Appendix H

Noise

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APPENDIX H: Noise

The following reports are included as part of this appendix to support the noise analysis:

- Appendix H-1: Introduction to Noise
- Appendix H-2: Existing Conditions Noise Analysis Technical Report
  - Attachment 1: Detailed Fleet Mix
  - Attachment 2: FAA Non-Standard Noise Aircraft Substitution Letter, 2/22/2017
  - Attachment 3: Flight Track Development Figures
- Appendix H-3: Future Scenarios Noise Analysis Technical Report
  - Attachment 1: Future Scenarios Fleet Mixes

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Appendix H-1

Introduction to Noise

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APPENDIX H-1: Introduction to Noise

H-1.1 Noise and Its Effect on People

Aircraft noise exposure in this document is primarily addressed using the Day-Night Average Sound Level (DNL) metric. This study also involves the use of supplemental noise metrics in addition to DNL to provide comprehensive analysis for quantifying a specific situation. To assist reviewers in interpreting complex noise metrics, this appendix presents an introduction to the relevant fundamentals of acoustics and noise terminology, and the effects of noise on human activity.

H-1.1.1 Noise and its Metrics

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with aircraft operations. Of course, aircraft are not the only sources of noise in an urban or suburban surrounding, where interstate and local roadway traffic, rail, industrial and neighbourhood sources may also intrude on the everyday quality of life. Nevertheless, aircraft are readily identifiable to those affected by their noise and are typically singled out for criticism. Consequently, aircraft noise problems often dominate analyses of environmental impacts.

A "metric" is defined as something "of, involving, or used in measurement." As used in environmental noise analyses, a metric refers to the unit or quantity that quantitatively measures the effect of noise on the environment. Noise studies have typically involved a confusing proliferation of noise metrics used by individual researchers who have attempted to understand and represent the effects of noise. As a result, literature describing environmental noise or environmental noise abatement has included many different metrics.

Various federal agencies involved in environmental noise mitigation have agreed on common metrics for environmental impact analysis documents. Furthermore, the Federal Aviation Administration (FAA) has specified which metrics, such as DNL, should be used for federal aviation noise assessments.

This section discusses the following acoustic terms and metrics:

- Decibel (dB)
- A-Weighted Decibel (dBA)
- Maximum Sound Level (L_{max})
- Sound Exposure Level (SEL)
- Equivalent Sound Level (L_{eq})
- Day-Night Average Sound Level (DNL)
- Time-Above a Specified Level (TA)

H-1.1.1.1 The Decibel (dB)

All sounds come from a sound source—a musical instrument, a speaking voice, or an airplane passing overhead. It takes energy to produce sound. The sound energy produced by any sound source is transmitted through the air in sound waves—tiny, quick oscillations of pressure just above and just below atmospheric pressure. These oscillations, or sound pressures, impinge on the ear creating the sound we hear.

Our ears are sensitive to a wide range of sound pressures. The loudest sound that we hear without pain has about one trillion times more energy than the quietest sounds we hear. On a linear scale, this range is unwieldy. Therefore, we compress the total range of sound pressures to a more meaningful range by introducing the concept of sound pressure level (SPL) and its logarithmic unit of decibel (dB).

SPL is a measure of the sound pressure of a given noise source relative to a standard reference value (typically the quietest sound that a young person with good hearing can detect). Decibels are logarithmic quantities —logarithms of the ratio of the two pressures, the numerator being the pressure of the sound source of interest, and the denominator being the reference pressure (the quietest sound we can hear).

The logarithmic conversion of sound pressure to SPL means that the quietest sound we can hear (the reference pressure) has a SPL of about zero decibels, while the loudest sounds we hear without pain have SPLs less than or equal to about 120 dB. Most sounds in our day-to-day environment have SPLs from 30 to 100 dB.

Because decibels are logarithmic quantities, they require logarithmic math and not simple (linear) addition and subtraction. For example, if two sound sources each produce 100 dB and are operated together, they produce only 103 dB—not 200 dB as might be expected. Four equal sources operating simultaneously result in a total SPL of 106 dB. In fact, for every doubling of the number of equal sources, the SPL (of all of the sources combined) increases another three decibels. A ten-fold increase in the number of sources makes the SPL increase by 10 dB. A hundredfold increase makes the level increase by 20 dB, and it takes a thousand equal sources to increase the level by 30 dB.

If one source is much louder than another, the two sources together will produce the same SPL (and sound to our ears) as if the louder source were operating alone. For example, a 100 dB source plus an 80 dB source produce 100 dB when operating together. The louder source “masks” the quieter one. But if the quieter source gets louder, it will have an increasing effect on the total SPL. When the two sources are equal, as described above, they produce a level 3 decibels above the sound level of either one by itself.

From these basic concepts, note that one hundred 80 dB sources will produce a combined level of 100 dB; if a single 100 dB source is added, the group will produce a total SPL of 103 dB. Clearly, the loudest source has the greatest effect on the total.

There are two useful rules of thumb to remember when comparing SPLs: (1) most of us perceive a 6 to 10 dB increase in the SPL to be an approximate doubling of loudness, and (2) changes in SPL of less than about 3 dB are not readily detectable outside of a laboratory environment.

H-1.1.1.2 A-Weighted Decibel (dBA)

Another important characteristic of sound is its frequency, or "pitch." This is the rate of repetition of the sound pressure oscillations as they reach our ear. Frequency can be expressed in units of cycles per second (cps) or Hertz (Hz). Although cps and Hz are equivalent, Hz is the preferred scientific unit and terminology.

A very good ear can hear sounds with frequencies from 16 Hz to 20,000 Hz. However, most people hear from approximately 20 Hz to approximately 10,000-15,000 Hz. People respond to sound most readily when the predominant frequency is in the range of normal conversation, around 1,000 to 4,000 Hz. Acousticians have developed and applied "filters" or "weightings" to SPLs to match our ears' sensitivity to the pitch of sounds and to help us judge the relative loudness of sounds made up of different frequencies. Two such filters, "A" and "C," are most applicable to environmental noises.

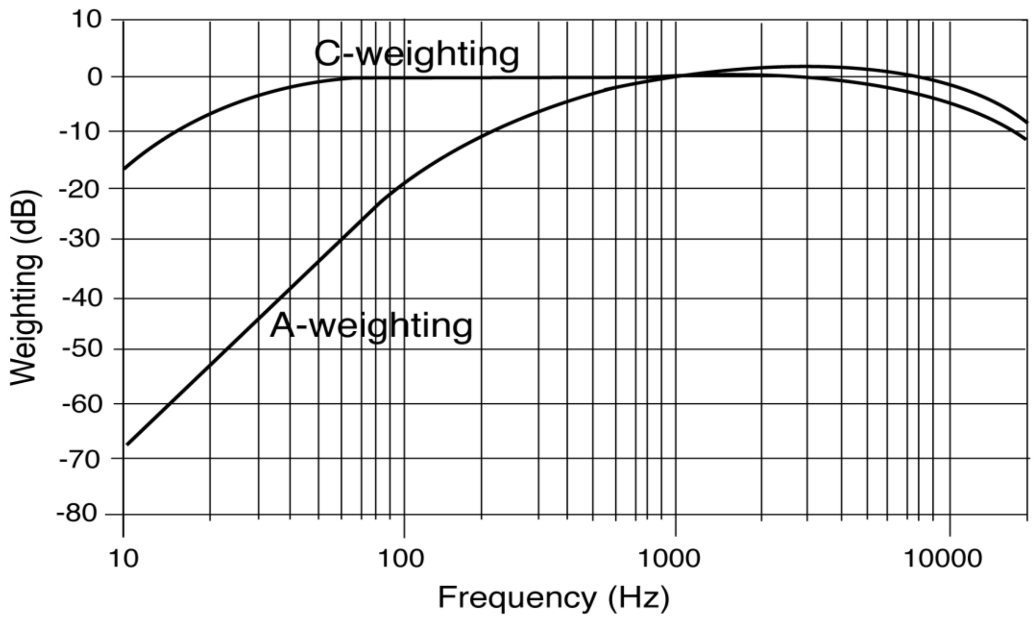
A-weighting significantly de-emphasizes noise at low and high frequencies (below approximately 500 Hz and above approximately 10,000 Hz) where we do not hear as well. The filter has little or no effect at intervening frequencies where our hearing is most efficient. **Figure H-1-1** shows a graph of the A-weighting as a function of frequency and its aforementioned characteristics. Because this filter generally matches our ears' sensitivity, sounds having higher A-weighted sound levels are usually judged to be louder than those with lower A-weighted sound levels, a relationship which does not always hold true for unweighted levels. Therefore, A-weighted sound levels are normally used to evaluate environmental noise. SPLs measured through this filter are referred to as A-weighted decibels (dBA).

As shown in Figure 1, C-weighting is nearly flat throughout the audible frequency range, hardly de-emphasizing the low frequency noise. C-weighted levels are not used as frequently as A-weighted levels, but they may be preferable in evaluating sounds whose low-frequency components are responsible for secondary effects such as the shaking of a building, window rattle, perceptible vibrations or other factors that can cause annoyance and complaints. Uses include the evaluation of blasting noise, artillery fire, sonic boom, and in some cases, aircraft noise inside buildings. SPLs measured through this filter are referred to as C-weighted decibels (dBC).

Other weighting networks have been developed to correspond to the sensitivity and perception of other types of sounds, such as the "B" and "D" filters. However, A-weighting has been adopted as the basic measure of community environmental noise by the U.S. Environmental Protection Agency (EPA) and nearly every other agency concerned with aircraft noise throughout the United States.

Figure H-1-1

Frequency Response Characteristics of Various Weighting Networks



Source: ANSI S1.4-1983 "Specification of Sound Level Meters."

Figure H-1-2 presents typical A-weighted sound levels of several common environmental sources. Sound levels measured (or computed) using A-weighting are most properly called "A-weighted sound levels" while sound levels measured without any frequency weighting are most properly called "sound levels." However, since this document deals only with A-weighted sound levels, the adjective "A-weighted" will be hereafter omitted, with A-weighted sound levels referred to simply as sound levels. As long as the use of A-weighting is understood, there is no difference implied by the terms "sound level" and "A-weighted sound level" or by the dB or dBA units.

An additional dimension to environmental noise is that sound levels vary with time and typically have a limited duration, as shown in **Figure H-1-3**. For example, the sound level increases as an aircraft approaches, then falls and blends into the background as the aircraft recedes into the distance (although even the background varies as birds chirp, the wind blows or a vehicle passes by). Sounds can be classified by their duration as continuous like a waterfall, impulsive like a firecracker or sonic boom or intermittent like an aircraft overflight or vehicle passby.

Figure H-1-2

Sound Levels of Typical Noise Sources (dBA)

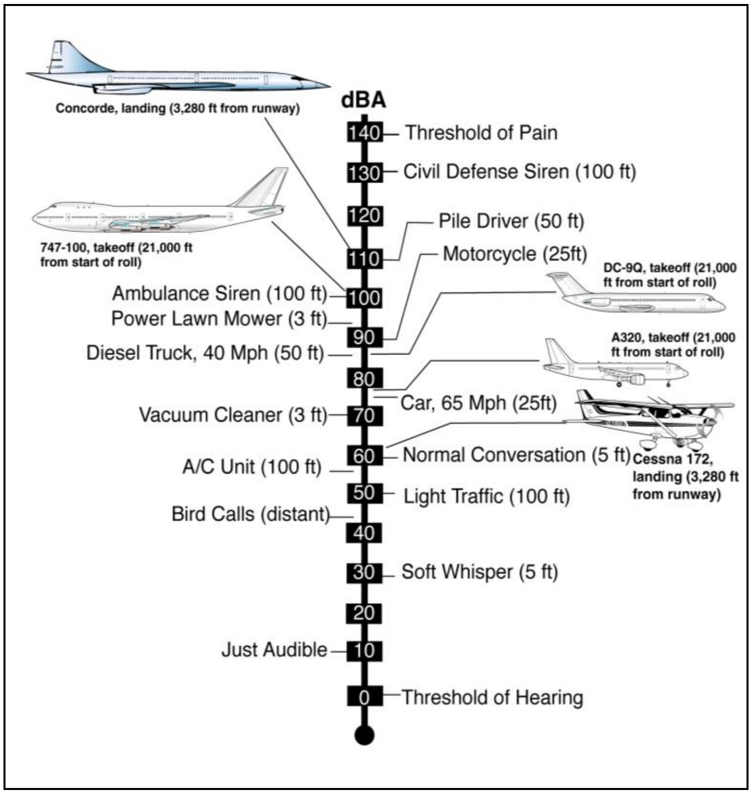
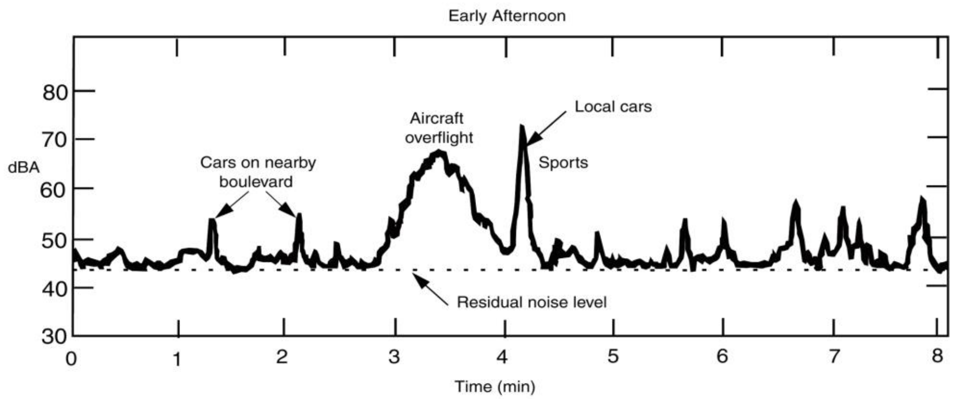


Figure H-1-3

Variation of Community Noise in a Suburban Neighborhood



Source: "Community Noise," NTID 300.3 EPA, December 1971.

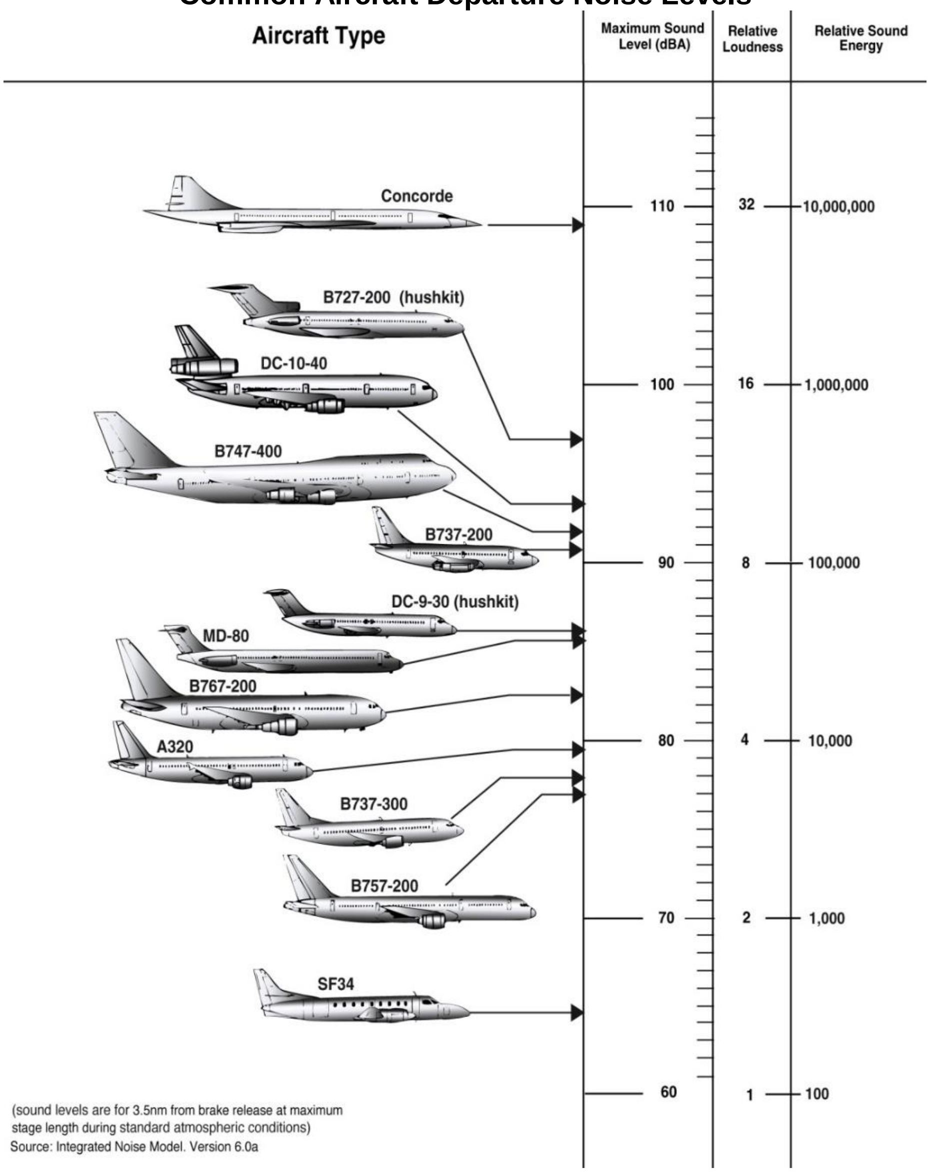
H-1.1.1.3 Maximum Sound Level (L_{max})

The variation in sound level over time often makes it convenient to describe a particular noise "event" by its maximum sound level, abbreviated as L_{max}. For the aircraft overflight event in Figure 3, the L_{max} is approximately 67 dBA.

Figure H-1-4 shows L_{max} values for a variety of common aircraft from the FAA's Integrated Noise Model (INM) database. These L_{max} values for each aircraft type are for aircraft performing a maximum stage (trip) length departure on a day with standard atmospheric conditions at a reference distance of 3.5 nautical miles (NM) from their brake release point. Of the dozen aircraft types listed on the figure, the Concorde has the highest L_{max} and the Saab 340 (SF340) has the lowest L_{max}.

Figure H-1-4

Common Aircraft Departure Noise Levels



The maximum level describes only one dimension of an event; it provides no information on the cumulative noise exposure generated by a sound source. In fact, two events with identical maxima may produce very different total exposures. One may be of short duration, while the other may continue for an extended period. The metric, discussed later in this appendix, corrects for this deficiency.

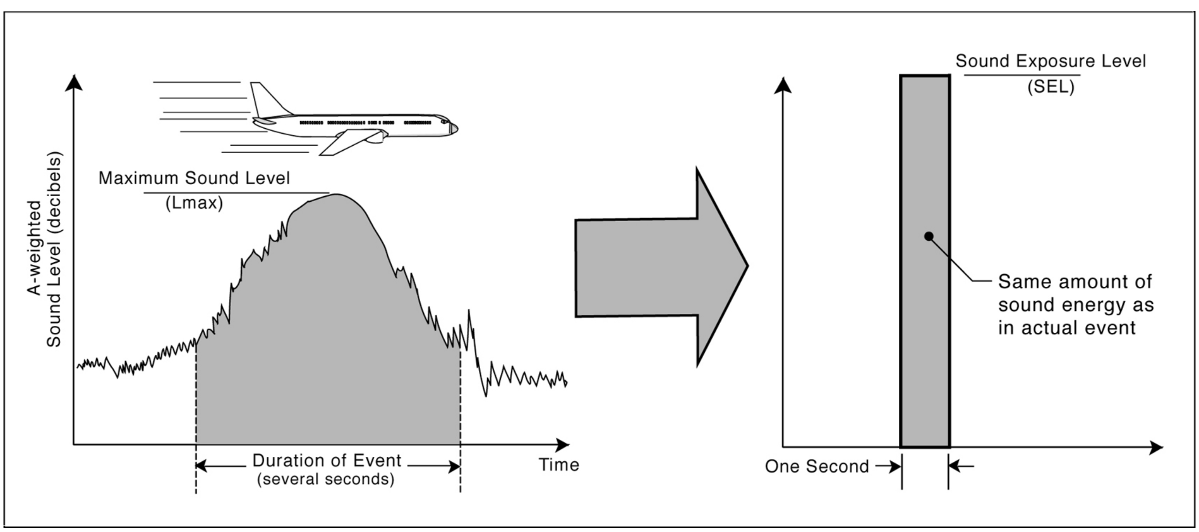
H-1.1.1.4 Sound Exposure Level (SEL)

A frequently used metric of noise exposure for a single aircraft flyover is the Sound Exposure Level, or SEL. SEL may be considered an accumulation of the sound energy over the duration of an event. The shaded area in **Figure H-1-5** illustrates that portion of the sound energy (or "dose") included in an SEL computation. The dose is then normalized (standardized) to a duration of one second. This "revised" dose is the SEL, shown as the shaded rectangular area in Figure H-1-5. Mathematically, the SEL represents the sound level of the constant sound that would, in one second, generate the same acoustic energy as the actual time-varying noise event. For events that last more than one second, SEL does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event.

Note that, because the SEL is normalized to one second, it will always be larger in magnitude than the maximum A-weighted level for an event that lasts longer than one second. In fact, for most aircraft overflights, the SEL is on the order of 7 to 12 dBA higher than the L_{max}. The fact that it is a cumulative measure means that not only do louder flyovers have higher SELs than quieter ones (of the same duration), but longer flyovers also have greater SELs than shorter ones (of the same L_{max}).

It is the SEL's inclusion of both the intensity and duration of a sound source that makes SEL the metric of choice for comparing the single-event levels of varying duration and maximum sound level. This metric provides a comprehensive basis for modeling a noise event in determining overall noise exposure.

Figure H-1-5
Relationship Between Single Event Noise Metrics



H-1.1.1.5 Equivalent Sound Level (L_{eq})

Maximum A-weighted level and SEL are used to measure the noise associated with individual events. The following metrics apply to longer-term cumulative noise exposure that often includes many events.

The first cumulative noise metric, the Equivalent Sound Level (abbreviated L_{eq}), is a measure of the exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest (e.g., an hour, an 8-hour school day, nighttime or a full 24-hour day). However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example $L_{eq(8)}$ or $L_{eq(24)}$.

As for its application to aircraft noise issues, L_{eq} is often presented for consecutive 1-hour periods to illustrate how the hourly noise dose rises and falls throughout a 24-hour period, as well as how certain hours are significantly affected by a few loud aircraft. Since the period of interest for this study is in a full 24-hour day, $L_{eq(24)}$ is the proper nomenclature.

Conceptually, L_{eq} may be thought of as a constant sound level over the period of interest that contains as much sound energy as the actual time-varying sound level with its normal "peaks" and "valleys," as illustrated in Figure 3. In the context of noise from typical aircraft flight events and as noted earlier for SEL, L_{eq} does not represent the sound level heard at any particular time, but rather represents the total sound exposure for the period of interest. Also, it should be noted that the "average" sound level suggested by L_{eq} is not an arithmetic value, but a logarithmic, or "energy-averaged," sound level. Thus, loud events tend to dominate the noise environment described by the L_{eq} metric.

H-1.1.1.6 Day-Night Average Sound Level (DNL)

DNL is the same as L_{eq} (an energy-average noise level over a 24-hour period) except that 10 dB is added to those noise events occurring at night (between 10 p.m. and 7 a.m.). This weighting reflects the added intrusiveness of nighttime noise events attributable to the fact that community background noise levels typically decrease by about 10 dB during those nighttime hours. DNL does not represent the sound level heard at any particular time, but rather represents the total (and partially weighted) sound exposure.

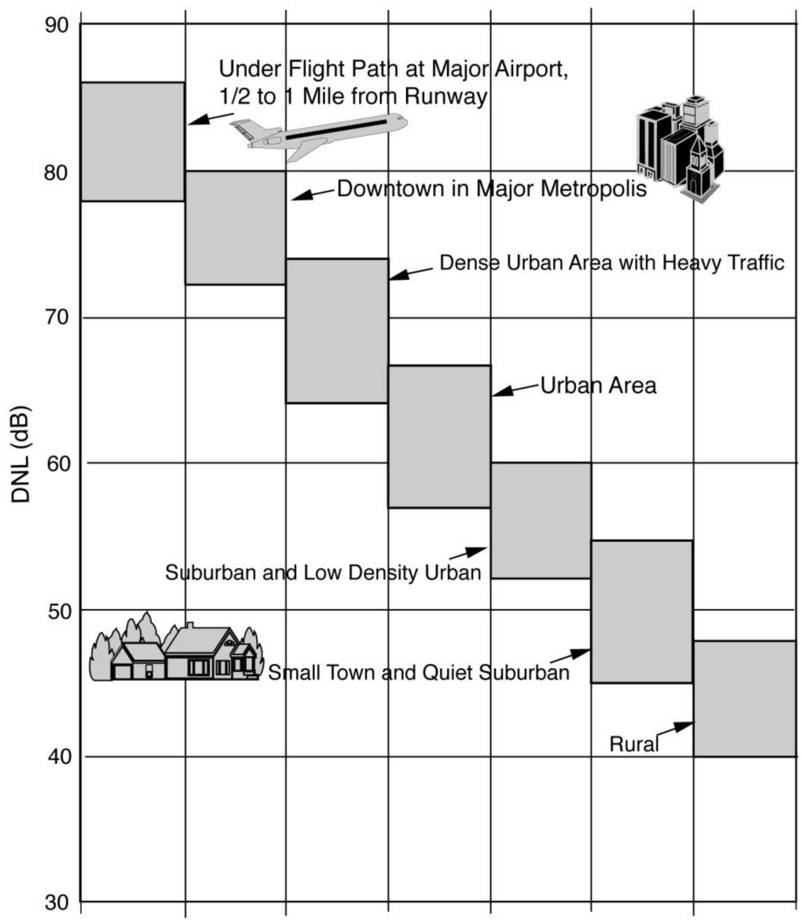
Typical DNL values for a variety of noise environments are shown in **Figure H-1-6** to indicate the range of noise exposure levels usually encountered.

Due to the DNL metric's excellent correlation with the degree of community annoyance from aircraft noise, DNL has been formally adopted by most federal agencies for measuring and evaluating aircraft noise for land use planning and noise impact assessment. Federal interagency committees such as the Federal Interagency Committee on Urban Noise (FICUN) and the Federal Interagency Committee on Noise (FICON) which include the EPA, FAA, Department of Defence, Department of Housing and Urban Development (HUD), and Veterans Administration, found DNL to be the best metric for land use planning. They also found no new cumulative sound descriptors or metrics of sufficient scientific standing to substitute for DNL. Other cumulative metrics could be used only to supplement, not replace DNL. Furthermore, FAA Order 1050.1E for environmental documents requires that DNL be used in describing cumulative noise exposure and in identifying aircraft noise/land use compatibility issues.[1 2 3 4 5]

Measurements of DNL are practical only for obtaining values for a relatively limited number of points. Instead, many noise studies, including this document, are based on estimates of DNL using an FAA-approved computer-based noise model.

Figure H-1-6

Typical Range of Outdoor Community Day-Night Average Sound Levels



Source: U.S. Department of Defense. Departments of the Air Force, the Army, and the Navy, 1978. *Planning in the Noise Environment.* AFM 19-10. TM 5-803-2, and NAVFAC P-970. Washington, D.C.: U.S. DoD.

H-1.1.1.7 Time-Above a Specified Level (TA)

The Time-Above a Specified Level (TA) metric describes the total number of minutes that instantaneous sound levels (usually from aircraft) are above a given threshold. For example, if 65 dB is the specified threshold, the metric would be referred to as "TA65." Like DNL, the TA metric is typically associated with a 24-hour annual average day or only for the DNL nighttime period of 10 p.m. to 7 a.m.

When the TA calculation is expressed as a percentage of the day it is referred to as "%TA." Although the threshold chosen for the TA calculation is arbitrary, it is usually the ambient level for the location of interest or 65 dB for comparison to a level of 65 dB DNL.

H-1.1.2 The Effects of Aircraft Noise on People

To many people, aircraft noise can be an annoyance and a nuisance. It can interfere with conversation and listening to television, disrupt classroom activities in schools and disrupt sleep. Relating these effects to specific noise metrics aids in the understanding of how and why people react to their environment. This section addresses three ways we are potentially affected by aircraft noise: annoyance, interference of speech and disturbance of sleep.

H-1.1.2.1 Community Annoyance

The primary potential effect of aircraft noise on exposed communities is one of annoyance. The U.S. EPA defines noise annoyance as any negative subjective reaction on the part of an individual or group.[1]

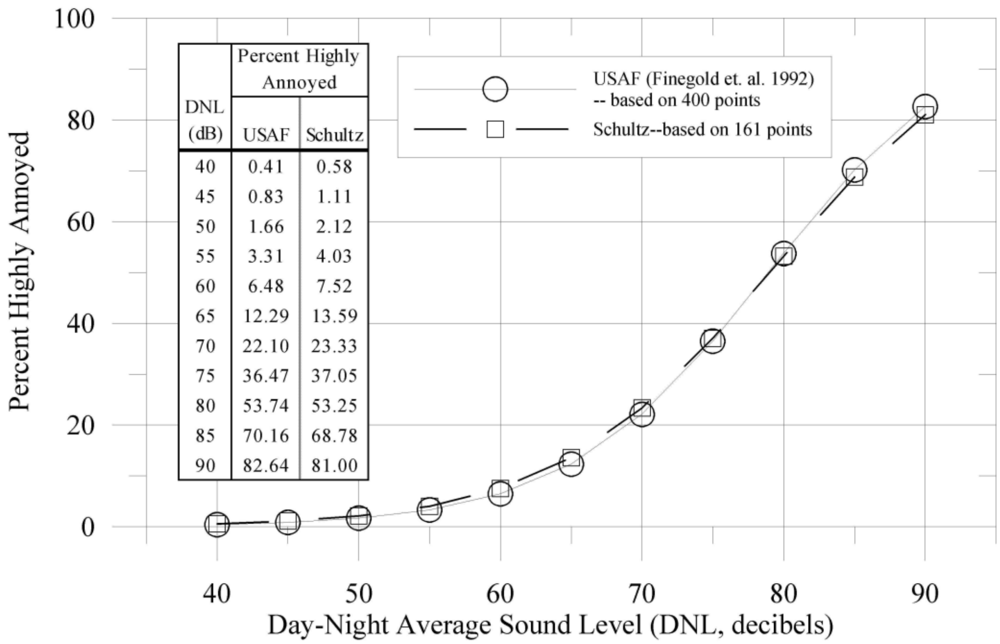
Scientific studies [1 2 3 6 7] and a large number of social/attitudinal surveys [8 9] have been conducted to appraise the U.S. and inter-national community of annoyance due to all types of environmental noise, especially aircraft events. These studies and surveys have found the DNL to be the best measure of that annoyance.

This relation between community annoyance and time-average sound level has been confirmed, even for infrequent aircraft noise events.[10] For helicopter overflights occurring at a rate of 1 to 52 per day, the stated reactions of community individuals correlated with the daily time-average sound levels of the helicopter overflights.

The relationship between annoyance and DNL that has been determined by the scientific community and endorsed by many federal agencies, including the FAA, is shown in **Figure H-1-7.** Two lines in Figure 7 represent two large sets of social/ attitudinal surveys: one for a curve fit of 161 data points compiled by an individual researcher, Ted Schultz, in 1978[8] and one for a curve fit of 400 data points (which include Schultz's 161 points) compiled in 1992 by the U.S. Air Force.[11] The agreement of these two curves simply means that when one combines the more recent studies with the early landmark surveys in 1978, the results of the early surveys (i.e., the quantified effect of noise on annoyance) are confirmed.

