ASPEN/PITKIN COUNTY AIRPORT

2024 ANNUAL NOISE REPORT

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233 Airport Road
Aspen, Colorado 81611

PREPARED BY:

BridgeNet INTERNATIONAL

TETRA TECH

BRIDGENET INTERNATIONAL, A TETRA TECH COMPANY

2024 Annual Noise Report

Prepared:
April 2025

Prepared For:

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1.0 Introduction

The purpose of this report is to present the results from the 2024 modeling survey at Aspen/Pitkin County Airport (ASE or Airport). This report serves to provide the average annual noise level from aircraft operations at ASE using the day night noise level (DNL) and equivalent noise level (LEQ).

In 2024, the Airport underwent changes to its noise monitoring system, including adding two radar receivers and seven (7) additional noise monitoring terminals in the valley. The DNL and LEQ noise levels for this report used radar data to model aircraft operations due to the noise monitors being deployed late in the fourth quarter; therefore, only capturing a small portion of the operations. Future noise reports will include information on aircraft noise monitoring.

2.0 Background and Information about Noise

2.1 Background

A review of noise metrics utilized in this report are presented in this section.

2.2 Noise Metrics

The description, analysis, and reporting of community sound levels from aircraft are difficult given the complexity of human response to sound. This analysis utilized two primary noise metrics for analysis of aircraft noise impacts: Day Night Average Sound Level (DNL) and the Equivalent Noise Level (Leq). Both metrics are based on the A-weighted decibel (dBA), which most closely replicates how the human ear hears sound. This discussion includes information on the maximum sound level (Lmax) and Sound Exposure Level (SEL) that are used in the calculation of DNL and Leq.

Maximum Sound Level. Lmax is a measure of single-event noise that describes the loudness of a single flyover regardless of the time of day or the number of such events. Lmax is the peak, or loudest, sound reached during an aircraft flyover. There are no noise or land use compatibility standards in terms of Lmax. In general, it is the metric that is more easily related to by the public because it is what the public hears on a per-event basis.

Sound Exposure Level. SEL is calculated by summing the dB level at each second during a noise event and compressing that noise into one second. It is the level the noise would be if it all occurred in one second and allows different noise events to be compared in a uniform manner. The SEL value is the integration of all the acoustic energy contained within an event and considers the maximum noise level and duration of the event.

Day Night Average Sound Level. DNL, the primary metric for analysis, is a cumulative noise metric because it represents a measure of the total noise over a 24-hour period. Cumulative noise metrics are useful because these scales attempt to combine the loudness of each event, the duration of these events, the total number of events, and the time of day these events occur into a single number rating scale. The DNL also considers the loudness of the events and how often and when they occur. Aircraft events occurring between 10 p.m. and 7 a.m. are penalized 10 dBA to account for lower ambient noise levels at night. The FAA, the Environmental Protection Agency (EPA), and other government agencies use DNL in assessing noise and land use compatibility.

Equivalent Noise Level. Leq is a cumulative metric that represents a defined time period, typically in hours. Leq measures the average acoustic energy over a period of time to take account of the cumulative effect of multiple noise events. Leq is defined as the level of continuous sound over a given time period that would deliver the same amount of energy as the actual, varying sound exposure. Leq is typically used to describe noise impacts for noise sensitive locations or situations. In this report, Leq16 is used to average noise over a 16-hour period that represents hours of operations at ASE from 7 am – 11 pm. As with the DNL metric, Leq includes a 10 dB nighttime penalty for operations after 10 pm.

2.3 Federal and Local Noise Assessment Guidelines

Noise/Land use guidelines have been developed by several agencies, including the FAA. As a means of implementing the Aviation Safety and Noise Abatement Act, the FAA adopted regulations on airport noise compatibility planning programs. The guidelines specify a maximum amount of noise exposure (in terms of the cumulative DNL noise metric) that will be considered acceptable to or compatible with people in both living and working areas. Residential land use is deemed compatible for noise exposures up to 65 DNL.

3.0 Annual Noise Contours

3.1 Introduction

The FAA's Aviation Environmental Design Tool (AEDT) was used to model the flight operations at Aspen/Pitkin County Airport and is the accepted industry standard software to model aircraft noise at airports in the United States as well as for international environmental analysis. The AEDT has an extensive database of civilian aircraft noise characteristics.

