Airport Noise Zone Update Martin State Airport

HMMH Report No.301960.010
May 2012

Prepared for:

Maryland Aviation Administration
991 Corporate Blvd.
Linthicum, MD 21090

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Executive Summary

Maryland Aviation Administration (MAA) is required by the Code of Maryland Regulations (COMAR) to update the Airport Noise Zone (ANZ) approximately every five years. Harris Miller Miller & Hanson Inc. (HMMH) has been retained by the MAA to develop noise contours for the Martin State Airport (MTN) ANZ update. The ANZ, defined in COMAR, is an area specified by noise level contours in terms of the Day-Night Average Sound Levels, abbreviated L_{dn}. This ANZ update will include the L_{dn} noise contours for the following three conditions:

- Base year 2012 conditions with the current runway layout
- Five year post certification, forecast 2017 conditions, with the updated runway layout as specified in the 2011 MTN ALP.
- Ten year post certification, forecast 2022 conditions, with the updated runway layout as specified in the 2011 MTN ALP.

The proposed Airport Noise Zone is comprised of the outer extent of each of the three contours described above. The Airport Noise Zone represents the largest extent of the annual L_{dn} contours for each of the three study years (2012, 2017 and 2022) 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.

In this study, the 2022 contour dominates the majority of the Noise Zone due to an increased number of overall operations as compared with 2012 and 2017. The exception to this is the area immediately off the end of Runway 33 to the south of the Airport.

The 65 dB L_{dn} contour remains mostly on airport property in all three study years with two exceptions:

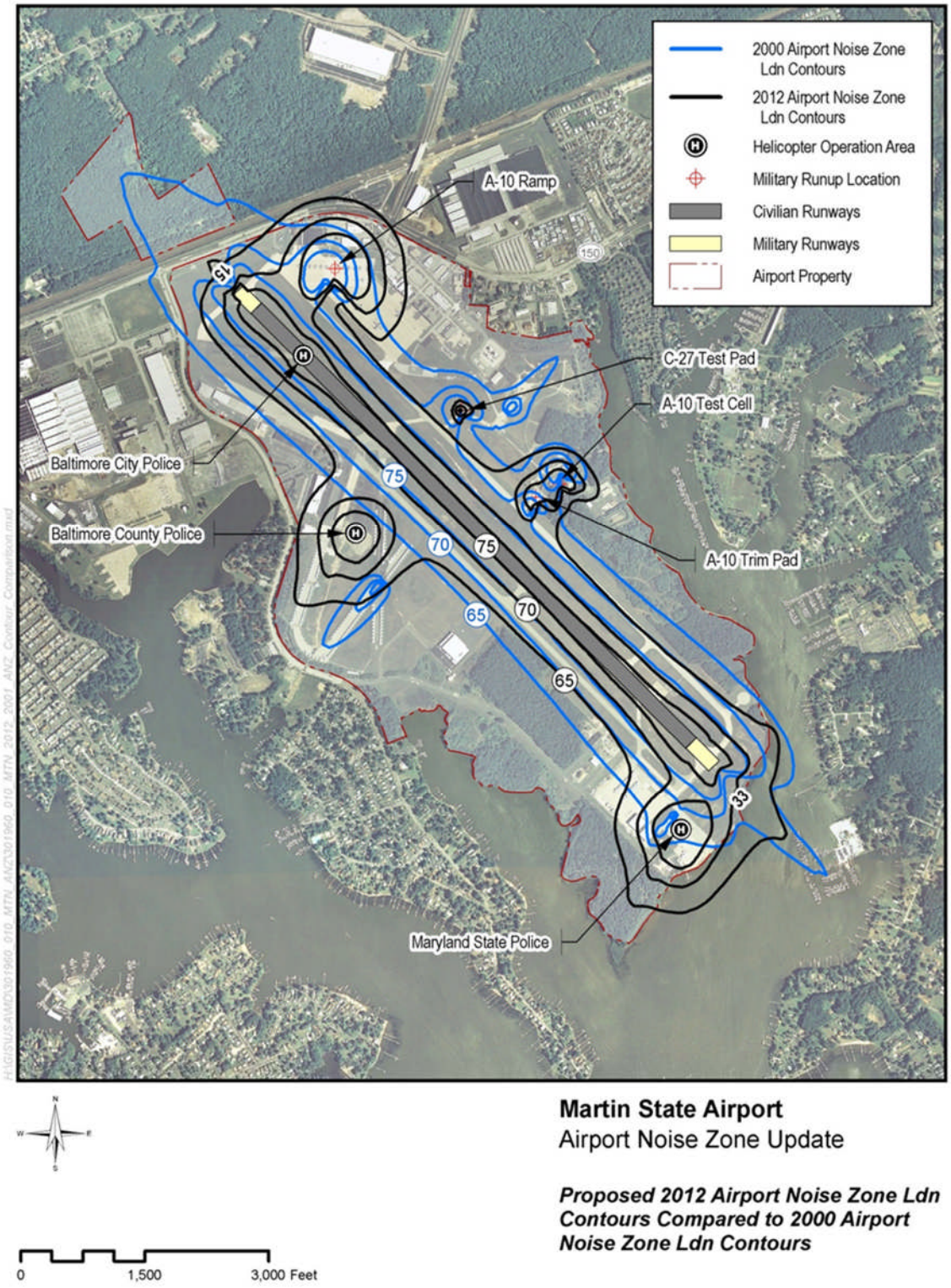
- An area on the northeast side of the airport off of Runway 15 due to Military maintenances run-ups of A10A aircraft on the Maryland Air National Guard (MANG) ramp area.
- An area to the southwest side of the airport off of Runway 33 due to fixed wing arrival operations, but dominated by helicopter activity at the Maryland State Police helipad.

The table below presents the area enclosed by each contour for each contour interval. The slight increase in contour area for each successive year is due to forecast growth in aircraft operations.

Acreage within Modeled Contours

L_{DN} Contour Interval	Area (Acres) Contained Within Each Contour Interval		
	2012 Baseyear	2017 Future year	2022 Future year
65-70dB	193	196	200
70-75dB	110	112	115
>75dB	70	74	78
Total >65dB	373	383	392
Source: HMMH, 2012			

Proposed 2012 ANZ L_{dn} Noise Contours



Martin State Airport
Airport Noise Zone Update

Proposed 2012 Airport Noise Zone Ldn Contours Compared to 2000 Airport Noise Zone Ldn Contours

Contents

Figures

Tables

1 Introduction

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The proposed Airport Noise Zone is comprised of the outer extent of each of the three contours described above. The Airport Noise Zone represents the largest extent of the annual L_{dn} contours for each of the three study years (2012, 2017 and 2022) 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.

In this study, the 2022 contour dominates the Noise Zone due to an increased number of overall operations as compared with 2012 and 2017. The exception to this is the area immediately off the end of Runway 33 to the south of the Airport, where anticipated changes in runway use result in a shift of the noise contours.

Section 2 of this report describes the methodology used in modeling noise contours. Section 3 describes in detail all of the inputs to the noise model for the three cases. Section 4 presents L_{dn} contours for each of the three cases, and ultimately the composite Noise Zone contour. Section 5 discusses the public consultation process undertaken for the study.

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2 Noise Modeling Methodology

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 metric of noise exposure used in this report is the Day-Night Average Sound Level, abbreviated L_{dn}. L_{dn} accounts for all sound energy produced by aircraft flight operations 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.

In 1974, the State of Maryland adopted the Day-Night Average Sound Level (L_{dn}) metric for defining noise exposure around its airports. Subsequently, in 1981, the Federal Aviation Administration (FAA), under requirements of the Aviation Noise and Safety Act of 1979, also adopted the L_{dn} method, and now requires its use by all airports conducting environmental studies.

The FAA Office of Environment and Energy approves the use of only one computer model, the Integrated Noise Model (INM), for use in developing airport noise contours. INM Version 7.0b, released in September 2009 by the FAA, was used in developing the L_{dn} contours for this study. The INM incorporates a comprehensive set of computer routines for calculating noise exposure contours around airports. Use of the INM computer model requires data in two principal categories: (1) aircraft noise and performance data, and (2) aircraft operational data.

INM utilizes the noise curves and performance profiles of the various aircraft types as provided in Version 7.0b of the database. The model uses the noise data to identify how loud specific aircraft types are at different distances between the aircraft and a location on the ground - these distances range from 200 feet to 25,000 feet. Data are provided for several different engine thrust settings used for takeoff and landing operations for a particular aircraft type; the program then interpolates between these values in its calculation process. The thrust values and distances are determined by performance profiles which are influenced by such factors as average annual air temperature, the elevation above sea level of the airport, runway gradients, headwind velocity and humidity. Of these factors, temperature and elevation have the greatest effect on aircraft performance, and thus on the noise generated by an aircraft. An aircraft departing an airport with a high temperature and/or a high airport elevation require the use of additional thrust than at lower temperature and lower airfield elevation. The performance data used by the model define the length of the takeoff roll (based on aircraft takeoff weight), the climb rate, and speeds for each flight segment.

2.1 INM non-standard inputs

Standard inputs from the INM version 7.0b database were used wherever possible for all noise modeling. The operations forecast did however require the use of four non-standard aircraft types; for these aircraft, FAA-recommended substitutions were used, as follows:

- Falcon 50 (INM Type FAL50) and Falcon 900 (INM Type FAL900): Modified INM LEAR35 with an increase of 1.8 dB to the INM Noise Power Distance Curves. These aircraft use the same engines as the Lear 35, but with an additional tail mounted TFE731engine.
- Fairchild/Dornier 328 (INM Type J328): Modified INM CL600 with a change in the departure spectral class to account for wing-mounted engines.
- C-27J Spartan (INM Type C-27J): Modified INM C130HP with a 3 dB reduction to the INM Noise Power Distance curves. The C130 and C-27 airframes have similar missions however the C-27 is a smaller twin-engine cargo airframe compared to the larger four-engine C130 airframe.

In additional, INM touch-and-go profiles for local A10A and C-27J operations were developed from noise map data from the MTN bed down study[1].

Additional information on non-standard noise modeling is provided in Appendix B.

[1] Noise Exposure Mapping and Analysis Report For 2005 Base Realignment and Closure Actions 175th Wing at Martin State Airport, Baltimore, Maryland May 2007

3 Noise Model Inputs

The 2012, 2017 and 2022 L_{dn} contours were developed using FAA's Integrated Noise Model (INM), Version 7.0b, in a manner consistent with section 11.03.03 of the Code of Maryland Regulations (COMAR). The INM requires inputs in the following categories:

- Physical description of the airport layout. The 2012 contours use the existing airport layout while 2017 and 2022 contours use the future airport layout
- Number and mix of aircraft operations
- Day-night split of operations (by aircraft type)
- Runway utilization rates and
- Prototypical flight track geometries and flight track utilization rates.

Flight track data that had been collected and stored by BWI's eTamis system as well as additional information obtained from MTN staff and the MANG were used to collect and refine the above information.

3.1 Meteorological Conditions

The INM has several settings that affect aircraft performance profiles and sound propagation based on meteorological data. Meteorological settings include average annual temperature, barometric pressure, relative humidity at the airport, and average headwind speed. Weather data from the National Climatic Data Center (NCDC, http://www.ncdc.noaa.gov) is not available specifically at MTN, so data from a neighboring station at BWI (WBAN # 93721) was used. Based on analysis of the NCDC data, the average annual conditions modeled are:

- Temperature: 56.0 degrees Fahrenheit,
- Sea level pressure: 29.86 in-Hg.,
- Relative humidity: 66.0 percent, and
- Headwind speed: 8.0 knots (INM default).

3.2 Airport Physical Parameters

There is one operational runway at MTN, Runway 15/33. Currently, civil aircraft are permitted to use 6,996 feet of the runway for arrival and departure operations; military aircraft use the 8,100 feet or full extent for all departures and for Runway 33 arrivals; Runway 15 arrivals have a displaced landing threshold of 1,113 feet.

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

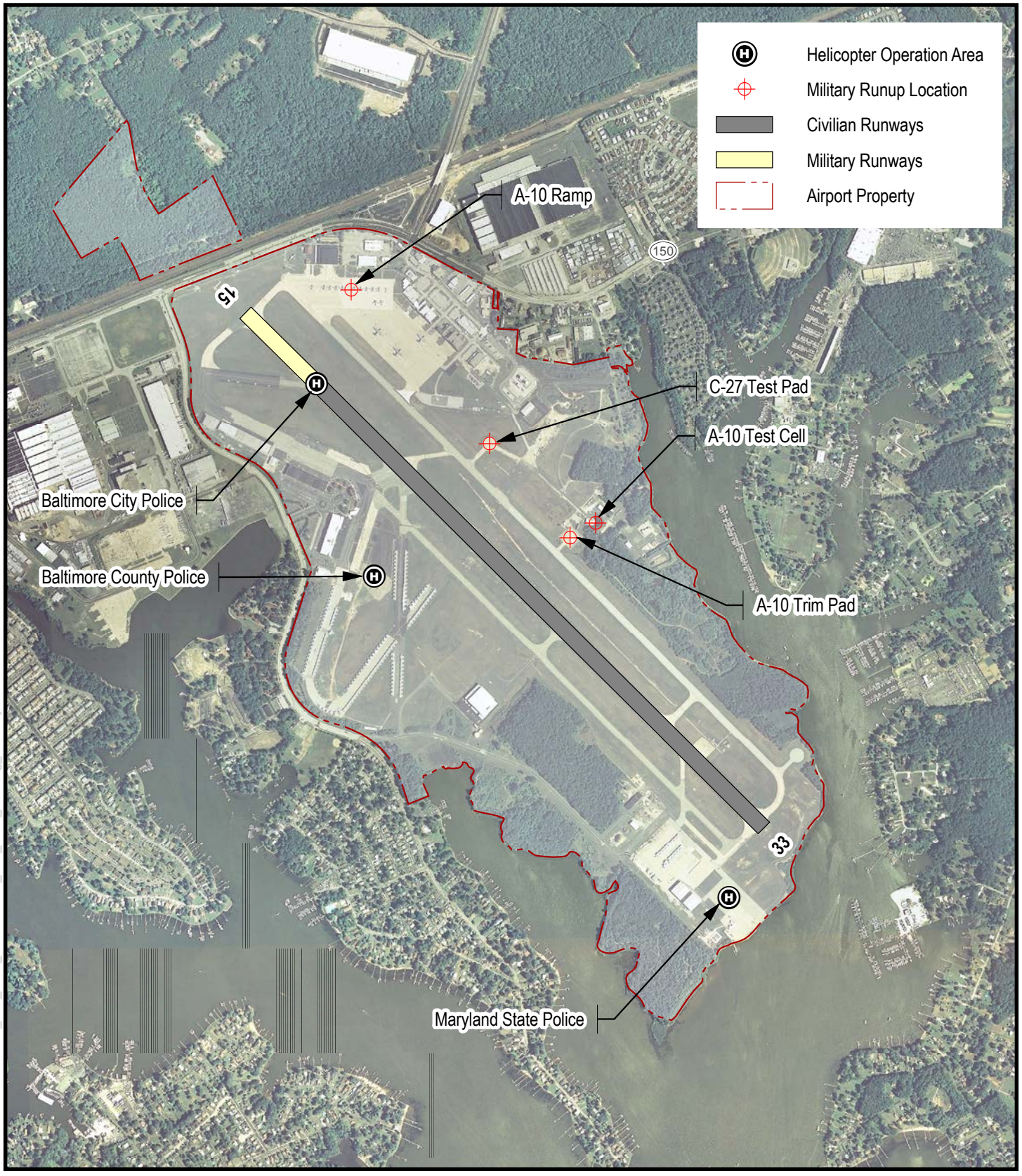
- The Baltimore City Police operate near the end of Runway 15 and their hangar.
- The Baltimore County Police and the majority of corporate helicopters operate from a helipad near Taxilane B and across from their hangar.
- The Maryland State Police operate in an area near their hangar and near the end of Runway 33.

Table 1 presents the locations and configurations for each runway and helicopter operational area for the 2012 existing conditions. Figure 1 presents an aerial photograph with the existing runway layout and notations for the airport property line, helicopter operational areas and military aircraft run-up locations.

Table 1 Current MTN Runway Layout (2012)

Runway	Latitude (deg)	Longitude (deg)	Length (feet)	Modeled End Elevation (feet)	Displaced Landing Threshold (feet)	Approach Slope (degrees)	Threshold Crossing Height (feet)	Runway Width (feet)
Fixed Wing Runways								
15	39.3324470	-76.4224500	6,996	22.3	0	3.1	55	180
33	39.3188280	-76.4050080	6,996	10.2	0	3.0	49	180
15 (Military)	39.3346420	-76.4252720	8,100	23.5	1,113	3.1	55	180
33 (Military)	39.3188280	-76.4050080	8,100	10.2	0	3.0	49	180
Helicopter Operations Areas								
Baltimore City Police (HBPD)	39.332473	-76.422484	N/A	21	N/A	N/A	N/A	N/A
Baltimore County Police (HCPD)	39.326586	-76.420273	N/A	21	N/A	N/A	N/A	N/A
Maryland State Police (HSPD)	39.316714	-76.406410	N/A	21	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: MAA, 2012
Helicopter Operations Areas: MTN staff and HMMH



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Martin State Airport
Airport Noise Zone Update

Figure 1
Existing (2012) Runway Layout

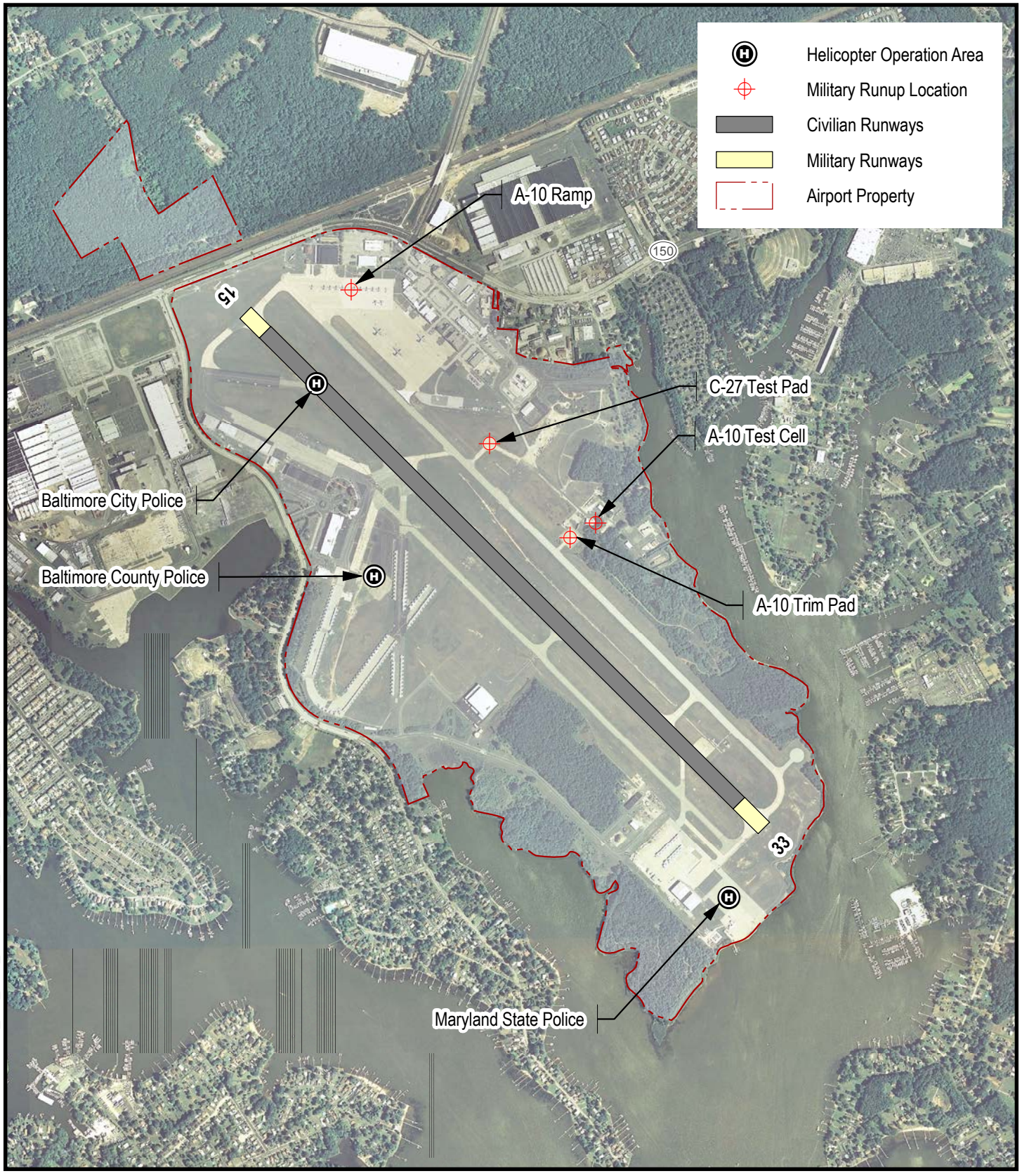
In the future year conditions, MAA proposes to shift Runway 15/33 northwest along the existing runway centerline. Civil aircraft will then use 7,430 feet of the total length of the runway. The displaced arrival thresholds for civil aircraft will shift 225 feet on Runway 15 and 390 feet on Runway 33. Military aircraft will continue to use the entire 8,100 foot length of Runway 15/33 for departures, and will use displaced arrival thresholds of 516 feet and 770 feet on Runways 15 33, respectively. No changes in the location of the helicopter operational areas are proposed.

Table 2 presents the locations and configurations of each runway and helicopter operational area for the future conditions of 2017 and 2022. Figure 2 presents an aerial photograph with the proposed future runway layout and notations for the airport property line, helicopter operational areas and military aircraft run-up locations.

Table 2 Future MTN Runway Layout (2017, 2022)

Runway	Latitude (deg)	Longitude (deg)	Length (feet)	Modeled End Elevation (feet)	Displaced Landing Threshold (feet)	Approach Slope (degrees)	Threshold Crossing Height (feet)	Runway Width (feet)
Fixed Wing Runways								
15	39.334051	-76.424502	7,430	22.8	225	3.1	55	180
33	39.319584	-76.405987	7,430	9.5	390	3.0	49	180
15 (Military)	39.334642	-76.425272	8,100	23.5	516	3.1	55	180
33 (Military)	39.318828	-76.405008	8,100	10.2	770	3.0	49	180
Helicopter Operations Areas								
Baltimore City Police (HBPD)	39.332473	-76.422484	N/A	21	N/A	N/A	N/A	N/A
Baltimore County Police (HCPD)	39.326586	-76.420273	N/A	21	N/A	N/A	N/A	N/A
Maryland State Police (HSPD)	39.316714	-76.406410	N/A	21	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: MAA, 2012
Helicopter Operations Areas: MTN staff and HMMH



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Martin State Airport
Airport Noise Zone Update

Figure 2
Future (2017, 2022) Runway Layout

3.3 Aircraft Operations

Itinerant and local operations for each forecast modeling year (2012, 2017, and 2022) were taken from the December 2010 FAA Terminal Area Forecast (TAF) and are reported in Table 3.

Table 3 Annual Forecast Model Operations

Year	Itinerant Operations				Local Operations		Total
	Air Carrier	Air Taxi	General Aviation	Military	General Aviation	Military	
2012	8	1,655	34,703	2,669	19,339	588	58,962
2017	8	1,655	37,274	2,669	20,176	588	62,370
2022	8	1,655	40,038	2,669	21,049	588	66,007
Source: FAA, December 2010 Terminal Area Forecast							

The detailed breakdown of operations by aircraft type for fixed wing civil aircraft was determined using the same one year sample (June 2007 through May 2008) of radar data also used for development of the published 2011 MTN ALP. Radar data for this sample originated from the BWI AirScene.com system for aircraft operating at MTN. Where possible, aircraft fleet distributions from the more recent data sample were compared to the June 2007 through May 2008 sample and no specific discrepancies were identified. The aircraft fleet mix distributions determined from the radar, were then applied to the operational totals shown in Table 3.

Detailed operations numbers for law enforcement helicopter operations were provided by MTN staff and applied towards the itinerant general aviation forecast numbers.

Military operations fleet distributions were estimated from information supplied by the Maryland Air National Guard and then applied to the forecast totals of the military operations identified in Table 3.

The average annual day operations are reported in tables 4 through 6, for 2012, 2017 and 2022 respectively and include breakouts by arrivals/departures/touch-and-go's and day/night activity.