Figure H-1-7

Relationship Between Annoyance and Day-Night Average Sound Level



DNL (dB)	Percent Highly Annoyed USAF	Schultz
40	0.41	0.58
45	0.83	1.11
50	1.66	2.12
55	3.31	4.03
60	6.48	7.52
65	12.29	13.59
70	22.10	23.33
75	36.47	37.05
80	53.74	53.25
85	70.16	68.78
90	82.64	81.00

Source: Federal Interagency Committee on Noise (FICON),
"*Federal Agency Review of Selected Airport Noise Analysis Issues*",
August 1992, p. 3-6, Figure 3.1

Figure 7 shows the percentage of people “highly annoyed” by a given DNL. For example, the two curves in the figure yield a value of about 13% for the percentage of people that would be highly annoyed by a DNL exposure of 65 dB. The figure also shows that at very low values of DNL, such as 45 dB or less, 1% or less of the exposed population would be highly annoyed. Furthermore, at very high values of DNL, such as 90 dB, more than 80% of the ex-posed population would be highly annoyed.

Recently, the use of DNL has been criticized as not accurately representing community annoyance and land-use compatibility with aircraft noise. One frequent criticism is based on the inherent feeling that people react more to single noise events and not as much to “meaningless” time-average sound levels. In fact, a time-average noise metric, such as DNL, takes into account both the noise levels of all individual events which occur during a 24-hour period and the number of times those events occur. As described briefly above, the logarithmic nature of the decibel unit causes the noise levels of the loudest events to control the 24-hour average.

As a simple example of this characteristic, consider a case in which only one aircraft overflight occurs in daytime hours during a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours 59 minutes and 30 seconds of the day, the ambient sound level is 50 dB. The DNL for this 24-hour period is 65.5 dB. As a second example, assume that 10 such 30-second overflights occur in daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The DNL for this 24-hour period is 75.4 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events. This is the basic concept of a time-average sound metric, and, specifically, the DNL.

It is often suggested that a lower DNL, such as 60 or 55 dB, be adopted as the threshold of community noise annoyance for FAA environmental analysis documents. While there is no technical reason why a lower level cannot be measured or calculated for comparison purposes, a DNL of 65 dB:

- Provides a valid basis for comparing and assessing community noise effects.
- Represents a noise exposure level that is normally dominated by aircraft noise and not other community or nearby highway noise sources.
- Reflects the FAA's threshold for grant-in-aid funding of airport noise mitigation projects.
- HUD also established a DNL standard of 65 dB for eligibility for federally guaranteed home loans.

H-1.1.2.2 Speech Interference

A primary effect of aircraft noise is its tendency to drown out or "mask" speech, making it difficult to carry on a normal conversation.

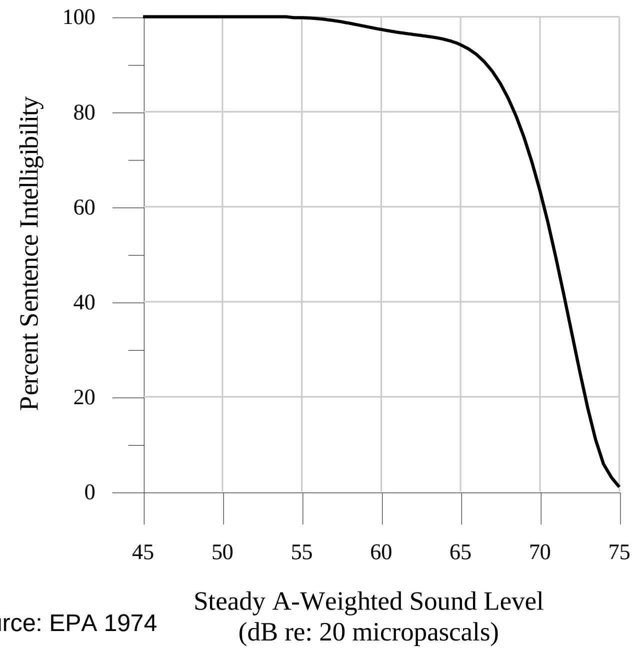
Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities, such as radio or television listening, telephone use or family conversation, causes frustration and aggravation. Research has shown that "whenever intrusive noise exceeds approximately 60 dB indoors, there will be interference with speech communication."[1]

Indoor speech interference can be expressed as a percentage of sentence intelligibility among two people speaking in relaxed conversation approximately one meter apart in a typical living room or bedroom.[1] The percentage of sentence intelligibility is a non-linear function of the (steady) indoor background sound level, as shown in **Figure H-1-8**. This curve was digitized and curve-fitted for the purposes of this document. Such a curve-fit yields 100 percent sentence intelligibility for background levels below 57 dB and yields less than 10 percent intelligibility for background levels above 73 dB. Note that the function is especially sensitive to changes in sound level between 65 dB and 75 dB. As an example of the sensitivity, a 1 dB increase in background sound level from 70 dB to 71 dB yields a 14 percent decrease in sentence intelligibility.

In the same document from which Figure H-1-8 was taken, the EPA established an indoor criterion of 45 dB DNL as requisite to protect against speech interference indoors.

Figure H-1-8

Percent Sentence Intelligibility



Source: EPA 1974

H-1.1.2.3 Sleep Disturbance

Sleep disturbance is another source of annoyance associated with aircraft noise. This is especially true because of the intermittent nature and content of aircraft noise, which is more disturbing than continuous noise of equal energy and neutral meaning.

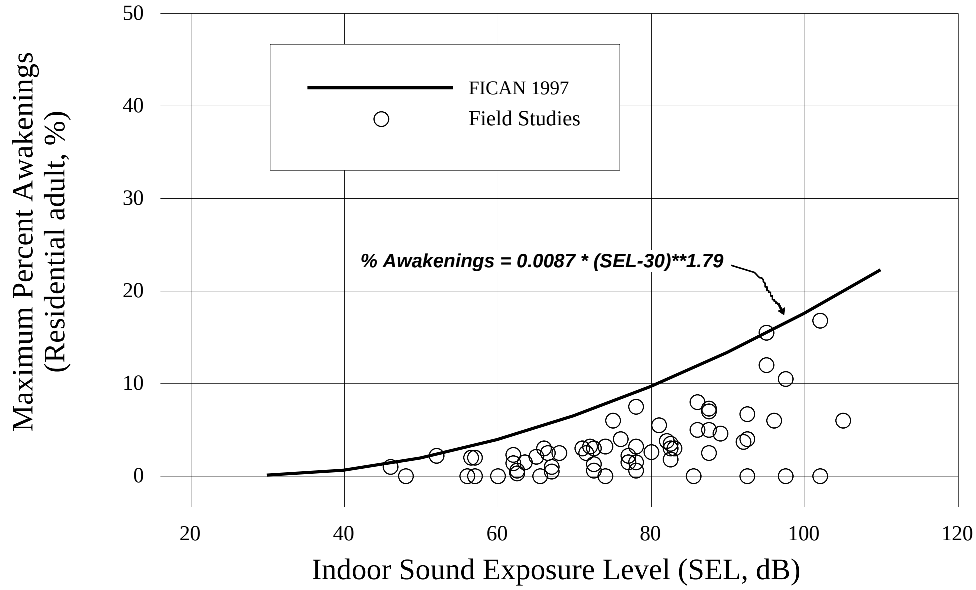
Sleep disturbance can be measured in one of two ways: "Arousal" represents awakening from sleep, while a change in "sleep stage" represents a shift from one of four sleep stages to another stage of lighter sleep without awakening. In general, arousal requires a higher noise level than does a change in sleep stage.

In terms of average daily noise levels, some guidance is available to judge sleep disturbance. The EPA identified an indoor DNL of 45 dB as necessary to protect against sleep interference.[1]

In June 1997, the Federal Interagency Committee on Aviation Noise (FICAN) reviewed the sleep disturbance issue and presented a sleep disturbance dose-response prediction curve.[12] FICAN based their curve on data from field studies[13 14 15 16] and recommends the curve as the tool for analysis of potential sleep disturbance for residential areas. **Figure H-1-9** shows this curve which, for an indoor SEL of 60 dB, predicts that a maximum of approximately 5 percent of the residential population exposed are expected to be behaviourally awakened. FICAN cautions that this curve should only be applied to long-term adult residents.

Figure H-1-9

Sleep Disturbance Dose-Response Relationship



Source: FICAN, 1997

H-1.2 Airport Noise Modeling

H-1.2.1 Introduction

Noise levels in the vicinity of an airport can be modeled using the aircraft fleet, the time of day of operations, the runway orientation, layout, and utilization, representative noise model flight tracks and their respective utilization, aircraft performance data, weather and terrain input data. For projects that require federal actions, the FAA mandates the use of Aviation Environmental Design Tool (AEDT) to conduct aviation noise modeling. In addition, DNL (See Section H-1.1.1.6) was used as the primary noise metrics for this study.

H-1.2.2 Noise Modeling Software

In 2015, the FAA released the Aviation Environmental Design Tool version 2b (AEDT 2b), which replaces both the INM and the Emissions and Dispersion Modeling System (EDMS), used for air quality analysis. The FAA issued a policy statement effective May 29, 2015 that required the use of AEDT 2b for new projects. Since the release of the AEDT 2b, the FAA has published several service packs that fixed various bugs and expanded its modeling capabilities. On September 12th, 2016, the FAA released AEDT version 2c (AEDT 2c) that incorporates various additional upgrades, which is the most current version when this report was written.

H-1.2.3 Noise Metrics - DNL

The DNL is the noise metric adopted by the Federal government to assess cumulative (i.e., multiple aircraft events) noise in the vicinity of airports. Therefore, in this analysis, aircraft noise is reported in terms of DNL. Details on DNL is included in Section H-1.1.1.6.

H-1.2.4 Operations

H-1.2.4.1 Average Annual Day (AAD)

AEDT uses the Average Annual Day (AAD) to represent the time and frequency of flights at the airport. AAD operations are representative of all aircraft operations that occur over the course of a year, averaged over 365 days.

H-1.2.4.2 Stage Length

Stage length is a noise modeling term used to refer to trip distance for an aircraft departure from origin to destination, and is a surrogate for aircraft weight. The trip distance influences the take-off weight (and therefore the thrust and performance) of the aircraft, as more fuel is required to fly longer distances and therefore adds weight to the aircraft.

H-1.2.4.3 Day/Night Split

As described in Section H-1.1.1.6, one operation occurring during nighttime (10pm – 7am) is equivalent to 10 daytime operations in terms of noise due to its annoyance.

H-1.2.5 Runway and Track Utilization

Runway use is a primary factor in the determination of noise exposure as how much each runway and helipad is utilized may determine the overall shape of the noise contour.

To determine projected noise levels on the ground, it is necessary to determine not only the frequency of aircraft operations, but also the altitude and location in which they fly. Flight routes to and from an airport, which are modeled as tracks in AEDT, are generally a function of the geometry of the airport's runways and the surrounding airspace structure in the vicinity of the airfield.

H-1.2.6 Maintenance Engine Run-ups

Engine run-ups can be modeled in AEDT, and depending on their frequency, may influence the size and location of noise exposure contours

H-1.2.7 Terrain

Terrain data is used to account for effects that variations in terrain have on noise propagation.

H-1.2.8 Weather

The noise model allows for the modeling of atmospheric conditions in the calculation of noise exposure, taking into consideration temperature and humidity. Temperature is an important factor in aircraft performance, as higher temperatures decrease the density of air, which increases aircraft takeoff distance and reduces climb performance. This generally results in increased noise propagation in hot temperatures, as compared to colder temperatures.

Endnotes

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[1] U.S. Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety," Report 550/9-74-004, March 1974.

[2] "Guidelines for Considering Noise in Land Use Planning and Control," Federal Interagency Committee on Urban Noise (FICUN), June 1980.

[3] "Federal Agency Review of Selected Airport Noise Analysis Issues," Federal Interagency Committee on Noise (FICON), August 1992.

[4] 14 CFR Part 150, Airport Noise Compatibility Planning, Amendment 150-3, Updated April 2012.

[5] FAA Order 1050.1E, Chg 1, Environmental Impacts: Policies and Procedures, Department of Transportation, Federal Aviation Administration, March 20, 2006.

[6] "Sound Level Descriptors for Determination of Compatible Land Use," American National Standards Institute Standard ANSI S3.23-1980.

[7] "Quantities and Procedures for Description and Measurement of Environmental Sound, Part I," American National Standards Institute Standard ANSI S21.9-1988.

[8] Schultz, T.J., "Synthesis of Social Surveys on Noise Annoyance," *J. Acoust. Soc. Am.,* 64, 377-405, August 1978.

[9] Fidell, S., Barger, D.S., Schultz, T.J., "Updating a Dosage-Effect Relationship for the Prevalence of Annoyance Due to General Transportation Noise." J. Acoust. Soc. Am., 89, 221-233, January 1991.

[10] "Community Reactions to Helicopter Noise: Results from an Experimental Study," *J. Acoust. Soc. Am.,* 479-492, August 1987.

[11] Finegold, L.S., C.S. Harris, H.E. VonGierke., "Applied Acoustical Report: Criteria for Assessment of Noise Impacts on People." *J. Acoust. Soc. Am.,* June 1992.

[12] Federal Interagency Committee on Aviation Noise (FICAN), "Effects of Aviation Noise on Awakenings from Sleep," June 1997.

[13] Pearson, K.S., Barber, D.S., Tabachnick, B.G., "Analyses of the Predictability of Noise-Induced Sleep Disturbance," USAF Report HSD-TR-89-029, October 1989.

[14] Ollerhead, J.B., Jones, C.J., Cadous, R.E., Woodley, A., Atkinson, B.J., Horne, J.A., Pankhurst, F., Reyner, L, Hume, K.I., Van, F., Watson, A., Diamond, I.D., Egger, P., Holmes, D., McKean, J., "Report of a Field Study of Aircraft Noise and Sleep Disturbance." London Department of Safety, Environment, and Engineering, 1992.

[15] Fidell, S., Pearsons, K., Howe, R., Tabachnick, B., Silvati, L., Barber, D.S. "Noise-Induced Sleep Disturbance in Residential Settings," AL/OH-TR-1994-0131, Wright Patterson AFB, OH, Armstrong Laboratory, Occupational and Environmental Health Division, 1994.

[16] Fidell, S., Howe, R., Tabachnick, B., Pearsons, K., Sneddon, M., "Noise-Induced Sleep Disturbance in Residences Near Two Civil Airports," Langley Research Center, 1995.

Appendix H-2

Existing Condition Noise Analysis

Technical Report

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ATTACHMENTS

APPENDIX H-2: Existing Condition Noise Analysis

1 Noise Modeling Methodology

The noise modelling methodology for this noise analysis is consistent with noise modelling of aircraft operations as required by the FAA. This study uses the Aviation Environmental Design Tool (AEDT) version 2c (AEDT 2c), averages operations using an Average Annual Day (AAD), and presents noise in terms of the Day-Night Average Sound Level (DNL) noise metric.

Previous noise analyses have been conducted at MTN, and were considered as part of this analysis. As required by the Code of Maryland Regulations (COMAR), an Airport Noise Zone (ANZ) update must be conducted every five years and was last completed in May 2012.[1] This ANZ included a noise analysis of the 2012 current conditions, 2017 forecast conditions, and 2022 forecast conditions, where forecast conditions included updated runway layouts as specified in the 2011 MTN Airport Layout Plan (ALP).[2]

1.1 AVIATION ENVIRONMENTAL DESIGN TOOL (AEDT)

In 2015, the FAA released the Aviation Environmental Design Tool version 2b (AEDT 2b), which replaces both the Integrated Noise Model (INM) and the Emissions and Dispersion Modeling System (EDMS), used for air quality analysis. The FAA issued a policy statement effective May 29, 2015 that required the use of AEDT 2b for new projects. Since the release of the AEDT 2b, the FAA has published several service packs that fixed various bugs and expanded its modeling capabilities. On September 12th, 2016, the FAA released AEDT version 2c (AEDT 2c) that incorporates various additional upgrades. The 2016 Existing Condition noise contour was modeled with AEDT 2c.

1.2 AVERAGE ANNUAL DAY (AAD)

Noise exposure is calculated based on an AAD conditions. AAD operations are representative of all aircraft operations that occur over the course of a year, averaged over 365 days. In this study, AAD operations consist of the number of aircraft operations, including departures and arrivals, by daytime and nighttime operations. In addition to operations, runway use, flight track use, and weather are also averaged.

1.3 DAY-NIGHT AVERAGE SOUND LEVEL (DNL)

The DNL is the noise metric adopted by the Federal government to assess cumulative (i.e., multiple aircraft events) noise near airports. Therefore, in this analysis, aircraft noise is reported in terms of DNL.

The DNL is a 24-hour, logarithmic- (or energy-) average, A-weighted sound pressure level with a 10-decibel (dB) penalty applied to “nighttime” aircraft events. For the purposes of the DNL metric, daytime is defined as 7:00 a.m. to 9:59 p.m., and nighttime is defined as 10:00 p.m. to 6:59 a.m. The 10 dB increases during nighttime hours are intended to account for the added intrusiveness of aircraft noise during time periods when ambient noise due to vehicle traffic and other sources is typically less than during the daytime, and when people are more likely to be in their homes.

2 2016 Existing Condition

This section provides information on the input data and noise exposure for 2016 Existing Condition, based on aircraft activity that occurred during calendar year 2016.

2.1 INPUT DATA

The noise model requires a set of detailed input data reflecting the operating environment at MTN in 2016. This includes the number, layout and use of runways, helipads and run-up areas; the number, frequency and type of operations; the location and use of representative flight tracks; and meteorological and terrain data. The following sections describe the input data collected and analyzed for use in the noise modeling procedures for MTN.

2.1.1 Facilities and Runways

This section presents the location of on-airport facilities including Runway15/33, helipads, and engine run-up locations. Runway 15/33 is the primary (and only) runway currently in use at MTN. The runway includes an actual pavement length of 8,100 feet and is 180 feet wide. The Runway 15 threshold has been relocated 1,104 feet, resulting in a usable runway length of 6,996 feet for civilian aircraft. The full 8,100 feet of pavement is available to the Maryland Air National Guard (MANG) for Runway 15 departures and Runway 33 arrivals. For arriving military aircraft, a displaced landing threshold of 1,113 feet for Runway 15 is observed; the threshold is not displaced for Runway 33.

MTN also has three helicopter operating areas at the airport, serving city, county and state law enforcement organizations, as indicated on Figure 1. A paved circular helipad (HCPD) is in the Central Terminal Area south of the ATCT. The Baltimore County Police, two news agencies, a flight training school and a medical emergency response unit’s flights operate from this helipad. Helicopters also land and depart from two other locations on MTN. The Baltimore City Police typically operate from the area near the Runway 15 end (HBPD), which provides the shortest taxi distance from their hangars. Military helicopter operations also occur from the HBPD helipad. Arrival and departure flight patterns generally follow the Eastern Avenue corridor to the southwest in the immediate vicinity of MTN. The Maryland State Police operate from the Strawberry Point Complex (HSPD), and often fly directly towards their destination due to their status as emergency responders.

Engine run-ups can be modeled in AEDT, and depending on their frequency, may influence the size and location of noise exposure contours. Engine run-ups associated with operations from the MDANG are included in the model and are located on the north side of Runway 15/33. Run-ups occur on the A-10 ramp, and at an A-10 test cell and trim pad located near the midway point of the runway.

Figure 1: MTN Airport Facilities

2.1.2 Meteorological Conditions

The noise model allows for the modeling of atmospheric conditions in the calculation of noise exposure, taking into consideration temperature and humidity. Temperature is an important factor in aircraft performance, as higher temperatures decrease the density of air, which increases aircraft takeoff distance and reduces climb performance. This generally results in increased noise propagation in hot temperatures, as compared to colder temperatures.

As stated in the FAA National Environmental Policy Act (NEPA) guidance[3], default weather parameters at MTN was applied in the noise modeling (shown in **Table 1**).

Table 1: AEDT Weather Parameters

Parameters	Existing Condition
Temperature (ºF)	55.0
Dew Point (ºF)	45.8
Pressure (millibar)	1017.8
Humidity (%)	66.8
Wind (knots)	5.9

Sources: AEDT 2c, 2017.

2.1.3 Terrain

Terrain data is used to account for effects that variations in terrain have on noise propagation. Terrain data was obtained from the U.S. Geological Survey (USGS).[4]

2.1.4 Operations

The number of AAD operations and the type of aircraft at MTN for the 2016 Existing Condition was determined based on the 2015 TAF, MTN based aircraft inventory, Traffic Flow Management Systems Counts (TFMS-C)[5], Operations Network (OPSNET)[6], and data provided by the MTN Air Traffic Control Tower (ATCT) and MDANG.

For the 2016 existing condition, 76,009 annual operations are modeled, which equates to approximately 174operations on an AAD as modeled in AEDT[1]. Most operations at MTN are categorized as General Aviation (GA) operations. Helicopter operations account for 30 operations on an AAD, while military operations account for approximately eight operations on an AAD, or roughly 4.6% of the total daily operations.

The 2016 Existing Condition incorporated the extensive use of helicopters at MTN. Based on the information provided by the airport staff, the 2016 Existing Condition modeled approximately 30

[1] AEDT models each local fixed-wing touch-and-go operation as one operation (34.4 operations) whereas the fleet mix forecast in Appendix I counts each local fixed-wing touch-and-go operation as two operations, including one arrival and one departure (68.8 operations). Therefore, AEDT modeled 174 AAD operations, while the fleet mix forecast includes 208 AAD operations.

daily helicopter operations including ten types of helicopters. The Baltimore County Police (Eurocopter AS350B3), two new agencies (Bell 206 JetRanger), a flight training school (Robinson R22), a medical emergency response unit (Eurocopter EC135), and other transient helicopters (Bell 429, Bell 430, Sikorsky S70, and Sikorsky S76) use the main helipad (HCPD) located near the Central Terminal Area south of the ATCT. The Maryland State Police operate from the Strawberry Point Complex (HSPD) and completed their transition from the Eurocopter AS365 Dauphin to the AgustaWestland AW139 helicopters in 2016. The Baltimore City Police typically operate from the area near Runway 15 (HBPD) using the Eurocopter EC120.

Table 1 in the **Attachment 1** provides a summary of aircraft and operations for the 2016 existing condition. Aircraft are categorized and are shown by the actual aircraft type and by corresponding noise model type. Operations are presented for type (arrival, departure, or touch-and-go) and by the time of day (day/night). The FAA categorizes operations as either itinerant or local. Itinerant operations represent flights that arrive from or depart to another airport outside the airport pattern, whereas local operations represent operations within the airport pattern. Most local operations can be attributed to training flights for either civil or military aircraft. Local operations are designated in the table as touch-and-go operations.

2.1.5 Noise Model Aircraft

The AEDT includes reference noise data for many civilian, military, and general aviation aircraft and helicopters. Most aircraft in operation at MTN have a direct corresponding AEDT aircraft type. Additionally, for aircraft that are not specifically in the AEDT database the FAA publishes a pre-approved substitution list that provides the AEDT user with an equivalent AEDT aircraft that closely resembles the noise profile of that aircraft. However, in some cases, aircraft that do not have an AEDT aircraft type or substitute aircraft are part of the fleet mix at an airport. In this situation, the FAA Office of Environment and Energy (AEE) provides guidance on the identification of a suitable aircraft (with similar noise characteristics) for use in the model. For a small percentage of the fleet mix, coordination with AEE was undertaken to identify the appropriate noise model aircraft, as shown in **Attachment 2**.

2.1.6 Day/ Night Distribution

The DNL metric takes into consideration the time of day of aircraft operations. The 2016 Existing Condition derived the distribution of hourly operations by civil and military aircraft using the Distributed Operations Network (Distributed OPSNET) dataset and consultation with the MDANG. The Distributed OPSNET is the official FAA air traffic operations and delay data which collects aviation activity data from all ATCT facilities except flight service stations. Since the reported traffic bears a time stamp, it can be used to study traffic delay and identify night-time operations for noise analysis purposes. The Distributed OPSNET database provides an hourly operation distribution by category such as air carrier and air taxi, general aviation, and military, which was used to calculate the day/night split for all aircraft by category, and applied to all operations by aircraft category except A-10A. Based on the information provided by the MDANG 175th Wing and airport staff, all but three A-10A operations occurred during daytime hours in 2016. Additionally, the 2016 Existing Condition also modeled two transient military aircraft, the C-17 Globemaster and C-130 Hercules, in support of overseas military missions. The total number of transient operations is 0.2 on an AAD, with 1.2% of operations occurring during nighttime hours. The 2016 Existing Condition analysis indicates that 96.5% of all operations occurred during the daytime (7:00 a.m. to 9:59 p.m.). Approximately 3.5% of all operations occur during the nighttime (10:00 p.m. to 6:59 a.m.). **Table 2** summarizes daytime and nighttime operations distribution by aircraft types.

Table 2: Day / Night Operations Distribution by Aircraft Types

Category	Operations			Percentages		
	Daytime	Nighttime	Total	Daytime	Nighttime	Total
Fixed-wing	129.5	6.0	135.5	95.6%	4.4%	100.0%
Helicopter	30.2	0.1	30.4	99.5%	0.5%	100.0%
Military	7.9	<0.1	7.9	99.5%	0.5%	100.0%
Total	*167.7*	*6.2*	*173.8*	96.5%	3.5%	100.0%

Sources: FAA Distributed OPSNET and HNTB Analysis, 2017.

2.1.7 Stage Length

Stage length is a noise modeling term used to refer to trip distance for an aircraft departure from origin to destination, and is a surrogate for aircraft weight. The trip distance influences the take-off weight (and therefore the thrust and performance) of the aircraft, as more fuel is required to fly longer distances and therefore adds weight to the aircraft. The AEDT uses nine stage length categories in increments of 500 or 1,000 nautical miles. Current stage lengths by aircraft type were derived from the Flight Explorer data which provides origin, destination, and aircraft information. Approximately 94.6% of all departures from MTN were identified as Stage Length 1 (flights of less than 500 nautical miles) in the fleet mix development. However, certain stage lengths noise parameters were unavailable in AEDT 2c, especially for propeller drive GA aircraft. Consequently, the maximum stage length for that aircraft was applied, resulting in approximately 99.9% of the departures were modeled with Stage Length 1.

2.1.8 Run-up Operations

Run-ups occur on the A-10A ramp, and at an A-10A test cell and trim pad located near the midway point of the runway. **Table 3** shows the number of A-10A run-up operations at each permitted location.

Table 3: A-10A Run-up Operations

Location	A-10A Run-ups
A-10A Ramp	2.9
A-10A Test Cell	0.5
Total	*3.4*

Sources: MAA 2017 and ANZ Study 2012.

2.1.9 Runway Use

Runway use is a primary factor in the determination of noise exposure. A runway use analysis was completed based on aircraft operations provided via a radar data sample for 2016. Civil operation runway use was determined for jet, piston and turboprop aircraft. This analysis indicated that Runway 33 is the predominant runway used for arrivals (52.7%), departures (57.7%) and touch-and-go operations (55.0%). Military aircraft use Runway 33 for approximately 55.6% of arrivals and departures. Military touch-and-go operations (commonly referred to as closed pattern operations) occur on Runway 15. **Table 4** presents runway use for the 2016 Existing Condition. Helicopter operations utilize multiple locations on the airport, as shown in **Table 5**.

Table 4: Existing Condition Runway Use

Runway	Operation Type	Aircraft Category							
		Daytime				Nighttime			
		Piston	Turboprop	Jet	Military	Piston	Turboprop	Jet	Military
15	Arrival	48.2%	42.2%	42.4%	44.4%	45.7%	45.0%	45.7%	44.4%
33		51.8%	57.8%	57.6%	55.6%	54.3%	55.0%	54.3%	55.6%
15	Departure	42.3%	37.8%	43.4%	44.4%	44.6%	45.0%	56.8%	44.4%
33		57.7%	62.2%	56.6%	55.6%	55.4%	55.0%	43.2%	55.6%
15	Touch-and-Go	45.0%	-	-	100.0%	-	-	-	-
33		55.0%	-	-	-	-	-	-	-
15	Overall	45.2%	40.0%	42.9%	53.9%	45.2%	45.0%	51.7%	44.4%
33		54.8%	60.0%	57.1%	46.1%	54.8%	55.0%	48.3%	55.6%

Source: MAA Radar Data and HNTB Analysis, 2017.

Table 5: Existing Condition Helipad Use

Helipad Description	Helipad	Operation Type	Existing Condition		
			Day	Night	Total
Baltimore City Police and Military	HBPD	Arrival	26.8%	31.4%	26.8%
Maryland State Police	HSPD		19.7%	23.6%	19.7%
Baltimore County Police and Civil	HCPD		53.5%	45.0%	53.5%
Baltimore City Police and Military	HBPD	Departure	26.8%	31.4%	26.8%
Maryland State Police	HSPD		19.7%	23.6%	19.7%
Baltimore County Police and Civil	HCPD		53.5%	45.0%	53.5%

Sources: MAA and HNTB Analysis, 2017.

2.1.10 Flight Track Locations and Use

To determine projected noise levels on the ground, it is necessary to determine not only the frequency of aircraft operations, but also the altitude and location in which they fly. Flight routes to and from an airport are generally a function of the geometry of the airport's runways and the surrounding airspace structure in the vicinity of the airfield. The noise model flight track locations from previous noise modeling efforts were evaluated and updated based on a sample of radar data provided by the MAA's flight tracking program. The radar data was used to verify and refine flight tracks flight tracks by jet, propeller, and helicopter aircraft.

Four representative weeks were selected with one week in each season to verify and refine flight tracks in the previous noise model. The selected representative weeks included the following:

- 01/31/2016 - 02/06/2016
- 04/24/2016 - 04/30/2016
- 07/03/2016 - 07/09/2016
- 10/02/2016 - 10/08/2016

The flight tracks obtained through radar samples were bundled by runway, operation type, and aircraft categories which include jets, propellers, and helicopters. Using these bundles and building upon existing aviation noise work completed for MTN, a unique average (backbone) flight track was developed if a suitable one did not exist from previous modeling. Existing noise model flight tracks were adjusted to more closely match flight paths seen in the radar data. Dispersion tracks were also created to capture the variance in aircraft paths based on radar tracks. **Figures 1** through **10** in **Attachment 3** show the flight tracks before and after the refinements for fixed-wing GA aircraft. **Table 6** presents the track utilization based on the radar data for the 2016 Existing Condition.

