

I Noise Analysis Technical Report

Appendix to the Draft Environmental Assessment for ATAAPS

October 2026

Prepared by:
United States Department of Transportation
Federal Aviation Administration



Anchorage, Alaska

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1 Introduction

This technical report describes noise modeling conducted for the Anchorage Terminal Airspace and Procedures Study (ATAAPS). This report contains:

- Noise analysis objectives (Section 2)
- Noise model and inputs (Section 3)
- Noise modeling procedures (Section 4)
- Noise analysis (Section 5)
- Supplements (Section 6)

The following describes the criteria used to identify potential noise impacts. Further information on the fundamentals of noise is provided in the Draft Environmental Analysis (DEA), Appendix F, *Basics of Noise*.

1.1 Noise Impact Criteria

The Federal Aviation Administration (FAA) has considered and identified threshold levels above which aircraft noise causes an adverse impact to people. The agency has determined that a significant impact occurs if a proposed action would result in an increase of Day-Night Average Sound Level¹ (DNL) 1.5 decibels (dB) or higher on noise-sensitive areas exposed to DNL 65 dB or higher levels.

In 1992, the Federal Interagency Committee on Noise (FICON) recommended that noise increases of DNL 3 dB or higher in areas with exposure levels between DNL 60 and 65 dB be evaluated in environmental studies when increases of DNL 1.5 dB or higher occur at noise-sensitive locations with exposure levels at or above DNL 65 dB. Increases of this magnitude in areas with noise exposure levels below DNL 65 dB are not to be considered as “significant impacts,” but are reportable changes and receive further consideration. FICON’s recommendation has been adopted by the FAA into FAA Order 1050.1G, *Environmental Impacts: Policies and Procedures*.

In 1990, the FAA issued a noise screening procedure for determining whether certain airspace actions at or above 3,000 feet (ft) above ground level (AGL) might result in increases to DNL levels of 5 dB or higher. The noise screening procedure was issued in response to FAA experience that increases in noise of DNL 5 dB or higher at cumulative levels well below DNL 65 dB could be disturbing to people and become a source of public concern. In the Environmental Impact Statement (EIS) for the Expanded East Coast Plan (EECP), the FAA evaluated noise levels down to the DNL 45 dB level for potential increases in DNL noise exposure of 5 dB or higher. In the EECP study, the FAA determined that the DNL 45 dB level is the minimum level at which noise needs to be considered because “even distant ambient noise sources and natural sounds such as wind in trees can easily exceed this (DNL 45 dB) value.”² This threshold of change was subsequently used in the Chicago Terminal Airspace Project (CTAP) EIS and the

¹ The DNL metric represents noise as it occurs over a 24-hour period, with one important exception: DNL treats noise occurring at night differently from daytime noise. In determining DNL, the metric assumes that the A-weighted levels occurring at night (defined as 10 p.m. to 7 a.m.) are 10 dB louder than they actually are. This 10-dB increase is applied to account for the fact that there is a greater sensitivity to nighttime noise and events at night are often perceived to be more intrusive because nighttime ambient noise is less than daytime ambient noise.

² U.S. Department of Transportation, Federal Aviation Administration, Expanded East Coast Plan – *Changes in Aircraft Flight Patterns Over the State of New Jersey*, pp. 5-9. 1995.

Potomac Consolidated TRACON Airspace Redesign EIS. FAA Order 1050 memorialized the formal guidelines for evaluating noise impacts.

Increases of DNL 3 dB between DNL 60 and 65 dB and of DNL 5 dB between DNL 45 and 60 dB are considered reportable changes when evaluating air traffic actions such as the Proposed Action. The increase in noise at these levels may be enough to be noticeable and potentially disturbing to some people, but the cumulative noise level is not high enough to constitute a “significant impact.” Table 1 summarizes the criteria utilized to assess the level of change in noise exposure attributable to the alternative scenarios discussed in the DEA.

Table 1 Criteria for Determining Impact of Increases in Aircraft Noise

DNL Noise Exposure Level	Increase in DNL with Proposed Action	Aircraft Noise Exposure Change Consideration
DNL 65 and higher	DNL 1.5 dB or higher ¹	Exceeds Threshold of Significance
DNL 60 to 65	DNL 3.0 dB or higher ²	Information Disclosed When Evaluating Air Traffic Actions
DNL 45 to 60	DNL 5.0 dB or greater ³	Information Disclosed When Evaluating Air Traffic Actions

¹ FAA Order 1050.1G; Title 14 C.F.R. Part 150.21 (2)(d); Federal Interagency Committee on Noise, Federal Agency Review of Selected Airport Noise Issues, August 1992.

² FAA Order 1050.1G; Federal Interagency Committee on Noise, Federal Agency Review of Selected Airport Noise Issues, August 1992.

³ FAA Order 1050.1G.

Source: FAA Order 1050.1G, June 2025.

Prepared By: ATAC Corporation, September 2025.

2 Noise Analysis Objectives

The objective of the ATAAPS Noise Analysis is to analyze environmental impacts due to proposed airspace changes at the following airports:

- Ted Stevens Anchorage International Airport (ANC)
- Elmendorf Air Force Base (EDF)
- Kenai Municipal Airport (ENA)
- Bryant Army Airfield (FRN)
- Lake Hood Airport (LHD)
- Merrill Field Airport (MRI)
- Warren "Bud" Woods Palmer Municipal Airport (PAQ)
- Soldotna Airport (SXQ)

These airports are referred to as Study Airports. The following sections present objectives of the analysis performed throughout the ATAAPS DEA General Study Area (henceforth referred to as the Study Area), as well as the ATAAPS DEA Supplementary Study Area (henceforth referred to as the Supplementary Study Area).

2.1 Evaluate Changes in Noise Levels

The FAA has developed specific guidance and requirements for the assessment of aircraft noise to comply with National Environmental Policy Act (NEPA) requirements. This guidance, specified in FAA Order 1050.1G, requires that aircraft noise be analyzed in terms of the annual DNL metric. In practice, DNL levels are computed for an Average Annual Day (AAD) of operations for the year of interest. An AAD represents all aircraft operations for each day in a study year divided by the number of days in a year (usually 365). The AAD does not reflect a particular day, but is meant to represent a typical day over a period of a year.

Beyond requiring use of the DNL metric, the FAA endorses the use of supplemental noise metrics on a case-by-case basis to describe aircraft noise impacts for specific noise sensitive locations. No supplemental noise metrics were determined to be necessary for the DEA.

The FAA requires aircraft noise to be evaluated using one of several authorized computer noise models. Specifically, for air traffic actions such as those proposed with ATAAPS, the Aviation Environmental Design Tool (AEDT) 3e model and NOISEMAP are used. See **Section 3.1** for a description of the AEDT model and **Section 3.2** for a description of the NOISEMAP model.

Typical noise studies use noise exposure contours (typically color-coded lines on a base map indicating a constant value usually spaced in DNL 5-dB increments) to describe noise impacts in the immediate vicinity of airports (three to five miles). Noise levels are recorded in AEDT at one or more georeferenced receivers or grid points called receptors.

For this DEA, receptors are located in the Study Area (details regarding the creation of the Study Area are discussed in the DEA Section 1.2 *General Study Area*) in order to analyze current and future noise levels in the areas surrounding the study airports. Additional receptors are located in regions covered by aircraft operating to/from previously mentioned airports traveling up to 18,000 feet AGL encompassed by an area referred to as the Supplemental Study Area. These additional receptors serve as locations for potential noise impact analysis to meet criteria set

forth in Section 4(f) of the Department of Transportation Act of 1966³ (see **Section 2.3.2** for details). Noise results at receptors are used to determine if more detailed NEPA analysis is required.

Details regarding receptors, and groups of receptors called receptor sets, used for the DEA are discussed in **Sections 3.1.13** and **3.2.11**.

The following scenarios were evaluated:

1. 2022/2023 Existing Conditions – routes as flown in the time period spanning 10/1/2022 through 9/30/2023
2. 2027 Future No Action – routes as forecasted to be flown in the year 2027 if no Proposed Action airspace changes are implemented
3. 2027 Future Proposed Action – routes as forecasted to be flown in the year 2027 if the Proposed Action changes are implemented
4. 2032 Future No Action – routes as forecasted to be flown in the year 2032 if no Proposed Action airspace changes are implemented
5. 2032 Future Proposed Action – routes as forecasted to be flown in the year 2032 if the Proposed Action changes are implemented

The information disclosed in this study includes the maximum potential number of people exposed to DNL changes that meet or exceed the thresholds stated in **Table 1** for the scenarios previously listed.

2.2 Model All Traffic Routes

2.2.1 ATAAPS DEA General Study Area

Radar data from both the FAA Performance Data Analysis and Reporting System (PDARS) and Micro En Route Automated Radar Tracking System (MEARTS) data from October 1, 2022, through September 30, 2023 was obtained and processed. Overall, 377,423 radar flight tracks were used to evaluate and model typical traffic routes and flows throughout the Study Area. Radar data included all military and civilian Instrument Flight Rules (IFR)⁴ flights that operated at Study Airports, Visual Flight Rules (VFR)⁴ flights from Study Airports within the Part 93⁵ airspace, as well as VFR helicopter flights at MRI.

2.2.2 Between ATAAPS DEA General Study Area Boundary and ATAAPS DEA Supplemental Study Area

Radar flight tracks were used to evaluate and model traffic routes in areas beyond the Study Area boundary up to where IFR aircraft operate at or below 18,000 feet AGL (ATAAPS DEA

3 U.S. Department of Transportation. (1966). *Department of Transportation Act, Section 4(f)*, 49 U.S.C. § 303 (1966). <https://www.transportation.gov/>

4 Aircraft operate under two distinct categories of flight rules: Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). These flight rules generally correspond with two categories of weather conditions: Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC). VMC generally exist during fair to good weather with good visibility. IMC occur during periods when visibility falls to less than three statute miles or the ceiling (the distance from the ground to the bottom layer of clouds when the clouds cover more than 50 percent of the sky) drops to lower than 1,000 feet. Under VFR, pilots are able to fly whatever route they choose and are responsible to “see and avoid” other aircraft and obstacles such as terrain to maintain safe separation. Under IFR, ATC is responsible for providing separation from other aircraft and terrain, and pilots use cockpit instruments and radar to fly routes specified by ATC and to comply with ATC instructions. Pilots must follow IFR during IMC; however, due to various factors such as the general requirement for aircraft to operate under IFR in Class A airspace [i.e., en route airspace between 18,000 and 60,000 feet above Mean Sea Level (MSL)], the majority of commercial air traffic operates under IFR regardless of weather conditions.

5 Part 93 airspace is established under Title 14 of the Code of Federal Regulations Part 93 to regulate traffic in high-density or complex airspace.

Supplemental Study Area). FAA Order 1050.1G, *Environmental Impacts: Policies and Procedures*, Appendix C, Section C-1.3, provides that the study area for the noise analysis of a proposed change in air traffic procedures may extend up to 18,000 feet AGL if the proposed action or alternatives are over a national park or wildlife refuge where other noise is very low, and a quiet setting is a generally recognized attribute.

2.3 Model Day & Night Noise Levels

2.3.1 Population Centroids

Within the Study Area, a total of 5,598 individual population points were evaluated, representing a total population of 454,517 people. These points, each of which represents a specific number of people, are referred to as population centroids. Each centroid represents a census block, the smallest geographical unit for which the US Census maintains population data. The centroid with the lowest population has a count of one, and the centroid with the highest population has 1,637. Centroid locations and population counts were drawn by the US Census Bureau based on 2020 US Census data. For each of the five modeling scenarios (see Section 2.1), DNL values were calculated at all population centroids within the Study Area. Exhibit 1 depicts population centroids modeled within the Study Area.

2.3.2 Section 4(f) Resources and Historic and Cultural Resources

A grid point analysis was performed to evaluate noise levels at sites or lands potentially protected under Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. § 300 *et seq.*) (herein referred to as Section 4(f) properties or resources). For the purposes of this analysis, Section 4(f) resources include Section 106 historic resources listed or eligible for listing on the National Register of Historic Places under the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. § 470 *et seq.*, as amended). The Section 4(f) sites were initially identified as single point locations within the Supplemental Study Area. In some cases, the Section 4(f) properties covered a large area (usually large parks or wilderness areas) that were not well represented by a single point. In these cases, a uniformly spaced grid of points was defined over each area to provide adequate coverage. Exhibit 2 depicts the grid points modeled for Section 4(f) resources in the Supplemental Study Area.

A grid point analysis was also performed to evaluate noise levels as applicable at national parks, national wildlife refuges, and national wilderness areas that are outside of the Study Area, but within the Supplemental Study Area. These points are included in Exhibit 2.

2.3.3 0.5 NM Evenly Spaced Grid Points

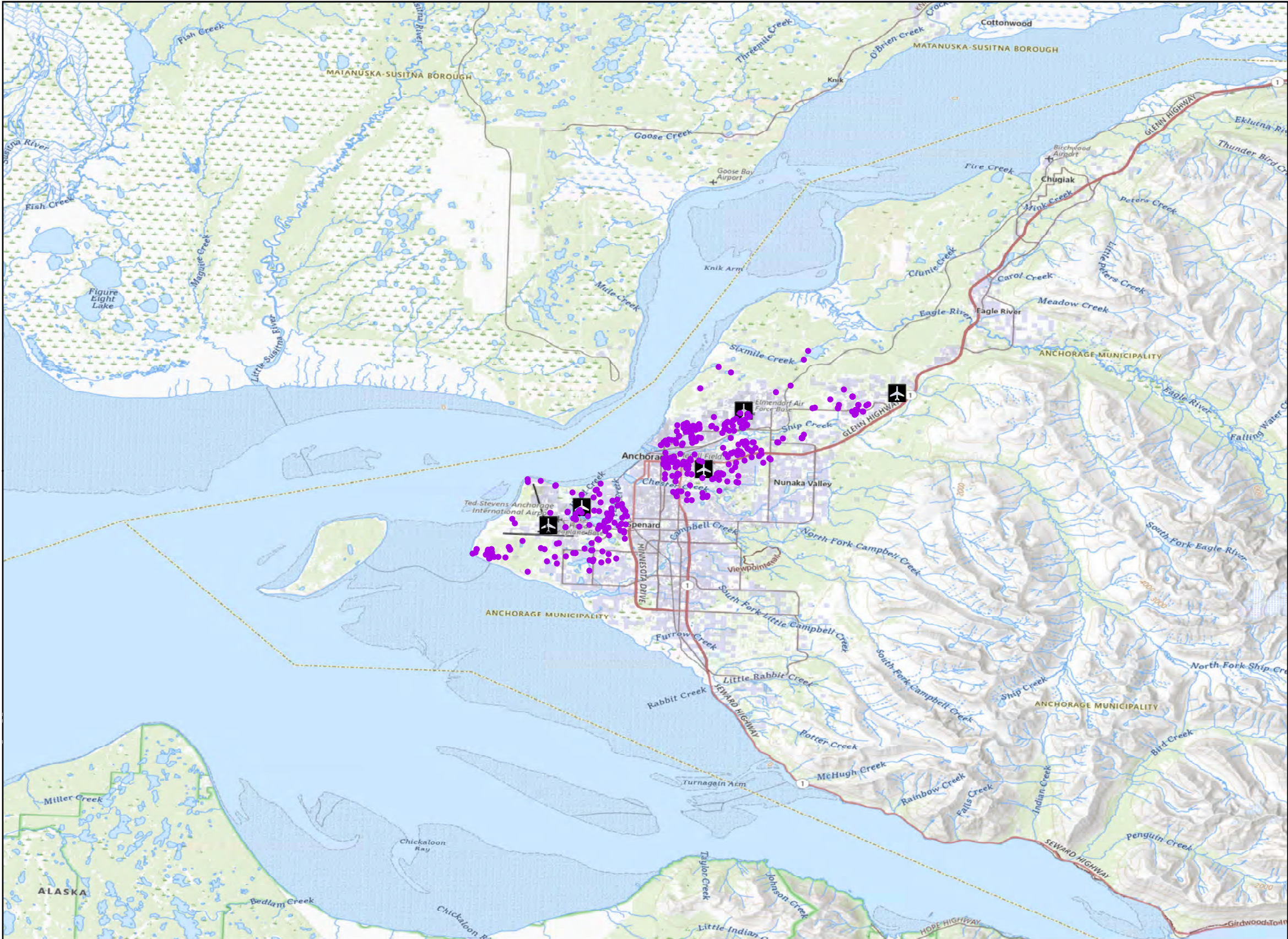
Another grid point analysis was performed to encompass the Supplemental Study Area. This analysis was done to capture the noise level changes in areas not covered by other grids. Grid points used for this analysis were evenly spaced in one-half NM intervals. Exhibit 3 depicts the 0.5 NM Evenly Spaced Grid Points.

2.3.4 Noise Sensitive Land Use Areas

Order 1050.1G Appendix C requires the FAA to identify the location and number of noise sensitive uses (e.g., schools, churches, hospitals, parks, recreation areas, etc.) in addition to residences that could be significantly impacted by noise.

The compatibility of noise sensitive uses is evaluated through comparison with the compatibility guidelines provided in 14 CFR Part 150, Appendix A, Table 1. The guidelines focus on areas exposed to noise levels of DNL 65 dB and greater.

The locations of these noise sensitive land use areas were identified and discussed in more detail in the DEA Section 4.2.1.3 *Noise Sensitive Areas and Uses*. **Exhibit 4** depicts grid points identified to represent the noise sensitive land use areas.



- Noise Sensitive Land Use
- General Study Area
- Study Airport
- US State Tiger Line

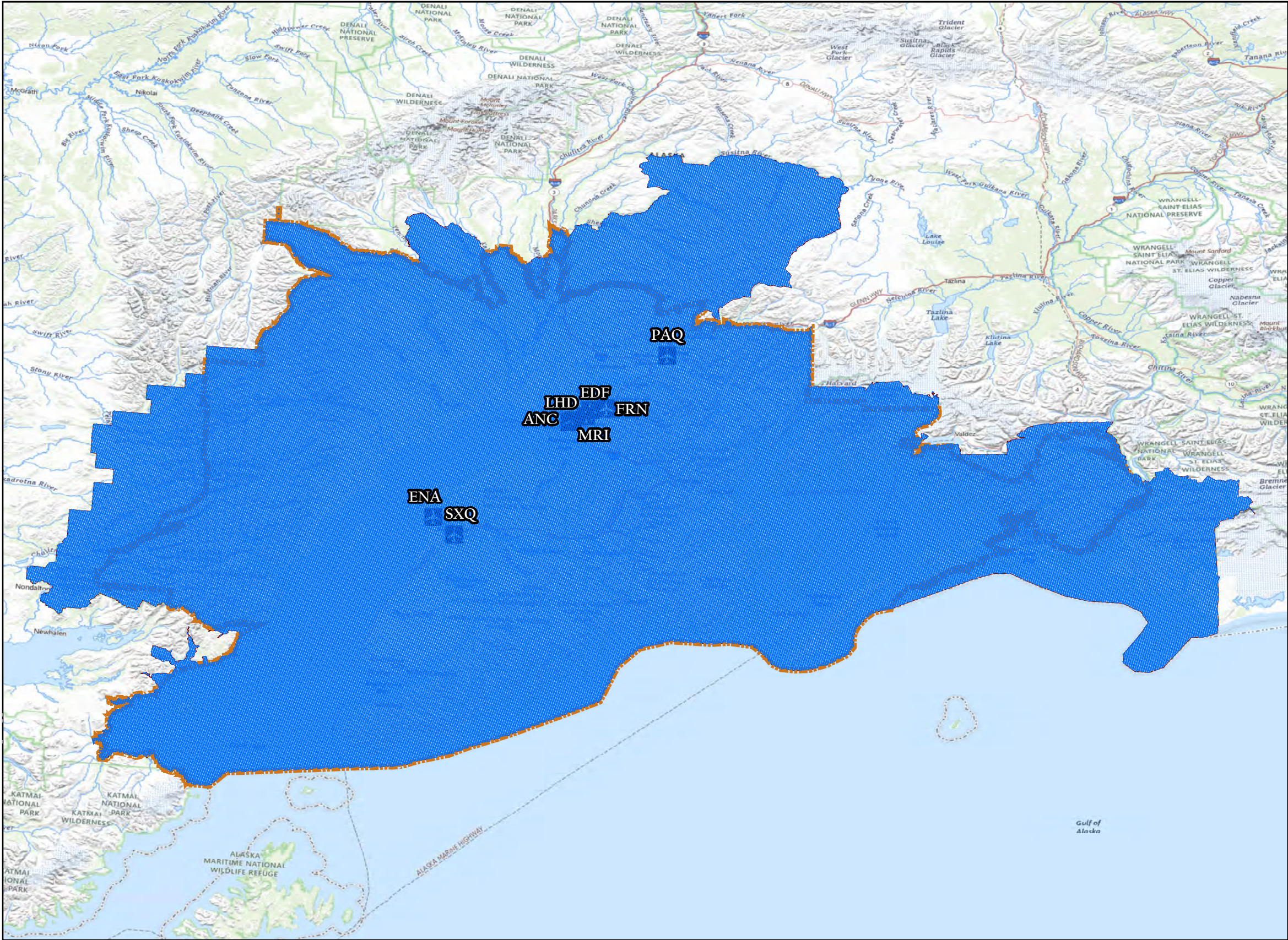
Notes:
Airport Identifier and Name:
ANC - Ted Stevens Anchorage International Airport
EDF - Elmendorf Air Force Base
ENA - Kenai Municipal Airport
FRN - Bryant Army Airfield
LHD - Lake Hood Seaplane Base
MRI - Merrill Field
PAQ - Palmer Airport
SXQ - Soldotna Airport

Projection: GCS North American 1983
Scale: 1:2,631,162

0 0.75 1.5 3 Miles



Sources: USGS The National Map: National Boundaries Dataset, National Elevation Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset: U.S. Census Bureau TIGER/Line; HERE Road Data.
Federal Aviation Administration, NFDC/CIFP airspace boundaries, waypoints and airports. ATAC Corp. AEDT 3e Existing Conditions census centroid noise results
Prepared by: ATAC Corporation, October 2026.



Legend

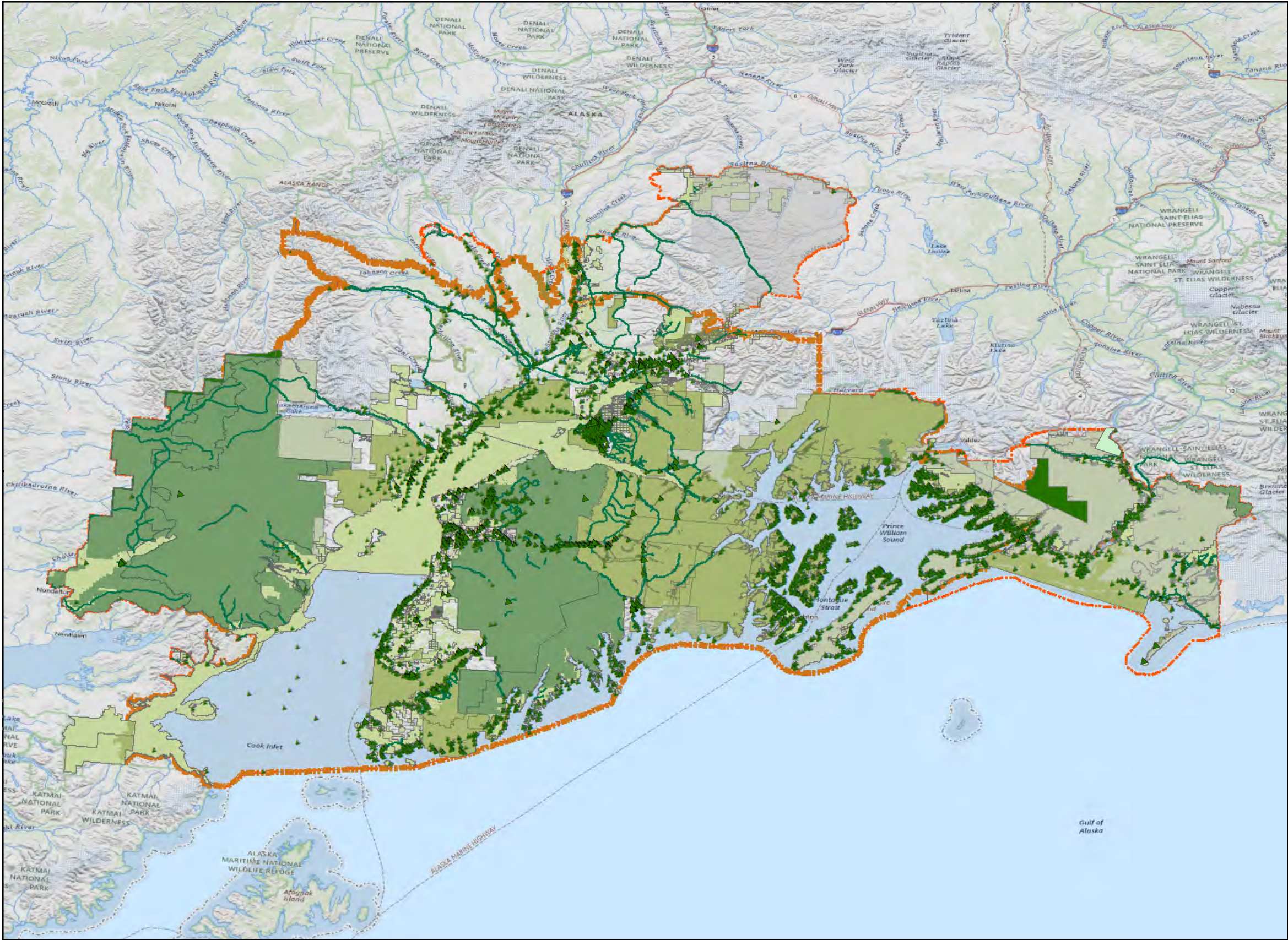
- 0.5 NM Evenly-Spaced Grid Point
- General Study Area
- 18K Supplemental Boundary
- Study Airport Legend
- US State Tiger Line Boundary

Notes:
Airport Identifier and Name:
 ANC - Ted Stevens Anchorage International Airport
 EDF - Elmendorf Air Force Base
 ENA - Kenai Municipal Airport
 FRN - Bryant Army Airfield
 LHD - Lake Hood Seaplane Base
 MRI - Merrill Field
 PAQ - Palmer Airport
 SXQ - Soldotna Airport

Projection: GCS North American 1983
 Scale: 1:2,631,162

0 5 10 20 Miles

Sources: USGS The National Map: National Boundaries Dataset, National Elevation Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset: U.S. Census Bureau TIGER/Line; HERE Road Data.
Federal Aviation Administration, NFDC/CIFP airspace boundaries, waypoints and airports. ATAC Corp. AEDT 3e Existing Conditions census centroid noise results
Prepared by: ATAC Corporation, October 2026.



LEGEND

- Section 4F, Section 106, Cultural, Historic Resource Points
- Section 4F, Section 106, Cultural, Historic Resource Lines
- Terrestrial 1 - managed for biodiversity - disturbance events proceed or are mimicked
- Terrestrial 2 - managed for biodiversity - disturbance events suppressed
- Terrestrial 3 - managed for multiple uses - subject to extractive (e.g. mining or logging) or OHV use
- Marine Area, 1 - managed for biodiversity - disturbance events proceed or are mimicked
- Marine Area, 2 - managed for biodiversity - disturbance events suppressed
- Marine Area, 3 - managed for multiple uses - subject to extractive (e.g. mining or logging) or OHV use
- Other Section 4F, Section 106, Cultural, Historic Resource Areas
- Tuxedni
- General Study Area
- 18K Supplemental Boundary
- US State Tiger Line Boundary

Notes:
Airport Identifier and Name:
ANC - Ted Stevens Anchorage International Airport
EDF - Elmendorf Air Force Base
ENA - Kenai Municipal Airport
FRN - Bryant Army Airfield
LHD - Lake Hood Seaplane Base
MRI - Merrill Field
PAQ - Palmer Airport
SXQ - Soldotna Airport

Projection: GCS North American 1983
Scale: 1:2,631,162

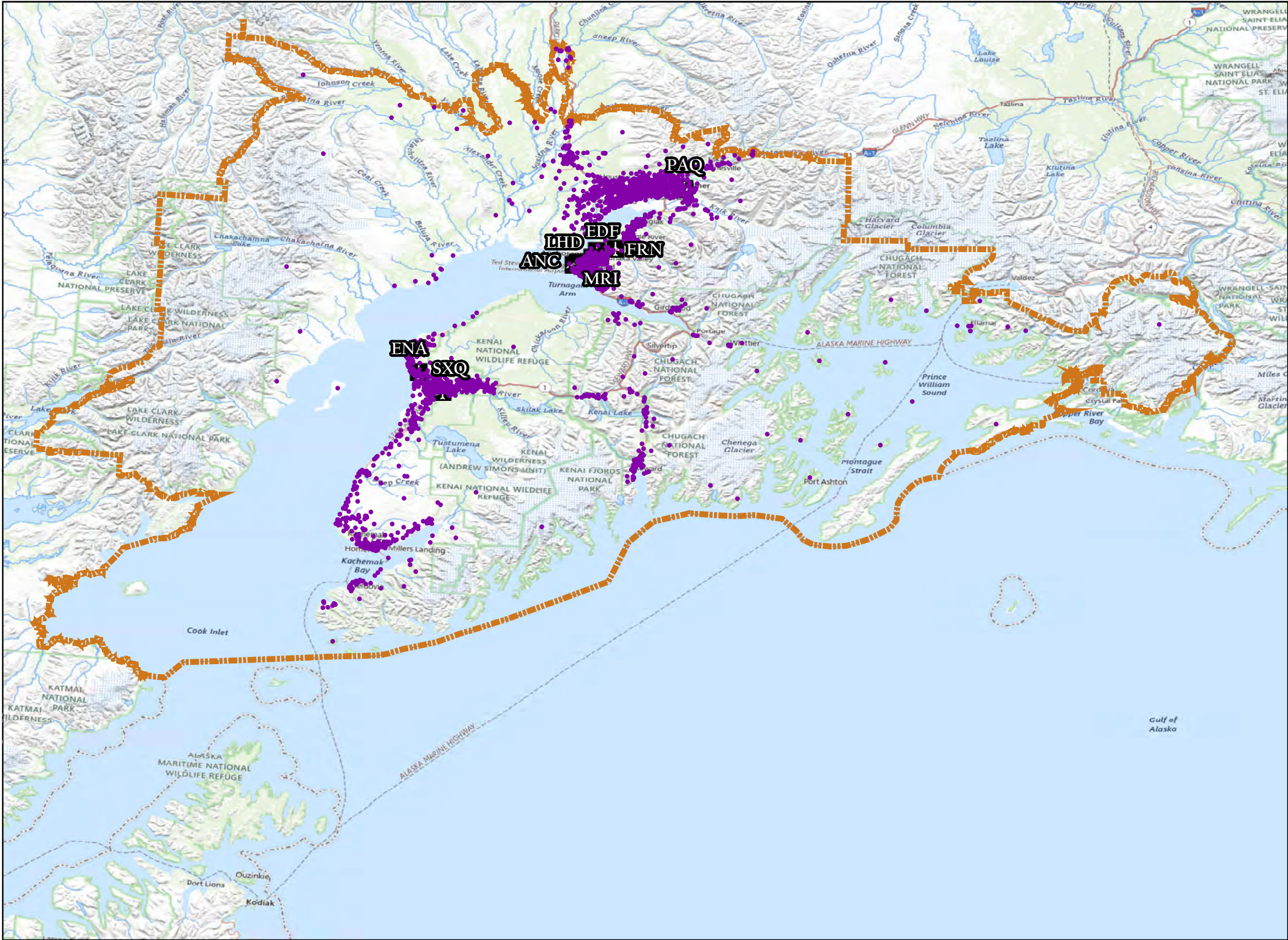
0 5 10 20 Miles



Sources: USGS The National Map: National Boundaries Dataset, National Elevation Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau TIGER/Line; HERE Road Data.
Federal Aviation Administration, NFD/CIFP airspace boundaries, waypoints and airports. For a complete listing of section 4(f) and 106 resources see table S4.1 in the Noise Technical Report.
Prepared by: ATAC Corporation, October 2026.

Exhibit 2

Section 4(f) Points in the 18K Supplemental Boundary Area



- Census Block Centroid Points in the ATAAPS General Study Area
- General Study Area
- Study Airport Legend
- US State Tiger Line Boundary

Notes:
Airport Identifier and Name:
ANC - Ted Stevens Anchorage International Airport
EDF - Elmendorf Air Force Base
ENA - Kenai Municipal Airport
FRN - Bryant Army Airfield
LHD - Lake Hood Seaplane Base
MRI - Merrill Field
PAQ - Palmer Airport
SXQ - Soldotna Airport

Projection: GCS North American 1983
Scale: 1:2,631,162

0 1.25 2.5 5 Miles

Sources: USGS The National Map: National Boundaries Dataset, National Elevation Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset: U.S. Census Bureau TIGER/Line; HERE Road Data.
Federal Aviation Administration, NFDC/CIFP airspace boundaries, waypoints and airports. US Census Bureau, Census Centroids.
Prepared by: ATAC Corporation, October 2026.

2.4 Use Standard Profiles with Targeted Altitudes

Aircraft operate in accordance with standardized air traffic control procedures. To model existing and proposed procedures, aircraft profiles were designed to meet target altitudes along the trajectory. These targeted altitudes were set by either air traffic control, airspace procedure restrictions, or recommended and approved by subject matter experts. See **Sections 3.1.8** and **3.2.8** for details.

2.5 Identify and Quantify Noise Changes and Causes Thereof

DNL noise levels were calculated for each centroid and grid point, and differences in noise exposure between the Proposed Action and the No Action for each of the future analysis years were quantified. Any significant or reportable noise changes are explained in **Section 5**. The criteria set to meet this objective are described in **Section 1.1**, *Noise Impact Criteria*.

2.6 Produce Easily Interpreted and Informative Tables and Graphics of Results

The complexity (number of flight routes, airports, operations, etc.) of the study created challenges in reporting noise modeling results in a useful format for analysis. Tables and graphics were designed to provide data that would be understandable to the general public.

3 Noise Models & Inputs

The FAA requires that aircraft noise be evaluated using authorized computer noise models. This project includes six civilian airports (ANC, ENA, LHD, MRI, PAQ, and SXQ), and two military airfields (EDF and FRN). For this reason, two separate noise modeling tools were used. For ANC, ENA, LHD, MRI, PAQ, and SXQ, AEDT version 3e model was used (see **Section 3.1**). Furthermore, helicopter operations at MRI exceed the 10 annual daily average thresholds, and are thus required to be included in the noise model in accordance to the FAA 1050.1 Desk Reference Section 11.1.2.⁶ Due to the differences in the modeling process for fixed-wing and helicopters in AEDT (see **Section 3.14**), a separate helicopter AEDT model was developed. Lastly, it was determined that VFR operations were required to be included in the noise model due to anticipated changes to the Part 93 airspace. Due to the more irregular operations of VFR flights, another separate VFR AEDT model was developed. See **Section 3.1.15** for details on VFR modeling. Noise results from these models are combined as described in **Section 4.3**.

EDF is located on a United States Air Force Base (Elmendorf Air Force Base), and FRN is an Army Air Field; thus their flight schedules, types of operations, and aircraft are primarily military. From consultations with the FAA Office of Environment and Energy, it was decided that modeling of EDF and FRN would be performed using NOISEMAP (see **Section 3.2**). As a result, this section segregates noise modeling inputs by the respective civilian (AEDT) and military (NOISEMAP) authorized noise models.

Using two noise modeling tools requires modeling inputs to vary. Effort was made to keep inputs and assumptions between the models as consistent as possible. Outputs were normalized using FAA-approved tools and methods to aggregate results to DNL values (See **Section 4.3**).

3.1 AEDT

AEDT is a software tool suite that models airspace traffic and its environmental effects for a range of scenarios from a single local flight to numerous global flights. Noise modeling in AEDT requires several types of input data including airport/runway locations, local environmental variables, operational levels, day/night distributions, runway usage, fleet mix, noise-power-distance relationships, climb/descent profiles, aircraft stage lengths, model track definition and assignment, user-defined profiles, and receptor sets. Details of the AEDT input data for the DEA are discussed below.

3.1.1 Model Background

AEDT is the FAA's regulatory noise modeling tool for air traffic actions such as those proposed for ATAAPS. By modeling aircraft performance in space and time, AEDT generates results for fuel consumption, emissions, noise, and air quality data for the purposes of evaluating environmental impacts. AEDT leverages the use of geographic information system (GIS) and relational database technology to provide the necessary scalability and flexibility to accommodate the size and detail of regional airspace studies.

⁶ FAA 1050.1 Desk Reference Section 11.1.2 – Projects Not Requiring a Noise Analysis: “...no noise analysis is needed for projects involving existing heliports or airports whose forecast helicopter operations in the period covered by the NEPA document do not exceed 10 annual daily average operations with hover times not exceeding 2 minutes. These numbers of helicopter operations result in DNL 60 dB contours of less than 0.1 square mile that extend no more than 1,000 feet from the pad. Note that this rule applies to the Sikorsky S-70 with a maximum gross takeoff weight of 20,224 pounds and any other helicopter weighing less or producing equal or lower noise levels.”

AEDT provides a powerful computational environment and graphical user interface, and provides the following major capabilities:

- Provides automated quantitative comparison of noise impacts across alternative airspace designs
- Imports and displays track and operation data from airspace models, and population and community data from other sources
- Enables users to specify air traffic control altitudes and automatically calculates required aircraft thrusts and speeds necessary for noise calculations
- Calculates predicted noise impacts at all population centroids (or other specially defined points) in large study areas
- Provides automated means of annualizing noise impact based on different operational configurations and/or runway usage statistics
- Identifies and maps all areas of change in noise impact
- Assembles tables and figures for noise-impact data analysis and report generation
- Applies multiple layers of data checking and quality control

AEDT is the officially-endorsed FAA tool for environmental modeling and analysis metrics (noise, fuel burn, and emissions) for regional airspace redesign/analysis projects. The official release of the initial AEDT 2a was on March, 21, 2012. Since then, subsequent versions of AEDT have been released. ATAAPS noise modeling was started in October 2023. FAA guidelines require all FAA actions requiring noise, fuel burn, or emissions modeling and for which the environmental analysis process began on or after March 29, 2021 to use AEDT 3e.⁷ To conform with these guidelines, the noise modeling for ATAAPS uses AEDT 3e.

3.1.2 Airport and Runway Data

Table 2 identifies airports and runway end names modeled. In total, six airports within the Study Area were evaluated. All runways at these airports were assumed to be available for traffic assignments in AEDT.

Table 2 Study Airport Details - AEDT

Airport Name	Code	Location	Runway End Names ¹
Ted Stevens Anchorage International Airport	ANC	Anchorage, Alaska	7R, 25L, 15, 33, 7L, 25R
Kenai Municipal Airport	ENA	Kenai, Alaska	2L, 20R, 2R, 20L, 2W, 20W
Lake Hood Airport	LHD	Anchorage, Alaska	14, 32
Merrill Field Airport	MRI	Anchorage, Alaska	5, 7, 16, 23, 25, 34
Warren "Bud" Woods Palmer Municipal Airport	PAQ	Palmer, Alaska	10, 16, 28, 34, 16S
Soldotna Airport	SXQ	Soldotna, Alaska	7, 25, 07S, 25S

¹ A runway can be used in both directions but is named in each direction separately. Runway number is based on the magnetic direction of the runway (e.g., Runway 09 points to the east direction). The two numbers on either side always differ by 180 degrees. If there is more than one runway pointing in the same direction, each runway number includes an L, C, or R at the end. This is based on a runway's position relative to others in the same direction – left, center, or right.

Source: Department of Transportation, Federal Aviation Administration. digital-Airport/Facility Directory. February 24, 2022 (http://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/dafd/search/; accessed March 2022).

Prepared by: ATAC Corporation, March 2024.

⁷ Per the FAA AEE memo dated September 27, 2017, "Guidance on determining which version of the Aviation Environmental Design Tool (AEDT) to use for FAA actions and studies," the latest version of AEDT becomes the approved model upon its release.

3.1.3 Local Environmental Variables

To calculate noise levels specific to local conditions, AEDT uses various local environmental variables such as temperature, pressure, dew point, humidity, and wind speed. This meteorological data is available for many weather stations in AEDT's airport database.

Detailed terrain data for the Study Area and Supplemental Study Area was incorporated from the United States Geological Study (USGS) 2-degree National Elevation Dataset (NED).⁸ NED is a digital elevation model with consistent grid-spacing of 1-arc-second (~30 meters) for 1-by-1-degree tiles covering the United States.⁹

3.1.4 Operation Levels and Day/Night Distribution

IFR operation levels (number of takeoffs and landings) for each Study Airport were based on radar data, historical airport counts from FAA sources including the Operations Network (OPSNET),¹⁰ Traffic Flow Management System Counts (TFMSC),¹¹ and Terminal Activity Forecasts (TAF),¹²

Forecasts are presented in *Appendix H: Flight Schedules Technical Report*. Information includes aircraft type, origin and destination airports, operation time, and the average number of daily operations. The detailed operation tables which comprise the forecast were developed for the forecast years 2027 and 2032. For this analysis, each forecast represents the average day (annual/365) of traffic for the year of interest. Table 3 presents the IFR operation totals modeled for the DEA.

Table 3 Modeled Average Annual Day IFR Operation Totals

Airport	Existing Conditions (10/2022 – 09/2023)		2027		2032	
	Day	Night	Day	Night	Day	Night
ANC	387.24	136.17	433.64	151.31	471.16	165.19
ENA	26.58	2.89	28.13	2.96	29.45	3.12
LHD	0.13	0.00	0.14	0.00	0.15	0.00
MRI	11.68	0.28	12.07	0.28	12.41	0.28
PAQ	2.04	0.22	2.04	0.22	2.04	0.22
SXQ	2.55	0.12	2.55	0.12	2.55	0.12

Source: PDARS Data (10/01/2022-09/30/2023), MEARTS Data (12/01/2022-03/30/2023), OPSNET (accessed October 2023), ATAC Corporation, March 2024.

Prepared by: ATAC Corporation, March 2024.

3.1.5 Runway Use

Generally, the primary factors determining runway use at an airport are weather and prevailing wind conditions at the time of a flight. Several secondary factors which may impact runway choice include runway safety issues [e.g., taxiing aircraft crossing active runways or Land and Hold Short (LAHSO)¹³ rules], current traffic composition (many arrivals or many departures), and origin or destination. This latter factor is also based on safety, in that traffic is easier to sort on the ground (taxi for direction) than it is in the air.

⁸ U.S. Department of the Interior, U.S. Geological Survey, National Elevation Dataset, (<http://ned.usgs.gov/>).

⁹ U.S. Department of the Interior, U.S. Geological Survey, (https://nationalmap.gov/PERS_Jan2002_NED_highlight_article.pdf)

¹⁰ FAA OPSNET, (<https://aspm.faa.gov/opsnet/sys/Airport.asp>)

¹¹ FAA TFMSC, (<https://aspm.faa.gov/tfms/sys/main.asp>)

¹² FAA TAF, (<https://taf.faa.gov/>)

¹³ FAA JO 7110.118B, "Land and Hold Short Operations (LAHSO)," November 9, 2015

Typically, arriving and departing aircraft are assigned to a specific fix. These fixes, in turn, may have a preferred arrival or departure runway assignment and a secondary arrival or departure runway assignment. As controllers balance delay and runway utilization based on demand, there are times when arriving and departing aircraft are diverted to a secondary runway. This is especially true when an airport has multiple parallel runways. This allows the airfield to operate in the safest and most efficient manner.

It is important to note that within the context of all of these factors, future runway use at an airport is, at best, an estimate. Simple changes over time, such as airlines changing the markets (destinations) that they serve, can have a notable effect on actual runway use in the future. Table 4 presents airport runway configuration usage for ANC based on analysis of 2022/2023 historical data (graphically, see DEA Exhibit 1-3). The primary runway operating configurations account for approximately 96.6% of the operations; the other 3.4% are accounted for with various other configurations utilizing a mix of runway listed in the primary runway operating configurations. The runway operating configuration refers to the direction a runway is used for arrivals and departures, which can vary based on the direction of prevailing winds.

Table 4 ANC Runway Configuration Utilization

Operating Configuration	Main Arrival Runways	Main Departure Runways	Percentage
East_East/North	7L, 7R	7L, 33	58.1%
South_South/West	15	15, 25L	16.9%
East_North	7L, 7R	33	12.02%
East_East	7L, 7R	7L, 7R	9.55%

Source: PDARS Data (10/01/2022-09/30/2023), MEARTS Data (12/01/2022-03/30/2023)
Prepared by: ATAC Corporation, March 2024

From discussions with FAA SMEs, runway utilization in both the No Action and Proposed Action Scenarios is expected to shift due to observed changing wind patterns in the region. The SMEs projected that some arrivals to 07R, currently the main arrival runway, would shift to Runway 15 such that their utilization is about equal. Arrivals to Runway 25R are also expected to increase such that it accounts for about 10% of total arrival operations. For departures, some traffic using Runway 33, currently the main departure runway, would instead use Runway 25L such that their utilization is roughly equal. At the time of this discussion, separate No Action and Proposed Action noise models had already been developed. Thus, runway utilization adjustments were made independently for each model. Special effort and attention were taken to ensure that key factors including aircraft category, day/night distribution, and airspace utilization remained as consistent as possible throughout the adjustment process.

The following tables reflect the runway utilization adjustments above. Tables 5 to 10 present IFR airport runway use percentages for ANC, ENA, LHD, MRI, PAQ, and SXQ arrivals and departures respectively, by daytime and nighttime, for the No Action and Proposed Action. The proposed air traffic procedures do not change runway use; therefore, the distribution of operations was held constant between No Action and Proposed Action.

The average annual runway use under 2022/2023, 2027, and 2032 conditions reflect average runway usage as sampled over 365 days from 10/1/2022-09/30/2023, providing a representative statistical sampling of existing conditions runway usage.¹⁴ Every day within the study period

¹⁴ See DEA Chapter 4, Section 4.2.1.1 Noise Modeling Methodology.

was included in the analysis. However, due to runway closure occurrences at certain Study Airports, operations were moved from the closed runway to an alternative open runway.

The average annual runway use for the Study Airports is presented in **Tables 5** through **10** for 2027 and 2032 No Action is based on historical runway use over a period from October 1, 2022 through September 30, 2023.

The average annual runway use for 2027 and 2032 Proposed Action is based on estimates provided by air traffic controllers associated with anticipated changes in airport runway operating configuration use with the new procedures in place. As depicted in the tables, runway use is not notably different between No Action and Proposed Action. Note that differences in configuration use between those used in this study and other studies may occur, given the use of different time periods to derive the No Action configuration use and, as a result, assumptions may vary about future configuration use.

