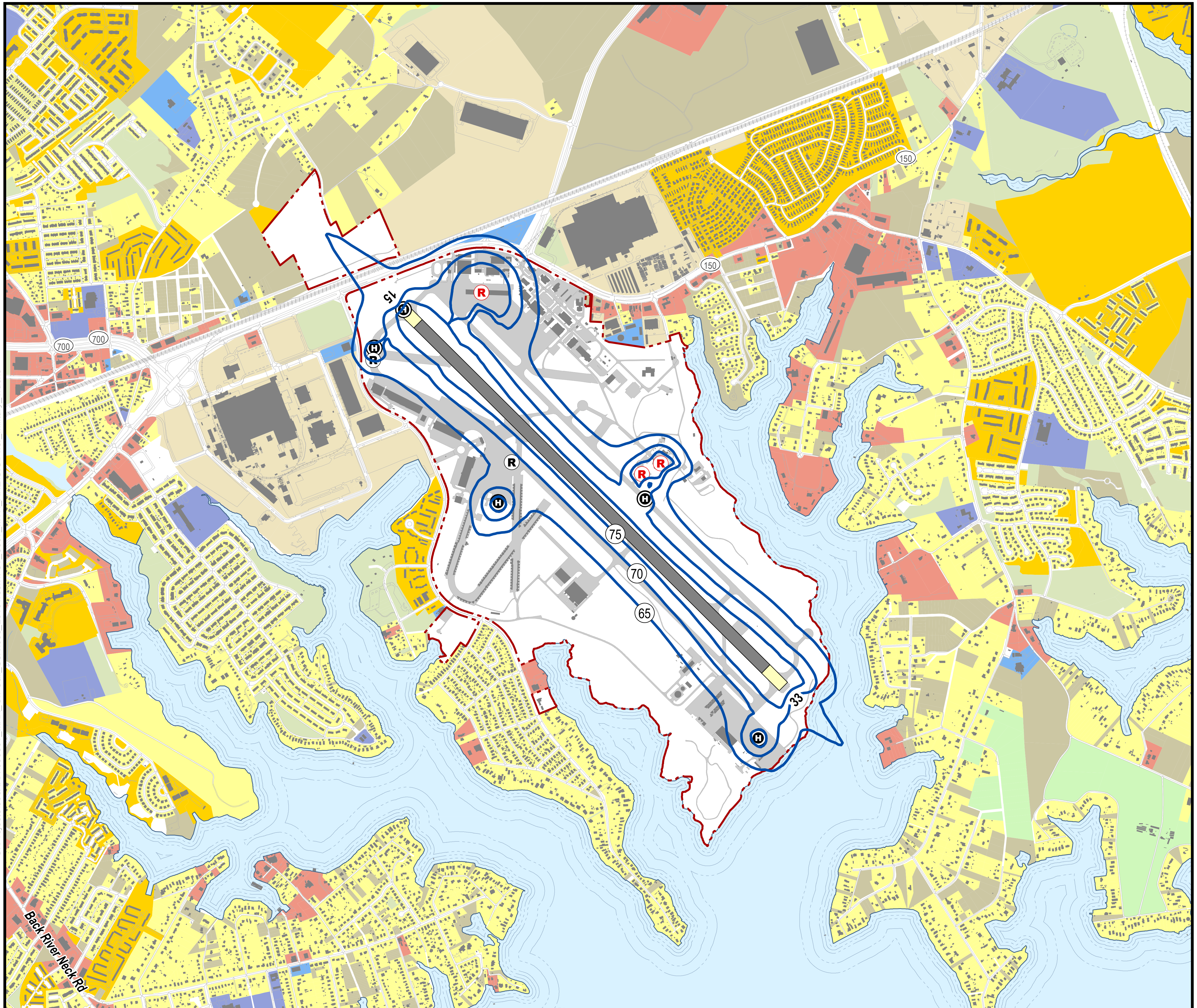
DNL Contour Interval	Residential Population	Residential Housing Units	Area (acres)
65-70 dB	0	0	198
70-75 dB	0	0	114
>75 dB	0	0	99
Total	0	0	411
Source: HMMH 2019			

MARTIN STATE AIRPORT

Airport Noise Zone Update

Figure 16

2020 MTN ANZ Contours Compared to Land Use



- 2020 Airport Noise Zone DNL Contours
- Airport Boundary
- Helicopter Operation Area
- Military Runup Location
- Civilian Runup Locations
- Civilian Runway (Future)
- Additional Runway Available for Military Operations
- Roads
- Railroad
- Stream / Creek
- Buildings
- Residential Use
- Recreational / Open Space
- Multi-Family Residential Use
- Commercial Use
- Mixed Use
- Manufacturing / Production
- Public Use (Non-Compatible)
- Vacant / Undeveloped
- Public Use (Compatible)
- Transportation / Utility
- Agriculture
- Water
- School
- Library
- Place of Worship
- Hospital / Health Care

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

0 1,500 3,000 Feet

5 Noise Abatement Plan

MARTIN STATE AIRPORT
NOISE ABATEMENT PLAN

Martin State Airport (MTN) is owned by the State of Maryland and operated by the Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA). Regulations regarding the Airport Noise Zone (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. The MTN 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.