Table 4 Modeled 2012 Average Daily Aircraft Operations

Aircraft Category	Aircraft Type	INM Aircraft Type	Arrivals		Departures		Local Patterns		Total
			Day	Night	Day	Night	Day	Night	
Air Carrier	Jet	CRJ9-ER	0.01	<0.01	0.01	<0.01	0.00	0.00	0.02
Air Carrier Subtotal			0.01	<0.01	0.01	<0.01	0.00	0.00	0.02
Air Taxi	Jet	CIT3	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		CL600	0.10	0.00	0.10	<0.01	0.00	0.00	0.21
		CL601	0.12	<0.01	0.12	<0.01	0.00	0.00	0.24
		CNA500	0.04	<0.01	0.04	0.00	0.00	0.00	0.09
		CNA55B	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		CNA750	0.03	0.00	0.03	<0.01	0.00	0.00	0.06
		EMB145	0.05	0.00	0.05	<0.01	0.00	0.00	0.10
		EMB14L	0.06	0.00	0.06	0.00	0.00	0.00	0.13
		FAL20	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		FAL900	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		GIIB	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		GIV	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		IA1125	0.07	<0.01	0.07	0.00	0.00	0.00	0.14
		LEAR25	<0.01	<0.01	<0.01	0.00	0.00	0.00	<0.01
		LEAR35	0.17	0.01	0.17	0.01	0.00	0.00	0.37
		MU3001	0.33	0.01	0.33	0.01	0.00	0.00	0.68
	Turbo-Prop	1900D	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		CNA441	<0.01	0.00	<0.01	0.00	0.00	0.00	0.02
		DHC6	0.07	<0.01	0.07	<0.01	0.00	0.00	0.15
		DHC8	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		DHC830	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		SD330	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		SF340	0.03	<0.01	0.03	<0.01	0.00	0.00	0.07
	Piston Prop	BEC58P	0.56	0.30	0.43	0.43	0.00	0.00	1.73
		CNA172	0.07	0.00	0.07	<0.01	0.00	0.00	0.14
		CNA206	0.11	0.00	0.10	<0.01	0.00	0.00	0.21
		CNA20T	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		GASEPF	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		GASEPV	0.04	<0.01	0.03	0.02	0.00	0.00	0.09
		PA31	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
Air Taxi Subtotal			1.91	0.35	1.77	0.49	0.00	0.00	4.52
General Aviation	Jet	BAC111	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		CIT3	0.15	0.01	0.15	0.01	0.00	0.00	0.33
		CL600	0.34	<0.01	0.32	0.03	0.00	0.00	0.70
		CL601	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		CNA500	0.34	0.01	0.33	0.03	0.00	0.00	0.71
		CNA55B	<0.01	<0.01	<0.01	<0.01	0.00	0.00	<0.01
		CNA750	0.07	<0.01	0.07	0.00	0.00	0.00	0.13
		FAL20	<0.01	0.00	<0.01	<0.01	0.00	0.00	0.01
		FAL50	0.04	0.00	0.04	0.00	0.00	0.00	0.07
		FAL900	0.21	<0.01	0.19	0.03	0.00	0.00	0.44
		GII	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		GIIB	0.09	<0.01	0.08	0.02	0.00	0.00	0.20
		GIV	0.03	<0.01	0.03	<0.01	0.00	0.00	0.07
		GV	0.35	0.03	0.33	0.06	0.00	0.00	0.77
		IA1125	0.42	0.04	0.40	0.06	0.00	0.00	0.92
		J328	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		LEAR25	0.02	0.00	0.02	<0.01	0.00	0.00	0.04
		LEAR35	0.82	0.02	0.81	0.03	0.00	0.00	1.69
		MU3001	0.60	0.01	0.58	0.04	0.00	0.00	1.24
		SABR80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Turbo-Prop	CNA441	0.64	0.04	0.67	0.01	0.00	0.00	1.36

Aircraft Category	Aircraft Type	INM Aircraft Type	Arrivals		Departures		Local Patterns		Total
			Day	Night	Day	Night	Day	Night	
		DHC6	0.75	0.02	0.71	0.06	0.00	0.00	1.54
		DHC8	0.01	0.00	0.01	0.00	0.00	0.00	0.02
		EMB120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SD330	0.63	0.01	0.62	0.02	0.00	0.00	1.28
	Piston Prop	BEC58P	2.70	0.07	2.74	0.03	6.39	0.00	11.93
		CNA172	2.78	0.06	2.83	0.01	6.41	0.00	12.09
		CNA206	0.41	<0.01	0.41	<0.01	0.92	0.00	1.76
		CNA20T	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		COMSEP	0.18	<0.01	0.18	0.00	0.67	0.00	1.04
		DC3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		GASEPF	1.42	0.02	1.43	0.01	3.28	0.00	6.18
		GASEPV	3.77	0.10	3.84	0.04	8.75	0.00	16.49
		PA28	0.10	<0.01	0.11	0.00	0.00	0.00	0.21
		PA30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		PA31	0.03	<0.01	0.03	0.00	0.00	0.00	0.07
	Helicopter	EC130	8.26	3.54	8.26	3.54	0.00	0.00	23.61
		H500D	3.55	2.13	4.26	1.42	0.00	0.00	11.37
		SA365N	9.35	3.12	9.35	3.12	0.00	0.00	24.93
General Aviation Subtotal			38.10	9.31	38.84	8.57	26.42	0.00	121.24
Military	Jet	A10A	2.19	0.00	2.19	0.00	0.48	0.00	4.86
	Turbo-Prop	C27J	1.46	0.00	1.46	0.00	0.32	0.00	3.24
Military Subtotal			3.65	0.00	3.65	0.00	0.80	0.00	8.10
Grand Total			43.67	9.65	44.26	9.06	27.22	0.00	133.88
Source: HMMH, 2012									

Table 5 Modeled 2017 Average Daily Aircraft Operations

Aircraft Category	Aircraft Type	INM Aircraft Type	Arrivals		Departures		Local Patterns		Total
			Day	Night	Day	Night	Day	Night	
Air Carrier	Jet	CRJ9-ER	0.01	<0.01	0.01	<0.01	0.00	0.00	0.02
Air Carrier Subtotal			0.01	<0.01	0.01	<0.01	0.00	0.00	0.02
Air Taxi	Jet	CIT3	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		CL600	0.10	0.00	0.10	<0.01	0.00	0.00	0.21
		CL601	0.12	<0.01	0.12	<0.01	0.00	0.00	0.24
		CNA500	0.04	<0.01	0.04	0.00	0.00	0.00	0.09
		CNA55B	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		CNA750	0.03	0.00	0.03	<0.01	0.00	0.00	0.06
		EMB145	0.05	0.00	0.05	<0.01	0.00	0.00	0.10
		EMB14L	0.06	0.00	0.06	0.00	0.00	0.00	0.13
		FAL20	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		FAL900	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		GIIB	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		GIV	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		IA1125	0.07	<0.01	0.07	0.00	0.00	0.00	0.14
		LEAR25	<0.01	<0.01	<0.01	0.00	0.00	0.00	<0.01
		LEAR35	0.17	0.01	0.17	0.01	0.00	0.00	0.37
		MU3001	0.33	0.01	0.33	0.01	0.00	0.00	0.68
	Turbo-Prop	1900D	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		CNA441	<0.01	0.00	<0.01	0.00	0.00	0.00	0.02
		DHC6	0.07	<0.01	0.07	<0.01	0.00	0.00	0.15
		DHC8	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		DHC830	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		SD330	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		SF340	0.03	<0.01	0.03	<0.01	0.00	0.00	0.07
	Piston Prop	BEC58P	0.57	0.30	0.43	0.43	0.00	0.00	1.73
		CNA172	0.07	0.00	0.07	<0.01	0.00	0.00	0.14
		CNA206	0.11	0.00	0.10	<0.01	0.00	0.00	0.21
		CNA20T	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		GASEPF	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		GASEPV	0.04	<0.01	0.03	0.02	0.00	0.00	0.09
		PA31	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
Air Taxi Subtotal			1.92	0.35	1.77	0.49	0.00	0.00	4.53
General Aviation	Jet	BAC111	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		CIT3	0.18	0.01	0.18	0.01	0.00	0.00	0.40
		CL600	0.41	0.01	0.38	0.04	0.00	0.00	0.85
		CL601	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		CNA500	0.41	0.02	0.39	0.04	0.00	0.00	0.86
		CNA55B	<0.01	<0.01	<0.01	<0.01	0.00	0.00	0.01
		CNA750	0.08	<0.01	0.08	0.00	0.00	0.00	0.16
		FAL20	<0.01	0.00	<0.01	<0.01	0.00	0.00	0.02
		FAL50	0.04	0.00	0.04	0.00	0.00	0.00	0.09
		FAL900	0.26	0.01	0.23	0.04	0.00	0.00	0.54
		GII	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		GIIB	0.11	0.01	0.10	0.02	0.00	0.00	0.24
		GIV	0.04	<0.01	0.04	<0.01	0.00	0.00	0.08
		GV	0.42	0.04	0.39	0.07	0.00	0.00	0.92
		IA1125	0.50	0.05	0.48	0.07	0.00	0.00	1.11
		J328	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		LEAR25	0.02	0.00	0.02	<0.01	0.00	0.00	0.05
		LEAR35	0.99	0.02	0.98	0.04	0.00	0.00	2.04
		MU3001	0.73	0.02	0.70	0.04	0.00	0.00	1.49
		SABR80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Turbo-Prop	CNA441	0.77	0.05	0.81	0.01	0.00	0.00	1.64

Aircraft Category	Aircraft Type	INM Aircraft Type	Arrivals		Departures		Local Patterns		Total
			Day	Night	Day	Night	Day	Night	
		DHC6	0.90	0.03	0.86	0.07	0.00	0.00	1.85
		DHC8	0.01	0.00	0.01	0.00	0.00	0.00	0.03
		EMB120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SD330	0.76	0.02	0.75	0.02	0.00	0.00	1.55
	Piston Prop	BEC58P	3.25	0.09	3.30	0.04	6.68	0.00	13.36
		CNA172	3.35	0.07	3.41	0.02	6.71	0.00	13.55
		CNA206	0.50	<0.01	0.50	<0.01	0.97	0.00	1.98
		CNA20T	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		COMSEP	0.22	<0.01	0.22	0.00	0.70	0.00	1.14
		DC3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		GASEPF	1.71	0.03	1.73	0.02	3.43	0.00	6.92
		GASEPV	4.54	0.12	4.62	0.04	9.15	0.00	18.48
		PA28	0.12	<0.01	0.13	0.00	0.00	0.00	0.26
		PA30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		PA31	0.04	<0.01	0.04	0.00	0.00	0.00	0.08
	Helicopter	EC130	8.28	3.55	8.29	3.55	0.00	0.00	23.67
		H500D	3.56	2.14	4.27	1.42	0.00	0.00	11.40
		SA365N	9.38	3.13	9.37	3.13	0.00	0.00	25.00
General Aviation Subtotal			41.62	9.44	42.37	8.69	27.64	0.00	129.76
Military	Jet	A10A	2.19	0.00	2.19	0.00	0.48	0.00	4.87
	Turbo-Prop	C27J	1.46	0.00	1.46	0.00	0.32	0.00	3.25
Military Subtotal			3.66	0.00	3.66	0.00	0.81	0.00	8.12
Grand Total			47.21	9.79	47.81	9.19	28.44	0.00	142.43
Source: HMMH, 2012									

Table 6 Modeled 2022 Average Daily Aircraft Operations

Aircraft Category	Aircraft Type	INM Aircraft Type	Arrivals		Departures		Local Patterns		Total
			Day	Night	Day	Night	Day	Night	
Air Carrier	Jet	CRJ9-ER	0.01	<0.01	0.01	<0.01	0.00	0.00	0.02
Air Carrier Subtotal			0.01	<0.01	0.01	<0.01	0.00	0.00	0.02
Air Taxi	Jet	CIT3	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		CL600	0.10	0.00	0.10	<0.01	0.00	0.00	0.21
		CL601	0.12	<0.01	0.12	<0.01	0.00	0.00	0.24
		CNA500	0.04	<0.01	0.04	0.00	0.00	0.00	0.09
		CNA55B	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		CNA750	0.03	0.00	0.03	<0.01	0.00	0.00	0.06
		EMB145	0.05	0.00	0.05	<0.01	0.00	0.00	0.10
		EMB14L	0.06	0.00	0.06	0.00	0.00	0.00	0.13
		FAL20	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		FAL900	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		GIIB	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		GIV	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		IA1125	0.07	<0.01	0.07	0.00	0.00	0.00	0.14
		LEAR25	<0.01	<0.01	<0.01	0.00	0.00	0.00	<0.01
		LEAR35	0.17	0.01	0.17	0.01	0.00	0.00	0.37
		MU3001	0.33	0.01	0.33	0.01	0.00	0.00	0.68
	Turbo-Prop	1900D	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		CNA441	<0.01	0.00	<0.01	0.00	0.00	0.00	0.02
		DHC6	0.07	<0.01	0.07	<0.01	0.00	0.00	0.15
		DHC8	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		DHC830	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		SD330	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		SF340	0.03	<0.01	0.03	<0.01	0.00	0.00	0.07
	Piston Prop	BEC58P	0.57	0.30	0.43	0.43	0.00	0.00	1.73
		CNA172	0.07	0.00	0.07	<0.01	0.00	0.00	0.14
		CNA206	0.11	0.00	0.10	<0.01	0.00	0.00	0.21
		CNA20T	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		GASEPF	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
		GASEPV	0.04	<0.01	0.03	0.02	0.00	0.00	0.09
		PA31	<0.01	0.00	<0.01	0.00	0.00	0.00	<0.01
Air Taxi Subtotal			1.92	0.35	1.77	0.49	0.00	0.00	4.53
General Aviation	Jet	BAC111	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		CIT3	0.22	0.02	0.22	0.02	0.00	0.00	0.47
		CL600	0.49	0.01	0.45	0.05	0.00	0.00	100
		CL601	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		CNA500	0.49	0.02	0.46	0.04	0.00	0.00	1.01
		CNA55B	<0.01	<0.01	<0.01	<0.01	0.00	0.00	0.01
		CNA750	0.09	<0.01	0.10	0.00	0.00	0.00	0.19
		FAL20	<0.01	0.00	<0.01	<0.01	0.00	0.00	0.02
		FAL50	0.05	0.00	0.05	0.00	0.00	0.00	0.11
		FAL900	0.30	0.01	0.27	0.04	0.00	0.00	0.63
		GII	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		GIIB	0.13	0.01	0.12	0.02	0.00	0.00	0.28
		GIV	0.04	<0.01	0.05	<0.01	0.00	0.00	0.10
		GV	0.50	0.04	0.46	0.08	0.00	0.00	1.09
		IA1125	0.59	0.06	0.57	0.08	0.00	0.00	1.30
		J328	<0.01	0.00	<0.01	0.00	0.00	0.00	0.01
		LEAR25	0.03	0.00	0.03	<0.01	0.00	0.00	0.06
		LEAR35	1.17	0.03	1.16	0.04	0.00	0.00	2.40
		MU3001	0.86	0.02	0.83	0.05	0.00	0.00	1.76
		SABR80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Turbo-Prop	CNA441	0.91	0.06	0.95	0.02	0.00	0.00	1.94

Aircraft Category	Aircraft Type	INM Aircraft Type	Arrivals		Departures		Local Patterns		Total
			Day	Night	Day	Night	Day	Night	
		DHC6	1.06	0.03	1.01	0.08	0.00	0.00	2.18
		DHC8	0.02	0.00	0.02	0.00	0.00	0.00	0.03
		EMB120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SD330	0.89	0.02	0.89	0.03	0.00	0.00	1.83
	Piston Prop	BEC58P	3.84	0.11	3.90	0.04	6.97	0.00	14.85
		CNA172	3.95	0.08	4.02	0.02	700	0.00	15.07
		CNA206	0.58	0.01	0.59	<0.01	1.01	0.00	2.20
		CNA20T	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		COMSEP	0.26	<0.01	0.26	0.00	0.73	0.00	1.25
		DC3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		GASEPF	2.02	0.03	2.04	0.02	3.58	0.00	7.70
		GASEPV	5.36	0.14	5.45	0.05	9.55	0.00	20.56
		PA28	0.15	<0.01	0.15	0.00	0.00	0.00	0.30
		PA30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		PA31	0.04	<0.01	0.05	0.00	0.00	0.00	0.09
	Helicopter	EC130	8.28	3.55	8.29	3.55	0.00	0.00	23.67
		H500D	3.56	2.14	4.27	1.42	0.00	0.00	11.40
		SA365N	9.38	3.13	9.37	3.13	0.00	0.00	25.00
General Aviation Subtotal			45.30	9.55	46.05	8.80	28.83	0.00	138.53
Military	Jet	A10A	2.19	0.00	2.19	0.00	0.48	0.00	4.87
	Turbo-Prop	C27J	1.46	0.00	1.46	0.00	0.32	0.00	3.25
Military Subtotal			3.66	0.00	3.66	0.00	0.81	0.00	8.12
Grand Total			50.88	9.90	51.49	9.29	29.64	0.00	151.20
Source: HMMH, 2012									

In addition to aircraft flight operations, The Maryland Air National Guard operates three maintenance run-up locations for its A-10A and C-27J aircraft, shown in Figures 1 and 2. During maintenance routines, an aircraft engine may be started; the power increased to a specified level higher than idle and can be increased up to the full departure power setting. Table 7 shows the run-up locations, configurations, operations, duration and power settings.

Table 7 Modeled Average Military Maintenance Run-up Activity

Aircraft Type	Site Name	Latitude (degrees)	Longitude (degrees)	Magnetic Heading (degrees)	Number of daily run-ups	Duration per run-up (sec.)	Approximate Power Setting (% of Takeoff Thurst)
A-10A	Ramp	39.335324	-76.421102	360º	2.9	150	85%
	Trim pad	39.327734	-76.412556	330º	0.05	300	94%
	Test cell	39.328166	-76.411542	330º	0.02	900	100%
C-27J	Test Pad	39.330616	-76.415701	330º	0.03	585	2000 lbs/hr
Source: Maryland Air National Guard, 2012							

3.4 Runway Utilization

Civil fixed wing aircraft runway use was developed in parallel with the fleet distribution described in Section 3.4, using the same AirScene Radar data sample. The helipad use for helicopter operations was provided by MTN staff in consultation with the local law enforcement operators; military runway use was estimated from information supplied by the Maryland Air National Guard.

Table 8 presents the full runway use numbers used for modeling purposes by runway, aircraft operator category operation type and day vs. night activity.

Table 8 Modeled Runway Use

Aircraft Category	Runway	Arrivals		Departures		Local Patterns	
		Day	Night	Day	Night	Day	Night
Air Carrier	15	43.2%	25.8%	43.5%	57.5%	0.0%	0.0%
	33	56.8%	74.2%	56.5%	42.5%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%
Air Taxi	15	44.2%	25.9%	44.5%	57.7%	0.0%	0.0%
	33	55.8%	74.1%	55.5%	42.3%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%
General Aviation (Jet)	15	47.6%	46.4%	46.4%	49.8%	0.0%	0.0%
	33	52.4%	53.6%	53.6%	50.2%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%
General Aviation (Turbo-Prop)	15	49.0%	0.0%	46.6%	25.0%	0.0%	0.0%
	33	51.0%	100.0%	53.4%	75.0%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%
General Aviation (Piston Prop)	15	45.8%	24.8%	45.4%	75.8%	45.5%	0.0%
	33	54.2%	75.2%	54.6%	24.2%	54.5%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%
General Aviation (All Fixed Wing)	15	46.6%	28.1%	45.7%	50.6%	45.5%	0.0%
	33	53.4%	71.9%	54.3%	49.4%	54.5%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%
General Aviation (Helicopter)	HCPD	39.0%	40.3%	37.8%	43.8%	0.0%	0.0%
	HBPD	16.8%	24.2%	19.5%	17.6%	0.0%	0.0%
	HSPD	44.2%	35.5%	42.7%	38.6%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%
Military	15	44.4%	0.0%	44.4%	0.0%	100.0%	0.0%
	33	55.6%	0.0%	55.6%	0.0%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%

Source: HMMH, 2012

3.5 Flight Track Geometry and Utilization

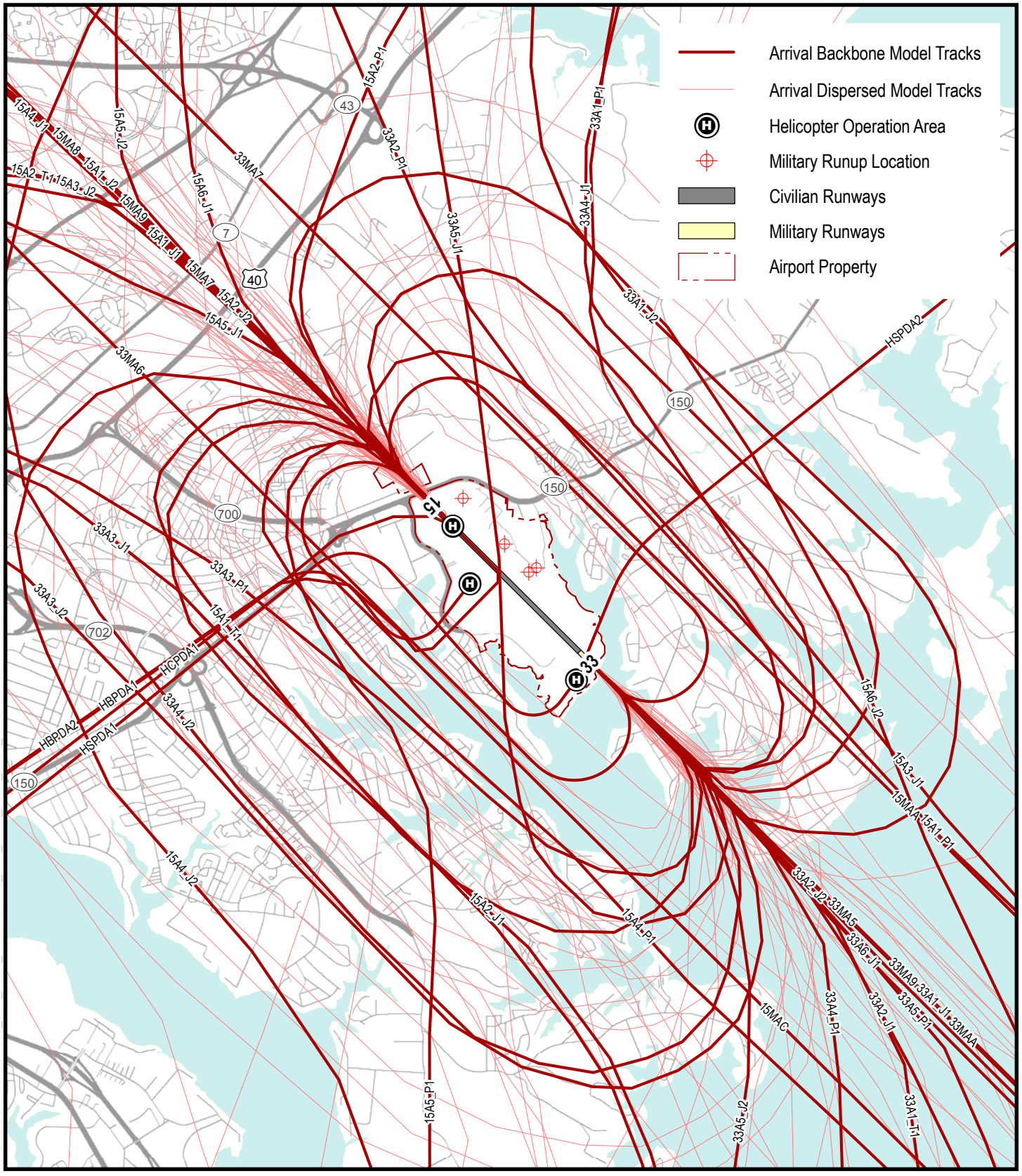
Civil fixed wing aircraft flight tracks were developed in parallel with the fleet distribution and runway use described in Section 3.4, using the same AirScene Radar data sample. Helicopter flight track geometry was determined in conjunction with MTN staff and in consultation with the local law enforcement operators. Military flight track geometry and utilization use was estimated from information supplied by the Maryland Air National Guard.

Table 9 presents the flight track utilization percentages by runway and aircraft operatory category. Figures 3, 4 and 5 display the flight tracks for arrival, departure and touch-and-go tracks, respectively.