Table 6: Existing Condition Flight Track Use

Aircraft Category	Runway	Arrivals		Departures		Local Patterns	
		Track	Use %	Track	Use %	Track	Use %
Jet	15	15A1_J2	18.10%	15D1_J1	0.90%		
		15A2_J2	20.70%	15D1_J2	48.30%		
		15A3_J1	1.20%	15D2_J1	2.10%		
		15A3_J2	3.70%	15D2_J2	26.40%		
		15A4_J2	23.50%	15D3_J1	3.00%		
		15A5_J2	23.90%	15D3_J2	18.60%		
		HB_15AJ1	1.90%	15D4_J1	0.70%		
		HB_15AJ2	4.00%				
		HB_15AJ3	3.00%				
	15 Total		100.00%		100.00%		N/A
	33	33A1_J2	6.50%	33D1_J1	1.90%		

Aircraft Category	Runway	Arrivals		Departures		Local Patterns	
		Track	Use %	Track	Use %	Track	Use %
		33A2_J1	10.10%	33D1_J2	54.50%		
		33A2_J2	8.80%	33D2_J1	0.10%		
		33A3_J2	21.60%	33D2_J2	25.60%		
		33A5_J2	8.00%	33D3_J1	0.10%		
		33A6_J1	19.30%	33D3_J2	13.60%		
		HB_33AJ1	16.30%	33D4_J2	3.80%		
		HB_33AJ2	5.40%	33D5_J1	0.40%		
		HB_33AJ3	4.00%				
	33 Total		100.00%		100.00%		N/A
Propeller	15	15A1_P1	8.40%	15D1_P1	1.70%	15P1	50.00%
		15A1_T1	18.10%	15D1_T1	22.50%	15P2	50.00%
		15A2_P1	14.60%	15D2_P1	28.80%		
		15A3_P1	8.80%	15D4_P1	3.70%		
		15A4_P1	4.90%	15D5_P1	9.00%		
		15A5_P1	1.50%	HB_15DP1	16.40%		
		HB_15AP1	4.40%	HB_15DP2	17.80%		
		HB_15AP2	29.90%				
		HB_15AP3	8.00%				
		HB_15AP4	1.40%				
	15 Total		100.00%		100.00%		100.00%
	33	33A1_P1	8.10%	33D1_P1	11.30%	33P1	50.00%
		33A2_P1	8.10%	33D2_P1	5.30%	33P2	50.00%
		33A4_P1	9.20%	33D3_P1	24.00%		
		33A5_P1	9.30%	33D4_P1	22.40%		
		HB_33AP1	35.20%	33D5_P1	21.10%		
		HB_33AP2	2.60%	HB_33DP1	1.80%		
		HB_33AP3	2.40%	HB_33DP2	14.10%		
		HB_33AP4	20.90%				
		HB_33AP5	4.10%				
	33 Total		100.00%		100.00%		100.00%
Helicopter	HBPD	HB_B_HA1	44.30%	HB_B_HD1	69.00%		
		HB_B_HA2	11.50%	HB_B_HD2	14.30%		
		STRAIGHT	44.30%	STRAIGHT	16.70%		
	HBPD Total		100.00%		100.00%		N/A
	HCPD	HB_C_HA1	100.00%	HB_C_DP3	21.40%		
				HB_C_HD1	57.10%		

Aircraft Category	Runway	Arrivals		Departures		Local Patterns	
		Track	Use %	Track	Use %	Track	Use %
				HB_C_HD2	21.40%		
	HCPD Total		100.00%		100.00%		N/A
	HSPD	HB_S_HA1	100.00%	HSPDD4	100.00%		
	HSPD Total		100.00%		100.00%		N/A
Military	15M	15MA7	14.40%	15MD6	12.80%	15MP3	75.00%
		15MA8	21.40%	15MD7	5.50%	15MP4	25.00%
		15MA9	21.40%	15MD8	27.20%		
		15MAA	21.40%	15MD9	27.20%		
		15MAC	21.40%	15MDA	27.20%		
	15M Total		100.00%		100.00%		100.00%
	33M	33MA5	20.70%	33MD6	6.60%		
		33MA6	20.70%	33MD7	15.30%		
		33MA7	20.70%	33MD8	26.00%		
		33MA9	20.70%	33MD9	26.00%		
		33MAA	17.40%	33MDA	26.00%		
	33M Total		100.00%		100.00%		N/A

Source: HNTB Analysis, 2017.

2.2 2016 EXISTING CONDITION NOISE EXPOSURE

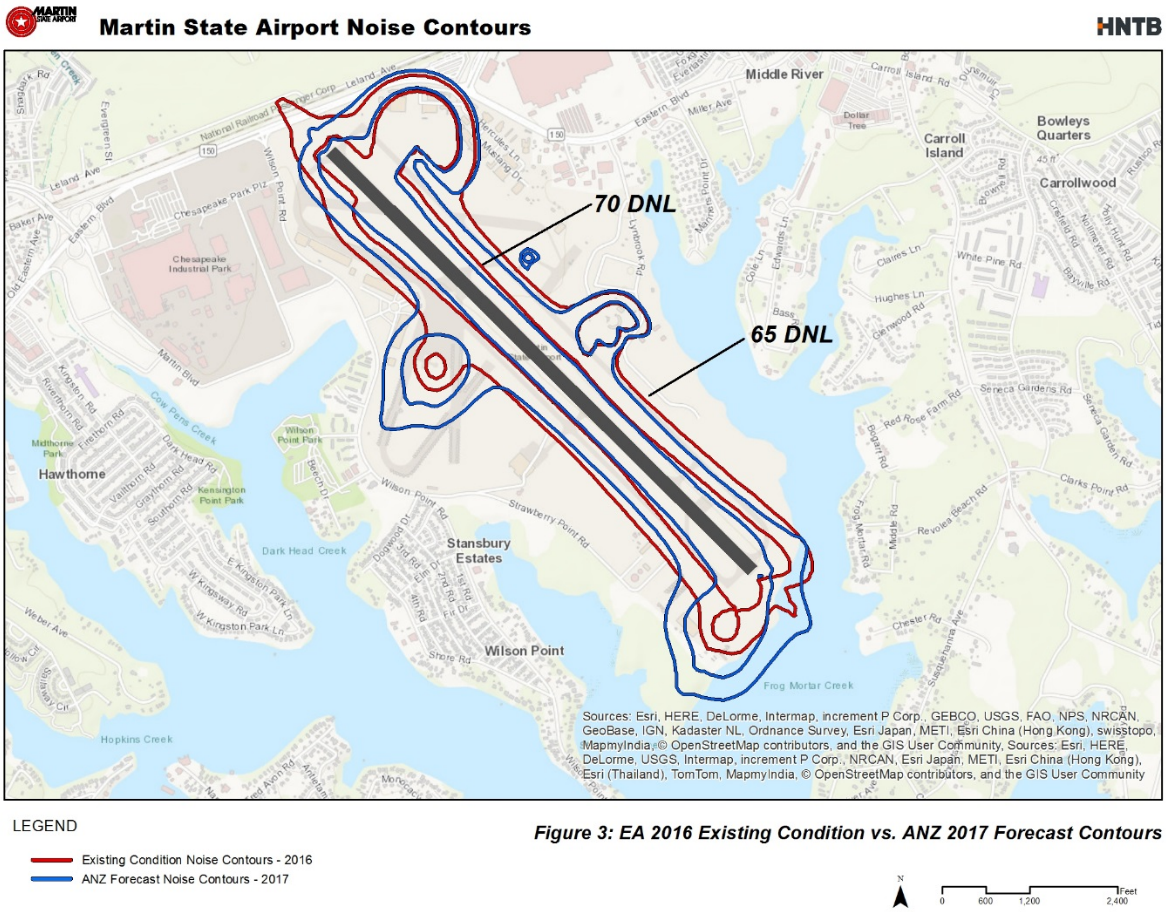
Noise exposure contours, when superimposed on a land use map, allow assessment of the underlying land use compatibility for existing and forecast noise exposure conditions. DNL noise contours were developed using AEDT 2c. Noise exposure in 5 DNL contour intervals from 65 to 75 DNL is shown on **Figure 2**, which illustrates the Existing Condition.

Figure 2: Existing Condition Noise Contours

2.2.1 Comparison with the ANZ 2017 Forecast Noise Contours

Figure 3 shows the preliminary EA 2016 Existing Conditions noise contours and a comparison with the ANZ 2017 forecast noise contours from 65 to 70 DNL.

Figure 3: EA 2016 Existing Conditions vs. ANZ 2017 Forecast Noise Contours



In general, the EA 2016 Existing Conditions noise contours agree with the ANZ 2017 forecast noise contours but with several noticeable differences. To the north of the airport, the EA 65 DNL noise contour extends north of Eastern Boulevard across the AMTRAK/MARC tracks while the ANZ 65 DNL noise contour remains south of Eastern Boulevard. This is mainly due to an increase in the total number of operations. The EA 2016 Existing Conditions noise exposure contour included 13,639 more annual operations, or approximately 32 more AAD operations than the ANZ 2017 forecast noise contours. In addition, the C-27J operations included in the ANZ study were replaced with noisier A-10A operations in the EA study, which also contributes to the increase of the noise contour.

Noise contours near the main helipad and Strawberry complex were much smaller due to the decrease of helicopter operations, especially nighttime operations. Due to the 10-dB penalty added to nighttime operations, the drop in the nighttime operations has a greater impact on the smaller contour than the drop in daytime operations.

Since the 135th Airlift Squadron is being reorganized and no longer flying C-27J at MTN, run-up operations by C-27J at the C-27 Test Pad included in the ANZ 2017 forecast noise contours was not modeled in the EA 2016 Existing Conditions. Therefore, the EA 2016 Existing Condition noise contours did not include a C-27J run-up noise contour at the C-27 Test Pad. However, the A-10A run-up noise contours at the A-10A Ramp and Trim Pad were included in both studies.

2.2.2 2016 Existing Condition Land Use Impacts

The 2016 Existing Condition 65 DNL noise exposure contour encompasses approximately 353.2 acres. All the area at or above the 65 DNL noise exposure contour remains over compatible land uses. The shape of the noise exposure contours conforms to the shape and length of the runway, reflecting the predominant flight tracks used by arriving and departing aircraft. Also, evident in the noise exposure contours are areas in which helicopters arrive and depart (notably in the Central Terminal Area and the Strawberry Point apron), and locations of engine run-ups (located in multiple locations northeast of Runway 15/33).

Table 7 presents the areas of the noise exposure contours located on airport property and encompassing various land uses surrounding MTN. Nearly 98% of the area at or above the 65 DNL noise contour remains on airport property, while the area at or above the 70 DNL noise exposure contour is completely on airport property. The off-Airport land uses included by the 65 DNL noise contour includes lands classified as exempt, commercial, industrial, transportation, and water.

Table 7: Estimated Noise Exposure Impacts – 2016 Existing Condition

Land Use	65 DNL (Acres)	70 DNL (Acres)	75+ DNL (Acres)	Total Acres (65+ DNL)
Airport Property	173.9	103.3	67.9	345.1
Exempt	<0.1	-	-	<0.1
Exempt Commercial	0.3	-	-	0.3
Industrial	0.4	-	-	0.4
Transportation	3.5	-	-	3.5
Water	4	-	-	4
Total	**182.1**	**103.3**	**67.9**	**353.2**

Note: Totals may not sum up due to rounding errors.

Source: HNTB Analysis, 2017.

Endnotes

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[1] Airport Noise Zone Update Martin State Airport, Sean Doyle, Mary E. Eagan, Harris Miller Miller & Hanson Inc, Prepared for Maryland Aviation Administration, May 2012.

[2] Martin State Airport Layout Plan Update, HNTB Corporation and Wilbur Smith Associates, Feb 2011.

[3] Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA, Sep 2016.

[4] United States Geological Survey (USGS), The National Map Elevation, http://viewer.nationalmap.gov/viewer/, accessed Nov 2016.

[5] Traffic Flow Management Systems Counts (TFMSC), FAA, https://aspm.faa.gov/etms/sys/main.asp, accessed Oct 2016.

[6] Air Traffic Activity Data System (ATADS), FAA, https://aspm.faa.gov/opsnet/sys/Main.asp?force=atads, accessed Oct 2016.

Attachment 1
Detailed Fleet Mix

Table 1: Detailed Fleet Mix of Existing Condition

Aircraft Category	Aircraft Description	AEDT Type	Arrivals			Departures			Touch-and-Go			AAD Total		
			Day	Night	Total	Day	Night	Total	Day	Night	Total	Day	Night	Total
JET	A10 - Fairchild A10	A10A	3.25	0.02	3.27	3.25	0.02	3.27	1.38	-	1.38	7.88	0.04	7.91
JET	ASTR - IAI Astra 1125	IA1125	0.03	0.00	0.04	0.04	0.00	0.04	-	-	-	0.07	0.00	0.07
JET	B787 - Boeing 737-800	737800	-	0.00	0.00	-	0.00	0.00	-	-	-	-	0.00	0.00
JET	BE40 - Raytheon/Beech Beechjet 400/T-1	BEC400	0.24	0.01	0.25	0.22	0.03	0.25	-	-	-	0.47	0.04	0.51
JET	C17 - Beoing C-17 Globemaster III	C17	0.01	0.00	0.01	0.01	0.00	0.01	-	-	-	0.02	0.00	0.02
JET	C25A - Cessna Citation CJ2	CNA525C	0.08	0.01	0.09	0.08	0.01	0.09	-	-	-	0.16	0.01	0.17
JET	C25B - Cessna Citation CJ3	CNA500	0.10	0.01	0.11	0.10	0.01	0.11	-	-	-	0.21	0.01	0.22
JET	C25C - Cessna Citation CJ4	CNA525C	0.04	0.00	0.04	0.04	0.00	0.04	-	-	-	0.07	0.00	0.08
JET	C500 - Cessna 500/Citation I	CNA500	0.01	0.00	0.01	0.01	0.00	0.01	-	-	-	0.03	0.00	0.03
JET	C501 - Cessna I/SP	CNA501	0.02	0.00	0.02	0.02	0.00	0.02	-	-	-	0.03	0.00	0.03
JET	C525 - Cessna CitationJet/CJ1	CNA525C	0.15	0.01	0.16	0.15	0.01	0.16	-	-	-	0.30	0.02	0.32
JET	C550 - Cessna Citation II/Bravo	CNA550	0.07	0.01	0.08	0.07	0.00	0.08	-	-	-	0.15	0.01	0.16
JET	C550 - Cessna Citation II/Bravo	CNA55B	0.07	0.01	0.08	0.07	0.00	0.08	-	-	-	0.15	0.01	0.16
JET	C560 - Cessna Citation V/Ultra/Encore	CNA560E	0.10	0.01	0.11	0.10	0.01	0.11	-	-	-	0.20	0.02	0.22
JET	C560 - Cessna Citation V/Ultra/Encore	CNA560U	0.10	0.01	0.11	0.10	0.01	0.11	-	-	-	0.20	0.02	0.22
JET	C56X - Cessna Excel/XLS	CNA560XL	0.38	0.02	0.40	0.35	0.05	0.40	-	-	-	0.73	0.07	0.80
JET	C650 - Cessna III/VI/VII	CNA650	0.15	0.01	0.17	0.16	0.01	0.17	-	-	-	0.31	0.02	0.33
JET	C680 - Cessna Citation Sovereign	CNA680	0.07	0.00	0.08	0.07	0.01	0.08	-	-	-	0.14	0.01	0.15
JET	C750 - Cessna Citation X	CNA750	0.18	0.01	0.19	0.17	0.02	0.19	-	-	-	0.36	0.03	0.38
JET	CL30 - Bombardier (Canadair) Challenger 300	BD100	0.19	0.01	0.20	0.18	0.02	0.20	-	-	-	0.37	0.03	0.40
JET	CL35 - Bombardier Challenger 300	CL600	0.02	0.00	0.02	0.01	0.00	0.02	-	-	-	0.03	0.00	0.03
JET	CL60 - Bombardier Challenger 600/601/604	CL600	0.13	0.01	0.14	0.13	0.01	0.14	-	-	-	0.26	0.02	0.28
JET	CL60 - Bombardier Challenger 600/601/604	CL601	0.13	0.01	0.14	0.13	0.01	0.14	-	-	-	0.26	0.02	0.28
JET	E135 - Embraer ERJ 135/140/Legacy	EMB135	0.02	0.00	0.03	0.02	0.00	0.03	-	-	-	0.05	0.00	0.05
JET	E50P - Embraer Phenom 100	CNA510	0.22	0.01	0.23	0.22	0.01	0.23	-	-	-	0.44	0.03	0.47
JET	E55P - Embraer Phenom 300	CNA560E	0.72	0.05	0.76	0.71	0.05	0.76	-	-	-	1.43	0.10	1.52

Aircraft Category	Aircraft Description	AEDT Type	Arrivals			Departures			Touch-and-Go			AAD Total		
			Day	Night	Total	Day	Night	Total	Day	Night	Total	Day	Night	Total
JET	EA50 - Eclipse 500	ECLIPSE500	0.03	0.00	0.04	0.04	0.00	0.04	-	-	-	0.07	0.00	0.07
JET	F2TH - Dassault Falcon 2000	FAL20A	0.36	0.02	0.38	0.35	0.03	0.38	-	-	-	0.71	0.05	0.76
JET	F900 - Dassault Falcon 900	FAL900	0.02	0.00	0.03	0.02	0.00	0.03	-	-	-	0.05	0.00	0.05
JET	FA50 - Dassault Falcon/Mystère 50	FAL50	0.03	0.00	0.03	0.03	0.00	0.03	-	-	-	0.06	0.00	0.06
JET	G150 - Gulfstream G150	G150	0.10	0.01	0.10	0.10	0.01	0.10	-	-	-	0.20	0.01	0.21
JET	G280 - Gulfstream G280	CL601	0.01	0.00	0.01	0.01	0.00	0.01	-	-	-	0.03	0.00	0.03
JET	GALX - IAI 1126 Galaxy/Gulfstream G200	G200	0.23	0.02	0.25	0.23	0.01	0.25	-	-	-	0.47	0.03	0.50
JET	GLEX - Bombardier BD-700 Global Express	BD700	0.07	0.00	0.08	0.07	0.00	0.08	-	-	-	0.14	0.01	0.15
JET	GLF4 - Gulfstream IV/G400	GIV	0.49	0.03	0.52	0.49	0.03	0.52	-	-	-	0.98	0.06	1.04
JET	GLF5 - Gulfstream V/G500	GV	0.13	0.01	0.14	0.13	0.01	0.14	-	-	-	0.26	0.02	0.28
JET	H25B - BAe HS 125/700-800/Hawker 800	HS1258	0.19	0.01	0.21	0.19	0.02	0.21	-	-	-	0.38	0.03	0.41
JET	LJ31 - Bombardier Learjet 31/A/B	LEAR31	0.04	0.00	0.04	0.04	0.00	0.04	-	-	-	0.08	0.00	0.08
JET	LJ35 - Bombardier Learjet 35/36	LEAR35	0.07	0.01	0.08	0.08	0.00	0.08	-	-	-	0.15	0.01	0.16
JET	LJ40 - Learjet 40; Gates Learjet	LEAR35	0.04	0.00	0.04	0.04	0.00	0.04	-	-	-	0.08	0.00	0.08
JET	LJ45 - Bombardier Learjet 45	LEAR45	0.11	0.01	0.12	0.11	0.01	0.12	-	-	-	0.22	0.02	0.24
JET	LJ60 - Bombardier Learjet 60	LEAR60	0.36	0.02	0.38	0.37	0.02	0.38	-	-	-	0.72	0.04	0.77
JET	LJ75 - Learjet 75	LEAR45	0.16	0.01	0.17	0.16	0.01	0.17	-	-	-	0.32	0.02	0.33
JET	PRM1 - Raytheon Premier 1/390 Premier 1	R390	0.02	0.00	0.02	0.02	0.00	0.02	-	-	-	0.04	0.00	0.04
SET	P46T - Piper Malibu Meridian	CNA208	0.05	0.00	0.05	0.05	0.00	0.05	-	-	-	0.10	0.01	0.11
SET	PC12 - Pilatus PC-12	PC12	0.50	0.03	0.53	0.49	0.04	0.53	-	-	-	0.99	0.07	1.06
SET	TBM8 - Socata TBM-850	CNA208	0.02	0.00	0.02	0.02	0.00	0.02	-	-	-	0.04	0.00	0.05
MET	AC90 - Gulfstream Commander	RWCM69	0.06	0.00	0.07	0.06	0.00	0.07	-	-	-	0.12	0.01	0.13
MET	AT43 - Aérospatiale/Alenia ATR 42-200/300/320	ATR42	0.07	0.00	0.07	0.07	0.00	0.07	-	-	-	0.13	0.01	0.14
MET	B190 - Beech 1900/C-12J	1900D	0.04	0.00	0.05	0.04	0.00	0.05	-	-	-	0.09	0.01	0.09
MET	B350 - Beech Super King Air 350	BEC30B	0.36	0.02	0.38	0.34	0.04	0.38	-	-	-	0.70	0.06	0.76
MET	BE10 - Beech King Air 100 A/B	BEC100	0.04	0.00	0.04	0.04	0.00	0.04	-	-	-	0.08	0.00	0.08
MET	BE20 - Beech 200 Super King	BEC200	0.16	0.01	0.16	0.15	0.01	0.16	-	-	-	0.31	0.02	0.33

Aircraft Category	Aircraft Description	AEDT Type	Arrivals			Departures			Touch-and-Go			AAD Total		
			Day	Night	Total	Day	Night	Total	Day	Night	Total	Day	Night	Total
MET	BE30 - Raytheon 300 Super King Air	BEC300	0.07	0.00	0.07	0.06	0.01	0.07	-	-	-	0.13	0.01	0.14
MET	BE9L - Beech King Air 90	BEC90	0.09	0.01	0.09	0.09	0.00	0.09	-	-	-	0.18	0.01	0.19
MET	C130 - Lockheed 130 Hercules	C130	0.05	-	0.05	0.05	-	0.05	-	-	-	0.10	-	0.10
MET	C130 - Lockheed 130 Hercules	C130E	0.05	-	0.05	0.05	-	0.05	-	-	-	0.10	-	0.10
MET	C441 - Cessna Conquest	CNA441	0.19	0.01	0.20	0.19	0.01	0.20	-	-	-	0.38	0.02	0.40
MET	DH8B - Bombardier DHC8-200	DHC8	0.05	0.00	0.05	0.05	0.00	0.05	-	-	-	0.10	0.01	0.11
MET	DH8B - Bombardier DHC8-200	DHC830	0.05	0.00	0.05	0.05	0.00	0.05	-	-	-	0.10	0.01	0.11
MET	MU2 - Mitsubishi Marquise/Solitaire	MU2	0.02	0.00	0.02	0.02	0.00	0.02	-	-	-	0.04	0.00	0.04
MET	SW4 - Swearingen Merlin 4/4A Metro2	SAMER4	0.22	0.01	0.22	0.19	0.04	0.22	-	-	-	0.40	0.05	0.45
SEP	AA5 - American AA-5 Traveler	AA5A	0.17	0.01	0.18	0.18	0.01	0.18	0.35	-	0.35	0.69	0.02	0.71
SEP	AA5A - Grumman AA-5A Cheetah; AA-5 Tiger	AA5A	-	-	-	-	-	-	0.35	-	0.35	0.35	-	0.35
SEP	AC11 - Rockwell Commander 114	RWCM14	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	AC12 - Rockwell Commander 112A	GASEPV	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	BE23 - Beechcraft Model 23 Musketeer	BEC23	-	-	-	-	-	-	0.86	-	0.86	0.86	-	0.86
SEP	BE24 - Beechcraft Model 24 Sierra/Musketeer	BEC24	-	-	-	-	-	-	0.35	-	0.35	0.35	-	0.35
SEP	BE33 - Beech Bonanza 33	BEC33	0.98	0.07	1.04	0.99	0.05	1.04	0.52	-	0.52	2.49	0.12	2.60
SEP	BE35 - Beech Bonanza 35	BECM35	1.30	0.09	1.39	1.32	0.07	1.39	1.56	-	1.56	4.18	0.16	4.34
SEP	BE36 - Beech Bonanza 36	BECM35	2.39	0.16	2.56	2.43	0.12	2.56	1.04	-	1.04	5.86	0.29	6.15
SEP	BL17 - Bellanca Super Viking Model 17-30A	BL26	-	-	-	-	-	-	0.52	-	0.52	0.52	-	0.52
SEP	C150 - Cessna 150 Single Engine SEPF	CNA150	-	-	-	-	-	-	0.52	-	0.52	0.52	-	0.52
SEP	C152 - Cessna 152 Single Engine SEPF	CNA152	-	-	-	-	-	-	0.35	-	0.35	0.35	-	0.35
SEP	C172 - Cessna Skyhawk 172/Cutlass	CNA172	8.72	0.60	9.32	8.86	0.46	9.32	3.98	-	3.98	21.56	1.06	22.62
SEP	C177 - Cessna 177 Cardinal	CNA177	0.46	0.03	0.49	0.47	0.02	0.49	1.21	-	1.21	2.14	0.06	2.19
SEP	C180 - Cessna 180 Skywagon	CNA180	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	C182 - Cessna Skylane 182	CNA182	2.01	0.13	2.14	2.02	0.13	2.14	2.25	-	2.25	6.28	0.26	6.54
SEP	C206 - Cessna 206 Stationair	CNA206	0.11	0.01	0.12	0.12	0.01	0.12	-	-	-	0.23	0.01	0.25
SEP	C210 - Cessna 210 Centurion	CNA210	0.31	0.02	0.34	0.31	0.02	0.34	-	-	-	0.63	0.04	0.67

Aircraft Category	Aircraft Description	AEDT Type	Arrivals			Departures			Touch-and-Go			AAD Total		
			Day	Night	Total	Day	Night	Total	Day	Night	Total	Day	Night	Total
SEP	C400 - Cessna 400 Corvalis/Lancair LC41/Columbia 400	GASEPV	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	C82R - Cessna Skylane RG	CNA182	0.54	0.04	0.57	0.54	0.03	0.57	-	-	-	1.08	0.06	1.14
SEP	CH75 - Zenith STOL CH-750	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	CH7A - Aeronca Model 7 Champion	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	CLDS - Rearwin Cloudster 8090/8125/8235	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	COL3 - Lancair LC-40 Columbia 400	GASEPV	0.48	0.03	0.51	0.49	0.02	0.51	0.17	-	0.17	1.14	0.06	1.19
SEP	COL4 - Lancair LC-41 Columbia 400	GASEPV	0.76	0.05	0.82	0.78	0.04	0.82	-	-	-	1.54	0.09	1.64
SEP	COZY - AeroCad AeroCanard	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	DA40 - Diamond Star DA40	GASEPV	0.13	0.01	0.14	0.14	0.01	0.14	0.17	-	0.17	0.44	0.02	0.46
SEP	DFLY - Viking Dragonfly	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	EAGL - Christen/Aviat Eagle	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	ERCO - ErCoupe	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	G109 - Burkhart Grob G109	GASEPV	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	G115 - Burkhart Grob G115	GROB15	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	G202 - Gearhardt J Giles G202	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	G2T1 - Great Lakes Sport Trainer	GSPORT	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	GA8 - Gippsland GA-8 Airvan	CNA206	0.03	0.00	0.03	0.03	0.01	0.03	-	-	-	0.06	0.01	0.06
SEP	LC42 - Cessna 350 Corvalis/Lancair LC42	GASEPV	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	LGEZ - Rutan 61 Long-EZ	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	M020 - Mooney Mark 20 Series	M20J	-	-	-	-	-	-	0.52	-	0.52	0.52	-	0.52
SEP	M20C - Mooney Mark 20 Series	M20J	-	-	-	-	-	-	0.35	-	0.35	0.35	-	0.35
SEP	M20F - Mooney Mark 20 Series	M20J	-	-	-	-	-	-	0.35	-	0.35	0.35	-	0.35
SEP	M20J - Mooney Mark 20 Series	M20J	-	-	-	-	-	-	0.69	-	0.69	0.69	-	0.69
SEP	M20K - Mooney 252TSE (M20K)	M20K	-	-	-	-	-	-	0.35	-	0.35	0.35	-	0.35
SEP	M20P - Mooney M-20C Ranger	M20J	0.99	0.07	1.06	1.01	0.05	1.06	-	-	-	2.01	0.12	2.13
SEP	M20T - Turbo Mooney M20K	M20J	1.07	0.07	1.14	1.09	0.06	1.14	0.17	-	0.17	2.33	0.13	2.46
SEP	MOR2 - Varga 2150 Kachina	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17

Aircraft Category	Aircraft Description	AEDT Type	Arrivals			Departures			Touch-and-Go			AAD Total		
			Day	Night	Total	Day	Night	Total	Day	Night	Total	Day	Night	Total
SEP	NAVI - Ryan L-17/U-18 Navion	M20J	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	P28A - Piper Cherokee	GASEPF	0.99	0.07	1.06	1.01	0.05	1.06	-	-	-	2.01	0.12	2.13
SEP	P28A - Piper Cherokee	PA28	0.99	0.07	1.06	1.01	0.05	1.06	-	-	-	2.01	0.12	2.13
SEP	P28R - Cherokee Arrow/Turbo	PA28CA	0.48	0.03	0.51	0.49	0.02	0.51	-	-	-	0.96	0.06	1.02
SEP	P28T - Piper PA-28R-180/200/201 Cherokee Arrow I/II/III	GASEPF	-	-	-	-	-	-	1.21	-	1.21	1.21	-	1.21
SEP	P32R - Piper 32	GASEPV	0.17	0.01	0.18	0.18	0.01	0.18	0.52	-	0.52	0.87	0.02	0.89
SEP	PA11 - Cub Crafters CC-11 Carbon Cub/ Sport Cub	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	PA20 - Piper PA-20 Pacer	GASEPF	-	-	-	-	-	-	0.35	-	0.35	0.35	-	0.35
SEP	PA24 - Piper PA-24 Comanche	PA24	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	PA28 - Piper Cherokee	GASEPF	-	-	-	-	-	-	2.07	-	2.07	2.07	-	2.07
SEP	PA28 - Piper Cherokee	PA28	0.36	0.03	0.39	0.37	0.02	0.39	-	-	-	0.73	0.04	0.78
SEP	PA32 - Piper Cherokee Six	GASEPV	1.30	0.09	1.39	1.32	0.07	1.39	2.07	-	2.07	4.70	0.16	4.85
SEP	PA38 - Piper PA-38 Tomahawk	PA38	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	PA46 - Piper Malibu	PA46	0.94	0.06	1.00	0.95	0.05	1.00	-	-	-	1.89	0.11	2.00
SEP	PARC - Piper PA-28-180/181 Cherokee Archer	GASEPV	-	-	-	-	-	-	0.52	-	0.52	0.52	-	0.52
SEP	RV4 - Van's Aircraft RV-4	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	RV6 - Vans RV-6	GASEPV	-	-	-	-	-	-	0.35	-	0.35	0.35	-	0.35
SEP	RV7A - Van's Aircraft RV-7/RV-7A	GASEPV	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	RV8 - Vans RV-8	GASEPV	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	SA30 - STOLP SA-300 Starduster Too	GASEPV	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	SIRA - Tecnam P2002 Sierra	GASEPF	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	SR20 - Cirrus SR-20	GASEPV	0.17	0.01	0.18	0.18	0.01	0.18	-	-	-	0.35	0.02	0.37
SEP	SR22 - Cirrus SR 22	SR22	3.09	0.21	3.30	3.13	0.17	3.30	0.69	-	0.69	6.92	0.38	7.30
SEP	YK52 - Aerostar Yak-52/54	GASEPV	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
SEP	Z42 - Moravan Zlin Z-242	GASEPV	0.42	0.03	0.45	0.43	0.02	0.45	-	-	-	0.85	0.05	0.90
MEP	AEST - Piper Aero Star	TED600	1.11	0.08	1.19	1.13	0.06	1.19	-	-	-	2.24	0.13	2.37
MEP	BE55 - Beech Baron 55	BEC55	0.96	0.07	1.02	0.97	0.05	1.02	0.52	-	0.52	2.45	0.12	2.56

Aircraft Category	Aircraft Description	AEDT Type	Arrivals			Departures			Touch-and-Go			AAD Total		
			Day	Night	Total	Day	Night	Total	Day	Night	Total	Day	Night	Total
MEP	BE58 - Beech 58	BEC58	3.23	0.22	3.45	3.28	0.17	3.45	0.52	-	0.52	7.02	0.39	7.42
MEP	BE60 - Beech 60 Duke	BEC60	0.17	0.01	0.18	0.18	0.01	0.18	-	-	-	0.35	0.02	0.37
MEP	BE76 - Beechcraft Model 76 Duchess	BEC76	-	-	-	-	-	-	0.35	-	0.35	0.35	-	0.35
MEP	C310 - Cessna 310	CNA310	0.36	0.03	0.39	0.37	0.02	0.39	0.17	-	0.17	0.91	0.04	0.95
MEP	C335 - Cessna 335 Twin Piston MEVP	CNA335	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
MEP	C340 - Cessna 340	CNA340	0.67	0.05	0.72	0.68	0.03	0.72	0.17	-	0.17	1.52	0.08	1.60
MEP	C414 - Cessna Chancellor 414	CNA414	0.33	0.02	0.35	0.33	0.02	0.35	-	-	-	0.66	0.04	0.70
MEP	C421 - Cessna Golden Eagle 421	CNA421	1.36	0.09	1.45	1.38	0.07	1.45	0.17	-	0.17	2.91	0.16	3.08
MEP	GA7 - Grumman American Cougar	GA7	0.65	0.04	0.70	0.66	0.03	0.70	0.35	-	0.35	1.66	0.08	1.74
MEP	PA27 - Piper Aztec	BEC58P	0.15	0.01	0.16	0.16	0.01	0.16	-	-	-	0.31	0.02	0.33
MEP	PA30 - Piper PA-30	GASEPV	-	-	-	-	-	-	0.17	-	0.17	0.17	-	0.17
MEP	PA30 - Piper PA-30	PA30	0.17	0.01	0.18	0.18	0.01	0.18	-	-	-	0.35	0.02	0.37
MEP	PA31 - Piper Navajo PA-31	GASEPV	-	-	-	-	-	-	0.35	-	0.35	0.35	-	0.35
MEP	PA31 - Piper Navajo PA-31	PA31	1.26	0.09	1.35	1.28	0.07	1.35	-	-	-	2.55	0.15	2.70
MEP	PA34 - Piper PA-34 Seneca	PA34	0.42	0.03	0.45	0.43	0.02	0.45	0.52	-	0.52	1.37	0.05	1.42
MEP	PA60 - Piper PA-60/PA-61 Aerostar (Aerostar 600/700)	PA60	-	-	-	-	-	-	0.35	-	0.35	0.35	-	0.35
HEL	A139 - Agusta AB-139	SA330J	2.73	0.02	2.75	2.74	0.01	2.75	-	-	-	5.47	0.03	5.50
HEL	AS50 - Eurocopter AS350B	SA355F	2.98	0.02	3.00	2.99	0.01	3.00	-	-	-	5.97	0.03	6.00
HEL	B06 - Bell 206B-3	B206L	1.49	0.01	1.50	1.49	0.01	1.50	-	-	-	2.98	0.02	3.00
HEL	B430 - Bell 430	B430	0.03	0.00	0.03	0.03	0.00	0.03	-	-	-	0.05	0.00	0.06
HEL	EC120 - Eurocopter EC-120	SA341G	3.97	0.03	4.00	3.98	0.02	4.00	-	-	-	7.95	0.05	8.00
HEL	EC135 - Eurocopter EC-135	EC130	0.99	0.01	1.00	1.00	0.00	1.00	-	-	-	1.99	0.01	2.00
HEL	EC45 - Eurocopter EC-145	B429	0.07	-	0.07	0.07	-	0.07	-	-	-	0.15	-	0.15
HEL	H60 - Sikorsky SH-60 Seahawk	S70	0.07	-	0.07	0.07	-	0.07	-	-	-	0.14	-	0.14
HEL	R22 - Robinson R22B w/Lycoming 0320	R22	2.75	-	2.75	2.75	-	2.75	-	-	-	5.50	-	5.50
HEL	S76 - Sikorsky S-76	S76	0.02	0.00	0.02	0.02	0.00	0.02	-	-	-	0.04	0.00	0.04

Aircraft Category	Aircraft Description	AEDT Type	Arrivals			Departures			Touch-and-Go			AAD Total		
			Day	Night	Total	Day	Night	Total	Day	Night	Total	Day	Night	Total
Grand Total			***66.39***	***3.34***	***69.73***	***66.90***	***2.83***	***69.73***	***34.39***	***-***	***34.39***	***167.68***	***6.17***	***173.85***

Sources: FAA Database and HNTB Analysis 2017.