In 1984 MTN adopted a NAP 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 Maryland Air National Guard (MDANG), airport users, the aviation industry, and local governments. It was updated in 1987 and reviewed with no changes as part of 2012 MTN ANZ Update. The NAP was reviewed and updated as part of the 2020 MTN ANZ update process in order to accurately reflect current operating conditions at MTN.

The NAP is formulated to minimize noise disturbance to neighboring communities while maintaining safe and efficient MTN Airport operations. The MDOT MAA Division of MTN Airport Operations is responsible for the overall administration of the MTN NAP, and the noise abatement procedures are reproduced in Martin State Airport Tenant Directive 501.1, which is distributed to all MTN tenants and is publicly available on MTN's website[8].

Per COMAR Section 11.03.02.10C(3)(b), the Maryland Air National Guard, the Maryland State Police, and local law enforcement agencies are exempt from the provisions of this regulation when operational necessity dictates noncompliance, or in the event of a State or national emergency.

The NAP is comprised of two parts; (1) the efforts MDOT MAA is taking to mitigate noise in the areas surrounding MTN, and (2) aircraft operating procedures.

NOISE MITIGATION EFFORTS

A. Airport Noise Zone (ANZ)

Maryland law requires the protection of citizens from the impact of transportation related noise. MDOT MAA is required to adopt an Airport Noise Zone (ANZ) that minimizes the impact of aircraft noise on people living near MTN and prevents incompatible land development around the airport.

[8] https://www.martinstateairport.com/content/airserv/directives.html

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

B. Control of Incompatible Development:

The State of Maryland regulates land use within the MTN ANZ. Anyone desiring to construct or modify a structure or land use is required to obtain an Airport Zoning Permit. An application can be obtained from the Baltimore County Office of Planning and Zoning or the MDOT MAA Office of Planning[9]. MDOT MAA is required by law to approve or deny zoning permits based on the location relative to the MTN ANZ and the compatibility standards listed in the chart below.

NOISE COMPATIBILITY STANDARDS	
Land Use	**Areas of 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: COMAR 11.03.03.03, Limits for Cumulative Noise Exposure. http://mdrules.elaws.us/comar/11.03.03.03	

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

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:

[9] https://www.marylandaviation.com/content/permitsandforms/constructionzoning/index.html

- 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.
- Agree to complete a post construction noise test to demonstrate that the house meets the required interior noise level of 45 dB.
- 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 MDOT 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 MTN Airport.

C. Noise Concerns:

MTN maintains telephone service to enable citizens to register noise-related complaints at any time 24 hours per day, 7 days a week. The telephone number is 410-682-8802. Complaints are investigated if appropriate and the complainant is provided with any relevant information.

Additionally, citizens can monitor MTN aircraft operations and register complaints utilizing MDOT MAA's WebTrak system (https://webtrak.emsbk.com/bwi3). WebTrak provides an interactive portal for the viewing of aircraft in the vicinity MTN as well as BWI Marshall and provides the opportunity to file noise complaints directly to MDOT MAA. WebTrak users can geolocate a place of interest (home, work, etc.) and view either current (30-minute delayed) or historical aircraft overflights. WebTrak includes an aircraft's type, altitude, origin & destination airports, and flight identification. Inquiries and complaints about aircraft flights at MTN submitted through WebTrak are passed to MTN Operations and Maintenance staff for review and follow-up. Note: WebTrak does not include data on military aircraft flights or operations due to reasons of national security.

D. Maryland Air National Guard (MDANG) Noise Barriers:

In 1989, MDANG erected noise barriers to provide reductions in noise impacts from engine maintenance activity for areas east and northeast of MTN.

E. Aircraft Maintenance Engine Run-up Areas

Aircraft maintenance engine run-ups are to be accomplished only in areas designated by the Chief, MTN Operations & Maintenance in accordance with MTN Tenant Directive 200.2.

MTN NOISE ABATEMENT PROCEDURES

A. Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) Departures

1. VFR Piston-engine Aircraft:

   Runway 15/33 – Unless otherwise instructed by Air Traffic Control (ATC), aircraft fly runway heading to 1000' Mean Sea Level (MSL) prior to turning to the ATC approved on-course heading or crosswind leg of the traffic pattern.

2. VFR Turbine Powered Aircraft:

Runway 15/33 – Unless otherwise instructed by ATC, aircraft shall fly runway heading to 1,500' MSL prior to turning to the ATC approved, on-course heading or crosswind leg of the traffic pattern.