Table 5 ANC Runway Use Percentages – Proposed Action and No Action

Table 5		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
ANC		2027									
No Action Arrivals	15	25.52%	28.55%	39.67%	33.72%	45.38%	46.88%	45.79%	46.64%	42.81%	45.24%
	33	1.52%	1.35%	1.50%	1.27%	0.81%	1.40%	8.72%	12.34%	0.63%	0.53%
	07L	6.82%	3.92%	10.60%	8.64%	13.98%	19.72%	14.24%	11.31%	18.06%	10.45%
	07R	65.63%	66.19%	40.69%	53.80%	33.95%	32.01%	9.19%	22.22%	3.44%	1.96%
	25L	0.01%	0.00%	0.02%	0.00%	0.00%	0.00%	0.60%	0.19%	3.71%	0.00%
	25R	0.50%	0.00%	7.52%	2.58%	5.88%	0.00%	21.47%	7.30%	31.36%	41.82%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	15	8.67%	12.95%	2.88%	3.87%	1.28%	0.97%	5.03%	14.08%	2.80%	0.35%
	33	43.76%	33.81%	42.98%	56.51%	44.76%	49.12%	21.29%	64.66%	4.41%	1.83%
	07L	3.84%	0.45%	4.04%	0.47%	5.70%	0.73%	40.97%	8.02%	37.58%	61.46%
	07R	0.02%	0.03%	0.03%	0.01%	0.00%	0.12%	6.53%	0.79%	12.84%	9.25%
	25L	43.08%	51.61%	48.97%	36.89%	46.46%	46.01%	25.00%	11.71%	38.92%	23.25%
	25R	0.64%	1.16%	1.11%	2.25%	1.81%	3.05%	1.17%	0.75%	3.45%	3.85%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	15	26.07%	29.12%	41.88%	34.62%	47.68%	49.05%	45.05%	45.93%	34.26%	17.69%
	33	1.52%	1.35%	1.50%	1.27%	0.81%	1.40%	8.69%	12.30%	0.62%	0.52%
	07L	6.82%	3.92%	10.60%	8.64%	13.97%	19.69%	14.27%	11.41%	18.05%	10.37%
	07R	62.76%	65.61%	35.53%	50.56%	21.52%	29.86%	13.22%	14.65%	21.02%	44.13%
	25L	0.01%	0.00%	0.02%	0.00%	0.00%	0.00%	0.60%	0.19%	3.69%	0.00%
	25R	2.81%	0.00%	10.46%	4.91%	16.02%	0.00%	18.17%	15.51%	22.35%	27.28%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	15	8.67%	12.95%	2.88%	3.87%	1.28%	0.97%	5.02%	14.09%	2.81%	0.37%
	33	43.76%	33.81%	42.97%	56.51%	44.79%	49.09%	21.31%	64.69%	4.45%	1.84%
	07L	3.84%	0.45%	4.04%	0.47%	5.68%	0.72%	40.95%	8.00%	37.49%	61.40%
	07R	0.02%	0.03%	0.03%	0.01%	0.00%	0.12%	6.53%	0.78%	12.82%	9.25%
	25L	43.08%	51.61%	48.97%	36.88%	46.45%	46.05%	25.02%	11.69%	38.99%	23.28%
	25R	0.64%	1.16%	1.11%	2.25%	1.80%	3.05%	1.17%	0.74%	3.45%	3.86%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 5		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		2032									
No Action Arrivals	15	25.54%	28.46%	39.68%	33.72%	45.25%	46.86%	45.76%	46.57%	42.84%	44.77%
	33	1.52%	1.36%	1.50%	1.27%	0.81%	1.39%	8.72%	12.44%	0.62%	0.56%
	07L	6.79%	3.92%	10.61%	8.64%	13.88%	19.64%	14.28%	11.31%	18.24%	10.37%
	07R	65.63%	66.27%	40.67%	53.78%	34.20%	32.11%	9.15%	22.06%	3.42%	2.30%
	25L	0.01%	0.00%	0.02%	0.00%	0.00%	0.00%	0.59%	0.19%	3.65%	0.00%
	25R	0.50%	0.00%	7.53%	2.58%	5.84%	0.00%	21.49%	7.42%	31.23%	42.00%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	15	8.80%	12.90%	2.88%	3.87%	1.29%	0.96%	5.04%	14.14%	2.80%	0.36%
	33	43.96%	34.05%	42.96%	56.52%	44.72%	48.96%	21.27%	64.74%	4.48%	1.87%
	07L	4.04%	0.45%	4.03%	0.47%	5.73%	0.72%	41.02%	7.97%	37.77%	61.65%
	07R	0.02%	0.03%	0.02%	0.01%	0.00%	0.12%	6.52%	0.78%	12.70%	9.32%
	25L	42.55%	51.42%	49.00%	36.88%	46.46%	46.19%	25.00%	11.62%	38.82%	23.00%
	25R	0.63%	1.15%	1.10%	2.25%	1.79%	3.06%	1.16%	0.74%	3.43%	3.81%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	15	26.09%	29.03%	41.89%	34.63%	47.55%	49.03%	45.02%	45.88%	34.17%	17.46%
	33	1.52%	1.36%	1.50%	1.27%	0.81%	1.39%	8.72%	12.44%	0.62%	0.56%
	07L	6.79%	3.92%	10.61%	8.64%	13.88%	19.64%	14.28%	11.31%	18.24%	10.37%
	07R	62.78%	65.70%	35.51%	50.55%	21.77%	29.94%	13.24%	14.70%	21.01%	44.35%
	25L	0.01%	0.00%	0.02%	0.00%	0.00%	0.00%	0.59%	0.19%	3.65%	0.00%
	25R	2.80%	0.00%	10.47%	4.91%	15.98%	0.00%	18.16%	15.47%	22.31%	27.26%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	15	8.80%	12.90%	2.88%	3.87%	1.29%	0.96%	5.04%	14.14%	2.80%	0.36%
	33	43.96%	34.05%	42.96%	56.52%	44.72%	48.96%	21.27%	64.74%	4.48%	1.87%
	07L	4.04%	0.45%	4.03%	0.47%	5.73%	0.72%	41.02%	7.97%	37.77%	61.65%
	07R	0.02%	0.03%	0.02%	0.01%	0.00%	0.12%	6.52%	0.78%	12.70%	9.32%
	25L	42.55%	51.42%	49.00%	36.88%	46.46%	46.19%	25.00%	11.62%	38.82%	23.00%
	25R	0.63%	1.15%	1.10%	2.25%	1.79%	3.06%	1.16%	0.74%	3.43%	3.81%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 5		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Daytime operations arrive or depart between 7 am and 10 pm.; nighttime operations arrive or depart between 10 pm and 7 am.
Totals may not add up to 100% due to rounding.

Source: PDARS Data (10/01/2022 – 09/30/2023), MEARTS Data (12/01/2022-03/30/2023), ATAC Corporation, March 2024.
Prepared by: ATAC Corporation, August 2025

Table 6 ENA Runway Use Percentages – Proposed Action and No Action

Table 6		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
ENA		2027									
No Action Arrivals	02L	0.00%	0.00%	48.26%	0.00%	32.03%	50.55%	25.87%	8.28%	26.34%	13.69%
	02R	0.00%	0.00%	1.89%	0.00%	0.00%	0.00%	1.65%	1.33%	0.98%	0.00%
	02W	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	0.26%	1.35%	0.00%
	20L	0.00%	0.00%	3.95%	0.00%	13.24%	0.00%	1.04%	0.79%	2.97%	5.34%
	20R	0.00%	0.00%	45.90%	100.00%	51.53%	24.73%	70.28%	87.77%	65.81%	77.84%
	20W	0.00%	0.00%	0.00%	0.00%	3.20%	24.73%	0.77%	1.56%	2.55%	3.13%
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	02L	0.00%	0.00%	50.06%	59.68%	41.40%	43.61%	68.74%	85.82%	57.22%	81.83%
	02R	0.00%	0.00%	0.00%	13.19%	0.00%	0.00%	2.93%	3.95%	3.16%	1.39%
	02W	0.00%	0.00%	0.00%	0.00%	1.84%	0.00%	0.73%	0.00%	1.17%	6.34%
	20L	0.00%	0.00%	0.00%	0.00%	8.72%	0.00%	1.16%	0.52%	1.18%	0.00%
	20R	0.00%	0.00%	49.94%	27.13%	45.63%	56.39%	25.58%	9.71%	35.37%	10.44%
	20W	0.00%	0.00%	0.00%	0.00%	2.42%	0.00%	0.85%	0.00%	1.90%	0.00%
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	02L	0.00%	0.00%	48.26%	0.00%	32.03%	50.55%	25.87%	8.28%	26.34%	13.69%
	02R	0.00%	0.00%	1.89%	0.00%	0.00%	0.00%	1.65%	1.33%	0.98%	0.00%
	02W	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	0.26%	1.35%	0.00%
	20L	0.00%	0.00%	3.95%	0.00%	13.24%	0.00%	1.04%	0.79%	2.97%	5.34%
	20R	0.00%	0.00%	45.90%	100.00%	51.53%	24.73%	70.28%	87.77%	65.81%	77.84%
	20W	0.00%	0.00%	0.00%	0.00%	3.20%	24.73%	0.77%	1.56%	2.55%	3.13%
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	02L	0.00%	0.00%	50.06%	59.68%	41.40%	43.61%	68.74%	85.82%	57.22%	81.83%
	02R	0.00%	0.00%	0.00%	13.19%	0.00%	0.00%	2.93%	3.95%	3.16%	1.39%
	02W	0.00%	0.00%	0.00%	0.00%	1.84%	0.00%	0.73%	0.00%	1.17%	6.34%
	20L	0.00%	0.00%	0.00%	0.00%	8.72%	0.00%	1.16%	0.52%	1.18%	0.00%
	20R	0.00%	0.00%	49.94%	27.13%	45.63%	56.39%	25.58%	9.71%	35.37%	10.44%
	20W	0.00%	0.00%	0.00%	0.00%	2.42%	0.00%	0.85%	0.00%	1.90%	0.00%
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 6		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		2032									
No Action Arrivals	02L	0.00%	0.00%	48.23%	0.00%	31.84%	50.99%	25.77%	8.23%	26.26%	13.69%
	02R	0.00%	0.00%	1.95%	0.00%	0.00%	0.00%	1.65%	1.34%	0.98%	0.00%
	02W	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	0.26%	1.36%	0.00%
	20L	0.00%	0.00%	3.99%	0.00%	13.51%	0.00%	1.05%	0.80%	2.97%	5.45%
	20R	0.00%	0.00%	45.84%	100.00%	51.46%	24.50%	70.36%	87.79%	65.85%	77.76%
	20W	0.00%	0.00%	0.00%	0.00%	3.18%	24.50%	0.77%	1.59%	2.58%	3.10%
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	02L	0.00%	0.00%	50.11%	59.34%	41.33%	43.61%	68.63%	85.83%	57.34%	81.96%
	02R	0.00%	0.00%	0.00%	13.62%	0.00%	0.00%	2.96%	3.98%	3.17%	1.37%
	02W	0.00%	0.00%	0.00%	0.00%	1.85%	0.00%	0.74%	0.00%	1.18%	6.34%
	20L	0.00%	0.00%	0.00%	0.00%	8.68%	0.00%	1.17%	0.51%	1.17%	0.00%
	20R	0.00%	0.00%	49.89%	27.05%	45.72%	56.39%	25.64%	9.67%	35.25%	10.33%
	20W	0.00%	0.00%	0.00%	0.00%	2.41%	0.00%	0.86%	0.00%	1.89%	0.00%
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	02L	0.00%	0.00%	48.23%	0.00%	31.84%	50.99%	25.77%	8.23%	26.26%	13.69%
	02R	0.00%	0.00%	1.95%	0.00%	0.00%	0.00%	1.65%	1.34%	0.98%	0.00%
	02W	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	0.26%	1.36%	0.00%
	20L	0.00%	0.00%	3.99%	0.00%	13.51%	0.00%	1.05%	0.80%	2.97%	5.45%
	20R	0.00%	0.00%	45.84%	100.00%	51.46%	24.50%	70.36%	87.79%	65.85%	77.76%
	20W	0.00%	0.00%	0.00%	0.00%	3.18%	24.50%	0.77%	1.59%	2.58%	3.10%
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	02L	0.00%	0.00%	50.11%	59.34%	41.33%	43.61%	68.63%	85.83%	57.34%	81.96%
	02R	0.00%	0.00%	0.00%	13.62%	0.00%	0.00%	2.96%	3.98%	3.17%	1.37%
	02W	0.00%	0.00%	0.00%	0.00%	1.85%	0.00%	0.74%	0.00%	1.18%	6.34%
	20L	0.00%	0.00%	0.00%	0.00%	8.68%	0.00%	1.17%	0.51%	1.17%	0.00%
	20R	0.00%	0.00%	49.89%	27.05%	45.72%	56.39%	25.64%	9.67%	35.25%	10.33%
	20W	0.00%	0.00%	0.00%	0.00%	2.41%	0.00%	0.86%	0.00%	1.89%	0.00%
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 6		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Daytime operations arrive or depart between 7 am and 10 pm.; nighttime operations arrive or depart between 10 pm and 7 am.

Totals may not add up to 100% due to rounding.

Source: PDARS Data (10/01/2022-09/30/2023), MEARTS Data (12/01/2022-03/30/2023), OPSNET (accessed October 2023), ATAC Corporation, March 2024.
Prepared by: ATAC Corporation, March 2024.

Table 7 LHD Runway Use Percentages – Proposed Action and No Action

Table 7		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
LHD		2027									
No Action Arrivals	14	0.00%	0.00%	37.50%	100.00%	0.00%	0.00%	31.09%	0.00%	33.93%	0.00%
	32	100.00%	0.00%	62.50%	0.00%	0.00%	0.00%	68.91%	0.00%	66.07%	0.00%
	Total	100.00%	0.00%	100.00%	100.00%	0.00%	0.00%	100.00%	0.00%	100.00%	0.00%
No Action Departures	14	17.98%	0.00%	30.00%	100.00%	0.00%	0.00%	83.62%	0.00%	3.33%	0.00%
	32	82.02%	0.00%	70.00%	0.00%	0.00%	0.00%	16.38%	0.00%	96.67%	100.00%
	Total	100.00%	0.00%	100.00%	100.00%	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%
Proposed Action Arrivals	14	0.00%	0.00%	37.50%	100.00%	0.00%	0.00%	31.09%	0.00%	33.93%	0.00%
	32	100.00%	0.00%	62.50%	0.00%	0.00%	0.00%	68.91%	0.00%	66.07%	0.00%
	Total	100.00%	0.00%	100.00%	100.00%	0.00%	0.00%	100.00%	0.00%	100.00%	0.00%
Proposed Action Departures	14	17.98%	0.00%	30.00%	100.00%	0.00%	0.00%	83.62%	0.00%	3.33%	0.00%
	32	82.02%	0.00%	70.00%	0.00%	0.00%	0.00%	16.38%	0.00%	96.67%	100.00%
	Total	100.00%	0.00%	100.00%	100.00%	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%
		2032									
No Action Arrivals	14	0.00%	0.00%	37.50%	100.00%	0.00%	0.00%	31.01%	0.00%	33.93%	0.00%
	32	100.00%	0.00%	62.50%	0.00%	0.00%	0.00%	68.99%	0.00%	66.07%	0.00%
	Total	100.00%	0.00%	100.00%	100.00%	0.00%	0.00%	100.00%	0.00%	100.00%	0.00%
No Action Departures	14	17.74%	0.00%	30.00%	100.00%	0.00%	0.00%	84.68%	0.00%	3.33%	0.00%
	32	82.26%	0.00%	70.00%	0.00%	0.00%	0.00%	15.32%	0.00%	96.67%	100.00%
	Total	100.00%	0.00%	100.00%	100.00%	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%
Proposed Action	14	0.00%	0.00%	37.50%	100.00%	0.00%	0.00%	31.01%	0.00%	33.93%	0.00%
	32	100.00%	0.00%	62.50%	0.00%	0.00%	0.00%	68.99%	0.00%	66.07%	0.00%

Table 7		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Proposed Action Departures	Total	100.00%	0.00%	100.00%	100.00%	0.00%	0.00%	100.00%	0.00%	100.00%	0.00%
	14	17.74%	0.00%	30.00%	100.00%	0.00%	0.00%	84.68%	0.00%	3.33%	0.00%
	32	82.26%	0.00%	70.00%	0.00%	0.00%	0.00%	15.32%	0.00%	96.67%	100.00%
	Total	100.00%	0.00%	100.00%	100.00%	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%

Daytime operations arrive or depart between 7 am and 10 pm.; nighttime operations arrive or depart between 10 pm and 7 am.

Totals may not add up to 100% due to rounding.

Source: PDARS Data (10/01/2022-09/30/2023), MEARTS Data (12/01/2022-03/30/2023), OPSNET (accessed October 2023), ATAC Corporation, March 2024.

Prepared by: ATAC Corporation, March 2024.

For Table 8, runway use percentages for helicopter aircraft types at the MRI airport are included due to its operations counts exceeding a 10 annual daily average threshold, and thus is included in the noise model in accordance to the FAA 1050.1 Desk Reference Section 11.1.2.¹⁵

Table 8 MRI Runway Use Percentages – Proposed Action and No Action

Table 8		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props		Helicopters	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
MRI		2027											
No Action Arrivals	5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	0.00%	0.14%	0.00%	0.79%	1.88%
	7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.21%	44.66%	19.42%	12.62%	18.85%	13.13%
	16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.33%	0.00%	4.58%	0.00%	1.28%	1.25%
	23	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.83%	0.00%	1.04%	5.38%	4.14%	7.50%
	25	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	63.63%	50.28%	66.25%	76.59%	19.64%	8.13%
	34	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.97%	5.06%	8.56%	5.41%	3.26%	3.75%
	Helipad	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	52.05%	64.38%
	Total	0.00%	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	2.08%	0.43%
	7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.09%	5.10%	1.75%	0.00%	19.69%	4.33%
	16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.45%	12.25%	21.47%	27.44%	6.58%	9.96%

¹⁵ FAA 1050.1 Desk Reference Section 11.1.2 – Projects Not Requiring a Noise Analysis: “...no noise analysis is needed for projects involving existing heliports or airports whose forecast helicopter operations in the period covered by the NEPA document do not exceed 10 annual daily average operations with hover times not exceeding 2 minutes. These numbers of helicopter operations result in DNL 60 dB contours of less than 0.1 square mile that extend no more than 1,000 feet from the pad. Note that this rule applies to the Sikorsky S-70 with a maximum gross takeoff weight of 20,224 pounds and any other helicopter weighing less or producing equal or less noise levels.”

Table 8		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props		Helicopters	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
	23	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%	0.00%	0.13%	0.00%	0.79%	0.87%
	25	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	82.51%	82.66%	74.13%	69.13%	10.14%	2.16%
	34	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.63%	0.00%	2.52%	3.43%	4.08%	0.43%
	Helipad	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	56.65%	81.82%
	Total	100.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	0.00%	0.14%	0.00%	0.79%	1.88%
	7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.21%	44.66%	19.42%	12.62%	18.85%	13.13%
	16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.33%	0.00%	4.58%	0.00%	1.28%	1.25%
	23	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.83%	0.00%	1.04%	5.38%	4.14%	7.50%
	25	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	63.63%	50.28%	66.25%	76.59%	19.64%	8.13%
	34	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.97%	5.06%	8.56%	5.41%	3.26%	3.75%
	Helipad	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	52.05%	64.38%
	Total	0.00%	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	2.08%	0.43%
	7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.09%	5.10%	1.75%	0.00%	19.69%	4.33%
	16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.45%	12.25%	21.47%	27.44%	6.58%	9.96%
	23	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%	0.00%	0.13%	0.00%	0.79%	0.87%
	25	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	82.51%	82.66%	74.13%	69.13%	10.14%	2.16%
	34	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.63%	0.00%	2.52%	3.43%	4.08%	0.43%
	Helipad	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	56.65%	81.82%
	Total	100.00%	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		2032											
No Action Arrivals	5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	0.00%	0.14%	0.00%	0.79%	1.88%
	7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.17%	44.37%	19.49%	12.62%	18.85%	13.13%
	16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.34%	0.00%	4.60%	0.00%	1.28%	1.25%
	23	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.83%	0.00%	1.04%	5.38%	4.14%	7.50%
	25	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	63.67%	50.65%	66.14%	76.59%	19.64%	8.13%
	34	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.95%	4.98%	8.59%	5.41%	3.26%	3.75%
	Helipad	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	52.05%	64.38%

Table 8		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props		Helicopters	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
	Total	0.00%	0.00%	00.00%	0.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	2.08%	0.43%
	7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.09%	5.07%	1.76%	0.00%	19.69%	4.33%
	16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.47%	12.65%	21.48%	27.44%	6.58%	9.96%
	23	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%	0.00%	0.13%	0.00%	0.79%	0.87%
	25	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	82.48%	82.28%	74.10%	69.13%	10.14%	2.16%
	34	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.64%	0.00%	2.52%	3.43%	4.08%	0.43%
	Helipad	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	56.65%	81.82%
	Total	0.00%	0.00%	00.00%	0.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	0.00%	0.14%	0.00%	0.79%	1.88%
	7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.17%	44.37%	19.49%	12.62%	18.85%	13.13%
	16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.34%	0.00%	4.60%	0.00%	1.28%	1.25%
	23	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.83%	0.00%	1.04%	5.38%	4.14%	7.50%
	25	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	63.67%	50.65%	66.14%	76.59%	19.64%	8.13%
	34	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.95%	4.98%	8.59%	5.41%	3.26%	3.75%
	Helipad	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	52.05%	64.38%
	Total	0.00%	0.00%	00.00%	0.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	2.08%	0.43%
	7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.09%	5.07%	1.76%	0.00%	19.69%	4.33%
	16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.47%	12.65%	21.48%	27.44%	6.58%	9.96%
	23	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%	0.00%	0.13%	0.00%	0.79%	0.87%
	25	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	82.48%	82.28%	74.10%	69.13%	10.14%	2.16%
	34	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.64%	0.00%	2.52%	3.43%	4.08%	0.43%
	Helipad	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	56.65%	81.82%
	Total	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Daytime operations arrive or depart between 7 am and 10 pm.; nighttime operations arrive or depart between 10 pm and 7 am.

Totals may not add up to 100% due to rounding.

Source: PDARS Data (10/01/2022-09/30/2023), MEARTS Data (12/01/2022-03/30/2023), OPSNET (accessed October 2023), ATAC Corporation, March 2024.

Prepared by: ATAC Corporation, March 2024.

Table 9 PAQ Runway Use Percentages – Proposed Action and No Action

Table 9		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
PAQ		2027									
No Action Arrivals	10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	24.44%	22.61%	38.92%	100.00%
	16	0.00%	0.00%	0.00%	0.00%	52.94%	33.33%	50.60%	32.86%	39.93%	0.00%
	28	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.22%	0.00%	0.00%	0.00%
	34	100.00%	0.00%	0.00%	0.00%	35.29%	66.67%	20.18%	40.87%	12.77%	0.00%
	16S	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0.00%	0.00%
	34S	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	1.56%	3.65%	8.38%	0.00%
	Total	100.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.45%	0.00%	2.22%	0.00%
	16	0.00%	0.00%	0.00%	0.00%	78.05%	72.22%	61.61%	51.99%	62.22%	50.00%
	28	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.82%	0.00%	4.44%	0.00%
	34	0.00%	0.00%	0.00%	0.00%	21.95%	27.78%	34.52%	48.01%	31.11%	50.00%
	16S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.59%	0.00%	0.00%	0.00%
	34S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Total	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	24.44%	22.61%	38.92%	100.00%
	16	0.00%	0.00%	0.00%	0.00%	52.94%	33.33%	50.60%	32.86%	39.93%	0.00%
	28	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.22%	0.00%	0.00%	0.00%
	34	100.00%	0.00%	0.00%	0.00%	35.29%	66.67%	20.18%	40.87%	12.77%	0.00%
	16S	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0.00%	0.00%
	34S	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	1.56%	3.65%	8.38%	0.00%
	Total	100.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.45%	0.00%	2.22%	0.00%
	16	0.00%	0.00%	0.00%	0.00%	78.05%	72.22%	61.61%	51.99%	62.22%	50.00%
	28	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.82%	0.00%	4.44%	0.00%
	34	0.00%	0.00%	0.00%	0.00%	21.95%	27.78%	34.52%	48.01%	31.11%	50.00%
	16S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.59%	0.00%	0.00%	0.00%
	34S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Total	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table 9		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
	Total	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		2032									
No Action Arrivals	10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	24.44%	22.61%	38.92%	100.00%
	16	0.00%	0.00%	0.00%	0.00%	52.94%	33.33%	50.60%	32.86%	39.93%	0.00%
	28	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.22%	0.00%	0.00%	0.00%
	34	100.00%	0.00%	0.00%	0.00%	35.29%	66.67%	20.18%	40.87%	12.77%	0.00%
	16S	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0.00%	0.00%
	34S	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	1.56%	3.65%	8.38%	0.00%
	Total	100.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.45%	0.00%	2.22%	0.00%
	16	0.00%	0.00%	0.00%	0.00%	78.05%	72.22%	61.61%	51.99%	62.22%	50.00%
	28	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.82%	0.00%	4.44%	0.00%
	34	0.00%	0.00%	0.00%	0.00%	21.95%	27.78%	34.52%	48.01%	31.11%	50.00%
	16S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.59%	0.00%	0.00%	0.00%
	34S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Total	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	24.44%	22.61%	38.92%	100.00%
	16	0.00%	0.00%	0.00%	0.00%	52.94%	33.33%	50.60%	32.86%	39.93%	0.00%
	28	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.22%	0.00%	0.00%	0.00%
	34	100.00%	0.00%	0.00%	0.00%	35.29%	66.67%	20.18%	40.87%	12.77%	0.00%
	16S	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0.00%	0.00%
	34S	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	1.56%	3.65%	8.38%	0.00%
	Total	100.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.45%	0.00%	2.22%	0.00%
	16	0.00%	0.00%	0.00%	0.00%	78.05%	72.22%	61.61%	51.99%	62.22%	50.00%
	28	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.82%	0.00%	4.44%	0.00%
	34	0.00%	0.00%	0.00%	0.00%	21.95%	27.78%	34.52%	48.01%	31.11%	50.00%
	16S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.59%	0.00%	0.00%	0.00%
	34S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Total	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table 9		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
	Total	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Daytime operations arrive or depart between 7 am and 10 pm.; nighttime operations arrive or depart between 10 pm and 7 am.

Totals may not add up to 100% due to rounding.

Source: PDARS Data (10/01/2022-09/30/2023), MEARTS Data (12/01/2022-03/30/2023), OPSNET (accessed October 2023), ATAC Corporation, March 2024.
Prepared by: ATAC Corporation, March 2024.

Table 10 SXQ Runway Use Percentages – Proposed Action and No Action

Table 10		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
SXQ		2027									
No Action Arrivals	7	0.00%	0.00%	27.27%	0.00%	100.00%	0.00%	48.46%	47.76%	15.38%	0.00%
	25	0.00%	0.00%	50.00%	0.00%	0.00%	100.00%	15.61%	37.81%	53.85%	0.00%
	07S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	26.84%	14.43%	15.38%	0.00%
	25S	0.00%	0.00%	22.73%	0.00%	0.00%	0.00%	9.08%	0.00%	15.38%	0.00%
	Total	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	0.00%
No Action Departures	7	0.00%	0.00%	33.33%	100.00%	0.00%	0.00%	20.24%	50.00%	27.27%	0.00%
	25	0.00%	0.00%	66.67%	0.00%	100.00%	0.00%	40.70%	33.33%	18.18%	100.00%
	07S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.70%	0.00%	36.36%	0.00%
	25S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	21.36%	16.67%	18.18%	0.00%
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	7	0.00%	0.00%	27.27%	0.00%	100.00%	0.00%	48.46%	47.76%	15.38%	0.00%
	25	0.00%	0.00%	50.00%	0.00%	0.00%	100.00%	15.61%	37.81%	53.85%	0.00%
	07S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	26.84%	14.43%	15.38%	0.00%
	25S	0.00%	0.00%	22.73%	0.00%	0.00%	0.00%	9.08%	0.00%	15.38%	0.00%
	Total	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	0.00%
Proposed Action Departures	7	0.00%	0.00%	33.33%	100.00%	0.00%	0.00%	20.24%	50.00%	27.27%	0.00%
	25	0.00%	0.00%	66.67%	0.00%	100.00%	0.00%	40.70%	33.33%	18.18%	100.00%
	07S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.70%	0.00%	36.36%	0.00%
	25S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	21.36%	16.67%	18.18%	0.00%
	Total	0.00%	0.00%	100.00%	100.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%
		2032									

Table 10		Heavy Jets		Large Jets		Small Jets		Turbo-Props		Props	
	RWY	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
No Action Arrivals	7	0.00%	0.00%	27.27%	0.00%	100.00%	0.00%	48.46%	47.76%	15.38%	0.00%
	7	0.00%	0.00%	27.27%	0.00%	100.00%	0.00%	48.46%	47.76%	15.38%	0.00%
	25	0.00%	0.00%	50.00%	0.00%	0.00%	100.00%	15.61%	37.81%	53.85%	0.00%
	07S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	26.84%	14.43%	15.38%	0.00%
	25S	0.00%	0.00%	22.73%	0.00%	0.00%	0.00%	9.08%	0.00%	15.38%	0.00%
No Action Departures	Total	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	0.00%
	7	0.00%	0.00%	33.33%	100.00%	0.00%	0.00%	20.24%	50.00%	27.27%	0.00%
	25	0.00%	0.00%	66.67%	0.00%	100.00%	0.00%	40.70%	33.33%	18.18%	100.00%
	07S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.70%	0.00%	36.36%	0.00%
	25S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	21.36%	16.67%	18.18%	0.00%
Proposed Action Arrivals	Total	0.00%	0.00%	100.00%	100.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%
	7	0.00%	0.00%	27.27%	0.00%	100.00%	0.00%	48.46%	47.76%	15.38%	0.00%
	25	0.00%	0.00%	50.00%	0.00%	0.00%	100.00%	15.61%	37.81%	53.85%	0.00%
	07S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	26.84%	14.43%	15.38%	0.00%
	25S	0.00%	0.00%	22.73%	0.00%	0.00%	0.00%	9.08%	0.00%	15.38%	0.00%
Proposed Action Departures	Total	0.00%	0.00%	100.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	0.00%
	7	0.00%	0.00%	33.33%	100.00%	0.00%	0.00%	20.24%	50.00%	27.27%	0.00%
	25	0.00%	0.00%	66.67%	0.00%	100.00%	0.00%	40.70%	33.33%	18.18%	100.00%
	07S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.70%	0.00%	36.36%	0.00%
	25S	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	21.36%	16.67%	18.18%	0.00%

Daytime operations arrive or depart between 7 am and 10 pm.; nighttime operations arrive or depart between 10 pm and 7 am.

Totals may not add up to 100% due to rounding.

Source: PDARS Data (10/01/2022-09/30/2023), MEARTS Data (12/01/2022-03/30/2023), OPSNET (accessed October 2023), ATAC Corporation, March 2024.

Prepared by: ATAC Corporation, March 2024.

3.1.6 Fleet Mix

Fleet mix assumptions were developed for the DEA as part of the forecasting effort. **Tables 11 and 12** present the forecasted fleet mixes for 2027 and 2032 for operations at ANC, ENA, LHD, MRI, PAQ, and SXQ for both the No Action and Proposed Action. The values are percentages calculated as the operation count of the aircraft type divided by the sum of operations the referenced airport and operation type. For example, there were 10,414.758 “7478” aircraft operations modeled in 2027 to arrive at ANC. Dividing this by the total number of arrival operations at ANC of 106,746.4 yields 9.76% as shown in the **Table 11**. These tables present aircraft types used in the AEDT model. Not all aircraft types in the forecast are available in the AEDT model. For those cases, FAA-approved substitutions of aircraft types provided in AEDT were chosen. For aircraft not listed in AEDT as approved substitutions, a proposed AEDT aircraft type based on similar operating and noise characteristics was chosen and approved by the FAA. The letter to the FAA requesting approval of these substitutions and the response from the FAA are included with this technical report as **Supplement 1**.

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Table II Forecast Fleet Mix for Noise Modeling - 2027

Aircraft		ANC		ENA		LHD		MRI		PAQ		SXQ	
Category	AEDT Type	A	D	A	D	A	D	A	D	A	D	A	D
Heavy Jets	7478	9.76%	9.79%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	7879	0.30%	0.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	757300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	767300	2.17%	2.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	767400	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	777200	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	777300	0.00%	8.95%	0.00%	0.00%	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	74720B	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	747400RN	10.10%	10.13%	0.00%	0.00%	0.00%	0.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	757RR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	767CF6	0.05%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	7773ER	9.12%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.13%	0.00%	0.00%	0.00%
	7878R	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A300-622R	0.03%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A310-304	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A330-301	0.28%	0.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A330-343	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A350-941	0.68%	0.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	DC1010	0.01%	0.01%	0.00%	0.00%	0.44%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	MD11GE	1.43%	1.44%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Large Jets	717200	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	737300	0.27%	0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	737400	0.74%	0.75%	0.02%	0.02%	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	737500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	737700	6.17%	6.19%	0.00%	0.00%	0.12%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	737800	11.23%	11.26%	0.02%	0.02%	0.98%	0.79%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	7378MAX	1.56%	1.56%	0.00%	0.00%	0.00%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	747400RN	0.07%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Aircraft		ANC		ENA		LHD		MRI		PAQ		SXQ	
Category	AEDT Type	A	D	A	D	A	D	A	D	A	D	A	D
	757RR	0.14%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A319-131	0.05%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A320-232	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A320-271N	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A321-232	0.67%	0.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CL600	0.19%	0.19%	0.13%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.78%	1.80%
	CNA510	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA525C	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.89%	0.90%
	CNA55B	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA560U	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA560XL	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA680	0.00%	0.00%	0.04%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA750	0.03%	0.03%	0.05%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.23%	2.25%
	ECLIPSE500	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	EMB145	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	EMB170	2.89%	2.90%	0.00%	0.02%	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	EMB175	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	EMB190	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	GIV	0.15%	0.15%	0.16%	0.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	GV	0.79%	0.78%	0.05%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	KC135R	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	LEAR35	0.01%	0.03%	0.69%	0.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	MD82	0.00%	0.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	MD83	0.00%	0.90%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	MD9025	1.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	MU3001	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Small Jets	CIT3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CL600	0.12%	0.11%	0.02%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.42%	0.41%	0.00%	0.00%

Aircraft		ANC		ENA		LHD		MRI		PAQ		SXQ	
Category	AEDT Type	A	D	A	D	A	D	A	D	A	D	A	D
	CNA510	0.05%	0.05%	0.05%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA525C	0.09%	0.09%	0.07%	0.09%	0.00%	0.00%	0.00%	0.00%	0.42%	0.41%	0.00%	0.00%
	CNA55B	0.07%	0.07%	0.07%	0.11%	0.00%	0.00%	0.00%	0.00%	1.25%	1.23%	0.00%	0.00%
	CNA560U	0.07%	0.07%	0.04%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA560XL	0.02%	0.02%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA680	0.05%	0.05%	0.05%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.45%
	CNA750	0.10%	0.10%	0.11%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	COMJET	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	ECLIPSE500	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%
	FAL20	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	GV	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	IA1125	0.04%	0.04%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	LEAR25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	LEAR35	1.65%	1.62%	0.16%	0.53%	0.00%	0.00%	0.00%	0.00%	6.27%	6.15%	0.89%	0.00%
	MU3001	0.00%	0.00%	0.02%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Turbo-Props	1900D	13.07%	13.00%	1.10%	1.10%	1.55%	0.95%	0.00%	0.00%	0.77%	0.54%	0.25%	0.51%
	C130	1.51%	1.50%	0.04%	0.04%	0.44%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.00%
	C130E	0.02%	0.02%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.77%	0.00%	0.45%	0.00%
	CNA208	6.13%	6.10%	33.70%	33.68%	60.21%	39.46%	11.31%	11.34%	46.48%	48.18%	25.83%	26.12%
	CNA441	1.90%	1.89%	1.22%	1.22%	0.50%	0.11%	0.16%	0.10%	0.14%	0.49%	0.45%	0.45%
	DC6	0.09%	0.10%	0.05%	0.04%	0.12%	0.00%	0.00%	0.00%	0.00%	0.32%	0.00%	0.00%
	DHC6	5.10%	5.07%	6.66%	6.68%	6.14%	2.65%	20.55%	19.51%	21.06%	20.98%	60.95%	61.66%
	DHC6QP	0.29%	0.29%	6.62%	6.62%	0.44%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.45%
	DHC8	5.07%	5.09%	41.25%	41.23%	0.37%	0.30%	0.00%	0.00%	1.13%	0.08%	0.00%	0.00%
	DHC830	0.96%	0.96%	0.10%	0.10%	0.00%	0.20%	0.00%	0.00%	0.00%	1.94%	0.00%	0.00%
	DO328	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	GASEPV	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.20%	0.23%	0.00%	0.00%	0.00%	0.00%
	HS748A	1.30%	1.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%	0.00%
	LEAR35	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Aircraft		ANC		ENA		LHD		MRI		PAQ		SXQ	
Category	AEDT Type	A	D	A	D	A	D	A	D	A	D	A	D
	PA42	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%
	SD330	0.17%	0.16%	0.04%	0.04%	0.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	SF340	0.35%	0.35%	0.06%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Props	BEC58P	1.59%	1.59%	6.27%	6.25%	21.65%	38.03%	1.97%	2.43%	0.84%	1.23%	0.45%	0.00%
	CNA172	0.01%	0.02%	0.71%	0.71%	4.03%	7.07%	4.78%	5.58%	14.64%	13.94%	3.56%	2.70%
	CNA182	0.00%	0.00%	0.02%	0.00%	0.00%	0.88%	0.12%	0.12%	0.42%	0.41%	0.45%	0.00%
	CNA441	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.05%	0.00%	0.00%	0.00%	0.45%
	COMSEP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.42%	0.00%	0.00%	0.00%
	DC3	0.04%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	DC6	0.00%	0.00%	0.02%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	GASEPF	0.00%	0.00%	0.02%	0.04%	0.00%	2.65%	0.40%	0.45%	1.67%	1.64%	0.00%	0.00%
	GASEPV	0.01%	0.02%	0.12%	0.14%	2.52%	5.31%	0.70%	0.77%	2.09%	2.05%	1.34%	2.25%
	PA30	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.09%	0.11%	0.00%	0.00%	0.00%	0.00%
Helicopters	B206B3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.32%	0.05%	0.00%	0.00%	0.00%	0.00%
	B206L	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.49%	0.47%	0.00%	0.00%	0.00%	0.00%
	B212	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.20%	0.94%	0.00%	0.00%	0.00%	0.00%
	B407	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.74%	14.92%	0.00%	0.00%	0.00%	0.00%
	B429	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%
	CH47D	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%
	EC130	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.05%	0.00%	0.00%	0.00%	0.00%
	H500D	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.69%	1.56%	0.00%	0.00%	0.00%	0.00%
	R22	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.15%	0.97%	0.00%	0.00%	0.00%	0.00%
	R44	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	21.33%	17.65%	0.00%	0.00%	0.00%	0.00%
	S70	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.15%	0.00%	0.00%	0.00%	0.00%
	S76	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.05%	0.00%	0.00%	0.00%	0.00%
	SA350D	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	23.58%	22.36%	0.00%	0.00%	0.00%	0.00%
	SA365N	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%

Totals may not add up to 100% due to rounding.

Heavy Jets = Aircraft capable of takeoff weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight. (FAA Order JO71110.65U, Air Traffic Control, Appendix A.)

Jets = Aircraft of more than 41,000 pounds, maximum certificated takeoff weight, up to but not including 300,000 pounds. (FAA Order JO71110.65U, Air Traffic Control, Appendix A.)

Small Jets = Aircraft of 41,000 pounds or less maximum certificated takeoff weight. (FAA Order JO71110.65U, Air Traffic Control, Appendix A.)

Turbo-Props / High Performance Turbo-Props = Aircraft powered by turboprop engines.

Props = Propeller driven aircraft

Source: Aircraft Data, AEDT; Forecasted fleet mix ATAC Corporation, January 2024.

Prepared by: ATAC Corporation, March 2024.

Table 12 Forecast Fleet Mix for Noise Modeling - 2032

Aircraft		ANC		ENA		LHD		MRI		PAQ		SXQ	
Category	AEDT Type	A	D	A	D	A	D	A	D	A	D	A	D
Heavy Jets	7478	9.82%	9.85%	0.00%	0.00%	0.00%	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	7879	0.70%	0.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	757300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	767300	2.19%	2.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	767400	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	777200	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	777300	0.00%	9.05%	0.00%	0.00%	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	74720B	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	747400RN	10.08%	10.11%	0.00%	0.00%	0.00%	0.48%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	757RR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	767CF6	0.05%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	7773ER	9.22%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.13%	0.00%	0.00%	0.00%
	7878R	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A300-622R	0.03%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A310-304	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A330-301	0.29%	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A330-343	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A350-941	0.62%	0.62%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	DC1010	0.01%	0.01%	0.00%	0.00%	0.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	MD11GE	1.44%	1.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Large Jets	717200	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	737300	0.27%	0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Aircraft		ANC		ENA		LHD		MRI		PAQ		SXQ	
Category	AEDT Type	A	D	A	D	A	D	A	D	A	D	A	D
	737400	0.75%	0.75%	0.02%	0.02%	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	737500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	737700	6.18%	6.20%	0.00%	0.00%	0.11%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	737800	11.30%	11.33%	0.02%	0.02%	0.88%	0.73%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	7378MAX	1.52%	1.53%	0.00%	0.00%	0.00%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	747400RN	0.07%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	757RR	0.14%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A319-131	0.05%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A320-232	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A320-271N	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	A321-232	0.73%	0.73%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CL600	0.19%	0.19%	0.13%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.78%	1.80%
	CNA510	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA525C	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.89%	0.90%
	CNA55B	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA560U	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA560XL	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA680	0.00%	0.00%	0.04%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA750	0.03%	0.03%	0.05%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.23%	2.25%
	ECLIPSE500	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	EMB145	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	EMB170	2.91%	2.92%	0.00%	0.02%	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	EMB175	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	EMB190	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	GIV	0.14%	0.14%	0.16%	0.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	GV	0.76%	0.75%	0.05%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	KC135R	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	LEAR35	0.01%	0.03%	0.70%	0.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	MD82	0.00%	0.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Aircraft		ANC		ENA		LHD		MRI		PAQ		SXQ	
Category	AEDT Type	A	D	A	D	A	D	A	D	A	D	A	D
Small Jets	MD83	0.00%	0.91%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	MD9025	1.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	MU3001	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CIT3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CL600	0.11%	0.11%	0.02%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.42%	0.41%	0.00%	0.00%
	CNA510	0.05%	0.05%	0.05%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA525C	0.08%	0.08%	0.07%	0.09%	0.00%	0.00%	0.00%	0.00%	0.42%	0.41%	0.00%	0.00%
	CNA55B	0.07%	0.06%	0.07%	0.11%	0.00%	0.00%	0.00%	0.00%	1.25%	1.23%	0.00%	0.00%
	CNA560U	0.07%	0.07%	0.04%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA560XL	0.02%	0.02%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	CNA680	0.05%	0.04%	0.05%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.45%
	CNA750	0.10%	0.10%	0.11%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	COMJET	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	ECLIPSE500	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%
	FAL20	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	GV	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	IAI125	0.04%	0.04%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	LEAR25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	LEAR35	1.56%	1.53%	0.16%	0.53%	0.00%	0.00%	0.00%	0.00%	6.27%	6.15%	0.89%	0.00%
	MU3001	0.00%	0.00%	0.02%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Turbo-Props	1900D	12.98%	12.90%	1.11%	1.11%	1.51%	0.93%	0.00%	0.00%	0.77%	0.54%	0.25%	0.51%
	C130	1.50%	1.49%	0.04%	0.04%	0.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.00%
	C130E	0.02%	0.02%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.77%	0.00%	0.45%	0.00%
	CNA208	6.04%	6.01%	34.14%	34.12%	60.38%	40.38%	11.61%	11.65%	46.48%	48.18%	25.83%	26.12%
	CNA441	1.88%	1.87%	1.26%	1.25%	0.51%	0.10%	0.16%	0.10%	0.14%	0.49%	0.45%	0.45%
	DC6	0.09%	0.10%	0.05%	0.04%	0.11%	0.00%	0.00%	0.00%	0.00%	0.32%	0.00%	0.00%
	DHC6	4.93%	4.90%	6.77%	6.79%	6.08%	2.62%	20.93%	19.86%	21.06%	20.98%	60.95%	61.66%
	DHC6QP	0.27%	0.27%	6.63%	6.62%	0.41%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.45%

Aircraft		ANC		ENA		LHD		MRI		PAQ		SXQ	
Category	AEDT Type	A	D	A	D	A	D	A	D	A	D	A	D
	DHC8	5.11%	5.12%	40.65%	40.62%	0.33%	0.27%	0.00%	0.00%	1.13%	0.08%	0.00%	0.00%
	DHC830	0.97%	0.97%	0.10%	0.10%	0.00%	0.18%	0.00%	0.00%	0.00%	1.94%	0.00%	0.00%
	DO328	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	GASEPV	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.20%	0.23%	0.00%	0.00%	0.00%	0.00%
	HS748A	1.30%	1.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%	0.00%
	LEAR35	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	PA42	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%
	SD330	0.15%	0.15%	0.04%	0.04%	0.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	SF340	0.35%	0.35%	0.06%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Props	BEC58P	1.48%	1.48%	6.28%	6.26%	21.77%	37.58%	1.97%	2.45%	0.84%	1.23%	0.45%	0.00%
	CNA172	0.01%	0.01%	0.71%	0.71%	4.05%	6.99%	4.75%	5.56%	14.64%	13.94%	3.56%	2.70%
	CNA182	0.00%	0.00%	0.02%	0.00%	0.00%	0.87%	0.12%	0.12%	0.42%	0.41%	0.45%	0.00%
	CNA441	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.05%	0.00%	0.00%	0.00%	0.45%
	COMSEP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.42%	0.00%	0.00%	0.00%
	DC3	0.04%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	DC6	0.00%	0.00%	0.02%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	GASEPF	0.00%	0.00%	0.02%	0.04%	0.00%	2.62%	0.40%	0.45%	1.67%	1.64%	0.00%	0.00%
	GASEPV	0.01%	0.02%	0.12%	0.14%	2.53%	5.24%	0.69%	0.77%	2.09%	2.05%	1.34%	2.25%
	PA30	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.09%	0.11%	0.00%	0.00%	0.00%	0.00%
Helicopters	B206B3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.32%	0.05%	0.00%	0.00%	0.00%	0.00%
	B206L	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.49%	0.47%	0.00%	0.00%	0.00%	0.00%
	B212	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.19%	0.93%	0.00%	0.00%	0.00%	0.00%
	B407	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.64%	14.76%	0.00%	0.00%	0.00%	0.00%
	B429	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%
	CH47D	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%
	EC130	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.05%	0.00%	0.00%	0.00%	0.00%
	H500D	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.67%	1.54%	0.00%	0.00%	0.00%	0.00%
	R22	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.14%	0.96%	0.00%	0.00%	0.00%	0.00%
	R44	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	21.09%	17.45%	0.00%	0.00%	0.00%	0.00%

Aircraft		ANC		ENA		LHD		MRI		PAQ		SXQ	
Category	AEDT Type	A	D	A	D	A	D	A	D	A	D	A	D
	S70	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.15%	0.00%	0.00%	0.00%	0.00%
	S76	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.05%	0.00%	0.00%	0.00%	0.00%
	SA350D	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	23.32%	22.11%	0.00%	0.00%	0.00%	0.00%
	SA365N	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	0.00%

Totals may not add up to 100% due to rounding.