Attachment 2
FAA Non-Standard Noise Aircraft Substitution Letter

U.S. Department
of Transportation
Federal Aviation Administration

Office of Environment and Energy

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

2/22/2017

Andrew Brooks
Environmental Program Manager
Federal Aviation Administration
Eastern Regional Office
1 Aviation Plaza
Jamaica, NY 11434

Dear Andrew,

The Office of Environment and Energy (AEE) has received the memo dated January 27th referencing the 2016 Environmental Assessment for Martin State Airport (MTN) requesting approval for the user defined AEDT aircraft substitutions and a user defined touch-and-go profile for the A10 military aircraft.

Listed below are the AEE responses for the requested AEDT aircraft substitutions:

Aircraft Type	Aircraft Code	Aircraft Description	Suggested AEDT ANP Substitution	Required AEE AEDT ANP Substitution
Single Engine Piston	C400	Cessna 400 Corvalis/Lancair LC41/Columbia 400	CNA206	**GASEPV**
Single Engine Piston	CH75	Zenith STOL CH-750	GASEPV	**GASEPF**
Single Engine Piston	CH7A	Aeronca Model 7A Champion	GASEPF	Concur
Single Engine Piston	CLDS	Rearwin Cloudster 8090/8125/8235	GASEPF	Concur
Single Engine Piston	COL3	Lancair LC-40 Columbia 400	CNA206	**GASEPV**
Single Engine Piston	COL4	Lancair LC-41 Columbia 400	CNA206	**GASEPV**
Single Engine Piston	COZY	AeroCad AeroCanard	CNA172	**GASEPF**
Single Engine Piston	DA40	Diamond Star DA40	GASEPV	Concur
Single Engine Piston	DFLY	Viking Dragonfly	GASEPV	**GASEPF**
Single Engine Piston	EAGL	Christen/Aviat Eagle	GASEPF	Concur
Single Engine Piston	ERCO	ErCoupe	GASEPF	Concur
Single Engine Piston	G109	Burkhart Grob G 109	GASEPV	Concur
Single Engine Piston	G202	Gearhardt J Giles G202	GASEPF	Concur
Single Engine Piston	GA8	Gippsland GA-8 Airvan	CNA206	Concur
Single Engine Piston	LC42	Cessna 350 Corvalis/Lancair LC42	CNA206	**GASEPV**
Single Engine Piston	LGEZ	Rutan 61 Long-EZ	GASEPF	Concur
Single Engine Piston	MOR2	Varga 2150 Kachina	GASEPF	Concur
Single Engine Piston	PA11	Cub Crafters CC-11 Carbon Cub/ Sport Cub	GASEPF	Concur
Single Engine Piston	PA20	Piper PA-20 Pacer	GASEPF	Concur
Single Engine Piston	RV4	Van's Aircraft RV-4	GASEPF	Concur

Single Engine Piston	RV6	Van’s Aircraft RV-6	GASEPV	Concur
Single Engine Piston	RV7A	Van's Aircraft RV-7/RV-7A	GASEPV	Concur
Single Engine Piston	RV8	Van’s Aircraft RV-8	GASEPV	Concur
Single Engine Piston	SIRA	Tecnam P2002 Sierra	GASEPF	Concur
Single Engine Piston	YK52	Aerostar Yak-52/54	GASEPV	Concur
Single Engine Piston	Z42	Moravan Zlin Z-242	GASEPV	Concur
Jet	CL35	Bombardier Challenger 300	CL600	Concur

Additionally, AEE has reviewed the request for use of NoiseMap derived; user defined A-10A AEDT 2c touch-and go-profiles and **conditionally approves** their use for this project.

AEE supports the methodology for developing these profiles from the *2005 Base Realignment and Closure Actions Act (BRAC) Noise Exposure Mapping and Analysis Report*, however requires as per NoiseMap best practices a current concurrence from the Maryland Air National Guard or other military operator at MTN that these touch-and-go profiles are still being operated in the same manner as described in the 2005 report. If accompanied by this concurrence AEE approves the use of the NoiseMap derived A-10A touch-and-go profiles for use in AEDT 2c.

Please understand that these approvals are limited to this particular Environmental Assessment for Martin State Airport and that other non-standard AEDT inputs for additional projects at this or any other site will require separate approval.

Sincerely,

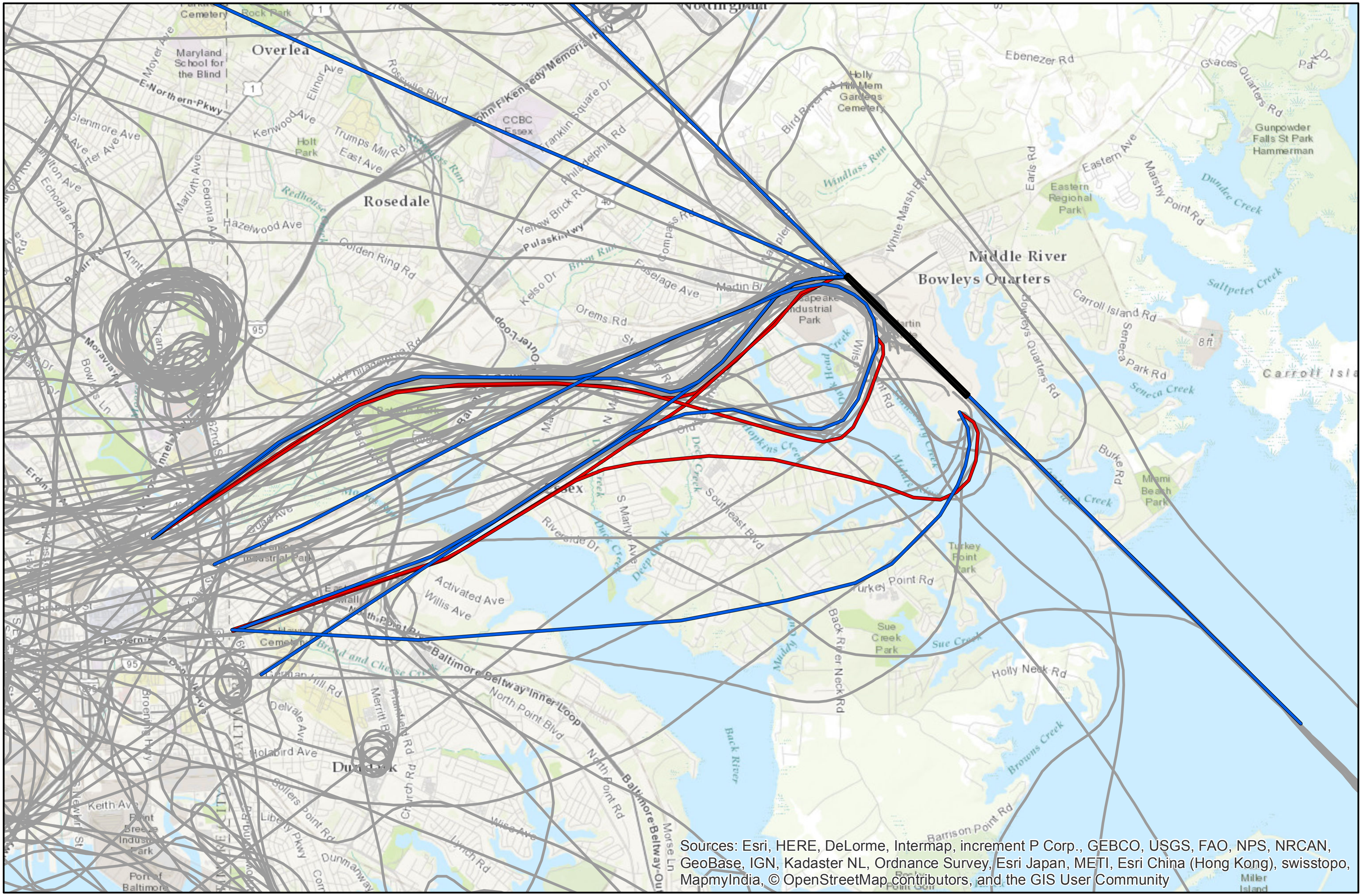
Rebecca Cointin

Rebecca Cointin
Manager
AEE-100/Noise Division

cc: Airports Contact (Jim Byers APP-400)

Attachment 3
Flight Track Development

Martin State Airport Flight Track Verification

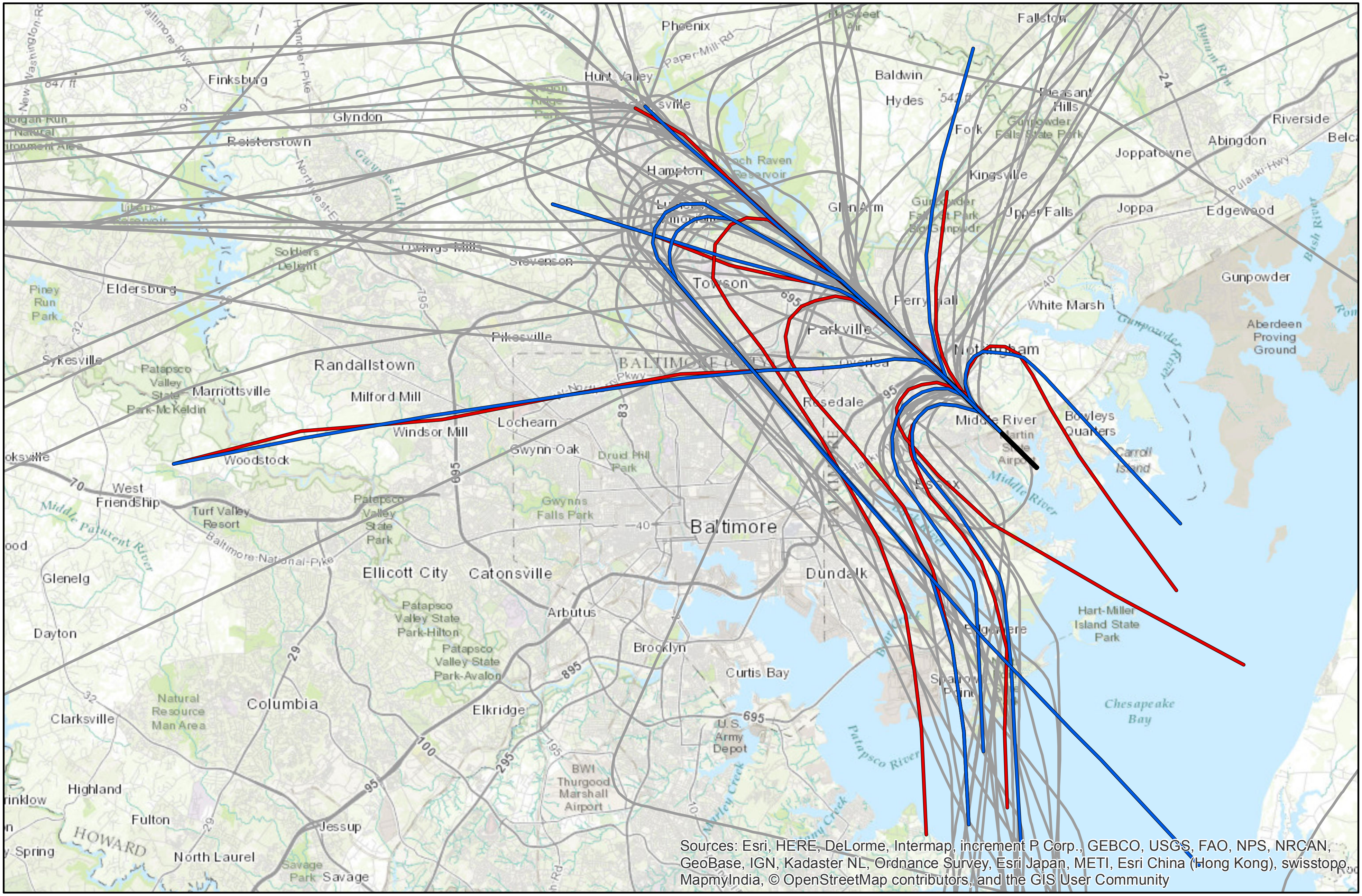


LEGEND

- Original Noise Model Flight Tracks
- Refined Noise Model Flight Tracks
- Radar Fllight Tracks
- Martin State Airport Runway

Figure 1: Comparison of MTN EA Flight Tracks and Radar Tracks Helicopter Arrivals

Martin State Airport Flight Track Verification



LEGEND

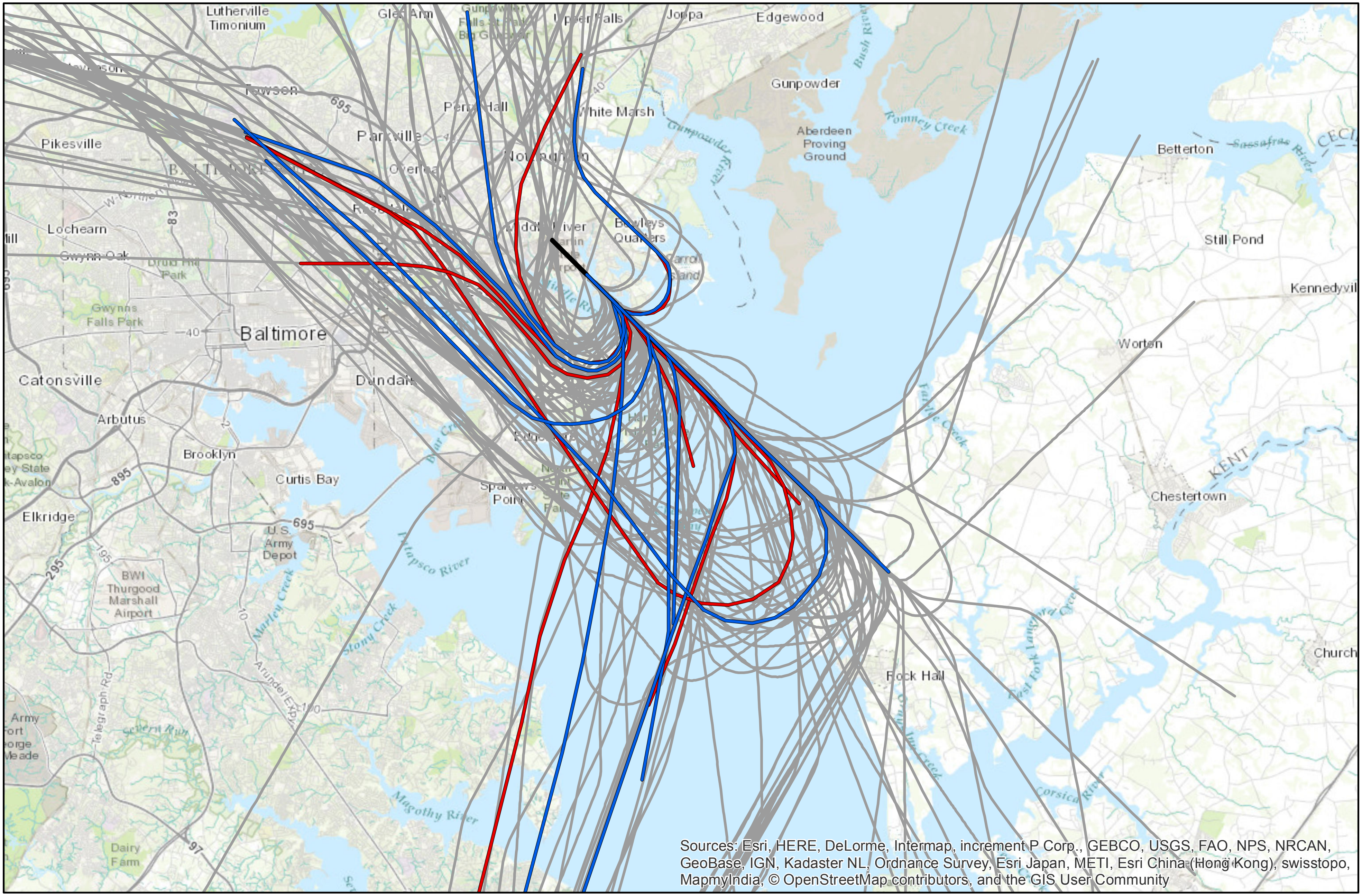
- Original Noise Model Flight Tracks
- Refined Noise Model Flight Tracks
- Radar Fllight Tracks
- Martin State Airport Runway

Figure 2: Comparison of MTN EA Flight Tracks and Radar Tracks
Runway 15 Jet Arrivals

N

0 0.75 1.5 3 Nautical Miles

Martin State Airport Flight Track Verification



LEGEND

- Original Noise Model Flight Tracks
- Refined Noise Model Flight Tracks
- Radar Fllight Tracks
- Martin State Airport Runway

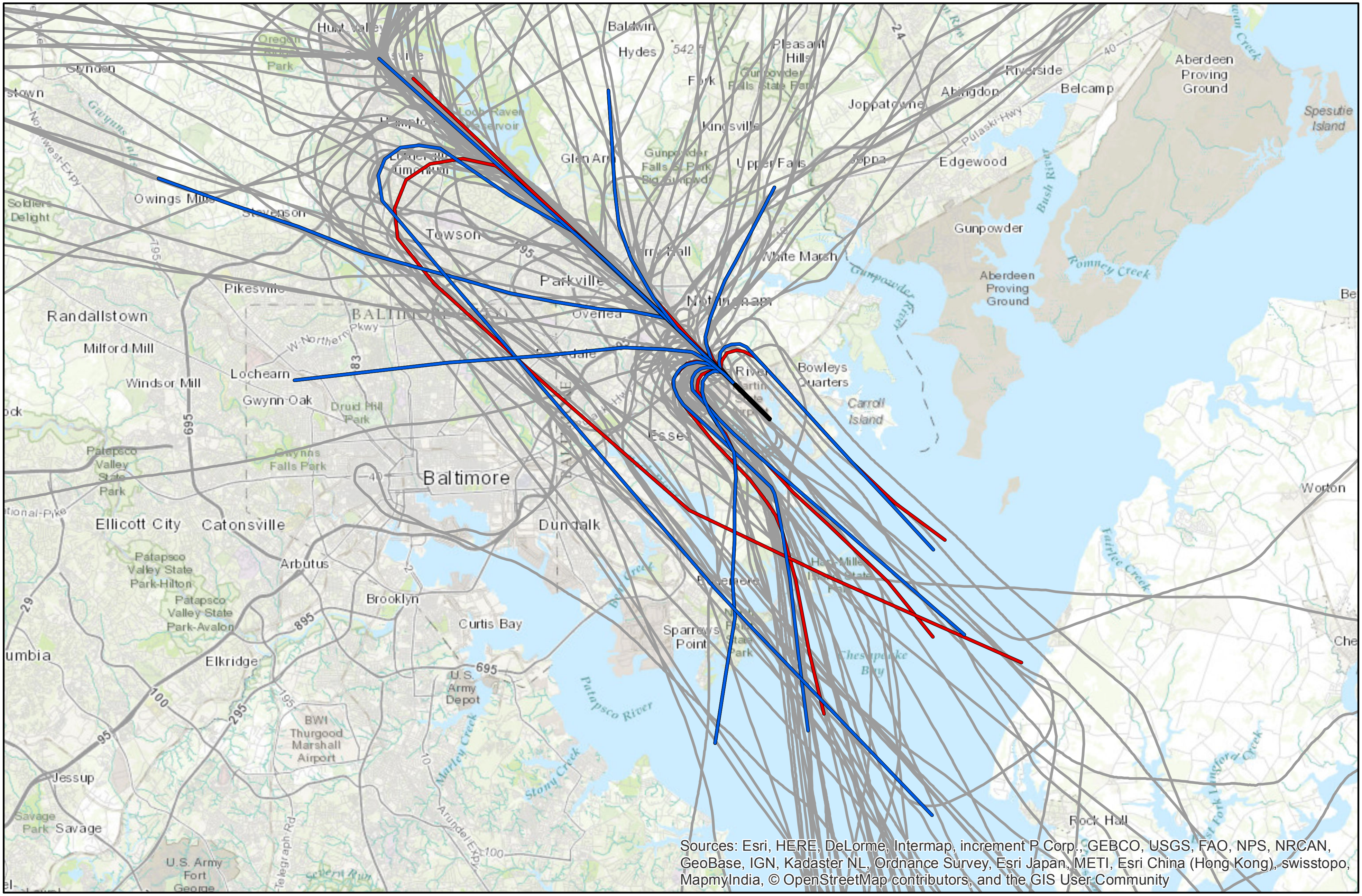
Figure 3: Comparison of MTN EA Flight Tracks and Radar Tracks
Runway 33 Jet Arrivals

N

0 0.75 1.5 3 Nautical Miles

Martin State Airport Flight Track Verification

HNTB



LEGEND

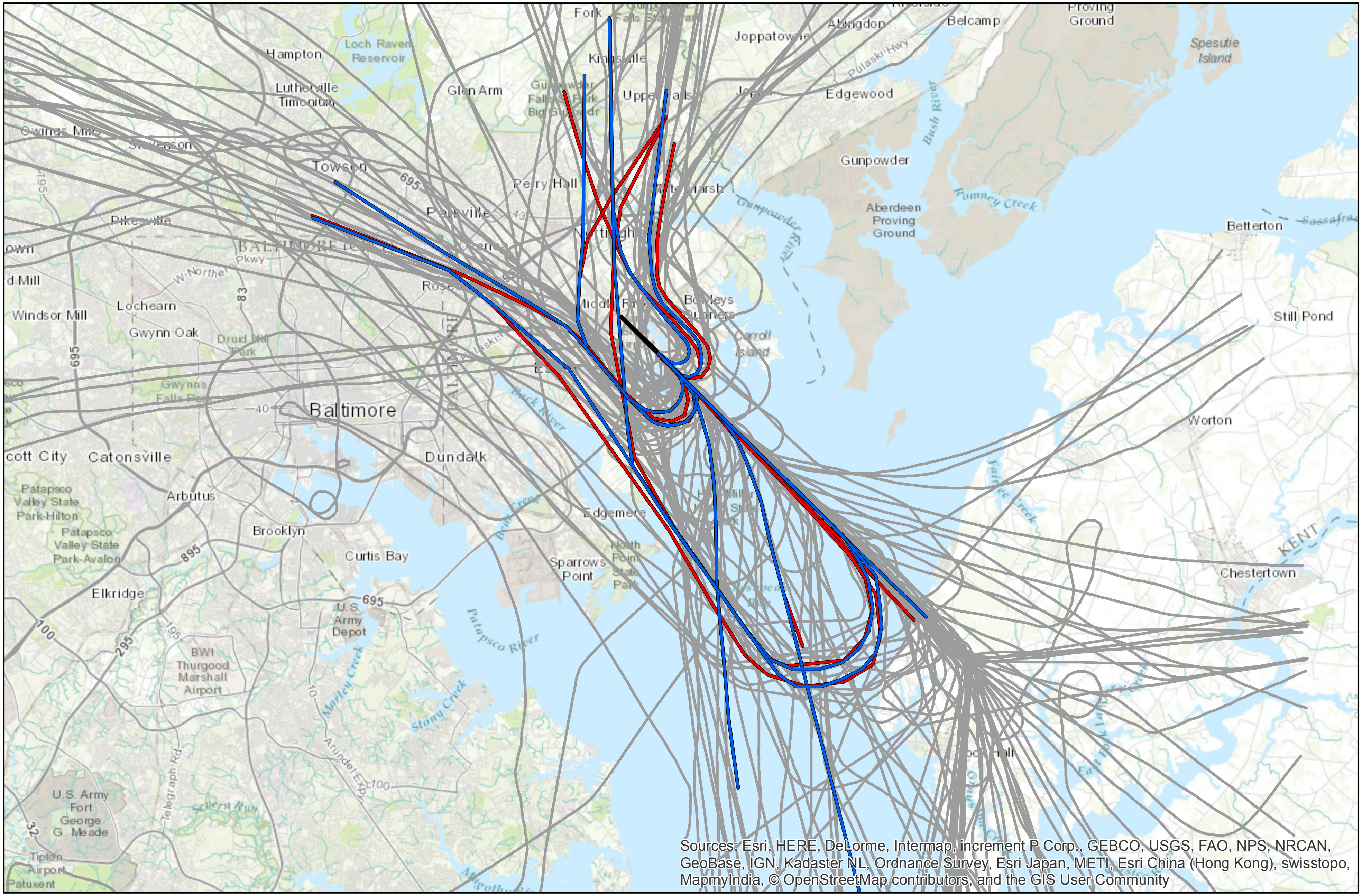
- Original Noise Model Flight Tracks
- Refined Noise Model Flight Tracks
- Radar Fllight Tracks
- Martin State Airport Runway

Figure 4: Comparison of MTN EA Flight Tracks and Radar Tracks
Runway 15 Propeller Arrivals

N

0 0.75 1.5 3 Nautical Miles

Martin State Airport Flight Track Verification



LEGEND

- Original Noise Model Flight Tracks
- Refined Noise Model Flight Tracks
- Radar Fllight Tracks
- Martin State Airport Runway

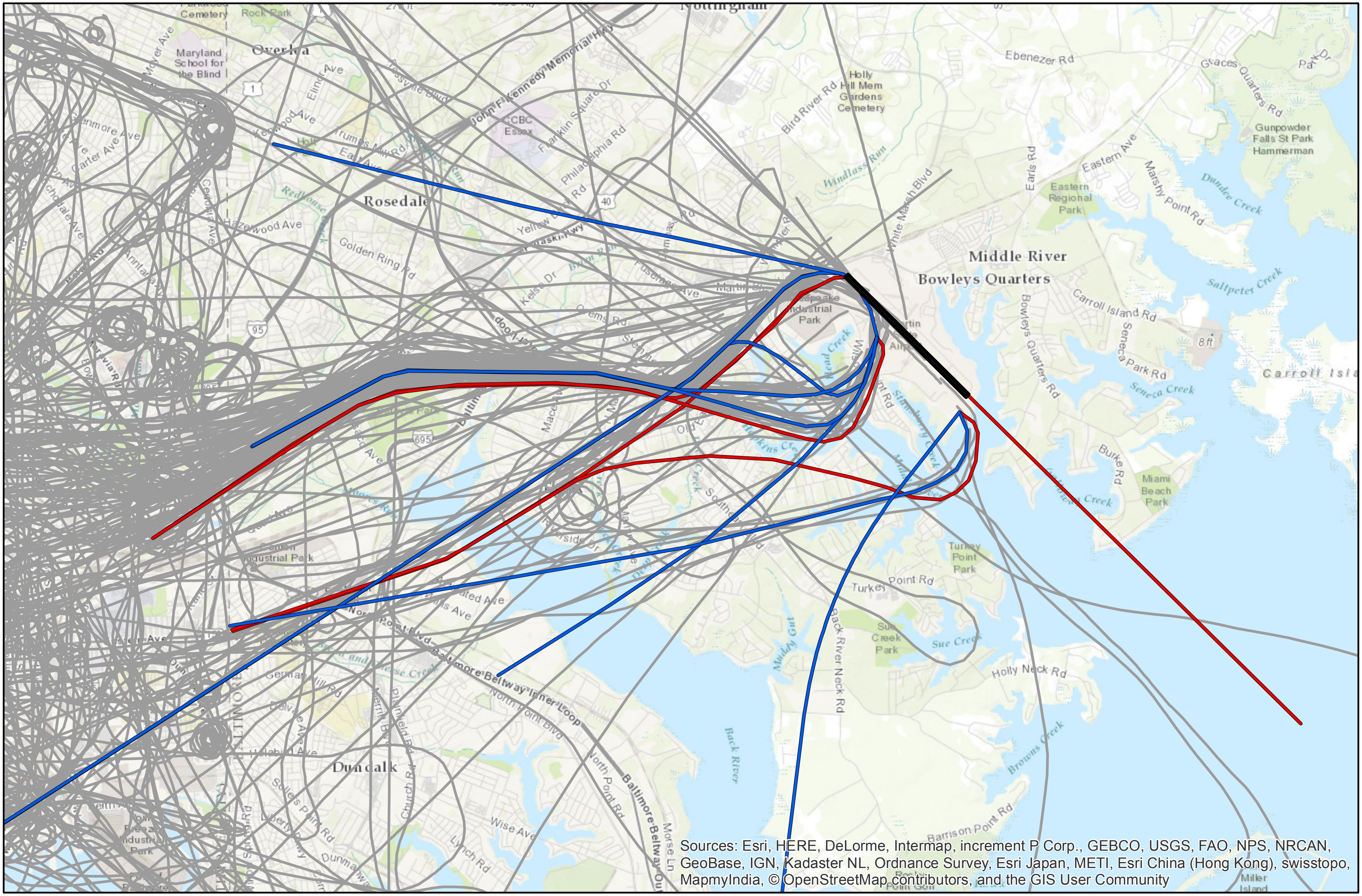
Figure 5: Comparison of MTN EA Flight Tracks and Radar Tracks
Runway 33 Propeller Arrivals