Table 9 Modeled Flight Track Utilization

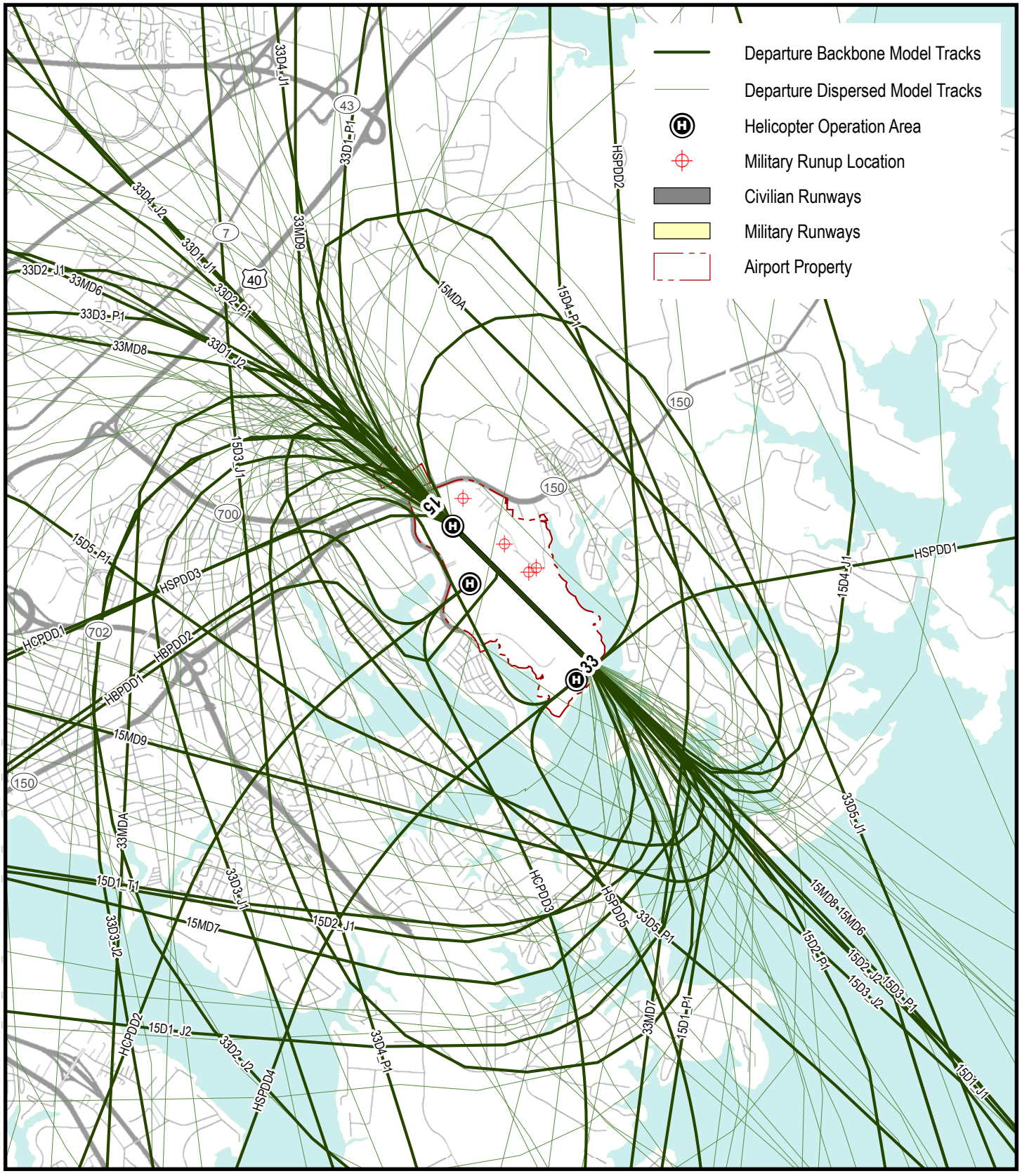
Aircraft Category	Runway	Arrivals		Departures		Local Patterns	
		Track	Use%	Track	Use%	Track	Use%
Air Carrier	15	15A1_J1	22.6%	15D1_J1	58.9%		
		15A2_J1	21.5%	15D2_J1	31.8%		
		15A3_J1	12.7%	15D3_J1	9.3%		
		15A4_J1	15.7%				
		15A5_J1	8.3%				
		15A6_J1	19.3%				
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
	33	33A1_J1	34.0%	33D1_J1	10.8%		
		33A2_J1	33.8%	33D2_J1	36.5%		
		33A3_J1	19.6%	33D3_J1	34.3%		
		33A4_J1	9.8%	33D4_J1	14.2%		
		33A5_J1	2.9%	33D5_J1	4.2%		
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
Air Taxi	15	15A1_J1	22.6%	15D1_J1	58.9%		
		15A2_J1	21.5%	15D2_J1	31.8%		
		15A3_J1	12.7%	15D3_J1	9.3%		
		15A4_J1	15.7%				
		15A5_J1	8.3%				
		15A6_J1	19.3%				
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
	33	33A1_J1	34.0%	33D1_J1	10.8%		
		33A2_J1	33.8%	33D2_J1	36.5%		
		33A3_J1	19.6%	33D3_J1	34.3%		
		33A4_J1	9.8%	33D4_J1	14.2%		
		33A5_J1	2.9%	33D5_J1	4.2%		
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
General Aviation (Jet)	15	15A1_J2	23.3%	15D1_J2	53.3%		
		15A2_J2	23.3%	15D2_J2	26.7%		
		15A3_J2	2.3%	15D3_J2	17.8%		
		15A4_J2	27.9%	15D4_J1	2.2%		
		15A5_J2	18.6%				
		15A6_J2	4.7%				
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
	33	33A1_J2	16.7%	33D1_J2	53.6%		
		33A2_J2	20.8%	33D2_J2	21.4%		
		33A3_J2	25.0%	33D3_J2	17.9%		
		33A4_J2	4.2%	33D4_J2	7.1%		
		33A5_J2	8.3%				
		33A6_J1	25.0%				
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
General Aviation (Turbo-Prop)	15	15A1_T1	36.8%	15D2_J2	31.6%		
		15A1_J2	36.8%	15D3_J2	31.6%		
		15A2_T1	26.3%	15D1_T1	36.8%		

Aircraft Category	Runway	Arrivals		Departures		Local Patterns	
		Track	Use%	Track	Use%	Track	Use%
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
	33	33A1_J2	15.0%	33D1_J2	35.0%		
		33A3_J2	25.0%	33D2_J2	30.0%		
		33A6_J1	30.0%	33D3_J2	20.0%		
		33A1_T1	30.0%	33D4_J2	15.0%		
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
General Aviation (Piston Prop)	15	15A1_P1	17.7%	15D1_P1	13.2%	15P1	50.0%
		15A2_P1	11.8%	15D2_P1	15.8%	15P2	50.0%
		15A1_J2	14.7%	15D3_P1	13.2%		
		15A3_P1	11.8%	15D2_J2	26.3%		
		15A1_T1	8.8%	15D1_T1	7.9%		
		15A4_P1	11.8%	15D4_P1	18.4%		
		15A5_P1	5.9%	15D5_P1	5.3%		
		15A5_J2	8.8%				
		15A2_J2	8.8%				
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**100.0%**
	33	33A1_P1	12.5%	33D1_P1	22.0%	33P1	50.0%
		33A2_P1	5.0%	33D4_J2	9.8%	33P2	50.0%
		33A3_P1	7.5%	33D2_P1	7.3%		
		33A5_J2	7.5%	33D3_P1	12.2%		
		33A4_P1	12.5%	33D4_P1	22.0%		
		33A5_P1	12.5%	33D5_P1	26.8%		
		33A6_J1	42.5%				
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**100.0%**
General Aviation (Helicopter)	HCPD (Baltimore City PD)	HCPDA1	100.0%	HCPDD1	40.0%		
				HCPDD2	30.0%		
				HCPDD3	30.0%		
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
	HBPD (Baltimore County PD)	HBPDA1	39.8%	HBPDD1	49.8%		
		HBPDA2	60.2%	HBPDD2	50.2%		
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
	HSPD (Maryland State PD)	HSPDA1	10.0%	HSPDD1	4.0%		
		HSPDA2	90.0%	HSPDD2	6.0%		
				HSPDD3	36.0%		
				HSPDD4	27.0%		
				HSPDD5	27.0%		
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
Military	15	15MAA	6.0%	15MDA	3.7%	15MP4	60.0%
		15MAC	6.0%	15MD6	3.7%	15MP3	40.0%
		15MA7	60.0%	15MD7	37.1%		
		15MA8	2.0%	15MD8	1.2%		
		15MA9	26.0%	15MD9	16.1%		
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**100.0%**
	33	33MAA	60.0%	33MDA	29.6%		
		33MA5	26.0%	33MD6	12.8%		
		33MA6	6.0%	33MD7	3.0%		
		33MA7	6.0%	33MD8	3.0%		
		33MA9	2.0%	33MD9	1.0%		
		Total	**100.0%**	**Total**	**100.0%**	**Total**	**N/A**
Source: HMMH, 2012							



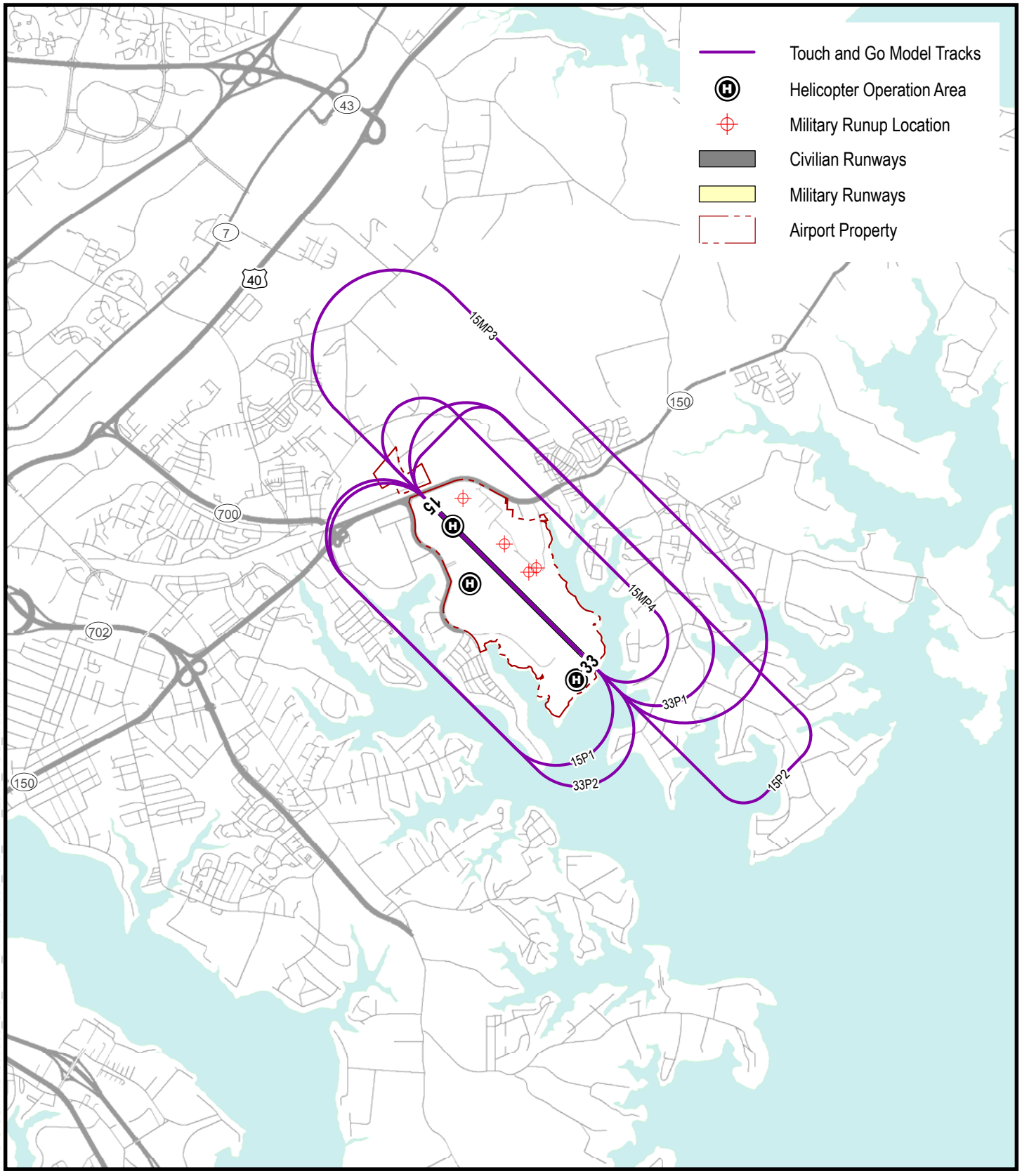
Martin State Airport
Airport Noise Zone Update

Figure 3
Arrival Flight Tracks



Martin State Airport
Airport Noise Zone Update

Figure 4
Departure Flight Tracks



Martin State Airport
Airport Noise Zone Update

Figure 5
Touch and Go Flight Tracks

4 L_{dn} Contour Results

Figures 6 through 8 display the 65, 70, and 75 decibel (dB) L_{dn} contours for each of the three modeled years 2012, 2017 and 2022. Figure 9 shows the proposed 2012 ANZ contour comprised of the outer extent each of the three model years' contours. Each contour set was generated using INM version 7.0b with the parameters described in Section 3.

4.1 2012, 2017 and 2022 L_{dn} Contour Results

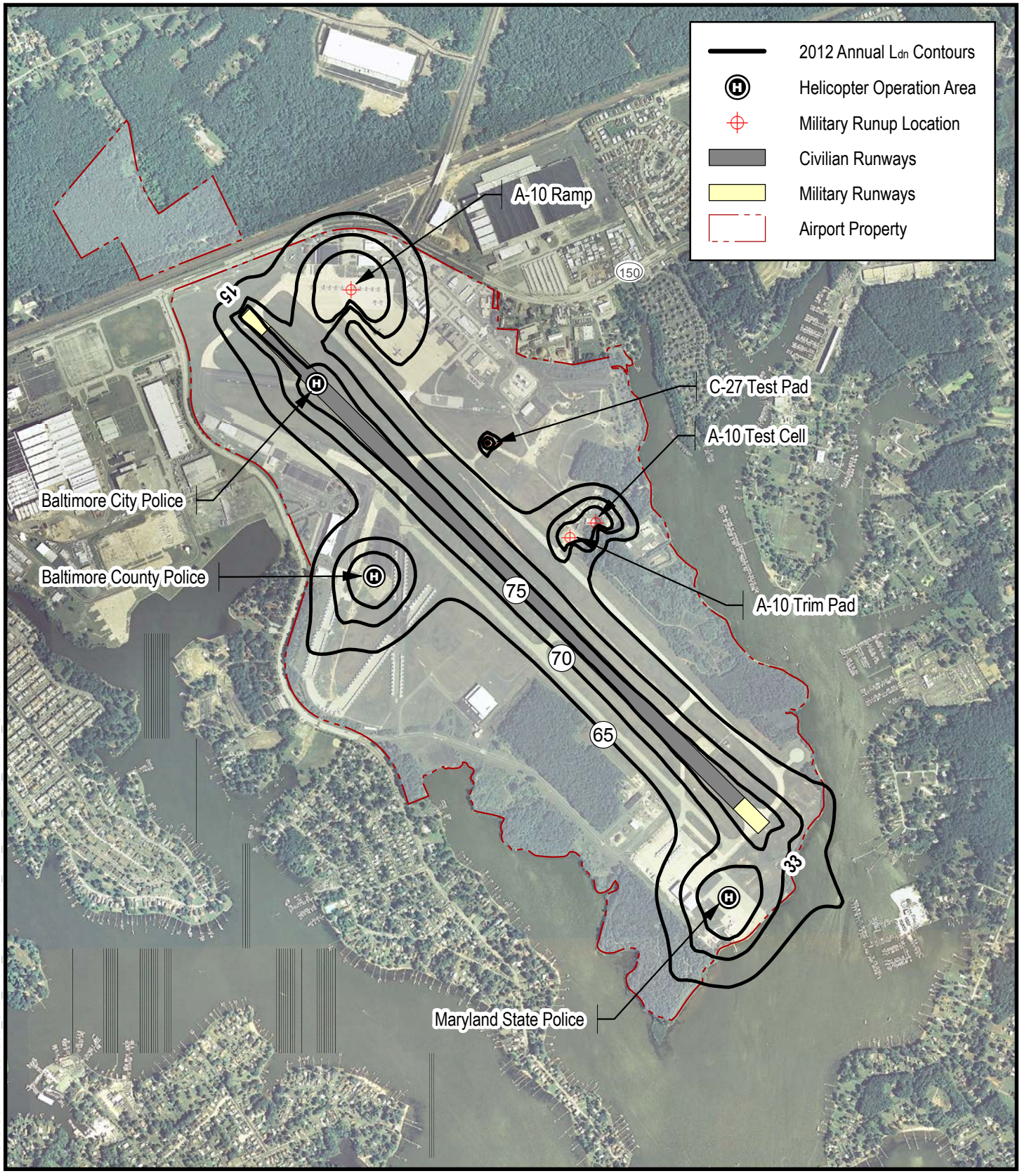
The 65 dB L_{dn} contour remains mostly on airport property in all three study years with two exceptions:

- An area on the northeast side of the airport off of Runway 15 due to Military maintenances run-ups of A10A aircraft on the MANG ramp area.
- An area to the southwest side of the airport off of Runway 33 due to fixed wing arrival operations, but dominated by helicopter activity at the Maryland State Police helipad.

Table 10 presents the area enclosed by each contour for each contour interval. The slight increase in contour area for each successive year is due to the aircraft forecast growth described in section 3.3.

Table 10 Acreage within Modeled Contours

L_{DN} Contour Interval	Area (Acres) Contained Within Each Contour Interval		
	2012 Baseyear	2017 Future year	2022 Future year
65-70dB	193	196	200
70-75dB	110	112	115
>75dB	70	74	78
Total >65dB	373	383	392
Source: HMMH, 2012			

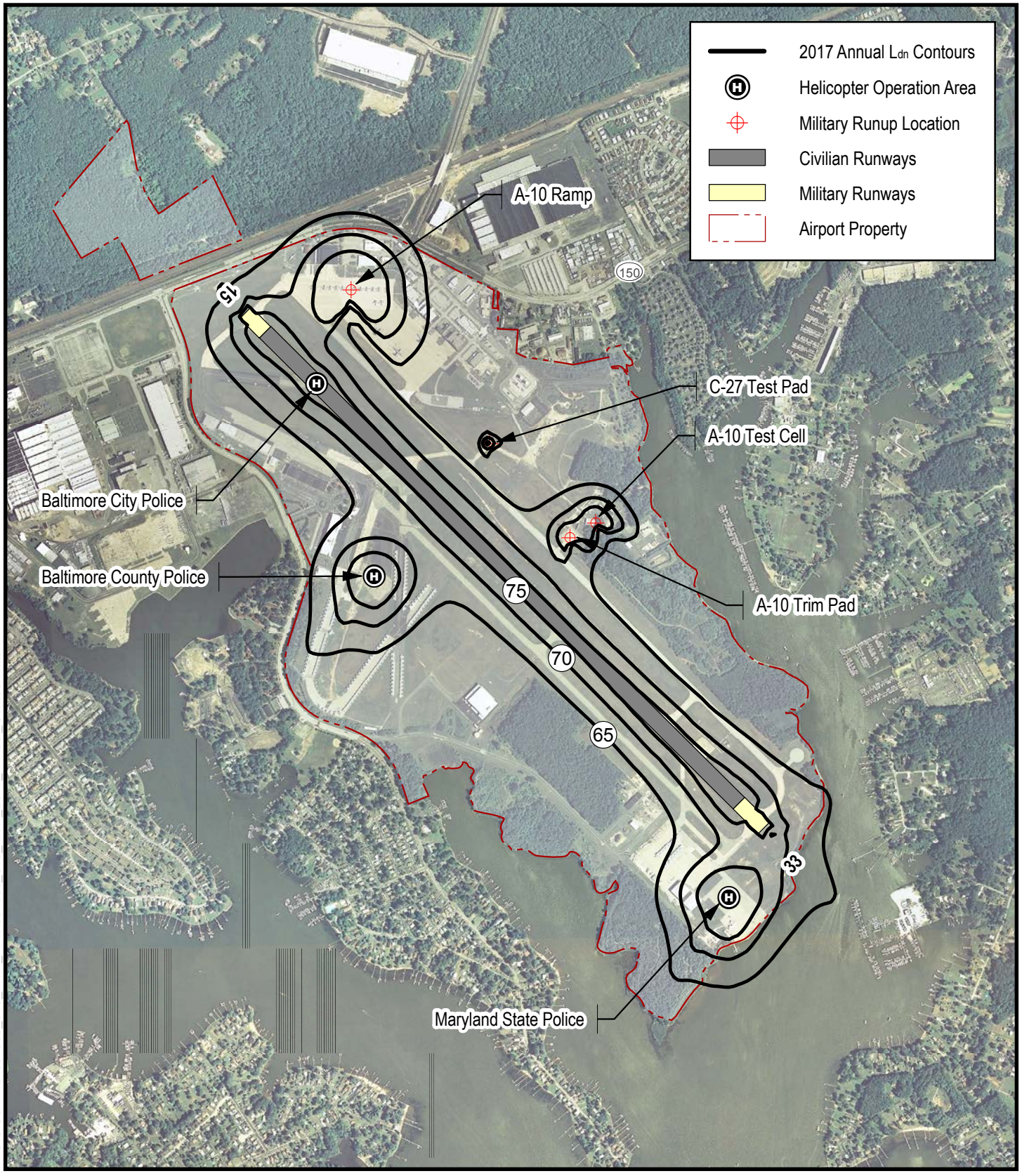


N
W
E
S

0 1,500 3,000 Feet

Martin State Airport
Airport Noise Zone Update

Figure 6
2012 L_{dn} Contours



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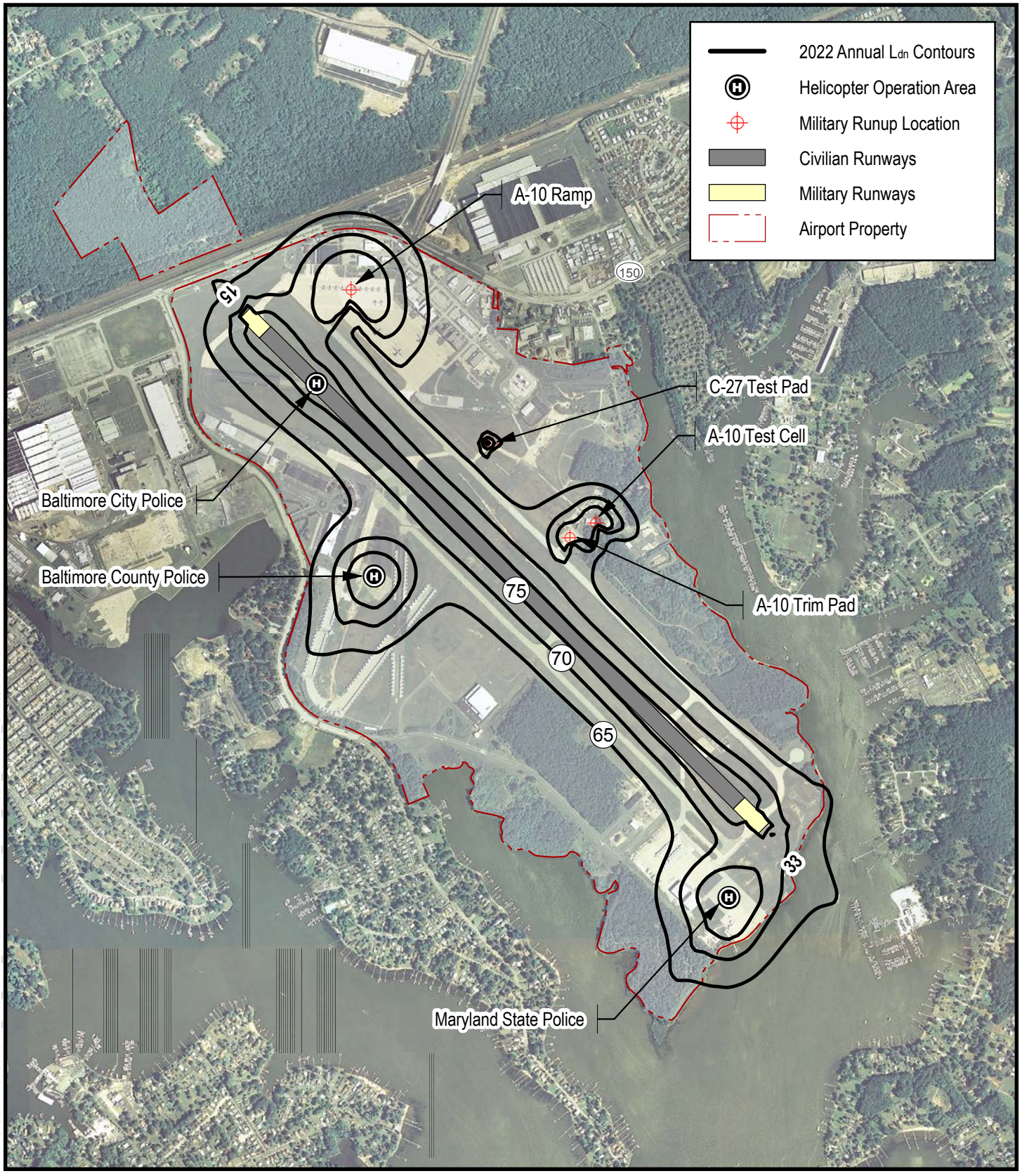
N
W
E
S

0 1,500 3,000 Feet

Martin State Airport
Airport Noise Zone Update

Figure 7
2017 L_{dn} Contours



H:\GIS\USAMD\301960_010_MTN_ANZ\301960_010_MTN_2022_Annual_Contour.mxd

N
W E
S

0 1,500 3,000 Feet

Martin State Airport
Airport Noise Zone Update

Figure 8
2022 L_{dn} Contours

4.2 2012 Airport Noise Zone Contours

The Proposed 2012 ANZ contour is shown in Figure 9. It represents the outer extent of the base-year, 5-year and 10-year forecast contours. As with the three individual model contours, the majority of the 65 dB L_{dn} contour remains on airport property with only the same exceptions noted in section 4.1. Similarly, the proposed ANZ contour does not expose any residential population to noise levels greater than 65 dB. The enclosed acreage is reported in Table 11.