Heavy Jets = Aircraft capable of takeoff weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight. (FAA Order JO71110.65Z, Air Traffic Control, Appendix A.)

Jets = Aircraft of more than 41,000 pounds, maximum certificated takeoff weight, up to but not including 300,000 pounds. (FAA Order JO71110.65Z, Air Traffic Control, Appendix A.)

Small Jets = Aircraft of 41,000 pounds or less maximum certificated takeoff weight. (FAA Order JO71110.65Z, Air Traffic Control, Appendix A.)

Turbo-Props / High Performance Turbo-Props = Aircraft powered by turboprop engines.

Props = Propeller driven aircraft

Source: Aircraft Data, AEDT; Forecasted fleet mix ATAC Corporation, January 2024.

Prepared by: ATAC Corporation, March 2024.

3.1.7 Noise-Power-Distance (NPD) Curves

AEDT uses tables of noise-power-distance data to represent noise levels for a given power setting (or thrust setting) at a range of distances from the aircraft to a receptor. The data consists of a set of sound exposure levels in decibels for various combinations of aircraft, engine power settings, and distances from the aircraft to a receptor. This NPD data is available for many aircraft and is stored in AEDT's fleet database.

NPD data is accessed during AEDT noise calculations to determine noise levels for the appropriate metric at each receptor. For accumulated noise metrics such as DNL used in this study (see [Section 1.1](#)) the contribution of each modeled operation to each receptor is calculated, then aggregated across all operations to measure the noise exposure of a given set of operations.¹⁶

3.1.8 Climb/Descent Profiles

AEDT generates climb/descent profiles for each operation that can be controlled with specified altitude control code values. Altitude control codes allow users to constrain climb/descent profiles as necessary. AEDT's aircraft performance module attempts to model climb and descent profiles within constraints of allowable aircraft performance. Air traffic procedure designs can be imposed onto climb and descent profiles through the use of altitude control codes.

For ATAAPS, altitude control codes are applied above 3,000 feet above field elevation (AFE). AEDT uses default profile data for climb/descent profiles at 3,000 feet AFE and below. Above 3,000 feet AFE, AEDT attempts to match altitude values prescribed by the input trajectory within the constraint of the altitude control code value. For model tracks that do not reach 3,000 feet AFE, an altitude control code is applied to its highest altitude. The four enumerations of altitude control code values are as follows: no altitude control, model to a specified altitude or higher, model exactly to a specified altitude, and model to a specified altitude or lower. If an operation cannot achieve the altitude with given the conditions and a specified altitude control code, it will not be modeled. In this case, the user may relax the constraining altitude control code(s) and attempt to model the operation again. This process can be repeated until all operations are successfully modeled in AEDT. Once modeled, the operation's performance includes parameters such as four-dimensional position, speed, and thrust.

3.1.9 Stage Length

Stage length refers to distance between origin and destination airports. In AEDT, stage length corresponds to aircraft starting weight as longer distances are mapped to larger stage length values with higher starting weights. Similarly, shorter distances are mapped to smaller stage length values with lighter starting weights. Great-circle distance calculations and the maximum stage length for a given aircraft is used to determine a stage length value for each aircraft operation.

3.1.10 Model Track Definitions

Proprietary software was utilized for the analysis of radar data for ANC, ENA, LHD, MRI PAQ, and SXQ (see [Section 2.2.1](#) for radar data details). Data was separated first by airport and operation type (e.g., arrival, departure). Radar flight tracks were grouped based on runway, aircraft category (e.g., jet, prop), time of day (day/night), and route similarity. Groups of radar flight were split as necessary to isolate sub-groups of tracks with restricted climb or descent

¹⁶ U.S. Department of Transportation, Federal Aviation Administration, *Aviation Environmental Design Tool (AEDT) Technical Manual*, Version 3e, May 2022.

profiles. Sub-groups represent radar flight tracks operating along specific air traffic control (ATC) climb or descent procedures or via ATC instructions.

Automated spatial analysis calculations were applied to sub-groups to calculate a primary, or backbone, model track. The proprietary software allows for the simultaneous computation of sub-tracks located adjacent to the backbone. Sub-tracks account for dispersion of radar flight tracks around the backbone, based on a distribution of radar tracks. A backbone and its associated sub-tracks are the tracks defined as input into the model and referred to as a bundle. The appropriate number of sub-tracks, distributional counts, and lateral distribution of sub-tracks are computed by the spatial analysis based on radar flight track locations along the backbone. The number of sub-tracks and the distributional factor associated with each model track are chosen based on the number of radar flight tracks in the bundle and their general spread throughout the traffic flow (see **Section 4.1.2** for data integrity checks on model tracks).

FAA Order JO 7400.2N, *Procedures for Handling Airspace Matters, Environmental Processing, Chapter 32, Section 2 (7400.2N 32-2-1e.2.(b))* recommends the analysis of project-related noise impacts in areas where IFR aircraft operate between 10,000 feet AGL and 18,000 feet AGL when a national park or wildlife refuge is present. To comply with this recommendation, all model tracks are intended to be modeled to 18,000 feet AGL. If a radar flight track does not reach 18,000 feet AGL, the radar flight track endpoint was determined at the intersection with the Supplemental Study Area. If a radar flight track does not reach 18,000 feet AGL or intersect the Supplemental Study Area, then the radar flight track's endpoint was determined such that the cruise portion is modeled as much as possible. The location of each endpoint was calculated and recorded.

The Supplemental Study Area is constructed by determining the spatial location of radar flight tracks crossing 18,000 feet AGL. Anomalous radar flight tracks are discarded from the construction of this boundary so that potential distortion of the lateral boundary can be avoided and the boundary is kept to a reasonable size.

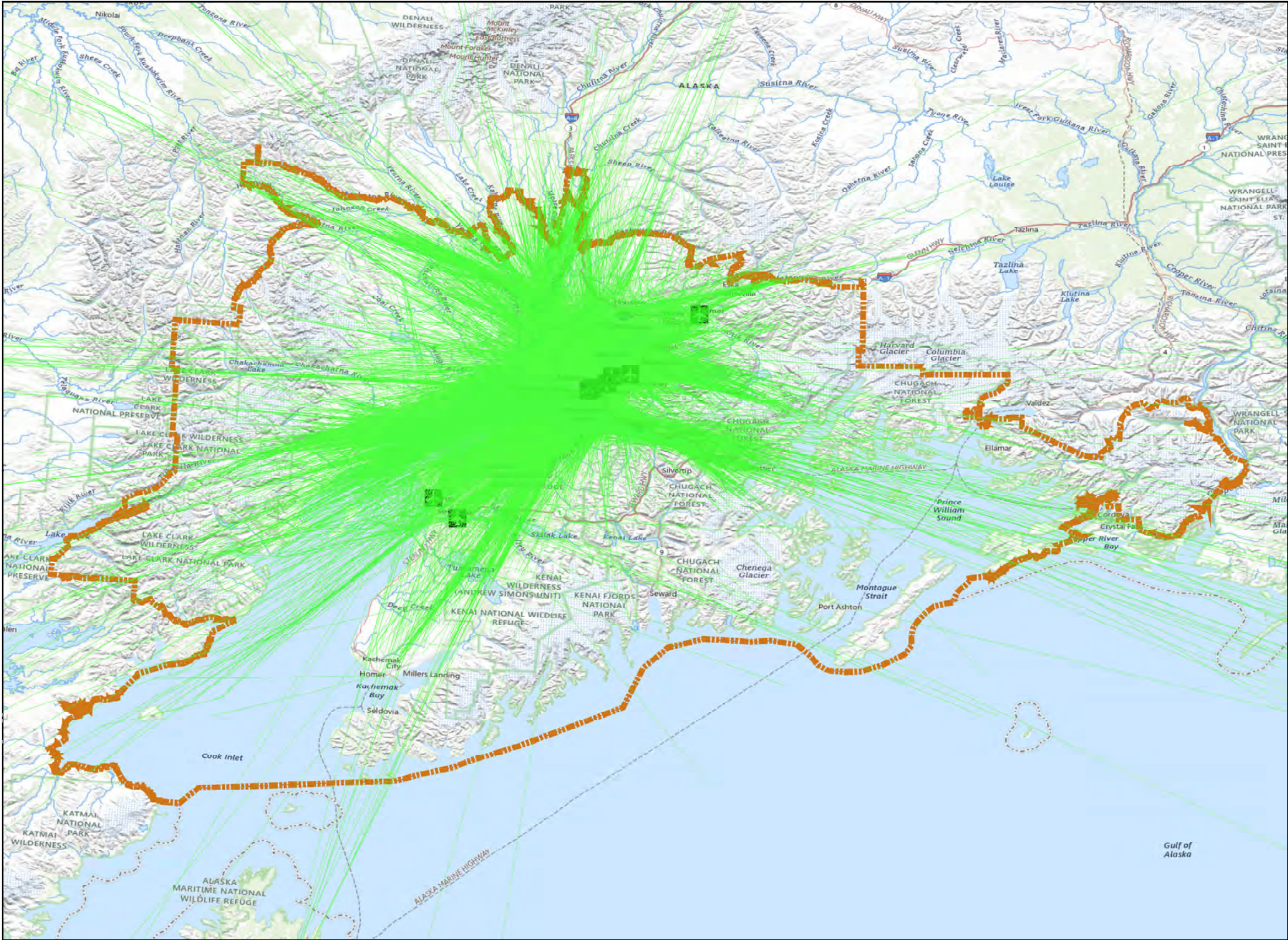
A backbone's endpoint location (and that of all associated sub-tracks) is determined to be the endpoint of the radar flight track that is furthest from the airport. For radar flight tracks that reach 18,000 feet AGL, calculating the location of a backbone's endpoint in this manner ensures the backbone endpoint's altitude reaches at least 18,000 feet AGL. Due to variety in endpoint location of the radar flight tracks that compose a bundle, the backbone endpoint's altitude is often determined to be higher than 18,000 feet AGL. For a small number of cases, due to complex track geometry, a backbone's endpoint can exist outside the Supplemental Study Area. Also note that this methodology can also result in flight tracks being modeled beyond the Air Defense Identification Zone (ADIZ).¹⁷ Note, however, that the lengths of the backbone tracks are preserved (either by preserving its total distance for departures, or relative straight-line distance from the airport for arrivals) in the modeling of Proposed Action tracks to ensure equity in track length when comparisons are made across scenarios.

This process resulted in 4,868 unique departure tracks for AEDT model input (backbones and sub-tracks). **Exhibit 5** presents the DEA AEDT and NOISEMAP departure tracks used in the modeling of 2022/2023 Existing Conditions scenario. The analysis also resulted in the development of 5,271 AEDT unique arrival tracks (backbones and sub-tracks). **Exhibit 6** presents the DEA AEDT and NOISEMAP arrival tracks used in the modeling of 2022/2023 Existing Conditions scenario.

¹⁷ FAA. https://www.faa.gov/air_traffic/publications/us_restrictions/airspace/#adiz, Accessed September 2022.

A majority of the routing for No Action airspace procedures in 2027 and 2032 is anticipated to be identical to the routing in the 2022/2023 Existing Conditions scenario. This assumption excludes the addition of previously developed procedures identified as having independent utility and separately analyzed for environmental effects (Cumulative Impacts in Section 5.10 of the EA). As a result, the model tracks created from 2022/2023 Existing Conditions scenario, including these procedures, were used directly in the modeling of No Action.

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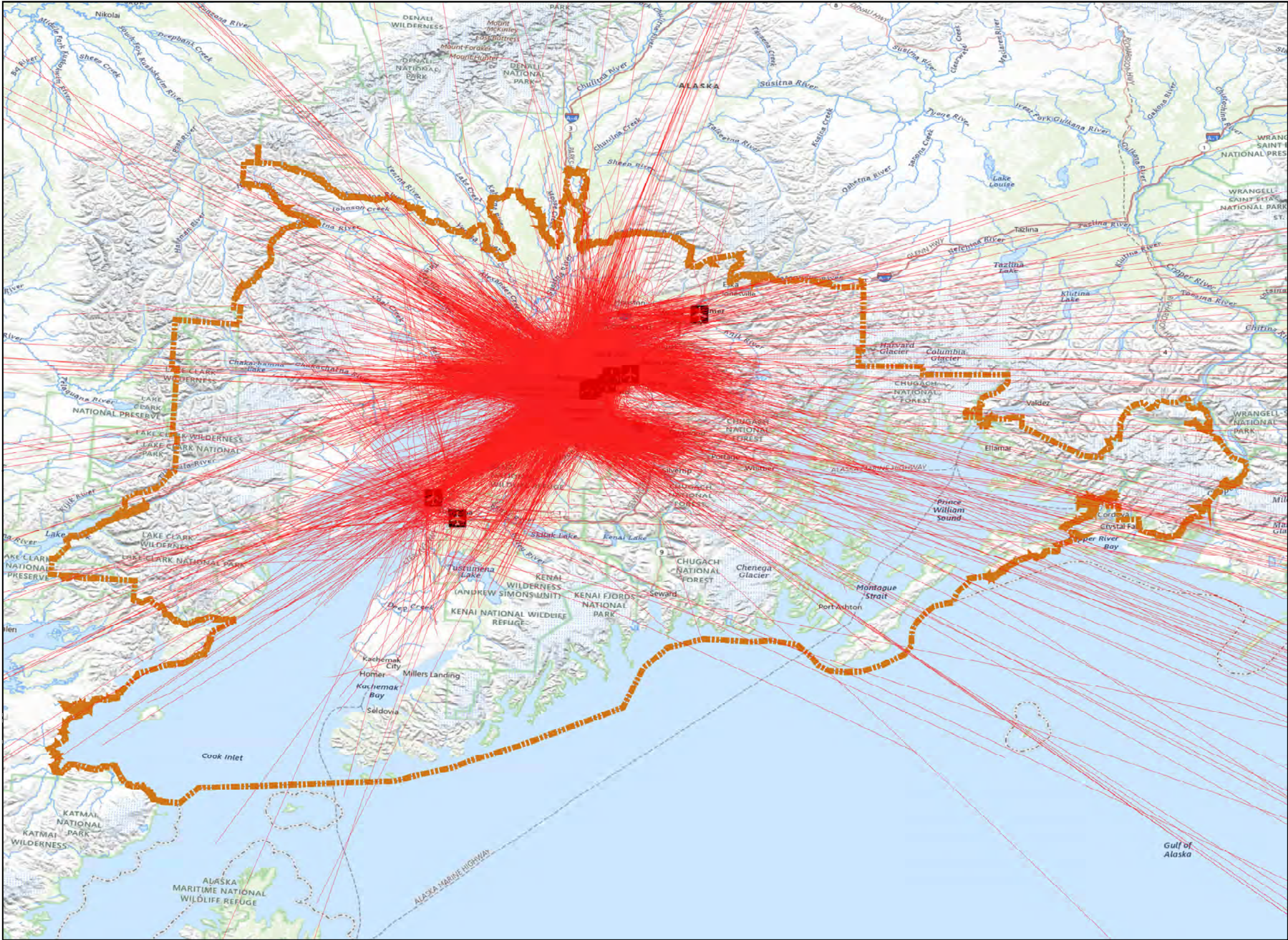
- Existing Conditions Arrival Flight
- General Study
- Study Airport
- US State Tiger Line

Notes:
Airport Identifier and Name:
ANC - Ted Stevens Anchorage International Airport
EDF - Elmendorf Air Force Base
ENA - Kenai Municipal Airport
FRN - Bryant Army Airfield
LHD - Lake Hood Seaplane Base
MRI - Merrill Field
PAQ - Palmer Airport
SXQ - Soldotna Airport

Projection: GCS North American 1983
Scale: 1:2,631,162

0 1.25 2.5 5 Miles

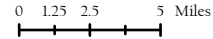
Sources: USGS The National Map: National Boundaries Dataset, National Elevation Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset: U.S. Census Bureau TIGER/Line; HERE Road Data.
Federal Aviation Administration, NFDC/CIIP airspace boundaries, waypoints and airports. ATAC Corp. AEDT 3e Existing Conditions census centroid noise results
Prepared by: ATAC Corporation, October 2026.



- Existing Conditions Departure Flight
- General Study
- Study Airport
- US State Tiger Line

Notes:
Airport Identifier and Name:
ANC - Ted Stevens Anchorage International Airport
EDF - Elmendorf Air Force Base
ENA - Kenai Municipal Airport
FRN - Bryant Army Airfield
LHD - Lake Hood Seaplane Base
MRI - Merrill Field
PAQ - Palmer Airport
SXQ - Soldotna Airport

Projection: GCS North American 1983
Scale: 1:2,631,162



Sources: USGS The National Map: National Boundaries Dataset, National Elevation Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset: U.S. Census Bureau TIGER/Line; HERE Road Data.
Federal Aviation Administration, NFDC/CIIP airspace boundaries, waypoints and airports. ATAC Corp. AEDT 3e Existing Conditions census centroid noise results.
Prepared by: ATAC Corporation, October 2026.

3.1.11 Model Track Assignments

Flight characteristics (e.g., aircraft type, time of day (day or night), and origin or destination) of each model track was retained as an attribute of each AEDT backbone and sub-track and assigned to each model track. As a result of operations levels analysis (see [Section 3.1.4](#)) and model track definitions (see [Section 3.1.10](#)), each AEDT model input track does not necessarily represent one flight operation; it could represent many or fractions of operations.

3.1.12 User-Defined Profiles

A user-defined profile was required to model arrivals for the MD11 aircraft type. AEDT 3e does not have procedure step profiles for arrivals for this aircraft type. Thus, a user-defined profile was created based on the approach procedure steps from a DC1030 aircraft in the model. Details regarding the creation of these user-defined profiles can also be found in [Supplement 2](#).

In addition, it was necessary to develop a methodology for adjusting existing AEDT helicopter profiles to create custom user-defined profiles. The existing profiles in AEDT 3e do not adequately reach the typical cruising altitude, speed, and distance of helicopter trajectories that operate in the region. Therefore, a methodology was developed to extend these profiles to appropriate heights and lengths. Details about this methodology can be found in [Supplement 2](#).

3.1.13 Receptor Sets

Receptors are locations in AEDT where noise is calculated. Receptors can be grouped together into receptor sets. The first receptor set contains 5,598 receptors based on population data to represent 454,517 people (see [Section 2.3.1](#) for details). The second receptor set contains 626,601 receptors¹⁸ representing Section 4(f), historic, cultural, and Department of Interior locations deemed noise sensitive (see [Section 2.3.2](#) for details). The third receptor set contains 160,980 receptors that have been regularly spaced at 0.5 NM apart to capture the noise level changes in any areas that were not covered by the population centroid and Section 4(f) properties and resources grids (see [Section 2.3.3](#) for details). The fourth receptor set contains 1,038 receptors to represent noise sensitive land use area in regions of high noise levels about the Study Airports (see [Section 2.3.4](#) for details).

Noise values for Existing Conditions, No Action, and Proposed Action scenarios for all of the aforementioned receptor sets can be found in [Supplements 3 to 6](#) of this report. Note that all noise values presented are calculated by combining noise results from AEDT and NOISEMAP (see [Section 4.3](#) for details).

3.1.14 Helicopter Modeling

Many aspects of the helicopter modeling followed the same steps as the fixed wing modeling. Environmental variables such as weather and terrain remained consistent, and the receptor sets were identical. The fleet mix, radar flight tracks, and day/night split were based on the same data source described in [Section 2.2.1](#).

However, some modeling aspects differed from the fixed-wing model. These included takeoff/landing locations, operations levels, NPD curves, and climb/descent profiles. While helicopter model tracks used the same runway ends as fixed-wing model tracks, they also utilized helipads for takeoffs and landings. The determination of runway end or helipad usage was based on radar flight track observation. Historical and forecast operation levels for

¹⁸ This count includes receptors with identical georeferences because a point can represent the same property from multiple sources.

helicopter operations were based on the Merrill Field Airport Master Plan and Noise Study, detailed further in Appendix H: *Flight Schedules Tech Report*.

Helicopter NPD curves in AEDT differ slightly from their fixed-wing counterparts, specifically in terms of the “power” portion of the curve. Instead of engine power setting, helicopter NPD curves use the helicopter’s operation mode (e.g. climb, descent, level, etc.). Additionally, helicopter NPD curves include additional parameters to address the directivity of helicopter noise.

Regarding climb/descent profiles, helicopter operations in AEDT do not utilize the same altitude controls described in Section 3.1.8. Instead, they are based on a standard fixed profile, customized to reach cruising altitude, speed, and distance of helicopter trajectories in the region. Details about this methodology can be found in Supplement 2.

3.1.15 VFR

Included in this project are changes to airspace boundaries set forth in the Code of Federal Regulations, Title 14, Chapter I, Subchapter F, Part 93, Subpart D – Anchorage, Alaska, Terminal Area. This regulation defines guidelines and airspace boundaries to regulate traffic in special airspace. Analysis suggested implementation of the Proposed Action would have an effect on this airspace; therefore, it is included in the DEA.

It was determined that traffic affected by changes to this airspace is limited to VFR traffic. All previously mentioned traffic was IFR traffic; thus, additional analysis of VFR traffic in this airspace was performed. The VFR analysis is limited to ANC, LHD, and MRI traffic, as only these Study Airports exist within the airspace. All environmental modeling of VFR traffic was performed using AEDT.

Best efforts were made to process VFR traffic similar to IFR traffic in preparation for modeling in AEDT; however, due to the difference in required reporting (i.e., VFR traffic is not required to file a flight plan) and nature of flight some data values are assumed or appropriately calculated. Consultations were held with FAA Subject Matter Experts (SMEs) and modeled according to their inputs.

Operation Levels and Day/Night Distribution

VFR operation levels (number of takeoffs and landings) for each Study Airport were based on radar data, Airport Master Records, historical airport counts from FAA sources including the Operations Network (OPSNET),¹⁹ Traffic Flow Management System Counts (TFMSC),²⁰ and Terminal Activity Forecasts (TAF).²¹ Operation counts for future years were based on total TAF operation counts. Table 13 presents the count of the modeled AAD VFR operations for each scenario year.

Table 13 Modeled Average Annual Day VFR Operation Totals

Airport	Existing Conditions (10/2022 – 09/2023)		2027		2032	
	Day	Night	Day	Night	Day	Night
ANC	178.27	27.45	195.91	30.22	210.25	32.47
LHD	194.36	2.91	206.76	3.08	222.09	3.29
MRI	197.24	4.34	200.01	4.40	202.92	4.47

Source: PDARS Data (10/01/2022-09/30/2023), MEARTS Data (12/01/2022-03/30/2023), OPSNET (accessed October 2023), ATAC Corporation, March 2025.
Prepared by: ATAC Corporation, March 2025.

¹⁹ FAA OPSNET, (<https://aspm.faa.gov/opsnet/sys/Airport.asp>)

²⁰ FAA TFMS, (<https://aspm.faa.gov/tfms/sys/main.asp>)

²¹ FAA TAF, (<https://taf.faa.gov/>)

Runway Use

Tables 14 to 16 present VFR airport runway use percentages for ANC, LHD, and MRI arrivals and departures respectively, by daytime and nighttime, for the No Action and Proposed Action. The proposed air traffic updates do not change runway use; therefore, the distribution of operations was held constant between No Action and Proposed Action.

The average annual runway use for the Study Airports is presented in Tables 14 through 16 for 2027 and 2032 No Action is based on historical runway use over a period from October 1, 2022 through September 30, 2023.

The average annual runway use for 2027 and 2032 Proposed Action is based on estimates provided by air traffic controllers associated with anticipated changes in airport runway operating configuration use with the new procedures in place. As depicted in the tables, runway use is not notably different between No Action and Proposed Action.

Table 14 ANC VFR Runway Use Percentages – Proposed Action and No Action

Table 14		Jets		Turbo-Props		Props	
RWY		Day	Night	Day	Night	Day	Night
ANC		2027					
No Action Arrivals	15	18.77%	20.46%	19.67%	21.64%	15.70%	23.34%
	33	0.80%	0.97%	2.37%	1.86%	1.69%	1.88%
	07L	12.06%	7.35%	17.05%	8.10%	17.21%	11.00%
	07R	67.95%	70.98%	57.34%	66.95%	38.00%	54.99%
	25L	0.14%	0.00%	1.85%	0.96%	8.15%	2.34%
	25R	0.28%	0.24%	1.72%	0.48%	19.24%	6.45%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	15	2.92%	4.86%	2.21%	1.30%	2.36%	4.14%
	33	66.80%	63.10%	16.08%	28.30%	13.97%	8.08%
	07L	5.18%	0.00%	39.88%	29.04%	24.47%	42.32%
	07R	3.85%	8.04%	20.25%	14.74%	39.40%	20.51%
	25L	19.83%	21.22%	18.71%	23.17%	15.10%	19.58%
	25R	1.43%	2.78%	2.87%	3.45%	4.70%	5.37%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	15	18.77%	20.46%	19.67%	21.64%	15.70%	23.34%
	33	0.80%	0.97%	2.37%	1.86%	1.69%	1.88%
	07L	12.06%	7.35%	17.05%	8.10%	17.21%	11.00%
	07R	67.95%	70.98%	57.34%	66.95%	38.00%	54.99%
	25L	0.14%	0.00%	1.85%	0.96%	8.15%	2.34%
	25R	0.28%	0.24%	1.72%	0.48%	19.24%	6.45%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	15	2.92%	4.86%	2.21%	1.30%	2.36%	4.14%
	33	66.80%	63.10%	16.08%	28.30%	13.97%	8.08%
	07L	5.18%	0.00%	39.88%	29.04%	24.47%	42.32%
	07R	3.85%	8.04%	20.25%	14.74%	39.40%	20.51%
	25L	19.83%	21.22%	18.71%	23.17%	15.10%	19.58%
	25R	1.43%	2.78%	2.87%	3.45%	4.70%	5.37%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 14		Jets		Turbo-Props		Props	
RWY		Day	Night	Day	Night	Day	Night
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		2032					
No Action Arrivals	15	18.74%	20.45%	19.67%	21.65%	15.68%	23.35%
	33	0.80%	0.96%	2.37%	1.86%	1.70%	1.88%
	07L	12.04%	7.36%	17.06%	8.11%	17.27%	11.00%
	07R	68.00%	70.99%	57.34%	66.94%	37.89%	54.97%
	25L	0.14%	0.00%	1.85%	0.96%	8.18%	2.34%
	25R	0.28%	0.24%	1.72%	0.48%	19.30%	6.46%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	15	2.90%	4.84%	2.21%	1.29%	2.35%	4.15%
	33	66.76%	63.11%	16.06%	28.30%	13.95%	8.07%
	07L	5.18%	0.00%	39.89%	29.04%	24.51%	42.33%
	07R	3.87%	8.05%	20.26%	14.75%	39.41%	20.51%
	25L	19.88%	21.22%	18.71%	23.17%	15.07%	19.59%
	25R	1.42%	2.78%	2.87%	3.45%	4.71%	5.36%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	15	18.74%	20.45%	19.67%	21.65%	15.68%	23.35%
	33	0.80%	0.96%	2.37%	1.86%	1.70%	1.88%
	07L	12.04%	7.36%	17.06%	8.11%	17.27%	11.00%
	07R	68.00%	70.99%	57.34%	66.94%	37.89%	54.97%
	25L	0.14%	0.00%	1.85%	0.96%	8.18%	2.34%
	25R	0.28%	0.24%	1.72%	0.48%	19.30%	6.46%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	15	2.90%	4.84%	2.21%	1.29%	2.35%	4.15%
	33	66.76%	63.11%	16.06%	28.30%	13.95%	8.07%
	07L	5.18%	0.00%	39.89%	29.04%	24.51%	42.33%
	07R	3.87%	8.05%	20.26%	14.75%	39.41%	20.51%
	25L	19.88%	21.22%	18.71%	23.17%	15.07%	19.59%
	25R	1.42%	2.78%	2.87%	3.45%	4.71%	5.36%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Daytime operations arrive or depart between 7 am and 10 pm.; nighttime operations arrive or depart between 10 pm and 7 am.
Totals may not add up to 100% due to rounding.

Source: PDARS Data (10/01/2022 – 09/30/2023), MEARTS Data (12/01/2022-03/30/2023), ATAC Corporation, March 2025.
Prepared by: ATAC Corporation, March 2025.

Table 15 LHD VFR Runway Use Percentages – Proposed Action and No Action

Table 15		Jets		Turbo-Props		Props	
RWY		Day	Night	Day	Night	Day	Night
LHD		2027					
No Action Arrivals	14	21.18%	0.00%	10.58%	30.66%	10.22%	22.98%
	32	62.93%	0.00%	35.54%	39.15%	38.96%	51.07%
	E	0.00%	0.00%	1.36%	0.00%	1.57%	3.25%
	N	0.00%	0.00%	0.09%	0.00%	0.05%	0.00%

Table 15		Jets		Turbo-Props		Props	
RWY		Day	Night	Day	Night	Day	Night
	NW	0.00%	0.00%	0.00%	0.00%	0.27%	0.81%
	S	0.00%	0.00%	0.37%	0.00%	0.58%	0.41%
	SE	5.30%	0.00%	7.37%	0.00%	8.32%	4.48%
	W	10.59%	0.00%	44.69%	30.19%	40.02%	17.00%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	14	0.00%	0.00%	22.10%	76.50%	11.65%	34.45%
	32	90.86%	0.00%	32.18%	19.97%	40.21%	40.42%
	E	0.00%	0.00%	12.40%	0.00%	11.18%	8.47%
	N	0.00%	0.00%	0.00%	0.00%	0.29%	0.00%
	NW	9.14%	0.00%	6.37%	3.53%	5.87%	2.12%
	S	0.00%	0.00%	0.20%	0.00%	0.25%	0.65%
	SE	0.00%	0.00%	26.75%	0.00%	30.54%	13.90%
	W	0.00%	0.00%	22.10%	76.50%	11.65%	34.45%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	14	21.18%	0.00%	10.58%	30.66%	10.22%	22.98%
	32	62.93%	0.00%	35.54%	39.15%	38.96%	51.07%
	E	0.00%	0.00%	1.36%	0.00%	1.57%	3.25%
	N	0.00%	0.00%	0.09%	0.00%	0.05%	0.00%
	NW	0.00%	0.00%	0.00%	0.00%	0.27%	0.81%
	S	0.00%	0.00%	0.37%	0.00%	0.58%	0.41%
	SE	5.30%	0.00%	7.37%	0.00%	8.32%	4.48%
	W	10.59%	0.00%	44.69%	30.19%	40.02%	17.00%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	14	0.00%	0.00%	22.10%	76.50%	11.65%	34.45%
	32	90.86%	0.00%	32.18%	19.97%	40.21%	40.42%
	E	0.00%	0.00%	12.40%	0.00%	11.18%	8.47%
	N	0.00%	0.00%	0.00%	0.00%	0.29%	0.00%
	NW	9.14%	0.00%	6.37%	3.53%	5.87%	2.12%
	S	0.00%	0.00%	0.20%	0.00%	0.25%	0.65%
	SE	0.00%	0.00%	26.75%	0.00%	30.54%	13.90%
	W	0.00%	0.00%	22.10%	76.50%	11.65%	34.45%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		2032					
No Action Arrivals	14	21.33%	0.00%	10.53%	30.53%	10.21%	22.95%
	32	62.67%	0.00%	35.42%	39.98%	38.95%	51.11%
	E	0.00%	0.00%	1.34%	0.00%	1.58%	3.27%
	N	0.00%	0.00%	0.08%	0.00%	0.05%	0.00%
	NW	0.00%	0.00%	0.00%	0.00%	0.27%	0.82%
	S	0.00%	0.00%	0.37%	0.00%	0.57%	0.41%
	SE	5.33%	0.00%	7.44%	0.00%	8.34%	4.51%
	W	10.66%	0.00%	44.81%	29.49%	40.03%	16.93%

Table 15		Jets		Turbo-Props		Props	
RWY		Day	Night	Day	Night	Day	Night
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	14	0.00%	0.00%	22.26%	77.25%	11.65%	34.37%
	32	90.81%	0.00%	31.78%	19.11%	40.17%	40.44%
	E	0.00%	0.00%	12.36%	0.00%	11.17%	8.43%
	N	0.00%	0.00%	0.00%	0.00%	0.29%	0.00%
	NW	9.19%	0.00%	6.33%	3.63%	5.86%	2.14%
	S	0.00%	0.00%	0.20%	0.00%	0.26%	0.65%
	SE	0.00%	0.00%	27.07%	0.00%	30.61%	13.97%
	W	0.00%	0.00%	22.26%	77.25%	11.65%	34.37%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	14	21.33%	0.00%	10.53%	30.53%	10.21%	22.95%
	32	62.67%	0.00%	35.42%	39.98%	38.95%	51.11%
	E	0.00%	0.00%	1.34%	0.00%	1.58%	3.27%
	N	0.00%	0.00%	0.08%	0.00%	0.05%	0.00%
	NW	0.00%	0.00%	0.00%	0.00%	0.27%	0.82%
	S	0.00%	0.00%	0.37%	0.00%	0.57%	0.41%
	SE	5.33%	0.00%	7.44%	0.00%	8.34%	4.51%
	W	10.66%	0.00%	44.81%	29.49%	40.03%	16.93%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	14	0.00%	0.00%	22.26%	77.25%	11.65%	34.37%
	32	90.81%	0.00%	31.78%	19.11%	40.17%	40.44%
	E	0.00%	0.00%	12.36%	0.00%	11.17%	8.43%
	N	0.00%	0.00%	0.00%	0.00%	0.29%	0.00%
	NW	9.19%	0.00%	6.33%	3.63%	5.86%	2.14%
	S	0.00%	0.00%	0.20%	0.00%	0.26%	0.65%
	SE	0.00%	0.00%	27.07%	0.00%	30.61%	13.97%
	W	0.00%	0.00%	22.26%	77.25%	11.65%	34.37%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Daytime operations arrive or depart between 7 am and 10 pm.; nighttime operations arrive or depart between 10 pm and 7 am.

Totals may not add up to 100% due to rounding.

Source: PDARS Data (10/01/2022 – 09/30/2023), MEARTS Data (12/01/2022-03/30/2023), ATAC Corporation, March 2025.

Prepared by: ATAC Corporation, March 2025.

Table 16 MRI VFR Runway Use Percentages – Proposed Action and No Action

Table 16		Jets		Turbo-props		Props	
RWY		Day	Night	Day	Night	Day	Night
MRI		2027					
No Action Arrivals	5	0.00%	0.00%	0.12%	2.51%	0.19%	0.38%
	7	5.00%	0.00%	13.22%	20.57%	3.14%	9.76%
	16	0.00%	0.00%	4.36%	2.73%	5.47%	4.50%
	23	20.00%	0.00%	2.13%	4.98%	3.74%	7.46%
	25	70.00%	0.00%	72.62%	58.94%	80.93%	74.28%
	34	5.00%	0.00%	7.55%	10.26%	6.53%	3.62%

Table 16		Jets		Turbo-props		Props	
RWY		Day	Night	Day	Night	Day	Night
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	5	5.56%	0.00%	0.17%	2.83%	0.13%	4.32%
	7	16.67%	0.00%	7.04%	14.28%	5.63%	7.88%
	16	16.67%	0.00%	14.18%	22.85%	26.70%	19.84%
	23	22.22%	0.00%	0.59%	2.83%	1.65%	1.63%
	25	38.89%	0.00%	76.47%	45.76%	63.13%	63.34%
	34	0.00%	0.00%	1.56%	11.45%	2.76%	2.99%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	5	0.00%	0.00%	0.12%	2.51%	0.19%	0.38%
	7	5.00%	0.00%	13.22%	20.57%	3.14%	9.76%
	16	0.00%	0.00%	4.36%	2.73%	5.47%	4.50%
	23	20.00%	0.00%	2.13%	4.98%	3.74%	7.46%
	25	70.00%	0.00%	72.62%	58.94%	80.93%	74.28%
	34	5.00%	0.00%	7.55%	10.26%	6.53%	3.62%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Departures	5	5.56%	0.00%	0.17%	2.83%	0.13%	4.32%
	7	16.67%	0.00%	7.04%	14.28%	5.63%	7.88%
	16	16.67%	0.00%	14.18%	22.85%	26.70%	19.84%
	23	22.22%	0.00%	0.59%	2.83%	1.65%	1.63%
	25	38.89%	0.00%	76.47%	45.76%	63.13%	63.34%
	34	0.00%	0.00%	1.56%	11.45%	2.76%	2.99%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		2032					
No Action Arrivals	5	0.00%	0.00%	0.12%	2.52%	0.19%	0.38%
	7	5.00%	0.00%	13.23%	20.64%	3.14%	9.76%
	16	0.00%	0.00%	4.36%	2.74%	5.47%	4.50%
	23	20.00%	0.00%	2.12%	4.96%	3.73%	7.44%
	25	70.00%	0.00%	72.62%	58.84%	80.94%	74.29%
	34	5.00%	0.00%	7.56%	10.30%	6.53%	3.62%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
No Action Departures	5	5.56%	0.00%	0.17%	2.80%	0.13%	4.30%
	7	16.67%	0.00%	7.03%	14.27%	5.63%	7.87%
	16	16.67%	0.00%	14.18%	22.85%	26.70%	19.83%
	23	22.22%	0.00%	0.58%	2.80%	1.65%	1.63%
	25	38.89%	0.00%	76.48%	45.80%	63.13%	63.39%
	34	0.00%	0.00%	1.55%	11.47%	2.76%	2.99%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proposed Action Arrivals	5	0.00%	0.00%	0.12%	2.52%	0.19%	0.38%
	7	5.00%	0.00%	13.23%	20.64%	3.14%	9.76%
	16	0.00%	0.00%	4.36%	2.74%	5.47%	4.50%
	23	20.00%	0.00%	2.12%	4.96%	3.73%	7.44%

Table 16		Jets		Turbo-props		Props	
RWY		Day	Night	Day	Night	Day	Night
Proposed Action Departures	25	70.00%	0.00%	72.62%	58.84%	80.94%	74.29%
	34	5.00%	0.00%	7.56%	10.30%	6.53%	3.62%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	5	5.56%	0.00%	0.17%	2.80%	0.13%	4.30%
	7	16.67%	0.00%	7.03%	14.27%	5.63%	7.87%
	16	16.67%	0.00%	14.18%	22.85%	26.70%	19.83%
	23	22.22%	0.00%	0.58%	2.80%	1.65%	1.63%
	25	38.89%	0.00%	76.48%	45.80%	63.13%	63.39%
	34	0.00%	0.00%	1.55%	11.47%	2.76%	2.99%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Daytime operations arrive or depart between 7 am and 10 pm.; nighttime operations arrive or depart between 10 pm and 7 am.
Totals may not add up to 100% due to rounding.

Source: PDARS Data (10/01/2022 – 09/30/2023), MEARTS Data (12/01/2022-03/30/2023), ATAC Corporation, March 2025.
Prepared by: ATAC Corporation, March 2025.

Fleet Mix

As less information is known about aircraft type for VFR compared to IFR, fleet mix data is consolidated to an aircraft category rather than modeled aircraft type. However, each operation's aircraft was selected based on representative frequency in the data when modeling in AEDT. The values are percentages calculated as the operation count of the aircraft category divided by the sum of operations the referenced airport and operation type. For example, there were 5,211.15 VFR jet aircraft operations modeled in 2027 to arrive at ANC. Dividing this by the total number of VFR arrival operations at ANC of 37,543.9 yields 13.88% as shown in Table 17.

Fleet mix presented in Tables 17 and 18 for 2027 and 2032 is based on historical fleet mix over a period from October 1, 2022 through September 30, 2023. After consulting with SMEs, there are no anticipated changes to fleet mix between 2027 and 2032. Additionally, there are no anticipated changes to fleet mix between No Action and Proposed Action.

Table 17 Forecast Fleet Mix for VFR Noise Modeling - 2027

Category	ANC		LHD		MRI	
	A	D	A	D	A	D
Jets	13.86%	13.81%	0.13%	0.07%	0.05%	0.05%
Turbo-Props	56.05%	56.11%	7.14%	7.04%	13.19%	13.16%
Props	30.09%	30.07%	92.73%	92.89%	86.75%	86.79%

Totals may not add up to 100% due to rounding.
Turbo-Props / High Performance Turbo-Props = Aircraft powered by turboprop engines.
Props = Propeller driven aircraft

Source: Aircraft Data, AEDT; Forecasted fleet mix ATAC Corporation, March 2025.
Prepared by: ATAC Corporation, March 2025.

Table 18 Forecast Fleet Mix for VFR Noise Modeling - 2032

	ANC		LHD		MRI	
Category	A	D	A	D	A	D
Jets	13.85%	13.80%	0.13%	0.07%	0.05%	0.05%
Turbo-Props	56.10%	56.16%	7.02%	6.92%	13.19%	13.16%
Props	30.05%	30.04%	92.85%	93.01%	86.76%	86.79%

Totals may not add up to 100% due to rounding.

Turbo-Props / High Performance Turbo-Props = Aircraft powered by turboprop engines.

Props = Propeller driven aircraft

Source: Aircraft Data, AEDT; Forecasted fleet mix ATAC Corporation, March 2025.

Prepared by: ATAC Corporation, March 2025.

3.2 NOISEMAP

Noise modeling in NOISEMAP requires several types of input data including airport/runway locations, local environmental variables, operational levels, day/night distributions, runway usage, fleet mix, climb/descent profiles, model track definitions and assignment, and receptor sets. Details of the NOISEMAP input data for the DEA are discussed below.

3.2.1 Model Background

NOISEMAP is a suite of aircraft noise models developed by the US Air Force, which serves as the lead Department of Defense (DoD) agency for aircraft noise modeling of air bases. NOISEMAP contains computational modules that accept data and estimate noise levels caused by aircraft events at many points on the ground in the airfield vicinity. BaseOps is a graphical user interface for the NOISEMAP suite.²²

Unlike AEDT, NOISEMAP does not provide emissions results, thus it does not contribute to air quality results. Moreover, the primary output of NOISEMAP are noise contours, and not necessarily noise values at particular receptor points. Section 4.3 discusses how noise results from the NOISEMAP models were combined with the AEDT results.

3.2.2 Leveraging Existing Reports & Models

At the FAA's direction, the noise modeling of EDF leveraged an existing NOISEMAP model. This model was developed from Air Installations Compatible Use Zones (AICUZ) study performed by the US Air Force Civil Engineer Center. The FAA provided the 2014 AICUZ model for EDF and an October 2019 report documenting a study which focused on both EDF and FRN, titled "Joint Base Elmendorf-Richardson, Alaska Air Installations Compatible Use Zones (AICUZ)." Information and data within this report supported assumptions and decisions made during the modeling process.

Much of the input data and information present in the model remained unchanged (e.g., runway and weather data). After thorough investigation, the model was determined to be correct and accurate. Adjustments were made to the existing model to accurately represent the EDF operations (e.g., flight tracks, flight profiles, runway use). Additionally, adjustments were made to the AICUZ model to more closely align with AEDT modeling.

An AICUZ model was not provided for FRN. In the absence of an existing NOISEMAP model for FRN, model tracks were constructed using similar methodology as the AEDT model (see Section 3.1.10). One year of radar data was converted to 'bundled' tracks, which were then

²² BaseOps 7.368 User's Guide, Air Force Civil Engineer/Comprehensive Planning Division

converted into NOISEMAP format. When possible, information such as weather was leveraged from the EDF AICUZ model.

The EDF and FRN NOISEMAP models developed for this study are referred to as the ATAAPS models for the remainder of the document.

3.2.3 Airport and Runway Data

Table 19 identifies the airports and runway end names modeled. In total, two airports within the Study Area were evaluated. All runways at these airports were assumed to be available for traffic assignments in NOISEMAP. Note that the North/South runway at EDF is currently named Runway 16/34. However, updates to its magnetic variation will change its name to Runway 17/35 in the near future. In anticipation of this name change, this North/South Runway is referred to as Runway 17/35 throughout this report.

Table 19 Study Airport Details - NOISEMAP

Airport Name	Code	Location	Runway End Names ¹
Elmendorf Air Force Base Airfield	EDF	Anchorage, Alaska	06, 17, 24, 35, Helipad
Bryant Army Airfield	FRN	Fort Richardson (Anchorage), Alaska	18, 36, Helipad

1/ A runway can be used in both directions but is named in each direction separately. Runway number is based on the magnetic direction of the runway (e.g., Runway 09 points to the east direction). The two numbers on either side always differ by 180 degrees. If there is more than one runway pointing in the same direction, each runway number includes an L, C, or R at the end. This is based on a runway's position relative to others in the same direction – left, center, or right.

Source: Department of the Air Force, Joint Base Elmendorf-Richardson, Alaska Air Installations Compatible Use Zones (AICUZ) Study, October 2019.

Prepared by: ATAC Corporation, February 2025.

3.2.4 Local Environmental Variables

ATAAPS models utilized the same terrain data used in AEDT modeling (see Section 3.1.3), incorporated from the USGS 2-degree NED. As a result, input terrain data is consistent between the NOISEMAP and AEDT models.

The EDF ATAAPS model retained weather settings that were used for the AICUZ study. These settings allow for entry of average temperature, relative humidity, and atmospheric pressure for each month. NOISEMAP calculates the 1,000 Hz atmospheric sound absorption coefficients for each month, and selects the weather conditions associated with the sixth smallest coefficient (i.e., a median is calculated). Due to close proximity to EDF, these same weather settings were used for the FRN ATAAPS model.

3.2.5 Operation Levels and Day/Night Distribution

The 2024 aircraft operation levels were taken from the 2019 Joint Base Elmendorf-Richardson (JBER) AICUZ study. The operation levels are “based on data from the Air Force and the 2018 F-22 Operational Efficiency FEIS and includes a 14% increase in F-22 operations to account for the additional aircraft operations from aircraft that were based at Tyndall AFB, Florida, prior to Hurricane Michael.” (JBER AICUZ 2019, p. 24)

EAs primarily focus on airspace changes. In contrast, AICUZ studies focus on compatible land use near the airport, within a 65 dB noise contour. To match the AEDT inputs and remain consistent with the airspace-focused modeling, the EDF ATAAPS model was updated to use operations from the 2019 AICUZ study. The FRN ATAAPS model was developed using radar traffic flows and operation counts were taken directly from the AICUZ study.