N

0 0.75 1.5 3 Nautical Miles

Martin State Airport Flight Track Verification

HNTB



LEGEND

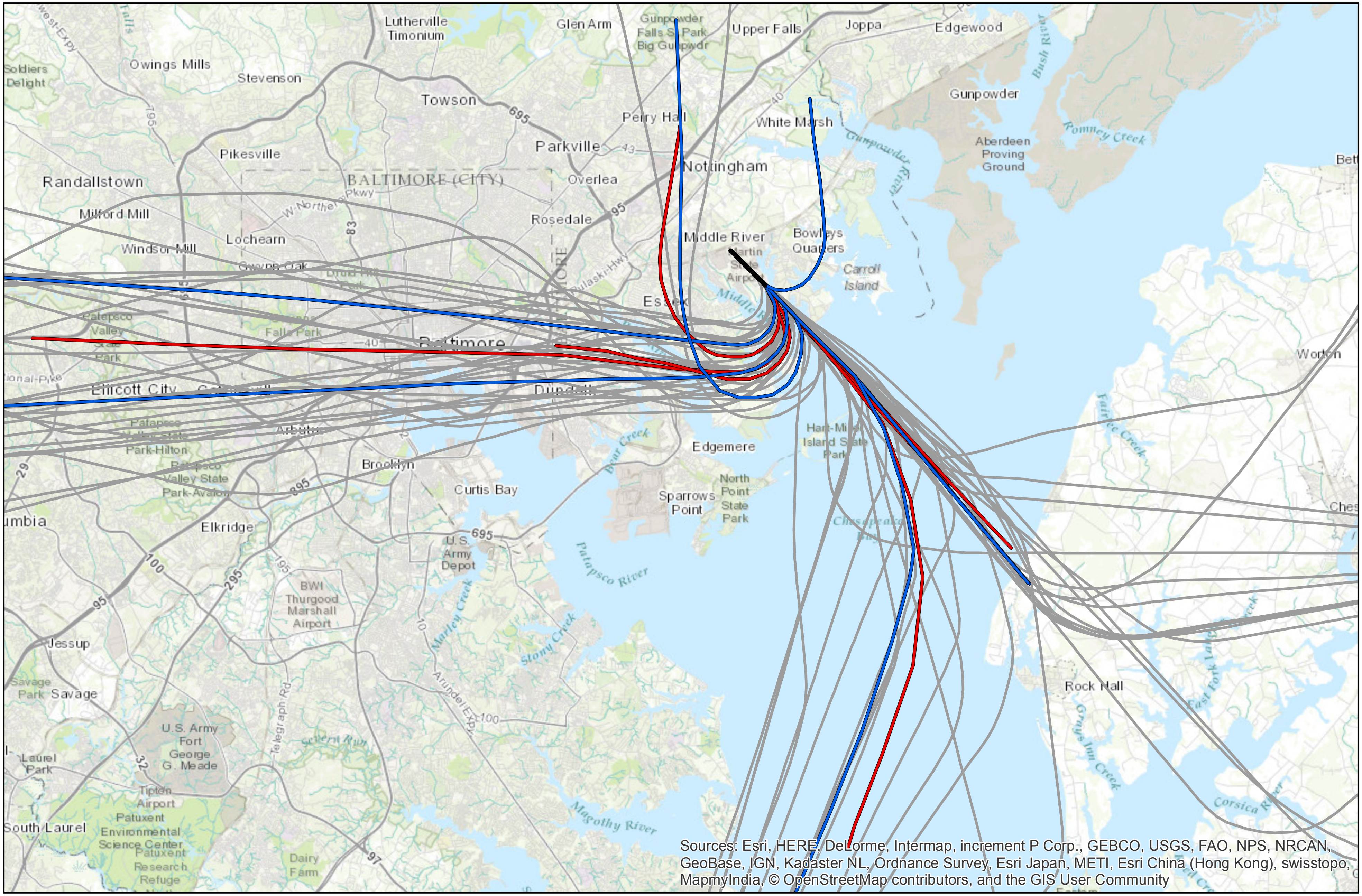
- Original Noise Model Flight Tracks
- Refined Noise Model Flight Tracks
- Radar Fllight Tracks
- Martin State Airport Runway

Figure 6: Comparison of MTN EA Flight Tracks and Radar Tracks Helicopter Departures

N

0 0.2 0.4 0.8 Nautical Miles

Martin State Airport Flight Track Verification



LEGEND

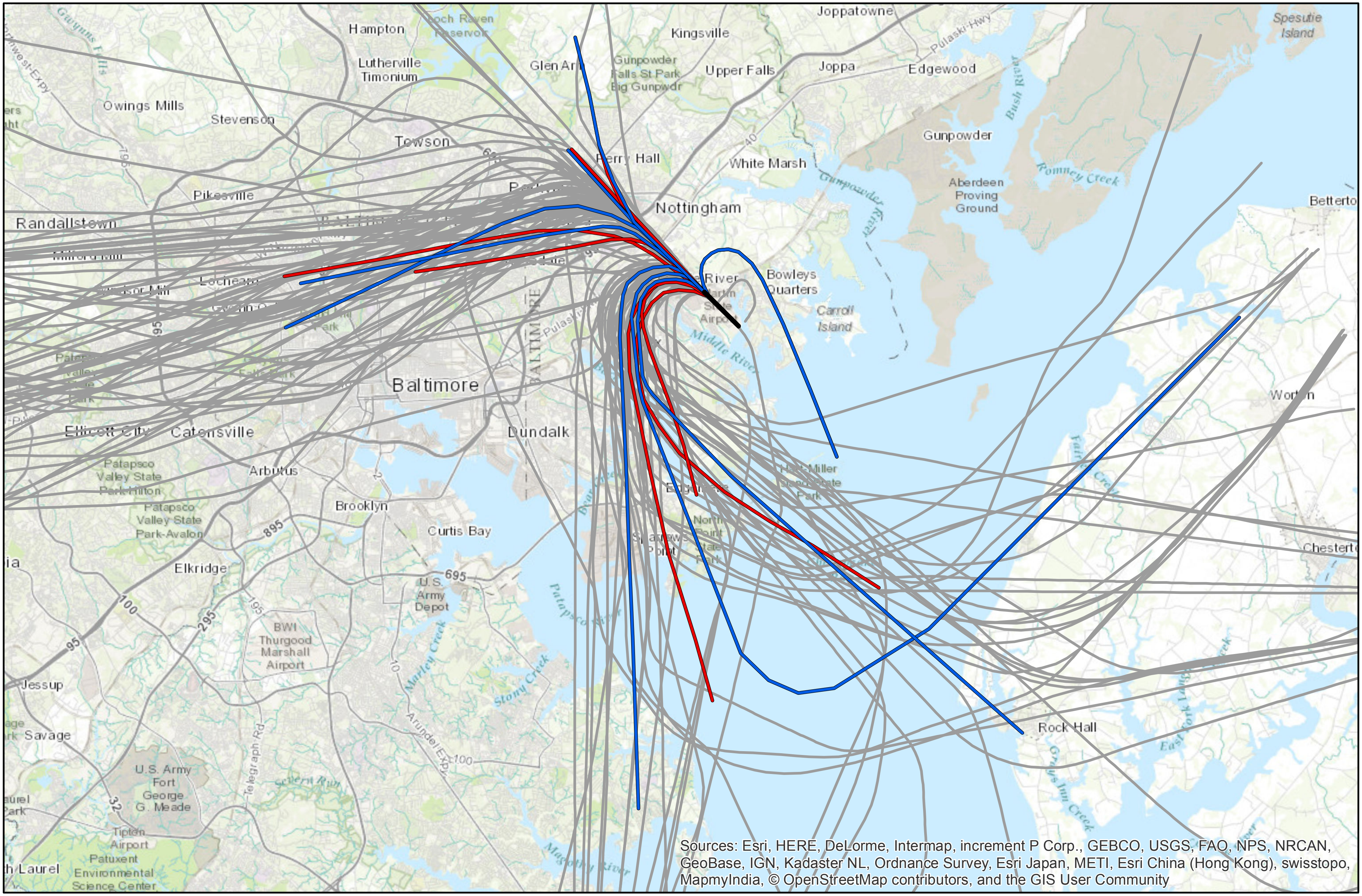
- Original Noise Model Flight Tracks
- Refined Noise Model Flight Tracks
- Radar Fllight Tracks
- Martin State Airport Runway

Figure 7: Comparison of MTN EA Flight Tracks and Radar Tracks
Runway 15 Jet Departures

N

0 0.75 1.5 3 Nautical Miles

Martin State Airport Flight Track Verification



LEGEND

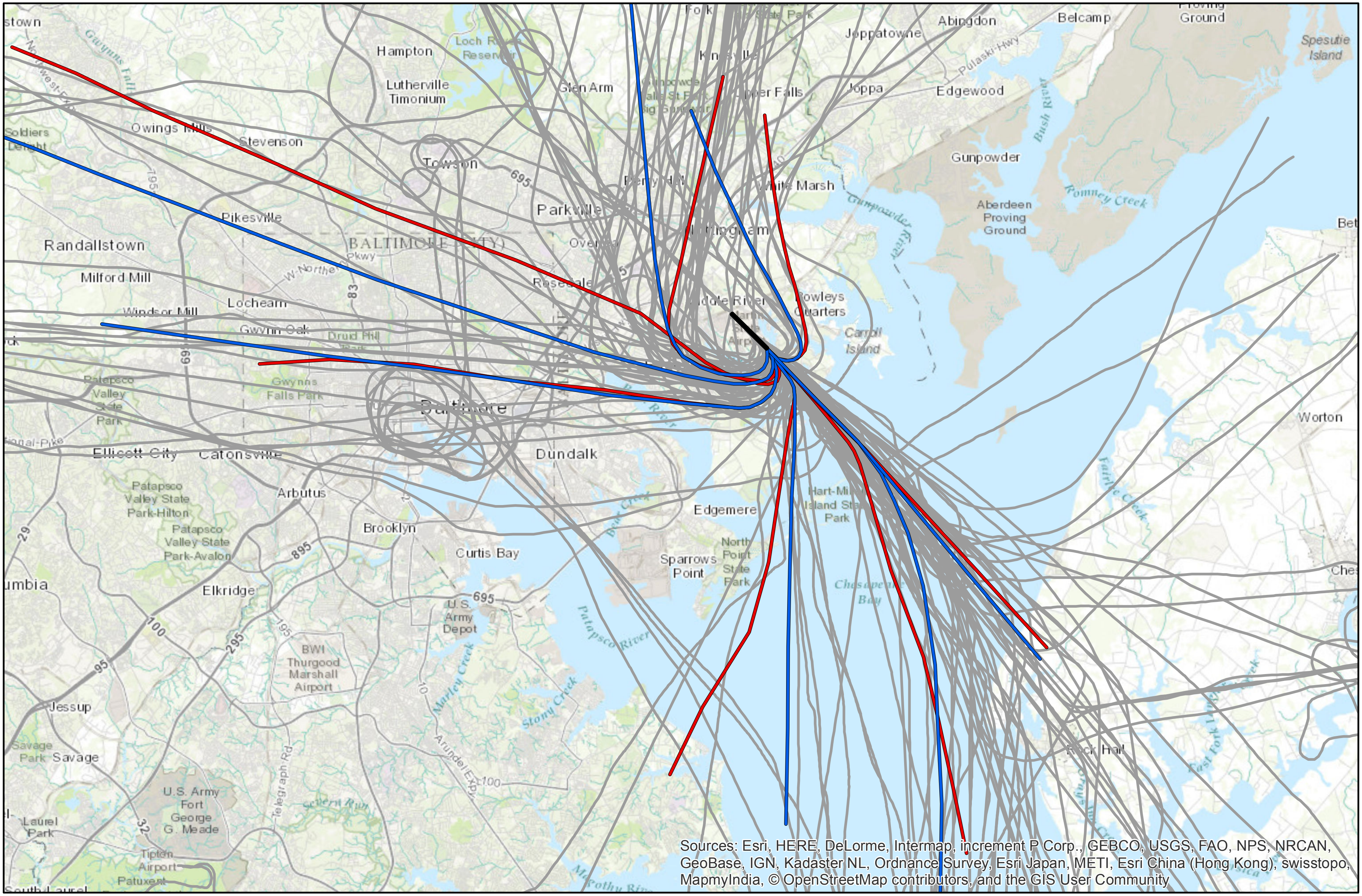
- Original Noise Model Flight Tracks
- Refined Noise Model Flight Tracks
- Radar Fllight Tracks
- Martin State Airport Runway

N

0 0.75 1.5 3 Nautical Miles

Figure 8: Comparison of MTN EA Flight Tracks and Radar Tracks Runway 33 Jet Departures

Martin State Airport Flight Track Verification



LEGEND

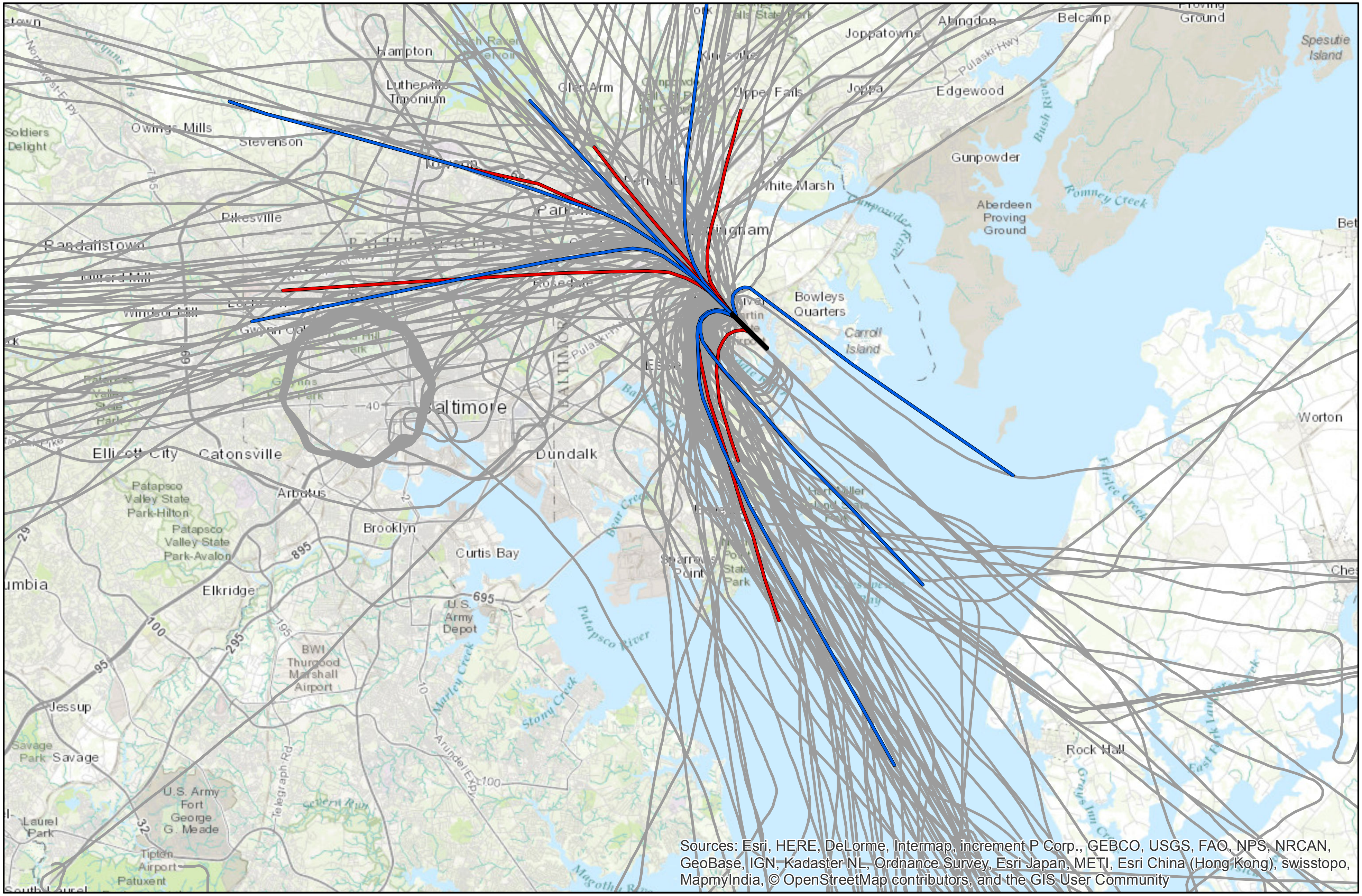
- Original Noise Model Flight Tracks
- Refined Noise Model Flight Tracks
- Radar Fllight Tracks
- Martin State Airport Runway

Figure 9: Comparison of MTN EA Flight Tracks and Radar Tracks Runway 15 Propeller Departures

N

0 0.75 1.5 3 Nautical Miles

Martin State Airport Flight Track Verification



LEGEND

- Original Noise Model Flight Tracks
- Refined Noise Model Flight Tracks
- Radar Fllight Tracks
- Martin State Airport Runway

Figure 10: Comparison of MTN EA Flight Tracks and Radar Tracks
Runway 33 Propeller Departures

N

0 0.75 1.5 3 Nautical Miles

Appendix H-3

Future Scenarios Noise Analysis Technical Report

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APPENDIX H-3:
Future Scenarios Noise Analysis

This appendix summarizes the data sources, assumptions and methodologies used to develop the Future Scenarios (2021 and 2026) noise contours for Martin State Airport (MTN). The Future Scenarios include three alternatives, which are described below:

- No Action Alternative (NA) represents MTN in its current state without any proposed project action(s). The airport remains as is and none of the improvements included in the Sponsor's Preferred Alternative are implemented.
- Minimum Action Alternative (MA) which assumes improvement would be made to ensure continued eligibility for federal funding under the Airport Improvement Program (AIP). This alternative also includes the actions required to maintain the maximum runway length determined eligible for FAA funding.
- Sponsor's Preferred Alternative/Proposed Action (PA) includes the actions identified as the Phase I Improvements on the MTN ALP, which includes both the actions needed to meet FAA standards as well as those actions needed to replace the Air Traffic Control Tower (ATCT) and accommodate anticipated general aviation demand.

Noise contours were developed for all the three alternatives (2021 and 2026). Fleet mixes were assumed to be identical among the three alternatives. The primary driver for the differences in the noise contours was determined to result from the differences in runway ends and displaced thresholds among the alternatives.

H-3.1 Martin State Airport Facilities in Future Scenarios

MTN currently has one runway and three helipads. Runway 15/33 is the primary (and only) runway currently in use at MTN. The existing runway includes an actual pavement length of 8,100 feet and is 180 feet wide. In the future scenarios, the runway ends and displaced threshold vary among the three alternatives, which primarily dictate the difference in the noise contours in the Future Scenarios.

In the NA Alternative, the runway ends and displaced threshold are identical to the Existing Condition. The Runway 15 threshold has been relocated 1,104 feet, resulting in a usable runway length of 6,996 feet for civilian aircraft. The full 8,100 feet of pavement is available to the Maryland Air National Guard (MANG) for Runway 15 departures and Runway 33 arrivals. For arriving military aircraft, a displaced landing threshold of 1,113 feet for Runway 15 is observed; the threshold is not displaced for Runway 33. In the MA Alternative, the Runway 15 end would be relocated approximately 291 feet from the existing runway end with a displaced threshold of 225 feet. The Runway 33 end would be relocated approximately 480 feet from the existing runway end with a displaced threshold of 290 feet. In the PA Alternative, the Runway 15 end would be relocated approximately 291 feet from the existing runway end with a displaced threshold of 225 feet. The Runway 33 end would be relocated approximately 380 feet from the existing runway end with a displaced threshold of 390 feet. **Table 1** describes the actions needed in each scenario related to relocating runway ends and displacing thresholds. In the NA Alternative, military aircraft can utilize the full 8,100 feet of runway while civilian aircraft can utilize 6,996 feet of runway. To model the differences in the available runway length, the full 8,100 feet of runway is designated as Runway 15M/33M while the reduced 6,996 feet of runway is designated as Runway 15/33.

In the NA and MA Alternatives, the three existing helipads (HCPD, HBPD, and HSPD) are not expected to change location. However, based on the June 2020 Airport Layout Plan (ALP) and information provided by the Airport, the helipad locations are expected to change in the PA Alternative:

- The paved circular helipad (existing HCPD) would be relocated from the Central Terminal Area to the Strawberry Point Complex (new HSPD), and the existing HCPD helipad would be eliminated. The new HSPD helipad would be located southeast of the existing HSPD helipad utilized by the Maryland State Police at the Strawberry Point Complex. The existing HSPD helipad would be replaced by the new HSPD helipad. The new HSPD helipad is expected to accommodate the Maryland State Police and other transient helicopter operations.
- The Baltimore City Police would relocate from operating at the existing HBPD helipad near the Runway 15 end to operating at the new HBPD helipad in front of the proposed corporate hanger southwest of the proposed Taxiway A.
- Helicopter training operations of the flight training school would relocate from operating at the existing HCPD helipad at the Central Terminal Area to operating circuit training flights at the new HPC helipad on Taxiway T to the southeast of the A10-A Trim Pad.
- Military operations would relocate from operating at the existing HBPD helipad to operating at the new HML helipad to the northwest of the Runway 15 end.

Table 2 shows the runway end and helipad coordinates of the three alternatives. **Figure 1** shows the locations of the future runway ends and helipad locations.

In the Future Scenarios, run-ups occur on the A-10A ramp, and at an A-10A test cell and trim pad located near the midway point of the runway, consistent with the Existing Condition.

Table 1: Actions Needed in NA, MA, and PA Alternatives

Alternative	Runway 15 End		Runway 33 End	
	Runway End	Displaced Threshold	Runway End	Displaced Threshold
No Action	No change	No change	No change	No change
Minimum Action	Relocate 291 feet	225 feet	Relocate 480 feet	290 feet
Sponsor's Preferred	Relocate 291 feet	225 feet	Relocate 380 feet	390 feet

Sources: ADCI and HNTB Proposed Changes to ALP, 2020.

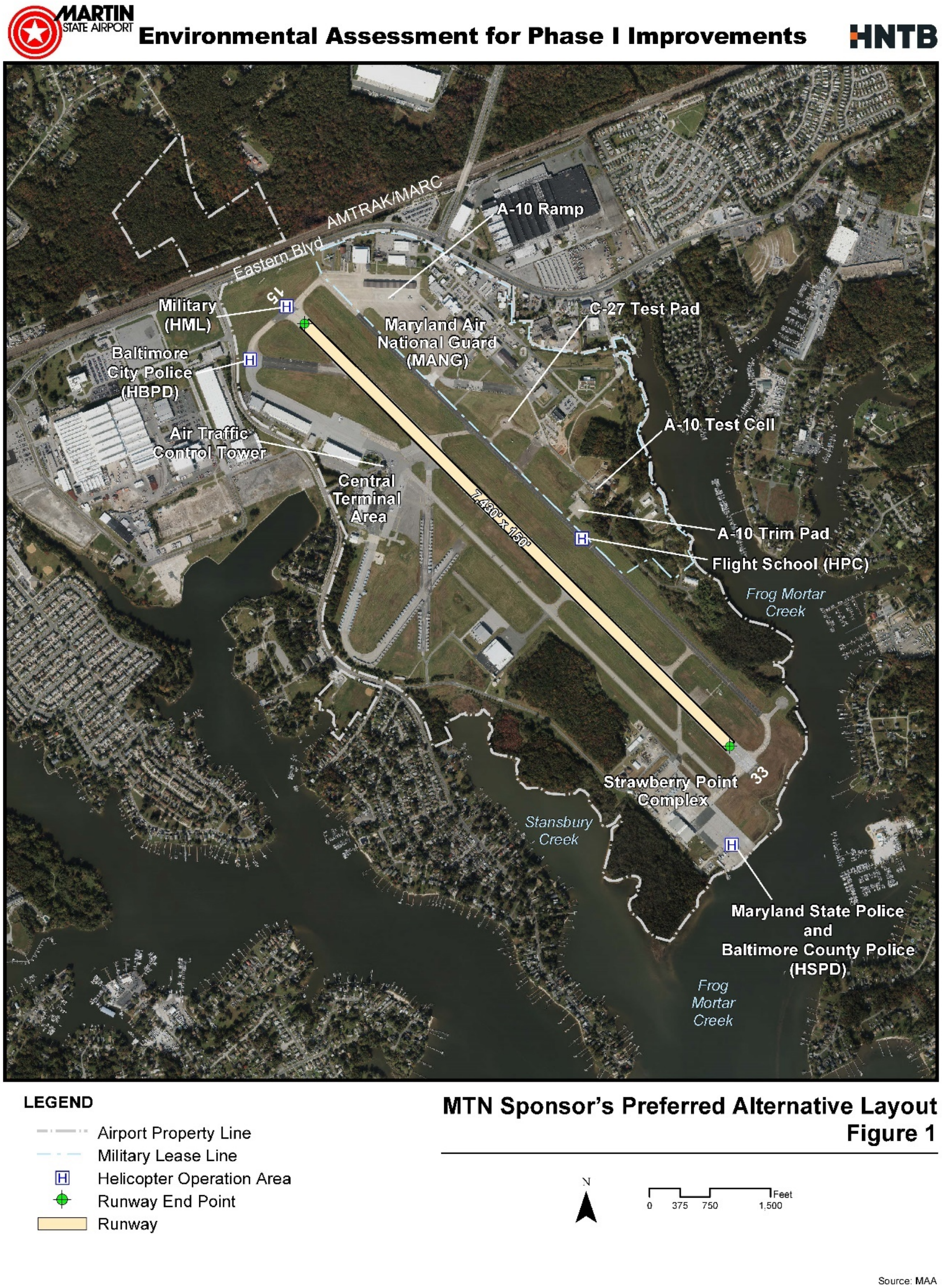
Table 2: Runway End and Helipad Coordinates of NA, MA, and PA Alternatives

Alternative	Runway / Helipad	Latitude	Longitude	Landing Displaced Threshold (ft)	Elevation (ft)
No Action	15	39.332447	-76.422450		22.3
	33	39.318828	-76.405008		9.2
	15M	39.334643	-76.425272	1,113	23.5
	33M	39.318828	-76.405008		9.2
	HBPD	39.332473	-76.422484		21.0
	HCPD	39.326586	-76.420273		21.0
	HSPD	39.316714	-76.406410		21.0
Minimum Action	15/15M	39.334050	-76.424500	225	22.8
	33/33M	39.319780	-76.406240	290	9.5
	HBPD	39.332473	-76.422484		21.0
	HCPD	39.326586	-76.420273		21.0
	HSPD	39.316714	-76.406410		21.0
Sponsor's Preferred	15/15M	39.334050	-76.424500	225	22.8
	33/33M	39.319583	-76.405986	390	9.5
	HBPD	39.332839	-76.426898		21.0
	HSPD	39.31624	-76.405931		21.0
	HPC	39.326683	-76.412404		21.0
	HML	39.334642	-76.425272		23.5

15/33: Runway 15/33 for Civilian Use; 15M/33M: Runway 15/33 for Military Use.

Sources: ADCI and HNTB ALP charts and HNTB analysis, 2020.

Figure 1: MTN Sponsor's Preferred Alternative Layout



H-3.2 Future Scenarios Noise Model Inputs

The Future Scenarios fleet mixes were approved by the FAA[1]. Physical changes to runway ends, displaced thresholds and helipad locations are discussed in the previous section. The Future Scenarios noise contours in 2021 and 2026 were modeled using AEDT version 2c. This section describes the assumptions, methodologies, and other model inputs applied in the noise modeling.

H-3.2.1 Fleet Mixes

The Future Scenarios modeled 77,845 annual operations in 2021 and 79,735 in 2026, which are equivalent to 179.6 and 189.8 operations on an Average Annual Day (AAD) in the noise model. The day/night split and stage lengths of the Future Scenarios were assumed to be consistent with the Existing Condition by aircraft type. **Table 3** shows the total annual operations in the Existing Condition and Future Scenarios. Detailed fleet mixes are shown in **Attachment 1**.

Table 3: Existing Condition and Future Scenarios Annual Operations

Scenarios	Itinerant				Local		Total
	Air Carrier	Air Taxi	General Aviation	Military	Civil	Military	
Existing (2016)	-	1,605	36,667	2,573	34,157	1,006	76,009
Future (2021)	-	1,605	37,222	2,573	35,439	1,006	77,845
Future (2026)	-	1,605	37,784	2,573	36,767	1,006	79,735

Source: FAA 2015 TAF and HNTB analysis, 2016.

In the Future Scenarios, the fleet composition by aircraft category also changed, based on the FAA's projection on the future flight hours by aircraft category (jet, piston, turboprop, and helicopter) and proprietary GA aircraft production model. In general, the percentage of piston operations was projected to decrease while the helicopter and jet operations were projected to increase.

Figure 2 shows the base year fleet composition and the number of operations by each category. In 2016, single engine piston aircraft accounted for approximately 58.2% of the total operations. Multi-Engine piston aircraft accounted for 14.8% of the total operations. In total, piston aircraft represented approximately 73.0% of the total operations. Helicopter operations comprised around 14.6% of the total operations. Operations by jet aircraft constituted 10.3% of the total, followed by multi-engine and single-engine turboprops at 2.1% of the total operations.

Figure 2: Existing Condition Fleet Mix by Aircraft Category

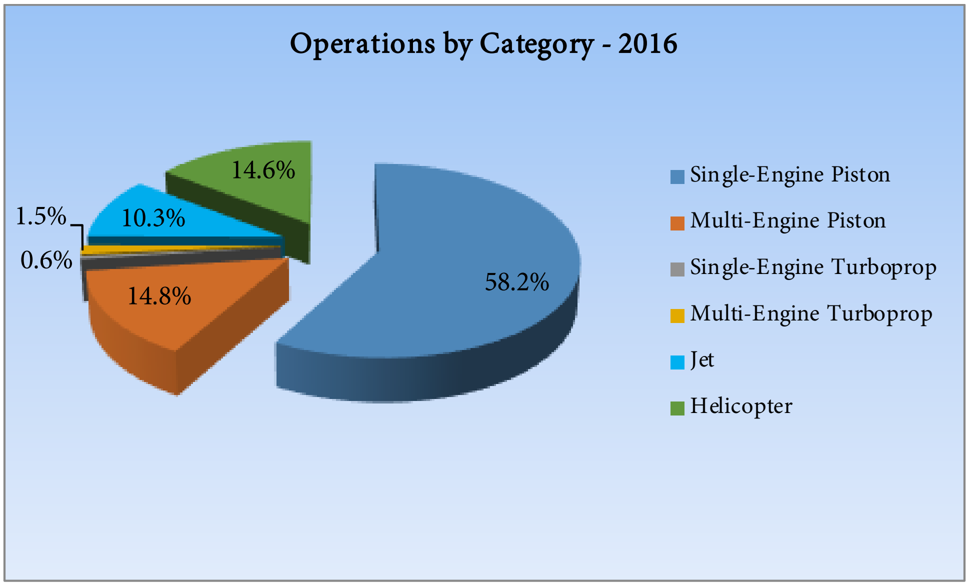


Figure 3 shows the 2021 forecast fleet composition by category. It is projected that in 2021 the share of piston aircraft operations will be reduced to 70.3%, with single-engine piston aircraft operations decreased slightly to 56.9% and multi-engine piston aircraft operations decreased to 13.4%. Helicopter operations are expected to increase to 16.8%. Jet operations are projected to increase to 10.9%. The remainder of the fleet, including single-engine and multi-engine turboprops, is projected to account for 2.0% of the total operations.