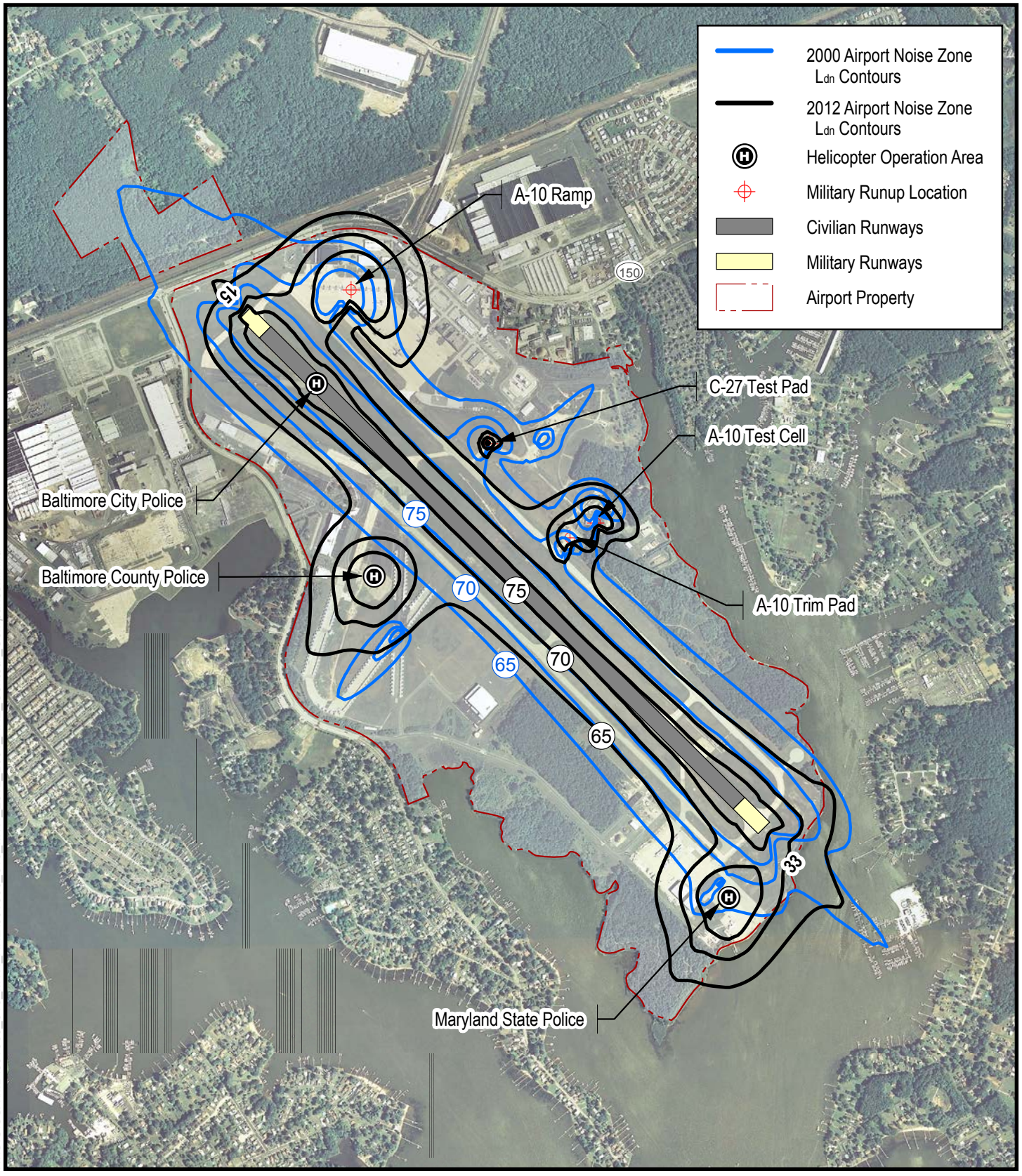
Table 11 Residential Population and Acreage within Proposed 2012 ANZ contour

L_{dn} Contour Interval	Residential Population	Residential Housing Units	Area (acres)
65-70dB	0	0	199
70-75dB	0	0	113
>75dB	0	0	81
Total >65dB	0	0	394
Source: HMMH, 2012			

The 2022 contour dominates the overall extent of the ANZ contour due to its projected higher operations levels. The one exception to this is the area immediately off the end of Runway 33 where aircraft operations are projected to shift to the northwest.

Figure 9 also presents a comparison of the Proposed 2012 ANZ contours to the previous 2000 ANZ contours. The 2012 ANZ contains 394 acres, an 11% reduction from 441 acres contained within the currently adopted ANZ. The reduced acreage of the ANZ is due to decreased operations, Maryland Air National Guard's shift to a quieter C-27J, as well as a general shift to quieter corporate jets.

There are a few areas in the current ANZ that are bigger than the 2000 ANZ. These reflect changes in helicopter noise modeling, as described below. The 2000 ANZ was modeled using INM version 6.0; at that time, the INM did not incorporate helicopter modeling. Beginning with INM version 7.0 and continuing in INM version 7.0b the introduction of a standard helicopter database has dramatically improved the accuracy helicopter noise resulting in the larger contour areas centered on the Maryland State and Baltimore County police helipads. Variations in the placement of the helipads and military Maintenance run-up areas are due to better data obtained through coordination with MTN airport staff and MANG. The large shift in the location of the Baltimore County Police helicopter activity is due to the use of a new helipad near Taxilane B across from their updated hangar facilities.



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N
W E
S

0 1,500 3,000 Feet

Martin State Airport
Airport Noise Zone Update

Figure 9
Proposed 2012 Airport Noise Zone L_{dn} Contours Compared to 2000 Airport Noise Zone L_{dn} Contours

5 Public Consultation

As required under COMAR, public consultation was sought for review of all inputs used in the development of the proposed ANZ noise contours. An Airport Advisory Committee was convened and two public meetings were held on June 7th 2011 and December 8th 2011. Inputs from these meetings were used to evaluate the noise modeling effort and provide comments used for revisions to the final modeling. Appendix C of this document provides the roster of the Airport Advisory Committee, published meeting invitations, the presentations given at the meetings as well as summary meeting notes.

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Appendix A Proposed Airport Noise Zone Overlaid on County Tax Maps

These are reduced scale versions of the proposed MTN Airport Noise Zone. The official versions have two sheets plotted at 1 inch=2,000 feet and two sheets plotted at 1 inch = 600 feet.

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COMAR 11.03.01.01-1B(6)

Martin State Airport

Airport Noise Zone

MARTIN STATE AIRPORT
AIRPORT NOISE ZONE

Prepared by:
Maryland Aviation Administration

Assisted by:
Harris Miller Miller & Hanson Inc.

443780 863258 | 445780 863258 | 447780 863258 | 449780 863258 | 451780 863258 | 453780 863258 | 455780 863258

186525 238908 | 184525 238908 | 182525 238908 | 180525 238908 | 178525 238908

COMAR 11.03.01.01-1B(6)
Martin State Airport
Airport Noise Zone

Loh 65

Data Sources: BWI Office of Facilities Planning, Noise Abatement Division; Maryland State Highway Administration; Maryland Department of Planning - 2010 MdPropertyView; Environmental System Research Group, Inc.; Harris Miller Miller & Hanson Inc

0 3000 6000 Feet

2012 Airport Noise Zone

Baltimore County, Maryland

2012 Airport Noise Zone
Prepared March 28, 2012

COMAR 11.03.01.01-1B(6)
Martin State Airport
Airport Noise Zone

091

098

443780 863258 | 445780 863258 | 447780 863258 | 449780 863258 | 451780 863258 | 453780 863258 | 455780 863258

186525 238908 | 184525 238908 | 182525 238908 | 180525 238908 | 178525 238908

Data Sources: BWI Office of Facilities Planning, Noise Abatement Division; Maryland State Highway Administration; Maryland Department of Planning - 2010 MdPropertyView; Environmental System Research Group, Inc.; Harris Miller Miller & Hanson Inc

0 3000 6000 Feet

2012 Airport Noise Zone

Baltimore County, Maryland

Tax Map Grid
Prepared March 28, 2012

449403 685139 | 451403 685139 | 453403 685139

185109 133942

COMAR 11.03.01.01-1B(6)
Martin State Airport
Airport Noise Zone

Ldn 65
Ldn 70
Ldn 75

AMTRAK MARC
BALTIMORE CROSSROADS 895
RAILROAD
EASTERN
SALTPETER CREEK
DUNDEE CREEK
WEISHUTTEL-PHOP 449 141
ARMSTRONG CREEK
FROG MORTAR CREEK
SENECA CREEK
STANSBURY CREEK
DARKHEAD CREEK
CLARK POINT
GLEN L. MARTIN STATE AIRPORT

UNITED STATES OF AMERICA 1600/477 50.93A P41
UNITED STATES OF AMERICA 2948/117 64.00A P 312
STATE OF MARYLAND MD DEPT OF TRANSPORTATION 5642/ 89 709.94 A P 152
BALTO COUNTY MD 5803/325 8.32 A P 209
BOARD OF EDUCATION 1040/558 1083/368 1517/441 12.00 A P 37
BOARD OF EDUCATION G.152/ G.20 19.00 A P 357
BALTO CO MD G.142/ 323 19.00 A P 435
HOWARD S. WENNINGER 5730/677 84.46 A. P 38
MEYERS BROTHERS REALTY CO., INC. 4295/194 123.2 AC. P.2 1 OF 3
P/O P.2 2 OF 3
P/O P.2 3 OF 3
LINDA PETRUSH, TR 9100/127 137.11A P 362
SENECA PARK BEACH 8.45 P 139
BALTIMORE GAS AND ELECTRIC CO. 3061/309 88.40 A.

Data Sources: BWI Office of Facilities Planning, Noise Abatement Division; Maryland State Highway Administration; Maryland Department of Planning - 2010 MdPropertyView; Environmental System Research Group, Inc.; Harris Miller Miller & Hanson Inc

183109 133942

0 1200 2400 3600 Feet

2012 Airport Noise Zone

Baltimore County, Maryland

Tax Map
Prepared March 28, 2012

MAP NO.
091

449403 732014 | 451403 732014 | 453403 732014

COMAR 11.03.01.01-1B(6)
Martin State Airport
Airport Noise Zone

MIDDLE RIVER

NORMAN CREEK

GALLOWAY CR.

SUE CREEK

CEDAR CREEK

GOOSE HARBOR INLET

WILSON PT

STRAWBERRY POINT

PINEY POINT

BARREN POINT

GALLOWAY POINT

LOG POINT

TURKEY POINT

SUE POINT

BOOBY POINT

BOWLEY BAR

BREEZY POINT

MIAMI BEACH PARK

BALTIMORE COUNTY MD
5817/165
57.68A
P29

BOWLEY'S QUARTERS REV PLAT 3
P.16

BOWLEYS QUARTERS RESORT

CARVILLE A LAUENSTEIN, ET AL
8989/600
55.00A
P186

BALTO. CO. MD.
6966/420
18.62 AC.
P.161

BALTO CO MARYLAND
6611/23
9.60A
P106

BALTO CO MARYLAND
8367/195
107.65
P107

BOARD OF ED
4367/81
35 A
P 217

BOARD OF EDUCATION OF BALTIMORE COUNTY
3700/247
49.49 A
P.78

BALTIMORE COUNTY
3780/196
18.75 A
P.159

M.W. VANDERMAST
7900/91
57.62
P.13
1of3

Data Sources: BWI Office of Facilities Planning, Noise Abatement Division; Maryland State Highway Administration; Maryland Department of Planning - 2010 MdPropertyView; Environmental System Research Group, Inc.; Harris Miller Miller & Hanson Inc

0 1200 2400 3600 Feet

2012 Airport Noise Zone

Baltimore County, Maryland

Tax Map
Prepared March 28, 2012

MAP NO.
098

179451

Appendix B Supplemental Noise Model Input Documentation

B.1 Submittal to FAA of Non-Standard Aircraft inputs used in the 2011 MTN Airport Layout Plan

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Burlington, MA 01803
T 781.229.0707
F 781.229.7939
www.hmmh.com

TECHNICAL MEMORANDUM

To:	Tom Priscilla, FAA Washington Airports District Office
cc:	Dean Mohr, MAA; Shawn Ames, MAA; Jake Plate, APP-400; Raquel Girvin, AEE-100, Becky Cointon AEE-100, Joe DiPardo AEE-100
From:	Sean M. Doyle, David A. Crandall
Date:	May 18, 2009
Subject:	INM Non-Standard Input for Airport Layout Plan for Martin State Airport
Reference:	HMMH Project 301960.007

Harris Miller Miller & Hanson Inc. (HMMH) is assisting the Maryland Aviation Administration (MAA) prepare the noise analysis associated with an Airport Layout Plan for the Martin State Airport (MTN). We are using the Integrated Noise Model (INM) Version 7.0b for all aircraft noise modeling. The MTN existing and forecasted operations include several civilian aircraft types and military aircraft types and circuit profiles for which there are no direct INM modeling inputs. Consistent with FAA's policy for non-standard modeling procedures this memorandum provides identifies our proposed non-standard modeling inputs.

As part of its based fleet, MTN houses Maryland Air National Guard A-10 and C-130J aircraft whose activities include touch-and-go training operations. The INM database does not currently include touch-and-go profiles for either of these aircraft. However 2005 Base Realignment and Closure Actions Act (BRAC) sponsored a Noise Exposure Mapping and Analysis Report1 in which A-10 and C-130 touch-and-go operations were modeled using the standard profiles in the United States Air Force's NOISEMAP model which is part of BaseOps. The Air Force Center or Engineering and the Environment (AFCEE) provided HMMH/MAA with a copy of the NOISEMAP study, which included A-10 and C-130J operations. The NOISEMAP study represented the C-130J with NOISEMAP type C130H&N&P. For BaseOps, the Noisefile database contains the C130H&N&P which has aircraft id M02903 and the C130HP in INM uses the Noise Id M02903. We therefore propose using non-standard inputs derived from NOISEMAP standard touch-and-go profiles in BaseOps version 7.32 for consistency.

We are requesting approval, for use in this project, of 1) non-standard INM aircraft and substitutions 2) user-defined A10A and C130HP touch-and-go profiles described in this memorandum. Please review this memorandum and provide either approval of the non-standard INM inputs described below or additional guidance. An electronic copy of the INM study accompanies this memorandum and has the proposed non-standard entries and was used to create the figures presented here.

[1] Noise Exposure Mapping and Analysis Report for 2005 Base Realignment and Closure Action 175th Wing At Martin State Airport, Baltimore, MA May 2007

This INM study, and the non-standard inputs covered for this request, will also be used for the Airport Noise Zone Update, as required by Maryland State regulations. Although the Airport Noise Zone is a state document and not subject to FAA review, we plan to use the same INM inputs as appropriate.

1. NON-STANDARD AIRCRAFT AND SUBSTITUTIONS

1.1 Lockheed C-130J (C130J)

As discussed above, the Maryland Air National Guard operates C-130J. Although there are several C130 aircraft in INM, none directly address the "J" variant. As discussed above, the aforementioned Air National Guard document and associated NOISEMAP modeling used NOISEMAP type C130H&N&P to represent the same C130J operations that we are modeling. NOISEMAP type C130H&N&P corresponds to INM military type C130HP

We propose to use INM military type C130HP to represent C130J operations.

1.2 Fairchild/Dornier 328 Regional Jet (J328)

The FAA has recently approved use of this user-defined aircraft for the PVD EIS using INM 7.0a (HMMH request dated September 28, 2009, FAA approval dated November 5, 2009). We propose to use the same user defined aircraft in INM 7.0b. Based on precedence and the lateral attenuation changes introduced in INM 6.1, we would like to create a user defined aircraft based on the CL600 and the AL502L noise identifier, with the change that it uses departure spectral class 104 instead of 113 to indicate to INM that this aircraft has wing mounted engines instead of tail mounted engines. We do not propose changing the arrival spectral class since only the departure spectral class informs INM that an aircraft has wing or tail mounted engines.

We propose to continue to model J328 operations with a user-defined aircraft based on the CL600 and the AL502L noise identifier, with the change that the user-defined aircraft uses departure spectral class 104 instead of 113 to reflect that the J328 has wing-mounted engines instead of tail-mounted engines.

1.3 Dassault Falcon 50 (FAL50)

The Falcon 50[2] is similar to the Lear 35 aircraft in the INM model except it has 3 TFE-731 Engines instead of 2 engines like the Lear 35. Page 8-7 in the INM 5.1 User Guide describes how to setup and model the Falcon 50 for the INM.

We propose to model the Falcon 50 with a USER Defined type which is a copy of the LEAR35 aircraft and associated noise-power-distance (NPD) curves and add 1.8 dB to the NPD curves as described in the INM 5.1 User Guide.

[2] The Dassault Falcon 50 as the official contraction "FA50" as defined in FAA Order 7340.12A Chapter 3. We are naming convention "FAL50" to be consistent with the FAL series (i.e. FAL20) already in the INM 7.0b substitution list.

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1.4 Dassault Falcon 900 (FAL900)

The Falcon 900[3] is similar to the Lear 35 aircraft in the INM model except it has 3 TFE-731 Engines instead of 2 engines like the Lear 35. Page 8-7 in the INM 5.1 User Guide describes how to setup and model the Falcon 900 for the INM.

We propose to model the Falcon 900 with a USER Defined type which is a copy of the LEAR35 aircraft and associated noise-power-distance (NPD) curves and add 1.8 dB to the NPD curves as described in the INM 5.1 User Guide.

2. MILITARY TOUCH-AND-GO PROFILES

The Maryland Air National Guard conducts touch-and-go operations at MTN with A10's and C130J's. However, touch-and-go profiles for both aircraft are not included in the INM standard database. The discussion in this memo varies from the FAA Profile Review Checklist (INM 7.0 User's Guide, Appendix B) in that the methodology laid out in the check list does not lend it self to the parameters of touch-and-go profiles and is aimed more directly at profiles for arrival and departure operations. The checklist calls for noise levels to be computed at half nautical mile intervals along a flight track. When considering closed pattern touch-and-go tracks however, an insufficient number of grid points would be available to draw the necessary conclusions. As an alternative we will show SEL contours along flight track in order to adequately describe the noise levels throughout the smaller confines of the touch-and-go profiles.

The following subsections follow the FAA Profile Review Checklist.

2.1 Background

As discussed above, this work supports the noise analysis associated with an Airport Layout Plan for the Martin State Airport (MTN). Maryland Aviation Administration is the sponsoring agency.

2.2 Statement of Benefit

As discussed previously, the Maryland Air National Guard operates A10 and C130J aircraft based at MTN. Operation levels in 2005 indicate that this unit performs approximately 250 touch-and-go operations (500 associated air traffic tower counts) annually in A-10 aircraft (INM type A10A) and 250 touch-and-go operations (500 associated air traffic tower counts) annually in C-130J aircraft (INM type C130HP, as represented in the NOISEMAP study). Project forecasts indicate that these levels should not appreciably change in the foreseeable future.

The INM standard database does not include touch-and-go profiles for these aircraft, however, the 2005 Base Realignment and Closure Actions Act (BRAC) sponsored a Noise Exposure Mapping and Analysis Report in which A-10 and C-130J touch-and-go operations were modeled using the standard profiles in the military NOISEMAP model. We propose user-defined profiles for INM types A10A and C130HP based on data presented in the BRAC NOISEMAP study for consistency.

[3] The Dassault Falcon 900 as the official contraction "F900" as defined in FAA Order 7340.12A Chapter 3. We are naming convention "FAL900" to be consistent with the FAL series (i.e. FAL20) already in the INM 7.0b substitution list.

2.3 Analysis of Demonstrated Benefit

This section provides SEL contours of the proposed profiles. Figure 1 presents the 85, 90, 95, and 100 dB SEL contours for the proposed A10A touch-and-go profile on Runway 15. This SEL contour set was generated using annual average atmospheric data for MTN (Temperature 56.0° F, Pressure 29.86 in Hg, humidity 66%).

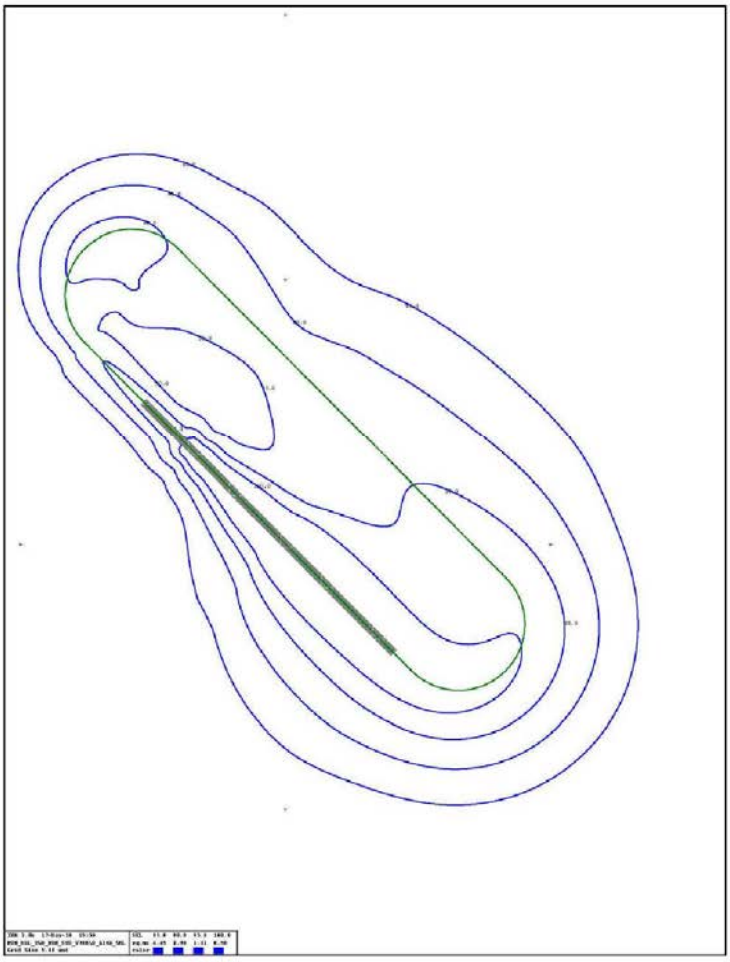

Figure 1 85, 90, 95, 100 dB SEL Contours for Proposed A10A USER Touch-and-Go Profile on Runway 15

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Figure 2 presents the 85, 90, 95, and 100 dB SEL contours for the proposed C130HP touch-and-go profile on Runway 15. This SEL contour set was generated using annual average atmospheric data for MTN (Temperature 56.0° F, Pressure 29.86 in Hg, humidity 66%).

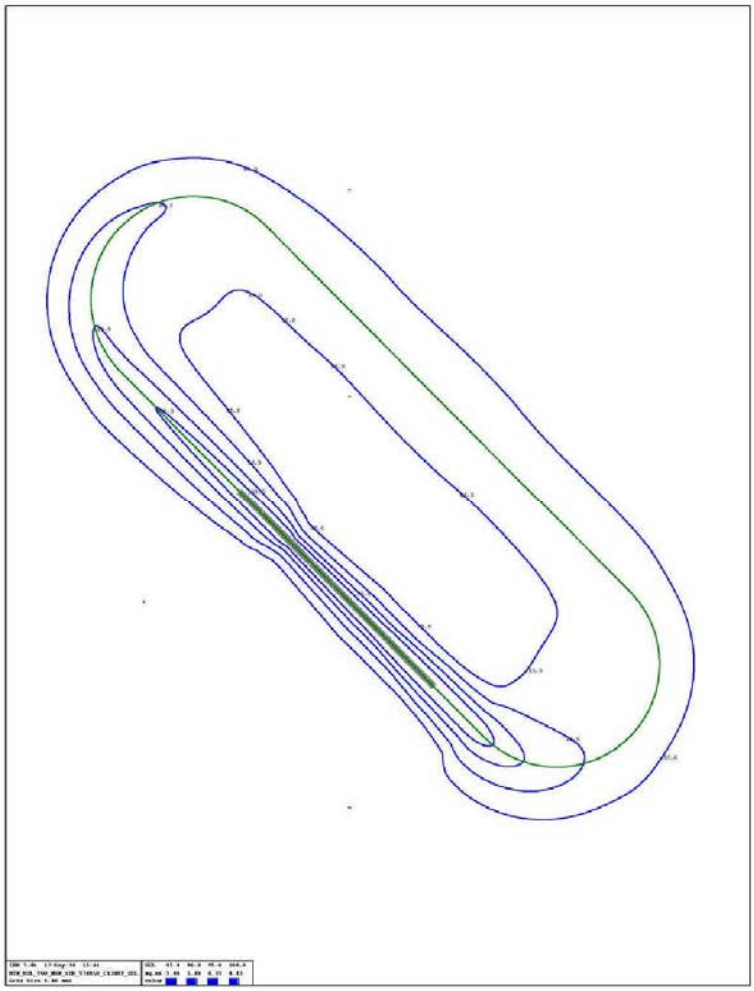

Figure 2 85, 90, 95, 100 dB SEL Contours for Proposed C130HP USER Touch-and-Go Profile on Runway 15

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2.4 Statement of Concurrence

Noise modeling for the BRAC study used the United States Air Force's NOISEMAP / BaseOps noise model. We propose to use this source as the "Concurrence on Aircraft Performance" as requested by the FAA Profile Review Checklist (INM 7.0 User's Guide, Appendix B).

The NOISEMAP / BaseOps profile data is provided below in Table 1 for the A10A NOISEMAP aircraft and in Table 2 for the C130H&N&P aircraft. The NOISEMAP / BaseOps profile graph figures are also shown here as Figure 3 for the A10 and Figure 4 for the C130.