Flight operation counts for all aircraft types in the ATAAPS models of EDF and FRN were kept the same for all scenarios modeled for this DEA.

Table 20 Modeled Average Annual Day Aircraft Operation Totals

Airport	Existing Conditions (10/2022 – 09/2023)		2027		2032	
	Day	Night	Day	Night	Day	Night
EDF	62.1	2.1	62.1	2.1	62.1	2.1
FRN	10.4	0.5	10.4	0.5	10.4	0.5

Source: Department of the Air Force, Joint Base Elmendorf-Richardson, Alaska Air Installations Compatible Use Zones (AICUZ) Study, October 2019.

Prepared by: ATAC Corporation, August, April 2024.

3.2.6 Runway Use

The frequency with which aircraft utilize a runway involves a variety of factors including but not limited to:

- Airfield environment (layout, lights, runway length)
- Direction of prevailing winds
- Location of natural terrain features (rivers, lakes, mountains, and other features)
- Wildlife activity
- Number of aircraft in the pattern and/or preference of a runway for the purpose of safety and noise abatement

Installation operations, control tower personnel, and the Supervisor of Flying establish the runway in use. Aviation planners adjust the pattern procedures accordingly to maximize air traffic flow efficiency.

For the Existing Conditions and No Action scenarios at EDF, runway utilization starts with the 2014 AICUZ model and is scaled as described in Section 3.2.5. Table 21 presents the Existing Conditions and No Action scenarios runway use at EDF.

Table 21 EDF Runway Use Percentages - Existing Conditions and No Action

Scenarios	Runway	Arrival Operations	Departure Operations
Existing Conditions No Action 2027 No Action 2032	06	89%	40%
	24	7%	32%
	17	2%	0%
	35	2%	27%
Total		100%	100%

Source: EDF ATAAPS Model NOISEMAP Report.

Prepared by: ATAC Corporation, February 2025.

With the guidance of FAA Subject Matter Experts (SMEs), it was estimated that fighter jet arrivals in the Proposed Action scenario would use Runway 17 at a rate similar the usage of Runway 06 in the Existing Condition scenario. Runway usage preference for departures and other arrival aircraft types would likely remain the same. Therefore, the EDF ATAAPS model was adjusted such that the correct proportion of fighter jet arrivals (F-15, F-22, etc.) landing on Runway 06 are reallocated to Runway 17.

Table 22 presents the runway utilization percentages for EDF in the Proposed Action scenarios.

Table 22 EDF Runway Use Percentages - Proposed Action

Scenarios	Runway	Arrival Operations	Departure Operations
Proposed Action 2027	06	35%	40%
	24	7%	32%
Proposed Action 2032	17	57%	0%
	35	2%	27%
Total		100%	100%

Source: EDF ATAAPS Model NOISEMAP Report.
Prepared by: ATAC Corporation, February 2025.

There were no anticipated changes to FRN operations. Thus, its runway use percentages are consistent across all ATAAPS models. Table 23 presents the FRN runway use percentages.

Table 23 FRN Runway Use Percentages – All Scenarios

Scenarios	Runway	Arrival Operations	Departure Operations
Existing Conditions	18	9%	4%
No Action 2027	36	23%	36%
No Action 2032			
Proposed Action 2027	Helipad	68%	60%
Proposed Action 2032			
Total		100%	100%

Source: FRN ATAAPS Model NOISEMAP Report
Prepared by: ATAC Corporation, February 2025.

3.2.7 Fleet Mix

Fleet mix and operation counts for the EDF and FRN ATAAPS models were taken directly from the AICUZ studies. Additional details for EDF and FRN fleet mix and operation counts are discussed in Appendix H: *Flight Schedules Technical Report*.

3.2.8 Climb/Descent Profiles

Climb/descent profiles were taken from the initial AICUZ model and adjusted to reflect designed airspace changes. Flight profiles were adjusted by lengthening model tracks to either reach the Study Area Boundary or 18,000 ft AGL (see Section 3.2.9). Departure flight profiles were adjusted to continue existing climb segments up to 18,000 ft AGL, or a cruise segment to the Supplemental Study Area Boundary. Similarly, arrival profiles were adjusted to maintain existing descent rates from 18,000 ft AGL, or a lower cruise segment to the Supplemental Study Area Boundary. Flight profiles were adjusted so that climb angles, power settings, and speeds were consistent with values in the original AICUZ model.

Flight profiles were created for the FRN model, as they did not exist in the AICUZ model. New profiles were based on existing profiles taken from the EDF AICUZ model for C-130 and HH-60 aircraft. New profiles for R-22/R-44 and UAS were created by replicating profiles from the radar data as best as possible and selecting appropriate power settings from the NOISEMAP options.

3.2.9 Model Track Definitions

AICUZ model tracks were used as starting point and modified as needed. To remain consistent with AEDT inputs and cover the required Section 4(f) criteria, model tracks from the original model were extended to reach 18,000 feet AGL or to the Supplemental Study Area Boundary, as appropriate. The maximum altitude for each modeled track was determined by measuring the average maximum altitude within each flow of the radar data. Additionally, tracks were modified laterally as needed to capture existing traffic flows in the historical radar data. In some

cases, additional tracks were defined to represent traffic flows found in the radar data which were not in the AICUZ models.

For No Action, selected arrival tracks were created and/or moved to represent the AMRMM and BANZI Standard Terminal Arrival Routes (STAR) because these procedures were anticipated to be pre-approved as Letters of Agreement (LOAs) prior to the implementation of the Proposed Action. Note that although flight tracks were updated in the No Action Scenario, the associated operations remained the same, with Runway 06 serving as the primary arrival runway for fighter jets (see Section 3.2.6).

For Proposed Action, tracks were created and/or moved to represent the proposed SIDs, STARs and SIAPs. For EDF SIDs, departure tracks were adjusted to reflect the update from EEEGL to SOAPP. There were no modellable changes needed for the EDF SID update. Arrival tracks were adjusted to utilize the AMRMM, BANZI, or JUNKY recovery STARs. Professional judgment guided decisions on which tracks were assigned to different enroute segments within each procedure. Tracks were also adjusted to follow Instrument Landing System (ILS) approaches or tactical arrival procedures, where appropriate.

Table 24 presents track counts for each of the ATAAPS models. Note that Existing Conditions and No Action scenarios for EDF had identical profiles, and the only change was track geometry changes due to the updated runway length. No changes are anticipated to FRN track counts; thus, counts are consistent across scenarios.

Table 24 NOISEMAP Model Track Counts

Airport Code	Original AICUZ Models		Existing Conditions/ No Action		Proposed Action	
Airport	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
EDF	41	33	56	38	63	38
FRN	N/A	N/A	14	8	14	8

Source: Department of the Air Force, Joint Base Elmendorf-Richardson, Alaska Air Installations Compatible Use Zones (AICUZ) Study, October 2019.

Prepared by: ATAC Corporation, August 2025.

3.2.10 Model Track Assignments

Operations assigned to modeled tracks were taken directly from the existing EDF AICUZ model. In some cases, it was necessary to create additional model tracks to represent observed traffic flows in existing radar data that were not represented in the existing AICUZ model (for Existing Conditions and No Action). For these cases, operations from existing nearby model tracks were transferred among the new model tracks to match the proportion of the observed traffic in each area. For FRN, model tracks were created to represent the traffic flows seen in the radar data.

3.2.11 Receptor Sets

The receptor set created in NOISEMAP is regularly spaced and composed of 3,850 by 2,750 points spaced 607 feet (0.1 NM) apart. This grid covers the Supplemental Study Boundary and noise results captured at these points are combined with results from the AEDT model (see Section 4.3).

4 Noise Model Processing

This section provides an overview of the processing of each noise model (AEDT and NOISEMAP), comparisons among scenarios, data integrity checks, and how results are extracted. Additionally, this section discusses how results from multiple models are integrated into a single set of results so that impact analysis across scenarios can be performed.

4.1 AEDT

AEDT processes flight track and operation data following several steps: data integration and quality control, calculation of flight dynamics (e.g., thrust and speed), noise exposure computation, annualization of noise exposures, change of exposure analysis, and report generation. Key aspects of this process, including model input, data integrity checks, and extraction of results are discussed below.

4.1.1 Data Integrity Checks

Data integrity checks are performed to ensure the model does not reject the inputs being provided. The following checks were made:

- Model tracks were adjusted so that no arrival model tracks contained any ascending segments and no departure model tracks contained any descending segments.
- Model tracks were adjusted so that unrealistic turn angles were not present.
- Runway end coordinates for model tracks were verified to be accurate and corrected if necessary.
- Input profiles were checked against those available in AEDT system databases to ensure that all profiles were available to be modeled.
- If necessary, aircraft profile data was adjusted to ensure compliance with aircraft profile approvals by the FAA.
- Operations counts were cross-referenced before and after input into the model to ensure that all operations were successfully imported into the model.
- After AEDT modeling was completed, other data integrity checks were performed to verify that all operations that were intended to be modeled were successfully modeled.

The following checks were made:

- Each operation was verified to have its performance calculations successfully modeled.
- All intended noise exposure and emissions calculations were successfully performed.

4.1.2 Extract Results

After all noise calculations were complete, AEDT noise data was recorded for all scenarios at each receptor location. These results were extracted, formatted, and prepared to be combined with NOISEMAP output data for impact analysis (see Section 4.3).

4.2 NOISEMAP

After all input data is inserted into the model (See Section 3.2), the noise model run is executed to compute noise. Upon execution, automated data integrity checks (see Section 4.2.2) are performed, and grid and contour properties are set up in the model based on user input. Once those parameters are set up, the steps executed are: Create Omega 10 and 11 Input Files, Run

Omega 10 and 11, Create NMap OPS File, Create NMap OPX File, Run NMap, and Create Grid. Omega 10 and 11 file are the United States Department of Defense's models for extrapolating measured noise data¹⁸ OPS and OPX files are operations files formatted to work with NMap. Additional details regarding BaseOps and NOISEMAP are available in the *BaseOps User's Guide* and *NMap 7.0 User's Manual*.

4.2.1 Data Integrity Checks

NOISEMAP has built-in data integrity checks, which are automatically assessed any time a case is run. These include, but are not limited to: checking that every profile is assigned to a flight track, ensuring that every profile length is no longer than its assigned track, and that each track is assigned to a runway.

Additionally, the following checks were made:

- Model tracks were adjusted so that unrealistic climb and descent angles were not present.
- Operations counts were cross-referenced before and after input into the model to ensure that all operations were successfully imported into the model.

4.2.2 Extract Results

After all noise calculations were complete, NOISEMAP noise data was recorded for all scenarios at each receptor. These results were extracted, formatted, and prepared to be combined with AEDT output data for impact analysis (see Section 4.3).

NOISEMAP uses the Noise Model Grid Format (NMGF) standard format to store noise values at receptor locations. This allows for post-processing of multiple noise model results at the same location and for the combining model outputs to produce an overall grid of noise results.

4.3 Integrate Output Data for Impact Analysis

NMPlot is part of the NOISEMAP toolset and can combine NMGF grid files (see Section 4.2.2) with different spacing and spatial coverage. Using this tool, noise results from each of the ATAAPS models (EDF and FRN), as well as each AEDT model (IFR fixed-wing, VFR fixed-wing, and MRI helicopter) were combined using the Multiple Grid Combining Tool in NMPlot version 4.974. Combining refers to the creation of a new grid by performing a mathematical operation on the data points in two existing grids. The mathematical operation is an addition of noise decibels, specifically DNL values for this effort. The resulting output reflects the noise contribution from all flight operations from each model. Each scenario's noise values were compared using the impact criteria presented in Section 1.1.

4.3.1 Determine Noise Impacts

After all noise calculations and combining were complete, noise impacts were determined by categorizing changes in noise values between scenarios. Using FAA threshold criteria (significant impact and reportable noise change thresholds described in Section 1.1, *Noise Impact Criteria*), maps depicting locations of significant or reportable change in DNL noise exposure between scenarios were produced for the entire Study Area.

5 Analysis

The noise and emissions results from the five scenarios outlined in **Section 2.1** were analyzed. Noise impact results were tabulated based on the potential implementation of the Proposed Action compared to the No Action at the previously described receptors. The impact analysis is presented in **Section 5.1.1** of the DEA. Fuel burn and CO₂ results were extracted and presented in **Section 5.6** of the DEA.

The following sections present a summary of the noise model input modifications made to model the Proposed Action to provide context to causes of potential noise impact, as well as the results of the noise impact analysis for each set of receptors.

5.1 Summary of Noise Model Inputs

The following sections summarize airspace procedures modeled in the Existing Conditions scenario and detail the modifications and changes implemented to develop the subsequent No Action and Proposed Action scenarios.

5.1.1 Existing Conditions

The 2022/2023 Existing Conditions scenario modeled in AEDT and NOISEMAP represent flight operations at the Study Airports from October 1, 2022 to September 30, 2023. During this time period, a total of 21 procedures were found across all Study Airports. The 21 procedures include ten Standard Terminal Arrival (STAR) procedures (AMOTT, ELLAM, KROTO, NEELL, PTERS, TAGER, WITI, YESKA, GRUBB, JINXX) and eleven Standard Instrument Departures (SIDs) (ANCHORAGE, FFITZ, KNIK, NOEND, POTTER, TURNAGAIN, ELMENDORF, MERRILL, PALMR, EEEGL, YUKLA). Versions of these airspace procedures were evaluated through previous environmental analysis documentation.

5.1.2 No Action

Input was directly based on the radar data analysis presented in previous sections and adjusted for interim changing conditions. Tracks were adjusted to account for the 2,500-foot runway extension at EDF runway 17/35. Details regarding this runway extension are discussed in **Section 1.1** of the DEA. Fighter jet arrival tracks at EDF representing pre-approved AMRMM and BANZI procedures were developed, as discussed in **Section 3.2.9**. Runway utilization adjustments at ANC were made based on FAA SME discussion. These adjustments are described in **Section 3.1.5**. Additionally, inputs were adjusted to reconcile runway closures during the 2022/2023 Existing Conditions study period. WITI and NEELL airspace procedures were updated after the 2022/2023 Existing Conditions study period concluded. These updates were made to the No Action scenarios. KROTO also changed after the 2022/2023 Existing Conditions study period concluded; however, the changes were not germane to the structural design of the procedure and were not updated in the No Action scenarios. New airspace procedures such as MERRILL and various SIAPs were introduced at Study Airports and were added to No Action scenarios. Adjustments to fleet mix distribution and operations forecast were made to account for changes in the subsequent scenario years. Details regarding flight schedule adjustments are available in a separate technical report in Appendix H: *Average Annual Day Flight Schedules*. Aside from the adjustments stated above, the 2027 and 2032 No Action scenarios model inputs were the same as the 2022/2023 Existing Conditions scenario.

5.1.3 Proposed Action

The Proposed Action consists of several air traffic procedure modifications as discussed in the EA, Chapter 3, *Alternatives*. Those modifications were implemented in the noise modeling through adjustments to the flight track routing at the Study Airports or developed as new tracks. Consultations with subject matter experts confirmed assumptions that were made with regard to the track adjustments. Utilization percentages of new Standard Instrument Arrival Procedures (SIAPs) at the Study Airports (see **Section 2**) were determined based on observations of operations in the flight data acquired to model the Existing Conditions scenario.

Since the Proposed Action does not involve changes that are considered capacity enhancements or any actions that would induce growth in operations, operation levels, fleet mix, and day/night distribution, inputs were the same as for No Action for both 2027 and 2032. Environmental variables (i.e., temperature, humidity, barometric pressure, and headwind) were the same among Existing Conditions, No Action, and Proposed Action. The following sections describe changes related to tracks developed for the Proposed Action.

Proposed Action changes are aimed to improve airspace safety and efficiency. Proposed changes increase efficiency by mitigating possible route conflicts and reducing the number and distance of level-offs that aircraft may be instructed fly. Moreover, new procedures will enhance safety in pilot-air traffic control communications by formalizing routes that are frequently used. These new routes are largely Area Navigation (RNAV) (GPS-based) or Required Navigational Performance (RNP) procedures that allow for greater control of aircraft in the airspace. This represents a greater use of standardized procedures that increase routing predictability, flexibility, and traffic segregation.

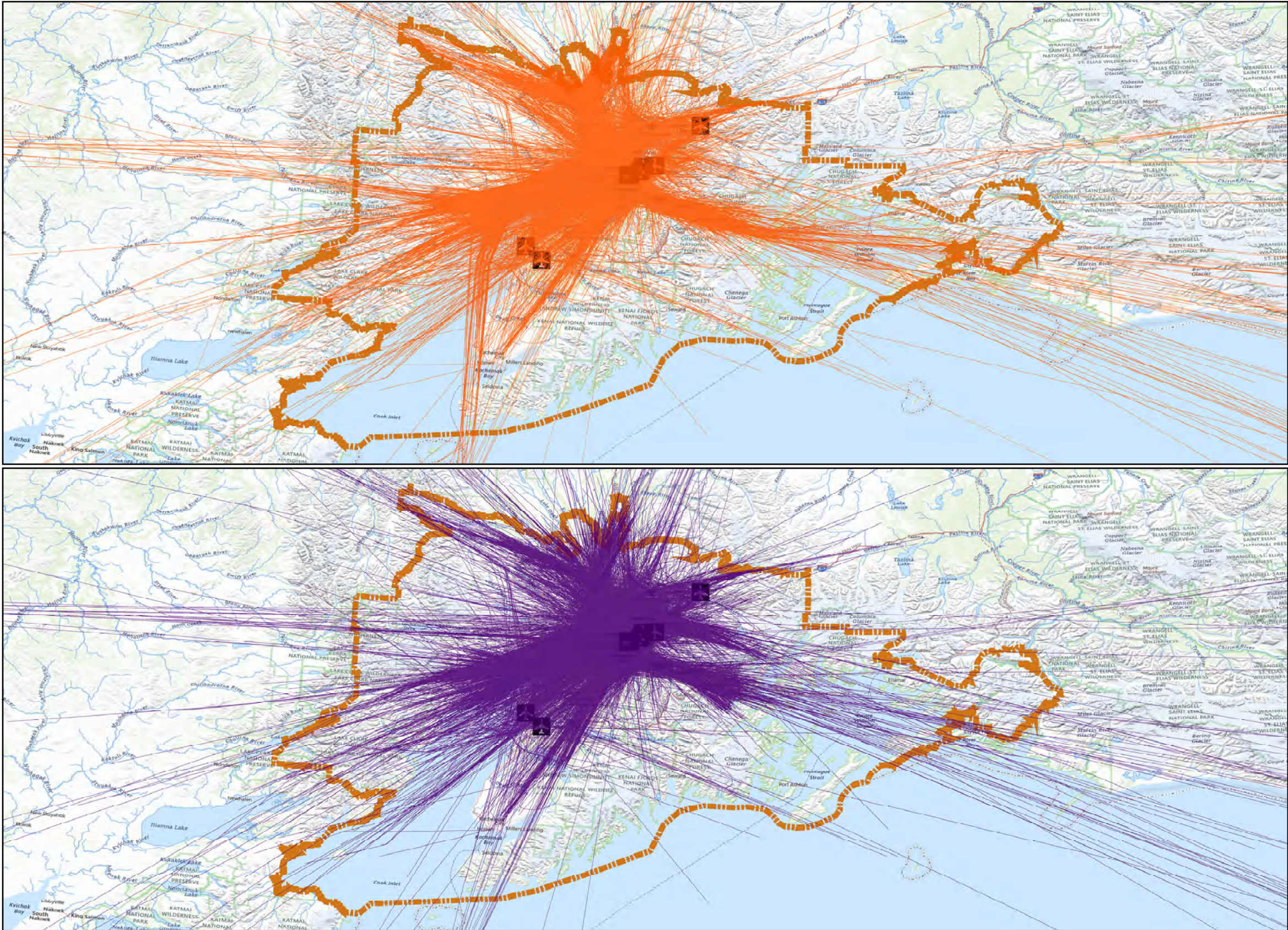
5.1.3.1 Departures

The Proposed Action changes constitute a general trend away from radar vector operational ATC procedures for portions of the departure trajectory and toward increased use of RNAV SID procedures. The changes between Proposed Action and No Action routing for AEDT and NOISEMAP departure tracks from the Study Airports are shown in **Exhibit 7**. Proposed Action routes are depicted in yellow, and No Action routes are depicted in blue.

5.1.3.2 Arrivals

The Proposed Action changes constitute a general trend away from radar vector operational ATC procedures for portions of the arrival trajectory and toward increased use of RNAV STAR procedures. Furthermore, there is a general trend to update and implement new RNP and GPS-based SIAPs. The changes between Proposed Action and No Action routing for AEDT and NOISEMAP arrival tracks to the Study Airports are shown in **Exhibit 8**. Proposed Action routes are depicted in orange, and No Action routes are depicted in purple.

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Legend

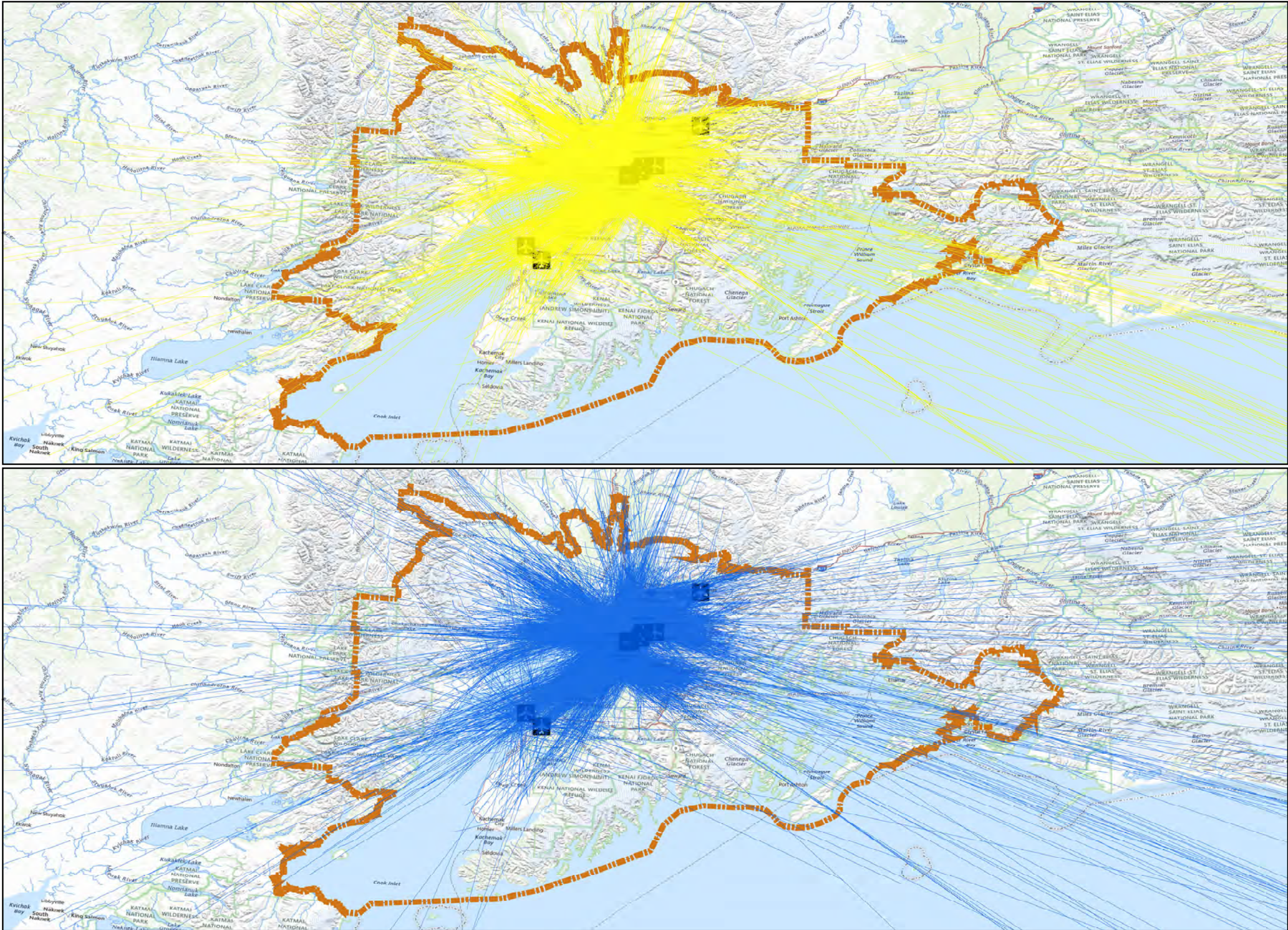
- Proposed Action AEDT Flight Track
- No Action AEDT Flight Track
- General Study Area
- Study Airport Legend
- US State Tiger Line Boundary

Notes:
Airport Identifier and Name:
ANC - Ted Stevens Anchorage International Airport
EDF - Elmendorf Air Force Base
ENA - Kenai Municipal Airport
FRN - Bryant Army Airfield
LHD - Lake Hood Seaplane Base
MRI - Merrill Field
PAQ - Palmer Airport
SXQ - Soldotna Airport

Projection :GCS North American 1983
Scale: 1:2,631,162

0 5 10 20 Miles
Scale bar

Federal Aviation Administration, NFDIC/CIFP airspace boundaries, waypoints and airports. ATAC Corp. AEDT 3e Existing Conditions census centroid noise results
Prepared by: ATAC Corporation, October 2026.



- Proposed Action AEDT Flight Track
- No Action AEDT Flight Track
- General Study
- Study Airport
- US State Tiger Line

Notes:
Airport Identifier and Name:
ANC - Ted Stevens Anchorage International Airport
EDF - Elmendorf Air Force Base
ENA - Kenai Municipal Airport
FRN - Bryant Army Airfield
LHD - Lake Hood Seaplane Base
MRI - Merrill Field
PAQ - Palmer Airport
SXQ - Soldotna Airport

Projection: GCS North American 1983
Scale: 1:2,631,162

0 1.25 2.5 5 Miles

Federal Aviation Administration, NPDC/CIPF airspace boundaries, waypoints and airports. ATAC Corp. AEDT 3e Existing Conditions census centroid noise results
Prepared by: ATAC Corporation, October 2026.

5.2 Impact Analysis Results

This section presents the results of the impact analysis between the Proposed Action and No Action scenarios. The summary includes results from the 2027 and 2032 scenarios across 2020 US census population centroids, 0.5 NM evenly spaced grid points, 4(f) resource points, and noise sensitive land use area points.

Table 25 presents a summary of the noise impacts for the 2027 Scenario.

Table 25 Impact Analysis Counts - 2027

Criteria	Census Centroid	Population	0.5 NM Evenly Spaced Grid	4(f) Receptor	Named Resources	Noise Sensitive Land Use
+1.5 DNL dB resulting in 65 DNL dB or higher	0	0	5	8	9	0
+3.0 dB resulting in a value of 60-65 DNL dB	0	0	4	6	2	0
+5.0 dB resulting in a value of 45-60 DNL dB	0	0	64	61	9	0

For 2027, no census centroid receptors were identified for significant noise increases (+1.5 DNL dB resulting in 65 DNL dB or higher). Five 0.5 NM evenly spaced grid receptors were identified for significant noise increases (+1.5 DNL dB resulting in 65 DNL dB or higher). Eight 4(f) receptors representing nine named resources were identified for significant noise increases (+1.5 DNL dB resulting in 65 DNL dB or higher). No noise sensitive land use area receptor was identified for significant noise increases (+1.5 DNL dB resulting in 65 DNL dB or higher).

No census centroid receptors were identified in the +3.0 dB resulting in a value of 60-65 DNL dB. Four 0.5 NM evenly spaced grid receptors were identified in the +3.0 dB resulting in a value of 60-65 DNL dB. Six 4(f) receptors representing two named resources were identified in the +3.0 dB resulting in a value of 60-65 DNL dB. No noise sensitive land use area receptors were identified in the +3.0 dB resulting in a value of 60-65 DNL dB.

No census centroid receptors were identified in the +5.0 dB resulting in a value of 45-60 DNL dB. 64 0.5 NM evenly spaced grid receptors were identified in the +5.0 resulting in a value of 45-60 DNL dB. 61 4(f) receptors representing nine named resources were identified in the +5.0 dB resulting in a value of 45-60 DNL. No noise sensitive land use area receptors were identified in the +5.0 dB resulting in a value of 45-60 dB.

Table 26 presents a summary of the noise impacts for the 2032 Scenario.

Table 26 Impact Analysis Counts - 2032

Criteria	Census Centroid	Population	0.5 NM Evenly Spaced Grid	4(f) Receptor	Named Resources	Noise Sensitive Land Use
+1.5 DNL dB resulting in 65 DNL dB or higher	0	0	5	8	9	0
+3.0 dB resulting in a value of 60-65 DNL dB	1	271	3	6	2	0
+5.0 dB resulting in a value of 45-60 DNL dB	2	93	62	105	18	0

For 2032, no census centroid receptors were identified for significant noise increases (+1.5 DNL dB resulting in 65 DNL dB or higher). Five 0.5 NM evenly spaced grid receptors were identified for significant noise increases (+1.5 DNL dB resulting in 65 DNL dB or higher). Eight 4(f) receptors representing nine named resources were identified for significant noise increases (+1.5

DNL dB resulting in 65 DNL dB or higher). No noise sensitive land use area receptor were identified for significant noise increases (+1.5 DNL dB resulting in 65 DNL dB or higher).

One census centroid receptor representing 271 persons was identified in the +3.0 dB resulting in a value of 60-65 DNL dB. Three 0.5 NM evenly spaced grid receptor were identified in the +3.0 dB resulting in a value of 60-65 DNL dB. Six 4(f) receptors representing two named resources were identified in the +3.0 dB resulting in a value of 60-65 DNL dB. No noise sensitive land use area receptors were identified in the +3.0 dB resulting in a value of 60-65 DNL dB.

Two census centroid receptors representing 93 persons were identified in the +5.0 dB resulting in a value of 45-60 DNL dB. 62 0.5 NM evenly spaced grid receptors were identified in the +5.0 dB resulting in a value of 45-60 DNL dB. 105 4(f) receptors representing 18 named resources were identified in the +5.0 dB resulting in a value of 45-60 DNL. No noise sensitive land use area receptors were identified in the +5.0 dB resulting in a value of 45-60 dB.

5.2.1 Population Data

Table 27 presents the change in potential population exposed to increased aircraft noise under the Proposed Action for 2027 conditions. The analysis indicates that the Proposed Action would not result in a DNL 1.5 dB increase in areas exposed to DNL of 65 dB and higher, nor would it result in a reportable noise increase of DNL 3.0 dB in areas exposed to DNL 60 dB to 65 dB, nor would it result in a reportable noise increase of DNL 5.0 dB in areas exposed to DNL 45 dB to 60 dB.

Table 27 Change in Potential Population Exposed to Increased Aircraft Noise - 2027

DNL Noise Exposure Level Under the Proposed Action	Increase in DNL with the Proposed Action	Population Exposed to Noise that Exceeds the Threshold
DNL 65 dB and higher	DNL 1.5 dB or greater	0
DNL 60 dB to 65 dB	DNL 3.0 dB or greater	0
DNL 45 dB to 60 dB	DNL 5.0 dB or greater	0

Source: 2020 U.S. Census (population centroid data), April 2022; ATAC Corporation, AEDT and NOISEMAP modeling results, August 2022

Prepared By: ATAC Corporation, June 2026

Table 28 presents the change in potential population exposed to increased aircraft noise under the Proposed Action for 2032 conditions. The analysis indicates that the Proposed Action would not result in a DNL 1.5 dB increase in areas exposed to DNL of 65 dB and higher.

However, the Proposed Action resulted in a reportable noise increase of DNL 3.0 dB in areas exposed to DNL 60 dB to 65 dB, as well as a reportable noise increase of DNL 5.0 dB in areas exposed to DNL 45 dB to 60 dB.

According to census data, a total of 364 people, associated with three population centroids, would be impacted by this increase. The population centroids are in two general areas: the first area is approximately 2 NM south of ANC; the second area is approximately 33-35 NM west of ANC. Details for these population centroids are presented in Supplement 3 and shown in Exhibit 5-2 in Chapter 5.

The reportable noise increase south of ANC is attributable to the redesigned KRAWL SID on Runway 15 as well as the arrivals usage of RNP 33. For the area west of ANC, the noise increase is likely attributable to the SQRIL STAR for ANC.

Table 28 Change in Potential Population Exposed to Increased Aircraft Noise - 2032

DNL Noise Exposure Level Under the Proposed Action	Increase in DNL with the Proposed Action	Population Exposed to Noise that Exceeds the Threshold
DNL 65 and higher	DNL 1.5 dB or greater	0
DNL 60 to 65	DNL 3.0 dB or greater	271
DNL 45 to 60	DNL 5.0 dB or greater	93

Source: 2020 U.S. Census (population centroid data), April 2022; ATAC Corporation, AEDT and NOISEMAP modeling results, August 2022.

Prepared By: ATAC Corporation, June 2026

5.2.2 4(f), Historic, and Cultural Resources

For the 4(f), Historic, and Cultural Resources areas in the 2027 scenarios, the analysis indicates that the Proposed Action did result in a DNL 1.5 dB increase in areas exposed to DNL of 65 dB and higher. Eight 4(f) receptors representing nine named resources were identified for significant noise increases. Six receptors are located on JBER-controlled property. The significant noise increases are likely attributable to the increased usage of Runway 17 at EDF (see Section 3.2.6). Two receptors, located in the Cook Inlet, are approximately 2.5 NM west of ANC. The significant noise increases are attributable to departures on runway 25L/R heading east to NOEND on the GLCRR SID at ANC (see Section 5.3 for supplementary metrics).

The Proposed Action did result in reportable noise increase of DNL 3.0 dB in areas exposed to DNL 60 dB to 65 dB compared with the 2027 No Action scenario. Six 4(f) receptors representing two named resources were identified in the +3.0 dB resulting in a value of 60-65 DNL dB. The 2027 Proposed Action did result in a reportable noise increase of DNL 5.0 dB in areas exposed to DNL 45 dB to 60 dB. 61 4(f) receptors representing nine named resources were identified in the +5.0 dB resulting in a value of 45-60 DNL.

The locations of these reportable noise points are in four general areas. The first area is 29 NM to the northwest of ANC. The noise increase in this area is attributable to operations on the SIDs to NODLE. The second area is located 35 NM west of ANC. Similar to the reportable noise impact found in the population centroids (see Section 5.2.1), the noise increase in this area is attributable to ANC arrivals on the SQRIL STAR. The third area is located approximately 22 NM north of ANC. The noise increase in this area is attributable to arrivals on the MRDOR STAR at ANC. The ANC arrivals utilizing the ILS approach to Runway 15 also contribute to the noise increase in this area. The fourth area is located approximately 3.5 NM northwest of ANC. The noise increase in this area is attributable to departures on runway 25L/R heading east to NOEND on the GLCRR SID at ANC.

These 4(f), Historic, and Cultural Resources areas with reportable noise impacts are shown in Exhibit 5-1 in Chapter 5. Detailed information for all 4(f), Historic, and Cultural Resources areas is provided in Supplement 4.

For the 4(f), Historic, and Cultural Resources areas in the 2032 scenarios, the analysis indicates that the Proposed Action did result in a DNL 1.5 dB increase in areas exposed to DNL of 65 dB and higher. Eight 4(f) receptors representing nine named resources were identified for significant noise increases. Six receptors are located on JBER-controlled property. The significant noise increases are likely attributable to the increased usage of Runway 17 at EDF (see Section 3.2.6). Two receptors, located in the Cook Inlet, are approximately 2.5 NM west of ANC. The significant noise increases are attributable to departures on runway 25L/R heading east to NOEND on the GLCRR SID at ANC (see Section 5.3).

The Proposed Action did result in reportable noise increase of DNL 3.0 dB in areas exposed to DNL 60 dB to 65 dB compared with the 2032 No Action scenario. Six 4(f) receptors

representing two named resources were identified in the +3.0 dB resulting in a value of 60-65 DNL dB. The reportable noise increase of one receptor south of ANC is attributable to the KRAWL SID on Runway 15, as well as the arrivals usage of RNP 33. The 2032 Proposed Action did result in a reportable noise increase of DNL 5.0 dB in areas exposed to DNL 45 dB to 60 dB. 105 4(f) receptors representing 18 named resources were identified in the +5.0 dB resulting in a value of 45-60 DNL.

The locations of these reportable noise points are in the same four general areas as the noise impact 4(f) receptors in the 2027 scenario. The reportable noise increases are attributable to the same factors described in the 2027 scenario above.

These 4(f), Historic, and Cultural Resources areas with reportable noise impacts are shown in **Exhibit 5-2** in Chapter 5. Detailed information for all 4(f), Historic, and Cultural Resources areas is provided in **Supplement 4**.

5.2.3 One-Half Nautical Mile Grid

For the 0.5 NM grid point data in the 2027 scenarios, the analysis indicates that the Proposed Action did result in a DNL 1.5 dB increase in areas exposed to DNL of 65 dB and higher. Five 0.5 NM evenly spaced grid receptors were identified for significant noise increases (+1.5 DNL dB resulting in 65 DNL dB or higher). Three receptors are located approximately 2 NM north of EDF. The significant noise increases are likely attributable to the increased usage of Runway 17 at EDF (see **Section 3.2.6**). Two receptors, located in the Cook Inlet, are approximately 2.5 NM west of ANC. The significant noise increases are attributable to departures on runway 25L/R heading east to NOEND on the GLCRR SID at ANC (see **Section 5.3**).

The Proposed Action did result in reportable noise increase of DNL 3.0 dB in areas exposed to DNL 60 dB to 65 dB compared with the 2027 No Action scenario. Four 0.5 NM evenly spaced grid receptor were identified in the +3.0 dB resulting in a value of 60-65 DNL dB. The 2027 Proposed Action did result in a reportable noise increase of DNL 5.0 dB in areas exposed to DNL 45 dB to 60 dB. 64 0.5 NM evenly spaced grid receptors were identified in the +5.0 resulting in a value of 45-60 DNL dB.

The locations of these reportable noise points are in the same four general areas as the 4(f) points found in the 2027 scenarios. The reportable noise increases are attributable to the same factors as described in **Section 5.2.2**.

For the 0.5 NM grid point areas in the 2032 scenarios, the analysis indicates that the Proposed Action did result in a DNL 1.5 dB increase in areas exposed to DNL of 65 dB and higher. Five 0.5 NM evenly spaced grid receptors were identified for significant noise increases (+1.5 DNL dB resulting in 65 DNL dB or higher). Three receptors are located approximately 2 NM north of EDF. The significant noise increases are likely attributable to the increased usage of Runway 17 at EDF (see **Section 3.2.6**). Two receptors, located in the Cook Inlet, are approximately 2.5 NM west of ANC. The significant noise increases are attributable to departures on runway 25L/R heading east to NOEND on the GLCRR SID at ANC. Supplementary metrics were calculated for these locations, which is discussed in **Section 5.3**.

The Proposed Action did result in reportable noise increase of DNL 3.0 dB in areas exposed to DNL 60 dB to 65 dB compared with the 2032 No Action scenario. Three 0.5 NM evenly spaced grid receptors were identified in the +3.0 dB resulting in a value of 60-65 DNL dB. The 2032 Proposed Action did result in a reportable noise increase of DNL 5.0 dB in areas exposed to DNL 45 dB to 60 dB. 62 0.5 NM evenly spaced grid receptors were identified in the +5.0 resulting in a value of 45-60 DNL dB.

The locations of these reportable noise points are in the same four general areas as the 4(f) points found in the 2032 scenarios. The reportable noise increases are attributable to the same factors as described in Section 5.2.2.

The 0.5 NM reportable noise impact points for the 2027 and 2032 scenarios are shown in Exhibits 9 and 10, respectively. Detailed information for all 0.5 NM Grid points is provided in Supplement 5.

5.2.4 Noise Sensitive Land Use Areas

For the noise sensitive land use areas in the 2027 and 2032 scenarios, the analysis indicates that the Proposed Action would not result in a DNL 1.5 dB increase in areas exposed to DNL of 65 dB and higher, nor would it result in a reportable noise increase of DNL 3.0 dB in areas exposed to DNL 60 dB to 65 dB. The Proposed Action did not result in a reportable noise increase of DNL 5.0 dB in areas exposed to DNL 45 dB to 60 dB.

5.3 Supplemental Metrics

The Proposed Action Scenarios resulted in two unique locations where the increase in aircraft noise exceeded the FAA significance threshold relative to the corresponding No Action Scenarios. Therefore, supplementary metrics were calculated in order to investigate the potential impacts to the beluga whale habitat.

Note that the Proposed Action 2032 was the scenario chosen for further investigation because it represents the most adverse noise outcome to the area and therefore provides the most conservative analysis approach.

5.3.1 4(f) Resource Noise Assessment

The locations of the significant noise impact are situated over the waters of Upper Cook Inlet and are associated with several mapped Section 4(f) resources, including the Anchorage Coastal Wildlife Refuge, designated scenic conservation areas, recreational trails, and habitat designated for the Cook Inlet Distinct Population Segment (DPS) of beluga whale (*Delphinapterus leucas*). These resources are listed in Table 29.

Table 29 Impact Locations

Latitude	Longitude	NA 2032	PA 2032	Difference	Type	Agency	Name	Source
61.172397	-150.103605	65.4332	67.2206	1.7874	STATE REFUGE	UNKNOWN	Anchorage Coastal Wildlife Refuge	AK_Game_Refuges_Crit_Hab_Sanctuaries_18K
61.174457	-150.086961	63.7534	65.9916	2.2382	STATE REFUGE	UNKNOWN	Anchorage Coastal Wildlife Refuge	AK_Game_Refuges_Crit_Hab_Sanctuaries_18K
61.172397	-150.103605	65.4332	67.2206	1.7874	STATE REFUGE	UNKNOWN	Anchorage Coastal Wildlife Refuge	Other_Section_4F_Section_106_Cultural_Historic_Resource_Areas
61.174457	-150.086961	63.7534	65.9916	2.2382	STATE REFUGE	UNKNOWN	Anchorage Coastal Wildlife Refuge	Other_Section_4F_Section_106_Cultural_Historic_Resource_Areas
61.172397	-150.103605	65.4332	67.2206	1.7874	SCA	SDNR	Anchorage Coastal Wildlife Refuge	PADUS3_clipped_to_18K_2
61.174457	-150.086961	63.7534	65.9916	2.2382	SCA	SDNR	Anchorage Coastal Wildlife Refuge	PADUS3_clipped_to_18K_2
61.172397	-150.103605	65.4332	67.2206	1.7874	Habitat	UNKNOWN	Whale, beluga [Cook Inlet DPS]	WhaleBeluga_CookInletDPS_20110411
61.174457	-150.086961	63.7534	65.9916	2.2382	Habitat	UNKNOWN	Whale, beluga [Cook Inlet DPS]	WhaleBeluga_CookInletDPS_20110411
61.174457	-150.086961	63.7534	65.9916	2.2382	Trail	UNKNOWN	Tour of Anchorage	NordicTrails
61.174457	-150.086961	63.7534	65.9916	2.2382	Trail	UNKNOWN	Kincaid Ski Trails	NordicTrails
61.174457	-150.086961	63.7534	65.9916	2.2382	Trail	UNKNOWN	Tony Knowles Coastal Trail	Section_4F_Section_106_Cultural_Historic_Resource_Lines
61.174457	-150.086961	63.7534	65.9916	2.2382	Trail	UNKNOWN	Sisson Trail	Section_4F_Section_106_Cultural_Historic_Resource_Lines

The two noise-impact locations occur over open water and do not overlap any residential population centroids or other noise-sensitive human land uses. Therefore, the identified significant noise increases do not represent direct impacts to residential populations. However, because the affected area overlaps designated habitat for the Cook Inlet DPS beluga whale, additional evaluation of potential impacts to marine mammals was conducted.

5.3.2 Marine Mammal Acoustic Criteria

The Cook Inlet beluga whale is protected under both the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). Under Section 3(18)(A)(ii) of the MMPA, Level B harassment is defined as any act that has the potential to disturb a marine mammal by causing disruption of behavioral patterns, including migration, breathing, nursing, breeding, feeding, or sheltering (16 U.S.C. §1362).

The National Marine Fisheries Service (NMFS) has established underwater acoustic thresholds for assessing behavioral disturbance and auditory injury to marine mammals. For continuous, non-impulsive underwater sound sources, NMFS generally applies a behavioral harassment (Level B harassment) threshold of 120 dB re 1 μ Pa (rms) (NMFS, 2005; NMFS, 2018). In some project-specific analyses within Cook Inlet, a threshold of 125 dB re 1 μ Pa (rms) has been considered to account for elevated ambient noise conditions. However, long-term acoustic monitoring conducted throughout Cook Inlet beluga whale habitat found that ambient sound levels frequently fall below 120 dB re 1 μ Pa (rms), suggesting that application of the higher threshold may not be appropriate in all locations (Castellote et al., 2018). Accordingly, this assessment uses the more conservative 120 dB re 1 μ Pa (rms) threshold for evaluating the potential for Level B harassment.

NMFS also establishes auditory injury (Level A harassment) criteria using cumulative Sound Exposure Level (SEL) metrics. Cook Inlet beluga whales are classified as high-frequency (HF) cetaceans. For continuous non-impulsive noise sources, the NMFS auditory injury threshold for HF cetaceans is 199 dB SEL, while the threshold for permanent threshold shift (PTS) onset is evaluated using the NMFS Technical Guidance framework (NMFS, 2018).

To evaluate potential impacts to beluga whales, supplemental aircraft-noise metrics including maximum sound level (L_{MAX}) and Sound Exposure Level (SEL) were calculated at each of the identified noise-impact locations and compared to the applicable NMFS acoustic criteria.

5.3.3 Screening-Level Estimation of Underwater Noise

There is currently no universally accepted analytical relationship for directly converting aircraft noise predicted in air by the Aviation Environmental Design Tool (AEDT) into underwater sound levels. Aircraft-generated sound reaching marine habitats is affected by multiple factors, including frequency content, grazing angle, sea state, water depth, bathymetry, and the acoustic impedance contrast between air and water (Urlick, 1983; Richardson et al., 1995).

Accordingly, a two-step screening-level approach was used to estimate potential underwater sound levels. The first step applies only the difference between airborne and underwater acoustic reference pressures, resulting in an intentionally conservative upper-bound estimate. The second step builds upon this reference-pressure adjustment by incorporating air-to-water transmission loss associated with the acoustic impedance mismatch between air and water, providing a more realistic screening-level estimate.