Figure 3: 2021 Fleet Mix by Aircraft Category

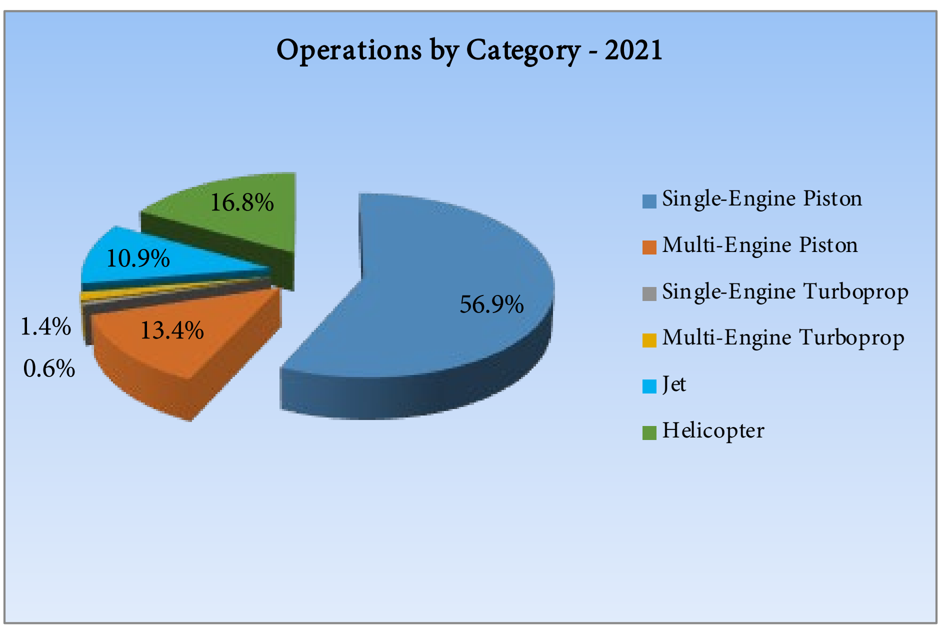
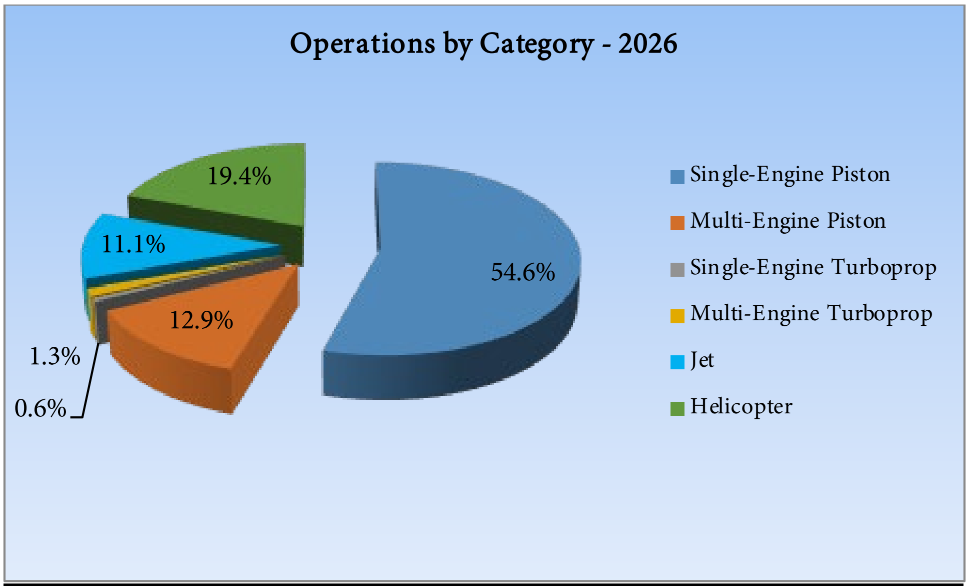


Figure 4 shows the 2026 fleet composition and operation projection. It is projected that in 2026 the share of piston aircraft operations will be further reduced to 67.5%, with single-engine piston aircraft operations decreased to 54.6% and multi-engine piston aircraft operations slightly decreasing to 12.9%. Helicopter operations are expected to continue to increase to 19.4%. Jet operations are projected to increase to 11.1%. Operations by single-engine and multi-engine turboprops are projected to account for 1.9% of the total operations.

Figure 4: 2026 Fleet Mix by Aircraft Category



H-3.2.2 Stage Length

Departure stage lengths for Future Scenarios were assumed to be consistent with the Existing Conditions by aircraft type. It was assumed that the same aircraft would have the same stage lengths as in the Existing Conditions. **Table 4** shows the distribution of departure stage length in 2021 and 2026. Most of the operations have a stage length of 1 (less than 500 nautical miles), which is typical for GA operations.

Table 4: Distribution of Stage Length

Stage Length	2021	2026
1	100.0%	100.0%
2	<0.1%	<0.1%

Source: FAA and HNTB analysis, 2016.

H-3.2.3 Day and Night Operations

The day and night split by aircraft type was also assumed to be consistent with the Existing Conditions. It was assumed that the same aircraft type would fly the same percentage of time during the daytime hours and nighttime hours as the Existing Conditions. Changes in the future fleet mixes would change the overall distribution of day and night operations as different aircraft were projected to grow at different rates. The Future Scenarios analysis indicates that approximately 97% of all operations would occur during the daytime and approximately 3% of all operations would occur during the night time. **Table 5** shows the projected distribution of daytime and night time operations in 2021 and 2026.

Table 5: Day and Night Operations

Year	Day	Night
2021	96.5%	3.5%
2026	96.7%	3.3%

Source: FAA and HNTB analysis, 2016.

H-3.2.4 Meteorological Conditions

For the Future Scenarios, default weather parameters in **Table 6** were applied based on the AEDT default weather parameters at MTN, as indicated in the FAA NEPA guidance[2]

Table 6: AEDT Weather Parameters

Parameters	Existing Condition
Temperature (ºF)	55.0
Dew Point (ºF)	45.8
Pressure (millibar)	1,017.8
Humidity (%)	66.8
Wind (knots)	5.9

Sources: AEDT 2c, 2017.

H-3.2.5 Terrain

Terrain data was obtained from the National Land Cover Database (NLCD) developed by the U.S. Department of the Interior[3].

H-3.2.6 Runway, Helipad, and Track Utilization

It was assumed that the runway and track utilization of the Future Scenarios to be the same as the Existing Condition by aircraft types for fixed-wing aircraft (Table 4 and Table 6 in Appendix H-2). For helicopter operations, it was assumed that the helipad and track utilization of the NA and MA Alternatives would be the same as the Existing Condition. For the PA Alternative, helipad utilization, track geometry, and track utilization were provided by the Airport. **Table 7** shows the helipad utilization for the PA Alternative. **Table 8** and **Table 9** show the helipad utilization and helicopter track utilization for the PA Alternative, respectively.

Table 7: Helipad Utilization for the PA Alternative

Helipad	User
HSPD	Maryland State Police
	Baltimore County Police
	News Agency
	Emergency Medical Response
	Other Transient Helicopters
HBPD	Baltimore City Police
HPC	Flight School
HML	Military

Source: MTN Airport, 2020.

Table 8: Sponsor's Preferred Alternative Helipad Use

User Group Description	Helipad	Operation Type	Sponsor's Preferred Alternative		
			Day	Night	Total
Baltimore City Police	HBPD	Arrival	27.1%	31.5%	27.1%
Baltimore County Police	HSPD		20.3%	23.6%	20.3%
Maryland State Police	HSPD		18.6%	21.6%	18.6%
Civilian	HPC		16.0%	0.0%	15.9%
	HSPD		17.6%	23.3%	17.7%
Military	HML		0.4%	0.0%	0.4%
Baltimore City Police	HBPD	Departure	27.1%	31.5%	27.1%
Baltimore County Police	HSPD		20.3%	23.6%	20.3%
Maryland State Police	HSPD		18.6%	21.6%	18.6%
Civilian	HPC		16.0%	0.0%	15.9%
	HSPD		17.6%	23.3%	17.7%
Military	HML		0.4%	0.0%	0.4%

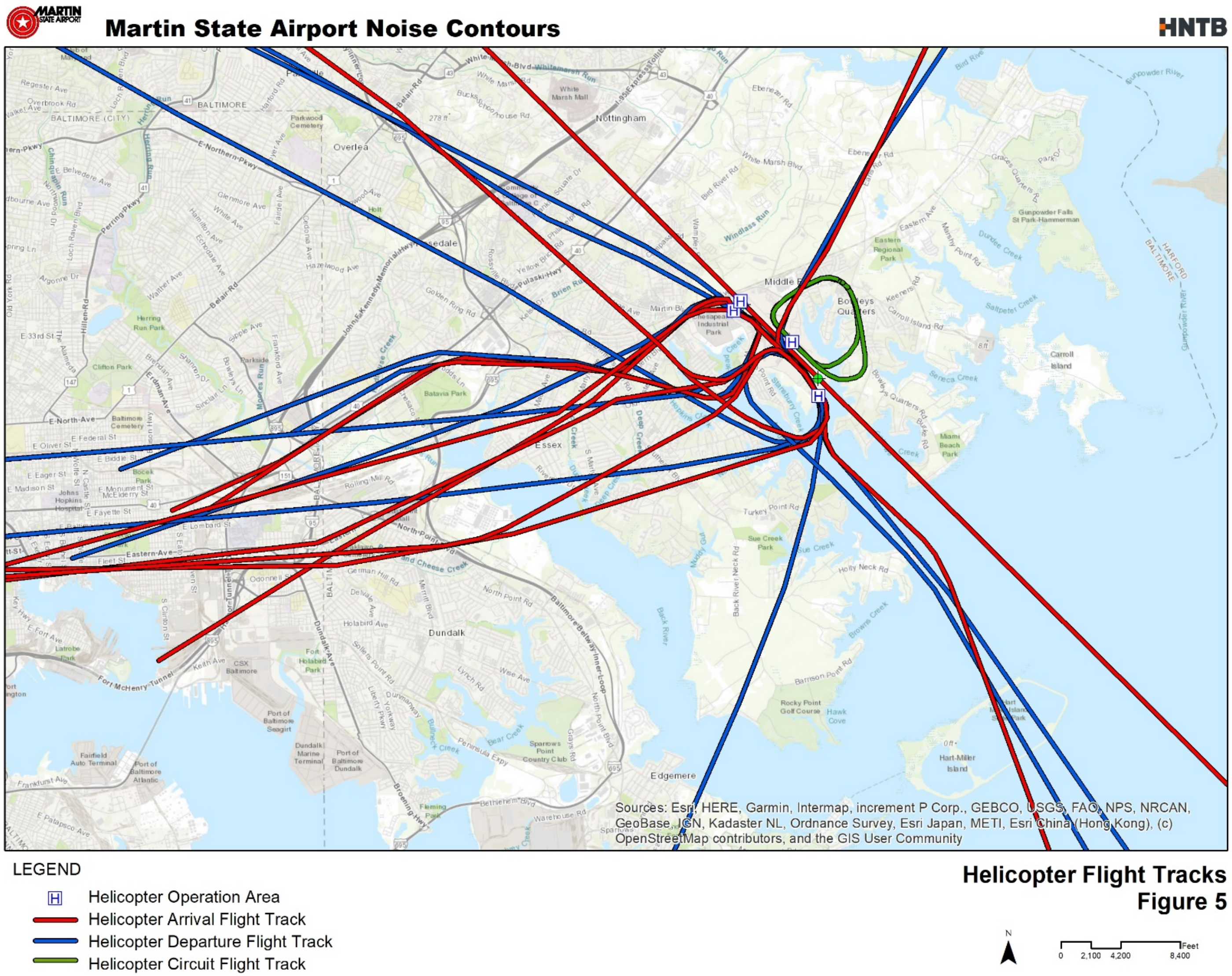
Sources: MAA and HNTB Analysis, 2020.

Table 9: Helicopter Track Utilization for the PA Alternative

User Group	Operation Type	Helipad	Track ID	Utilization
Civilian	Arrival	HBPD	AHHBP01	58.5%
			AHHBP02	18.8%
			AHHBP03	11.9%
			AHHBP04	10.8%
		HSPD	AHHSP01	19.5%
			AHHSP02	11.3%
			AHHSP03	33.6%
			AHHSP04	19.2%
			AHHSP05	7.6%
			AHHCP01	4.4%
			AHHCP02	4.4%
	Departure	HBPD	DHHBP01	3.4%
			DHHBP02	9.7%
			DHHBP03	50.3%
			DHHBP04	36.6%
		HSPD	DHHSP01	27.4%
			DHHSP02	9.0%
			DHHSP03	8.4%
			DHHSP04	8.1%
			DHHSP05	22.3%
			DHHSP06	11.0%
			DHHSP07	7.1%
			DHHSP08	6.7%
	Circuit	HPC	CHHPC01A	25.0%
			CHHPC02A	25.0%
			CHHPC03A	25.0%
			CHHPC04A	25.0%
Military	Arrival	HML	AHML150	44.4%
			AHML330	55.6%
	Departure	HML	DHML150	44.4%
			DHML330	55.6%

Source: MTN Airport, 2020.

Figure 5: Helicopter Tracks in the Sponsor's Preferred Alternative



H-3.2.7 Noise Contours and Comparison

Noise contours of NA, MA, and PA alternatives were modeled using AEDT 2c in terms of Day-Night Average Sound Level (DNL). **Figure 4**, **Figure 5**, and **Figure 6** show the DNL 65 dB and 70 dB noise contour comparisons between the Existing Condition and NA, MA, and PA Alternatives. **Table 10** shows the areas at or above DNL 65 dB for the Existing Condition and Future Scenarios. Due to the relocated runway ends and thresholds, the MA and PA noise contours would shift towards northwest and extend further beyond the AMTRAK/MARC train line compared with the NA noise contours. The new areas at or above DNL 65 dB are expected to be comprised of wooded area along the centerline extension of the Runway 15/33. The MA and PA noise contours to the southeast of the airport are expected to recede slightly as a result of runway end and threshold relocations. As a result of the helipad relocations, the areas at or above DNL 65 dB in the PA are expected to expand into Frog Mortar Creek. The DNL 65 dB areas at the proposed coporate hanger are expected to increase because of the Baltimore City Police helicopter operations (HBPD). The DNL 65 dB areas near the existing HCPD helipad are expected to decrease as it would be demolished and relocated in the PA Alternative.

Compared with the Existing Condition, the NA Alternative would increase the areas at or above DNL 65 dB by approximately 1.6% in 2021 and by 2.4% in 2026. The MA and PA Alternatives would introduce slightly lower impacts in terms of areas within DNL 65 dB. In 2021, the MA Alternative would increase the areas at or above DNL 65 dB by approximately 0.6% while the PA Alternative by 0.2%. In 2026, the MA Alternative would increase the area at or above DNL 65 dB by approximately 1.6% while the PA Alternative by 1.6%.

Compared with the NA Alternative, the area at or above DNL 65 dB in the MA Alternative would be 1.0% smaller in 2021 and 0.8% smaller in 2026. Similarly, the area at or above DNL 65 dB in the PA Alternative would be 1.4% smaller in 2021 and 0.8% smaller in 2026 compared with the NA Alternative.

Table 10: Noise Contours Comparison

Alternatives	65+ DNL (acres)	% Change	
		Compared with Existing	Compare with No Action
2016 Existing Condition	353.2	-	-
2021 No Action	358.9	1.6%	-
2026 No Action	361.6	2.4%	-
2021 Minimum Action	355.2	0.6%	-1.0%
2026 Minimum Action	358.8	1.6%	-0.8%
2021 Sponsor's Preferred	353.8	0.2%	-1.4%
2026 Sponsor's Preferred	358.8	1.6%	-0.8%

Sources: HNTB Analysis 2020.

H-3.3 Noise and Compatible Land Use

The FAA Order 1050.1F defines the noise sensitive area as "An area where noise interferes with normal activities associated with its use. Normally, noise sensitive areas include residential, educational, health, and religious structures and sites, and parks, recreational areas, areas with wilderness characteristics, wildlife and waterfowl refuges, and cultural and historical sites[4]. " **Tables 11** through **16** summarize land use type and noise sensitive areas within the 2021 and 2026 noise contours for the NA, MA, and PA alternatives. The analysis shows the majority of the areas at or above DNL 65 dB fall within the airport property, while the rest of the land use categories at or above DNL 65 dB include exempt, exempt commercial, industrial, transportation, and water. It also shows none of the area at or above DNL 65 dB would be defined as the noise sensitive area.

The FAA Order 1050.1E defines the threshold of significance for noise impacts as follows: "A significant noise impact would occur if analysis shows that the proposed action will cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same timeframe[5]." Since none of the area at or above DNL 65 dB would be defined as the noise sensitive area, this study concludes that no significant noise impacts would be introduced by any of the Future Scenarios alternatives.

Table 11: 2021 Land Use – No Action

Land Use	DNL 65 dB (Acres)	DNL 70 dB (Acres)	DNL 75+ dB (Acres)	Total Acres (DNL 65 dB+)
Airport Property	175.5	105.2	69.4	350.0
Exempt	<0.1	0	0	<0.1
Exempt Commercial	0.3	0	0	0.3
Industrial	0.4	0	0	0.4
Transportation	3.7	0	0	3.7
Water	4.5	0	0	4.5
Total	**184.4**	**105.2**	**69.4**	**358.9**

Note: Totals may not sum up due to rounding errors.

Source: HNTB Analysis, 2017.

Table 12: 2026 Land Use – No Action

Land Use	DNL 65 dB (Acres)	DNL 70 dB (Acres)	DNL 75+ dB (Acres)	Total Acres (DNL 65 dB+)
Airport Property	176.0	106.0	70.1	352.1
Exempt	<0.1	0	0	<0.1
Exempt Commercial	0.3	0	0	0.3
Industrial	0.5	0.0	0	0.5
Transportation	3.8	0	0	3.8
Water	4.9	0	0	4.9
Total	**185.5**	**106.0**	**70.1**	**361.6**

Note: Totals may not sum up due to rounding errors.

Source: HNTB Analysis, 2017.

Table 13: 2021 Land Use – Minimum Action

Land Use	DNL 65 dB (Acres)	DNL 70 dB (Acres)	DNL 75+ dB (Acres)	Total Acres (DNL 65 dB+)
Airport Property	182.2	98.1	68.9	349.2
Exempt	0.1	0	0	0.1
Exempt Commercial	0.4	0	0	0.4
Industrial	0.2	0	0	0.2
Transportation	5.1	0	0	5.1
Water	0.2	0	0	0.2
Total	**188.2**	**98.1**	**68.9**	**355.2**

Note: Totals may not sum up due to rounding errors.

Source: HNTB Analysis, 2017.

Table 14: 2026 Land Use – Minimum Action

Land Use	DNL 65 dB (Acres)	DNL 70 dB (Acres)	DNL 75+ dB (Acres)	Total Acres (DNL 65 dB+)
Airport Property	183.5	99.2	69.7	352.4
Exempt	0.1	0	0	0.1
Exempt Commercial	0.4	0	0	0.4
Industrial	0.3	0	0	0.3
Transportation	5.3	0	0	5.3
Water	0.3	0	0	0.3
Total	**190.0**	**99.2**	**69.7**	**358.8**

Note: Totals may not sum up due to rounding errors.

Source: HNTB Analysis, 2017.

Table 15: 2021 Land Use – Sponsor's Preferred Alternative

Land Use	DNL 65 dB (Acres)	DNL 70 dB (Acres)	DNL 75+ dB (Acres)	Total Acres (DNL 65 dB+)
Airport Property	176.4	99.7	68.3	344.4
Exempt	0.1	0.0	0.0	0.1
Exempt Commercial	0.1	0.0	0.0	0.1
Industrial	0.0	0.0	0.0	0.0
Transportation	5.8	0.0	0.0	5.8
Water	3.6	0.0	0.0	3.6
Total	**186.0**	**99.7**	**68.3**	**354.0**

Note: Totals may not sum up due to rounding errors.

Source: HNTB Analysis, 2020.

Table 16: 2026 Land Use – Sponsor's Preferred Alternative

Land Use	DNL 65 dB (Acres)	DNL 70 dB (Acres)	DNL 75+ dB (Acres)	Total Acres (DNL 65 dB+)
Airport Property	177.7	100.5	69.2	347.4
Exempt	0.1	0.0	0.0	0.1
Exempt Commercial	0.2	0.0	0.0	0.2
Industrial	0.1	0.0	0.0	0.1
Transportation	6.1	0.0	0.0	6.1
Water	5.0	0.2	0.0	5.2
Total	**189.2**	**100.7**	**69.2**	**359.1**

Note: Totals may not sum up due to rounding errors.

Source: HNTB Analysis, 2020.

Figure 6: Existing Condition and Future No Action Noise Contours

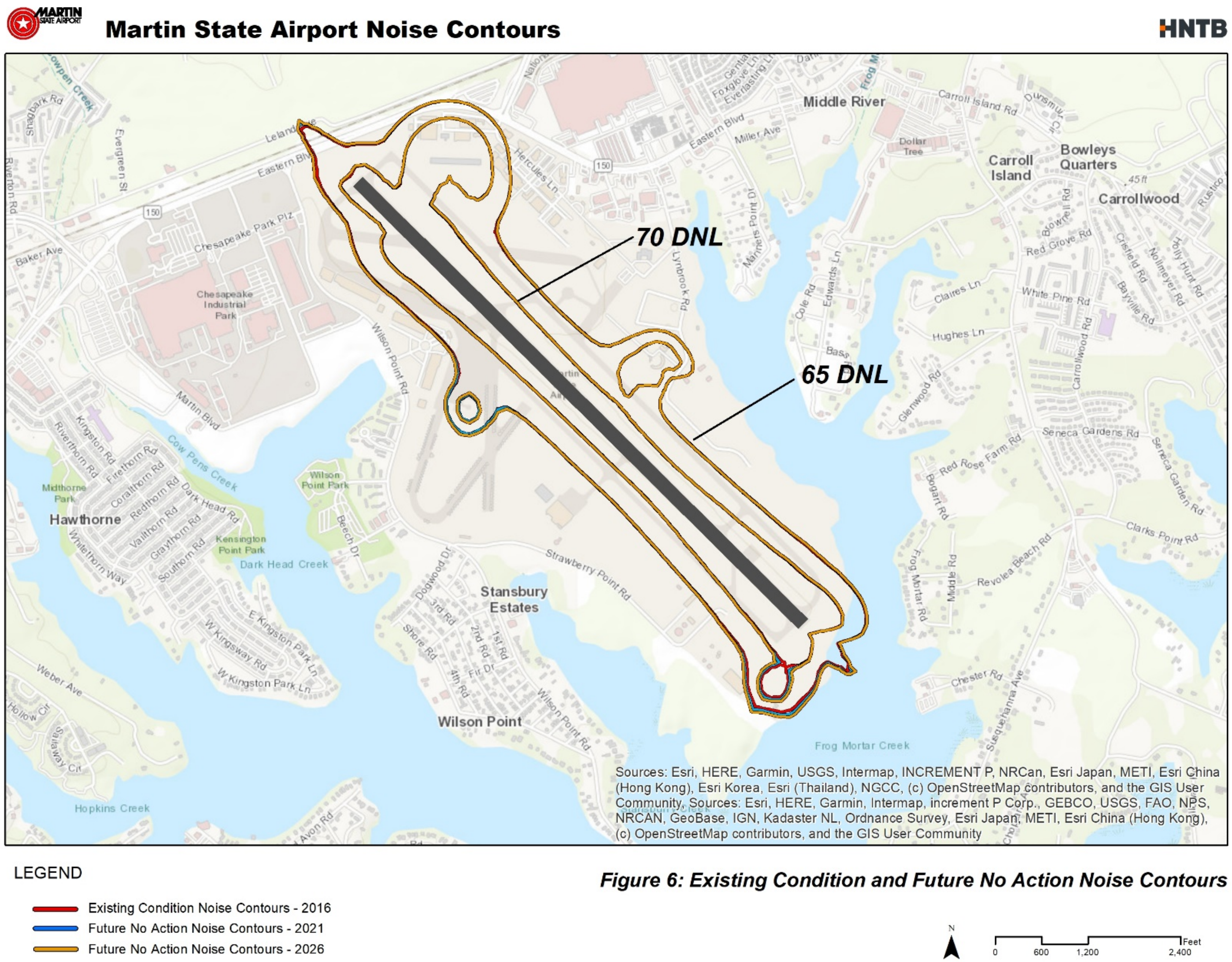


Figure 6: Existing Condition and Future No Action Noise Contours

Figure 7: Existing Condition and Minimum Action Noise Contours

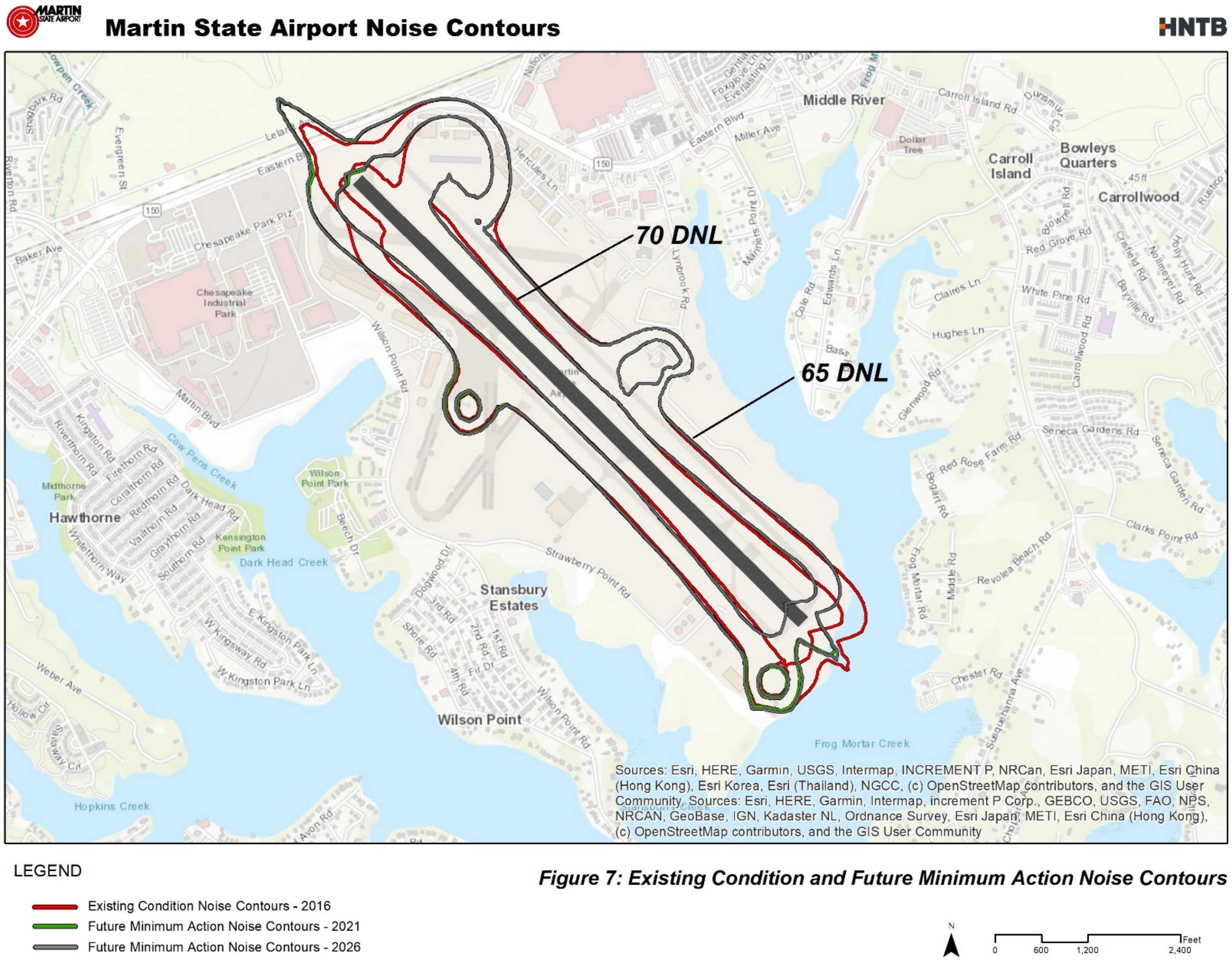


Figure 7: Existing Condition and Future Minimum Action Noise Contours

Figure 8: Existing Condition and Future Sponsor's Preferred Alternative Noise Contours

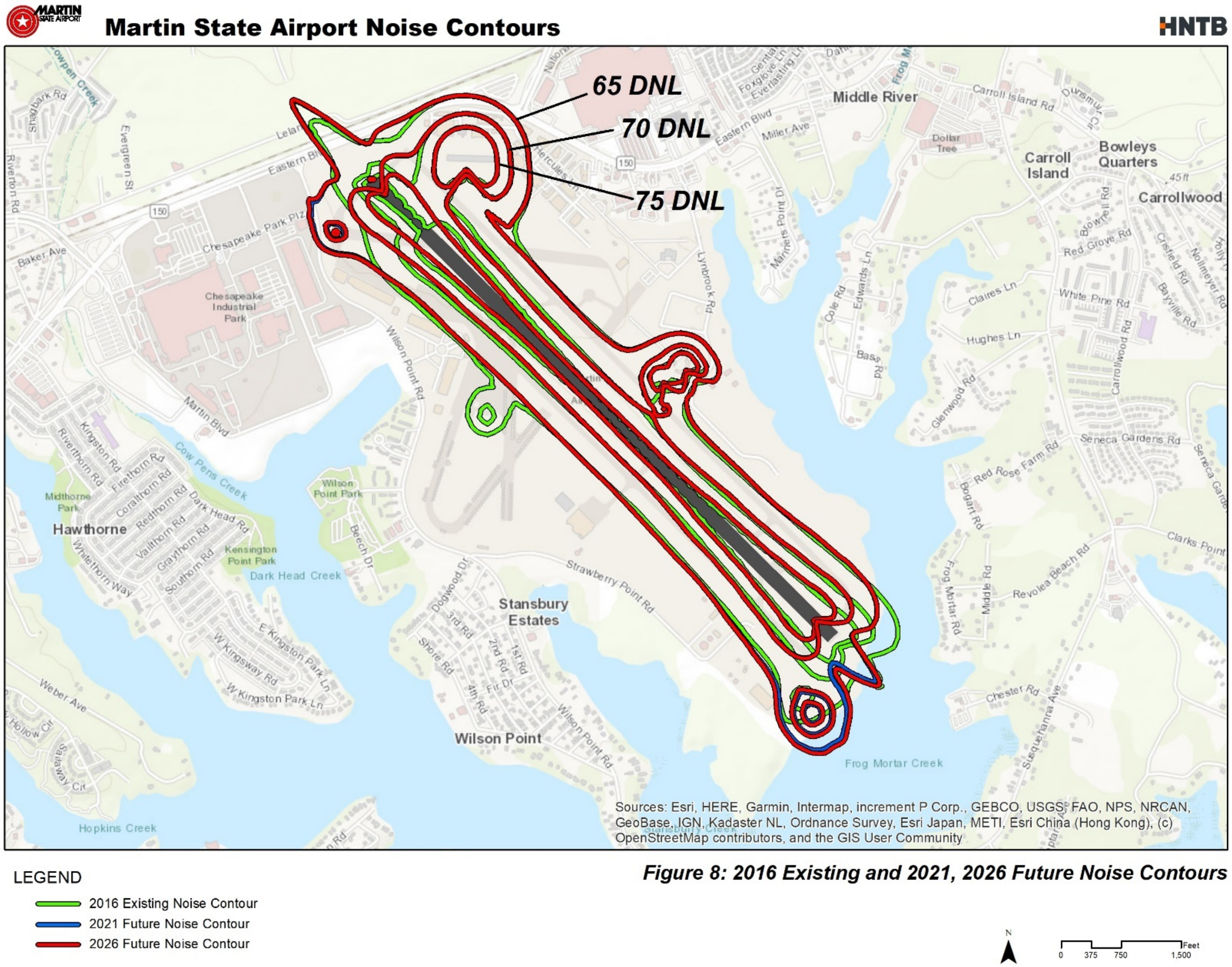


Figure 8: 2016 Existing and 2021, 2026 Future Noise Contours

End Note

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[1] Fleet mixes were approved by the Washington ADO on December 22nd, 2016.