Airport noise contours were generated using AEDT Version 3g, the most recent version available at the time of this report. Version 3g was released for use in August 2024, and is state-of-the-art airport noise modeling. AEDT is a computer program developed to plot noise contours for airports which includes standard aircraft noise and performance data for more than 200 aircraft types and can be tailored to the characteristics of the airport in question.

One of the most important factors in generating accurate noise contours is the collection of accurate operational data. AEDT requires the input of the physical and operational characteristics of an airport. Physical characteristics include runway coordinates, airport elevation, temperature, and optional topographical data. Operational characteristics include various types of aircraft data. This includes not only the aircraft types and flight tracks but also departure procedures, arrival procedures, and stage lengths specific to the operations at the airport. While AEDT contains a wealth of information, there were minor adjustments made to these inputs to better reflect local conditions as captured and validated by the noise monitors in the Park and south of the Airport. Aircraft data needed to generate noise contours include:

- Number of operations by aircraft type
- Types of aircraft
- Daytime/nighttime distribution by aircraft type
- Flight tracks
- Flight track utilization by aircraft type
- Flight profiles
- Typical operational procedures
- Average meteorological conditions

3.2 Existing Aircraft Operations

The existing noise environment for the Airport was analyzed based upon the 2024 annual operations. The data was derived from various sources, which include radar system data. A variety of operational data is necessary to determine the noise environment around the airport. This data includes the following summary information and is discussed in detail in the following paragraphs:

- Aircraft activity levels

- Fleet mix
- Time of day
- Runway use
- Flight path utilization

The tower count data showed that for 2024, there was a total of 48,502 annual operations, or an average of 133 operations per day. An operation is a departure or an arrival. The breakdown by aircraft category was determined from a variety of sources that include:

- Airport radar
- FAA Operations Network (OPSNET)
- FAA Traffic Flow Management Systems (TFMS)

The 2024 aircraft operations for each category of operation are summarized in **Table 3-1.** These operations are categorized as narrow-body jets, regional jets, business jets, general aviation (GA) multi and single engine/other. The total number of annual GA jet aircraft was determined from the Airport's radar data, which provides information on aircraft that file IFR flight plans, accounting for nearly all larger aircraft including business jets. Larger twin-engine propeller aircraft are also counted in airport radar, but smaller aircraft flying VFR are not always included. The AEDT model was based upon a compilation of all 48,502 operations at the Airport.

Table 3-1
Summary of Operations - 2024

Category	Arrivals		Departures		Daily	Annual	Percent
	Day	*Night*	*Day*	*Night*	**Operations**	**Operations**	
Narrow-body Jet	0.02	-	0.02	-	0.05	18	0.0%
Regional Jet	19.99	0.31	20.26	0.04	40.60	14,860	30.6%
Business Jet	35.41	0.03	35.41	0.03	70.87	25,938	53.5%
GA Multi Eng	1.84	0.02	1.84	0.02	3.72	1,362	2.8%
GA Single Eng/Other	8.58	0.06	8.63	0.01	17.28	6,324	13.0%
Totals	**65.84**	**0.42**	**66.17**	**0.09**	**132.52**	**48,502**	**100.0%**