5.3.3.1 Method 1 – Reference Pressure Adjustment Only

Sound pressure level is defined as:²³

$$L_p = 20 \log_{10} \left(\frac{p}{p_{ref}} \right)$$

AEDT reports aircraft sound levels referenced to 20 μPa ,²⁴ whereas underwater acoustic measurements are referenced to 1 μPa .²⁵ If only the reference pressure difference is considered, the adjustment is:

$$20 \log_{10} \left(\frac{20}{1} \right) = 26.0 \text{ dB}$$

Therefore:

$$L_{water} = L_{air} + 26$$

This method assumes that all airborne acoustic energy is transmitted into the water and therefore represents an intentionally conservative upper-bound estimate.

5.3.3.2 Method 2 – Reference Pressure Adjustment with Air-to-Water Transmission Loss

A more realistic estimate accounts for the large acoustic impedance mismatch between air and water. The normal-incidence acoustic intensity transmission coefficient is given by Kinsler 6.2.11 (Kinsler et al., 2000):²⁶

$$T_I = \frac{4Z_{air}Z_{water}}{(Z_{air} + Z_{water})^2}$$

where acoustic impedance is:

$$Z = \rho c$$

and:

- ρ = medium density
- c = speed of sound in the medium

Using representative values (Kinsler 5.10.4 and 5.10.5):

$$Z_{air} \approx 415 \left(\frac{\text{kg}}{\text{m}^2\text{s}} \right)$$
$$Z_{water} \approx 1.5 \times 10^6 \left(\frac{\text{kg}}{\text{m}^2\text{s}} \right)$$

results in:

$$T_I \approx 0.0011$$

which corresponds to:

$$10\log_{10}(T_I) \approx -29.6 \text{ dB}$$

²³ AEDT 3e Technical Manual, May 2022.

²⁴ AEDT 3e Technical Manual, May 2022.

²⁵ NMFS: Summary of Recommended Marine Mammal Protection Act Acoustic Thresholds, September 2025.
<https://www.fisheries.noaa.gov/s3/2025-09/MM-Acoustic-Thresholds-508-secure-SEPT-2025-OPR1.pdf>

²⁶ Kinsler, L.E., Frey, A.R., Coppens, A.B., and Sanders, J.V. 2000. *Fundamentals of Acoustics*, 4th Edition. John Wiley & Sons.
<https://jontalle.web.engr.illinois.edu/Public/BOOKS/KinslerFreyCoopSanders.00.pdf>

Combining the reference-pressure adjustment derived from the AEDT sound pressure level definition with the Kinsler (2000) transmission coefficient yields the following screening-level relationship:

$$L_{\text{underwater}} = L_{\text{air}} + 26 - 29.6$$

$$L_{\text{underwater}} \approx L_{\text{air}} - 3.6$$

The transmission coefficient shown above assumes normal incidence, meaning the acoustic wave arrives perpendicular to the water surface. This represents the maximum possible transmission of acoustic energy across the air-water interface. Aircraft noise reaching the water surface at oblique angles would experience additional reflection losses and reduced transmission into the water column. Accordingly, the normal-incidence assumption represents a conservative worst-case condition. Furthermore, this approach neglects additional attenuation mechanisms associated with geometric spreading, frequency-dependent absorption, sea-state effects, bathymetry, and other environmental factors that would further reduce underwater sound levels.

Method 1 provides an intentionally conservative upper-bound estimate by assuming complete transmission of airborne sound into the water column. Method 2 builds upon the Method 1 adjustment by accounting for transmission loss at the air-water interface and therefore provides a more realistic screening-level estimate. Presentation of both estimates illustrates the sensitivity of the results to the treatment of air-water transmission and demonstrates that the conclusions remain unchanged under either approach.

5.3.4 Results

Because two modeling tools were used for this effort (see Section 3), the potential impacts to beluga whale habitat were evaluated separately for each model. Section 5.3.4.1 presents the results for airport noise modeled in AEDT, and Section 5.3.4.2 presents the results for operations modeled in EDF.

5.3.4.1 AEDT Results

The calculated LAMAX and SEL_{cum} values for each noise-impact location, together with the Method 1 and Method 2 underwater screening estimates, are provided in Table 30.

Table 30 LAMAX and SEL Underwater Estimates – AEDT Model

Latitude (deg)	Longitude (deg)	Level B Harassment			Level A Harassment		
		Proposed Action 2032 dB LAMAX	Method 1 (LAMAX +26 dB)	Method 2 (LAMAX - 3.6 dB)	Proposed Action 2032 dB SEL	Method 1 (SEL +26 dB)	Method 2 (SEL - 3.6 dB)
61.172397	-150.103605	91.31	117.31	87.71	110.421	136.421	106.821
61.174457	-150.086961	91.45	117.45	87.85	108.673	134.673	105.073

Under both screening methodologies, the estimated underwater sound levels remain below the NMFS Level B behavioral harassment threshold of 120 dB re 1 µPa (rms), providing a substantial margin below the level associated with behavioral disturbance. Because the analysis demonstrates compliance with this conservative 120 dB criterion, the results would also remain below any higher threshold that may be considered for portions of Cook Inlet.

Similarly, cumulative SEL_{cum} values remain well below the NMFS auditory injury criteria applicable to HF cetaceans (199 dB, see Section 5.2.2).

5.3.4.2 EDF Results

For EDF, the flight track in the Proposed Scenario that was closest to the location of the significant impact was run in NOISEMAP, and its LAMAX and SEL values were calculated. The closest flight track was chosen to represent the most adverse noise outcome to the area and therefore provides the most conservative analysis approach.

Table 31 presents the calculated LAMAX and SEL values for each noise-impact location, along with the Method 1 and Method 2 underwater screening estimates.

Table 31 LAMAX and SEL Underwater Estimates – NOISEMAP Model

Latitude (deg)	Longitude (deg)	Level B Harassment			Level A Harassment		
		Proposed Action LAMAX	Method 1 (LAMAX +26 dB)	Method 2 (LAMAX - 3.6 dB)	Proposed Action SEL	Method 1 (SEL +26 dB)	Method 2 (SEL - 3.6 dB)
61.172397	-150.103605	51.2	77.2	47.6	65.5	91.5	61.9
61.174457	-150.086961	49.6	75.6	46.0	65.7	91.7	62.1

Under both screening methodologies, the estimated underwater sound levels for LAMAX and SEL remain below the NMFS Level B behavioral harassment threshold and the applicable Level A auditory injury criteria, respectively. These results likewise indicate that aircraft operations evaluated using EDF are not expected to result in behavioral disturbance or auditory injury to Cook Inlet beluga whales.

5.3.5 Findings

Based on the screening-level acoustic analysis, aircraft operations associated with the Proposed Action are not expected to result in Level A or Level B harassment of Cook Inlet beluga whales.. Consequently, no additional noise mitigation measures are warranted based on the available acoustic analysis.

The FAA will coordinate these findings with the Alaska Department of Fish and Game regarding the Anchorage Coastal Wildlife Refuge and with NOAA Fisheries during agency consultation and environmental review.

5.3.6 References

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6 Supplements

Supplement 1 – AEDT Aircraft Substitution Requests and Approvals

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February 4, 2025

Lonnie Covalt
Environmental Specialist
Federal Aviation Administration
Western Service Center
2200 S. 216th St
Des Moines, WA 98198
Lonnie.D.Covalt@faa.gov

Subject: AEDT Aircraft Substitution Request
Reference: Anchorage Terminal Area Airspace and Procedures Study (ATAAPS) Environmental Assessment (EA)
Contract No.: 693KA8-22-D-00025
Delivery Order: 693KA8-23-F-00251

Dear Lonnie:

As part of the Anchorage Terminal Area Airspace and Procedures Study Environmental Assessment, ATAC is developing the inputs for the Aviation Environmental Design Tool (AEDT). AEDT will be used to model the noise effects resulting from proposed changes to the airspace. Consistent with Federal Aviation Administration (FAA) policies and procedures, we submit this request for approval of the Anchorage Terminal Airspace and Procedures Environmental Assessment identified aircraft types of interest (Attachment A).

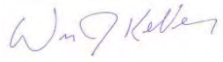
While AEDT 3e includes supporting noise data from the legacy environmental tools such as the Integrated Noise Model (INM) version 7.0b and the Noise Integrated Routing System (NIRS) version 7.0b3, as well as its own improvements and additions, certain aircraft types that occur in the regional airspace existing and forecast fleets are not included in the AEDT database. Since this is an airspace study, procedure step profiles for both arrivals and departures are required in order to use altitude controls in AEDT. These altitude controls are important to accurately model the noise impact of different altitude profiles such as existing step-down procedures in comparison to proposed new Optimized Profile Descents. We have identified surrogate departure and/or arrival aircraft types that would be compatible with AEDT. We request that the FAA review and approve these AEDT 3e substitutes for each of these aircraft types or provide a suitable substitution.

In accordance with FAA policy, we expect that this request will be reviewed by the FAA's Office of Environment and Energy Noise Division (AEE-100). We will be happy to respond to questions regarding this request from yourself or those offices.

Note that a version (rev. 1) of this request was submitted on January 3, 2024, and subsequently approved on January 16, 2024. This revised version (rev. 2) contains substitution requests for additional aircraft types that were identified due to an increase of project scale and application. After some discussions, it was preferred to revise the current request rather than creating a supplementary one to ensure better tracking all aircraft substitutions in a single document.

Thank you for your assistance.

Sincerely,

A handwritten signature in purple ink that reads "Bill Keller".

Bill Keller
ATAC Corporation

Attachment A: AEDT Aircraft Substitution Requests and Suggestions

Attachment A: AEDT Aircraft Substitution Requests and Suggestions

The following aircraft types included in the Anchorage Terminal Airspace and Procedures Environmental Assessment require an FAA-approved substitution. In each case, a recommended substitute with a similar aircraft type from the existing AEDT 3e database is presented.

FAA AEE provided a SQL query to run against the AEDT databases, which resulted in a table containing AEDT-recommended substitutions. FAA AEE also indicated that if a substitution was covered by the AEDT-recommended substitutions table, a request and subsequent approval is not required.

The methodology used to evaluate aircraft substitutions consisted of first developing a list of aircraft types that require substitutions. The resulting list was cross-referenced against AEDT-recommended substitutions, and if available, the AEDT recommendation would be used. Next, for the aircraft types that were left without an AEDT recommendation, an analysis to determine the best AEDT aircraft substitution was conducted.

Table 1 presents the Anchorage Terminal Airspace and Procedures Environmental Assessment aircraft substitution requests previously submitted by ATAC that have historically been FAA AEE approved. The approvals used for this aircraft substitution request include the San Antonio Metroplex aircraft substitution approval dated July 18, 2022. The copies of previous aircraft substitution requests and approvals are available upon request. For each row in Table 1, the aircraft substitution choices are discussed in subsections following Table 1.

Table 1: Previously Approved Metroplex EA Aircraft Substitutions for Anchorage Terminal Airspace and Procedures Environmental Assessment

Aircraft Code	Represented Aircraft	Operation Type	AEDT EQUIP_ID	AEDT ANP_ID	AEDT Airframe	AEDT ENGINE	AEDT BADA	Source
B753	Boeing 757-300	Arrivals Only	392	757RR	Boeing 757-200 Series	1430	B752	SAT Metroplex
B772	Boeing 777-200	Arrivals Only	665	7773ER	Boeing 777-300 ER	2153	B77W	SAT Metroplex
B77L	B777-200LR	Arrivals Only	665	7773ER	Boeing 777-300 ER	2153	B77W	SAT Metroplex
EXP	Any experimental (piston homebuilt)	Arrivals and Departures	6329	GASEPV	Vans RV6 (FAS)	1567	TB21	SAT Metroplex
EXPR	Express 2000	Arrivals and Departures	1271	GASEPV	Piper PA-32 Cherokee Six	1715	P28A	SAT Metroplex
FA50	Dassault Falcon 50	Arrivals and Departures	3818	COMJET	1985 BUSINESS JET	1205	F900	SAT Metroplex
GL5T	Bombardier Global Express	Arrivals and Departures	2432	GV	Gulfstream V-SP	1377	GLF5	SAT Metroplex
GLEX	Bombardier Global 6000	Arrivals and Departures	2432	GV	Gulfstream V-SP	1377	GLF5	SAT Metroplex
MD82	MD-82	Arrivals Only	2091	MD9025	Boeing MD-90	1437	MD83	SAT Metroplex
MD83	MD-83	Arrivals Only	2091	MD9025	Boeing MD-90	1437	MD83	SAT Metroplex

B753

The 757300 (a direct match) was used for the AEDT departure model substitution for the B753. Because there is no arrival procedure step in AEDT for the B753, the substitution 757RR was used for arrivals. This aircraft is a variant of the Boeing 757, and is similar in size, configuration, and engine type.

B772

The AEDT type 777200 (a direct match) was recommended by the AEDT model substitution database and was used as a departure substitution aircraft for the B772. However, the 777200 does not have arrival procedure step profiles available. Thus, for arrivals the AEDT type 7773ER was used. The 7773ER is similar aircraft in size, configuration, and engine type to the B772.

B77L

The AEDT type 777300 was recommended by the AEDT model substitution database and was used as a departure substitution aircraft for the B77L, but the 777300 does not have arrival procedure step profiles available. Thus, for arrivals the AEDT type 7773ER was used. Both of these aircraft are variants of the B77L and are similar aircraft in size, configuration, and engine type.

EXP

The AEDT type GASEPV (General Aviation Single Engine Prop Variable) was used as a substitution aircraft for departures and arrivals for the EXP. The EXP can represent any experimental (piston homebuilt) aircraft. These aircraft can be a general aviation variable pitch propeller aircraft, and therefore GASEPV is a good substitution.

EXPR

The AEDT type GASEPV (General Aviation Single Engine Prop Variable) was used as a substitution aircraft for departures and arrivals for the EXPR. The EXPR is a single-engine, light piston propeller aircraft, and therefore GASEPV is a good substitution.

FA50

FA50 is the aircraft designator for the Dassault Falcon 50. The Falcon 50 is a French super-midsize, long-range business jet. Due to errors in the standard FAL900EX ANP arrival procedural profile when modeled in conjunction with altitude control codes, this aircraft was mapped to the 1985 Business Jet airframe, COMJET ANP_ID, F900 BADA, and TFE731-3 engines.

GL5T

The Bombardier Global Express, with a maximum takeoff weight (MTOW) of 92,500 lbs., having 2 x BR710A2-20 engines, each generating 14,750 lbf. (65.6 kN) thrust was mapped to the Gulfstream V (GV), with a MTOW of 90,500 lbs., (41,050 kg), having 2 x Rolls-Royce BR710A1-10 turbofan engines, each generating 14,750 lbf. (65.6 kN) thrust each engine. The GL5T aircraft is a variant of the GV and is similar aircraft in size, configuration, and engine type.

GLEX

The Bombardier Global 6000, with a MTOW of 99,500 lbs., having 2 x BR10A2-20 engines, each generating 14,750 lbf. (65.6 kN) of thrust was mapped to the Gulfstream V (GV), with a MTOW of 90,500 lbs. (41,050 kg), having 2 x Rolls-Royce BR710A1-10 turbofan engines, each generating 14,750 lbf. (65.6 kN) thrust each engine. The GLEX aircraft is a variant of the GV and is similar aircraft in size, configuration, and engine type.

MD82

The AEDT type MD82 (a direct match) was recommended by the AEDT model substitution database and was used as a departure substitution aircraft for the MD82. However, the MD82 does not have arrival procedure step profiles available within AEDT. Thus, for arrivals the AEDT type MD9025 was used. The MD9025 substitution is the closest available match within AEDT to the MD82 in terms of aircraft size, configuration, and engine type.

MD83

The AEDT type MD83 (a direct match) was recommended by the AEDT model substitution database and was used as a departure substitution aircraft for the MD83, but the MD83 does not have arrival procedure step profiles available. Thus, for arrivals the AEDT type MD9025 was used. The MD9025 substitution is the closest match within AEDT to the MD83 in terms of aircraft size, configuration, and engine type.

Table 2 presents substitutions for aircraft types that have no historical Metroplex EA precedence. For each row, the aircraft substitution choices are discussed in following subsections.

Table 2: Aircraft Substitutions for Anchorage Terminal Area Airspace and Procedures Environmental Assessment

Aircraft Code	Represented Aircraft	Operation Type	AEDT EQUIP_ID	AEDT ANP_ID	AEDT Airframe	AEDT ENGINE	AEDT BADA
AR15	Aeronca 15AC Sedan	Arrivals and Departures	6259	GASEPV	Bellanca 8 Scout Super Decathlon (FAS)	1567	TB21
B18T	Raytheon Beech 18	Arrivals and Departures	1549	DHC6	Raytheon Beech 18	1725	PAY2
B38M	Boeing 737 MAX 8	Arrivals and Departures	4129	7378MAX	Boeing 737-8	2175	B38M
B39M	Boeing 737 MAX 9	Arrivals and Departures	6406	7378MAX	Boeing 737-9	2176	B39M
B3XM	Boeing 737 MAX 10	Arrivals and Departures	6406	7378MAX	Boeing 737-9	2176	B39M
B764	Boeing 767-400	Arrivals	517	767300	Boeing 767-300 Series	1395	B763
B773	Boeing 777-300	Arrivals Only	665	7773ER	Boeing 777-300 ER	2153	B77W
B779	Boeing 777-900	Arrivals and Departures	665	7773ER	Boeing 777-300 ER	2153	B77W
BLCF	Boeing 747-400 LCF	Arrivals and Departures	6027	747400RN	Boeing 747-400 ERF	1940	B744
C140	Cessna 140	Arrivals and Departures	1882	GASEPF	Cessna 150 Series	1593	C172
C408	Cessna 408 SkyCourier	Arrivals and Departures	6280	GASEPV	Cessna 400 (FAS)	1745	TB21
CH7A	Aeronca Champion	Arrivals and Departures	6259	GASEPV	Bellanca 8 Scout Super Decathlon (FAS)	1567	TB21

Aircraft Code	Represented Aircraft	Operation Type	AEDT EQUIP_ID	AEDT ANP_ID	AEDT Airframe	AEDT ENGINE	AEDT BADA
COUR	Helio Courier	Arrivals and Departures	6314	GASEPV	Piper PA-36 Pawnee Brave (FAS)	1715	P28A
FBA2	Canadian four/five-seat cabin aircraft	Arrivals and Departures	6311	GASEPF	Piper J-3 Cub (FAS)	1593	C172
G44	Grumman G-44 Widgeon	Arrivals and Departures	777	BEC58P	Britten-Norman BN-2 Islander	1715	PA31
GL7T	Bombardier Global 7500	Arrivals and Departures	1928	GV	Gulfstream G-5 Gulfstream 5 / G-5SP Gulfstream G500	1435	FA7X
LNC4	Columbia Aircraft Lancair (All Types)	Departure Only	6283	GASEPV	Columbia Aircraft Lancair (COL3/4 All Types) (FAS)	1715	P28A
M4	Maule M-4	Arrivals and Departures	1268	GASEPV	Maule MT-7-235	1715	P28A
M5	Maule M5	Arrivals and Departures	1268	GASEPV	Maule MT-7-235	1715	P28A
M6	Maule M-6	Arrivals and Departures	1268	GASEPV	Maule MT-7-235	1715	P28A
MAUL	Maule M-4	Arrivals and Departures	1268	GASEPV	Maule MT-7-235	1715	P28A
MD80	MD-80 McDonnell-Douglas	Arrivals Only	2091	MD9025	Boeing MD-90	1437	MD83
P3	Lockheed P-3 Orion	Arrivals and Departures	1218	C130	Lockheed C-130 Hercules	1681	C30J
PA11	Piper Cub	Arrivals and Departures	6311	GASEPF	Piper J-3 Cub (FAS)	1593	C172
PA12	Piper PA-12 Super Cruiser	Arrivals and Departures	6312	GASEPF	Piper PA-18-150 (FAS)	1594	P28A
PA14	Piper Family Cruiser	Arrivals and Departures	6311	GASEPF	Piper J-3 Cub (FAS)	1593	C172
PC6T	Pilatus PC-6 Porter	Arrivals and Departures	1489	CNA208	Pilatus PC-12	1612	PC12

AR15

AR15 is the aircraft designator for a Aeronca 15AC Sedan aircraft, which is a single-engine light piston aircraft. ATAC requests that this be mapped to the Bellanca 8 Scout Super Decathlon (FAS) airframe, GASEPV ANP_ID, TB21 BADA, and IO-360-B engines.

BI8T

BI8T is the aircraft designator for a Raytheon Beech 18 aircraft, a light twin engine, low wing, tail wheel aircraft. This aircraft has been mapped to the Raytheon Beech 18 airframe, DHC6 ANP_ID, PAY2 BADA, and TPE331-1 engines.

B38M

B38M is the aircraft designator for a Boeing 737 MAX 8 aircraft, which is a twin-engine narrow-body airliner. ATAC requests that this be mapped to the Boeing 737-8 airframe, 7378MAX ANP_ID, B38M BADA, and CFM LEAP-1B27 engines.

B39M

B739M is the aircraft designator for a Boeing 737 MAX 9 aircraft, which is a twin-engine narrow-body airliner. ATAC requests that this be mapped to the Boeing 737-9 airframe, 7378MAX ANP_ID, B39M BADA, and LEAP-1B28/28B1/28B2/28B3 engines.

B3XM

B3XM is the aircraft designator for a Boeing 737 MAX 10 aircraft, which is a twin-engine narrow-body airliner. ATAC requests that this be mapped to the Boeing 737-9 airframe, 7378MAX ANP_ID, B39M BADA, and LEAP-1B28/28B1/28B2/28B3 engines.

B764

B764 is the aircraft designator for a Boeing 767-400 aircraft, which is a twin-engine wide-body airliner. AEDT has a direct mapping for departures. However, AEDT has no procedural steps for arrivals. ATAC requests that for B764 arrivals, substitution to the Boeing 767-300 Series airframe, 767300 ANP_ID, B763 BADA, and CF6-80C2B8FA engines.

B773

B773 is the aircraft designator for a Boeing 777 300 aircraft, which is a twin-engine wide-body airliner. AEDT has a direct mapping for departures. However, AEDT has no procedural steps for arrivals. ATAC requests that for B773 arrivals, substitution to the Boeing 777-300 ER airframe, 7773ER ANP_ID, B77W BADA, and GE90-115B engines.

B779

B779 is the aircraft designator for a Boeing 777-900 aircraft, which is a twin-engine wide-body airliner. ATAC requests that be mapped to the Boeing 777-300 ER airframe, 7773ER ANP_ID, B77W BADA, and GE90-115B engines.

BLCF

BLCF is the aircraft designator for a Boeing 747-400 aircraft, which is a four-engine wide-body airliner. ATAC requests that this be mapped to the Boeing 747-400 ERF airframe, 747400RN ANP_ID, B744 BADA, and PW4062 engines.

C140

C140 is the aircraft designator for a Cessna 140, which is a single-engine, two-seat, light aircraft equipped with conventional landing gear. ATAC requests that this be mapped to the Cessna 150 Series airframe, GASEPF ANP_ID, C172 BADA, and O-200 engines.

C408

C408 is the aircraft designator for a Cessna 408 SkyCourier, which is a twin-engine, light turboprop aircraft. ATAC requests that this be mapped to the Cessna 400 (FAS) airframe, GASEPV ANP_ID, TB21 BADA, and TSIO-360C engines.

CH7A

CH7A is the aircraft designator for a Aeronca Champion, which is a single-engine, two-seat, light piston aircraft. ATAC requests that this be mapped to the Bellanca 8 Scout Super Decathlon (FAS) airframe, GASEPV ANP_ID, TB21 BADA, and IO-360-B engines.

COUR

COUR is the aircraft designator for a Helio Courier aircraft, which is a single-engine, light piston aircraft. ATAC requests that this be mapped to the Bellanca 8 Scout Super Decathlon (FAS) airframe, GASEPV ANP_ID, TB21 BADA, and TIO-540-J2B2 engines.

FBA2

FBA2 is the aircraft designator for a Canadian four/five-seat cabin aircraft, which is a single-engine, light piston aircraft. ATAC requests that this be mapped to the Piper J-3 Cub (FAS) airframe, GASEPF ANP_ID, C172 BADA, and O-200 engines.

G44

G44 is the aircraft designator for a Grumman G-44 Widgeon, which is a twin-engine, light piston amphibious aircraft. ATAC requests that this be mapped to the Britten-Norman BN-2 Islander airframe, BEC58P ANP_ID, PA31 BADA, and TIO-540-J2B2 engines.

GL7T

GL7T is the aircraft designator for the Bombardier Global 7500 aircraft. The Global 7500 is a large long-range private jet. It is powered by two General Electric Passport engines capable of 18,920 lbf. (84.2 kN). This aircraft was mapped to the Gulfstream G-5 Gulfstream 5 / G-5SP Gulfstream G500 airframe, GV ANP_ID, FA7X BADA, and BR700-715A1-30 engines.

LNC4

LNC4 is the aircraft designator for a Columbia Aircraft Lancair (All Types), which is a single-engine, light piston aircraft. ATAC requests that this be mapped to the Columbia Aircraft Lancair (COL3/4 All Types) (FAS) airframe, GASEPV ANP_ID, P28A BADA, and TIO-540-J2B2 engines.

M4

M4 is the aircraft designator for a Maule M-4, which is a single-engine, light piston aircraft. ATAC requests that this be mapped to the Maule MT-7-235 airframe, GASEPV ANP_ID, P28A BADA, and TIO-540-J2B2 engines.

M5

M5 is the aircraft designator for a Maule M5, which is a single-engine, light piston aircraft. ATAC requests that this be mapped to the Maule MT-7-235 airframe, GASEPV ANP_ID, P28A BADA, and TIO-540-J2B2 engines.

M6

M6 is the aircraft designator for a Maule M-6, which is a single-engine, light piston aircraft. ATAC requests that this be mapped to the Maule MT-7-235 airframe, GASEPV ANP_ID, P28A BADA, and TIO-540-J2B2 engines.

MAUL

MAUL is the aircraft designator for a Maule M-4, which is a single-engine, light piston aircraft. ATAC requests that this be mapped to the Maule MT-7-235 airframe, GASEPV ANP_ID, P28A BADA, and TIO-540-J2B2 engines.

MD80

The AEDT type MD82, a McDonnell-Douglas MD-80 variant was recommended by the AEDT model substitution database and was used as a departure substitution aircraft for the MD80, but the MD82 does not have arrival procedure step profiles available. Thus, for arrivals the AEDT type Boeing MD-90 was used. The Boeing MD-90 substitution is the closest match within AEDT to the MD80 in terms of aircraft size, configuration, and engine type.

P3

P3 is the aircraft designator for a Lockheed P-3 Orion, which is a four-engine turboprop, anti-submarine patrol aircraft. ATAC requests that this be mapped to the Lockheed C-130 Hercules airframe, C130 ANP_ID, C30J BADA, and T56-A-15 engines.

PA11

The AEDT type PA11 Piper Cub aircraft. The PA11 is a single-engine, high-wing, two-seat, general aviation aircraft. The aircraft that ATAC mapped the PA11 is a Piper Cub variant, a Piper J-3 Cub (FAS) airframe, GASEPF ANP_ID, C172 BADA, and O-200 engine.

PA12

The AEDT type PA12 Piper PA-12 Super Cruiser aircraft. The PA12 is a single-engine, high-wing, two-seat, general aviation aircraft. The aircraft that ATAC mapped the PA12 is a Piper Cub variant, a Piper PA-18-150 (FAS) airframe, GASEPF ANP_ID, P28A BADA, and O-320 engine.

PA14

PA14 is the aircraft designator for Piper Family Cruiser, which is a single-engine, light piston aircraft. ATAC requests that this be mapped to the Piper J-3 Cub (FAS) airframe, GASEPF ANP_ID, C172 BADA, and O-200 engines.

PC6T

PC6T is the aircraft designator for a Pilatus PC-6 Porter, which is a single-engine, light turboprop aircraft. ATAC requests that this be mapped to the Pilatus PC-12 airframe, CNA208 ANP_ID, PC12 BADA, and PT6A-67B engines.

Table 3 presents substitutions for helicopter types that are included in the Anchorage Terminal Area Airspace and Procedures Environmental Assessment and have no historical Metroplex EA precedence. For each row, the helicopter substitution choices are discussed in following subsections.

Table 3: Helicopter Substitutions for Anchorage Terminal Area Airspace and Procedures Environmental Assessment

Aircraft Code	Represented Aircraft	Operation Type	AEDT EQUIP_ID	AEDT ANP_ID	AEDT Airframe	AEDT ENGINE	AEDT BADA
AS65	Aerospatiale SA-365N Dauphin (AS-365N)	Arrivals and Departures	4121	SA365N	Eurocopter EC-155B1	1694	P28A
B206	BELL 206L-3	Arrivals and Departures	4091	B206L	Bell 206L-4T Long Ranger	1339	P28A
B212	BELL 212	Arrivals and Departures	3	B212	Bell UH-1 Iroquois	1675	P28A
B412	BELL, 412 Griffin	Arrivals and Departures	22	S76	Sikorsky S-76 Spirit	1695	P28A

Aircraft Code	Represented Aircraft	Operation Type	AEDT EQUIP_ID	AEDT ANP_ID	AEDT Airframe	AEDT ENGINE	AEDT BADA
BK17	EUROCOPTER-KAWASAKI, BK-117	Arrivals and Departures	4125	B429	Bell 429	1725	P28A
EC45	AIRBUS HELICOPTERS-KAWASAKI, EC-145	Arrivals and Departures	4125	B429	Bell 429	1725	P28A
R66	ROBINSON HELICOPTER CO R66	Arrivals and Departures	30	H500D	Hughes 500D	1339	P28A

AS65

The AEDT type SA365N was used as a substitution aircraft for departures and arrivals for the AS65 helicopter. The SA365N is a medium-weight multi-purpose twin-engine helicopter. The SA365N substitution is the closest available match within AEDT to the AS65 in terms of aircraft size, configuration, and engine type.

B206

The AEDT type B206L was used as a substitution aircraft for departures and arrivals for the B206. The B206L is an extended version of the B206, featuring a longer fuselage and offering higher payload capacity. The B206L substitution is the closest available match within AEDT to the B206 in terms of aircraft configuration, and engine type.

B212

The AEDT type Bell UH-1 Iroquois was used as a substitution for the B212. The Bell UH-1 Iroquois is a utility helicopter designed for military use and is powered by one Lycoming T53-L-13 turboshaft engine. This substitution is the closest available match within AEDT to the B212 in terms of aircraft size, configuration, and engine type.

B412

The AEDT type Sikorsky S-76 Spirit was used as a substitution aircraft for departures and arrivals for the B412 helicopter. The Sikorsky S-76 Spirit is a mid-sized utility helicopter designed with versatile configurations for operations and powered by dual turboshaft engines. The Sikorsky S-76 Spirit substitution is the closest available match within AEDT to the B412 in terms of aircraft size, configuration, and engine type.

BK17

The AEDT type B429 was used as a substitution aircraft for departures and arrivals for the BK17 helicopter. The B429 is a light, twin-engine helicopter with versatile configurations and capable of performing a wide range of missions. The B429 substitution is the closest available match within AEDT to the BK17 in terms of aircraft size, configuration, and engine type.

EC45

The AEDT type B429 was used as a substitution aircraft for departures and arrivals for the EC45 helicopter. The B429 is a light, twin-engine helicopter with versatile configurations and capable of performing a wide range of missions. The B429 substitution is the closest available match within AEDT to the EC45 in terms of aircraft size, configuration, and engine type.

R66

The AEDT type Hughes 500D was used as a substitution aircraft for departures and arrivals for the R66 helicopter. The Hughes 500D is a light utility, single-engine helicopter powered by a turboshaft engine. The Hughes 500D substitution is the closest available match within AEDT to the R66 in terms of aircraft size, configuration, and engine type.



U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of Environment and Energy

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

2/18/2025

Lonnie Covalt
Lead Environmental Protection Specialist
Air Traffic Operations, Western Service Center
Federal Aviation Administration
2200 S. 216th St.
Des Moines, WA 98198

Dear Lonnie Covalt,

The Office of Environment and Energy (AEE) has received the revised memo from ATAC dated February 4, 2025, referencing the Anchorage Terminal Area Airspace and Procedures Study (ATAAPS) Environmental Assessment (EA). The revised memo requests approval for multiple non-standard AEDT aircraft substitutions in AEDT version 3e and supplements a prior memo approved by AEE on January 16, 2024 for the ATAAPS project.

AEE has reviewed the proposed substitutions in the revised memo and is providing a list of approvals or required updates in the tables below.

Table 1: Aircraft Lacking Procedural Profiles in the AEDT 3e Database

- AEE does not approve the proposed arrival only substitution for the Boeing B764 aircraft type. An alternative substitution is provided.
- AEE approves the proposed arrival only substitutions for the Boeing B753, B772, B773, B77L, and the McDonnell Douglas MD80, MD82, and MD83 aircraft types.
- AEE approves the proposed departure and arrival substitutions for the Dassault FA50, and the Bombardier GL5T and GLEX aircraft types.

Table 2: Aircraft Not Present in the AEDT 3e Database

- AEE does not approve the proposed substitutions for the Boeing BLCF, Cessna C408, Aeronca CH7A, Helio COUR, Found FBA2, Grumman G44, Lockheed P3, and Piper PA14 aircraft types. Alternative substitutions are provided.
- AEE approves the proposed substitutions for the Raytheon B18T, the Boeing B38M, B39M, B3XM, and B779, Homebuilt EXP, Express EXPR, Bombardier GL7T, and Piper PA11 and PA12 aircraft types.
- The Aeronca AR15, Cessna C140, Columbia LNC4, the Maule M4, M5, M6, and MAUL, and Pilatus PC6T aircraft types do not require a substitution, as the AEDT 3e database contains these aircraft. The approved assignments in the AEDT 3e database are provided for reference.

Table 3: Helicopters Not Present in the AEDT 3e Database

- AEE approves the proposed substitutions for the Aerospatiale AS65, Bell B206, B212, and B412, Eurocopter BK17, Airbus Helicopters EC45, and Robinson R66 helicopter types.

Table 1: Aircraft Lacking Procedural Profiles in the AEDT 3e database

ATAC Proposed and FAA AEE Approved Substitutions							
Aircraft Code	Represented Aircraft	AEDT EQUIP_ID	AEDT Airframe	AEDT Engine	AEDT ANP_ID	AEDT BADA_ID	Notes
B753	Boeing 757-300	392	Boeing 757-200 Series	RB211-535E4B	757RR	B752	Proposed Approved Non-Standard Arrival
B764	Boeing 767-400	457	Boeing 767-300 ER	CF6-80C2B6F	767300	B763	AEE Approved Non-Standard Arrival
B772	Boeing 777-200	665	Boeing 777-300 ER	GE90-115B	7773ER	B77W	Proposed Approved Non-Standard Arrival
B773	Boeing 777-300	665	Boeing 777-300 ER	GE90-115B	7773ER	B77W	Proposed Approved Non-Standard Arrival
B77L	Boeing 777-200LR	665	Boeing 777-300 ER	GE90-115B	7773ER	B77W	Proposed Approved Non-Standard Arrival
MD80	MD-80	2091	Boeing MD-90	BR700-715C1-30	MD9025	MD83	Proposed Approved Non-Standard Arrival
MD82	MD-82	2091	Boeing MD-90	BR700-715C1-30	MD9025	MD83	Proposed Approved Non-Standard Arrival
MD83	MD-83	2091	Boeing MD-90	BR700-715C1-30	MD9025	MD83	Proposed Approved Non-Standard Arrival
FA50	Dassault Falcon 50	3818	1985 BUSINESS JET	TFE731-3	COMJET	F900	Proposed Approved Non-Standard Arrival and Departure
GL5T	Bombardier Global Express	2432	Gulfstream V-SP	BR700-710A1-10	GV	GLF5	Proposed Approved Non-Standard Arrival and Departure
GLEX	Bombardier Global 6000	2432	Gulfstream V-SP	BR700-710A1-10	GV	GLF5	Proposed Approved Non-Standard Arrival and Departure

Table 2: Aircraft Not Present in the AEDT 3e Database

ATAC Proposed and FAA AEE Approved Substitutions							
Aircraft Code	Represented Aircraft	AEDT EQUIP_ID	AEDT Airframe	AEDT Engine	AEDT ANP_ID	AEDT BADA_ID	Notes
AR15	Aeronca 15AC Sedan	6241	Aeronca 15 Sedan (FAS)	O-200	GASEPF	C172	Aircraft Present in AEDT Database. Non-Standard Substitution Not Required
B18T	Raytheon Beech 18	1549	Raytheon Beech 18	TPE331-1	DHC6	PAY2	Proposed Approved
B38M	Boeing 737 MAX 8	4129	Boeing 737-8	LEAP-1B27	7378MAX	B38M	Proposed Approved
B39M	Boeing 737 MAX 9	6406	Boeing 737-9	LEAP-1B28/28B1/28B2/28B3	7378MAX	B39M	Proposed Approved
B3XM	Boeing 737 MAX 10	6406	Boeing 737-9	LEAP-1B28/28B1/28B2/28B3	7378MAX	B39M	Proposed Approved
B779	Boeing 777-900	665	Boeing 777-300 ER	GE90-115B	7773ER	B77W	Proposed Approved
BLCF	Boeing 747-400 LCF	6420	Boeing 747-400BCF	PW4056	747400RN	B744	AEE Approved Substitution
C140	Cessna 140	6261	Cessna 140 (FAS)	O-200	GASEPF	C172	Aircraft Present in AEDT Database. Non-Standard Substitution Not Required
C408	Cessna 408 SkyCourier	3140	Shorts 330-200 Series	PT6A-65B	SD330	SH36	AEE Approved Substitution
CH7A	Aeronca Champion	6242	American Champion Cibrata (FAS)	O-320	CNA172	C172	AEE Approved Substitution
COUR	Helio Courier	1262	Cessna 182	IO-360-B	CNA182	C182	AEE Approved Substitution
EXP	Any experimental (piston homebuilt)	6329	Vans RV6 (FAS)	IO-360-B	GASEPV	TB21	Proposed Approved
EXPR	Express 2000	1271	Piper PA-32 Cherokee Six	TIO540	TIO540	TIO540	Proposed Approved

ATAC Proposed and FAA AEE Approved Substitutions							
Aircraft Code	Represented Aircraft	AEDT EQUIP_ID	AEDT Airframe	AEDT Engine	AEDT ANP_ID	AEDT BADA_ID	Notes
FBA2	Found - Canadian four/five-seat cabin aircraft	6271	Cessna 185 Skywagon	IO-360-B	CNA182	C188	AEE Approved Substitution
G44	Grumman G-44 Widgeon	781	Vulcanair P.68	IO-360-B	PA30	BE76	AEE Approved Substitution
GL7T	Bombardier Global 7500	1928	Gulfstream G-5 Gulfstream 5 / G-5SP Gulfstream G500	BR700-715A1-30	GV	FA7X	Proposed Approved
LNC4	Columbia Aircraft Lancair (All Types)	6283	Columbia Aircraft Lancair (COL3/4 All Types) (FAS)	TIO-540-J2B2	GASEPV	P28A	Aircraft Present in AEDT Database. Non-Standard Substitution Not Required
M4	Maule M-4	1268	Maule MT-7-235	TIO-540-J2B2	GASEPV	P28A	Aircraft Present in AEDT Database. Non-Standard Substitution Not Required
M5	Maule M5	1268	Maule MT-7-235	TIO-540-J2B2	GASEPV	P28A	Aircraft Present in AEDT Database. Non-Standard Substitution Not Required
M6	Maule M-6	1268	Maule MT-7-235	TIO-540-J2B2	GASEPV	P28A	Aircraft Present in AEDT Database. Non-Standard Substitution Not Required
MAUL	Maule M-4	1268	Maule MT-7-235	TIO-540-J2B2	GASEPV	P28A	Aircraft Present in AEDT Database. Non-Standard Substitution Not Required
P3	Lockheed P-3 Orion	1220	Lockheed P-3 Orion	T56-A-15	C130	C130	AEE Approved Substitution
PA11	Piper Cub	6311	Piper J-3 Cub (FAS)	O-200	GASEPF	C172	Proposed Approved
PA12	Piper PA-12 Super Cruiser	6312	Piper PA-18-150 (FAS)	O-320	GASEPF	P28A	Proposed Approved
PA14	Piper Family Cruiser	6312	Piper PA-18-150 (FAS)	O-320	GASEPF	P28A	AEE Approved Substitution

ATAC Proposed and FAA AEE Approved Substitutions							
Aircraft Code	Represented Aircraft	AEDT EQUIP_ID	AEDT Airframe	AEDT Engine	AEDT ANP_ID	AEDT BADA_ID	Notes
PC6T	Pilatus PC-6 Porter	1502	Pilatus PC-6 Porter	PT6A-27	CNA208	TBM8	Aircraft Present in AEDT Database. Non-Standard Substitution Not Required

Table 3: Helicopters Not Present in the AEDT 3e Database

ATAC Proposed and FAA AEE Approved Substitutions							
Helicopter Code	Represented Helicopter	AEDT EQUIP_ID	AEDT Airframe	AEDT Engine	AEDT ANP_ID	AEDT BADA_ID	Notes
AS65	Aerospatiale SA-365N Dauphin (AS-365N)	4121	Eurocopter EC-155B1	T700-GE-401 - 401C	SA365N	P28A	Proposed Approved
B206	BELL 206L-3	4091	Bell 206L-4T Long Ranger	250B17B	B206L	P28A	Proposed Approved
B212	BELL 212	3	Bell UH-1 Iroquois	T400-CP-400	B212	P28A	Proposed Approved
B412	BELL, 412 Griffin	22	Sikorsky S-76 Spirit	T700-GE-700	S76	P28A	Proposed Approved
BK17	EUROCOPTER-KAWASAKI, BK-117	4125	Bell 429	TPE331-1	B429	P28A	Proposed Approved
EC45	AIRBUS HELICOPTERS-KAWASAKI, EC-145	4125	Bell 429	TPE331-1	B429	P28A	Proposed Approved
R66	ROBINSON HELICOPTER CO R66	30	Hughes 500D	250B17B	H500D	P28A	Proposed Approved

Please understand that this approval is limited to this particular Environmental Assessment for the Anchorage Terminal Area Airspace and Procedures Study and for use with AEDT 3e only. Further non-standard AEDT inputs for additional projects at this or any other site will require separate approval.

Sincerely,

David Senzig
Manager (Acting)
AEE-100/Noise Division

cc: ATO Contacts (Joseph Bert, AJV-W250)

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Supplement 2 – AEDT User-Defined Profile Requests and Approvals

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Anchorage Terminal Area Airspace and Procedures Study (ATAAPS)
AEDT User-Defined Profile Submission – User-Defined Profiles
January 12, 2024

Prepared for:



Prepared by:

ATAC Corporation



2770 De La Cruz Boulevard
Santa Clara, CA 94050



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1 Introduction

1.1 Background & Purpose

This submittal contains data and information describing the use and implementation of user-defined profiles in the Federal Aviation Administration (FAA)'s Aviation Environmental Design Tool (AEDT). AEDT is a comprehensive software tool that provides aircraft noise, fuel burn, and emissions information to the FAA and its stakeholders. AEDT facilitates environmental review activities required under the National Environmental Policy Act (NEPA) by consolidating the modeling of these environmental impacts in a single tool. Use of non-default methods or data for environmental analysis of FAA actions generally requires written approval from the FAA's Office of Environment and Energy (AEE). AEDT provides pre-packaged default profiles that are appropriate for most studies. In certain situations, user-defined profiles are required.

The purpose of this submittal is to seek approval of a methodology of creating user-defined helicopter profiles for an Environmental Assessment (EA) for the Anchorage Terminal Area Airspace and Procedures Study (ATAAPS). Note that at the time of this report, there are no proposed helicopter procedure changes involved in this project. The helicopter operations in the model are only included to establish appropriate baseline noise levels in the region where they operate. The request for approval is limited to the methodology for creating helicopter profiles mentioned in this submittal in support of this project. This request seeks approval for a methodology to develop helicopter user-defined profiles for a range of cruising altitudes (1,000 to 9,000 feet above mean sea level) and speeds (102 to 135 knots ground speed) as defined in radar data for various helicopter types that operate in the region.

This submittal follows the guidance that was put forth in the FAA document titled *Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA*.¹ Section 5.3.2 from the AEDT guidance document outlines the additional information to include in the submittal package when requesting the use of user-defined profiles.

This submittal includes a statement of the problem, the proposed solution, an explanation of the methodology, and then follows the outline of additional information to include specified in Section 5.3.2 of the FAA guidance document. This submittal does not include some or all information for the following items because they are not applicable under the conditions of this request:

- #1 Analysis Demonstrating Change: This section is included, but lacks receptors representing noise sensitive areas. Existing receptors should adequately represent noise impacts; however, additional receptors can be considered if appropriate.
- #2 Concurrence on Aircraft Performance
- #4 Graphical and Tabular Comparison, subsection C regarding thrust: There are no thrust calculations for helicopter flight paths and therefore graphs and tables for thrust data is not included in this submittal.

1.2 Problem Statement

In AEDT, helicopter profiles are defined as a set of pre-determined, static procedure steps that compose a flight profile. Helicopter profiles exist for combinations of different helicopter and operation types (e.g., 'SA350D' helicopter type, 'Arrival' operation type).

The existing set of helicopter profiles does not adequately represent the helicopter profiles on the designed helicopter procedures in ATAAPS. In general, existing AEDT helicopter profiles do not reach the typical cruising altitude and distance of helicopter trajectories that operate in the region. When existing profiles are deemed inappropriate for a study, AEE requires users to submit a request to use user-defined

¹ Federal Aviation Administration. *Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA*, Retrieved from https://aedt.faa.gov/2d_information.aspx on May 30, 2018.

profiles. As the existing helicopter profiles are inappropriate, a solution to accurately model these operations is explored.

1.3 Proposed Solution

ATAC proposes to construct profiles for helicopter types, identified in Section 2.1, by adjusting existing departure and arrival profiles (and procedure steps), such that cruise segments are modeled by selected radar data altitudes and speeds. For this study, ATAC utilizes historical radar data to ensure that all targeted cruising altitudes and speeds are realistic for each route.

Section 2.3 details a step-by-step explanation of the proposed solution methodology that solves the problem identified in Section 1.2.

To model helicopter operations, ATAC proposes to use non-default AEDT data in the form of user-defined helicopter procedure steps. All other data (including NPD data) necessary for AEDT to model helicopter performance, emissions, and noise will come from the respective HELO_ID.

1.4 Statement of Benefit

Implementing the proposed solution in Section 1.3 allows for helicopter operations to be modeled to a more satisfactory level, to better measure the noise generated by helicopters operating in the region.

2 Methodology

This section presents the methodology used to create user-defined profiles for helicopter operations supporting ATAAPS, using SA350D as an example aircraft. Section 2.1 provides information regarding analysis of historical radar data to determine the scope of this request. Section 2.2 describes the default profiles and procedure steps for helicopters available in AEDT 3e. Section 2.3 describes how the user-defined profiles are constructed using default profiles and procedure steps.