[2] Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA, Sep 2016.

[3] U.S. Geological Survey, Multi-Resolution Land Characteristics Consortium (MRLC), National Land Cover Database (NLCD), U.S. Department of Interior, http://www.mrlc.gov/finddata.php.

[4] FAA Order 1050 1f, Environmental Impacts: Policies and Procedures, Paragraph 11-5.b(10).

[5] FAA Order 1050 1E, Environmental Impacts: Policies and Procedures, Appendix A, paragraph 14.3, page A-61.

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Attachment 1: Future Scenarios Fleet Mix Tables

Table 1

Fleet and Average Daily Operations - 2021

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
A10	A10 - Fairchild A10	A	A10A	1	3.27	0.02	3.29
A10	A10 - Fairchild A10	D	A10A	1	3.27	0.02	3.29
A10	A10 - Fairchild A10	T	A10A	1	1.38	-	1.38
A139	A139 - Agusta AB-139	A	SA330J	1	3.32	0.02	3.34
A139	A139 - Agusta AB-139	D	SA330J	1	3.32	0.02	3.34
AA5	AA5 - American AA-5 Traveler	A	AA5A	1	0.15	0.01	0.17
AA5	AA5 - American AA-5 Traveler	D	AA5A	1	0.16	0.01	0.17
AA5	AA5 - American AA-5 Traveler	T	AA5A	1	0.32	-	0.32
AA5A	AA5A - Grumman AA-5A Cheetah; AA-5 Tiger	T	AA5A	1	0.32	-	0.32
AC11	AC11 - Rockwell Commander 114	T	RWCM14	1	0.16	-	0.16
AC12	AC12 - Rockwell Commander 112A	T	GASEPV	1	0.17	-	0.17
AC90	AC90 - Gulfstream Commander	A	RWCM69	1	0.06	0.00	0.06
AC90	AC90 - Gulfstream Commander	D	RWCM69	1	0.06	0.00	0.06
AEST	AEST - Piper Aero Star	A	TED600	1	0.99	0.07	1.06
AEST	AEST - Piper Aero Star	D	TED600	1	1.00	0.05	1.06
AS50	AS50 - Eurocopter AS350B	A	SA355F	1	3.62	0.02	3.64
AS50	AS50 - Eurocopter AS350B	D	SA355F	1	3.62	0.02	3.64
ASTR	ASTR - IAI Astra 1125	A	IA1125	1	0.03	0.00	0.04
ASTR	ASTR - IAI Astra 1125	D	IA1125	1	0.03	0.00	0.04
AT43	AT43 - Aérospatiale/Alenia ATR 42-200/300/320	A	ATR42	1	0.07	0.00	0.07
AT43	AT43 - Aérospatiale/Alenia ATR 42-200/300/320	D	ATR42	1	0.07	0.00	0.07
B06	B06 - Bell 206B-3	A	B206L	1	1.81	0.01	1.82
B06	B06 - Bell 206B-3	D	B206L	1	1.81	0.01	1.82
B190	B190 - Beech 1900/C-12J	A	1900D	1	0.04	0.00	0.04
B190	B190 - Beech 1900/C-12J	D	1900D	1	0.04	0.00	0.04
B350	B350 - Beech Super King Air 350	A	BEC30B	1	0.36	0.02	0.38
B350	B350 - Beech Super King Air 350	D	BEC30B	1	0.17	0.02	0.19
B350	B350 - Beech Super King Air 350	D	BEC30B	2	0.17	0.02	0.19
B430	B430 - Bell 430	A	B430	1	0.03	0.00	0.03
B430	B430 - Bell 430	D	B430	1	0.03	0.00	0.03
B738	B787 - Boeing 737-800	A	737800	1	-	0.00	0.00
B738	B787 - Boeing 737-800	D	737800	1	-	0.00	0.00
BE10	BE10 - Beech King Air 100 A/B	A	BEC100	1	0.04	0.00	0.04
BE10	BE10 - Beech King Air 100 A/B	D	BEC100	1	0.04	0.00	0.04
BE20	BE20 - Beech 200 Super King	A	BEC200	1	0.15	0.01	0.16

Table 1
Fleet and Average Daily Operations - 2021

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
BE20	BE20 - Beech 200 Super King	D	BEC200	1	0.15	0.01	0.16
BE23	BE23 - Beechcraft Model 23 Musketeer	T	BEC23	1	0.80	-	0.80
BE24	BE24 - Beechcraft Model 24 Sierra/Musketeer	T	BEC24	1	0.32	-	0.32
BE30	BE30 - Raytheon 300 Super King Air	A	BEC300	1	0.06	0.00	0.06
BE30	BE30 - Raytheon 300 Super King Air	D	BEC300	1	0.05	0.01	0.06
BE33	BE33 - Beech Bonanza 33	A	BEC33	1	0.88	0.06	0.94
BE33	BE33 - Beech Bonanza 33	D	BEC33	1	0.89	0.05	0.94
BE33	BE33 - Beech Bonanza 33	T	BEC33	1	0.48	-	0.48
BE35	BE35 - Beech Bonanza 35	A	BECM35	1	1.17	0.08	1.25
BE35	BE35 - Beech Bonanza 35	D	BECM35	1	1.19	0.06	1.25
BE35	BE35 - Beech Bonanza 35	T	BECM35	1	1.44	-	1.44
BE36	BE36 - Beech Bonanza 36	A	BECM35	1	2.15	0.15	2.30
BE36	BE36 - Beech Bonanza 36	D	BECM35	1	2.19	0.11	2.30
BE36	BE36 - Beech Bonanza 36	T	BECM35	1	0.96	-	0.96
BE40	BE40 - Raytheon/Beech Beechjet 400/T-1	A	BEC400	1	0.24	0.01	0.26
BE40	BE40 - Raytheon/Beech Beechjet 400/T-1	D	BEC400	1	0.18	0.03	0.21
BE40	BE40 - Raytheon/Beech Beechjet 400/T-1	D	BEC400	2	0.04	0.01	0.05
BE55	BE55 - Beech Baron 55	A	BEC55	1	0.85	0.06	0.91
BE55	BE55 - Beech Baron 55	D	BEC55	1	0.87	0.04	0.91
BE55	BE55 - Beech Baron 55	T	BEC55	1	0.47	-	0.47
BE58	BE58 - Beech 58	A	BEC58	1	3.10	0.21	3.31
BE58	BE58 - Beech 58	D	BEC58	1	2.62	0.14	2.76
BE58	BE58 - Beech 58	D	BEC58	2	0.52	0.03	0.55
BE58	BE58 - Beech 58	T	BEC58	1	0.51	-	0.51
BE60	BE60 - Beech 60 Duke	A	BEC60	1	0.15	0.01	0.16
BE60	BE60 - Beech 60 Duke	D	BEC60	1	0.16	0.01	0.16
BE76	BE76 - Beechcraft Model 76 Duchess	T	BEC76	1	0.32	-	0.32
BE9L	BE9L - Beech King Air 90	A	BEC90	1	0.09	0.01	0.09
BE9L	BE9L - Beech King Air 90	D	BEC90	1	0.09	0.00	0.09
BL17	BL17 - Bellanca Super Viking Model 17-30A	T	BL26	1	0.48	-	0.48
C130	C130 - Lockheed 130 Hercules	A	C130/C130E	1	0.08	-	0.08
C130	C130 - Lockheed 130 Hercules	D	C130/C130E	1	0.08	-	0.08
C150	C150 - Cessna 150 Single Engine SEPF	T	CNA150	1	0.48	-	0.48
C152	C152 - Cessna 152 Single Engine SEPF	T	CNA152	1	0.32	-	0.32
C17	C17 - Beoing C-17 Globemaster III	A	C17	1	0.01	0.00	0.01
C17	C17 - Beoing C-17 Globemaster III	D	C17	1	0.01	0.00	0.01

Table 1
Fleet and Average Daily Operations - 2021

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
C172	C172 - Cessna Skyhawk 172/Cutlass	A	CNA172	1	7.84	0.54	8.38
C172	C172 - Cessna Skyhawk 172/Cutlass	D	CNA172	1	7.97	0.41	8.38
C172	C172 - Cessna Skyhawk 172/Cutlass	T	CNA172	1	3.68	-	3.68
C177	C177 - Cessna 177 Cardinal	A	CNA177	1	0.41	0.03	0.44
C177	C177 - Cessna 177 Cardinal	D	CNA177	1	0.42	0.02	0.44
C177	C177 - Cessna 177 Cardinal	T	CNA177	1	1.12	-	1.12
C180	C180 - Cessna 180 Skywagon	T	CNA180	1	0.16	-	0.16
C182	C182 - Cessna Skylane 182	A	CNA182	1	1.90	0.13	2.03
C182	C182 - Cessna Skylane 182	D	CNA182	1	1.91	0.12	2.03
C182	C182 - Cessna Skylane 182	T	CNA182	1	2.21	-	2.21
C206	C206 - Cessna 206 Stationair	A	CNA206	1	0.11	0.01	0.12
C206	C206 - Cessna 206 Stationair	D	CNA206	1	0.11	0.01	0.12
C210	C210 - Cessna 210 Centurion	A	CNA210	1	0.28	0.02	0.30
C210	C210 - Cessna 210 Centurion	D	CNA210	1	0.28	0.02	0.30
C25A	C25A - Cessna Citation CJ2	A	CNA525C	1	0.13	0.01	0.14
C25A	C25A - Cessna Citation CJ2	D	CNA525C	1	0.13	0.01	0.14
C25B	C25B - Cessna Citation CJ3	A	CNA500	1	0.19	0.01	0.20
C25B	C25B - Cessna Citation CJ3	D	CNA500	1	0.19	0.01	0.20
C25C	C25C - Cessna Citation CJ4	A	CNA525C	1	0.04	0.00	0.05
C25C	C25C - Cessna Citation CJ4	D	CNA525C	1	0.05	0.00	0.05
C310	C310 - Cessna 310	A	CNA310	1	0.32	0.02	0.35
C310	C310 - Cessna 310	D	CNA310	1	0.33	0.02	0.35
C310	C310 - Cessna 310	T	CNA310	1	0.16	-	0.16
C335	C335 - Cessna 335 Twin Piston MEVP	T	CNA335	1	0.16	-	0.16
C340	C340 - Cessna 340	A	CNA340	1	0.60	0.04	0.64
C340	C340 - Cessna 340	D	CNA340	1	0.61	0.03	0.64
C340	C340 - Cessna 340	T	CNA340	1	0.16	-	0.16
C400	C400 - Cessna 400 Corvalis/Lancair LC41/Columbia 400	T	GASEPV	1	0.17	-	0.17
C414	C414 - Cessna Chancellor 414	A	CNA414	1	0.29	0.02	0.31
C414	C414 - Cessna Chancellor 414	D	CNA414	1	0.29	0.01	0.31
C421	C421 - Cessna Golden Eagle 421	A	CNA421	1	1.21	0.08	1.29
C421	C421 - Cessna Golden Eagle 421	D	CNA421	1	1.23	0.06	1.29
C421	C421 - Cessna Golden Eagle 421	T	CNA421	1	0.16	-	0.16
C441	C441 - Cessna Conquest	A	CNA441	1	0.17	0.01	0.19
C441	C441 - Cessna Conquest	D	CNA441	1	0.18	0.01	0.19
C500	C500 - Cessna 500/Citation I	A	CNA500	1	0.01	0.00	0.01

Table 1

Fleet and Average Daily Operations - 2021

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
C500	C500 - Cessna 500/Citation I	D	CNA500	1	0.01	0.00	0.01
C501	C501 - Cessna I/SP	A	CNA501	1	0.01	0.00	0.02
C501	C501 - Cessna I/SP	D	CNA501	1	0.01	0.00	0.02
C525	C525 - Cessna CitationJet/CJ1	A	CNA525C	1	0.17	0.01	0.18
C525	C525 - Cessna CitationJet/CJ1	D	CNA525C	1	0.17	0.01	0.18
C550	C550 - Cessna Citation II/Bravo	A	CNA55B/CNA550	1	0.14	0.01	0.15
C550	C550 - Cessna Citation II/Bravo	D	CNA55B/CNA550	1	0.14	-	0.14
C550	C550 - Cessna Citation II/Bravo	D	CNA55B/CNA550	3	-	0.01	0.01
C560	C560 - Cessna Citation V/Ultra/Encore	A	CNA560E/CNA560U	1	0.21	0.01	0.22
C560	C560 - Cessna Citation V/Ultra/Encore	D	CNA560E/CNA560U	1	0.09	0.01	0.10
C560	C560 - Cessna Citation V/Ultra/Encore	D	CNA560E/CNA560U	2	0.11	0.01	0.12
C56X	C56X - Cessna Excel/XLS	A	CNA560XL	1	0.41	0.02	0.43
C56X	C56X - Cessna Excel/XLS	D	CNA560XL	1	0.15	-	0.15
C56X	C56X - Cessna Excel/XLS	D	CNA560XL	2	0.23	-	0.23
C56X	C56X - Cessna Excel/XLS	D	CNA560XL	3	-	0.05	0.05
C650	C650 - Cessna III/VI/VII	A	CNA650	1	0.15	0.01	0.16
C650	C650 - Cessna III/VI/VII	D	CNA650	1	0.15	0.01	0.16
C680	C680 - Cessna Citation Sovereign	A	CNA680	1	0.13	0.01	0.13
C680	C680 - Cessna Citation Sovereign	D	CNA680	1	0.12	0.02	0.13
C750	C750 - Cessna Citation X	A	CNA750	1	0.20	0.01	0.21
C750	C750 - Cessna Citation X	D	CNA750	1	0.11	0.01	0.12
C750	C750 - Cessna Citation X	D	CNA750	2	0.08	0.01	0.09
C82R	C82R - Cessna Skylane RG	A	CNA182	1	0.53	0.04	0.57
C82R	C82R - Cessna Skylane RG	D	CNA182	1	0.54	0.03	0.57
CH75	CH75 - Zenith STOL CH-750	T	GASEPV	1	0.17	-	0.17
CH7A	CH7A - Aeronca Model 7 Champion	T	GASEPF	1	0.17	-	0.17
CL30	CL30 - Bombardier (Canadair) Challenger 300	A	BD100	1	0.33	0.02	0.35
CL30	CL30 - Bombardier (Canadair) Challenger 300	D	BD100	1	0.31	0.04	0.35
CL35	CL35 - Bombardier Challenger 300	A	CL600	1	0.02	0.00	0.02
CL35	CL35 - Bombardier Challenger 300	D	CL600	1	0.01	0.00	0.02
CL35	CL35 - Bombardier Challenger 300	D	CL600	4	-	0.00	0.00
CL60	CL60 - Bombardier Challenger 600/601/604	A	CL600/CL601	1	0.27	0.02	0.29
CL60	CL60 - Bombardier Challenger 600/601/604	D	CL600/CL601	2	0.14	0.01	0.15
CL60	CL60 - Bombardier Challenger 600/601/604	D	CL600/CL601	4	0.14	0.01	0.15
CLDS	CLDS - Rearwin Cloudster 8090/8125/8235	T	GASEPF	1	0.17	-	0.17

Table 1

Fleet and Average Daily Operations - 2021

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
COL3	COL3 - Lancair LC-40 Columbia 400	A	GASEPV	1	0.80	0.06	0.86
COL3	COL3 - Lancair LC-40 Columbia 400	D	GASEPV	1	0.82	0.04	0.86
COL3	COL3 - Lancair LC-40 Columbia 400	T	GASEPV	1	0.30	-	0.30
COL4	COL4 - Lancair LC-41 Columbia 400	A	GASEPV	1	1.33	0.09	1.43
COL4	COL4 - Lancair LC-41 Columbia 400	D	GASEPV	1	1.36	0.07	1.43
COZY	COZY - AeroCad AeroCanard	T	GASEPF	1	0.17	-	0.17
DA40	DA40 - Diamond Star DA40	A	GASEPV	1	0.20	0.01	0.22
DA40	DA40 - Diamond Star DA40	D	GASEPV	1	0.21	0.01	0.22
DA40	DA40 - Diamond Star DA40	T	GASEPV	1	0.27	-	0.27
DFLY	DFLY - Viking Dragonfly	T	GASEPV	1	0.17	-	0.17
DH8B	DH8B - Bombardier DHC8-200	A	DHC8/DHC830	1	0.10	0.01	0.11
DH8B	DH8B - Bombardier DHC8-200	D	DHC8/DHC830	1	0.10	0.01	0.11
E135	E135 - Embraer ERJ 135/140/Legacy	A	EMB135	1	0.03	0.00	0.03
E135	E135 - Embraer ERJ 135/140/Legacy	D	EMB135	1	0.03	0.00	0.03
E50P	E50P - Embraer Phenom 100	A	CNA510	1	0.21	0.01	0.22
E50P	E50P - Embraer Phenom 100	D	CNA510	1	0.07	0.00	0.07
E50P	E50P - Embraer Phenom 100	D	CNA510	2	0.14	0.01	0.15
E55P	E55P - Embraer Phenom 300	A	CNA560E	1	0.85	0.06	0.90
E55P	E55P - Embraer Phenom 300	D	CNA560E	1	0.62	0.02	0.64
E55P	E55P - Embraer Phenom 300	D	CNA560E	2	0.22	0.03	0.26
EA50	EA50 - Eclipse 500	A	ECLIPSE500	1	0.03	0.00	0.04
EA50	EA50 - Eclipse 500	D	ECLIPSE500	1	0.03	0.00	0.04
EAGL	EAGL - Christen/Aviat Eagle	T	GASEPF	1	0.17	-	0.17
EC20	EC120 - Eurocopter EC-120	A	SA341G	1	4.82	0.03	4.85
EC20	EC120 - Eurocopter EC-120	D	SA341G	1	4.83	0.02	4.85
EC35	EC135 - Eurocopter EC-135	A	EC130	1	1.21	0.01	1.21
EC35	EC135 - Eurocopter EC-135	D	EC130	1	1.21	0.01	1.21
EC45	EC45 - Eurocopter EC-145	A	B429	1	0.07	-	0.07
EC45	EC45 - Eurocopter EC-145	D	B429	1	0.07	-	0.07
ERCO	ERCO - ErCoupe	T	GASEPF	1	0.17	-	0.17
F2TH	F2TH - Dassault Falcon 2000	A	FAL20A	1	0.39	0.03	0.42
F2TH	F2TH - Dassault Falcon 2000	D	FAL20A	1	0.21	0.02	0.23
F2TH	F2TH - Dassault Falcon 2000	D	FAL20A	2	0.18	0.01	0.19
F900	F900 - Dassault Falcon 900	A	FAL900	1	0.03	0.00	0.03
F900	F900 - Dassault Falcon 900	D	FAL900	1	0.03	0.00	0.03
FA50	FA50 - Dassault Falcon/Mystère 50	A	FAL50	1	0.03	0.00	0.03

Table 1

Fleet and Average Daily Operations - 2021

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
FA50	FA50 - Dassault Falcon/Mystère 50	D	FAL50	2	0.03	0.00	0.03
G109	G109 - Burkhart Grob G109	T	GASEPV	1	0.17	-	0.17
G115	G115 - Burkhart Grob G115	T	GROB15	1	0.17	-	0.17
G150	G150 - Gulfstream G150	A	G150	1	0.19	0.01	0.20
G150	G150 - Gulfstream G150	D	G150	1	0.06	0.00	0.06
G150	G150 - Gulfstream G150	D	G150	2	0.08	0.00	0.08
G150	G150 - Gulfstream G150	D	G150	3	0.06	0.00	0.06
G202	G202 - Gearhardt J Giles G202	T	GASEPF	1	0.17	-	0.17
G280	G280 - Gulfstream G280	A	CL601	1	0.02	0.00	0.02
G280	G280 - Gulfstream G280	D	CL601	1	0.02	0.00	0.02
G2T1	G2T1 - Great Lakes Sport Trainer	T	GSPORT	1	0.17	-	0.17
GA7	GA7 - Grumman American Cougar	A	GA7	1	0.64	0.04	0.68
GA7	GA7 - Grumman American Cougar	D	GA7	1	0.65	0.03	0.68
GA7	GA7 - Grumman American Cougar	T	GA7	1	0.35	-	0.35
GA8	GA8 - Gippsland GA-8 Airvan	A	CNA206	1	0.03	0.00	0.03
GA8	GA8 - Gippsland GA-8 Airvan	D	CNA206	1	0.02	0.00	0.03
GALX	GALX - IAI 1126 Galaxy/Gulfstream G200	A	G200	1	0.27	0.02	0.29
GALX	GALX - IAI 1126 Galaxy/Gulfstream G200	D	G200	1	0.06	0.00	0.06
GALX	GALX - IAI 1126 Galaxy/Gulfstream G200	D	G200	2	0.22	0.01	0.23
GLEX	GLEX - Bombardier BD-700 Global Express	A	BD700	1	0.08	0.01	0.09
GLEX	GLEX - Bombardier BD-700 Global Express	D	BD700	1	0.04	0.00	0.04
GLEX	GLEX - Bombardier BD-700 Global Express	D	BD700	4	0.04	0.00	0.04
GLF4	GLF4 - Gulfstream IV/G400	A	GIV	1	0.47	0.03	0.50
GLF4	GLF4 - Gulfstream IV/G400	D	GIV	1	0.35	0.02	0.37
GLF4	GLF4 - Gulfstream IV/G400	D	GIV	3	0.12	0.01	0.12
GLF5	GLF5 - Gulfstream V/G500	A	GV	1	0.15	0.01	0.16
GLF5	GLF5 - Gulfstream V/G500	D	GV	1	0.10	0.01	0.11
GLF5	GLF5 - Gulfstream V/G500	D	GV	3	0.05	0.00	0.05
H25B	H25B - BAe HS 125/700-800/Hawker 800	A	HS1258	1	0.20	0.01	0.21
H25B	H25B - BAe HS 125/700-800/Hawker 800	D	HS1258	1	0.19	0.02	0.21
H60	H60 - Sikorsky SH-60 Seahawk	A	S70	1	0.07	-	0.07
H60	H60 - Sikorsky SH-60 Seahawk	D	S70	1	0.07	-	0.07
LC42	LC42 - Cessna 350 Corvalis/Lancair LC42	T	GASEPV	1	0.17	-	0.17
LGEZ	LGEZ - Rutan 61 Long-EZ	T	GASEPF	1	0.17	-	0.17
LJ31	LJ31 - Bombardier Learjet 31/A/B	A	LEAR31	1	0.04	0.00	0.04
LJ31	LJ31 - Bombardier Learjet 31/A/B	D	LEAR31	1	0.04	0.00	0.04

Table 1
Fleet and Average Daily Operations - 2021

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
LJ35	LJ35 - Bombardier Learjet 35/36	A	LEAR35	1	0.07	0.00	0.08
LJ35	LJ35 - Bombardier Learjet 35/36	D	LEAR35	1	0.07	0.00	0.08
LJ40	LJ40 - Learjet 40; Gates Learjet	A	LEAR35	1	0.07	0.01	0.08
LJ40	LJ40 - Learjet 40; Gates Learjet	D	LEAR35	1	0.07	0.00	0.08
LJ45	LJ45 - Bombardier Learjet 45	A	LEAR45	1	0.13	0.01	0.13
LJ45	LJ45 - Bombardier Learjet 45	D	LEAR45	2	0.12	0.01	0.13
LJ60	LJ60 - Bombardier Learjet 60	A	LEAR60	1	0.35	0.02	0.37
LJ60	LJ60 - Bombardier Learjet 60	D	LEAR60	1	0.18	0.01	0.18
LJ60	LJ60 - Bombardier Learjet 60	D	LEAR60	2	0.18	0.01	0.18
LJ75	LJ75 - Learjet 75	A	LEAR45	1	0.19	0.01	0.20
LJ75	LJ75 - Learjet 75	D	LEAR45	1	0.19	0.01	0.20
M020	M020 - Mooney Mark 20 Series	T	M20J	1	0.48	-	0.48
M20C	M20C - Mooney Mark 20 Series	T	M20J	1	0.35	-	0.35
M20F	M20F - Mooney Mark 20 Series	T	M20J	1	0.35	-	0.35
M20J	M20J - Mooney Mark 20 Series	T	M20J	1	0.64	-	0.64
M20K	M20K - Mooney 252TSE (M20K)	T	M20K	1	0.35	-	0.35
M20P	M20P - Mooney M-20C Ranger	A	M20J	1	0.89	0.06	0.96
M20P	M20P - Mooney M-20C Ranger	D	M20J	1	0.91	0.05	0.96
M20T	M20T - Turbo Mooney M20K	A	M20J	1	1.05	0.07	1.12
M20T	M20T - Turbo Mooney M20K	D	M20J	1	1.07	0.05	1.12
M20T	M20T - Turbo Mooney M20K	T	M20J	1	0.17	-	0.17
MOR2	MOR2 - Varga 2150 Kachina	T	GASEPF	1	0.17	-	0.17
MU2	MU2 - Mitsubishi Marquise/Solitaire	A	MU2	1	0.02	0.00	0.02
MU2	MU2 - Mitsubishi Marquise/Solitaire	D	MU2	1	0.01	0.00	0.02
NAVI	NAVI - Ryan L-17/U-18 Navion	T	M20J	1	0.17	-	0.17
P28A	P28A - Piper Cherokee	A	PA28/GASEPF	1	1.91	0.13	2.04
P28A	P28A - Piper Cherokee	D	PA28/GASEPF	1	1.94	0.10	2.04
P28R	P28R - Cherokee Arrow/Turbo	A	PA28CA	1	0.46	0.03	0.49
P28R	P28R - Cherokee Arrow/Turbo	D	PA28CA	1	0.47	0.02	0.49
P28T	P28T - Piper PA-28R-180/200/201 Cherokee Arrow I/II/III	T	GASEPF	1	1.22	-	1.22
P32R	P32R - Piper 32	A	GASEPV	1	0.15	0.01	0.17
P32R	P32R - Piper 32	D	GASEPV	1	0.16	0.01	0.17
P32R	P32R - Piper 32	T	GASEPV	1	0.48	-	0.48
P46T	P46T - Piper Malibu Meridian	A	CNA208	1	0.08	0.01	0.08
P46T	P46T - Piper Malibu Meridian	D	CNA208	1	0.08	0.00	0.08

Table 1
Fleet and Average Daily Operations - 2021

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
PA11	PA11 - Cub Crafters CC-11 Carbon Cub/ Sport Cub	T	GASEPF	1	0.17	-	0.17
PA20	PA20 - Piper PA-20 Pacer	T	GASEPF	1	0.35	-	0.35
PA24	PA24 - Piper PA-24 Comanche	T	PA24	1	0.16	-	0.16
PA27	PA27 - Piper Aztec	A	BEC58P	1	0.14	0.01	0.15
PA27	PA27 - Piper Aztec	D	BEC58P	1	0.07	0.00	0.07
PA27	PA27 - Piper Aztec	D	BEC58P	2	0.07	0.00	0.07
PA28	PA28 - Piper Cherokee	A	PA28	1	0.35	0.02	0.37
PA28	PA28 - Piper Cherokee	D	PA28	1	0.35	0.02	0.37
PA28	PA28 - Piper Cherokee	T	GASEPF	1	2.05	-	2.05
PA30	PA30 - Piper PA-30	A	PA30	1	0.15	0.01	0.16
PA30	PA30 - Piper PA-30	D	PA30	1	0.16	0.01	0.16
PA30	PA30 - Piper PA-30	T	GASEPV	1	0.16	-	0.16
PA31	PA31 - Piper Navajo PA-31	A	PA31	1	1.12	0.08	1.20
PA31	PA31 - Piper Navajo PA-31	D	PA31	1	1.14	0.06	1.20
PA31	PA31 - Piper Navajo PA-31	T	GASEPV	1	0.32	-	0.32
PA32	PA32 - Piper Cherokee Six	A	GASEPV	1	1.17	0.08	1.25
PA32	PA32 - Piper Cherokee Six	D	GASEPV	1	1.19	0.06	1.25
PA32	PA32 - Piper Cherokee Six	T	GASEPV	1	1.92	-	1.92
PA34	PA34 - Piper PA-34 Seneca	A	PA34	1	0.41	0.03	0.43
PA34	PA34 - Piper PA-34 Seneca	D	PA34	1	0.41	0.02	0.43
PA34	PA34 - Piper PA-34 Seneca	T	PA34	1	0.51	-	0.51
PA38	PA38 - Piper PA-38 Tomahawk	T	PA38	1	0.17	-	0.17
PA46	PA46 - Piper Malibu	A	PA46	1	0.84	0.06	0.90
PA46	PA46 - Piper Malibu	D	PA46	1	0.43	0.02	0.45
PA46	PA46 - Piper Malibu	D	PA46	2	0.43	0.02	0.45
PA60	PA60 - Piper PA-60/PA-61 Aerostar (Aerostar 600/700)	T	PA60	1	0.35	-	0.35
PARC	PARC - Piper PA-28-180/181 Cherokee Archer	T	GASEPV	1	0.52	-	0.52
PC12	PC12 - Pilatus PC-12	A	PC12	1	0.53	0.03	0.56
PC12	PC12 - Pilatus PC-12	D	PC12	1	0.26	0.04	0.30
PC12	PC12 - Pilatus PC-12	D	PC12	2	0.26	-	0.26
PRM1	PRM1 - Raytheon Premier 1/390 Premier 1	A	R390	1	0.03	0.00	0.03
PRM1	PRM1 - Raytheon Premier 1/390 Premier 1	D	R390	2	0.03	0.00	0.03
R22	R22 - Robinson R22B w/Lycoming 0320	A	R22	1	2.85	-	2.85
R22	R22 - Robinson R22B w/Lycoming 0320	D	R22	1	2.85	-	2.85
RV4	RV4 - Van's Aircraft RV-4	T	GASEPF	1	0.17	-	0.17

Table 1

Fleet and Average Daily Operations - 2021

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
RV6	RV6 - Vans RV-6	T	GASEPV	1	0.36	-	0.36
RV7A	RV7A - Van's Aircraft RV-7/RV-7A	T	GASEPV	1	0.17	-	0.17
RV8	RV8 - Vans RV-8	T	GASEPV	1	0.17	-	0.17
S76	S76 - Sikorsky S-76	A	S76	1	0.02	0.00	0.02
S76	S76 - Sikorsky S-76	D	S76	1	0.02	0.00	0.02
SA30	SA30 - STOLP SA-300 Starduster Too	T	GASEPV	1	0.17	-	0.17
SIRA	SIRA - Tecnam P2002 Sierra	T	GASEPF	1	0.17	-	0.17
SR20	SR20 - Cirrus SR-20	A	GASEPV	1	0.19	0.01	0.20
SR20	SR20 - Cirrus SR-20	D	GASEPV	1	0.19	0.01	0.20
SR22	SR22 - Cirrus SR 22	A	SR22	1	4.78	0.33	5.11
SR22	SR22 - Cirrus SR 22	D	SR22	1	4.84	0.26	5.11
SR22	SR22 - Cirrus SR 22	T	SR22	1	1.10	-	1.10
SW4	SW4 - Swearingen Merlin 4/4A Metro2	A	SAMER4	1	0.18	0.01	0.18
SW4	SW4 - Swearingen Merlin 4/4A Metro2	D	SAMER4	1	0.15	0.03	0.18
TBM8	TBM8 - Socata TBM-850	A	CNA208	1	0.02	0.00	0.02
TBM8	TBM8 - Socata TBM-850	D	CNA208	1	0.02	0.00	0.02
YK52	YK52 - Aerostar Yak-52/54	T	GASEPV	1	0.17	-	0.17
Z42	Z42 - Moravan Zlin Z-242	A	GASEPV	1	0.41	0.03	0.44
Z42	Z42 - Moravan Zlin Z-242	D	GASEPV	1	0.42	0.02	0.44
Grand Total					173.36	6.26	179.62