3. VFR Helicopter Departures:

Unless operating under a Letter of Agreement (LOA) with MTN ATC specifying otherwise, helicopters shall climb to 500' AGL on initial departure heading before turning on-course.

4. All IFR Departures

IFR departures shall be accomplished in accordance with ATC direction or clearance.

B. VFR and IFR Arrivals and Traffic Patterns

VFR and IFR aircraft approach should, to the maximum extent feasible, maintain the highest practical altitude, commensurate with flight and ATC procedures in order to minimize aircraft noise exposure to communities underlying the final approach courses.

C. Closed Traffic Patterns

A left-hand traffic pattern shall be used at MTN unless otherwise directed by ATC. Piston fixed-wing aircraft should fly runway heading until reaching 1,000' MSL prior to turning to the crosswind leg of the traffic pattern. Turbine aircraft should fly runway heading until reaching 1,500'MSL prior to turning to the crosswind leg of the traffic pattern.

Traffic pattern altitudes are:

Fixed Wing	Piston engine	1,000' MSL
	Civil turbine and military turboprop	1,500' MSL
	Military Jet	2,000' MSL
Rotary Wing		500' MSL

D. Touch-and-Go or Practice Approaches

1. No touch-and-go and/or practice approaches or practice landings are permitted between 10:00 p.m. to 6:00 a.m. daily unless approved by MTN Operations and Maintenance staff.

2. Between 6:00 a.m. – 10:00 p.m. daily:

FAA Weight Class	Description	Weight	Limitation
Small	Small Single Engine/Twin Engine Aircraft, Helicopters, and Transient Military (e.g. Cessna 172, Piper Cherokee)	12,500 lbs. or less	No restrictions
Medium	Medium Aircraft and Transient Military* (e.g. military fighter jets, Learjet 35, Bombardier CRJ-200LR)	Between 12,500 and 41,000 lbs	Limit of two practice approaches
Large	Large Jet/Large Commuter/757/Heavy Aircraft	More than 41,000 lbs.	Practice approaches and landings are not authorized without prior permission from MTN Operations and Maintenance staff.
* Military aircraft shall be limited to two practice landings/take-offs or approaches unless additional operations are approved by MTN Operations and Maintenance staff. https://aspmhelp.faa.gov/index.php/Weight_Class			

6 Public Consultation

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

6.1 Stakeholder Advisory Committee (SAC)

The SAC included representatives of stakeholder groups affected by airport activities to ensure that these groups were informed of the 2020 MTN ANZ update process and methodology. Members of the SAC were invited to participate throughout the MTN ANZ update process by attending meetings and providing input. They were encouraged to share pertinent MTN ANZ update information with the groups or any interested citizens that they represent.

The SAC served in an advisory role to the MDOT MAA solely for purposes of the MTN ANZ update process. The SAC is composed of stakeholders representing all significant interests at MTN:

- Local government planning staff
- Community organizations
- MTN tenants and users
- Aviation trade associations

MDOT 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 NAP. SAC members were asked to review the land use inventory and planning considerations.

The SAC was convened twice during the ANZ update process. Both meetings were held in Hangar 4 at MTN. The first meeting was held September 12, 2019. During the first meeting MDOT MAA presented the purpose and objectives of the update process, along with preliminary planning parameters and noise modeling inputs. At the second meeting, held January 14, 2020, additional background information was presented to the SAC. The presentation covered results of the modeling process, including the resulting contours and land use inventory, as well as a review of the NAP. Prior to the second meeting, ANZ noise contours and the related land-use inventory, along with the NAP, were shared with all SAC members for review. All meeting materials, including the SAC committee roster, meeting invitations, sign-in sheets, meeting minutes, and presentations are included in Appendix B.

6.2 Public Workshop and Hearing

As required by Maryland law, a public workshop and hearing were held concerning the 2020 MTN ANZ. The public workshop and hearing afforded all interested persons with an opportunity to comment on proposed revisions to the MTN ANZ and NAP.

The public workshop and hearing were held virtually, due to the COVID-19 pandemic, on January 26, 2021 from 6:00 to 8:00 PM EST. During the workshop, MDOT MAA staff and HMMH staff were available to discuss the MTN ANZ update process and outcomes. Public comments on MDOT MAA's 2020 MTN ANZ and NAP were accepted during the hearing via a court reporter. Additional public comments were accepted via email or postal mail until February 16, 2021. Information concerning the public workshop and hearing was available at the MAA community relations website: https://maacommunityrelations.com/

Public Hearing and Workshop Information		
Date: January 26, 2021	Time: 6:00 – 8:00 PM EST	Location: Virtual via GoToWebinar

MDOT MAA considered all oral and written comments received during the public comment period. Notification in the Maryland Register formally adopts the 2020 ANZ and NAP into Maryland law. MDOT MAA will then certify and submit the adopted ANZ to the Baltimore County Land Record Officer for use in land-use planning and development.