2.1 Historical Radar Data Analysis

This study requires modeling arrival and departure helicopter operations to or from study airports, which are not necessarily complete end-to-end trajectories. For modeling purposes, departure trajectories begin from a runway or helipad and terminate at the end of cruise. Correspondingly, arrival trajectories begin at the initial cruise and terminate at a runway or helipad. Additionally, this study also requires modeling operations for helicopter types that are not directly available in AEDT 3e. A separate aircraft substitution request will be submitted for these helicopter types.

For each helicopter trajectory found in the historical radar data used for this study, the helicopter type, cruising altitude, and cruising speed are determined. From this information, the set of helicopter types and their corresponding cruising speeds is determined. The cruising speed for each helicopter type is calculated as the 95th percentile of its speeds across all radar trajectories used in the study. **Table 1** presents this information, along with the AEDT ANP Helicopter Type and Equipment ID that will be utilized to model these operations.

Table 1 Helicopter Types and Speeds

Helicopter Type	Helicopter Description	AEDT ANP Helicopter Type	Equipment ID	Speed (knots ground speed)
AS50	Aerospatiale SA-350D Astar (AS-350)	SA350D	3810	126.6
AS65	Eurocopter SA 365/AS365 Dauphin 2	SA365N	4121	129.0
B06	Bell 206	B206L	26	111.2
B206B3	Bell 206B-3	B206B3	4123	109.3
B206L	Bell 206L Long Ranger	B206L	4091	121.0
B212	Bell 212 Huey (UH-1N) (CH-135)	B212	3	120.2
B407	Bell 407	B407	3160	130.2
B412	Bell 412	S76	22	116.7
BK17	MBB/Kawasaki BK 117	B429	4125	126.5
CH47	Boeing CH-47 Chinook	CH47D	6	118.1
EC130	Eurocopter EC-130 w/Arriel 2B1	EC130	3806	130.0
H369D	Hughes 500	H500D	30	129.5
H60	Sikorsky H-60	S70	20	128.5
R22	Robinson R22B w/Lycoming 0320	R22	4105	102.5
R44	Robinson R44 Raven / Lycoming O-540-F1B5	R44	3161	106.5
R66	Robinson R66	H500D	30	126.2
UH60	Sikorsky UH-60 Black Hawk	S70	21	135.1

Source: PDARS Radar Data October 2022 – September 2023

Prepared by: ATAC, December 2023

The maximum altitude along each flight trajectory is obtained and used as the cruising altitude for that respective trajectory.

2.2 Default Profiles and Procedure Steps

Creating user-defined profiles begins with the default helicopter procedure steps contained within AEDT 3e. The SA350D departure and arrival procedure steps is presented here as an example. This data can be found in the [FLT_ANP_HELICOPTER_PROCEDURES] table in the FLEET database. The fields in this table are:

- STEP_NUM – Defines the order of procedure steps
- HELO_ID – Helicopter type
- OP_TYPE – Operation type; 'A' = Arrival, 'D' = Departure
- PROF_ID1 – Primary profile name
- PROF_ID2 – Secondary profile name
- STEP_TYPE – Encoded step definition, see **Appendix A – AEDT Helicopter Procedure Step Definitions**
- DURATION – Duration of step in seconds
- DISTANCE – 2-D distance of step in feet
- ALTITUDE – Elevation of step in feet referenced to the airfield (AFE)
- SPEED – Groundspeed of step in knots

Table 2 contains procedure steps for an SA350D arrival profile. Cells shaded grey indicate values edited when creating user-defined profiles.

Table 2 Default SA350D Arrival Helicopter Procedure Steps

STEP_NUM	HELO_ID	OP_TYPE	PROF_ID1	PROF_ID2	STEP_TYPE	DURATION	DISTANCE	ALTITUDE	SPEED
1	SA350D	A	STANDARD	1	S	0	0	1000	116
2	SA350D	A	STANDARD	1	L	0	87250	0	0
3	SA350D	A	STANDARD	1	B	0	5000	0	63
4	SA350D	A	STANDARD	1	A	0	4800	500	0
5	SA350D	A	STANDARD	1	C	0	2850	15	0
6	SA350D	A	STANDARD	1	Y	3	0	0	0
7	SA350D	A	STANDARD	1	H	30	0	0	0
8	SA350D	A	STANDARD	1	G	30	0	0	0

Source: AEDT Version 3e, FLEET Database Version 3.40.6, FLT_ANP_HELICOPTER_PROCEDURES table
Prepared by: ATAC, December 2023

Table 3 contains procedure steps for an SA350D departure profile. Cells shaded grey indicate values edited when creating user-defined profiles.

Table 3 Default SA350D Departure Helicopter Procedure Steps

STEP_NUM	HELO_ID	OP_TYPE	PROF_ID1	PROF_ID2	STEP_TYPE	DURATION	DISTANCE	ALTITUDE	SPEED
1	SA350D	D	STANDARD	1	G	30	0	0	0
2	SA350D	D	STANDARD	1	H	30	0	0	0
3	SA350D	D	STANDARD	1	V	3	0	15	0
4	SA350D	D	STANDARD	1	E	0	100	0	30
5	SA350D	D	STANDARD	1	F	0	500	30	63
6	SA350D	D	STANDARD	1	D	0	3500	1000	0
7	SA350D	D	STANDARD	1	E	0	2800	0	116
8	SA350D	D	STANDARD	1	L	0	93100	0	0

Source: AEDT Version 3e, FLEET Database Version 3.40.6, FLT_ANP_HELICOPTER_PROCEDURES table
Prepared by: ATAC, December 2023

2.3 User-Defined Profiles and Procedure Steps

This section describes how a user-defined profile (and procedure steps) is created to solve the problem identified in Section 1.2.. The methodology is described using a cruise altitude of 2,000 feet above mean sea level (MSL) and speed of 145 knots; however, ATAC uses appropriate radar trajectory cruising altitudes and speeds for each route. For the purpose of this request, the modeled cruising altitudes for each route are within a range of 1,000 to 9,000 feet MSL. Similarly, the modeled cruising speeds for each route are within a range of 102 to 135 knots ground speed.

2.3.1 Arrival

This section presents the methodology used to create a user-defined arrival SA350D profile in support of this project by creating a new set of procedure steps.

1. Copy existing values from correct [FLT_ANP_HELICOPTER_PROFILES] record, edit value of PROF_ID1 field, and insert new record into table.

2. Copy existing values from correct [FLT_ANP_HELICOPTER_PROCEDURES] records and insert new records into table.
3. Edit values of newly inserted records into [FLT_ANP_HELICOPTER_PROCEDURES] table:
 - a. Identify elevation of operating runway end/helipad
 - b. Calculate cruise altitude, in feet, referenced to operating runway end/helipad elevation to achieve a cruise altitude of 2,000 ft MSL using equation:

$$Elevation_{ARE} = Elevation_{MSL} - Elevation_{RE}$$

where

$Elevation_{ARE}$	elevation in feet above operating runway end/helipad
$Elevation_{MSL}$	elevation in feet above mean sea level
$Elevation_{RE}$	elevation in feet of operating runway end/helipad

Store calculated $Elevation_{ARE}$ value in ALTITUDE field of STEP_NUM '1'. Set SPEED field value to '145' of STEP_NUM '1'.

- c. Calculate DISTANCE value of STEP_NUM '4'. Value is calculated keeping descent rate equal to that of default profile. Descent rate of default step of 0.10416667 vertical feet per horizontal foot $((1000 - 500) / 4800)$ (see **Table 2**).
 - i. Calculate vertical distance to descend by subtracting ALTITUDE value in STEP_NUM '1' by ALTITUDE in STEP_NUM '4'.
 - ii. Solve for DISTANCE in STEP_NUM '4' by dividing calculated vertical distance value by descent rate.
 - iii. Store solved for value in DISTANCE field of STEP_NUM '4'.
- d. Calculate DISTANCE value level cruise step (STEP_TYPE 'L') of STEP_NUM '2'.
 - i. Calculate cumulative flight trajectory distance.
 - ii. Subtract from it the cumulative distance from all subsequent steps.
 - iii. Store solved for value in DISTANCE field of STEP_NUM '2'.

2.3.2 Departure

This section presents the methodology used to create a user-defined departure SA350D profile in support of this project by creating a new set of procedure steps.

1. Copy existing values from correct [FLT_ANP_HELICOPTER_PROFILES] record, edit value of PROF_ID1 field, and insert new record into table.
2. Copy existing values from correct [FLT_ANP_HELICOPTER_PROCEDURES] records and insert new records into table.
3. Edit values of newly inserted records into [FLT_ANP_HELICOPTER_PROCEDURES] table:
 - a. Identify elevation of operating runway end/helipad
 - b. Calculate cruise altitude, in feet, referenced to operating runway end/helipad elevation to achieve a cruise altitude of 2,000 ft MSL using equation:

$$Elevation_{ARE} = Elevation_{MSL} - Elevation_{RE}$$

where

$Elevation_{ARE}$ elevation in feet above operating runway end/helipad

$Elevation_{MSL}$ elevation in feet above mean sea level

$Elevation_{RE}$ elevation in feet of operating runway end/helipad

Store $Elevation_{ARE}$ value in ALTITUDE field of STEP_NUM '6'.

- c. Calculate DISTANCE value of STEP_NUM '6'. Value is calculated keeping ascent rate of this step equal to that of default profile for the given step. Ascent rate of default step is 0.277143 vertical feet per horizontal foot $((1000 - 30) / 3500)$ (see **Table 3**).
 - i. Calculate vertical distance to ascend by subtracting ALTITUDE value in STEP_NUM '6' by ALTITUDE in STEP_NUM '5'
 - ii. Solve for DISTANCE in STEP_NUM '6' by dividing calculated vertical distance value by ascent rate.
 - iii. Store solved for value in DISTANCE field of STEP_NUM '6'.
- d. Set value of SPEED field to '145' for STEP_NUM '7'.
- e. Calculate DISTANCE value level cruise step (STEP_TYPE 'L') of STEP_NUM '8'.
 - i. Calculate cumulative flight trajectory distance.
 - ii. Subtract from it the cumulative distance from all previous steps.
 - iii. Store solved for value in DISTANCE field of STEP_NUM '8'.

3 Analysis Demonstrating Change

As outlined in Section 5.3.2 of the "Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA" document, noise results for user-defined profiles should be reported by placing noise receptors 0.5 nautical miles (NM) apart below the flight path. This section presents an example scenario of implementing the methodology defined in Section 2.3 followed by the noise results comparing the default and user-defined profiles applied to the example scenario. Similar to previous sections, data presented in this section uses a cruise altitude of 2,000 ft MSL and speed of 145 kn; however, ATACA uses the appropriate radar trajectory cruising altitude and speed for each route. For the purpose of this request, the modeled cruising altitudes for each route will be within a range of 1,000 to 9,000 feet MSL. Similarly, the modeled cruising speeds for each route will be within a range of 102 to 135 knots ground speed.

3.1 Example Scenario Definition

To show both a user-defined departure and a user-defined arrival, a flight departing Merrill Field (PAMR) and a flight arriving to Kenai Municipal (PAEN) is created. Each trajectory is assigned an Aerospatiale SA-350D Astar (AS-350) (HELO_ID "SA350D") aircraft type with an operation count of "1.0". Annualizations for all scenarios and cases were set to "1.0".

All data presented from this point forward was generated from these two example trajectories.

3.2 Comparative Noise Results

As a part of this submittal, noise results are reported by placing noise receptors 0.5 NM apart below the flight path beginning from the helipad until 10 NM was reached. Noise results for each of the profiles are presented in tabular and graphical format. It is noted that noise results were not computed with terrain effects.

Table 4 presents the noise levels, using the Sound Exposure Level (SEL) metric measured in decibels (dB), of the arrival default (see **Table 2**) and user-defined (see **Table 6**) profiles. Additionally, the starting weight of the aircraft in pounds (lbs.) is presented.

Table 4 Example Scenario Comparative Arrival Noise Results

AEDT Helicopter Model: SA350D		Profile Weight: 4,300 lbs.	
Receptors	AEDT Default Profile	User-Defined Profile	Difference
(NM)	(SEL dB)	(SEL dB)	(SEL dB)
0	121.8	121.8	0
0.5	92.16	92.16	0
1.0	87.67	87.70	0.03
1.5	85.32	85.86	0.54
2.0	83.41	84.40	0.99
2.5	79.43	83.09	3.66
3.0	78.99	80.96	1.97
3.5	79.02	78.56	-0.46
4.0	79.07	76.06	-3.01
4.5	79.12	75.74	-3.38
5.0	79.17	75.74	-3.43
5.5	79.21	75.76	-3.45
6.0	79.24	75.79	-3.45
6.5	79.27	75.81	-3.46
7.0	79.30	75.84	-3.46
7.5	79.33	75.86	-3.47
8.0	79.35	75.89	-3.46
8.5	79.36	75.91	-3.45
9.0	79.37	75.93	-3.44
9.5	79.38	75.95	-3.43
10.0	79.39	75.97	-3.42

Source: ATAC, January 2024

Prepared by: ATAC, January 2024

It can be observed from **Table 4** that differences in noise levels do exist between arrival default and user-defined profiles.

Table 5 presents the noise levels, using SEL metric measured dB, of the departure default (see **Table 3**) and user-defined (see **Table 7**) profiles. Additionally, the starting weight of the aircraft in pounds is presented.

Table 5 Example Scenario Comparative Departure Noise Results

AEDT Helicopter Model: SA350D		Profile Weight: 4,300 lbs.	
Receptors	AEDT Default Profile	User-Defined Profile	Difference
(NM)	(SEL dB)	(SEL dB)	(SEL dB)
0.0	116	116	0
0.5	84.12	83.95	-0.17
1.0	79.81	79.17	-0.64
1.5	79.04	76.24	-2.80
2.0	78.83	76.03	-2.80
2.5	78.87	75.61	-3.26
3.0	78.93	75.59	-3.34
3.5	78.98	75.61	-3.37
4.0	79.03	75.64	-3.39
4.5	79.07	75.67	-3.40
5.0	79.11	75.70	-3.41
5.5	79.15	75.73	-3.42
6.0	79.19	75.75	-3.44
6.5	79.22	75.78	-3.44
7.0	79.24	75.81	-3.43
7.5	79.26	75.83	-3.43
8.0	79.28	75.85	-3.43
8.5	79.30	75.88	-3.42
9.0	79.31	75.90	-3.41
9.5	79.32	75.92	-3.40
10.0	79.32	75.94	-3.38

Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

It can be observed from **Table 5** that small differences in noise levels do exist between departure default and user-defined profiles.

4 Performance Characteristics

As outlined in Section 5.3.2 of the “Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA” document, aircraft performance characteristics must be correctly translated into the AEDT formatted profile. This section combines the example scenario defined in Section 3.1 with the methodology to create user-defined profiles in Section 2.3 to produce the user-defined profiles and procedure steps for the example scenario. This section contains sub-sections for each operation type, walks through the methodology in Section 2.3 step-by-step, and presents the resulting user-defined profile and procedure steps. Similar to previous sections, data presented in this section uses a cruise altitude of 2,000 ft MSL and speed of 145 kn; however, ATACA will use the appropriate radar trajectory cruising altitude and speed for each route. For the purpose of this request, the modeled cruising altitudes for each route will be within a range of 1,000 to 9,000 feet MSL. Similarly, the modeled cruising speeds for each route will be within a range of 102 to 135 knots ground speed.

4.1 Arrival

This section applies the methodology of creating an arrival user-defined profile (see Section 2.3.1) for the example scenario and presents the resulting procedure steps.

4.1.1 Example

This section walks through creating of a user-defined arrival profile and procedure steps for the example scenario.

1. Copy existing values from [FLT_ANP_HELICOPTER_PROFILES] where HELO_ID = 'SA350D' and OP_TYPE = 'A'. Set PROF_ID1 to unique value based on route and insert record into table.
2. Copy existing values from [FLT_ANP_HELICOPTER_PROCEDURES] where HELO_ID = 'SA350D' and OP_TYPE = 'A'. For all records, set PROF_ID1 equal to unique value and insert into table.
3. Edit values in [FLT_ANP_HELICOPTER_PROCEDURES] table:
 - a. Elevation of 'H1' helipad at PAEN = 99.6 (100)
 - b. Cruise Elevation = 1900 (1900 = 2000 – 100)
Store '1900' in ALTITUDE field of STEP_NUM '1'. Set SPEED field value to '145' of STEP_NUM '1'.
 - c. DISTANCE value of STEP_NUM '4' = '13440'
 - i. Vertical distance to descend = 1400 (1400 = 1900 – 500)
 - ii. Distance = 13440 (13440 = 1400 / 0.10416667)
 - iii. Store '13440' in DISTANCE field of STEP_NUM '4'.
 - d. DISTANCE value level cruise step (STEP_TYPE 'L') of STEP_NUM '2' = '149712.69'
 - i. Cumulative flight trajectory distance (ft) = 171002.69
 - ii. Cumulative distance of all subsequent steps = 21290 (21290 = 5000 + 13,440 + 2,850). Subtract it from 171002.69 = 149712.69 (149712.69 = 171002.69 – 21290)
 - iii. Store '149712.69' in DISTANCE field of STEP_NUM '2'.

4.1.2 Result

Table 6 contains the result of applying the methodology from Section 2.3.1 on the example scenario in AEDT format. Additionally, values for the PROF_ID1 field are edited to provide a unique name. The origin airport/heliport code and destination airport/heliport code are concatenated with an underscore to populate these fields. Cells shaded grey indicate values edited when creating user-defined profiles and procedure steps.

Table 6 User-Defined SA350D Arrival Helicopter Procedure Steps

STEP_NUM	HELO_ID	OP_TYPE	PROF_ID1	PROF_ID2	STEP_TYPE	DURATION	DISTANCE	ALTITUDE	SPEED
1	SA350D	A	UDP_A_PAEN	1	S	0	0	1900	145
2	SA350D	A	UDP_A_PAEN	1	L	0	149712.68	0	0
3	SA350D	A	UDP_A_PAEN	1	B	0	5000	0	63
4	SA350D	A	UDP_A_PAEN	1	A	0	13440	500	0
5	SA350D	A	UDP_A_PAEN	1	C	0	2850	15	0
6	SA350D	A	UDP_A_PAEN	1	Y	3	0	0	0
7	SA350D	A	UDP_A_PAEN	1	H	30	0	0	0
8	SA350D	A	UDP_A_PAEN	1	G	30	0	0	0

Source: ATAC, January 2024

Prepared by: ATAC, January 2024

4.2 Departure

This section applies the methodology of creating a departure user-defined profile (see Section 2.3.2) for the example scenario and presents the resulting procedure steps.

4.2.1 Example

This section walks through creating of a user-defined departure profile and procedure steps for the example scenario.

1. Copy existing values from [FLT_ANP_HELICOPTER_PROFILES] where HELO_ID = 'SA350D' and OP_TYPE = 'D'. Set PROF_ID1 to unique value based on route and insert record into table.
2. Copy existing values from [FLT_ANP_HELICOPTER_PROCEDURES] where HELO_ID = 'SA350D' and OP_TYPE = 'D'. For all records, set PROF_ID1 equal to unique value and insert into table.
3. Edit values in [FLT_ANP_HELICOPTER_PROCEDURES] table:
 - a. Elevation of 'H1' helipad at PAMR = 137
 - b. Cruise Elevation = 1863 (1863 = 2000 – 137)
Store '1863' in ALTITUDE field of STEP_NUM '6'
 - c. DISTANCE value of STEP_NUM '6' = '6613.92'
 - i. Vertical distance to ascend = 1833 (1833 = 1863 – 30)
 - ii. Distance = 6,613.92 (6,613.92 = 1833 / 0.277143)
 - iii. Store '6,613.92' in DISTANCE field of STEP_NUM '6'
 - d. Set SPEED field value to '145' of STEP_NUM '7'.
 - e. DISTANCE value level cruise step (STEP_TYPE 'L') of STEP_NUM '8' = '160540.29'
 - i. Cumulative flight trajectory distance (ft) = 170554.21
 - ii. Cumulative distance of all previous steps = 10013.92 (10013.92 = 2800 + 6,613.92 + 500 + 100). Subtract it from 170554.21 = 160540.29 (160540.29 = 170554.21 – 10013.92)
 - iii. Store '160540.29' in DISTANCE field of STEP_NUM '8'.

4.2.2 Result

Table 7 contains the result of applying the methodology from Section 2.3.2 on the example scenario in AEDT format. The origin airport/heliport code and destination airport/heliport code are concatenated with an underscore to populate these fields. Cells shaded grey indicate values edited when creating user-defined profiles and procedure steps.

Table 7 User-Defined SA350D Departure Helicopter Procedure Steps

STEP_NUM	HELO_ID	OP_TYPE	PROF_ID1	PROF_ID2	STEP_TYPE	DURATION	DISTANCE	ALTITUDE	SPEED
1	SA350D	D	UDP D PAMR	1	G	30	0	0	0
2	SA350D	D	UDP D PAMR	1	H	30	0	0	0
3	SA350D	D	UDP D PAMR	1	V	3	0	15	0
4	SA350D	D	UDP D PAMR	1	E	0	100	0	30
5	SA350D	D	UDP D PAMR	1	F	0	500	30	63
6	SA350D	D	UDP D PAMR	1	D	0	6613.92	1863	0
7	SA350D	D	UDP D PAMR	1	E	0	2800	0	145
8	SA350D	D	UDP D PAMR	1	L	0	160540.29	0	0

Source: ATAC, January 2024

Prepared by: ATAC, January 2024

5 Graphical and Tabular Comparison

Section 5.3.2 of the “Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA” document also states that graphics and tables depicting each proposed change in profile are to be provided to display the effect on aircraft performance in altitude vs. distance and speed vs. distance.

This section provides charts and tables based on the example scenario (see Section 3.1). As the user-defined profile is longer than the default profile, plots are displayed with data truncated or linearly interpolated to the shorter value such that equitable comparisons are made. Complete data is presented in tables for transparency.

Additionally, this section includes a quantitative comparison comparing user-defined and default profiles. Similar to previous sections, data presented in this section uses a cruise altitude of 2,000 ft MSL and speed of 145 kn; however, ATAC uses the appropriate radar trajectory cruising altitude and speed for each route. For the purpose of this request, the modeled cruising altitudes for each route will be within a range of 1,000 to 9,000 feet MSL. Similarly, the modeled cruising speeds for each route will be within a range of 102 to 135 knots ground speed.

5.1 Altitude vs. Distance

This section contains tables and graphs of track distance from the helipad (NM) and altitude (MSL ft) of the default and user-defined profiles for each operation type.

5.1.1 Arrival

Table 8 and **Table 9** contain distance and altitude values of default and user-defined arrival profiles from the example scenario for the arrival operation type, respectively.

Table 8 Default SA350D Arrival Profile – Altitude vs. Track Distance Comparison

Track Distance from Helipad (NM)	Altitude MSL (ft)
0	100.0
0	100.0
0	100.0
0	115.0
0	145.3
0.1	236.3
0.3	387.8
0.5	600.0
1.3	1100.0
1.5	1100.0
1.8	1100.0
2.1	1100.0
16.4	1100.0

Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

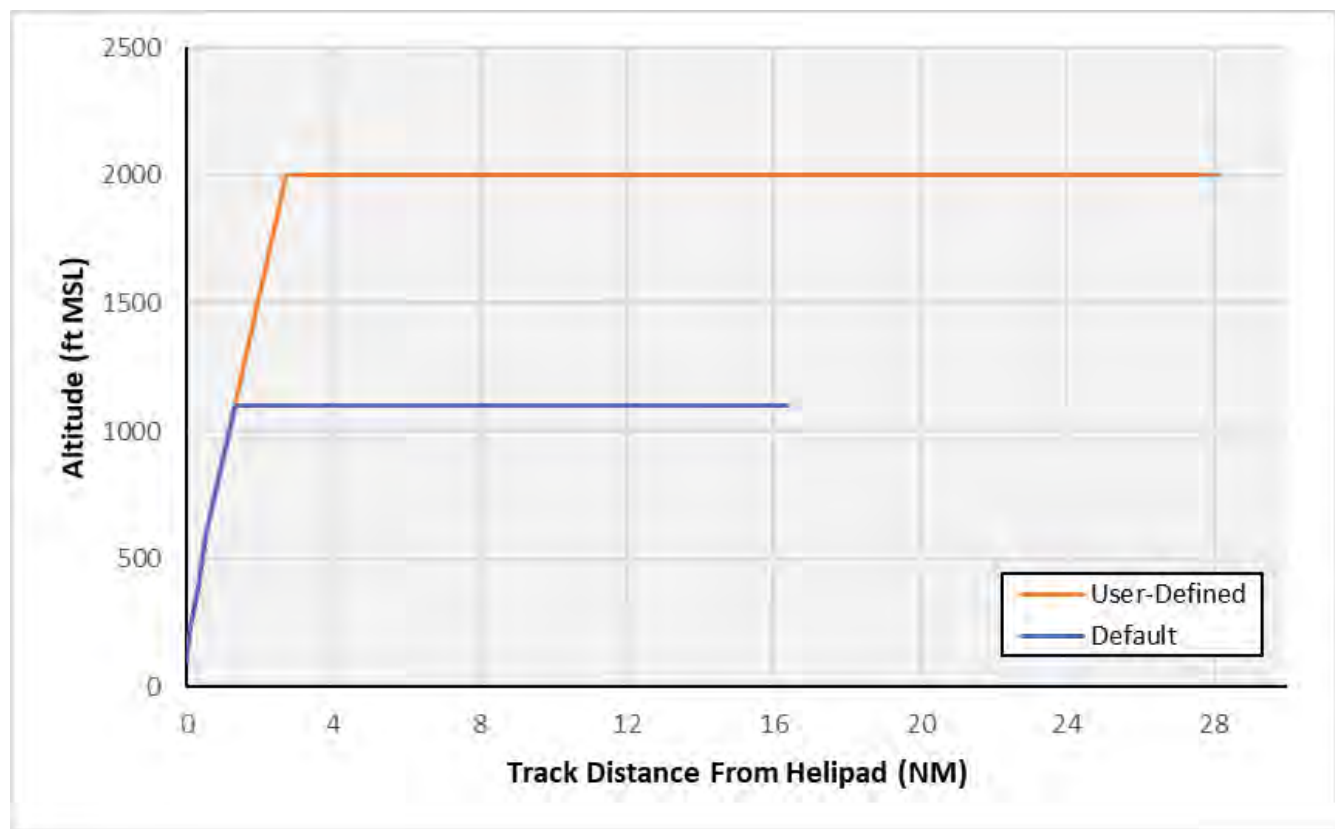
Table 9 User-Defined SA350D Arrival Profile – Altitude vs. Track Distance Comparison

Track Distance from Helipad (NM)	Altitude MSL (ft)
0	100.0
0	100.0
0	100.0
0	115.0
0	145.3
0.1	236.3
0.3	387.8
0.5	600.0
2.7	2000.0
2.8	2000.0
2.9	2000.0
3.1	2000.0
3.3	2000.0
3.5	2000.0
28.1	2000.0

Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

The data from **Table 8** and **Table 9** is plotted in **Figure 1**. The default altitude profile is represented by the blue line. The user-defined altitude profile is represented by the orange line. Note that the default profile extends only to 16.4 NM, which is short of the desired distance.

Figure 1 SA350D Arrival Profile – Altitude vs. Track Distance Comparison



Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

It is noted from the figure that the default profile’s cruise altitude is equal to 1,000 feet above the helipad altitude (100 ft), which is the default behavior of helicopter profiles in AEDT. Note that the user-defined cruise altitude has been adjusted such that the cruise occurs at 2,000 ft MSL. Additionally, note that the rates of descent of the two profiles match.

5.1.2 Departure

Table 10 and **Table 11** contain the distance and altitude values of the default and user-defined departure profiles from the example scenario for the departure operation type, respectively.

Table 10 Default SA350D Departure Profile – Altitude vs. Track Distance Comparison

Track Distance from Helipad (NM)	Altitude MSL (ft)
0.0	137.0
0.0	137.0
0.0	137.0
0.0	152.0
0.0	152.0
0.0	152.0
0.0	152.0
0.1	158.2
0.1	167.0

Track Distance from Helipad (NM)	Altitude MSL (ft)
0.7	1137.0
0.8	1137.0
1.0	1137.0
1.1	1137.0
16.5	1137.0

Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

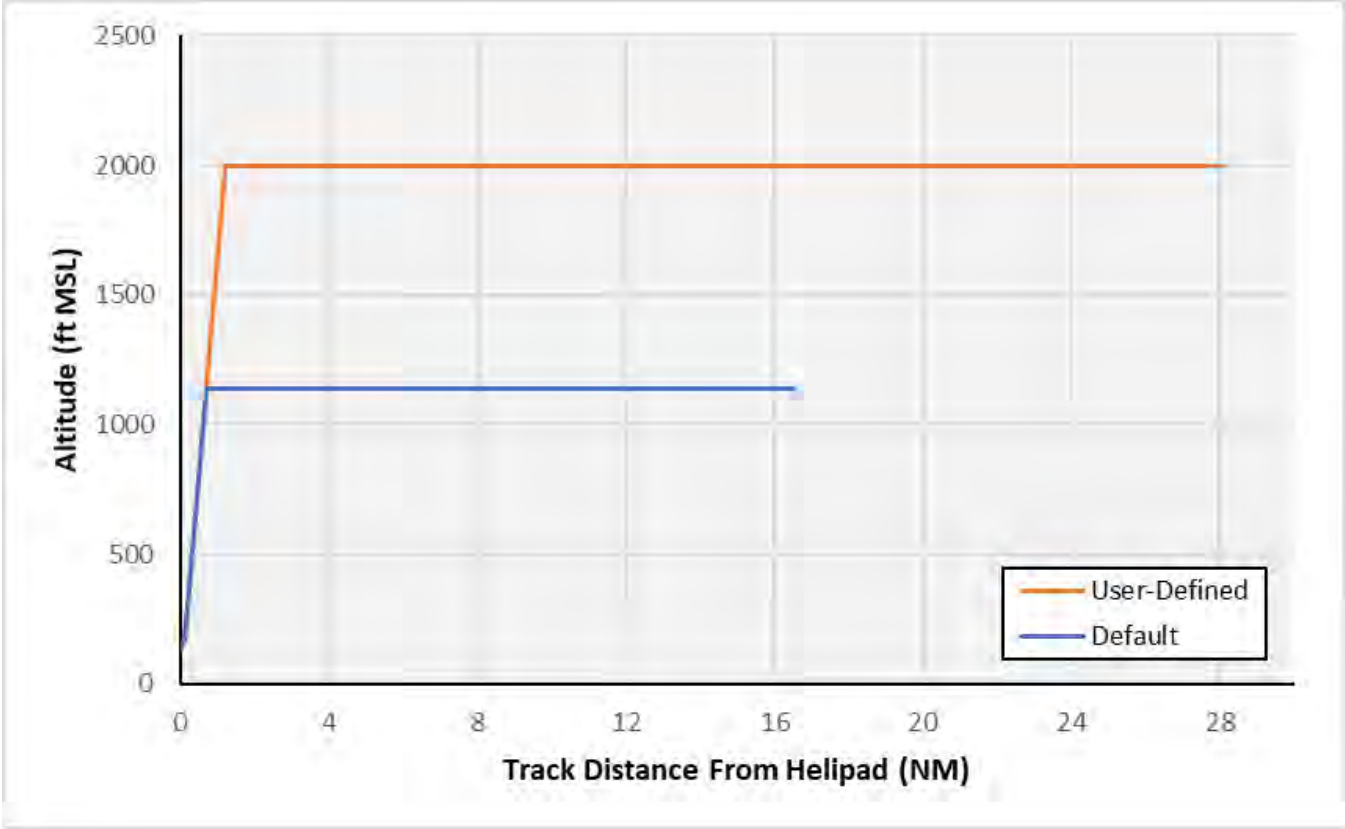
Table 11 User-Defined SA350D Departure Profile – Altitude vs. Track Distance Comparison

Track Distance from Helipad (NM)	Altitude MSL (ft)
0.0	137.0
0.0	137.0
0.0	137.0
0.0	152.0
0.0	152.0
0.0	152.0
0.0	152.0
0.1	158.2
0.1	167.0
1.2	2000.0
1.2	2000.0
1.3	2000.0
1.4	2000.0
1.5	2000.0
1.6	2000.0
28.1	2000.0
28.1	2000.0

Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

The data from **Table 10** and **Table 11** is plotted in **Figure 2**. The default altitude profile is represented by the blue line. The user-defined altitude profile is represented by the orange line. Note that the default profile extends only to 16.5 NM, which is short of the desired distance.

Figure 2 SA350D Departure Profile – Altitude vs. Track Distance Comparison



Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

It is noted from the figure that the default profile's cruise altitude is equal to 1,000 feet above the helipad altitude (137 ft), which is the default behavior of helicopter profiles in AEDT. Note that the user-defined cruise altitude has been adjusted such that the cruise occurs at 2,000 ft MSL. Additionally, note that the rate of ascent of the two profiles matches.

5.2 Speed vs. Distance

This section contains tables and graphs of track distance from the helipad (NM) and speed (groundspeed in knots) of the default and user-defined profiles for each operation type.

5.2.1 Arrival

Table 12 and **Table 13** contain the distance and speed values of the default and user-defined arrival profiles from the example scenario for the arrival operation type, respectively.

Table 12 Default SA350D Arrival Profile – Speed vs. Track Distance Comparison

Track Distance from Helipad (NM)	Groundspeed (kts)
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	15.8
0.1	31.5
0.3	47.3
0.5	63.0
1.3	63.0
1.5	80.7
1.7	98.3
2.1	116.0
16.4	116.0

Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

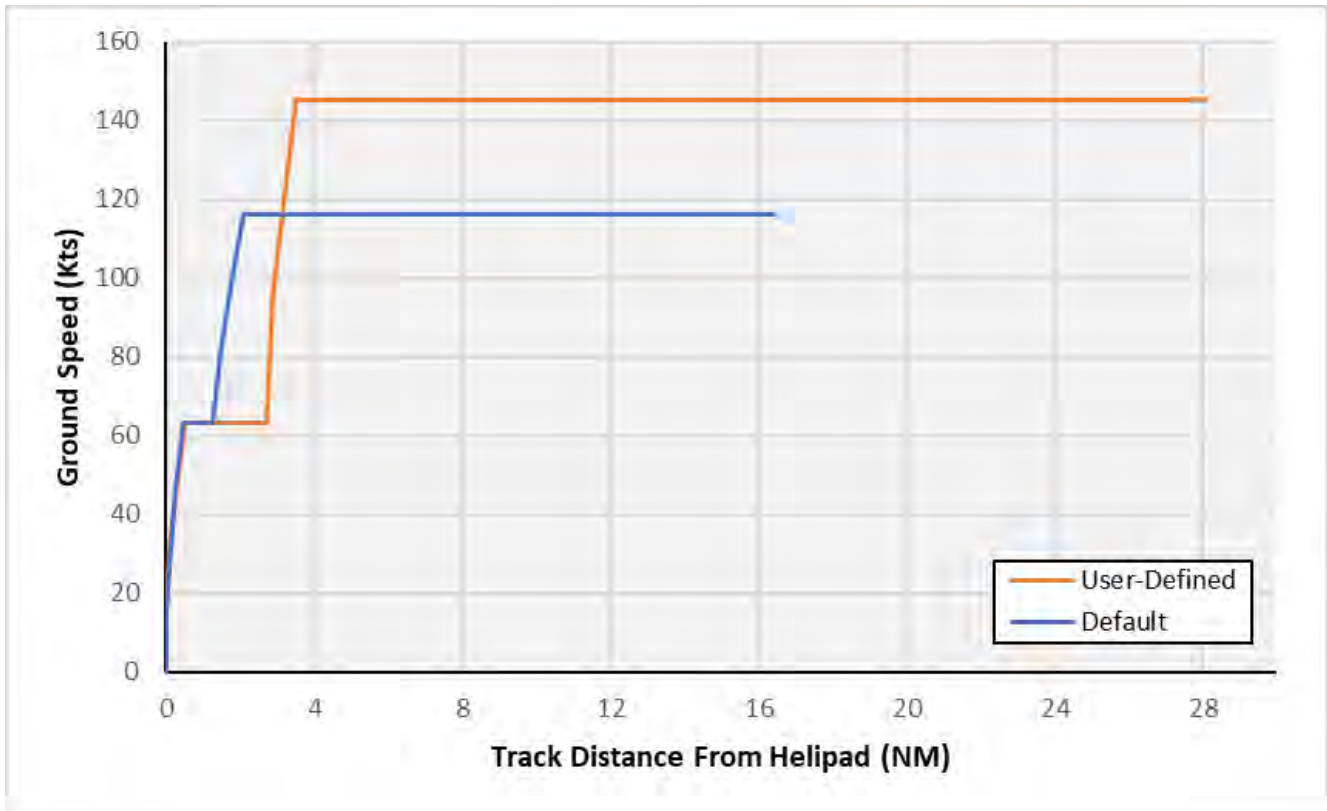
Table 13 User-Defined SA350D Arrival Profile – Speed vs. Track Distance Comparison

Track Distance from Helipad (NM)	Groundspeed (kts)
0	0.0
0	0.0
0	0.0
0	0.0
0	15.8
0.1	31.5
0.3	47.3
0.5	63.0
2.7	63.0
2.8	79.4
2.9	95.8
3.1	112.2
3.3	128.6
3.5	145.0
28.1	145.0

Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

The data from **Table 12** and **Table 13** is plotted in **Figure 3**. The default speed profile is represented by the blue line. The user-defined speed profile is represented by the orange line.

Figure 3 SA350D Arrival Profile – Speed vs. Track Distance Comparison



Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

It is noted from the figure that the default profile's cruise speed is slower than the user-defined profile's cruise speed. Additionally, note the difference in speed values during descent. This may exist as a byproduct of matching the altitude profiles during descent.

5.2.2 Departure

Table 14 and **Table 15** contain the distance and speed values of the default and user-defined departure profiles from the example scenario for the departure operation type, respectively.

Table 14 Default SA350D Departure Profile – Speed vs. Track Distance Comparison

Track Distance from Helipad (NM)	Groundspeed (kts)
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	15.0
0.0	30.0
0.1	46.5
0.1	63.0
0.7	63.0

Track Distance from Helipad (NM)	Groundspeed (kts)
0.8	80.7
0.9	98.3
1.1	116.0
16.5	116.0

Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

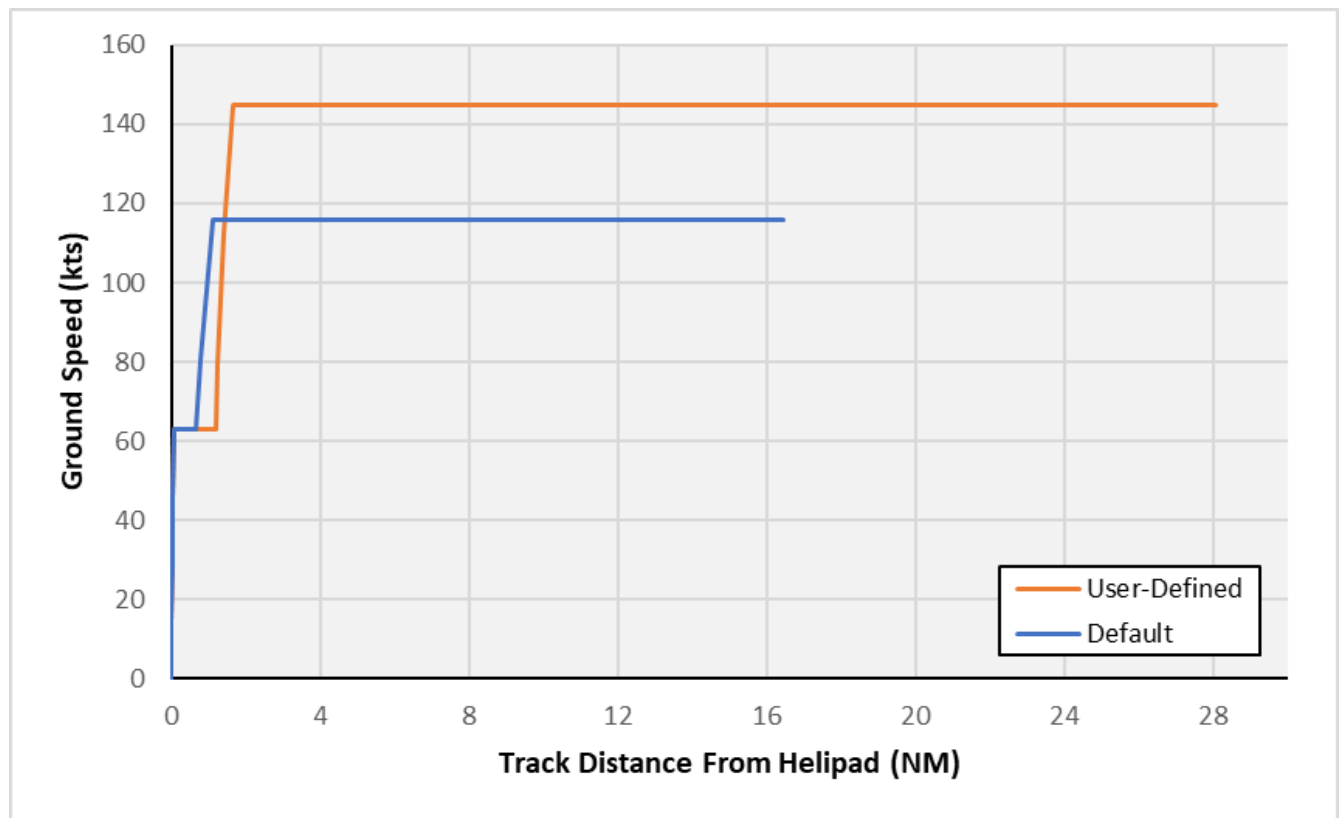
Table 15 User-Defined SA350D Departure Profile – Speed vs. Track Distance Comparison

Track Distance from Helipad (NM)	Groundspeed (kts)
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	15.0
0.0	30.0
0.1	46.5
0.1	63.0
1.2	63.0
1.2	79.4
1.3	95.8
1.4	112.2
1.5	128.6
1.6	145.0
28.1	145.0
28.1	145.0

Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

The data from **Table 14** and **Table 15** is plotted in **Figure 4**. The default speed profile is represented by the blue line. The user-defined speed profile is represented by the orange line.

Figure 4 SA350D Departure Profile – Speed vs. Track Distance Comparison



Source: ATAC, January 2024
 Prepared by: ATAC, January 2024

It is noted from the figure that the default profile's cruise speed is slower than the user-defined profile's cruise speed. Additionally, note the difference in speed values during ascent. This may exist as a byproduct of matching the altitude profiles during ascent.

5.3 Quantitative Comparison

The objective of this analysis is to demonstrate the magnitude of differences between default and user-defined profiles with respect to aircraft performance. This section describes the methodology and results of making quantitative comparisons between profiles. Similar to previous sections, data presented in this section uses a cruise altitude of 2,000 ft MSL and speed of 145 kn; however, ATAC will use the appropriate radar trajectory cruising altitude and speed for each route. For the purpose of this request, the modeled cruising altitudes for each route will be within a range of 1,000 to 9,000 feet MSL. Similarly, the modeled cruising speeds for each route will be within a range of 102 to 135 knots ground speed.

5.3.1 Methodology

A commonly used measure of the differences between values is the root-mean-square error (RMSE). RMSE is computed by calculating the square root of the average of squared errors. In this application, the error is the difference between the default value and the user-defined value for altitude and speed. These differences were calculated every 0.01 NM along the track. RMSE is defined by the following formula where $\hat{y}$ is equal to user-defined value and y is the default value:

$$RMSE = \sqrt{\frac{\sum(\hat{y} - y)^2}{n}}$$

A RMSE value of 0 indicates that the default and user-defined values are identical. In general, lower RMSE values indicate the default and user-defined values are similar and higher RMSE values indicate less similarity. It should be noted that comparisons across parameters are invalid because RMSE is dependent on the scale of numbers used. In other words, the RMSE value for altitude cannot be compared to the RMSE value for speed.

5.3.2 Results

This section quantitatively compares the results of the default and user-defined profiles for altitude and speed using the methodology presented in Section 5.3.1 and presents the RMSE values calculated for each aircraft performance parameter.

Table 16 RMSE Summary Table

Operation Type	RMSE Values	
	Altitude	Speed
Arrival	837.4	29.1
Departure	836.0	28.5

Source: ATAC, January 2024
Prepared by: ATAC, January 2024

The RMSE values from **Table 16** for altitude indicate that neither the arrival nor departure user-defined profiles are identical to the default altitude profile. Both RMSE altitude values can be largely explained by the different cruising altitudes specified by the profile. It is noted that the difference in operating helipad elevation (Arrival: 100 ft, Departure: 137 ft, see Section 4) contributes to the differences in these error values.

The RMSE values from **Table 16** for speed indicate that neither the arrival nor departure user-defined profiles are identical to the default speed profile. The arrival and departure user-defined speed profiles have a similar magnitude of error from their respective default profiles.

6 Conclusion

ATAC is seeking approval of the presented methodology of creating user-defined helicopter profiles to model environmental consequences of proposed helicopter routes supporting ATAAPS. The proposed solution relies on AEDT-default data as a starting point and edits targeted profile values to accurately model proposed operations on helicopter routes. This is a viable method that stays within reasonable levels of effort with respect to project timeline to model operations while maintaining high levels of modeling fidelity.