Sources: FAA TAF 2015, OPSNET, TFMS-C, Flight Explorer, and HNTB Analysis 2016

Table 2

Fleet and Average Daily Operations - 2026

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
A10	A10 - Fairchild A10	A	A10A	1	3.29	0.02	3.31
A10	A10 - Fairchild A10	D	A10A	1	3.29	0.02	3.31
A10	A10 - Fairchild A10	T	A10A	1	1.38	-	1.38
A139	A139 - Agusta AB-139	A	SA330J	1	4.04	0.03	4.06
A139	A139 - Agusta AB-139	D	SA330J	1	4.04	0.02	4.06
AA5	AA5 - American AA-5 Traveler	A	AA5A	1	0.15	0.01	0.16
AA5	AA5 - American AA-5 Traveler	D	AA5A	1	0.15	0.01	0.16
AA5	AA5 - American AA-5 Traveler	T	AA5A	1	0.30	-	0.30
AA5A	AA5A - Grumman AA-5A Cheetah; AA-5 Tiger	T	AA5A	1	0.30	-	0.30
AC11	AC11 - Rockwell Commander 114	T	RWCM14	1	0.15	-	0.15
AC12	AC12 - Rockwell Commander 112A	T	GASEPV	1	0.18	-	0.18
AC90	AC90 - Gulfstream Commander	A	RWCM69	1	0.06	0.00	0.06
AC90	AC90 - Gulfstream Commander	D	RWCM69	1	0.06	0.00	0.06
AEST	AEST - Piper Aero Star	A	TED600	1	0.97	0.07	1.04
AEST	AEST - Piper Aero Star	D	TED600	1	0.99	0.05	1.04
AS50	AS50 - Eurocopter AS350B	A	SA355F	1	4.40	0.03	4.43
AS50	AS50 - Eurocopter AS350B	D	SA355F	1	4.41	0.02	4.43
ASTR	ASTR - IAI Astra 1125	A	IA1125	1	0.03	0.00	0.04
ASTR	ASTR - IAI Astra 1125	D	IA1125	1	0.03	0.00	0.04
AT43	AT43 - Aérospatiale/Alenia ATR 42-200/300/320	A	ATR42	1	0.07	0.00	0.07
AT43	AT43 - Aérospatiale/Alenia ATR 42-200/300/320	D	ATR42	1	0.07	0.00	0.07
B06	B06 - Bell 206B-3	A	B206L	1	4.20	0.01	4.21
B06	B06 - Bell 206B-3	D	B206L	1	4.20	0.01	4.21
B190	B190 - Beech 1900/C-12J	A	1900D	1	0.04	0.00	0.04
B190	B190 - Beech 1900/C-12J	D	1900D	1	0.04	0.00	0.04
B350	B350 - Beech Super King Air 350	A	BEC30B	1	0.36	0.02	0.38
B350	B350 - Beech Super King Air 350	D	BEC30B	1	0.17	0.02	0.19
B350	B350 - Beech Super King Air 350	D	BEC30B	2	0.17	0.02	0.19
B430	B430 - Bell 430	A	B430	1	0.04	0.00	0.04
B430	B430 - Bell 430	D	B430	1	0.04	0.00	0.04
B738	B787 - Boeing 737-800	A	737800	1	-	0.00	0.00
B738	B787 - Boeing 737-800	D	737800	1	-	0.00	0.00
BE10	BE10 - Beech King Air 100 A/B	A	BEC100	1	0.04	0.00	0.04
BE10	BE10 - Beech King Air 100 A/B	D	BEC100	1	0.04	0.00	0.04
BE20	BE20 - Beech 200 Super King	A	BEC200	1	0.15	0.01	0.16

Table 2
Fleet and Average Daily Operations - 2026

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
BE20	BE20 - Beech 200 Super King	D	BEC200	1	0.15	0.01	0.16
BE23	BE23 - Beechcraft Model 23 Musketeer	T	BEC23	1	0.76	-	0.76
BE24	BE24 - Beechcraft Model 24 Sierra/Musketeer	T	BEC24	1	0.30	-	0.30
BE30	BE30 - Raytheon 300 Super King Air	A	BEC300	1	0.05	0.00	0.06
BE30	BE30 - Raytheon 300 Super King Air	D	BEC300	1	0.05	0.01	0.06
BE33	BE33 - Beech Bonanza 33	A	BEC33	1	0.85	0.06	0.91
BE33	BE33 - Beech Bonanza 33	D	BEC33	1	0.87	0.04	0.91
BE33	BE33 - Beech Bonanza 33	T	BEC33	1	0.46	-	0.46
BE35	BE35 - Beech Bonanza 35	A	BECM35	1	0.93	0.06	1.00
BE35	BE35 - Beech Bonanza 35	D	BECM35	1	0.95	0.05	1.00
BE35	BE35 - Beech Bonanza 35	T	BECM35	1	1.12	-	1.12
BE36	BE36 - Beech Bonanza 36	A	BECM35	1	2.09	0.14	2.24
BE36	BE36 - Beech Bonanza 36	D	BECM35	1	2.13	0.11	2.24
BE36	BE36 - Beech Bonanza 36	T	BECM35	1	0.91	-	0.91
BE40	BE40 - Raytheon/Beech Beechjet 400/T-1	A	BEC400	1	0.25	0.01	0.26
BE40	BE40 - Raytheon/Beech Beechjet 400/T-1	D	BEC400	1	0.19	0.03	0.21
BE40	BE40 - Raytheon/Beech Beechjet 400/T-1	D	BEC400	2	0.04	0.01	0.05
BE55	BE55 - Beech Baron 55	A	BEC55	1	0.84	0.06	0.90
BE55	BE55 - Beech Baron 55	D	BEC55	1	0.85	0.04	0.90
BE55	BE55 - Beech Baron 55	T	BEC55	1	0.46	-	0.46
BE58	BE58 - Beech 58	A	BEC58	1	3.15	0.22	3.37
BE58	BE58 - Beech 58	D	BEC58	1	2.67	0.14	2.80
BE58	BE58 - Beech 58	D	BEC58	2	0.53	0.03	0.56
BE58	BE58 - Beech 58	T	BEC58	1	0.51	-	0.51
BE60	BE60 - Beech 60 Duke	A	BEC60	1	0.15	0.01	0.16
BE60	BE60 - Beech 60 Duke	D	BEC60	1	0.15	0.01	0.16
BE76	BE76 - Beechcraft Model 76 Duchess	T	BEC76	1	0.31	-	0.31
BE9L	BE9L - Beech King Air 90	A	BEC90	1	0.09	0.01	0.09
BE9L	BE9L - Beech King Air 90	D	BEC90	1	0.09	0.00	0.09
BL17	BL17 - Bellanca Super Viking Model 17-30A	T	BL26	1	0.46	-	0.46
C130	C130 - Lockheed 130 Hercules	A	C130/C130E	1	0.06	-	0.06
C130	C130 - Lockheed 130 Hercules	D	C130/C130E	1	0.06	-	0.06
C150	C150 - Cessna 150 Single Engine SEPF	T	CNA150	1	0.37	-	0.37

Table 2
Fleet and Average Daily Operations - 2026

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
C152	C152 - Cessna 152 Single Engine SEPF	T	CNA152	1	0.30	-	0.30
C17	C17 - Beoing C-17 Globemaster III	A	C17	1	0.01	0.00	0.01
C17	C17 - Beoing C-17 Globemaster III	D	C17	1	0.01	0.00	0.01
C172	C172 - Cessna Skyhawk 172/Cutlass	A	CNA172	1	7.63	0.52	8.15
C172	C172 - Cessna Skyhawk 172/Cutlass	D	CNA172	1	7.75	0.40	8.15
C172	C172 - Cessna Skyhawk 172/Cutlass	T	CNA172	1	3.50	-	3.50
C177	C177 - Cessna 177 Cardinal	A	CNA177	1	0.40	0.03	0.43
C177	C177 - Cessna 177 Cardinal	D	CNA177	1	0.41	0.02	0.43
C177	C177 - Cessna 177 Cardinal	T	CNA177	1	1.06	-	1.06
C180	C180 - Cessna 180 Skywagon	T	CNA180	1	0.12	-	0.12
C182	C182 - Cessna Skylane 182	A	CNA182	1	1.88	0.13	2.01
C182	C182 - Cessna Skylane 182	D	CNA182	1	1.90	0.12	2.01
C182	C182 - Cessna Skylane 182	T	CNA182	1	2.15	-	2.15
C206	C206 - Cessna 206 Stationair	A	CNA206	1	0.11	0.01	0.12
C206	C206 - Cessna 206 Stationair	D	CNA206	1	0.11	0.01	0.12
C210	C210 - Cessna 210 Centurion	A	CNA210	1	0.27	0.02	0.29
C210	C210 - Cessna 210 Centurion	D	CNA210	1	0.27	0.02	0.29
C25A	C25A - Cessna Citation CJ2	A	CNA525C	1	0.14	0.01	0.15
C25A	C25A - Cessna Citation CJ2	D	CNA525C	1	0.14	0.01	0.15
C25B	C25B - Cessna Citation CJ3	A	CNA500	1	0.21	0.01	0.22
C25B	C25B - Cessna Citation CJ3	D	CNA500	1	0.21	0.02	0.22
C25C	C25C - Cessna Citation CJ4	A	CNA525C	1	0.06	0.00	0.06
C25C	C25C - Cessna Citation CJ4	D	CNA525C	1	0.06	0.00	0.06
C310	C310 - Cessna 310	A	CNA310	1	0.26	0.02	0.28
C310	C310 - Cessna 310	D	CNA310	1	0.27	0.01	0.28
C310	C310 - Cessna 310	T	CNA310	1	0.12	-	0.12
C335	C335 - Cessna 335 Twin Piston MEVP	T	CNA335	1	0.15	-	0.15
C340	C340 - Cessna 340	A	CNA340	1	0.59	0.04	0.63
C340	C340 - Cessna 340	D	CNA340	1	0.60	0.03	0.63
C340	C340 - Cessna 340	T	CNA340	1	0.15	-	0.15
C400	C400 - Cessna 400 Corvalis/Lancair LC41/Columbia 400	T	GASEPV	1	0.18	-	0.18
C414	C414 - Cessna Chancellor 414	A	CNA414	1	0.29	0.02	0.31
C414	C414 - Cessna Chancellor 414	D	CNA414	1	0.29	0.01	0.31
C421	C421 - Cessna Golden Eagle 421	A	CNA421	1	1.19	0.08	1.27

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Fleet and Average Daily Operations - 2026

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
C421	C421 - Cessna Golden Eagle 421	D	CNA421	1	1.21	0.06	1.27
C421	C421 - Cessna Golden Eagle 421	T	CNA421	1	0.15	-	0.15
C441	C441 - Cessna Conquest	A	CNA441	1	0.17	0.01	0.18
C441	C441 - Cessna Conquest	D	CNA441	1	0.17	0.01	0.18
C500	C500 - Cessna 500/Citation I	A	CNA500	1	0.01	0.00	0.01
C500	C500 - Cessna 500/Citation I	D	CNA500	1	0.01	0.00	0.01
C501	C501 - Cessna I/SP	A	CNA501	1	0.01	0.00	0.02
C501	C501 - Cessna I/SP	D	CNA501	1	0.01	0.00	0.02
C525	C525 - Cessna CitationJet/CJ1	A	CNA525C	1	0.18	0.01	0.19
C525	C525 - Cessna CitationJet/CJ1	D	CNA525C	1	0.18	0.01	0.19
C550	C550 - Cessna Citation II/Bravo	A	CNA55B/CNA550	1	0.14	0.01	0.15
C550	C550 - Cessna Citation II/Bravo	D	CNA55B/CNA550	1	0.14	-	0.14
C550	C550 - Cessna Citation II/Bravo	D	CNA55B/CNA550	3	-	0.01	0.01
C560	C560 - Cessna Citation V/Ultra/Encore	A	CNA560E/CNA560U	1	0.22	0.01	0.23
C560	C560 - Cessna Citation V/Ultra/Encore	D	CNA560E/CNA560U	1	0.09	0.01	0.10
C560	C560 - Cessna Citation V/Ultra/Encore	D	CNA560E/CNA560U	2	0.11	0.01	0.13
C56X	C56X - Cessna Excel/XLS	A	CNA560XL	1	0.42	0.02	0.44
C56X	C56X - Cessna Excel/XLS	D	CNA560XL	1	0.16	-	0.16
C56X	C56X - Cessna Excel/XLS	D	CNA560XL	2	0.23	-	0.23
C56X	C56X - Cessna Excel/XLS	D	CNA560XL	3	-	0.05	0.05
C650	C650 - Cessna III/VI/VII	A	CNA650	1	0.15	0.01	0.16
C650	C650 - Cessna III/VI/VII	D	CNA650	1	0.15	0.01	0.16
C680	C680 - Cessna Citation Sovereign	A	CNA680	1	0.14	0.01	0.14
C680	C680 - Cessna Citation Sovereign	D	CNA680	1	0.13	0.02	0.14
C750	C750 - Cessna Citation X	A	CNA750	1	0.21	0.01	0.22
C750	C750 - Cessna Citation X	D	CNA750	1	0.11	0.01	0.13
C750	C750 - Cessna Citation X	D	CNA750	2	0.09	0.01	0.09
C82R	C82R - Cessna Skylane RG	A	CNA182	1	0.53	0.04	0.57
C82R	C82R - Cessna Skylane RG	D	CNA182	1	0.54	0.03	0.57
CH75	CH75 - Zenith STOL CH-750	T	GASEPV	1	0.18	-	0.18
CH7A	CH7A - Aeronca Model 7 Champion	T	GASEPF	1	0.18	-	0.18
CL30	CL30 - Bombardier (Canadair) Challenger 300	A	BD100	1	0.36	0.02	0.38
CL30	CL30 - Bombardier (Canadair) Challenger 300	D	BD100	1	0.34	0.04	0.38
CL35	CL35 - Bombardier Challenger 300	A	CL600	1	0.02	0.00	0.02

Table 2

Fleet and Average Daily Operations - 2026

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
CL35	CL35 - Bombardier Challenger 300	D	CL600	1	0.02	0.00	0.02
CL35	CL35 - Bombardier Challenger 300	D	CL600	4	-	0.00	0.00
CL60	CL60 - Bombardier Challenger 600/601/604	A	CL600/CL601	1	0.28	0.02	0.30
CL60	CL60 - Bombardier Challenger 600/601/604	D	CL600/CL601	2	0.14	0.01	0.15
CL60	CL60 - Bombardier Challenger 600/601/604	D	CL600/CL601	4	0.14	0.01	0.15
CLDS	CLDS - Rearwin Cloudster 8090/8125/8235	T	GASEPF	1	0.18	-	0.18
COL3	COL3 - Lancair LC-40 Columbia 400	A	GASEPV	1	0.85	0.06	0.91
COL3	COL3 - Lancair LC-40 Columbia 400	D	GASEPV	1	0.87	0.04	0.91
COL3	COL3 - Lancair LC-40 Columbia 400	T	GASEPV	1	0.31	-	0.31
COL4	COL4 - Lancair LC-41 Columbia 400	A	GASEPV	1	1.44	0.10	1.54
COL4	COL4 - Lancair LC-41 Columbia 400	D	GASEPV	1	1.46	0.07	1.54
COZY	COZY - AeroCad AeroCanard	T	GASEPF	1	0.18	-	0.18
DA40	DA40 - Diamond Star DA40	A	GASEPV	1	0.21	0.01	0.23
DA40	DA40 - Diamond Star DA40	D	GASEPV	1	0.22	0.01	0.23
DA40	DA40 - Diamond Star DA40	T	GASEPV	1	0.28	-	0.28
DFLY	DFLY - Viking Dragonfly	T	GASEPF	1	0.18	-	0.18
DH8B	DH8B - Bombardier DHC8-200	A	DHC8/DHC830	1	0.12	0.01	0.13
DH8B	DH8B - Bombardier DHC8-200	D	DHC8/DHC830	1	0.12	0.01	0.13
E135	E135 - Embraer ERJ 135/140/Legacy	A	EMB135	1	0.03	0.00	0.03
E135	E135 - Embraer ERJ 135/140/Legacy	D	EMB135	1	0.03	0.00	0.03
E50P	E50P - Embraer Phenom 100	A	CNA510	1	0.21	0.01	0.22
E50P	E50P - Embraer Phenom 100	D	CNA510	1	0.07	0.00	0.07
E50P	E50P - Embraer Phenom 100	D	CNA510	2	0.14	0.01	0.15
E55P	E55P - Embraer Phenom 300	A	CNA560E	1	1.07	0.07	1.14
E55P	E55P - Embraer Phenom 300	D	CNA560E	1	0.78	0.03	0.81
E55P	E55P - Embraer Phenom 300	D	CNA560E	2	0.28	0.04	0.33
EA50	EA50 - Eclipse 500	A	ECLIPSE500	1	0.03	0.00	0.04
EA50	EA50 - Eclipse 500	D	ECLIPSE500	1	0.03	0.00	0.04
EAGL	EAGL - Christen/Aviat Eagle	T	GASEPF	1	0.18	-	0.18
EC20	EC120 - Eurocopter EC-120	A	SA341G	1	5.87	0.04	5.91
EC20	EC120 - Eurocopter EC-120	D	SA341G	1	5.88	0.03	5.91
EC35	EC135 - Eurocopter EC-135	A	EC130	1	1.47	0.01	1.48
EC35	EC135 - Eurocopter EC-135	D	EC130	1	1.47	0.01	1.48
EC45	EC45 - Eurocopter EC-145	A	B429	1	0.07	-	0.07

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Fleet and Average Daily Operations - 2026

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
EC45	EC45 - Eurocopter EC-145	D	B429	1	0.07	-	0.07
ERCO	ERCO - ErCoupe	T	GASEPF	1	0.18	-	0.18
F2TH	F2TH - Dassault Falcon 2000	A	FAL20A	1	0.41	0.03	0.44
F2TH	F2TH - Dassault Falcon 2000	D	FAL20A	1	0.22	0.02	0.24
F2TH	F2TH - Dassault Falcon 2000	D	FAL20A	2	0.19	0.01	0.20
F900	F900 - Dassault Falcon 900	A	FAL900	1	0.03	0.00	0.03
F900	F900 - Dassault Falcon 900	D	FAL900	1	0.03	0.00	0.03
FA50	FA50 - Dassault Falcon/Mystère 50	A	FAL50	1	0.03	0.00	0.03
FA50	FA50 - Dassault Falcon/Mystère 50	D	FAL50	2	0.03	0.00	0.03
G109	G109 - Burkhart Grob G109	T	GASEPV	1	0.18	-	0.18
G115	G115 - Burkhart Grob G115	T	GROB15	1	0.18	-	0.18
G150	G150 - Gulfstream G150	A	G150	1	0.21	0.01	0.23
G150	G150 - Gulfstream G150	D	G150	1	0.06	0.00	0.07
G150	G150 - Gulfstream G150	D	G150	2	0.09	0.00	0.09
G150	G150 - Gulfstream G150	D	G150	3	0.06	0.00	0.07
G202	G202 - Gearhardt J Giles G202	T	GASEPF	1	0.18	-	0.18
G280	G280 - Gulfstream G280	A	CL601	1	0.02	0.00	0.02
G280	G280 - Gulfstream G280	D	CL601	1	0.02	0.00	0.02
G2T1	G2T1 - Great Lakes Sport Trainer	T	GSPORT	1	0.18	-	0.18
GA7	GA7 - Grumman American Cougar	A	GA7	1	0.70	0.05	0.74
GA7	GA7 - Grumman American Cougar	D	GA7	1	0.71	0.04	0.74
GA7	GA7 - Grumman American Cougar	T	GA7	1	0.37	-	0.37
GA8	GA8 - Gippsland GA-8 Airvan	A	CNA206	1	0.03	0.00	0.03
GA8	GA8 - Gippsland GA-8 Airvan	D	CNA206	1	0.02	0.00	0.03
GALX	GALX - IAI 1126 Galaxy/Gulfstream G200	A	G200	1	0.29	0.02	0.31
GALX	GALX - IAI 1126 Galaxy/Gulfstream G200	D	G200	1	0.06	0.00	0.06
GALX	GALX - IAI 1126 Galaxy/Gulfstream G200	D	G200	2	0.24	0.01	0.25
GLEX	GLEX - Bombardier BD-700 Global Express	A	BD700	1	0.09	0.01	0.09
GLEX	GLEX - Bombardier BD-700 Global Express	D	BD700	1	0.04	0.00	0.05
GLEX	GLEX - Bombardier BD-700 Global Express	D	BD700	4	0.04	0.00	0.05
GLF4	GLF4 - Gulfstream IV/G400	A	GIV	1	0.47	0.03	0.50
GLF4	GLF4 - Gulfstream IV/G400	D	GIV	1	0.35	0.02	0.37
GLF4	GLF4 - Gulfstream IV/G400	D	GIV	3	0.12	0.01	0.12
GLF5	GLF5 - Gulfstream V/G500	A	GV	1	0.16	0.01	0.17

Table 2

Fleet and Average Daily Operations - 2026

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
GLF5	GLF5 - Gulfstream V/G500	D	GV	1	0.11	0.01	0.12
GLF5	GLF5 - Gulfstream V/G500	D	GV	3	0.05	0.00	0.06
H25B	H25B - BAe HS 125/700-800/Hawker 800	A	HS1258	1	0.20	0.01	0.21
H25B	H25B - BAe HS 125/700-800/Hawker 800	D	HS1258	1	0.20	0.02	0.21
H60	H60 - Sikorsky SH-60 Seahawk	A	S70	1	0.07	-	0.07
H60	H60 - Sikorsky SH-60 Seahawk	D	S70	1	0.07	-	0.07
LC42	LC42 - Cessna 350 Corvalis/Lancair LC42	T	GASEPV	1	0.18	-	0.18
LGEZ	LGEZ - Rutan 61 Long-EZ	T	GASEPF	1	0.18	-	0.18
LJ31	LJ31 - Bombardier Learjet 31/A/B	A	LEAR31	1	0.04	0.00	0.04
LJ31	LJ31 - Bombardier Learjet 31/A/B	D	LEAR31	1	0.04	0.00	0.04
LJ35	LJ35 - Bombardier Learjet 35/36	A	LEAR35	1	0.07	0.00	0.08
LJ35	LJ35 - Bombardier Learjet 35/36	D	LEAR35	1	0.07	0.00	0.08
LJ40	LJ40 - Learjet 40; Gates Learjet	A	LEAR35	1	0.08	0.01	0.09
LJ40	LJ40 - Learjet 40; Gates Learjet	D	LEAR35	1	0.08	0.00	0.09
LJ45	LJ45 - Bombardier Learjet 45	A	LEAR45	1	0.13	0.01	0.14
LJ45	LJ45 - Bombardier Learjet 45	D	LEAR45	2	0.13	0.01	0.14
LJ60	LJ60 - Bombardier Learjet 60	A	LEAR60	1	0.35	0.02	0.37
LJ60	LJ60 - Bombardier Learjet 60	D	LEAR60	1	0.18	0.01	0.19
LJ60	LJ60 - Bombardier Learjet 60	D	LEAR60	2	0.18	0.01	0.19
LJ75	LJ75 - Learjet 75	A	LEAR45	1	0.24	0.02	0.26
LJ75	LJ75 - Learjet 75	D	LEAR45	1	0.24	0.01	0.26
M020	M020 - Mooney Mark 20 Series	T	M20J	1	0.46	-	0.46
M20C	M20C - Mooney Mark 20 Series	T	M20J	1	0.36	-	0.36
M20F	M20F - Mooney Mark 20 Series	T	M20J	1	0.36	-	0.36
M20J	M20J - Mooney Mark 20 Series	T	M20J	1	0.61	-	0.61
M20K	M20K - Mooney 252TSE (M20K)	T	M20K	1	0.36	-	0.36
M20P	M20P - Mooney M-20C Ranger	A	M20J	1	0.87	0.06	0.93
M20P	M20P - Mooney M-20C Ranger	D	M20J	1	0.89	0.04	0.93
M20T	M20T - Turbo Mooney M20K	A	M20J	1	1.11	0.08	1.18
M20T	M20T - Turbo Mooney M20K	D	M20J	1	1.12	0.06	1.18
M20T	M20T - Turbo Mooney M20K	T	M20J	1	0.18	-	0.18
MOR2	MOR2 - Varga 2150 Kachina	T	GASEPF	1	0.18	-	0.18
MU2	MU2 - Mitsubishi Marquise/Solitaire	A	MU2	1	0.02	0.00	0.02
MU2	MU2 - Mitsubishi Marquise/Solitaire	D	MU2	1	0.01	0.00	0.02
NAVI	NAVI - Ryan L-17/U-18 Navion	T	M20J	1	0.18	-	0.18

Table 2

Fleet and Average Daily Operations - 2026

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
P28A	P28A - Piper Cherokee	A	PA28/GASEPF	1	1.91	0.13	2.04
P28A	P28A - Piper Cherokee	D	PA28/GASEPF	1	1.94	0.10	2.04
P28R	P28R - Cherokee Arrow/Turbo	A	PA28CA	1	0.46	0.03	0.49
P28R	P28R - Cherokee Arrow/Turbo	D	PA28CA	1	0.47	0.02	0.49
P28T	P28T - Piper PA-28R-180/200/201 Cherokee Arrow I/II/III	T	GASEPF	1	1.20	-	1.20
P32R	P32R - Piper 32	A	GASEPV	1	0.15	0.01	0.16
P32R	P32R - Piper 32	D	GASEPV	1	0.15	0.01	0.16
P32R	P32R - Piper 32	T	GASEPV	1	0.46	-	0.46
P46T	P46T - Piper Malibu Meridian	A	CNA208	1	0.08	0.01	0.09
P46T	P46T - Piper Malibu Meridian	D	CNA208	1	0.08	0.00	0.09
PA11	PA11 - Cub Crafters CC-11 Carbon Cub/ Sport Cub	T	GASEPF	1	0.18	-	0.18
PA20	PA20 - Piper PA-20 Pacer	T	GASEPF	1	0.36	-	0.36
PA24	PA24 - Piper PA-24 Comanche	T	PA24	1	0.12	-	0.12
PA27	PA27 - Piper Aztec	A	BEC58P	1	0.13	0.01	0.14
PA27	PA27 - Piper Aztec	D	BEC58P	1	0.07	0.00	0.07
PA27	PA27 - Piper Aztec	D	BEC58P	2	0.07	0.00	0.07
PA28	PA28 - Piper Cherokee	A	PA28	1	0.35	0.02	0.37
PA28	PA28 - Piper Cherokee	D	PA28	1	0.35	0.02	0.37
PA28	PA28 - Piper Cherokee	T	GASEPF	1	2.00	-	2.00
PA30	PA30 - Piper PA-30	A	PA30	1	0.12	0.01	0.13
PA30	PA30 - Piper PA-30	D	PA30	1	0.13	0.01	0.13
PA30	PA30 - Piper PA-30	T	GASEPV	1	0.12	-	0.12
PA31	PA31 - Piper Navajo PA-31	A	PA31	1	1.11	0.08	1.18
PA31	PA31 - Piper Navajo PA-31	D	PA31	1	1.13	0.06	1.18
PA31	PA31 - Piper Navajo PA-31	T	GASEPV	1	0.31	-	0.31
PA32	PA32 - Piper Cherokee Six	A	GASEPV	1	1.14	0.08	1.22
PA32	PA32 - Piper Cherokee Six	D	GASEPV	1	1.16	0.06	1.22
PA32	PA32 - Piper Cherokee Six	T	GASEPV	1	1.83	-	1.83
PA34	PA34 - Piper PA-34 Seneca	A	PA34	1	0.41	0.03	0.44
PA34	PA34 - Piper PA-34 Seneca	D	PA34	1	0.42	0.02	0.44
PA34	PA34 - Piper PA-34 Seneca	T	PA34	1	0.51	-	0.51
PA38	PA38 - Piper PA-38 Tomahawk	T	PA38	1	0.18	-	0.18
PA46	PA46 - Piper Malibu	A	PA46	1	0.82	0.06	0.88
PA46	PA46 - Piper Malibu	D	PA46	1	0.42	0.02	0.44
PA46	PA46 - Piper Malibu	D	PA46	2	0.42	0.02	0.44

Table 2
Fleet and Average Daily Operations - 2026

Aircraft Code	Aircraft Description	Operation Type	Noise Aircraft	Stage Length	Day Ops	Night Ops	Total Ops
PA60	PA60 - Piper PA-60/PA-61 Aerostar (Aerostar 600/700)	T	PA60	1	0.37	-	0.37
PARC	PARC - Piper PA-28-180/181 Cherokee Archer	T	GASEPV	1	0.54	-	0.54
PC12	PC12 - Pilatus PC-12	A	PC12	1	0.54	0.03	0.57
PC12	PC12 - Pilatus PC-12	D	PC12	1	0.26	0.04	0.31
PC12	PC12 - Pilatus PC-12	D	PC12	2	0.26	-	0.26
PRM1	PRM1 - Raytheon Premier 1/390 Premier 1	A	R390	1	0.04	0.00	0.04
PRM1	PRM1 - Raytheon Premier 1/390 Premier 1	D	R390	2	0.04	0.00	0.04
R22	R22 - Robinson R22B w/Lycoming 0320	A	R22	1	2.84	-	2.84
R22	R22 - Robinson R22B w/Lycoming 0320	D	R22	1	2.84	-	2.84
RV4	RV4 - Van's Aircraft RV-4	T	GASEPF	1	0.18	-	0.18
RV6	RV6 - Vans RV-6	T	GASEPV	1	0.36	-	0.36
RV7A	RV7A - Van's Aircraft RV-7/RV-7A	T	GASEPV	1	0.18	-	0.18
RV8	RV8 - Vans RV-8	T	GASEPV	1	0.18	-	0.18
S76	S76 - Sikorsky S-76	A	S76	1	0.02	0.00	0.02
S76	S76 - Sikorsky S-76	D	S76	1	0.02	0.00	0.02
SA30	SA30 - STOLP SA-300 Starduster Too	T	GASEPV	1	0.18	-	0.18
SIRA	SIRA - Tecnam P2002 Sierra	T	GASEPF	1	0.18	-	0.18
SR20	SR20 - Cirrus SR-20	A	GASEPV	1	0.20	0.01	0.21
SR20	SR20 - Cirrus SR-20	D	GASEPV	1	0.20	0.01	0.21
SR22	SR22 - Cirrus SR 22	A	SR22	1	5.07	0.35	5.42
SR22	SR22 - Cirrus SR 22	D	SR22	1	5.14	0.28	5.42
SR22	SR22 - Cirrus SR 22	T	SR22	1	1.15	-	1.15
SW4	SW4 - Swearingen Merlin 4/4A Metro2	A	SAMER4	1	0.16	0.01	0.17
SW4	SW4 - Swearingen Merlin 4/4A Metro2	D	SAMER4	1	0.14	0.03	0.17
TBM8	TBM8 - Socata TBM-850	A	CNA208	1	0.03	0.00	0.03
TBM8	TBM8 - Socata TBM-850	D	CNA208	1	0.03	0.00	0.03
YK52	YK52 - Aerostar Yak-52/54	T	GASEPV	1	0.18	-	0.18
Z42	Z42 - Moravan Zlin Z-242	A	GASEPV	1	0.43	0.03	0.46
Z42	Z42 - Moravan Zlin Z-242	D	GASEPV	1	0.44	0.02	0.46
Grand Total					183.50	6.34	189.84

Sources: FAA TAF 2015, OPSNET, TFMS-C, Flight Explorer, and HNTB Analysis 2016