Table 1 Flight Profile A-10A from NOISEMAP / BaseOps Inputs

Distance (ft)	Height (ft, AGL)	Power (NF)	Speed (knots)
0	0	6700 Max Rated Thrust	0
2,500	0	6700 Max Rated Thrust	165
8,000	675	6365 Max Rated Thrust	180
18,000	2000	5695 Traffic Pattern	200
23,338	1000	5695 Traffic Pattern	200
27,342.52	300	4690 Approach	135
30,380.58	50	4690 Approach	135

Table 2 Flight Profile C130H&N&P from NOISEMAP / BaseOps Inputs

Distance (ft)	Height (ft, AGL)	Power (IN-LBS)	Speed (knots)
0	0	5700 Takeoff	133
3,038.058	0	9770 Takeoff	145
7,595.144	50	9770 Takeoff	145
12,152.23	1500	9300 Variable	200
24,304.46	1500	9330 Variable	200
36,456.69	1000	6000 Approach	145
42,532.81	300	5700 Approach	135
48608.92	50	5700 Approach	120

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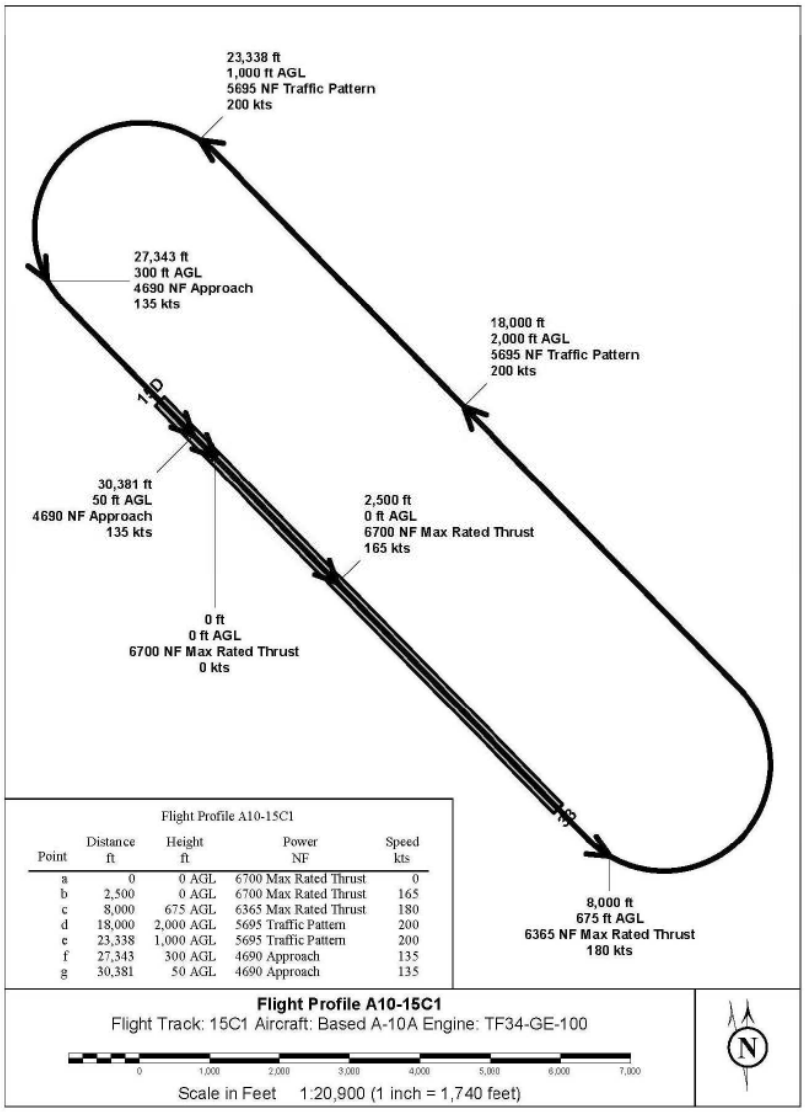
HARRIS MILLER MILLER & HANSON INC.

INM Non-Standard Input for Martin State Airport (MTN) Airport Layout Plan (ALP)
May 18, 2009
Page 7



Flight Profile A10-15C1

Point	Distance ft	Height ft	Power NF	Speed kts
a	0	0 AGL	6700 Max Rated Thrust	0
b	2,500	0 AGL	6700 Max Rated Thrust	165
c	8,000	675 AGL	6365 Max Rated Thrust	180
d	18,000	2,000 AGL	5695 Traffic Pattern	200
e	23,338	1,000 AGL	5695 Traffic Pattern	200
f	27,343	300 AGL	4690 Approach	135
g	30,381	50 AGL	4690 Approach	135

Figure 5 NOISEMAP / BaseOps A10 Touch-and-Go Profile Output

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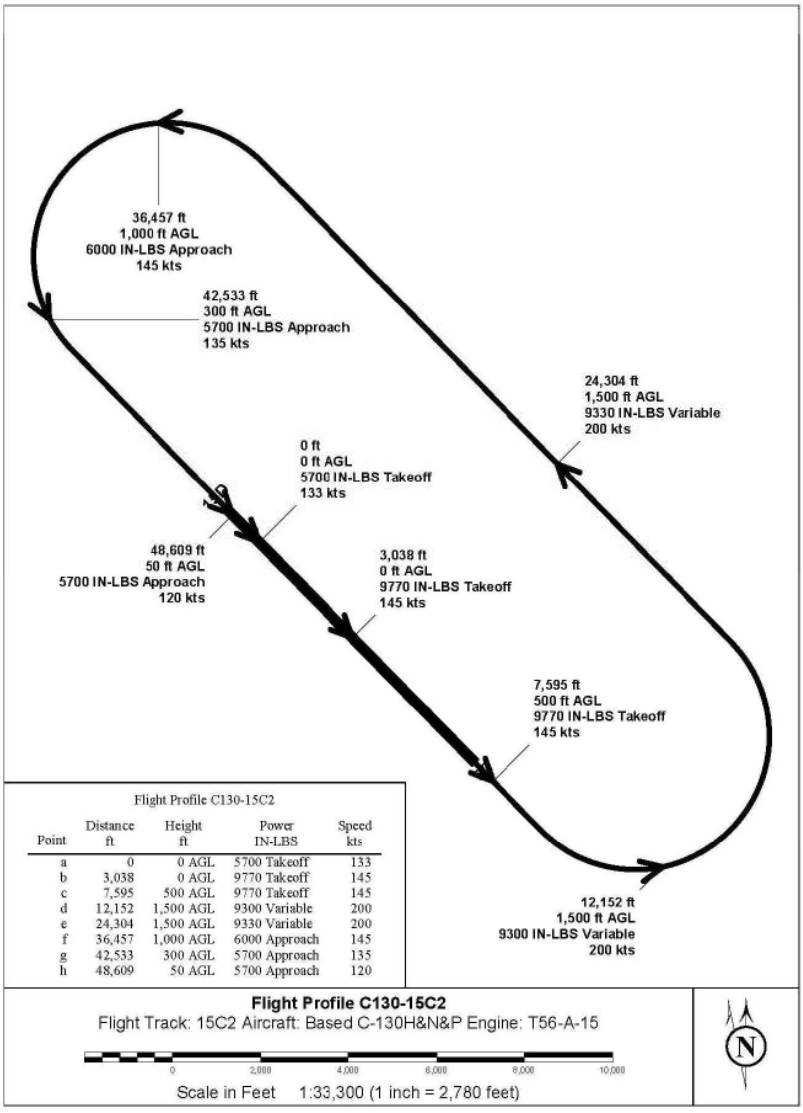

Figure 6 NOISEMAP / BaseOps C130 Touch-and-Go Profile Output

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2.5 Certification of New Parameters

Only slight modifications to the NOISEMAP / BaseOps profiles were needed for input to the INM. These modifications are to define the profile, in terms of profile points, such that

- The intermediated NOISEMAP "Traffic Pattern" thrust setting for the A-10A was defined as equivalent to the INM A10A arrival OP_MODE.
- The intermediated NOISEMAP "Variable" thrust setting for the C130H&N&P was defined as equivalent to the INM C130HP arrival OP_MODE.
- The Power Setting values for the C130H&N&P in NOISEMAP correspond to equivalent NPD values in INM when the number is divided by 10. (i.e. a NOISEMAP Power setting of 5700 is equivalent to an INM power setting of 570)
- The NOISEMAP profile for the A10A did not include a speed value at zero AGL in the transition between the arrival and departure segment of the touch-and-go profile. An intermediate value between the preceding and following points was therefore used.
- The NOISEMAP profile for the A10A did not require a level segment in the downwind leg of the touch-and-go profile. For compatibility with INM a small level segment was introduced to the profile.

We certify that we have prepared the data to these requirements.

2.6 Graphical and Tabular Comparison

2.6.1 Touch-and-Go profile for A10A

Table 3 provides the INM formatted profile points data for the A10A USER-1 touch-and-go profile. Figure 7 graphically presents the altitude versus ground track distance profile. Figure 8 graphically presents the speed versus ground track distance profile. Figure 9 graphically presents the thrust versus ground track distance profile.

Table 3 Profile Points for A10A Touch-and-Go Operations
(OP_TYPE = T, PROF_ID2 = USER and PROF_ID2 = 1)

ACFT_ID	PT_NUM	DISTANCE	ALTITUDE	SPEED	THR_SET	OP_MODE
A10A	1	-12809.0	2000.0	200.0	5695.00	A
A10A	2	-12800.0	2000.0	200.0	5695.00	A
A10A	3	-7473.0	1000.0	200.0	5695.00	A
A10A	4	-3468.5	300.0	135.0	4690.00	A
A10A	5	-430.4	50.0	135.0	4690.00	A
A10A	6	0.0	0.0	150.0	4690.00	D
A10A	7	2500.0	0.0	165.0	6700.00	D
A10A	8	8000.0	675.0	180.0	6365.00	D
A10A	9	17990.0	2000.0	200.0	6365.00	D
A10A	10	18000.0	2000.0	200.0	6365.00	D

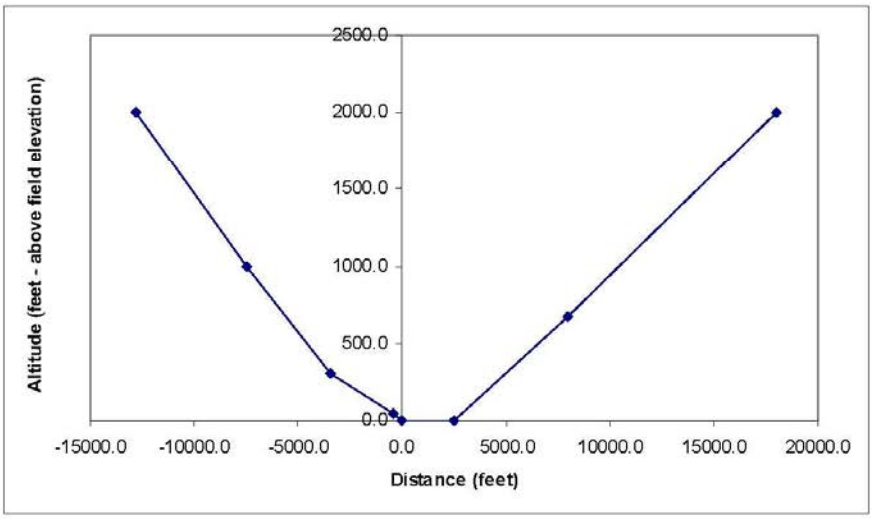

Figure 7 A10A Touch-and-Go Profile USER-1 Altitude vs. Distance

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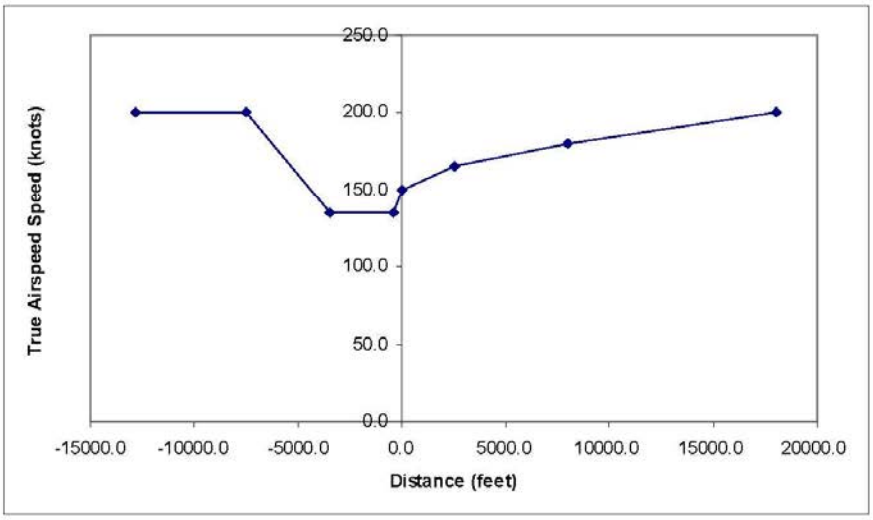

Figure 8 A10A Touch-and-Go Profile USER-1 Speed vs. Distance

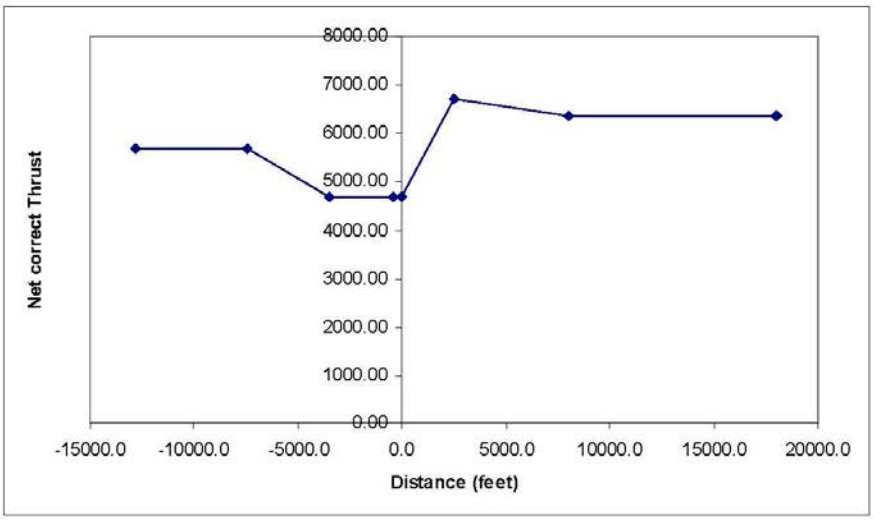

Figure 9 A10A Touch-and-Go USER-1 Thrust vs. Distance

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Touch-and-Go profile for C130HP

Table 4 provides the INM formatted profile points data for the C130HP USER-1 touch-and-go profile. Figure 7 graphically presents the altitude versus ground track distance profile. Figure 10 graphically presents the altitude versus ground track distance profile. Figure 11 graphically presents the speed versus ground track distance profile. Figure 12 graphically presents the thrust versus ground track distance profile.

Table 4 Profile Points for C130HP Touch-and-Go Operations (OP_TYPE = T, PROF_ID2 = USER and PROF_ID2 = 1)

ACFT_ID	PT_NUM	DISTANCE	ALTITUDE	SPEED	THR_SET	OP_MODE
C130HP	1	-25664.5	1500.0	200.0	933.00	A
C130HP	2	-25164.5	1500.0	200.0	933.00	A
C130HP	3	-13012.3	1000.0	145.0	600.00	A
C130HP	4	-6936.2	300.0	135.0	570.00	A
C130HP	5	-860.1	50.0	120.0	570.00	A
C130HP	6	0.0	0.0	133.0	570.00	D
C130HP	7	3038.1	0.0	145.0	977.00	D
C130HP	8	7595.1	50.0	145.0	977.00	D
C130HP	9	12152.2	1500.0	200.0	930.00	D
C130HP	10	12652.2	1500.0	200.0	930.00	D

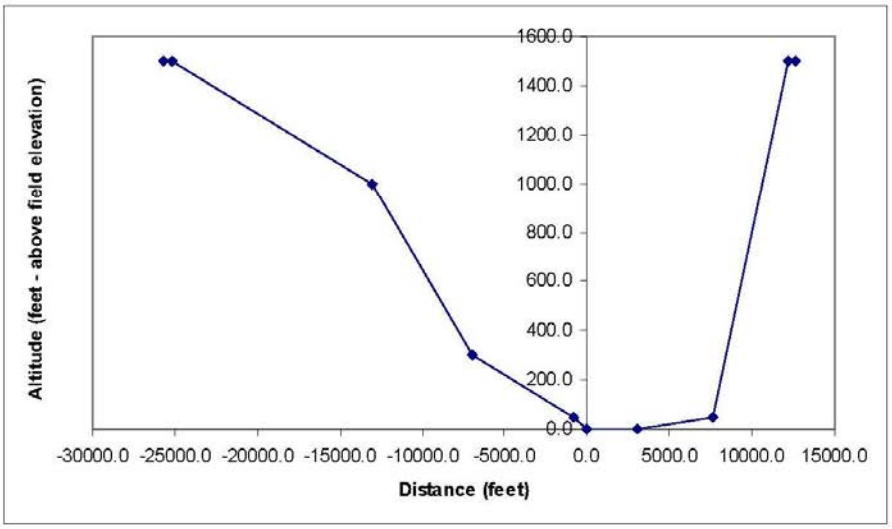

Figure 10 C130HP Touch-and-Go Profile USER-1 Altitude vs. Distance

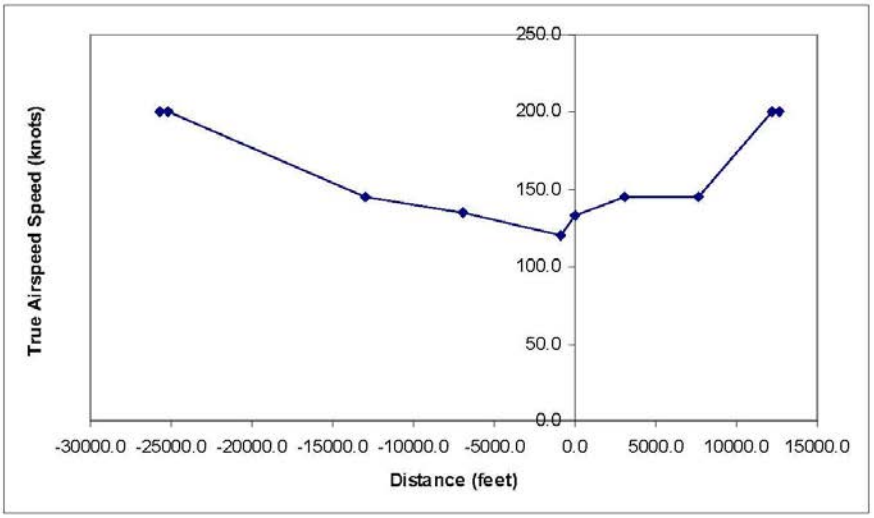

Figure 11 C130HP Touch-and-Go Profile USER-1 Speed vs. Distance

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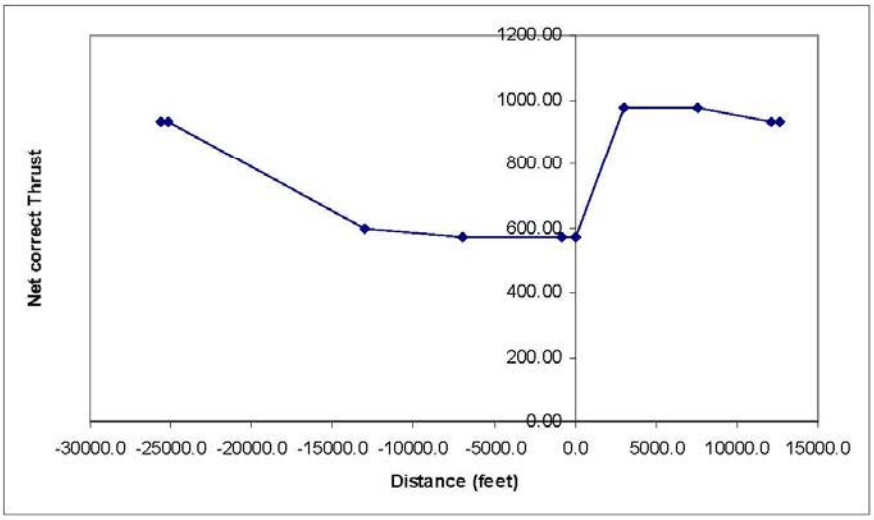

Figure 12 C130HP Touch-and-Go USER-1 Thrust vs. Distance

2.7 Conclusions and Recommendation

INM does not have standard touch-and-go profiles for either the A10A or C130HP aircraft. These aircraft do however have touch-and-go profiles defined in NOISEMAP and are readily accessible for use as INM user defined profiles. Their use additionally provides consistency with the 2007 BRAC study as previously discussed. We propose to use the touch-and-go profiles described here with data in Table 3 and Table 4.

Table 5 Listing of Figures and Associated Cases and Output Directories in the Accompanying INM study

	INM Study Folders		
Figure	**Scenario**	**Case**	**Output**
Figure 1	S_A10A	C_A10A	O_A10A_SEL
Figure 2	S_C130HP	C_C130HP	O_C130HP_SEL

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B.2 FAA acceptance letter for submittal for Non-Standard Aircraft inputs used in the 2011 MTN Airport Layout Plan

U.S. Department of Transportation
Federal Aviation Administration

Office of Environment and Energy

800 Independence Ave., S.W.
Washington, D.C. 20591

June 11, 2010

Tom Priscilla
Cargo Bldg.
FAA Washington ADO
23723 Air Freight Ln.
Dulles, VA 20166

Dear Mr. Priscilla,

The Office of Environment and Energy (AEE) has received the memo dated May 20, 2009, referencing HMMH Project Number 301960.007 requesting approval for aircraft substitutions and touch and go profile creation for an Airport Layout Plan for the Martin State Airport (MTN).

AEE has reviewed your request for the four aircraft substitutions. AEE approves the substitutions in the following table.

Aircraft	INM Substitution
Lockheed C-130J (C130J)	C130HP
Fairchild/Dornier 328 Regional Jet (J328)	User-defined aircraft based on the CL600 and the AL502L noise identifier, with departure spectral class 104
Dassault Falcon 50 (FAL50)	LEAR35aircraft and associated noise-power-distance (NPD) curves and add 1.8 dB to the NPD curves
Dassault Falcon 900 (FAL900)	LEAR35aircraft and associated noise-power-distance (NPD) curves and add 1.8 dB to the NPD curves

In addition, AEE has reviewed the request for the touch and go military profile at MTN with A10's and C130J's. AEE recognizes that these profiles were developed using information from United States Air Force's NOISEMAP / BaseOps noise model. AEE approves the touch and go profiles as described within the memo.

Please understand that this approval is limited to this particular Airport Layout Plan for MTN. Any additional projects or non-standard INM input at MTN or any other site will require separate approval.

Sincerely,

Raquel Girvin, Ph.D.
Manager
AEE/Noise Division

cc: Jake Plante, APP-400

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Appendix C MTN Advisory Committee Meetings

C.1 MTN Advisory Committee Roster

Airport Noise Zone Advisory Committee - 2011
(Revised 6/3/11)

Committee Roster

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MTN ANZ Roster 2011.doc 1

Airport Noise Zone Advisory Committee - 2011
(Revised 6/3/11)

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Airport Noise Zone Advisory Committee - 2011
(Revised 6/3/11)

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Airport Noise Zone Advisory Committee - 2011
(Revised 6/3/11)

Committee Roster

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C.2 Material Related to June 7th, 2011 MTN Advisory Committee Meeting

Meeting Announcement:

Maryland Aviation Administration

Martin O'Malley
Governor

Anthony G. Brown
Lt. Governor

Beverley K. Swaim-Staley
Secretary of Transportation

Paul J. Wiedefeld, A.A.E.
Executive Director

May 10, 2011

«Title» «FirstName» «LastName»
«JobTitle»
«Company»
«Address1»., «Address2»
«City», «State» «Zip»

Dear «Title» «LastName»:

The Maryland Aviation Administration (MAA) has begun the process of updating its Airport Noise Zone (ANZ) and Noise Abatement Plan for Martin State Airport (MTN). As part of this effort, we are seeking input from communities surrounding the airport regarding noise issues, including strategies to reduce airport-related noise.

I invite you, or another representative of your organization, to join our Community Noise Advisory Committee (Committee). The purpose of the Committee is to identify those who are affected by airport noise and to determine the most appropriate ways to reduce noise. The Committee will include representatives of the MAA and MTN, the Maryland Air National Guard, local businesses and government agencies, and members of the general public.

We anticipate that the Committee will meet twice. Our first meeting is scheduled for Tuesday, June 7, 2011 at 6:00 p.m. The meeting will be held in Room 412, located in the lower level of Hangar 4 at MTN. The second meeting will be held in late summer of 2011. Following the Advisory Committee meetings, a public hearing will be held. We appreciate your interest in airport issues and look forward to working with you on updating our ANZ and Noise Abatement Plan.

Please call Ms. Pauline O'Connor at 410- 859-7550 or email to poconnor@bwiairport.com if you plan to attend.