Appendix A – AEDT Helicopter Procedure Step Definitions

Step Type	Description	State	Parameters
A	Approach at constant KTAS	Move	Dist Alt
D	Depart at constant KTAS	Move	Dist Alt
L	Level flyover at constant KTAS	Move	Dist
G	Ground idle	Static	Dur
H	Flight idle	Static	Dur
I	Hover in ground effect	Static	Dur
J	Hover out of ground effect	Static	Dur
V	Vertical ascent in ground effect	Static	Dur Alt
W	Vertical ascent out of ground effect	Static	Dur Alt
Y	Vertical descent in ground effect	Static	Dur Alt
Z	Vertical descent out of ground effect	Static	Dur Alt
B	Approach with horizontal deceleration	Move	Dist Spd
C	Approach with descending deceleration	Move	Dist Alt Spd
E	Depart with horizontal acceleration	Move	Dist Spd
F	Depart with climbing acceleration	Move	Dist Alt Spd
X	Taxi at constant speed	Move	Spd
S	Start altitude (feet AFE) at constant KTAS	--	Alt Spd

Source: U.S. Department of Transportation, Federal Aviation Administration, *Aviation Environmental Design Tool (AEDT) Version 3e User Manual*; Appendix M.2.2 Helicopter Procedure Step Types (Pp. 452), March 2021

Prepared by: ATAC, November 2023



U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of Environment and Energy

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

1/26/2024

Lonnie Covalt
Lead Environmental Protection Specialist
Air Traffic Operations, Western Service Center
Federal Aviation Administration
2200 S. 216th St.
Des Moines, WA 98198

Dear Lonnie Covalt,

The Office of Environment and Energy (AEE) has received the revised memo from ATAC dated January 12, 2024, referencing the Anchorage Terminal Area Airspace and Procedures Study (ATAAPS) Environmental Assessment (EA). The memo requests approval for a methodology to develop non-standard user-defined helicopter arrival and departure profiles in AEDT 3e for the following helicopter types as detailed in the table below:

Table 1. Helicopter Types Requested for use with Non-Standard User-Defined Arrival and Departure Profiles

Helicopter Type	Represented Helicopter	AEDT EQUIP_ID	AEDT Airframe	AEDT Engine	AEDT ANP_ID	AEDT BADA_ID
AS50	Aerospatiale SA-350D Astar (AS-350)	3810	Aerospatiale SA-350D Astar (AS-350)	TPE331-3	SA350D	P28A
AS65	Eurocopter SA 365/AS365 Dauphin 2	4121	Eurocopter EC-155B1	T700-GE-401 - 401C	SA365N	P28A
B06	Bell 206	26	Bell 206 JetRanger	250B17B	B206L	P28A
B206B3	Bell 206B-3	4123	Bell 206B-3	250B17B	B206B3	P28A
B206	Bell 206L Long Ranger	4091	Bell 206L-4T Long Ranger	250B17B	B206L	P28A
B212	Bell 212 Huey (UH-1N) (CH-135)	3	Bell UH-1 Iroquois	T400-CP-400	B212	P28A
B407	Bell 407	3160	Bell 407 / Rolls-Royce 250-C47B	250B17B	B407	P28A
B412	Bell 412	22	Sikorsky S-76 Spirit	T700-GE-700	S76	P28A
BK17	MBB/Kawasaki BK 117	4125	Bell 429	TPE331-1	B429	P28A
CH47	Boeing CH-47 Chinook	6	Boeing CH-46 Sea Knight	T58-GE-16	CH47D	P28A
EC130	Eurocopter EC-130 w/Arriel 2B1	3806	Eurocopter EC-130	TPE331-3	EC130	P28A

Helicopter Type	Represented Helicopter	AEDT EQUIP_ID	AEDT Airframe	AEDT Engine	AEDT ANP_ID	AEDT BADA_ID
H369D	Hughes 500	30	Hughes 500D	250B17B	H500D	P28A
H60	Sikorsky H-60	20	Sikorsky SH-60 Sea Hawk	T700-GE-401 - 401C	S70	P28A
R22	Robinson R22B w/Lycoming 0320	4105	Robinson R22 Mariner	IO-320-D1AD	R22	P28A
R44	Robinson R44 Raven / Lycoming O-540-F1B5	3161	Robinson R44 Raven / Lycoming O-540-F1B5	TIO-540-J2B2	R44	P28A
R66	Robinson R66	30	Hughes 500D	250B17B	H500D	P28A
UH60	Sikorsky UH-60 Black Hawk	21	Sikorsky UH-60 Black Hawk	T700-GE-700	S70	P28A

The standard helicopter arrival and departure profiles in AEDT 3e for these helicopter types do not reach the typical range of cruising altitudes of 1,000-9,000 feet above Mean Sea Level (MSL), distances, or cruise speeds of 102-135 knots needed to represent profiles on the designed helicopter procedures being considered as part of the ATAAPS EA. Therefore, ATAC is seeking approval for adjustment of these standard helicopter profiles to accurately reflect the typical range of cruising altitudes, distances, and speeds utilizing non-standard user-defined profiles.

The proposed revised methodology for developing non-standard user-defined helicopter profiles in AEDT 3e appears to be adequate for this analysis; therefore, AEE approves use of the methodology proposed for this project. Please understand that this approval is limited to this particular Environmental Assessment for the Anchorage Terminal Area Airspace and Procedures Study and for the helicopter types identified in Table 1 for use with AEDT 3e only. Further non-standard AEDT inputs or methodologies for additional projects at this or any other site will require separate approval.

Sincerely,

David Senzig
Manager (Acting)
AEE-100/Noise Division

cc: ATO Contacts (Joseph Bert, AJV-W250)

**Anchorage Terminal Area Airspace and Procedures Study (ATAAPS)
AEDT User-defined Profile Submission – MD11GE**

February 21, 2025

Prepared for:



Prepared by:

ATAC Corporation



2770 De La Cruz Boulevard
Santa Clara, CA 94050

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1 Introduction

1.1 Background

This submittal contains data and information describing the use and implementation of user-defined procedure profiles in the Federal Aviation Administration's (FAA's) Aviation Environmental Design Tool (AEDT). AEDT is a comprehensive software tool that provides aircraft noise, fuel burn, and emissions information to FAA and its stakeholders. AEDT facilitates environmental review activities required under the National Environmental Policy Act (NEPA) by consolidating the modeling of these environmental impacts in a single tool.

1.2 Purpose

Use of non-default methods or data for environmental analysis of FAA actions generally requires written approval from the FAA's Office of Environment and Energy (AEE). AEDT provides pre-packaged default profiles that are appropriate for most studies. In certain situations, user-defined profiles are created. The purpose of this submittal is to obtain permission from AEE to use a user-defined approach profile for the MD11GE arrivals in the Anchorage Terminal Area Airspace and Procedures Study (ATAAPS).

This submittal follows the guidance put forth in the FAA document titled, "Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA"¹. Section 5.3.2, "User-defined Profiles", from the FAA document outlines additional information to include in the submittal package when requesting the use of user-defined profiles. The reason for this request is to acquire permission to utilize user-defined approach procedure steps rather than the default profile points for MD11GE arrivals that is currently implemented in AEDT 3e. Procedure steps instruct how to flight profiles are modeled within AEDT. Because procedure steps are a set of instructions, the modeled flight profile can vary depending on a given trajectory. In contrast, profile points are a set of pre-determined, static points that make up a flight profile. For airspace noise analyses, procedure step profiles are preferred due to their dynamic nature and utilization of altitude control code functionality – modeling aircraft trajectory and performance to a higher fidelity compared to profile point profiles. It is proposed that using user-defined procedure steps is preferable over the use of an aircraft substitution for the MD11GE. This submittal does not include information for the following items that are found in Section 5.3.2 because they are not applicable under the conditions of this request:

- #1 Analysis Demonstrating Change: While the noise receptors spaced at 0.5 nautical miles under the flight path are evaluated, the receptors for Noise Sensitive Areas are not. The Day/Night Noise Level (DNL) exposure levels where the requested profile segment will most likely be applied are primarily levels below DNL 65.
- #2 Concurrence of Aircraft Performance: The request is not related to developing a custom performance climb or descent profile for specific aircraft types.
- #3 Performance Characteristics: The request is not related to developing a custom performance climb or descent profile for specific aircraft types.

¹ Federal Aviation Administration. *Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA*, Retrieved from https://aedt.faa.gov/2d_information.aspx on May 30, 2018.

1.3 Problem Statement

In AEDT 3e, the MD11GE only has profile points available for approaches. Due to the high amount of varying flight trajectories in airspace noise studies, it is not desirable to represent all MD11GE arrival flight trajectories using a single, static fixed-point profile.

Although the DC1030 presents a viable substitution, its noise levels at altitude appear to be less than the MD11GE.

1.4 Proposed Solution

The proposed solution is to copy the approach procedure steps from a DC1030 and apply it for the MD11GE approach profile, thus creating a non-standard aircraft model. The non-standard aircraft model would use the approach procedure steps of the DC1030, while maintaining the use of the Noise-Power-Distance (NPD) curve and other attributes (equipment, engine type, etc.) of the MD11GE. NPD data in AEDT is a set of noise levels expressed as a function of engine power (usually the corrected net thrust per engine), and distance.

1.5 Statement of Benefit

Implementing the proposed solution in Section 1.4 allows for the retention of the MD11GE noise characteristics while leveraging the similar DC1030 approach profile, which also allows the ability to vary altitude trajectories within the ATAAPS.

2 Methodology

This section presents the methodology used to compare the default MD11GE profile points against the MD11GE user-defined procedure step profile. Section 2.1 presents the AEDT modeling methodology, and Section 2.2 presents how performance results were compared.

2.1 Modeling

The resulting altitude, speed, and thrust profiles were compared for a sample MD11GE arrival flight using profile points (default) and user-defined procedure steps described in Section 1.4. Sound Exposure Level (SEL) noise values every half nautical mile along the flight trajectory were also compared between the two versions of the MD11GE.

A straight vector track trajectory landing at Ted Stevens Anchorage International Airport (PANC) on Runway 25L was used for the comparison. The operation count was set to '1' for both flights. All annualization factors were set to a value of '1'.

AEDT's option to utilize terrain data when calculating noise values was enabled using data from the United States Geological Survey (USGS). Data from the USGS's digital elevation model in 2 arc second resolution was downloaded, input, and used during runtime affecting the noise values for both the user-defined and default profiles.

2.2 Analysis of Aircraft Performance Comparison

The objective of this analysis is to demonstrate the magnitude of differences between default and user-defined profiles with respect to aircraft performance. A commonly used measure of the differences between values is the root-mean-square error (RMSE). RMSE is computed by calculating the square root of the average of squared errors. In this application, the error is the difference between the default value and the user-defined value for each of the three aircraft performance parameters (altitude, speed, and thrust). These differences were calculated every 1

Nautical Mile (NM). along the track until the end of the shorter track is reached, which is approximately 20 NM (see Section 5). RMSE is defined by the following formula where $\hat{y}$ is equal to user-defined value and y is the default value.

$$RMSE = \sqrt{\frac{\sum(\hat{y} - y)^2}{n}}$$

A RMSE value of 0 indicates that the default and user-defined values are identical. In general, lower RMSE values indicate the default and user-defined values are similar and higher RMSE values indicate less similarity. It should be noted that comparisons across data types are invalid because RMSE is dependent on the scale of numbers used. In other words, the RMSE for altitude cannot be compared to the RMSE for speed.

3 ATAAPS

Table 3-1 summarizes the amount of MD11GE arrival operations in the ATAAPS for all five scenarios.

Table 3-1 MD11GE Scaled Arrival Operations per Scenario

Scenario	Year	MD11GE Arrivals Operation Count	MD11GE Arrivals AAD Operation Count	Scenario Operation Count	MD11GE Arrivals Operation %
Existing Conditions	2022-2023	2,263.18	6.200	208,015.00	1.09%
No Action	2027	1,527.87	4.190	231,211.64	0.66%
	2032	1,673.44	4.585	250,640.78	0.67%
Proposed Action	2027	1,527.87	4.190	231,211.64	0.66%
	2032	1,673.44	4.585	250,640.78	0.67%

Source: ATAC, February 2025
Prepared by: ATAC, February 2025

Table 3-2 summarizes the amount of MD11GE arrival tracks in the ATAAP Project for all five scenarios.

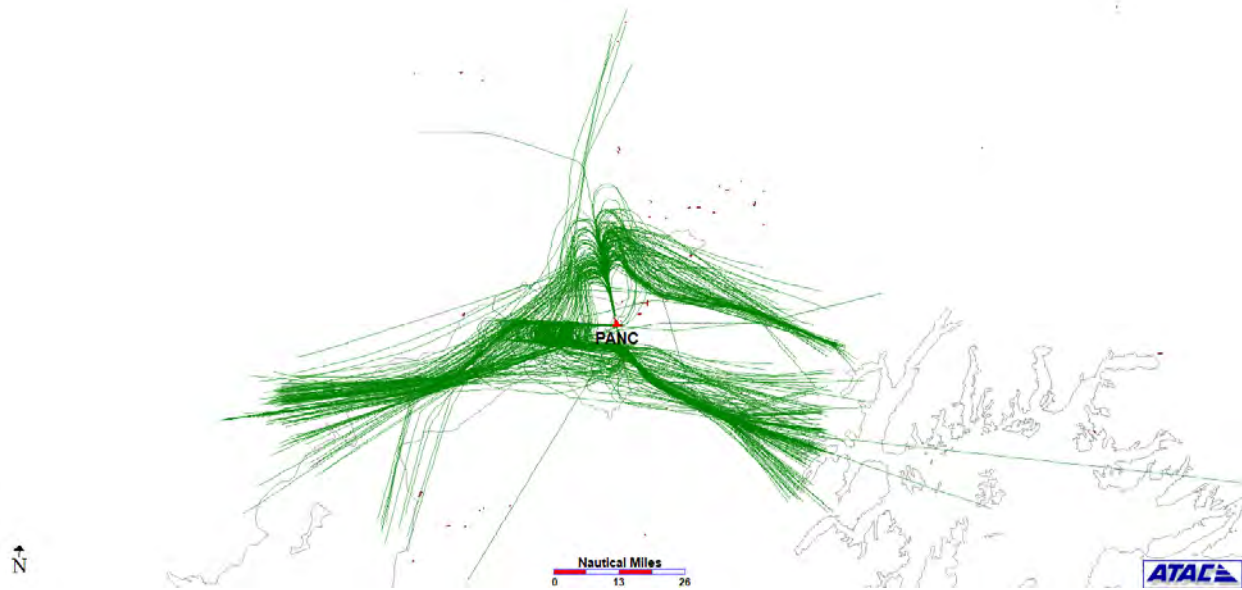
Table 3-2 MD11GE Arrival Tracks per Scenario

Scenario	Year	MD11GE Arrivals Track Count	Scenario Track Count	MD11GE Arrivals Track %
Existing Conditions	2022-2023	611	45,096	1.35%
No Action	2027	738	53,783	1.37%
	2032	743	53,527	1.39%
Proposed Action	2027	2,133	89,800	2.38%
	2032	2,150	89,305	2.41%

Source: ATAC, February 2025
Prepared by: ATAC, February 2025

Exhibit 1 displays the MD11GE arrival tracks in the Existing Conditions scenario (green).

Exhibit 1 MD11GE Arrival AEDT Flight Tracks Using User-Defined Profile



Source: ATAC, February 2024
Prepared by: ATAC, February 2024

3.1 Implementation of Proposed Solution

A new user-defined approach profile for the MD11GE ACFT_ID named 'STD_DC10' was created using the same values as the MD11GE STANDARD approach profile found within the FLT_ANP_AIRPLANE_PROFILES table. Thus, retaining the aircraft weight of the MD11GE. The next step was to copy the necessary FLAP_IDs of the DC1030 from the FLT_ANP_AIRPLANE_FLAPS table and associate them with the MD11GE.

Table 3-3 presents the default set of flaps available for the DC1030. **Table 3-4** presents the default set of flaps available for the MD11GE as well as the additional flap records that were copied from the DC1030 (shaded in grey for clarity).

Table 3-3 AEDT Default Flaps for DC1030

ACFT_ID	FLAP_ID	OP_TYPE	COEFF_R	COEFF_C D	COEFF_B
DC1030	U-20	A	0.104	0	0
DC1030	D-35	A	0.13	0.2534	0
DC1030	20	D	0.104	0.2434	0.003091
DC1030	ZERO	D	0.06519	0	0
DC1030	INT1	D	0.09454	0	0
DC1030	INT2	D	0.07307	0	0

Source: AEDT Version 3e, FLEET Database Version 3.45.4, FLT_ANP_AIRPLANE_FLAPS table
Prepared by: ATAC, December 2023

Table 3-4 AEDT User-Defined Flaps for User-Defined MD11GE

ACFT_ID	FLAP_ID	OP_TYPE	COEFF_R	COEFF_C D	COEFF_B
MD11GE	D-35	A	0.13	0.2534	0
MD11GE	U-20	A	0.104	0	0
MD11GE	INT2	D	0.07307	0	0
MD11GE	ZERO	D	0.0551	0	0
MD11GE	10	D	0.0843	0.2648	0.003812
MD11GE	15	D	0.0891	0.2578	0.003625
MD11GE	20	D	0.0947	0.2524	0.003509
MD11GE	0/EXT	D	0.0692	0	0
MD11GE	25	D	0.1016	0.2481	0.003443
MD11GE	0/RET	D	0.0551	0	0

Source: AEDT Version 3e, FLEET Database Version 3.40.6, FLT_ANP_AIRPLANE_FLAPS table
 Prepared by: ATAC, December 2023

Next, the procedure profile was defined by copying the values of the DC1030 approach profile from the FLT_ANP_AIRPLANE_PROCEDURES table.

Table 3-5 and **Table 3-6** below present the default AEDT approach procedural profile for the DC1030 (for comparative purposes) and the user-defined procedural profile created for the MD11GE (the differences between the tables have their cells shaded grey), respectively.

Table 3-5 AEDT Default Approach Procedure Profile for DC1030

ACFT_ID	OP_TYPE	PROF_ID1	PROF_ID2	STEP_NUM	FLAP_ID	STEP_TYPE	THR_TYPE	PARAM1	PARAM2	PARAM3
DC1030	A	STANDARD	1	1	ZERO	D		6000	250	3
DC1030	A	STANDARD	1	2	INT2	D		3000	172.6	3
DC1030	A	STANDARD	1	3	U-20	D		1500	162.6	3
DC1030	A	STANDARD	1	4	D-35	D		1000	152.6	3
DC1030	A	STANDARD	1	5	D-35	L		392.2	152.6	0
DC1030	A	STANDARD	1	6	NULL	B	V	3529.8	144.8	10
DC1030	A	STANDARD	1	7	NULL	B	L	0	30	10

Source: AEDT Version 3e, FLEET Database Version 3.40.6, FLT_ANP_AIRPLANE_PROCEDURES table
 Prepared by: ATAC, December 2023

Table 3-6 AEDT User-Defined Approach Procedure Profile for User-Defined MD11GE

ACFT_ID	OP_TYPE	PROF_ID1	PROF_ID2	STEP_NUM	FLAP_ID	STEP_TYPE	THR_TYPE	PARAM1	PARAM2	PARAM3
MD11GE	A	STD_DC10	1	1	ZERO	D		6000	250	3
MD11GE	A	STD_DC10	1	2	INT2	D		3000	172.6	3
MD11GE	A	STD_DC10	1	3	U-20	D		1500	162.6	3
MD11GE	A	STD_DC10	1	4	D-35	D		1000	152.6	3
MD11GE	A	STD_DC10	1	5	D-35	L		392.2	152.6	0
MD11GE	A	STD_DC10	1	6	NULL	B	V	3529.8	144.8	10
MD11GE	A	STD_DC10	1	7	NULL	B	L	0	30	10

Source: AEDT Version 3e, FLEET Database Version 3.40.6, FLT_ANP_AIRPLANE_PROCEDURES table
 Prepared by: ATAC, December 2023

After all profile inputs for the user-defined aircraft has been added to the AEDT study, all arrival MD11GE AIR_OPERATIONS were assigned to use the user-defined profile.

4 Analysis Demonstrating Change

As outlined in Section 5.3.2 of the “Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA” document, noise results for arrival tracks should be reported by placing noise receptors 0.5 NM apart underneath the flight path. This analysis and all remaining analysis sections was performed on a straight vector track arriving to ANC on runway 25L.

Table 4-1 compares the noise output of the modeled track using the MD11GE profile points (default) against the procedure steps user-defined profile. The AEDT aircraft model (also known as “ANP_ACFT_ID”) is presented along with the profile weight which describes the starting weight of the aircraft in pounds (lbs). The first column presents the distance from the arriving runway end to the particular noise receptor placed underneath the given track in nautical miles. The second column is the noise value generated from the default profile at each receptor in SEL in decibels (dB). The third column is the noise value generated from the user-defined profile at each receptor in SEL dB. The fourth column is a difference between the third and fourth columns presented in dB. (Due to rounding, this column may contain values that are not accurately represented by the hundredth decimal place.) To capture the noise impacts of the entire approach procedure profile, noise receptors were placed underneath the track until 20 NM of cumulative distance was reached, which is approximately the length of both profiles.

Table 4-1 Comparative Noise Analysis

AEDT Aircraft Model: MD11GE		Profile Weight: 390,000 lbs	
Receptors	AEDT Default Profile	User-Defined Profile	Diff
(NM)	(SEL dB)	(SEL dB)	(dB)
0.5	100.98	103.74	2.76
1	95.87	98.25	2.38
1.5	92.94	94.8	1.86
2	91.14	92.53	1.39
2.5	89.69	90.58	0.89
3	89.04	89.42	0.38
3.5	88.23	88.36	0.13
4	86.96	86.88	-0.08
4.5	85.98	85.65	-0.33
5	84.99	84.42	-0.57
5.5	84.19	83.55	-0.64
6	83.59	82.85	-0.74
6.5	82.98	82.08	-0.90
7	82.54	81.58	-0.96
7.5	82.07	81.05	-1.02
8	81.98	80.87	-1.11
8.5	82.47	81.25	-1.22
9	82.73	81.41	-1.32
9.5	83.36	81.88	-1.48
10	85.58	83.8	-1.78
10.5	88.3	86.45	-1.85
11	89.08	87.27	-1.81
11.5	91.04	88.98	-2.06
12	84.58	82.7	-1.88
12.5	84.91	83.02	-1.89
13	104.2	102.24	-1.96

AEDT Aircraft Model: MD11GE		Profile Weight: 390,000 lbs	
Receptors	AEDT Default Profile	User-Defined Profile	Diff
(NM)	(SEL dB)	(SEL dB)	(dB)
13.5	85.46	83.56	-1.90
14	83.98	82.22	-1.76
14.5	78.27	76.84	-1.43
15	76.48	74.96	-1.52
15.5	77.42	75.76	-1.66
16	79.21	77.74	-1.47
16.5	79.31	77.94	-1.37
17	81.49	79.92	-1.57
17.5	78.56	77.01	-1.55
18	77.57	76.09	-1.48
18.5	80.75	79.21	-1.54
19	75.76	74.38	-1.38
19.5	64.11	62.67	-1.44
20	55.23	53.85	-1.38

Source: ATAC, January 2024
Prepared by: ATAC, January 2024

Table 4-1 shows that noise values generated from the user-defined procedure profile are different from the noise values generated from the default procedure profile, which is the expected result due to the different profiles.

5 Graphical and Tabular Comparison

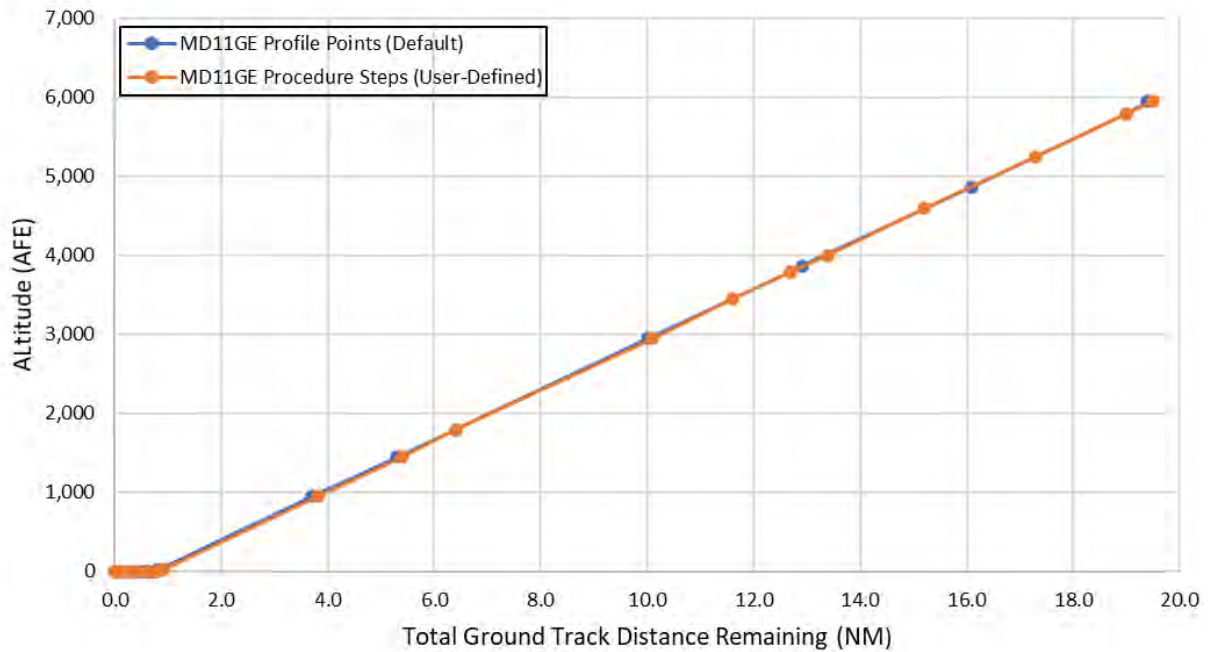
Section 5.3.2 of the “Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA” document also describes that graphics depicting each proposed change in profile be provided to display the effect on aircraft performance in the three following ways:

- Altitude vs. Total Ground Track Distance Remaining
- Speed vs. Total Ground Track Distance Remaining
- Thrust vs. Total Ground Track Distance Remaining

This section provides charts for the modeled track plotting total ground track distance remaining until the end of roll in nautical miles along the x-axis versus altitude in feet referenced using Above Airfield Elevation (AFE), speed measured as ground speed in knots, and thrust measured as net corrected thrust in pounds, respectively.

For all charts, the default approach procedure profile will be presented as a blue line and the user-defined approach procedure profile will be presented as a solid orange line. Similar to the comparative noise analysis presented in Section 4, all of the charts presented will be truncated at approximately 20 NM in order to depict the complete approach procedure profile.

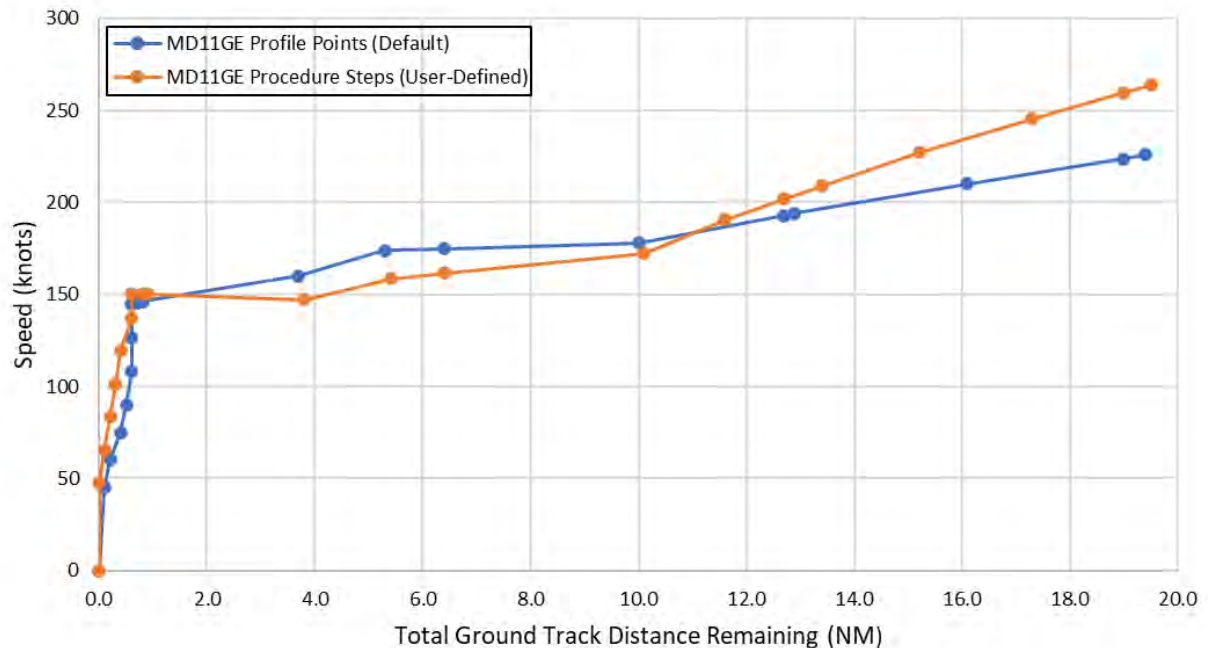
Exhibit 2 Altitude vs. Total Ground Track Distance Remaining



Source: ATAC, January 2024

Prepared by: ATAC, January 2024

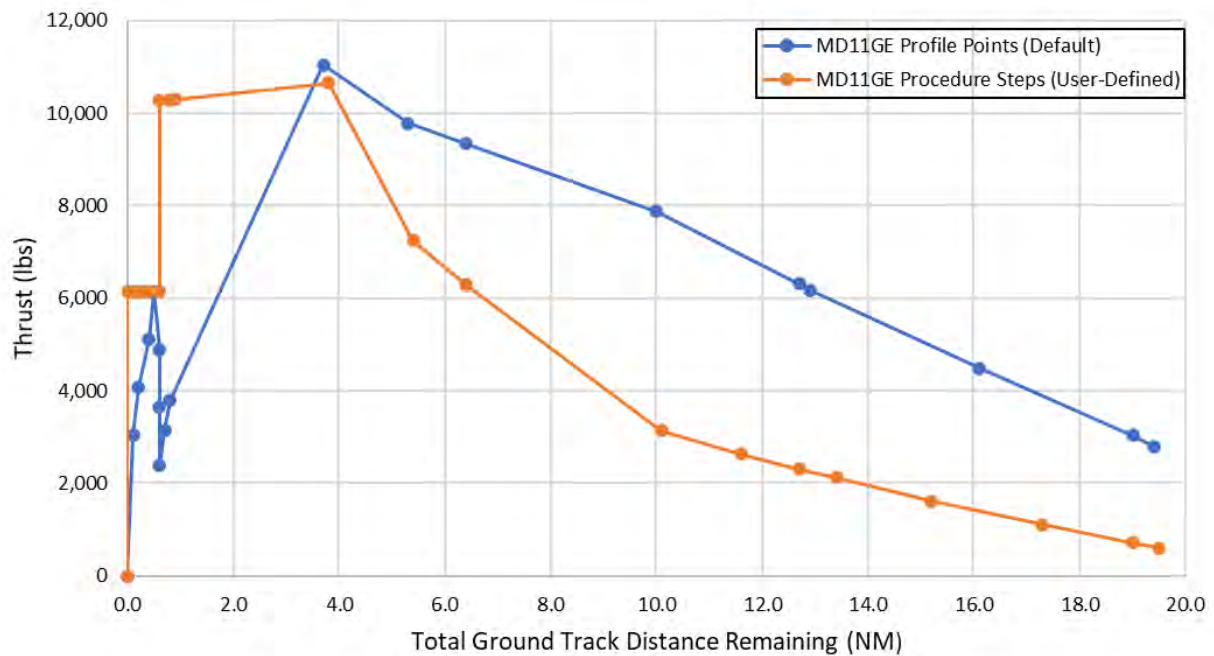
Exhibit 3 Speed vs. Total Ground Track Distance Remaining



Source: ATAC, January 2024

Prepared by: ATAC, January 2024

Exhibit 4 Thrust vs. Total Ground Track Distance Remaining



Source: ATAC, January 2024
Prepared by: ATAC, January 2024

It can be observed from **Exhibit 2** and **Exhibit 3** that altitude and speed values for the default and user-defined procedure profiles are very similar. **Exhibit 4** shows that net corrected thrust between profiles is different due to the difference in profiles used.

Table 5-1 contains the data used to plot the graphs found in **Exhibit 2**, **Exhibit 3**, and **Exhibit 4**.

Table 5-1 Comparative Aircraft Performance

MD11GE Profile Points (Default)				MD11GE Procedure Steps (User-Defined)			
Cumulative Distance (NM)	Altitude (ft. AFE)	Speed (knots)	Net Corrected Thrust (lbs.)	Cumulative Distance (NM)	Altitude (ft. AFE)	Speed (knots)	Net Corrected Thrust (lbs.)
0.0	-52.0	30.0	2011.0	0.0	-52.0	29.5	6150.0
0.0	-52.0	0.0	0.0	0.0	-52.0	0.0	0.0
0.1	-52.0	45.0	3045.8	0.0	-52.0	47.5	6150.0
0.2	-52.0	60.0	4080.5	0.1	-52.0	65.4	6150.0
0.4	-52.0	75.0	5115.3	0.2	-52.0	83.4	6150.0
0.5	-52.0	90.0	6150.0	0.3	-52.0	101.3	6150.0
0.6	-52.0	108.3	4894.0	0.4	-52.0	119.3	6150.0
0.6	-52.0	126.7	3638.0	0.6	-52.0	137.2	6150.0
0.6	-52.0	145.0	2382.0	0.6	-52.0	150.5	10272.5
0.7	-11.2	145.6	3151.0	0.8	-11.2	150.3	10288.0
0.8	23.0	146.2	3792.7	0.9	23.0	150.2	10301.1
3.7	948.0	160.0	11037.0	3.8	948.0	147.1	10647.9
5.3	1448.0	174.0	9786.0	5.4	1448.0	158.3	7247.5
6.4	1796.0	174.9	9342.4	6.4	1796.0	161.5	6293.3
10.0	2948.0	178.0	7874.0	10.1	2948.0	172.2	3134.6
12.7	3796.0	192.7	6313.6	11.6	3447.3	190.5	2628.6
12.9	3868.8	194.0	6179.7	12.7	3796.0	202.1	2307.8
16.1	4868.8	210.0	4485.3	13.4	3997.0	208.8	2122.7
19.0	5796.0	223.7	3029.6	15.2	4597.0	227.1	1616.8
19.4	5948.0	226.0	2791.0	17.3	5247.3	245.4	1110.9
				19.0	5796.0	259.7	714.8
				19.5	5948.0	263.6	605.0

Source: ATAC, January 2024
Prepared by: ATAC, January 2024

6 Quantitative Comparison of Results

This section quantitatively compares the results of the default and user-defined profiles for altitude, speed, and net corrected thrust using the methodology presented in Section 2.2. Table 6-1 presents the RMSE values calculated for each aircraft performance parameter.

Table 6-1 RMSE Summary Table

Parameter	RMSE
Altitude	0.012
Speed	17.113
Thrust	3,535.227

Source: ATAC, January 2024
Prepared by: ATAC, January 2024

The RMSE values in Table 6-1 indicate that the aircraft performance of the default and user-defined profiles are similar.

7 Conclusion

ATAAC is seeking approval for the use of the user-defined approach profile described in Section 1.4 in order to more accurately model MD11GE arrivals. MD11GE arrivals constitutes about 0.6% of the total operations in the ATAAP Study. Comparisons show slight differences in altitude vs. distance and slightly larger differences in speed vs. distance between the default and proposed user-defined profile. These factors help explain differences in net corrected thrust, but the noise results do not significantly differ with a maximum difference of 2.76 dB. Small noise differences between the default and proposed user-defined profiles exist; however, the benefit to the model of allowing for dynamic approach profiles using procedure step profiles and altitude control codes exceeds this cost.



U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of Environment and Energy

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

3/6/2025

Lonnie Covalt
Lead Environmental Protection Specialist
Air Traffic Operations, Western Service Center
Federal Aviation Administration
2200 S. 216th St.
Des Moines, WA 98198

Dear Lonnie Covalt,

The Office of Environment and Energy (AEE) has received the memo from ATAC dated February 21, 2025, referencing the Anchorage Terminal Area Airspace and Procedures Study (ATAAPS) Environmental Assessment (EA). The memo requests approval for the use of the DC1030 ANP type arrival procedure profile for use with the MD11GE ANP type, in lieu of its standard fixed point profile data in AEDT 3e. This request was made so that altitude control code functionality not available for aircraft with fixed point profiles, may be used during the modeling process for the MD11GE.

AEE approves the use of an MD11GE non-standard arrival profile based on the DC1030 arrival profile for this purpose.

Please understand that this approval is limited to this particular Environmental Assessment for the Anchorage Terminal Area Airspace and Procedures Study and for use with AEDT 3e only. Further non-standard AEDT inputs for additional projects at this or any other site will require separate approval.

Sincerely,

David Senzig
Manager (Acting)
AEE-100/Noise Division

cc: ATO Contacts (Joseph Bert, AJV-W250)

Supplement 3 – Census Block Noise Results

S3.1 Reportable Noise Increases 2027

There were no reportable or significant census block noise impacts for the 2027 Scenario.

S3.2 Reportable Noise Increases 2032

Table S3.2.1 and Table S3.2.2 identify US Census blocks that would experience a DNL 3.0 dB or greater increase in areas exposed to DNL between 60 dB and 65 dB, and a DNL 5.0 dB or greater increase in areas exposed to DNL between 45 dB and 60 dB under the 2032 Proposed Action scenario when compared to the 2032 No Action scenario. Exhibit 5-2 in Chapter 5 identifies the location of the population centroids for the census block. For the affected centroids, Table S3.2.1 and Table S3.2.2 provides the US Census block identification number, geographical coordinates (latitude and longitude), population count, the calculated DNL under No Action and Proposed Action conditions for 2032, and the change in DNL.

Table S3.2.1 Reportable Noise Increases in the DNL 60 dB to 65 dB Range - 2032

Census Block ID	Latitude	Longitude	Population	No Action DNL	Proposed Action DNL	Change
20200023014008	61.1417286	-149.9765899	271	56.3332	60.0255	3.6923

Source: AEDT and NOISEMAP modeling results, June 2026.
Prepared by: ATAC Corporation, June 2026.

Table S3.2.2 Reportable Noise Increases in the DNL 45 dB to 60 dB Range - 2032

Census Block ID	Latitude	Longitude	Population	No Action DNL	Proposed Action DNL	Change
21220001001207	61.0503166	-151.3101379	1	39.8544	45.1286	5.2742
21220001001087	61.0873828	-151.1606831	92	39.4655	45.2219	5.7564

Source: AEDT and NOISEMAP modeling results, June 2026.
Prepared by: ATAC Corporation, June 2026.

Supplement 4 – Section 4(f), Historic, and Cultural Resources Noise Results

S4.1 Inventory

This supplement provides an inventory of Department of Transportation Act (DOT Act), Section 4(f) (49 U.S.C. § 303; 23 U.S.C. § 138) resources, including historical/cultural properties also covered under Section 106 of the National Historic Preservation Act (NHPA) (16 U.S.C. § 470), that were identified and evaluated as part of the DEA.

The inventory of Section 4(f) resources and historical/cultural properties is intended to include all public parks, recreation areas, wildlife and waterfowl refuges, and historic sites, including properties listed (or eligible) on the National Register of Historic Places (National Register) located within the Supplemental Study Area. Properties listed (or eligible to be listed) on the National Register and considered under both Section 4(f) and Section 106 of the NHPA are included in this supplement. Spatial data for the National Register properties was downloaded from the National Park Service Integrated Resource Management Applications Portal. Spatial data for cultural and park properties was downloaded from readily available federal, state, and local sources. Source information is identified in Table S4.1.

Note: Alaska Heritage Resource Survey information, which is under the jurisdiction of the Dept. of Defense, may be included in this compilation if available and applicable.

Table S4.1 Types of Section 4(f) Resources Considered

Source	Name
State of Alaska Geoportal	AK National Wilderness Area
State of Alaska Geoportal	AK National Wildlife Refuges
State of Alaska Geoportal	Alaska Seabird Colony 1 nm buffer
State of Alaska Geoportal	Alaska State Game Refuges, Critical Habitat, Sanctuaries
State of Alaska Geoportal	Alaska SW DPS Sea Otter Critical Habitat
State of Alaska Geoportal	BLM AK Areas of Critical Environmental Concern
State of Alaska Geoportal	BLM AK Iditarod National Historic Trail
State of Alaska Geoportal	BLM AK National Conservation Area
State of Alaska Geoportal	BLM AK Native Selections
State of Alaska Geoportal	BLM AK Wild and Scenic River Corridor
State of Alaska Geoportal	BLM AK Wild Scenic Rivers
State of Alaska Geoportal	BLM AK Wilderness Study Area (WSA)
State of Alaska Geoportal	BLM Lands
State of Alaska Geoportal	BLM Other Nationally Designated Areas
State of Alaska Geoportal	Chugach State Park Hosted
State of Alaska Geoportal	Community Culture and History
State of Alaska Geoportal	Cook Inlet Oil and Gas
State of Alaska Geoportal	Documented Eagle Nest Sites
State of Alaska Geoportal	Environmental Wetlands Cook Inlet
State of Alaska Geoportal	Federally Recognized Tribes
State of Alaska Geoportal	Fish & Wildlife Service Designated Wilderness and Proposed Wilderness
State of Alaska Geoportal	Fish and Wildlife Services (FWS) National Realty Tracks
State of Alaska Geoportal	FWS Assets Water Resources
State of Alaska Geoportal	FWS HQ ES Critical Habitat
State of Alaska Geoportal	FWS Marine Protected Area
State of Alaska Geoportal	FWS Migratory Birds
State of Alaska Geoportal	FWS National Wilderness Boundaries
State of Alaska Geoportal	FWS Properties
State of Alaska Geoportal	FWS Special Designation
State of Alaska Geoportal	FWS Trail Segments
State of Alaska Geoportal	FWS Waterfowl Flyways
State of Alaska Geoportal	Historic Transportation Routes
State of Alaska Geoportal	Historical Mining Districts

Source	Name
State of Alaska Geoportal	Important Bird Area Colony Points
State of Alaska Geoportal	Kenai Peninsula Borough 50-foot Habitat Protection District
State of Alaska Geoportal	KPB 21.18 Anadromous Lakes and Areas
State of Alaska Geoportal	KPB 21.18 Anadromous Streams
State of Alaska Geoportal	KPB 21.18 Recreation Service Areas
State of Alaska Geoportal	Matanuska Susitna Recreational Local Parks
State of Alaska Geoportal	Military Boundary Hosted
State of Alaska Geoportal	Moose Range Inventories
State of Alaska Geoportal	Nordic Trails
State of Alaska Geoportal	Parks Rec Trails Merged
State of Alaska Geoportal	Ports and Harbors
State of Alaska Geoportal	Priority Protection Areas
State of Alaska Geoportal	Priority Protection Sites
State of Alaska Geoportal	School Enrollments
State of Alaska Geoportal	Schools PK-12
Geographic Names Information System	Schools/USA Schools
State of Alaska Geoportal	Sea Lion Rookery
State of Alaska Geoportal	Spectacled Eider Critical Habitat + 1 nm Buffer
State of Alaska Geoportal	State Forest Boundaries
State of Alaska Geoportal	State Park Boundaries
State of Alaska Geoportal	State Park Trail
State of Alaska Geoportal	Steller's Eider Critical Habitat + 1 nm Buffer
State of Alaska Geoportal	Hospitals
US Fish and Wildlife Services	Alaska Bald Eagle Nest Sites (USFWS)
US Fish and Wildlife Services	Boundaries
State of Alaska Geoportal	Cook Inlet Wetlands
National Park Services	Parks, Preserves and Monuments
Bureau of Land Management	Critical Habitats
US Fish and Wildlife Services	Wilderness Areas
State of Alaska Geoportal	Iditarod Trail
State of Alaska Geoportal	Recreational Local Parks
National Estuarine Research Reserve System	Kachemak Bay
United States Geological Survey	National Register of Historic Places
ESRI	Places of Worship
National Parks Service	National Wild and Scenic River Eligible and Suitable Segments
PADUS, Protected Area Database	United States Terrestrial 1, 2, and 3; Marine Areas 1, 2, and 3

Source: ATAC Corporation, March 2025.

Prepared By: ATAC Corporation, March 2025.

S4.2 Reportable Noise Increases 2027

Table S4.2 identifies Section 4(f) resources and historical/cultural properties identified within the Study Area that would result in a DNL 1.5 dB increase in areas exposed to DNL of 65 dB and higher. Exhibit 5-1 in Chapter 5 identifies the location of the Section 4(f) resources and historical/cultural properties. Table S4.2 provides a location identifier, geographical coordinates (latitude and longitude), place name, the calculated DNL under No Action and Proposed Action conditions for 2027, and the change in DNL. Note that some places are in identical geographic coordinates either due to their proximity to each other or having originated from different data resources (see Table S4.1), however all named places with unique resource numbering are listed in this table for completeness.

Table S4.2 Reportable Noise Increases in the DNL 65+ dB Range - 2027

Location ID	Latitude	Longitude	Name	No Action DNL	Proposed Action DNL	Change
SECTION4F0182910	61.286159	-149.795425		67.7131	72.2249	4.5118

Location ID	Latitude	Longitude	Name	No Action DNL	Proposed Action DNL	Change
SECTION4F0194603	61.308913	-149.797068	Cook Inlet Region Inc	61.7854	65.0501	3.2647
SECTION4F0194709	61.280029	-149.797	Cook Inlet Region Inc	72.0061	74.1464	2.1403
GRID000002780378	61.172397	-150.103605	Anchorage Coastal Wildlife Refuge	65.0496	66.8442	1.7946
GRID000002782329	61.174457	-150.086961	Anchorage Coastal Wildlife Refuge	63.3696	65.6052	2.2356
GRID000002821360	61.303766	-149.799774		63.3977	65.2343	1.8366
GRID000002821358	61.287668	-149.791361		67.1112	71.2882	4.177
GRID000002821359	61.295717	-149.795567		66.0584	69.406	3.3476
GRID000002821360	61.303766	-149.799774	Cook Inlet Region Inc	63.3977	65.2343	1.8366
GRID000002821358	61.287668	-149.791361	Cook Inlet Region Inc	67.1112	71.2882	4.177
GRID000002821359	61.295717	-149.795567	Cook Inlet Region Inc	66.0584	69.406	3.3476
GRID000002780378	61.172397	-150.103605	Anchorage Coastal Wildlife Refuge	65.0496	66.8442	1.7946
GRID000002782329	61.174457	-150.086961	Anchorage Coastal Wildlife Refuge	63.3696	65.6052	2.2356
GRID000002821360	61.303766	-149.799774	Joint Base Elmendorf-Richardson	63.3977	65.2343	1.8366
GRID000002821358	61.287668	-149.791361	Joint Base Elmendorf-Richardson	67.1112	71.2882	4.177
GRID000002821359	61.295717	-149.795567	Joint Base Elmendorf-Richardson	66.0584	69.406	3.3476
GRID000002780378	61.172397	-150.103605	Anchorage Coastal Wildlife Refuge	65.0496	66.8442	1.7946
GRID000002782329	61.174457	-150.086961	Anchorage Coastal Wildlife Refuge	63.3696	65.6052	2.2356
GRID000002780378	61.172397	-150.103605	Whale, Beluga [Cook Inlet DPS]	65.0496	66.8442	1.7946
GRID000002782329	61.174457	-150.086961	Whale, Beluga [Cook Inlet DPS]	63.3696	65.6052	2.2356
GRID000002782329	61.174457	-150.086961	Tour of Anchorage	63.3696	65.6052	2.2356
GRID000002782329	61.174457	-150.086961	Kincaid Ski Trails	63.3696	65.6052	2.2356
GRID000002782329	61.174457	-150.086961	Tony Knowles Coastal Trail	63.3696	65.6052	2.2356
GRID000002782329	61.174457	-150.086961	Sisson Trail	63.3696	65.6052	2.2356

Source: AEDT and NOISEMAP modeling results, June 2026.

Prepared By: ATAC Corporation, June 2026.