Sincerely,

Al Pollard, A.A.E.
Director

cc: Ms. Louisa H. Goldstein, Assistant Attorney General, MAA
Ms. Pauline O'Connor, Planner, Office of Noise, & Land Use Compatibility, MAA
Mr. Paul L. Shank, P.E., C.M., Deputy Executive Director, Facilities Development & Engineering, MAA

MARTIN STATE AIRPORT
701 Wilson Point Road – Box 1
Baltimore, Maryland 21220-4282
Telephone: 410-682-8800 • Fax: 410-682-8822 • TTY/TDD for the hearing impaired: 410-859-7227 • www.martinstateairport.com

The Maryland Aviation Administration is an agency of the Maryland Department of Transportation

Sign In Sheet:

SIGN-IN-SHEET
Airport Noise Zone and Noise Abatement Plan
Advisory Committee Meeting
Martin State Airport
June 7, 2011 6:00 p.m.

Name	Signature	Organization
PAULA O'CONNOR	Paula O'Connor	MAA
ROSS HARRINGTON	Ross Harrington	WPCIA
Bob Bendler	Robert Bendler	WPCIA
Michelle Prettyman	Michelle Prettyman	BQCA
JANET WALPER	Janet Walper	BQCA
Mike BRANDT		PHI AIRMEDICAL
Alverna "A.J." Durham	A J Durham	Straughan Environmental 410-297-6502
Michael DeRuggieri	Michael DeRuggieri	MSP-Aviation MDeRuggieri@MDSP.org
Peter Loebach, Lt Col	Peter Loebach	175 WG, MDANG 410-918-6486 peter.loebach@ang.af.mil

Name	Signature	Organization
WILLIAM PEGGY JONES	W. H. Jones	ESSEX MIDDLE RIVER CIVIC COUNCIL
JACK LUDLAM	Jack Ludlam	MTN CONTROL TOWER
MATT JACKSON	Matt Jackson	Balto. County Police Dept
Marsha Aynes	Marsha Aynes	Bowleys Quarters Improvement Assn.
Ellen Sander	Ellen Sander	Maryland Aviation Adm
Jeanne Harrison	Jeanne Harrison	Windlass Run Improv. Assoc.
Lewis Hay	Lewis Hay	Brent Co. Planning Office
DOUG TOMECEK	Doug Tomecek	Hawthorne Civic Assn.

Meeting Notes:

Martin State Airport Advisory Committee Meeting
Martin State Airport – Hanger 4, Room 412
June 7, 2011 – 6:00 p.m.

Attendees: See attached sign-in sheet

- Ellen made opening remarks noting that the last Airport Noise Zone completed for Martin's was in 2000.
- Al Pollard made a few opening remarks. Martin State Airport is quiet today compared to earlier years. Traffic at Martin is tied to the economic pulse of Baltimore. Businesses are not flying into and out of Baltimore as much due to the price of gas as well as the downturn in the economy.
- Al stated that the staff at Martin State Airport works with pilots on noise abatement issues. He also noted that the helicopters at the airport are mainly used for law enforcement and medivac purposes.
- Mary Ellen spoke noting that she will be presenting the draft findings for the Airport Noise Zone. She stated that she wanted to hear comments and opinions from those in attendance. Everyone in the audience then introduced themselves. Mary Ellen also asked those in attendance if they knew of anyone that should be invited to future meetings.
- Mary Ellen began a PowerPoint presentation by going over the agenda, the list of invited participants, and what an airport noise zone means.
- Mary Ellen said that three sets of contours were prepared for 3 year, 5 year and 10 year projections. The process of developing the Airport Noise Zone includes the preparation of contours, developing a composite, creating a land use inventory then a public hearing will be held and the final Airport Noise Zone will be incorporated into COMAR.
- The Airport Noise Zone on a map will be a legal document.
- The FAA Integrated Noise Model is used in developing the ANZ. Operational activity, types of aircraft, runway use and flight track information are used as inputs into the noise model.
- The noise contours haven't changed much even though there is less traffic because the nosiest aircraft traffic has remained steady.
- Based on the FAA Terminal Area Forecast, helicopter use remains constant.

- A participant from Wilson Point Improvement Association noted that 2 of the C130s will be gone from Martin by the end of the year. The Air Guard will use C-27(?) to replace C130.

- Maryland State Police stated that the delivery of some new aircraft will take place in 5/2012.

- There are 11 helicopters at Martin. Baltimore Co. has 3. Baltimore City has 4 and there is 1 medivac and 1 news helicopter.

- Mary Ellen discussed the Noise Abatement Plan and asked if there was anything in the plan not working. One participant noted that while they are ok with the medivac and police helicopters taking the shortest route, he would like someone to enforce the return route procedures for noise abatement and ask the pilots to use the correct return route.

- Al asked that they call the Airport when this happens so they can contact the pilot.

- It was noted that sometimes transient helicopters use Martin to refuel and the Airport can't control their route.

- Maryland State Police stated their pilots, even those who were training, were well versed in the rules and procedures of the Noise Abatement Plan.

- The gentleman from Wilson Point (Bob) indicated that this is not a major problem and only happened occasionally.

- Someone commented that light aircraft noise and vibrations could be felt at home on 1500 Burke Road.

- Mary Ellen asked those in attendance if basically the noise abatement procedures are good, but just need some enforcement. There was general agreement

- It was also mentioned that winds often dictate which approach will be used for safety reasons.

- There was some discussion about noise monitors. Mary Ellen said she would put the location of the noise monitors on the ANZ map.

- Someone asked if the decibel levels measured included operations and quite time combined (averaged). Mary Ellen said yes. The attendee stated that she didn't feel the contours were completely accurate because they don't depict the loudest decibels heard or that could be heard. Mary Ellen stated that the regulation was for land uses, specifically residential uses. Mary Ellen stated that she could add max noise predicted.

- Someone asked if there was a maximum noise threshold that aircrafts have to be under. Mary Ellen replied yes and no. Military aircraft are exempt from noise thresholds and commercial aircraft thresholds are tied to the weight of the aircraft. It was then asked if each aircraft was tested. Mary Ellen replied that aircraft are certified before they become eligible for flight.

- Someone asked if current noise levels are accurate with noise levels previously predicted for this time. Mary Ellen replied they were for the most part. Current conditions have lower than predicted operations but higher decibel levels for helicopters.

- The Air National Guard stated that they will be completing their own noise studies sometime next year which will include data from the new helicopters. They volunteered to share their results. Baltimore County also will share their data.

- The next meeting will be held in August.

Presentation:

www.hmmh.com

Martin State Airport
Airport Noise Zone Update
Advisory Committee Meeting

MARTIN STATE AIRPORT

June 7, 2011

Agenda

MARTIN STATE AIRPORT

www.hmmh.com

- Advisory Committee (Review and Introductions)
- State of Maryland's Airport Noise Zone (COMAR)
- Airport Noise Zone Update
- Schedule

Advisory Committee: Invited Participants

www.hmmh.com

Organization	Representing	Representative
Government Officials	▪Baltimore City Police Dept/Helicopter Unit	▪Lt. Carl Crenshaw ▪Sgt. Wayne Lloyd ▪Sgt. Ron Wines
	▪Baltimore County Department of Planning	▪Jeff Mayhew
	▪Civil Air Patrol – HQ Group II – USAF Aux.	▪Maj. Chris Roche
	▪Maryland Air National Guard	▪Col. Pete Loebach
	▪Maryland State Police	▪Maj. A.J. McAndrew
	▪Air Traffic Manager	▪Jack Ludlam
	▪Maryland Aviation Administration	▪Pauline O'Connor, Noise Office ▪Al Pollard, Airport Manager ▪Ellen Sample, Manager, Noise Division ▪Paul Shank, Dep Exec Dir

Noise Zone Update Tasks

www.hmmh.com

- Prepare base year, 5-year, 10-year forecast contours
- Compile composite Airport Noise Zone
- Conduct land use inventory
- Conduct public hearing
- Incorporate into Code of Maryland Regulations (COMAR)

Noise Model Inputs

www.hmmh.com

- Operational Activity
  - Daily traffic
  - Aircraft types
- Runway Use
- Flight Tracks and Flight Track Use

Baseline Average Daily Operations

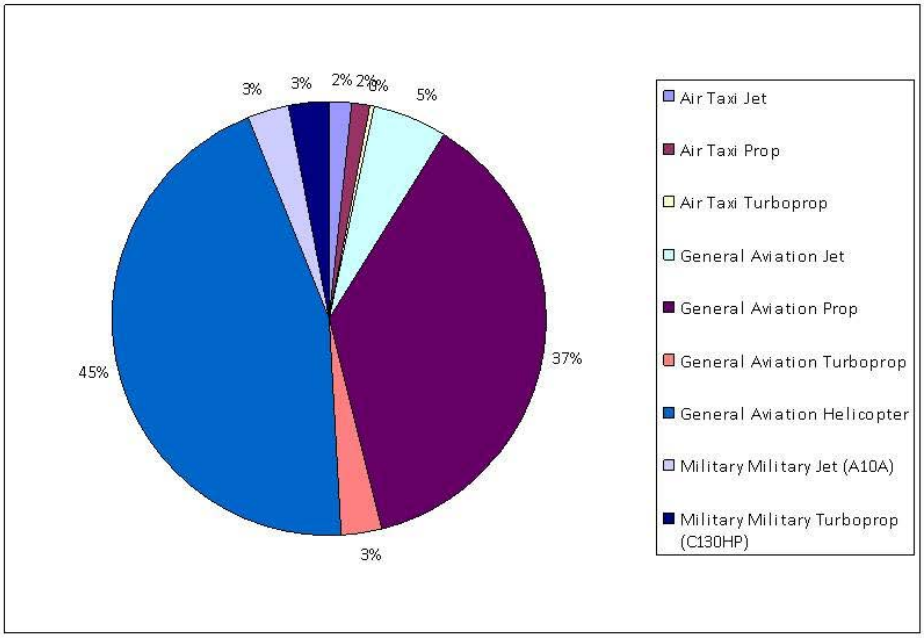
www.hmmh.com

		DAY			Night			TOTAL
		ARR	DEP	TGO	ARR	DEP	TGO	OPS
Air Carrier	Jet	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Taxi	Jet	1.0	1.0	0.0	0.0	0.0	0.0	2.1
Air Taxi	Prop	0.8	0.6	0.0	0.3	0.5	0.0	2.2
Air Taxi	Turboprop	0.1	0.1	0.0	0.0	0.0	0.0	0.3
General Aviation	Jet	3.5	3.4	0.0	0.2	0.3	0.0	7.4
General Aviation	Prop	11.4	11.6	26.4	0.3	0.1	0.0	49.8
General Aviation	Turboprop	2.0	2.0	0.0	0.1	0.1	0.0	4.2
General Aviation	Helicopter	21.2	21.9	0.0	8.8	8.1	0.0	59.9
Military	Military Jet (A10A)	1.8	1.8	0.4	0.0	0.0	0.0	4.0
Military	Military Turboprop (C130HP)	1.8	1.8	0.4	0.0	0.0	0.0	4.0
	Total	**43.7**	**44.3**	**27.2**	**9.7**	**9.1**	**0.0**	**133.9**

Distribution of Operations by Aircraft Type

MARTIN STATE AIRPORT

www.hmmh.com



2017 Average Daily Operations

MARTIN STATE AIRPORT

www.hmmh.com

		DAY			Night			TOTAL
		ARR	DEP	TGO	ARR	DEP	TGO	OPS
Air Carrier	Jet	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Taxi	Jet	1.0	1.0	0.0	0.0	0.0	0.0	2.1
Air Taxi	Prop	0.8	0.6	0.0	0.3	0.5	0.0	2.2
Air Taxi	Turboprop	0.1	0.1	0.0	0.0	0.0	0.0	0.3
General Aviation	Jet	4.2	4.1	0.0	0.2	0.4	0.0	8.9
General Aviation	Prop	13.7	13.9	27.6	0.3	0.1	0.0	55.8
General Aviation	Turboprop	2.4	2.4	0.0	0.1	0.1	0.0	5.1
General Aviation	Helicopter	21.2	21.9	0.0	8.8	8.1	0.0	60.1
Military	Military Jet (A10A)	1.8	1.8	0.4	0.0	0.0	0.0	4.1
Military	Military Turboprop (C130HP)	1.8	1.8	0.4	0.0	0.0	0.0	4.1
	Total	**47.2**	**47.8**	**28.4**	**9.8**	**9.2**	**0.0**	**142.4**

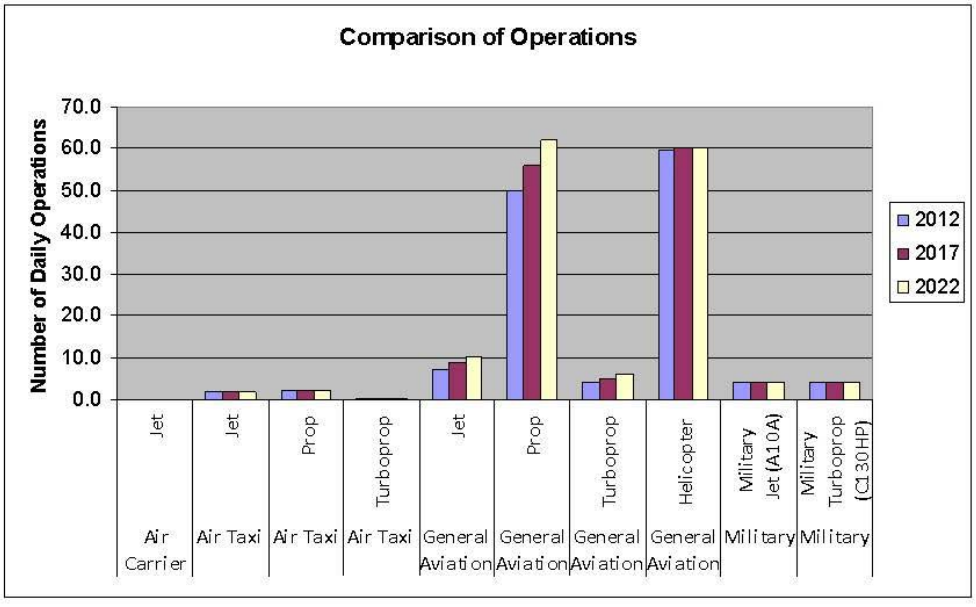
2022 Average Daily Operations

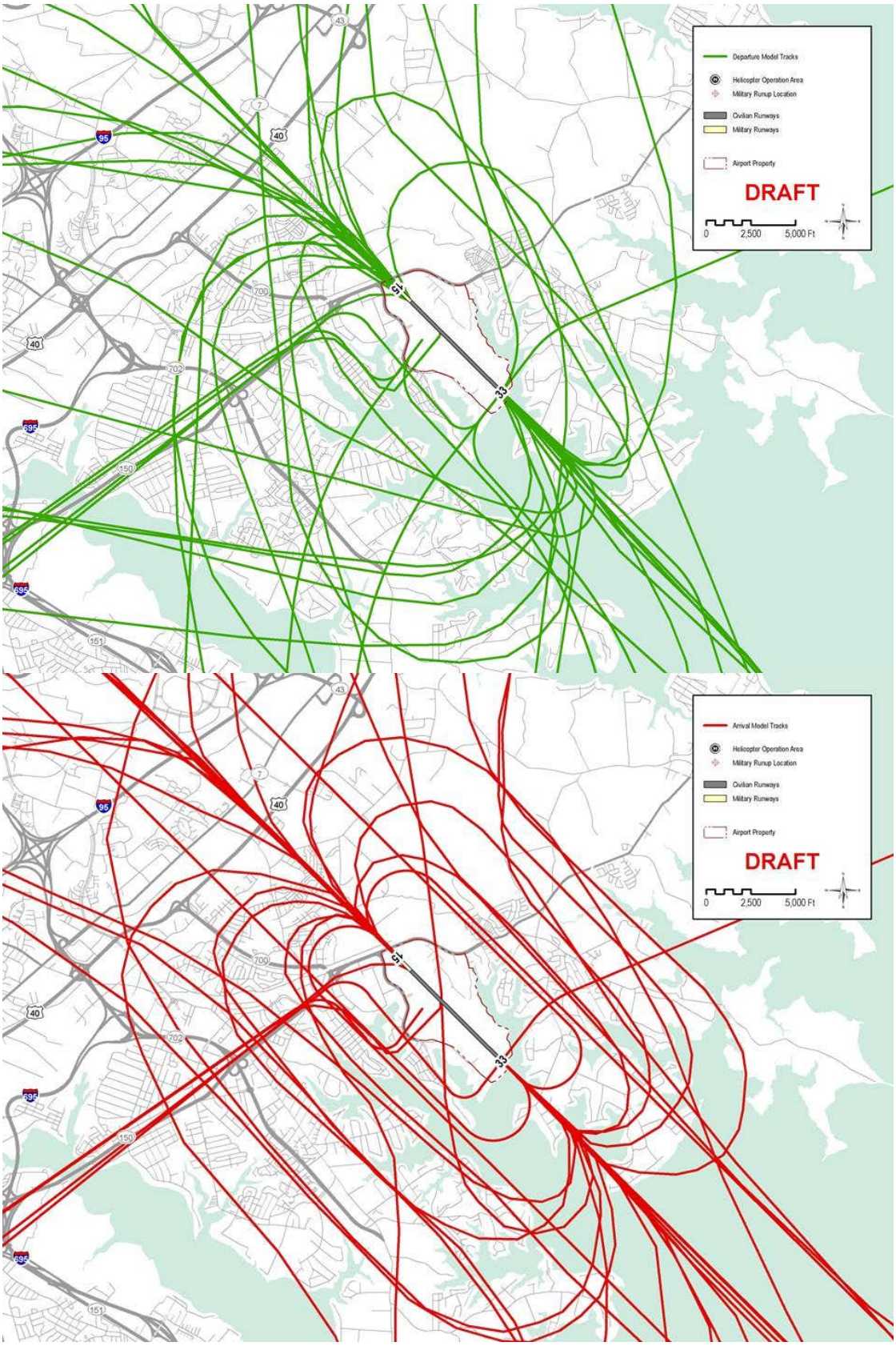
www.hmmh.com

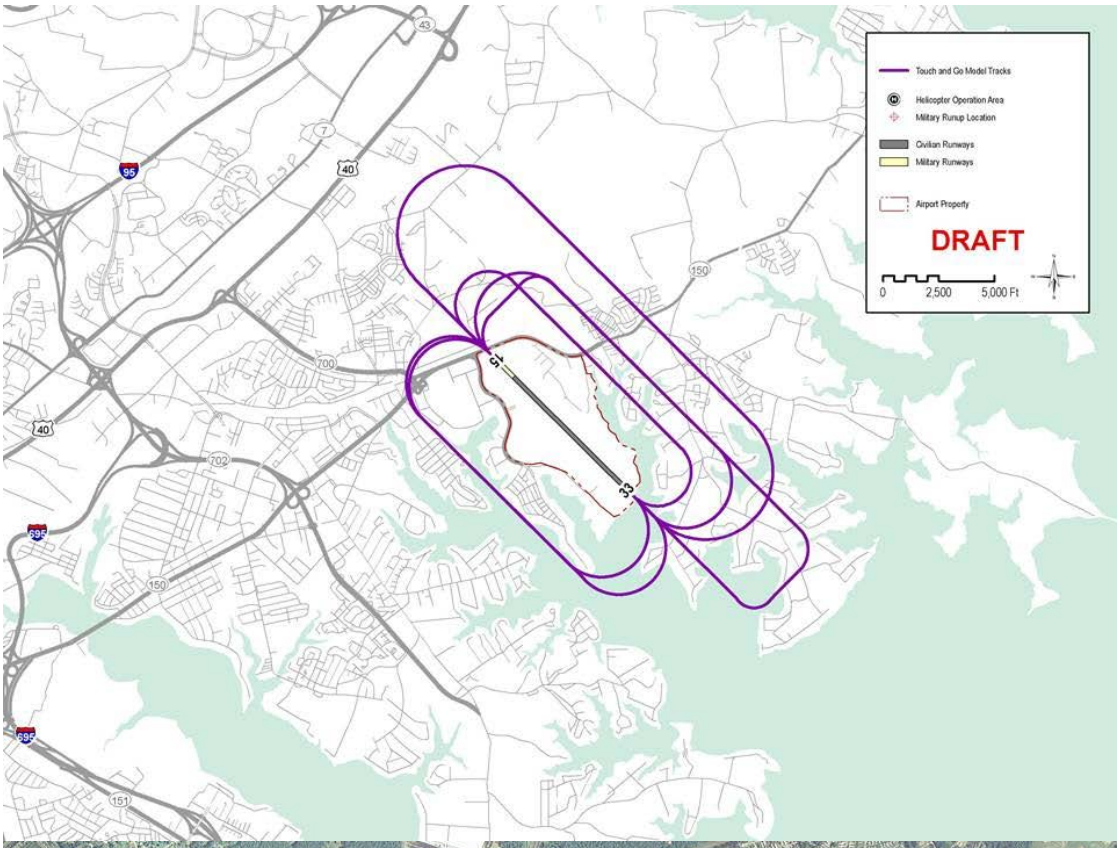
		DAY			Night			TOTAL
		ARR	DEP	TGO	ARR	DEP	TGO	OPS
Air Carrier	Jet	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Taxi	Jet	1.0	1.0	0.0	0.0	0.0	0.0	2.1
Air Taxi	Prop	0.8	0.6	0.0	0.3	0.5	0.0	2.2
Air Taxi	Turboprop	0.1	0.1	0.0	0.0	0.0	0.0	0.3
General Aviation	Jet	5.0	4.8	0.0	0.2	0.4	0.0	10.5
General Aviation	Prop	16.2	16.5	28.8	0.4	0.1	0.0	62.0
General Aviation	Turboprop	2.9	2.9	0.0	0.1	0.1	0.0	6.0
General Aviation	Helicopter	21.2	21.9	0.0	8.8	8.1	0.0	60.1
Military	Military Jet (A10A)	1.8	1.8	0.4	0.0	0.0	0.0	4.1
Military	Military Turboprop (C130HP)	1.8	1.8	0.4	0.0	0.0	0.0	4.1
	Total	**50.9**	**51.5**	**29.6**	**9.9**	**9.3**	**0.0**	**151.2**

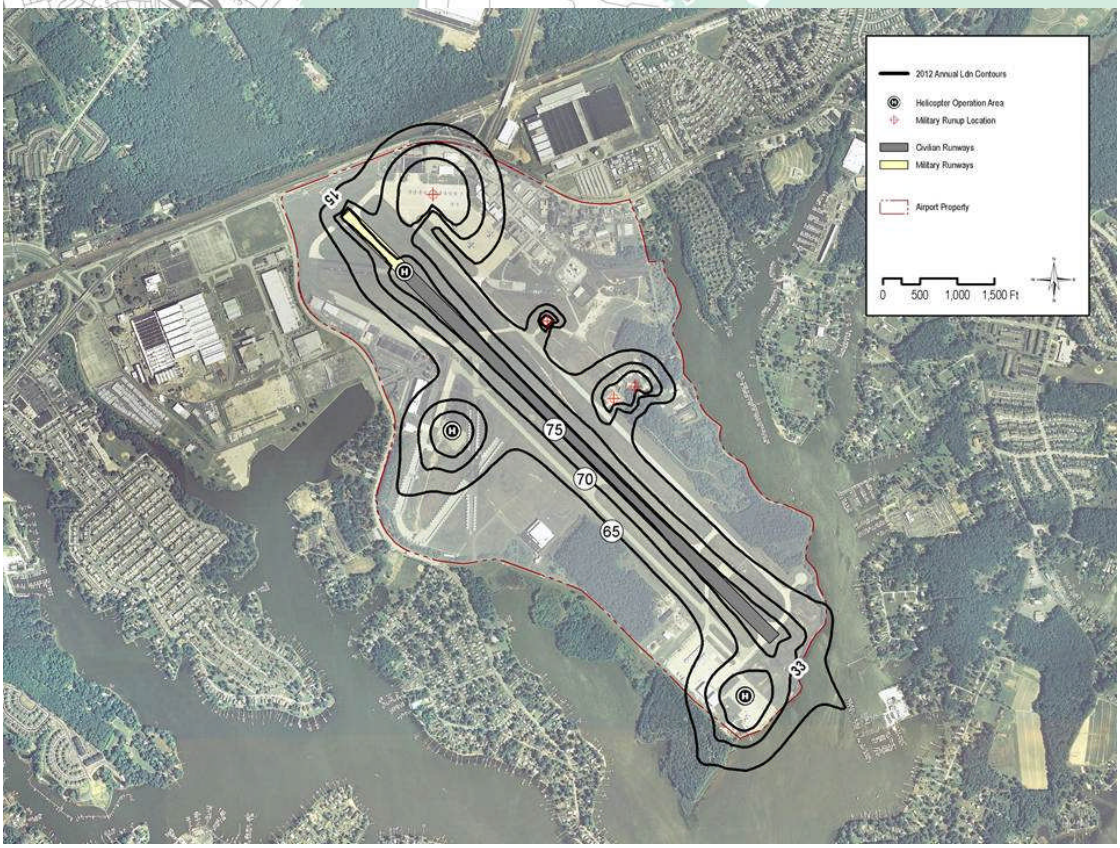
Comparison of Forecast Operations

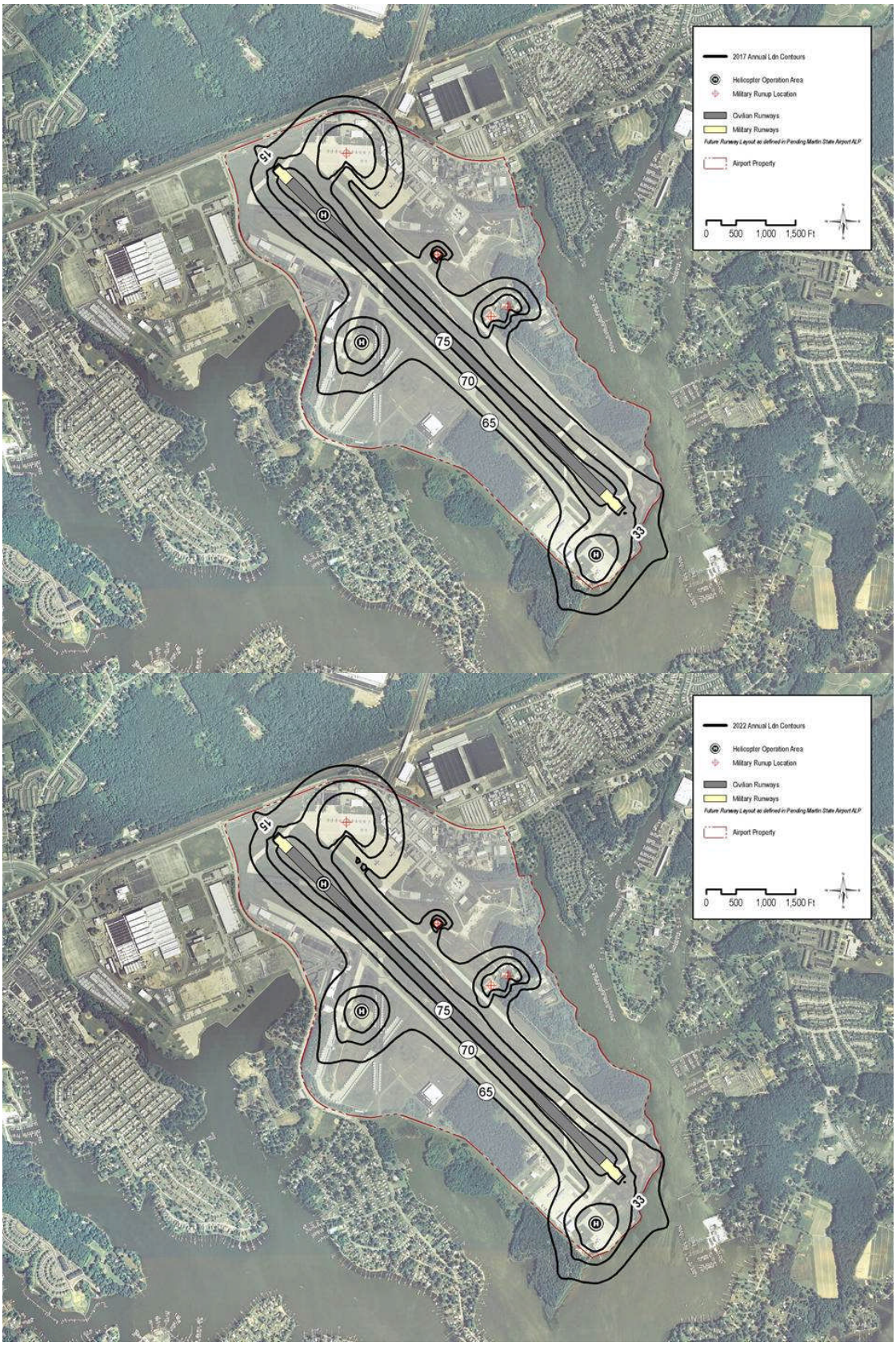
www.hmmh.com

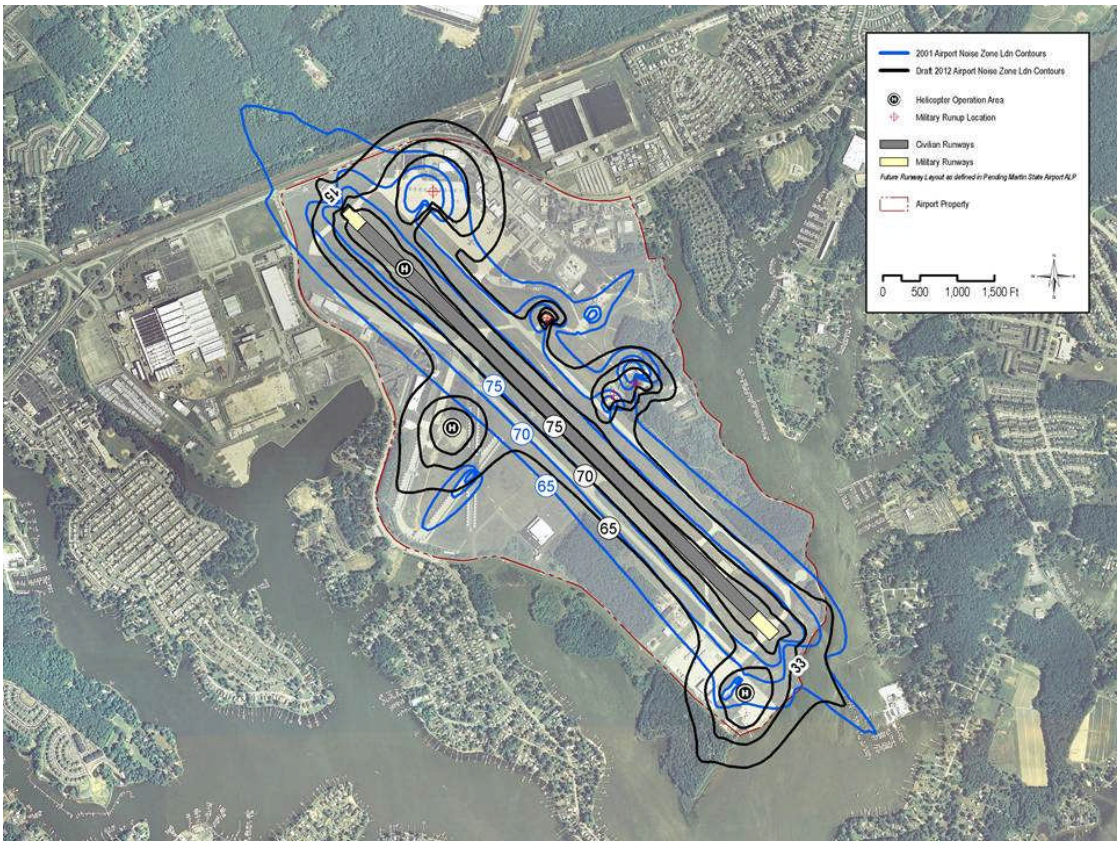



Departure Model Tracks
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Airport Property
DRAFT
0
2,500
5,000 Ft
15
33
Arrival Model Tracks
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Airport Property
DRAFT
0
2,500
5,000 Ft
15
33


Touch and Go Model Tracks
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Airport Property
DRAFT
0 2,500 5,000 Ft
15
33
95
40
7
43
150
700
702
695
151


2012 Annual Ldn Contours
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Airport Property
0 500 1,000 1,500 Ft
15
33
75
70
65


2017 Annual Ldn Contours
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Future Runway Layout as defined in Pending Martin State Airport ALP
Airport Property
0 500 1,000 1,500 Ft
15
33
75
70
65
2022 Annual Ldn Contours
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Future Runway Layout as defined in Pending Martin State Airport ALP
Airport Property
0 500 1,000 1,500 Ft
15
33
75
70
65



Land Use Analysis

MARTIN STATE AIRPORT

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Day-Night Average Sound Level (DNL), in dBA	Area in Noise Contour Intervals (sq. mi.)		
	Baseline	2017	2022
>65	0.61	0.62	0.64
>70	0.29	0.30	0.31
>75	0.12	0.12	0.13

MTN Noise Abatement Plan

www.hmmh.com

- Adopted in 1984
- Includes multiple elements
  - Traffic procedures
  - Taxiing aircraft procedures
  - "Touch-and-Go" restrictions
  - Helicopter procedures
  - Complaint procedures
  - Zoning permit and appeals process
  - MANG noise barriers
  - Piston aircraft fly runway heading for one mile before turning on course

Proposed Schedule

www.hmmh.com

June 8, 2011	1st Advisory Committee Meeting: ▪Introductions ▪Overview of Noise Zone Update Scope and Schedule ▪Presentation of Draft Contours
August 2011	2nd Advisory Committee Meeting: ▪Airport Noise Zone Results
September 2011	Public Workshop/Public Hearing

Advisory Committee: Invited Participants

www.hmmh.com

Organization	Representing	Representative
Aviation Representatives	▪AMAV, Inc.	▪Joseph Toskes
	▪Brett Aviation	▪Helen Frado
	▪Executive Flight Solutions	▪James Baran
	▪Flightpath Aviation	▪Scott Lebert
	▪Glenn L. Martin Museum	▪Gil Pascal
	▪Helicopter Transport Services, Inc.	▪Linda Burr
	▪Jet Center	▪Michael Woolston
	▪Lockheed Martin Corp/Corporate Aircraft	▪Ken DeFrancesco
	▪McCormick & Company	▪Jim Adams
	▪PHI Air Medical Maryland	▪Mike McCabe
	▪Phoenix Aviation	▪Charles Shaefer
	▪Skytech, Inc.	▪John Foster
	▪Stanley Black & Decker Corp.	▪Gary Gagliostro

Advisory Committee: Invited Participants

www.hmmh.com

Organization	Representing	Representative
Community Members	▪Ballard Gardens Improvement Association	▪Michelle Wilson
	▪Baltimore Co Mobile Homeowners Ass'n	▪Linda Hart
	▪Bowleys Quarters Improvement Association	▪Marsha Ayres
		▪Mike Vivirito
		▪Janet Walper
	▪Essex-Middle River Civic Council	▪William Jones
		▪Raymond Reiner
	▪Hawthorne Civic Association	▪Chuck Munzert
		▪Doug Tomecek
		▪Lillian Tomecek
	▪Nottingham Association	▪Rick DeSimone
	▪Oliver Beach Improvement Association	▪Frank Orzolek
	▪Stevens Road Improvement Association	▪Dave Cahlander
	▪Wilson Point Civic Improvement Association	▪Bob Bendler
		▪Russ Harrington
	▪Windless Run Civic Association	▪Randy Cogar
		▪Bruce Kammer

Airport Noise Zone Update

www.hmmh.com

Airport Noise Zone:

- Enabled by Maryland Environmental Noise Act 1974
- Noise impact determined by DNL composite contours:
  - Base year
  - 5-year forecast
  - 10-year forecast
- ANZ uses largest of three contours at each location around the Airport

Comments:

C.2 Material Related to December 8th, 2011 MTN Advisory Committee Meeting Announcement:

Maryland Aviation Administration

Martin O'Malley
Governor
Anthony G. Brown
Lt. Governor
Beverley K. Swaim-Staley
Secretary of Transportation

Paul J. Wiedefeld, A.A.E.
Executive Director

Nov 18, 2011

«Title» «FirstName» «LastNarne»
«JobTitle» «Company»
«Addressl»«Address2»
«City» «State» «PostalCode»

Dear «Title» «LastNarne»,

The Maryland Aviation Administration (MAA) is continuing the process of updating its Airport Noise Zone and Noise Abatement Plan for Martin Start Airport (MTN). As part of this effort, we are seeking input from communities surrounding the airport regarding noise issues, including strategies to reduce airport-related noise.

I invite you, or another representative of your organization, to join our Community Noise Advisory Committee (Committee). The purpose of the Committee is to identify those who are affected by airport noise, and to determine the most appropriate ways to reduce noise. The Committee will include representatives of the MAA and MTN, the Maryland Air National Guard, local businesses and government agencies, and members of the general public.

This will be the second and final Committee meeting, and is scheduled for Thursday, Dec 8th, 2011 at 6:00 p.m. The meeting will be held in Room 412, located in the lower level of Hangar 4 at MTN. We appreciate your interest in airport issues and look forward to working with you on updating our Noise Abatement Plan.

Please call Ms. Pauline O'Connor at (410) 859-7550 if you plan to attend.

Sincerely,

Mr. Al Pollard
Manager

MARTIN STATE AIRPORT
701 Wilson Point Road - Box 1
Baltimore, Maryland 21220-4282
Telephone: (410)682-8800 • TDD for the Hearing Impaired: (410)859-7227 • FAX (410) 682=8822

The Maryland Aviation Administration is an agency of the Maryland Department of Transportation.

Sign In Sheet:

MARTIN STATE AIRPORT

SIGN-IN-SHEET
Airport Noise Zone and Noise Abatement Plan
Advisory Committee Meeting
Martin State Airport
December 8 , 2011 6:00 p.m.

Name	Signature	Organization
Al Pollard		MAA / MARTEN
Marsha Ayres	Marsha Ayres	Bowleys Quarters Improvement Assn.
Ken DeFrancesco		Lockheed Martin Corp.
Nick Brandt		PHI AIRMEDICAL
Jack Ludlam	J Ludlam	MTN Tower
Ray Reiner		Oliver Beach
Rocky Jones	Rocky Jones	ESSEX MIDDLE RIVER CIVIC COUNCIL
Dave Cahlander		BQIA & Stevens Rd.
Alverna R Durham		Straughan Environmental

Name	Signature	Organization
Paula O'Connor	Paula O'Conn	MAA
Ellen Sample	Ellen Sample	MAA
MaryEllen Eagan	MaryEllen Eagan	HMMH

Meeting Notes:

Martin State Airport Advisory Committee Meeting
Martin State Airport – Hanger 4, Room 412
December 8, 2011 – 6:00 p.m.

Attendees: See attached sign-in sheet

- Because of technical difficulties, the planned PowerPoint presentation was printed and handed out to those in attendance. Mary Ellen explained that the meeting was to present the findings of the projected noise contours based on feedback at the last meeting.
- Mary Ellen went through the presentation, with attendees following along using the printed copies. She explained that at the last meeting, participants offered information on the new aircraft that the Air Guard will be using in the near future. The new aircrafts (C27s) are quitter then what the Air Guard currently uses (C130s). Maryland State Police said they expect to receive new replacement aircraft (helicopters) beginning in 2012.
- The feedback was beneficial in making more accurate projections. Rerunning the noise models using the new data resulted in slightly lower noise projections.
- Mary Ellen discussed the Noise Abatement Plan and asked if there was anything any one would like to add. One person stated that besides the occasional A-10 making swirly turns (?), things were generally quiet.
- Al announced that aircraft that will be preforming during the airshow to commemorate the War of 1812 over the Inner Harbor will be housed at the airport. The airshow will take place this summer (June 2012).
- Ellen Sample ended the meeting by thanking everyone who attended and committing to send color copies of the presentation to everyone who was invited.

Presentation:

www.hmmh.com

Martin State Airport
Airport Noise Zone Update
Advisory Committee Meeting

MARTIN STATE AIRPORT

December 8, 2011

Agenda

MARTIN STATE AIRPORT

www.hmmh.com

- Advisory Committee (Review and Introductions)
- State of Maryland's Airport Noise Zone (COMAR)
- Airport Noise Zone Update
- Schedule

Advisory Committee: Invited Participants

www.hmmh.com

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	▪Air Traffic Manager	▪Jack Ludlam
	▪Maryland Aviation Administration	▪Pauline O'Connor, Noise Office ▪Al Pollard, Airport Manager ▪Ellen Sample, Manager, Noise Division ▪Paul Shank, Dep Exec Dir

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www.hmmh.com

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www.hmmh.com

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	▪Essex-Middle River Civic Council	▪William Jones
		▪Raymond Reiner
	▪Hawthorne Civic Association	▪Chuck Munzert
		▪Doug Tomecek
		▪Lillian Tomecek
	▪Nottingham Association	▪Rick DeSimone
	▪Oliver Beach Improvement Association	▪Frank Orzolek
	▪Stevens Road Improvement Association	▪Dave Cahlander
	▪Wilson Point Civic Improvement Association	▪Bob Bendler
		▪Russ Harrington
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		▪Bruce Kammer

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Noise Zone Update Tasks

www.hmmh.com

- Prepare base year, 5-year, 10-year forecast contours
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Noise Model Inputs

www.hmmh.com

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www.hmmh.com

Aircraft Group		DAY			Night			TOTAL
		ARR	DEP	TGO	ARR	DEP	TGO	OPS
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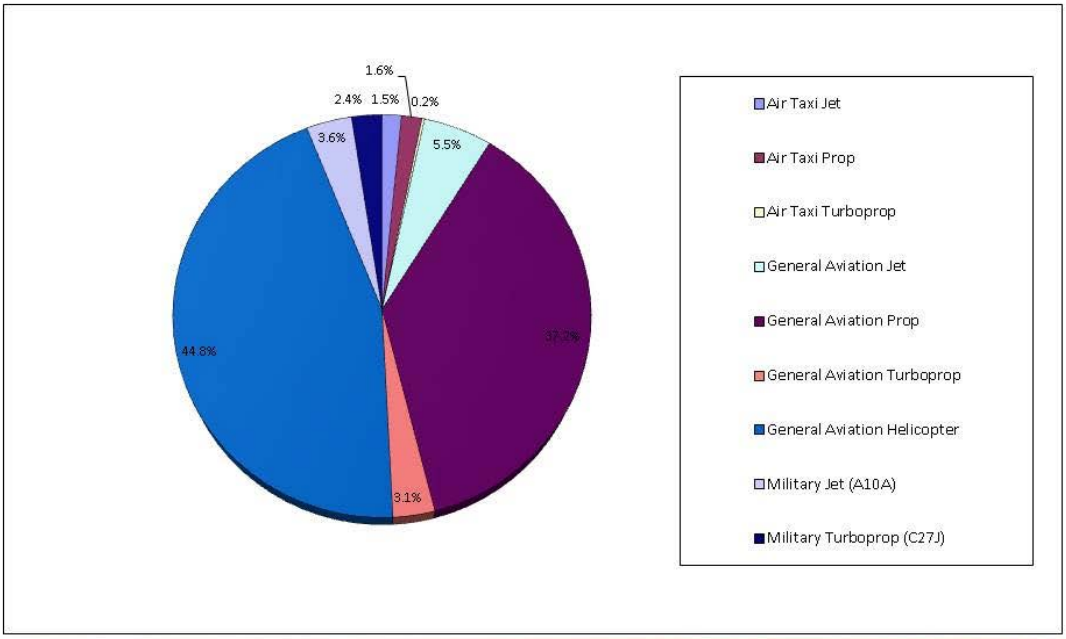
General Aviation	Prop	11.4	11.6	26.4	0.3	0.1	0.0	49.8
General Aviation	Turboprop	2.0	2.0	0.0	0.1	0.1	0.0	4.2
General Aviation	Helicopter	21.2	21.9	0.0	8.8	8.1	0.0	59.9
Military	Military Jet (A10A)	2.2	2.2	0.5	0.0	0.0	0.0	4.9
Military	Military Turboprop (C27J)	1.5	1.5	0.3	0.0	0.0	0.0	3.2
	Total	**43.7**	**44.3**	**27.2**	**9.7**	**9.1**	**0.0**	**133.9**

Distribution of Operations by Aircraft Type

www.hmmh.com



2017 Average Daily Operations

www.hmmh.com

Aircraft Group		DAY			Night			TOTAL
		ARR	DEP	TGO	ARR	DEP	TGO	OPS
Air Carrier	Jet	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Taxi	Jet	1.0	1.0	0.0	0.0	0.0	0.0	2.1
Air Taxi	Prop	0.8	0.6	0.0	0.3	0.5	0.0	2.2
Air Taxi	Turboprop	0.1	0.1	0.0	0.0	0.0	0.0	0.3
General Aviation	Jet	4.2	4.1	0.0	0.2	0.4	0.0	8.9
General Aviation	Prop	13.7	13.9	27.6	0.3	0.1	0.0	55.8
General Aviation	Turboprop	2.4	2.4	0.0	0.1	0.1	0.0	5.1
General Aviation	Helicopter	21.2	21.9	0.0	8.8	8.1	0.0	60.1
Military	Military Jet (A10A)	2.2	2.2	0.5	0.0	0.0	0.0	4.9
Military	Military Turboprop (C27J)	1.5	1.5	0.3	0.0	0.0	0.0	3.2
	Total	**47.2**	**47.8**	**28.4**	**9.8**	**9.2**	**0.0**	**142.4**

2022 Average Daily Operations

www.hmmh.com

Aircraft Group		DAY			Night			TOTAL
		ARR	DEP	TGO	ARR	DEP	TGO	OPS
Air Carrier	Jet	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Air Taxi	Jet	1.0	1.0	0.0	0.0	0.0	0.0	2.1
Air Taxi	Prop	0.8	0.6	0.0	0.3	0.5	0.0	2.2
Air Taxi	Turboprop	0.1	0.1	0.0	0.0	0.0	0.0	0.3
General Aviation	Jet	5.0	4.8	0.0	0.2	0.4	0.0	10.5
General Aviation	Prop	16.2	16.5	28.8	0.4	0.1	0.0	62.0
General Aviation	Turboprop	2.9	2.9	0.0	0.1	0.1	0.0	6.0
General Aviation	Helicopter	21.2	21.9	0.0	8.8	8.1	0.0	60.1
Military	Military Jet (A10A)	2.2	2.2	0.5	0.0	0.0	0.0	4.9
Military	Military Turboprop (C27J)	1.5	1.5	0.3	0.0	0.0	0.0	3.2
	Total	**50.9**	**51.5**	**29.6**	**9.9**	**9.3**	**0.0**	**151.2**

Comparison of Forecast Operations

MARTIN STATE AIRPORT

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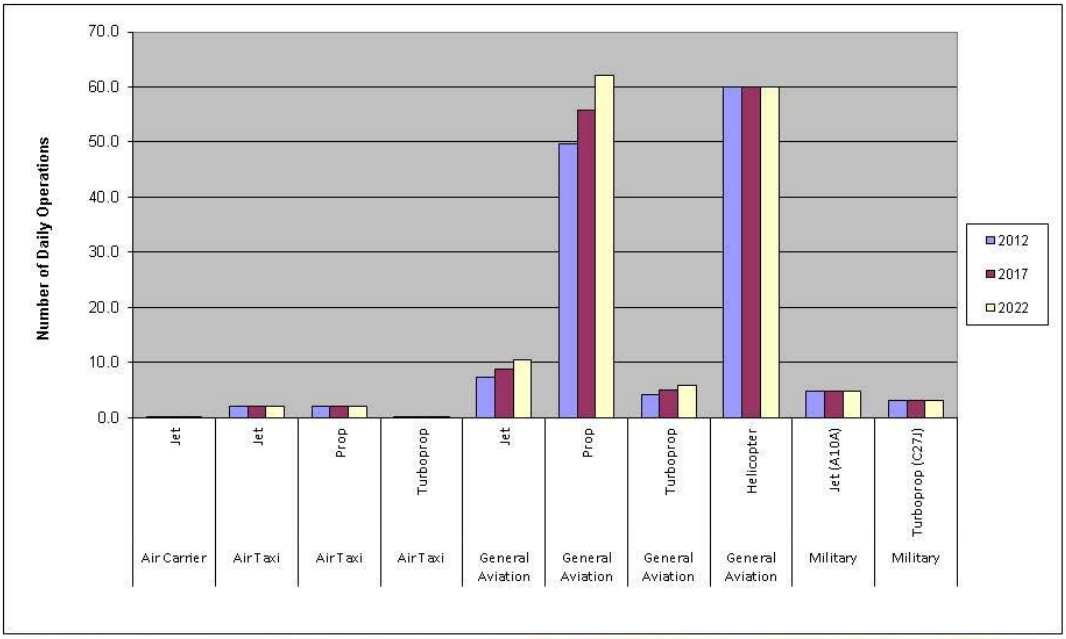