Table S4.3 identifies the Section 4(f) resources and historical/cultural properties identified within the Study Area that would result in a DNL 3.0 dB increase in areas exposed to DNL 60 dB to 65 dB. Exhibit 5-1 in Chapter 5 identifies the location of the Section 4(f) resources and historical/cultural properties. Table S4.3 provides a location identifier, geographical coordinates (latitude and longitude), place name, the calculated DNL under No Action and Proposed Action conditions for 2027, and the change in DNL. Note that some places are in identical geographic coordinates either due to their proximity to each other or having originated from different data resources (see Table S4.1), however all named places with unique resource numbering are listed in this table for completeness.

Table S4.3 Reportable Noise Increases in the DNL 60 dB to 65 dB Range - 2027

Location ID	Latitude	Longitude	Name	No Action DNL	Proposed Action DNL	Change
SECTION4F0192737	61.316133	-149.797118	Cook Inlet Region Inc	60.3087	63.3492	3.0405
SECTION4F0194601	61.308919	-149.789565	Cook Inlet Region Inc	61.0678	64.6681	3.6003
GRID000002823313	61.321887	-149.791452		58.8002	62.2322	3.432

Location ID	Latitude	Longitude	Name	No Action DNL	Proposed Action DNL	Change
GRID000002823313	61.321887	-149.791452	Cook Inlet Region Inc	58.8002	62.2322	3.432
GRID000002780379	61.180435	-150.107874	Whale, beluga [Cook Inlet DPS]	58.0259	61.0712	3.0453
GRID000002782330	61.182496	-150.091227	Whale, beluga [Cook Inlet DPS]	57.2833	60.8666	3.5833
GRID000002823314	61.329936	-149.795663	Whale, beluga [Cook Inlet DPS]	57.9436	60.9489	3.0053

Source: AEDT and NOISEMAP modeling results, June 2026.
Prepared By: ATAC Corporation, June 2026.

Table S4.4 identifies the Section 4(f) resources and historical/cultural properties identified within the Study Area that would result in a DNL 5.0 dB increase in areas exposed to DNL 45 dB to 60 dB. **Exhibit 5-1** in Chapter 5 identifies the location of the Section 4(f) resources and historical/cultural properties. **Table S4.4** provides a location identifier, geographical coordinates (latitude and longitude), place name/description, the calculated DNL under No Action and Proposed Action conditions for 2027, and the change in DNL. Note that some places are in identical geographic coordinates either due to their proximity to each other or having originated from different data resources (see **Table S4.1**), however all named places with unique resource numbering are listed in this table for completeness.

Table S4.4 Reportable Noise Increases in the DNL 45 dB to 60 dB Range - 2027

For Table S4.4, please see Addendum S4-A

S4.2 Reportable Noise Increases 2032

Table S4.5 identifies the Section 4(f) resources and historical/cultural properties identified within the Study Area that would result in a DNL 1.5 dB increase in areas exposed to DNL of 65 dB. **Exhibit 5-2** in Chapter 5 identifies the location of the Section 4(f) resources and historical/cultural properties. **Table S4.5** provides a location identifier, geographical coordinates (latitude and longitude), place name/description, the calculated DNL under No Action and Proposed Action conditions for 2032, and the change in DNL. Note that some places are in identical geographic coordinates due to either their proximity to each other or having originated from different data resources (see **Table S4.1**), however all named places with unique resource numbering are listed in this table for completeness.

Table S4.5 Reportable Noise Increases in the DNL 65+ dB Range - 2032

Location ID	Latitude	Longitude	Name	No Action DNL	Proposed Action DNL	Change
SECTION4F0182910	61.286159	-149.795425		67.7188	72.2257	4.5069
SECTION4F0194603	61.308913	-149.797068	Cook Inlet Region Inc	61.8036	65.055	3.2514
SECTION4F0194709	61.280029	-149.797	Cook Inlet Region Inc	72.0082	74.1469	2.1387
GRID000002780378	61.172397	-150.103605	Anchorage Coastal Wildlife Refuge	65.4332	67.2206	1.7874
GRID000002782329	61.174457	-150.086961	Anchorage Coastal Wildlife Refuge	63.7534	65.9916	2.2382
GRID000002821360	61.303766	-149.799774		63.4112	65.2389	1.8277
GRID000002821358	61.287668	-149.791361		67.1177	71.2893	4.1716
GRID000002821359	61.295717	-149.795567		66.0663	69.4077	3.3414
GRID000002821360	61.303766	-149.799774	Cook Inlet Region Inc	63.4112	65.2389	1.8277
GRID000002821358	61.287668	-149.791361	Cook Inlet Region Inc	67.1177	71.2893	4.1716
GRID000002821359	61.295717	-149.795567	Cook Inlet Region Inc	66.0663	69.4077	3.3414

Location ID	Latitude	Longitude	Name	No Action DNL	Proposed Action DNL	Change
GRID000002780378	61.172397	-150.103605	Anchorage Coastal Wildlife Refuge	65.4332	67.2206	1.7874
GRID000002782329	61.174457	-150.086961	Anchorage Coastal Wildlife Refuge	63.7534	65.9916	2.2382
GRID000002821360	61.303766	-149.799774	Joint Base Elmendorf-Richardson	63.4112	65.2389	1.8277
GRID000002821358	61.287668	-149.791361	Joint Base Elmendorf-Richardson	67.1177	71.2893	4.1716
GRID000002821359	61.295717	-149.795567	Joint Base Elmendorf-Richardson	66.0663	69.4077	3.3414
GRID000002780378	61.172397	-150.103605	Anchorage Coastal Wildlife Refuge	65.4332	67.2206	1.7874
GRID000002782329	61.174457	-150.086961	Anchorage Coastal Wildlife Refuge	63.7534	65.9916	2.2382
GRID000002780378	61.172397	-150.103605	Whale, beluga [Cook Inlet DPS]	65.4332	67.2206	1.7874
GRID000002782329	61.174457	-150.086961	Whale, beluga [Cook Inlet DPS]	63.7534	65.9916	2.2382
GRID000002782329	61.174457	-150.086961	Tour of Anchorage	63.7534	65.9916	2.2382
GRID000002782329	61.174457	-150.086961	Kincaid Ski Trails	63.7534	65.9916	2.2382
GRID000002782329	61.174457	-150.086961	Tony Knowles Coastal Trail	63.7534	65.9916	2.2382
GRID000002782329	61.174457	-150.086961	Sisson Trail	63.7534	65.9916	2.2382

Source: AEDT and NOISEMAP modeling results, June 2026.
Prepared By: ATAC Corporation, June 2026.

Table S4.6 identifies the Section 4(f) resources and historical/cultural properties identified within the Study Area that would result in a DNL 3.0 dB increase in areas exposed to DNL 60 dB to 65 dB. Exhibit 5-2 in Chapter 5 identifies the location of the Section 4(f) resources and historical/cultural properties. Table S4.6 provides a location identifier, geographical coordinates (latitude and longitude), place name, the calculated DNL under No Action and Proposed Action conditions for 2032, and the change in DNL. Note that some places are in identical geographic coordinates either due to their proximity to each other or having originated from different data resources (see Table S4.1), however all named places with unique resource numbering are listed in this table for completeness.

Table S4.6 Reportable Noise Increases in the DNL 60 dB to 65 dB Range - 2032

Location ID	Latitude	Longitude	Name	No Action DNL	Proposed Action DNL	Change
SECTION4F0160128	61.141247	-149.976737		56.3537	60.0233	3.6696
SECTION4F0192737	61.316133	-149.797118	Cook Inlet Region Inc	60.3323	63.3565	3.0242
SECTION4F0194601	61.308919	-149.789565	Cook Inlet Region Inc	61.0894	64.6733	3.5839
GRID000002823313	61.321887	-149.791452		58.8308	62.2411	3.4103
GRID000002823313	61.321887	-149.791452	Cook Inlet Region Inc	58.8308	62.2411	3.4103
GRID000002780379	61.180435	-150.107874	Whale, Beluga [Cook Inlet DPS]	58.3995	61.448	3.0485
GRID000002782330	61.182496	-150.091227	Whale, Beluga [Cook Inlet DPS]	57.6552	61.2431	3.5879

Source: AEDT and NOISEMAP modeling results, June 2026.
Prepared By: ATAC Corporation, June 2026.

Table S4.7 identifies the Section 4(f) resources and historical/cultural properties identified within the Study Area that would result in a DNL 5.0 dB increase in areas exposed to DNL 45 dB to 60 dB. Exhibit 5-2 in Chapter 5 identifies the location of the Section 4(f) resources and historical/cultural properties. Table S4.7 provides a location identifier, geographical coordinates

(latitude and longitude), place name/description, the calculated DNL under No Action and Proposed Action conditions for 2032, and the change in DNL. Note that some places are in identical geographic coordinates either due to their proximity to each other or having originated from different data resources (see Table S4.1), however all named places with unique resource numbering are listed in this table for completeness.

Table S4.7 Reportable Noise Increases in the DNL 45 dB to 60 dB Range - 2032

For Table S4.7, please see Addendum S4-B.

Supplement 5 – One-Half Nautical Mile Grid Noise Results

S5.1 Reportable Noise Increases 2027

Table S5.1 identifies the 0.5 NM grid points identified within the Study Area that would result in a DNL 1.5 dB increase in areas exposed to DNL of 65 dB. Exhibit 5-1 in Chapter 5 identifies the location of 0.5 NM grid points. Table S5.1 provides the location identifier, geographical coordinates (latitude and longitude), the calculated DNL under No Action and Proposed Action conditions for 2027, and the change in DNL.

Table S5.1 Reportable Noise Increases in the DNL 65+ dB Range - 2027

Location ID	Latitude	Longitude	No Action DNL	Proposed Action DNL	Change
GRID000098960592	61.17239716	-150.1036047	65.0496	66.8442	1.7946
GRID000098960896	61.17445725	-150.0869614	63.3696	65.6052	2.2356
GRID000098966651	61.2876683	-149.7913613	67.1112	71.2882	4.177
GRID000098966652	61.29571716	-149.7955666	66.0584	69.406	3.3476
GRID000098966653	61.30376591	-149.7997742	63.3977	65.2343	1.8366

Source: AEDT and NOISEMAP modeling results, June 2026.
Prepared By: ATAC Corporation, June 2026.

Table S5.2 identifies the 0.5 NM grid points identified within the Study Area that would result in a DNL 3.0 dB increase in areas exposed to DNL 60 dB to 65 dB. Exhibit 5-1 in Chapter 5 identifies the location of 0.5 NM grid points. Table S5.2 provides the location identifier, geographical coordinates (latitude and longitude), the calculated DNL under No Action and Proposed Action conditions for 2027, and the change in DNL.

Table S5.2 Reportable Noise Increases in the DNL 60 dB to 65 dB Range - 2027

Location ID	Latitude	Longitude	No Action DNL	Proposed Action DNL	Change
GRID000098960593	61.18043492	-150.1078742	58.0259	61.0712	3.0453
GRID000098960897	61.18249559	-150.0912269	57.2833	60.8666	3.5833
GRID000098966940	61.321887	-149.7914524	58.8002	62.2322	3.432
GRID000098966941	61.32993597	-149.7956627	57.9436	60.9489	3.0053

Source: AEDT and NOISEMAP modeling results, June 2026.
Prepared By: ATAC Corporation, June 2026.

Table S5.3 identifies the 0.5 NM grid points identified within the Study Area that would result in a DNL 5.0 dB increase in areas exposed to DNL 45 dB to 60 dB. Exhibit 5-1 in Chapter 5 identifies the location of 0.5 NM grid points. Table S5.3 provides the location identifier, geographical coordinates (latitude and longitude), the calculated DNL under No Action and Proposed Action conditions for 2027, and the change in DNL.

Table S5.3 Reportable Noise Increases in the DNL 45 dB to 60 dB Range - 2027

Location ID	Latitude	Longitude	No Action DNL	Proposed Action DNL	Change
GRID000098937617	61.06965995	-151.2360641	39.321	45.0233	5.7023
GRID000098937965	61.07985825	-151.2241024	39.8736	45.131	5.2574
GRID000098938312	61.08205783	-151.2075916	39.7319	45.1168	5.3849
GRID000098939007	61.08645086	-151.1745629	39.613	45.0494	5.4364
GRID000098942815	61.32657667	-151.1148188	43.6192	49.0408	5.4216
GRID000098942816	61.33457889	-151.1193747	42.581	48.0835	5.5025
GRID000098942817	61.34258096	-151.1239332	41.5889	46.7541	5.1652

Location ID	Latitude	Longitude	No Action DNL	Proposed Action DNL	Change
GRID000098943150	61.32076129	-151.0936177	44.3715	49.7385	5.367
GRID000098943151	61.32876426	-151.0981672	43.3193	49.1287	5.8094
GRID000098943152	61.33676709	-151.1027192	42.2933	48.105	5.8117
GRID000098943153	61.34476979	-151.1072737	41.3326	46.7111	5.3785
GRID000098943489	61.32294619	-151.0769677	44.0671	49.7663	5.6992
GRID000098943490	61.33094978	-151.0815133	43.0172	49.0613	6.0441
GRID000098943491	61.33895323	-151.0860613	42.0069	47.9423	5.9354
GRID000098943492	61.34695655	-151.0906118	41.0762	46.5041	5.4279
GRID000098943836	61.32512902	-151.0603153	43.7327	49.328	5.5953
GRID000098943837	61.33313323	-151.0648568	42.714	48.6536	5.9396
GRID000098943838	61.3411373	-151.0694009	41.7212	47.4688	5.7476
GRID000098943839	61.34914124	-151.0739473	40.8216	46.0357	5.2141
GRID000098944186	61.32730978	-151.0436604	43.374	48.823	5.449
GRID000098944187	61.33531461	-151.048198	42.3783	48.0614	5.6831
GRID000098944188	61.3433193	-151.052738	41.4235	46.8024	5.3789
GRID000098944544	61.32948847	-151.027003	43.0167	48.1642	5.1475
GRID000098944545	61.33749392	-151.0315366	42.0443	47.2873	5.243
GRID000098958801	61.49732609	-150.3857579	37.9142	45.052	7.1378
GRID000098958802	61.50535515	-150.3901502	38.1453	45.3717	7.2264
GRID000098958803	61.51338409	-150.3945448	37.6022	45.2057	7.6035
GRID000098959110	61.52351206	-150.3821304	36.7528	45.1189	8.3661
GRID000098959416	61.533639	-150.3697077	37.0949	45.1431	8.0482
GRID000098959723	61.54376491	-150.3572769	36.3268	45.0237	8.6969
GRID000098960030	61.54585897	-150.3404501	36.3729	45.2873	8.9144
GRID000098960292	61.20248298	-150.1373536	51.6128	57.129	5.5162
GRID000098960335	61.54795094	-150.3236208	36.0239	45.1262	9.1023
GRID000098960595	61.19651008	-150.1164202	52.1186	57.4383	5.3197
GRID000098960596	61.20454748	-150.1206966	51.8043	57.7376	5.9333
GRID000098960639	61.55004081	-150.3067892	35.9576	45.0923	9.1347
GRID000098960943	61.55212859	-150.2899552	35.8109	45.0535	9.2426
GRID000098961245	61.54618094	-150.2687498	35.9037	45.1051	9.2014
GRID000098961541	61.54022989	-150.2475526	36.555	45.0245	8.4695
GRID000098961542	61.54826392	-150.2519152	35.9592	45.2016	9.2424
GRID000098961833	61.52624055	-150.22201	38.4062	45.0015	6.5953
GRID000098961834	61.53427542	-150.2263637	37.8063	45.4072	7.6009
GRID000098961835	61.54231018	-150.2307197	37.2994	45.2712	7.9718
GRID000098962123	61.5042104	-150.1921483	40.5251	45.6932	5.1681
GRID000098962124	61.51224624	-150.1964908	39.6279	45.6916	6.0637
GRID000098962125	61.52028196	-150.2008357	38.8601	45.81	6.9499
GRID000098962126	61.52831755	-150.2051829	38.2119	45.6209	7.409

Source: AEDT and NOISEMAP modeling results, June 2026.
Prepared By: ATAC Corporation, June 2026.

S5.2 Reportable Noise Increases 2032

Table S5.4 identifies the 0.5 NM grid points identified within the Study Area that would result in a DNL 1.5 dB increase in areas exposed to DNL of 65 dB. Exhibit 5-2 in Chapter 5 identifies the location of 0.5 NM grid points. Table S5.4 provides the location identifier, geographical

coordinates (latitude and longitude), the calculated DNL under No Action and Proposed Action conditions for 2032, and the change in DNL.

Table S5.4 Reportable Noise Increases in the DNL 65+ dB Range - 2032

Location ID	Latitude	Longitude	No Action DNL	Proposed Action DNL	Change
GRID000098960592	61.17239716	-150.1036047	65.4332	67.2206	1.7874
GRID000098960896	61.17445725	-150.0869614	63.7534	65.9916	2.2382
GRID000098966651	61.2876683	-149.7913613	67.1177	71.2893	4.1716
GRID000098966652	61.29571716	-149.7955666	66.0663	69.4077	3.3414
GRID000098966653	61.30376591	-149.7997742	63.4112	65.2389	1.8277

Source: AEDT and NOISEMAP modeling results, June 2026.
Prepared By: ATAC Corporation, June 2026.

Table S5.5 identifies the 0.5 NM grid points identified within the Study Area that would result in a DNL 3.0 dB increase in areas exposed to DNL 60 dB to 65 dB. Exhibit 5-2 in the Noise Technical Report identifies the location of 0.5 NM grid points. Table S5.5 provides the location identifier, geographical coordinates (latitude and longitude), the calculated DNL under No Action and Proposed Action conditions for 2032, and the change in DNL.

Table S5.5 Reportable Noise Increases in the DNL 60 dB to 65 dB Range - 2032

Location ID	Latitude	Longitude	No Action DNL	Proposed Action DNL	Change
GRID000098960593	61.18043492	-150.1078742	58.3995	61.448	3.0485
GRID000098960897	61.18249559	-150.0912269	57.6552	61.2431	3.5879
GRID000098966940	61.321887	-149.7914524	58.8308	62.2411	3.4103

Source: AEDT and NOISEMAP modeling results, June 2026.
Prepared By: ATAC Corporation, June 2026.

Table S5.6 identifies the 0.5 NM grid points identified within the Study Area that would result in a DNL 5.0 dB increase in areas exposed to DNL 45 dB to 60 dB. Exhibit 5-2 in Chapter 5 identifies the location of 0.5 NM grid points. Table S5.6 provides the location identifier, geographical coordinates (latitude and longitude), the calculated DNL under No Action and Proposed Action conditions for 2032, and the change in DNL.

Table S5.6 Reportable Noise Increases in the DNL 45 dB to 60 dB Range - 2032

Location ID	Latitude	Longitude	No Action DNL	Proposed Action DNL	Change
GRID000098935866	61.05063	-151.314	39.9465	45.1295	5.183
GRID000098936217	61.05284	-151.297	39.6099	45.114	5.5041
GRID000098936567	61.05505	-151.281	39.0277	45.105	6.0773
GRID000098936568	61.06304	-151.286	40.0307	45.1988	5.1681
GRID000098936918	61.05726	-151.265	38.2671	45.0304	6.7633
GRID000098936919	61.06525	-151.269	40.0671	45.3193	5.2522
GRID000098937268	61.06746	-151.253	39.7017	45.3112	5.6095
GRID000098937269	61.07545	-151.257	39.7408	45.0449	5.3041
GRID000098937617	61.06966	-151.236	39.5978	45.3928	5.795
GRID000098937964	61.07186	-151.22	39.1757	45.3469	6.1712
GRID000098937965	61.07986	-151.224	40.142	45.5025	5.3605
GRID000098938311	61.07406	-151.203	38.6109	45.1726	6.5617

Location ID	Latitude	Longitude	No Action DNL	Proposed Action DNL	Change
GRID000098938312	61.08206	-151.208	40.0079	45.4831	5.4752
GRID000098938659	61.07626	-151.187	38.4328	45.0487	6.6159
GRID000098939007	61.08645	-151.175	39.887	45.4173	5.5303
GRID000098939353	61.08864	-151.158	39.5967	45.248	5.6513
GRID000098942815	61.32658	-151.115	43.9925	49.4091	5.4166
GRID000098942816	61.33458	-151.119	42.9546	48.4519	5.4973
GRID000098942817	61.34258	-151.124	41.9614	47.122	5.1606
GRID000098943150	61.32076	-151.094	44.7457	50.1168	5.3711
GRID000098943151	61.32876	-151.098	43.6927	49.4972	5.8045
GRID000098943152	61.33677	-151.103	42.6668	48.4832	5.8164
GRID000098943153	61.34477	-151.107	41.7038	47.0884	5.3846
GRID000098943489	61.32295	-151.077	44.4402	50.1347	5.6945
GRID000098943490	61.33095	-151.082	43.3905	49.4396	6.0491
GRID000098943491	61.33895	-151.086	42.3793	48.3203	5.941
GRID000098943492	61.34696	-151.091	41.4467	46.8814	5.4347
GRID000098943836	61.32513	-151.06	44.1058	49.6964	5.5906
GRID000098943837	61.33313	-151.065	43.0864	49.0315	5.9451
GRID000098943838	61.34114	-151.069	42.0935	47.837	5.7435
GRID000098943839	61.34914	-151.074	41.1917	46.4031	5.2114
GRID000098944186	61.32731	-151.044	43.7471	49.1914	5.4443
GRID000098944187	61.33531	-151.048	42.7505	48.4393	5.6888
GRID000098944188	61.34332	-151.053	41.7956	47.1704	5.3748
GRID000098944544	61.32949	-151.027	43.3898	48.5421	5.1523
GRID000098944545	61.33749	-151.032	42.4165	47.665	5.2485
GRID000098958800	61.4893	-150.381	38.1497	45.1756	7.0259
GRID000098958801	61.49733	-150.386	38.2274	45.4147	7.1873
GRID000098958802	61.50536	-150.39	38.4537	45.7425	7.2888
GRID000098958803	61.51338	-150.395	37.9181	45.579	7.6609
GRID000098959110	61.52351	-150.382	37.0836	45.4949	8.4113
GRID000098959416	61.53364	-150.37	37.4263	45.5091	8.0828
GRID000098959723	61.54376	-150.357	36.6728	45.3915	8.7187
GRID000098960030	61.54586	-150.34	36.7221	45.6556	8.9335
GRID000098960292	61.20248	-150.137	51.953	57.4914	5.5384
GRID000098960335	61.54795	-150.324	36.3823	45.4947	9.1124
GRID000098960595	61.19651	-150.116	52.4753	57.8045	5.3292
GRID000098960596	61.20455	-150.121	52.1464	58.1107	5.9643
GRID000098960639	61.55004	-150.307	36.3081	45.4708	9.1627
GRID000098960943	61.55213	-150.29	36.1668	45.4218	9.255
GRID000098961245	61.54618	-150.269	36.2591	45.4832	9.2241
GRID000098961246	61.55421	-150.273	35.6555	45.2082	9.5527
GRID000098961541	61.54023	-150.248	36.9065	45.3919	8.4854
GRID000098961542	61.54826	-150.252	36.3028	45.5791	9.2763

Location ID	Latitude	Longitude	No Action DNL	Proposed Action DNL	Change
GRID000098961833	61.52624	-150.222	38.7495	45.3766	6.6271
GRID000098961834	61.53428	-150.226	38.1548	45.783	7.6282
GRID000098961835	61.54231	-150.231	37.6397	45.6376	7.9979
GRID000098962123	61.50421	-150.192	40.8759	46.0697	5.1938
GRID000098962124	61.51225	-150.196	39.9854	46.0682	6.0828
GRID000098962125	61.52028	-150.201	39.2166	46.187	6.9704
GRID000098962126	61.52832	-150.205	38.5658	45.9977	7.4319
GRID000098962412	61.51432	-150.18	39.9093	45.3218	5.4125

Source: AEDT and NOISEMAP modeling results, June 2026.
Prepared By: ATAC Corporation, June 2026.

Addendum S4-A

Table S4.4 Reportable Noise Increases in the DNL 45 dB to 60 dB Range – 2027

LocationID	Latitude	Longitude	Name	No Action DNL	Proposed Action DNL	Change
SECTION4F0146787	61.521802	-150.1947		38.7278	45.4372	6.7094
SECTION4F0146791	61.522551	-150.188702		38.7344	45.0178	6.2834
SECTION4F0146792	61.523081	-150.195927		38.6046	45.4088	6.8042
SECTION4F0146793	61.524578	-150.195133		38.491	45.2515	6.7605
SECTION4F0158049	61.521727	-150.193411		38.7456	45.3776	6.632
SECTION4F0168553	61.523518	-150.195861		38.5678	45.3792	6.8114
SECTION4F0168554	61.525609	-150.194071		38.4161	45.076	6.6599
SECTION4F0169963	61.522319	-150.195383		38.6787	45.4375	6.7588
SECTION4F0169965	61.521509	-150.193903		38.7571	45.4169	6.6598
SECTION4F0169966	61.521679	-150.190839		38.7724	45.2214	6.449
SECTION4F0195839	61.509943	-150.180621	D4	39.9945	45.3883	5.3938
SECTION4F0195840	61.510731	-150.183089	D21	39.8839	45.4999	5.616
SECTION4F0119065	61.511302	-150.176923		19 39.9285	45.0563	5.1278
GRID000002680912	61.34477	-151.107274		41.3326	46.7111	5.3785
GRID000002682863	61.346957	-151.090612		41.0762	46.5041	5.4279
GRID000002684814	61.349141	-151.073947		40.8216	46.0357	5.2141
GRID000002678961	61.342581	-151.123933		41.5889	46.7541	5.1652
GRID000002678960	61.334579	-151.119375		42.581	48.0835	5.5025
GRID000002678959	61.326577	-151.114819		43.6192	49.0408	5.4216
GRID000002680911	61.336767	-151.102719		42.2933	48.105	5.8117
GRID000002684811	61.325129	-151.060315		43.7327	49.328	5.5953
GRID000002680909	61.320761	-151.093618		44.3715	49.7385	5.367
GRID000002680910	61.328764	-151.098167		43.3193	49.1287	5.8094
GRID000002684813	61.341137	-151.069401		41.7212	47.4688	5.7476
GRID000002682861	61.33095	-151.081513		43.0172	49.0613	6.0441
GRID000002686764	61.343319	-151.052738		41.4235	46.8024	5.3789
GRID000002686763	61.335315	-151.048198		42.3783	48.0614	5.6831
GRID000002686762	61.32731	-151.04366		43.374	48.823	5.449
GRID000002684812	61.333133	-151.064857		42.714	48.6536	5.9396
GRID000002682862	61.338953	-151.086061		42.0069	47.9423	5.9354
GRID000002682860	61.322946	-151.076968		44.0671	49.7663	5.6992
GRID000002688713	61.329488	-151.027003		43.0167	48.1642	5.1475
GRID000002688714	61.337494	-151.031537		42.0443	47.2873	5.243
GRID000002776523	61.545859	-150.34045		36.3729	45.2873	8.9144
GRID000002782376	61.552129	-150.289955		35.8109	45.0535	9.2426
GRID000002772620	61.533639	-150.369708		37.0949	45.1431	8.0482
GRID000002788225	61.526241	-150.22201		38.4062	45.0015	6.5953
GRID000002778474	61.547951	-150.323621		36.0239	45.1262	9.1023
GRID000002786277	61.548264	-150.251915		35.9592	45.2016	9.2424
GRID000002784326	61.546181	-150.26875		35.9037	45.1051	9.2014
GRID000002768716	61.513384	-150.394545		37.6022	45.2057	7.6035
GRID000002786276	61.54023	-150.247553		36.555	45.0245	8.4695
GRID000002788226	61.534275	-150.226364		37.8063	45.4072	7.6009
GRID000002788227	61.54231	-150.23072		37.2994	45.2712	7.9718
GRID000002770668	61.523512	-150.38213		36.7528	45.1189	8.3661
GRID000002774572	61.543765	-150.357277		36.3268	45.0237	8.6969
GRID000002780425	61.550041	-150.306789		35.9576	45.0923	9.1347
GRID000002790175	61.520282	-150.200836		38.8601	45.81	6.9499
GRID000002790176	61.528318	-150.205183		38.2119	45.6209	7.409
GRID000002768715	61.505355	-150.39015		38.1453	45.3717	7.2264
GRID000002790174	61.512246	-150.196491		39.6279	45.6916	6.0637
GRID000002790173	61.50421	-150.192148		40.5251	45.6932	5.1681
GRID000002768714	61.497326	-150.385758		37.9142	45.052	7.1378
GRID000002653569	61.082058	-151.207592		39.7319	45.1168	5.3849
GRID000002651618	61.079858	-151.224102		39.8736	45.131	5.2574
GRID000002655520	61.084255	-151.191078		39.8176	45.1766	5.359
GRID000002657471	61.086451	-151.174563		39.613	45.0494	5.4364
GRID000002649666	61.06966	-151.236064		39.321	45.0233	5.7023

GRID000002684811	61.325129	-151.060315	State Land Disposals - Municipal Purposes	43.7327	49.328	5.5953
GRID000002688713	61.329488	-151.027003	State Land Disposals - Municipal Purposes	43.0167	48.1642	5.1475
GRID000002688714	61.337494	-151.031537	State Land Disposals - Municipal Purposes	42.0443	47.2873	5.243
GRID000002768714	61.497326	-150.385758	State Land Disposals - Municipal Purposes	37.9142	45.052	7.1378
GRID000002768715	61.505355	-150.39015	State Land Disposals - Municipal Purposes	38.1453	45.3717	7.2264
GRID000002788225	61.526241	-150.22201	State Land Disposals - Municipal Purposes	38.4062	45.0015	6.5953
GRID000002788226	61.534275	-150.226364	State Land Disposals - Municipal Purposes	37.8063	45.4072	7.6009
GRID000002790173	61.50421	-150.192148	State Land Disposals - Municipal Purposes	40.5251	45.6932	5.1681
GRID000002790174	61.512246	-150.196491	State Land Disposals - Municipal Purposes	39.6279	45.6916	6.0637
GRID000002790176	61.528318	-150.205183	State Land Disposals - Municipal Purposes	38.2119	45.6209	7.409
GRID000002686762	61.32731	-151.04366	State Patented	43.374	48.823	5.449
GRID000002686763	61.335315	-151.048198	State Patented	42.3783	48.0614	5.6831
GRID000002686764	61.343319	-151.052738	State Patented	41.4235	46.8024	5.3789
GRID000002768716	61.513384	-150.394545	State Patented	37.6022	45.2057	7.6035
GRID000002770668	61.523512	-150.38213	State Patented	36.7528	45.1189	8.3661
GRID000002772620	61.533639	-150.369708	State Patented	37.0949	45.1431	8.0482
GRID000002774572	61.543765	-150.357277	State Patented	36.3268	45.0237	8.6969
GRID000002776523	61.545859	-150.34045	State Patented	36.3729	45.2873	8.9144
GRID000002778474	61.547951	-150.323621	State Patented	36.0239	45.1262	9.1023
GRID000002780425	61.550041	-150.306789	State Patented	35.9576	45.0923	9.1347
GRID000002782376	61.552129	-150.289955	State Patented	35.8109	45.0535	9.2426
GRID000002784326	61.546181	-150.26875	State Patented	35.9037	45.1051	9.2014
GRID000002786276	61.54023	-150.247553	State Patented	36.555	45.0245	8.4695
GRID000002786277	61.548264	-150.251915	State Patented	35.9592	45.2016	9.2424
GRID000002788227	61.54231	-150.23072	State Patented	37.2994	45.2712	7.9718
GRID000002778431	61.202483	-150.137354	Whale, beluga [Cook Inlet DPS]	51.6128	57.129	5.5162
GRID000002780381	61.19651	-150.11642	Whale, beluga [Cook Inlet DPS]	52.1186	57.4383	5.3197
GRID000002780382	61.204547	-150.120697	Whale, beluga [Cook Inlet DPS]	51.8043	57.7376	5.9333
GRID000002772620	61.533639	-150.369708	Willow to Yentna	37.0949	45.1431	8.0482
GRID000002768715	61.505355	-150.39015	Willow to Yentna	38.1453	45.3717	7.2264
GRID000002768716	61.513384	-150.394545	Willow to Yentna	37.6022	45.2057	7.6035
GRID000002770668	61.523512	-150.38213	Willow to Yentna	36.7528	45.1189	8.3661
GRID000002772620	61.533639	-150.369708	Knik-Susitna	37.0949	45.1431	8.0482
GRID000002768716	61.513384	-150.394545	Knik-Susitna	37.6022	45.2057	7.6035
GRID000002770668	61.523512	-150.38213	Knik-Susitna	36.7528	45.1189	8.3661
GRID000002678961	61.342581	-151.123933	Beluga Indian Trail	41.5889	46.7541	5.1652
GRID000002678960	61.334579	-151.119375	Beluga Indian Trail	42.581	48.0835	5.5025
GRID000002678959	61.326577	-151.114819	Beluga Indian Trail	43.6192	49.0408	5.4216
GRID000002680909	61.320761	-151.093618	Beluga Indian Trail	44.3715	49.7385	5.367
GRID000002682860	61.322946	-151.076968	Beluga Indian Trail	44.0671	49.7663	5.6992

Addendum S4-B

Table S4.7 Reportable Noise Increases in the DNL 45 dB to 60 dB Range – 2032

LocationID	Latitude	Longitude	Name	No Action DNL	Proposed Action DNL	Change
SECTION4F0145753	61.473731	-150.387238		39.2064	45.136	5.9296
SECTION4F0145754	61.474292	-150.383246		39.1323	45.2617	6.1294
SECTION4F0145755	61.476419	-150.381771		38.8719	45.227	6.3551
SECTION4F0145756	61.478443	-150.381635		38.6629	45.1525	6.4896
SECTION4F0145769	61.479787	-150.379614		38.5881	45.0987	6.5106
SECTION4F0146744	61.526474	-150.191548		38.7256	45.1122	6.3866
SECTION4F0146787	61.521802	-150.1947		39.0752	45.8139	6.7387
SECTION4F0146790	61.522248	-150.186295		39.1236	45.153	6.0294
SECTION4F0146791	61.522551	-150.188702		39.0906	45.3942	6.3036
SECTION4F0146792	61.523081	-150.195927		38.96	45.7855	6.8255
SECTION4F0146793	61.524578	-150.195133		38.8395	45.6284	6.7889
SECTION4F0158049	61.521727	-150.193411		39.0947	45.7545	6.6598
SECTION4F0158074	61.51364	-150.210829		39.8578	45.0905	5.2327
SECTION4F0166111	61.473409	-150.3882		39.24	45.0684	5.8284
SECTION4F0166112	61.475074	-150.382302		39.0262	45.2264	6.2002
SECTION4F0166113	61.47377	-150.385194		39.195	45.1742	5.9792
SECTION4F0166166	61.478898	-150.380634		38.6381	45.1297	6.4916
SECTION4F0166189	61.521023	-150.184751		39.2419	45.1259	5.884
SECTION4F0166209	61.477782	-150.382028		38.7335	45.2243	6.4908
SECTION4F0166211	61.479679	-150.378626		38.6145	45.0519	6.4374
SECTION4F0168552	61.522978	-150.187196		39.0625	45.1909	6.1284
SECTION4F0168553	61.523518	-150.195861		38.9231	45.7558	6.8327
SECTION4F0168554	61.525609	-150.194071		38.7713	45.4525	6.6812
SECTION4F0168661	61.47601	-150.385404		38.9304	45.1629	6.2325
SECTION4F0168662	61.475507	-150.387912		39.0048	45.0607	6.0559
SECTION4F0169963	61.522319	-150.195383		39.0259	45.8142	6.7883
SECTION4F0169965	61.521509	-150.193903		39.1061	45.7939	6.6878
SECTION4F0169966	61.521679	-150.190839		39.1286	45.598	6.4694
SECTION4F0169971	61.521617	-150.185977		39.1778	45.1922	6.0144
SECTION4F0176539	61.522563	-150.187745		39.0994	45.3265	6.2271
SECTION4F0195839	61.509943	-150.180621	D4	40.3446	45.7647	5.4201
SECTION4F0195840	61.510731	-150.183089	D21	40.2426	45.8765	5.6339
SECTION4F0195858	61.516569	-150.179649	K4	39.6971	45.0706	5.3735
SECTION4F0195863	61.518463	-150.182229	K2-4	39.4918	45.1309	5.6391
SECTION4F0117009	61.074038	-151.256076	TYONEK RESERVE 1	40.0581	45.2124	5.1543
SECTION4F0117010	61.074038	-151.256076	TYONEK RESERVE 1 Re-entryXX	40.0581	45.2124	5.1543
SECTION4F0117089	61.069792	-151.250264	SIMPCO CHUITNA 1XX	39.8166	45.33	5.5134
SECTION4F0117092	61.069792	-151.250264	SIMPCO CHUITNA 1XX	39.8166	45.33	5.5134
SECTION4F0118366	61.095672	-151.13853		15 40.0399	45.2549	5.215
SECTION4F0119055	61.481202	-150.385123		1 38.4032	45.2209	6.8177
SECTION4F0119056	61.481202	-150.379923		14 38.4936	45.1079	6.6143
SECTION4F0119065	61.511302	-150.176923		19 40.2849	45.4316	5.1467
GRID000002680912	61.34477	-151.107274		41.7038	47.0884	5.3846
GRID000002682863	61.346957	-151.090612		41.4467	46.8814	5.4347
GRID000002684814	61.349141	-151.073947		41.1917	46.4031	5.2114
GRID000002678961	61.342581	-151.123933		41.9614	47.122	5.1606
GRID000002678960	61.334579	-151.119375		42.9546	48.4519	5.4973
GRID000002678959	61.326577	-151.114819		43.9925	49.4091	5.4166
GRID000002680911	61.336767	-151.102719		42.6668	48.4832	5.8164
GRID000002684811	61.325129	-151.060315		44.1058	49.6964	5.5906
GRID000002680909	61.320761	-151.093618		44.7457	50.1168	5.3711
GRID000002680910	61.328764	-151.098167		43.6927	49.4972	5.8045
GRID000002684813	61.341137	-151.069401		42.0935	47.837	5.7435
GRID000002682861	61.33095	-151.081513		43.3905	49.4396	6.0491
GRID000002686764	61.343319	-151.052738		41.7956	47.1704	5.3748
GRID000002686763	61.335315	-151.048198		42.7505	48.4393	5.6888
GRID000002686762	61.32731	-151.04366		43.7471	49.1914	5.4443
GRID000002684812	61.333133	-151.064857		43.0864	49.0315	5.9451

GRID000002682862	61.338953	-151.086061		42.3793	48.3203	5.941
GRID000002682860	61.322946	-151.076968		44.4402	50.1347	5.6945
GRID000002688713	61.329488	-151.027003		43.3898	48.5421	5.1523
GRID000002688714	61.337494	-151.031537		42.4165	47.665	5.2485
GRID000002776523	61.545859	-150.34045		36.7221	45.6556	8.9335
GRID000002782376	61.552129	-150.289955		36.1668	45.4218	9.255
GRID000002772620	61.533639	-150.369708		37.4263	45.5091	8.0828
GRID000002788225	61.526241	-150.22201		38.7495	45.3766	6.6271
GRID000002778474	61.547951	-150.323621		36.3823	45.4947	9.1124
GRID000002786277	61.548264	-150.251915		36.3028	45.5791	9.2763
GRID000002784327	61.554214	-150.273119		35.6555	45.2082	9.5527
GRID000002784326	61.546181	-150.26875		36.2591	45.4832	9.2241
GRID000002768716	61.513384	-150.394545		37.9181	45.579	7.6609
GRID000002786276	61.54023	-150.247553		36.9065	45.3919	8.4854
GRID000002788226	61.534275	-150.226364		38.1548	45.783	7.6282
GRID000002788227	61.54231	-150.23072		37.6397	45.6376	7.9979
GRID000002770668	61.523512	-150.38213		37.0836	45.4949	8.4113
GRID000002774572	61.543765	-150.357277		36.6728	45.3915	8.7187
GRID000002780425	61.550041	-150.306789		36.3081	45.4708	9.1627
GRID000002790175	61.520282	-150.200836		39.2166	46.187	6.9704
GRID000002790176	61.528318	-150.205183		38.5658	45.9977	7.4319
GRID000002768715	61.505355	-150.39015		38.4537	45.7425	7.2888
GRID000002790174	61.512246	-150.196491		39.9854	46.0682	6.0828
GRID000002790177	61.536353	-150.209532		38.049	45.3025	7.2535
GRID000002790173	61.50421	-150.192148		40.8759	46.0697	5.1938
GRID000002792125	61.51432	-150.17967		39.9093	45.3218	5.4125
GRID000002768714	61.497326	-150.385758		38.2274	45.4147	7.1873
GRID000002768711	61.473238	-150.372595		39.2489	45.0595	5.8106
GRID000002768713	61.489297	-150.381368		38.1497	45.1756	7.0259
GRID000002653569	61.082058	-151.207592		40.0079	45.4831	5.4752
GRID000002651617	61.071861	-151.21956		39.1757	45.3469	6.1712
GRID000002647715	61.067457	-151.252566		39.7017	45.3112	5.6095
GRID000002643812	61.05505	-151.281007		39.0277	45.105	6.0773
GRID000002641861	61.052841	-151.297498		39.6099	45.114	5.5041
GRID000002643813	61.063045	-151.285563		40.0307	45.1988	5.1681
GRID000002647716	61.075453	-151.257117		39.7408	45.0449	5.3041
GRID000002645763	61.057256	-151.264514		38.2671	45.0304	6.7633
GRID000002651618	61.079858	-151.224102		40.142	45.5025	5.3605
GRID000002655520	61.084255	-151.191078		40.0892	45.5416	5.4524
GRID000002655519	61.076257	-151.186544		38.4328	45.0487	6.6159
GRID000002653568	61.07406	-151.203053		38.6109	45.1726	6.5617
GRID000002657471	61.086451	-151.174563		39.887	45.4173	5.5303
GRID000002659422	61.088644	-151.158045		39.5967	45.248	5.6513
GRID000002645764	61.065252	-151.269066		40.0671	45.3193	5.2522
GRID000002649666	61.06966	-151.236064		39.5978	45.3928	5.795
GRID000002639910	61.050631	-151.313986		39.9465	45.1295	5.183
GRID000002684811	61.325129	-151.060315	State Land Disposals - Municipal Purposes	44.1058	49.6964	5.5906
GRID000002688713	61.329488	-151.027003	State Land Disposals - Municipal Purposes	43.3898	48.5421	5.1523
GRID000002688714	61.337494	-151.031537	State Land Disposals - Municipal Purposes	42.4165	47.665	5.2485
GRID000002768711	61.473238	-150.372595	State Land Disposals - Municipal Purposes	39.2489	45.0595	5.8106
GRID000002768713	61.489297	-150.381368	State Land Disposals - Municipal Purposes	38.1497	45.1756	7.0259
GRID000002768714	61.497326	-150.385758	State Land Disposals - Municipal Purposes	38.2274	45.4147	7.1873
GRID000002768715	61.505355	-150.39015	State Land Disposals - Municipal Purposes	38.4537	45.7425	7.2888
GRID000002788225	61.526241	-150.22201	State Land Disposals - Municipal Purposes	38.7495	45.3766	6.6271
GRID000002788226	61.534275	-150.226364	State Land Disposals - Municipal Purposes	38.1548	45.783	7.6282
GRID000002790173	61.50421	-150.192148	State Land Disposals - Municipal Purposes	40.8759	46.0697	5.1938
GRID000002790174	61.512246	-150.196491	State Land Disposals - Municipal Purposes	39.9854	46.0682	6.0828
GRID000002790176	61.528318	-150.205183	State Land Disposals - Municipal Purposes	38.5658	45.9977	7.4319
GRID000002790177	61.536353	-150.209532	State Land Disposals - Municipal Purposes	38.049	45.3025	7.2535

GRID000002686762	61.32731	-151.04366	State Patented	43.7471	49.1914	5.4443
GRID000002686763	61.335315	-151.048198	State Patented	42.7505	48.4393	5.6888
GRID000002686764	61.343319	-151.052738	State Patented	41.7956	47.1704	5.3748
GRID000002768716	61.513384	-150.394545	State Patented	37.9181	45.579	7.6609
GRID000002770668	61.523512	-150.38213	State Patented	37.0836	45.4949	8.4113
GRID000002772620	61.533639	-150.369708	State Patented	37.4263	45.5091	8.0828
GRID000002774572	61.543765	-150.357277	State Patented	36.6728	45.3915	8.7187
GRID000002776523	61.545859	-150.34045	State Patented	36.7221	45.6556	8.9335
GRID000002778474	61.547951	-150.323621	State Patented	36.3823	45.4947	9.1124
GRID000002780425	61.550041	-150.306789	State Patented	36.3081	45.4708	9.1627
GRID000002782376	61.552129	-150.289955	State Patented	36.1668	45.4218	9.255
GRID000002784326	61.546181	-150.26875	State Patented	36.2591	45.4832	9.2241
GRID000002784327	61.554214	-150.273119	State Patented	35.6555	45.2082	9.5527
GRID000002786276	61.54023	-150.247553	State Patented	36.9065	45.3919	8.4854
GRID000002786277	61.548264	-150.251915	State Patented	36.3028	45.5791	9.2763
GRID000002788227	61.54231	-150.23072	State Patented	37.6397	45.6376	7.9979
GRID000002778431	61.202483	-150.137354	Whale, beluga [Cook Inlet DPS]	51.953	57.4914	5.5384
GRID000002780381	61.19651	-150.11642	Whale, beluga [Cook Inlet DPS]	52.4753	57.8045	5.3292
GRID000002780382	61.204547	-150.120697	Whale, beluga [Cook Inlet DPS]	52.1464	58.1107	5.9643
GRID000002772620	61.533639	-150.369708	Willow to Yentna	37.4263	45.5091	8.0828
GRID000002768715	61.505355	-150.39015	Willow to Yentna	38.4537	45.7425	7.2888
GRID000002768716	61.513384	-150.394545	Willow to Yentna	37.9181	45.579	7.6609
GRID000002770668	61.523512	-150.38213	Willow to Yentna	37.0836	45.4949	8.4113
GRID000002772620	61.533639	-150.369708	Knik-Susitna	37.4263	45.5091	8.0828
GRID000002768716	61.513384	-150.394545	Knik-Susitna	37.9181	45.579	7.6609
GRID000002770668	61.523512	-150.38213	Knik-Susitna	37.0836	45.4949	8.4113
GRID000002678961	61.342581	-151.123933	Beluga Indian Trail	41.9614	47.122	5.1606
GRID000002678960	61.334579	-151.119375	Beluga Indian Trail	42.9546	48.4519	5.4973
GRID000002678959	61.326577	-151.114819	Beluga Indian Trail	43.9925	49.4091	5.4166
GRID000002680909	61.320761	-151.093618	Beluga Indian Trail	44.7457	50.1168	5.3711
GRID000002682860	61.322946	-151.076968	Beluga Indian Trail	44.4402	50.1347	5.6945
GRID000002659422	61.088644	-151.158045	Susitna-Tyonek	39.5967	45.248	5.6513