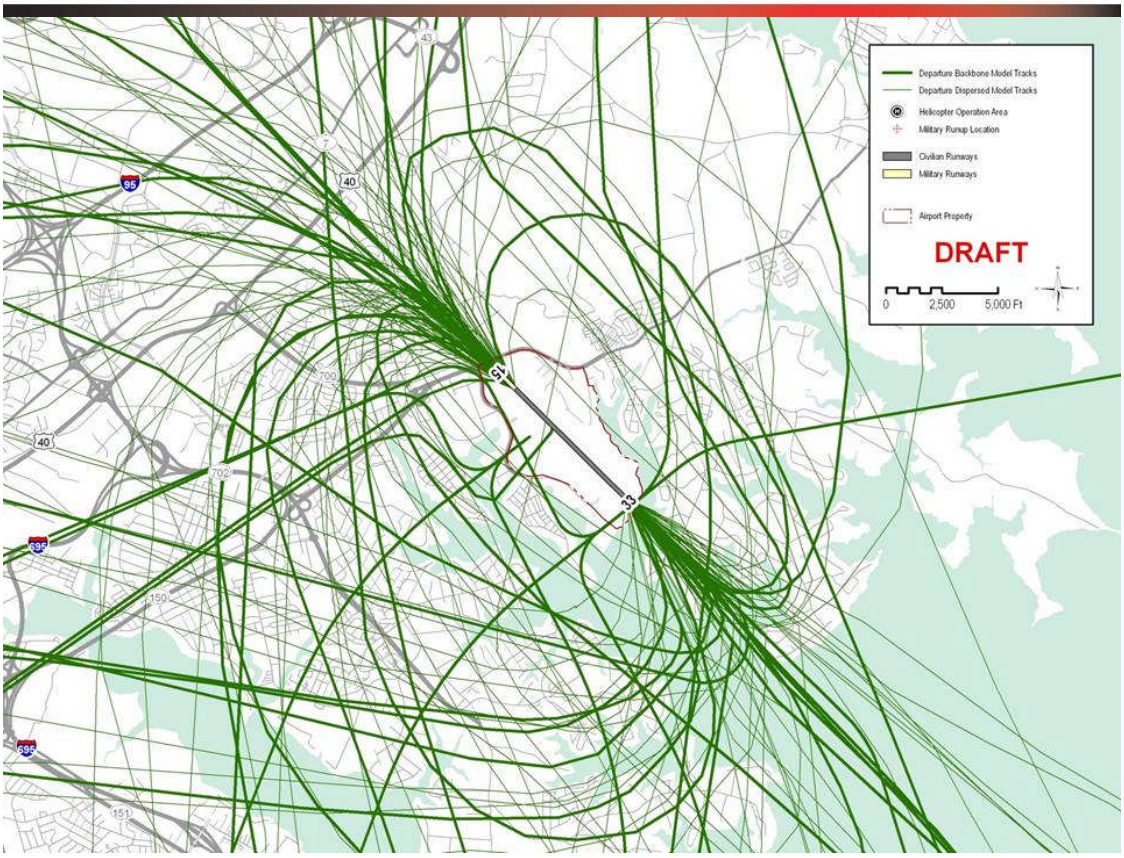

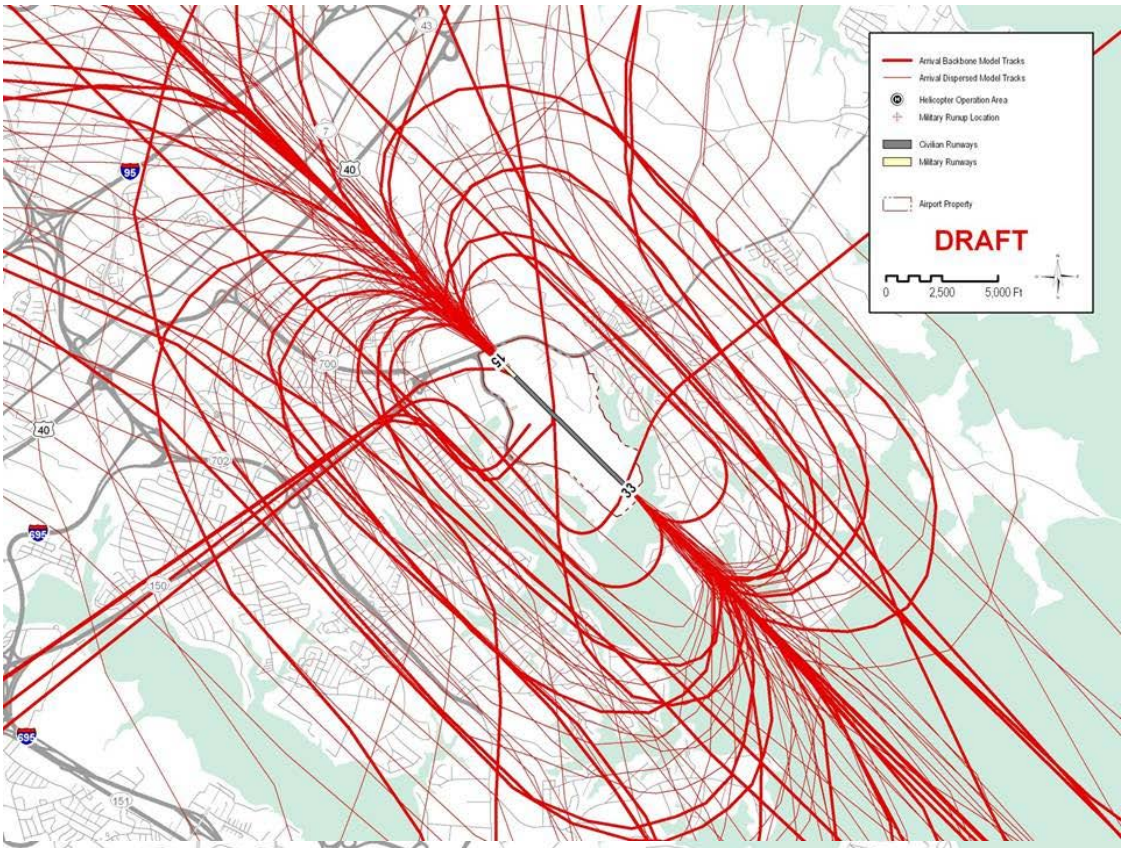
Arrival Backbone Model Tracks
Arrival Dispersed Model Tracks
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Airport Property
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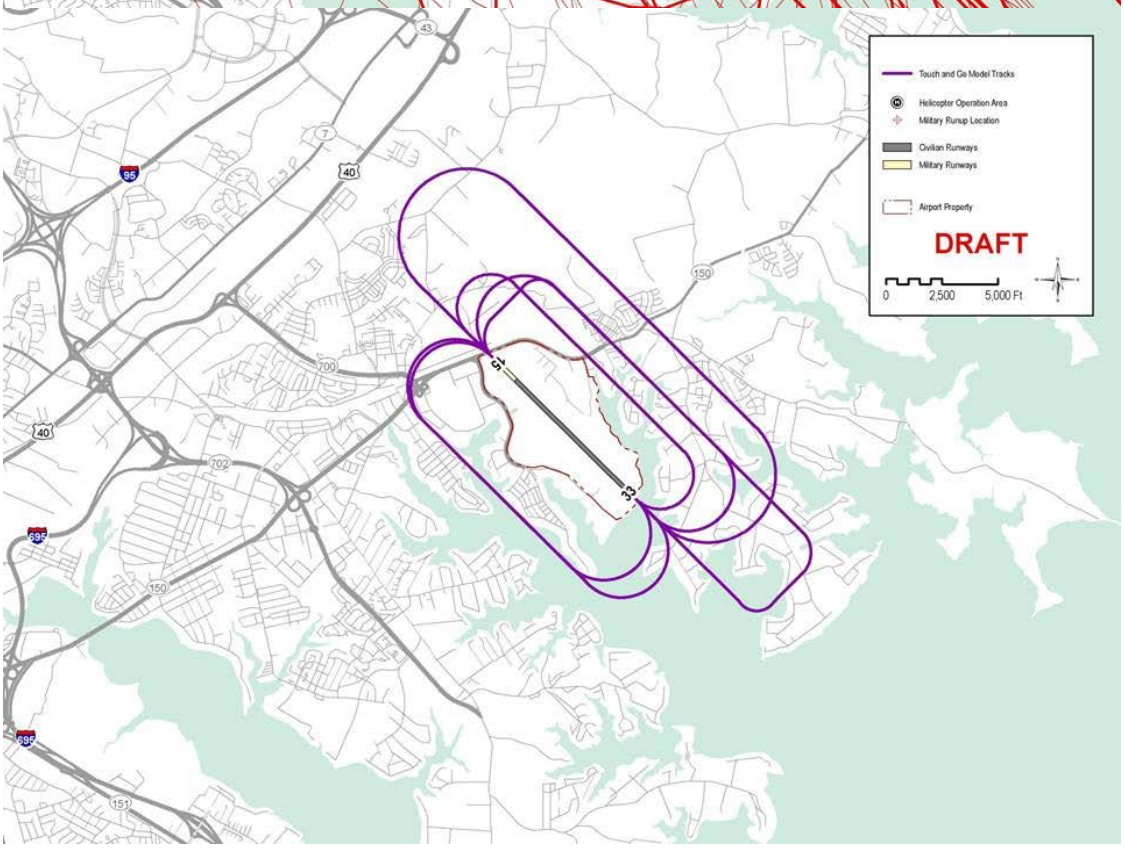
5,000 Ft
15
33
95
40
695
150
151
700
702
43
7


Touch and Go Model Tracks
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Airport Property
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5,000 Ft
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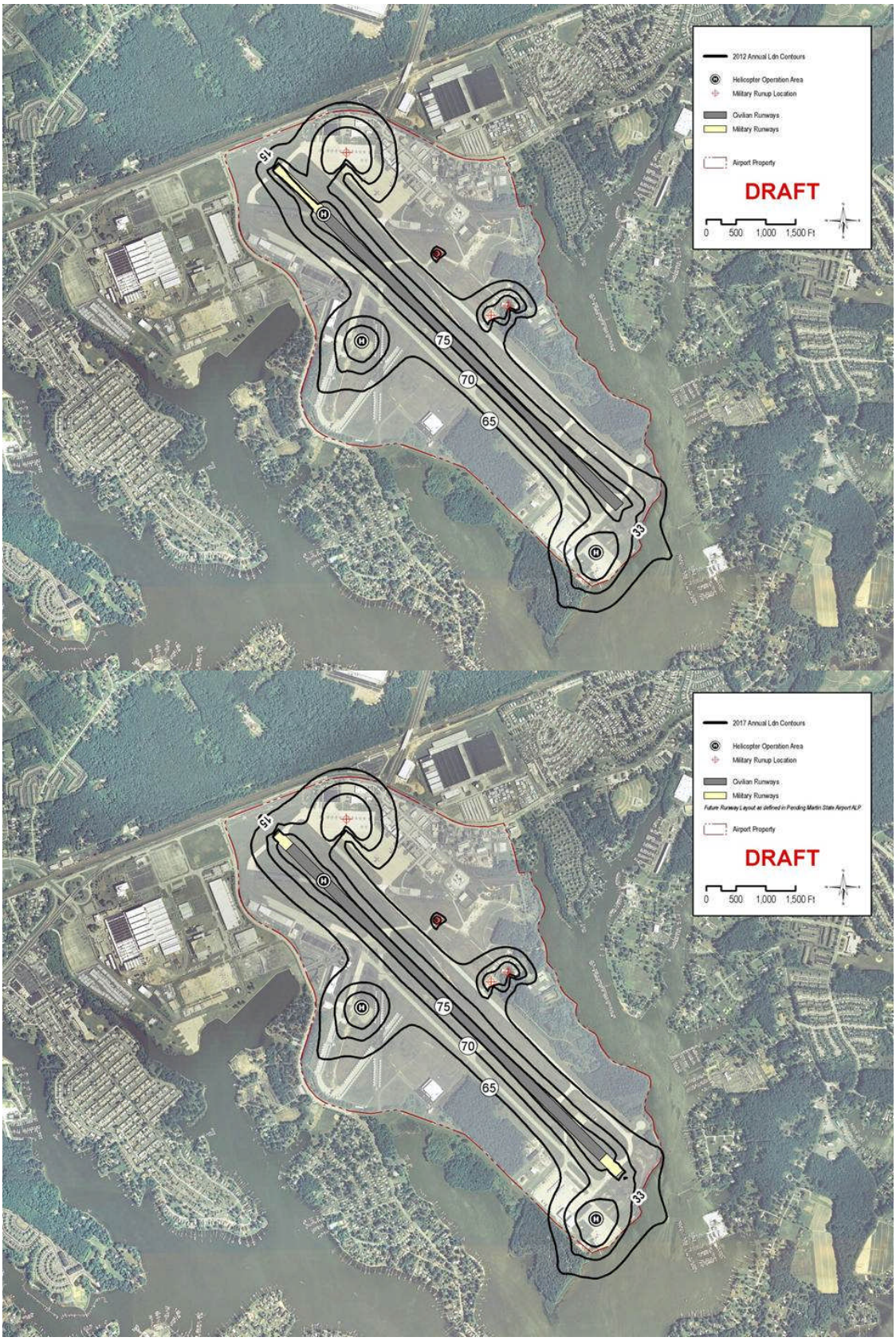
2012 Annual Ldn Contours
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Airport Property
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75
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2017 Annual Ldn Contours
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Future Runway Layout as defined in Pending Martin State Airport ALP
Airport Property
DRAFT
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15
75
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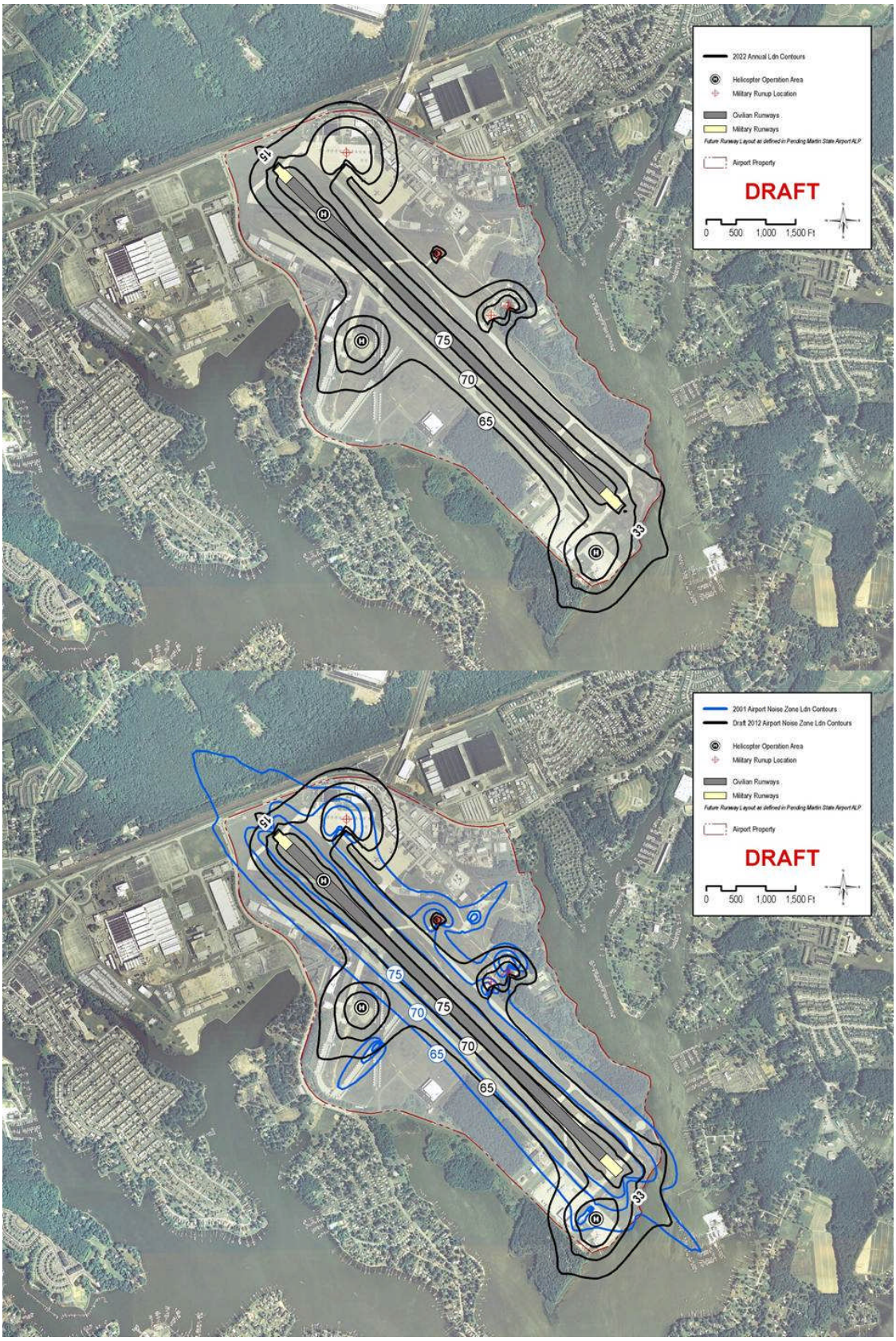
65
33


2022 Annual Ldn Contours
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Future Runway Layout as defined in Pending Martin State Airport ALP
Airport Property
DRAFT
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15
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75
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65
2001 Airport Noise Zone Ldn Contours
Draft 2012 Airport Noise Zone Ldn Contours
Helicopter Operation Area
Military Runup Location
Civilian Runways
Military Runways
Future Runway Layout as defined in Pending Martin State Airport ALP
Airport Property
DRAFT
0 500 1,000 1,500 Ft
15
33
75
70
75
70
65
65

Land Use Analysis

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Day-Night Average Sound Level (DNL), in dBA	Area in Noise Contour Intervals (sq. mi.)		
	Baseline	2017	2022
>65	0.58	0.60	0.61
>70	0.28	0.29	0.30
>75	0.11	0.12	0.12

MTN Noise Abatement Plan

www.hmmh.com

- Adopted in 1984
- Includes multiple elements
  - Traffic procedures
  - Taxiing aircraft procedures
  - "Touch-and-Go" restrictions
  - Helicopter procedures
  - Complaint procedures
  - Zoning permit and appeals process
  - MANG noise barriers
  - Piston aircraft fly runway heading for one mile before turning on course

Proposed Schedule

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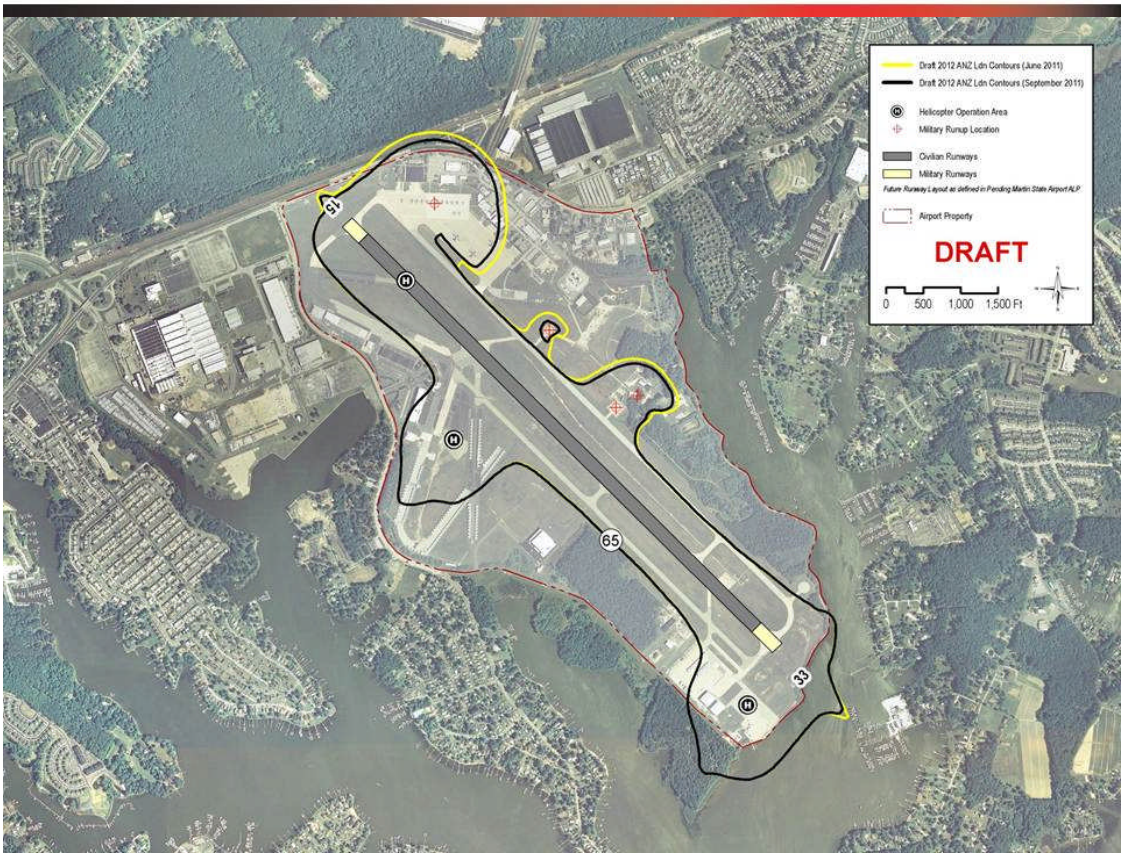
June 8, 2011	1st Advisory Committee Meeting: ▪Introductions ▪Overview of Noise Zone Update Scope and Schedule ▪Presentation of Draft Contours
December 8, 2011	2nd Advisory Committee Meeting: ▪Airport Noise Zone Results
??? 2012	Public Workshop/Public Hearing



Comments:

Appendix D Existing MTN Noise Abatement Plan

In 1984, Martin State Airport adopted a Noise Abatement Plan which is designed to minimize the noise of aircraft operations within the constraints of the Federal Air Traffic Control system and aircraft safety. This Plan was developed with the cooperation of the MANG, Airport users, aviation industry and local governments. It was updated in 1987.

Note that C-27J aircraft are replacing C-130 aircraft in the MDANG fleet and should therefore assume the same noise abatement plan elements as assigned to the C-130, however the plan has not yet been update to reflect this recent change.

The Plan includes the following Visual Flight Rules (VFR) or "good weather" abatement procedures:

Departures

1. Piston engine aircraft shall fly runway heading for one mile prior to turning to the tower-approved on-course heading.
2. Turbine powered aircraft shall climb on runway heading for one mile or leaving 1,500' MSL prior to turning to the tower-approved on-course heading.
3. Helicopters shall climb to 500' MSL on departure heading before turning on-course, unless operating under a Letter of Agreement specifying otherwise.

Note: IFR departures will be accomplished in accordance with Air Traffic Control (ATC) direction or clearance.

Arrivals

1. Aircraft conducting a visual approach should, to the maximum extent feasible, remain at or above the ILS or PLASI glide slope. Aircraft should intercept the ILS or PLASI glideslope at the highest feasible altitude, commensurate with flight and air traffic procedures, to minimize aircraft noise exposure to communities underlying the final approach course.
2. A left hand traffic pattern shall be used at MTN unless otherwise directed by Air Traffic Control (ATC). Traffic pattern altitudes are 1,000' MSL for piston engine, 1,500' MSL for civil turbine and military turboprop, 2,000' MSL for military jet , and 500' MSL for rotary wing aircraft.

Closed Traffic Patterns

1. Aircraft remaining in closed traffic under VFR conditions will not turn crosswind until reaching the airport boundary unless cleared otherwise by Martin Tower (left closed traffic Runway 15 excepted).
2. Fixed Wing remaining in left closed traffic Runway 15 (VFR) shall fly runway heading for one mile before turning crosswind at the western shore of Galloway Creek, and fly crosswind leg until abeam the western shore of Seneca Creek prior to beginning a turn to downwind. The downwind leg should be entered level at the appropriate pattern altitude for aircraft type. Fly the downwind leg until north of the large government warehouse prior to turning base leg.

Taxiing Aircraft

All taxiing C-130 aircraft shall perform engine run-up on Tango Taxiway abeam Delta Taxiway prior to departing Runway 33.

"Touch and Go" and/or Practice Approach Restrictions.

1. No touch and go operations permitted for aircraft having a maximum gross landing weight in excess of 12,500 pounds without the permission of the Airport Manager.
2. No practice approaches or practice landings permitted from 9:45 p.m. to 6:15 a.m. local time.
3. Military Aircraft (Transient and/or Military) shall be limited to two (2) practice landings/take-offs, or approaches unless additional operations are approved by Airport Management personnel.

Helicopter Special VFR Arrival / Departure Procedures

The Plan also includes a Tenant Directive, revised in June of 1994, which outlines Helicopter Special VFR or "marginal weather" arrival / departure procedures. These procedures reduce noise exposure in local communities by keeping helicopter operations over less populated areas. A copy of the Tenant Directive is on file in Airport Operations.

Noise Concerns

A telephone hotline has been established since 1977 to enable the MAA to respond to citizen concerns about aircraft noise. The Noise Hotline number is 410.682.8802.

Zoning Permit and Appeal Procedure

The MAA regulates land use within the Airport Noise Zone. 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 MAA Office of Aviation Noise and Abatement. Either office will assist the applicant in completing application.

The MAA is required by law to approve or deny zoning permits based on the location relative to the Airport Noise Zone, and the compatibility standards listed in the chart in Figure 4.1. For example, a person may wish to build a new housing development within the Ldn 65 dB noise contour. As the limit for new residential land use is Ldn 65 dB, (see Noise Compatibility Standards Chart), the applicant would be denied a permit by the MAA. In the event a permit application is denied by the MAA the applicant may appeal to the Board of Airport Zoning Appeals (BAZA) for a variance. The BAZA 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.

MANG Noise Barriers

In 1989, the MANG erected two noise barriers, both located between the MANG's engine maintenance area and the homes northeast of the Airport. The identical barriers, each constructed of four trailers, are 80 feet in length and 19 feet high, and are attached together by riveted sheet metal. They are secured to the ground with cables fastened to concrete anchor pads. The trailer-barriers provide approximately a 10 decibel (dB) reduction in noise levels from aircraft maintenance runups at homes at the southern end of Edward Lane and Golf Road. The barriers become less effective at homes further to the east and to the north of that location, providing approximately 3 to 6 dB reduction in noise levels from maintenance activities. These barriers provide significant noise reduction from engine maintenance activity at several homes located east and northeast of the Airport.