Source: FAA OPSNET, FAA TFMS data, and Airport Noise Monitoring System

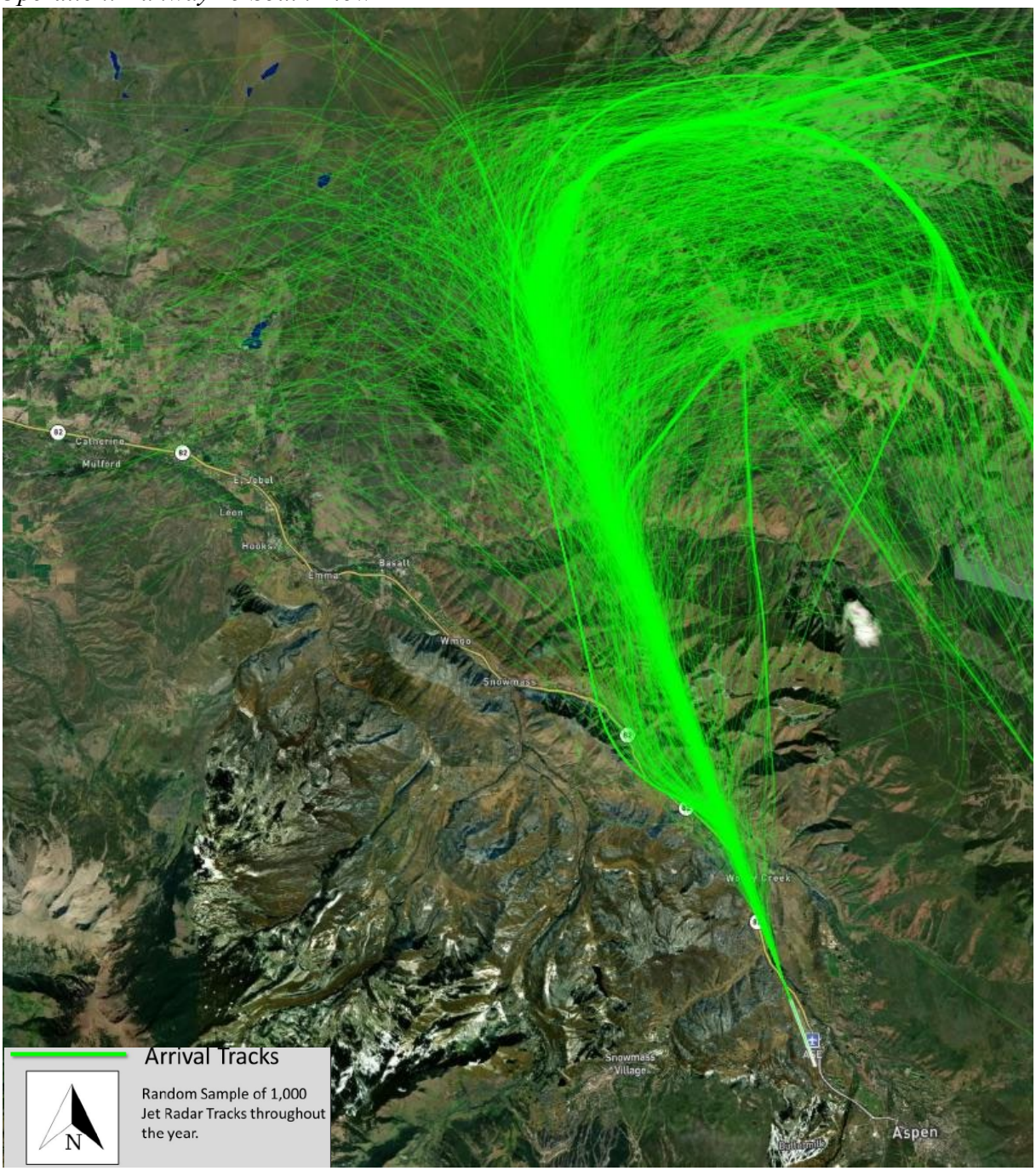
Fleet Mix: The fleet mix of aircraft that operate at the airport is one of the most important factors of the aircraft noise environment. The fleet mix data was determined from a review of various sources including the airport radar database and FAA TFMS data.

Time of Day: In the DNL metric, any operations that occur after 10 p.m. and before 7 a.m. are labeled "nighttime operations." These operations are considered more intrusive and are weighted by 10 dBA. Therefore, the number of nighttime operations is critical in determining the DNL noise environment and is also important to the residences around the Airport. The nighttime operational assumption data is summarized in **Table 3-1**.

Runway Use: An additional important consideration in developing the noise contours is the percentage of time each runway is utilized. Wind direction, weather and terrain dictate the runway direction utilized by an aircraft. From a safety standpoint, it is safest for an aircraft to arrive and depart into the wind; when wind direction changes, operations are shifted to the runway that favors the new wind direction. For the Airport, due to the mountainous terrain, aircraft typically arrive and depart in the same direction, arriving on Runway 15 and departing on Runway 33.

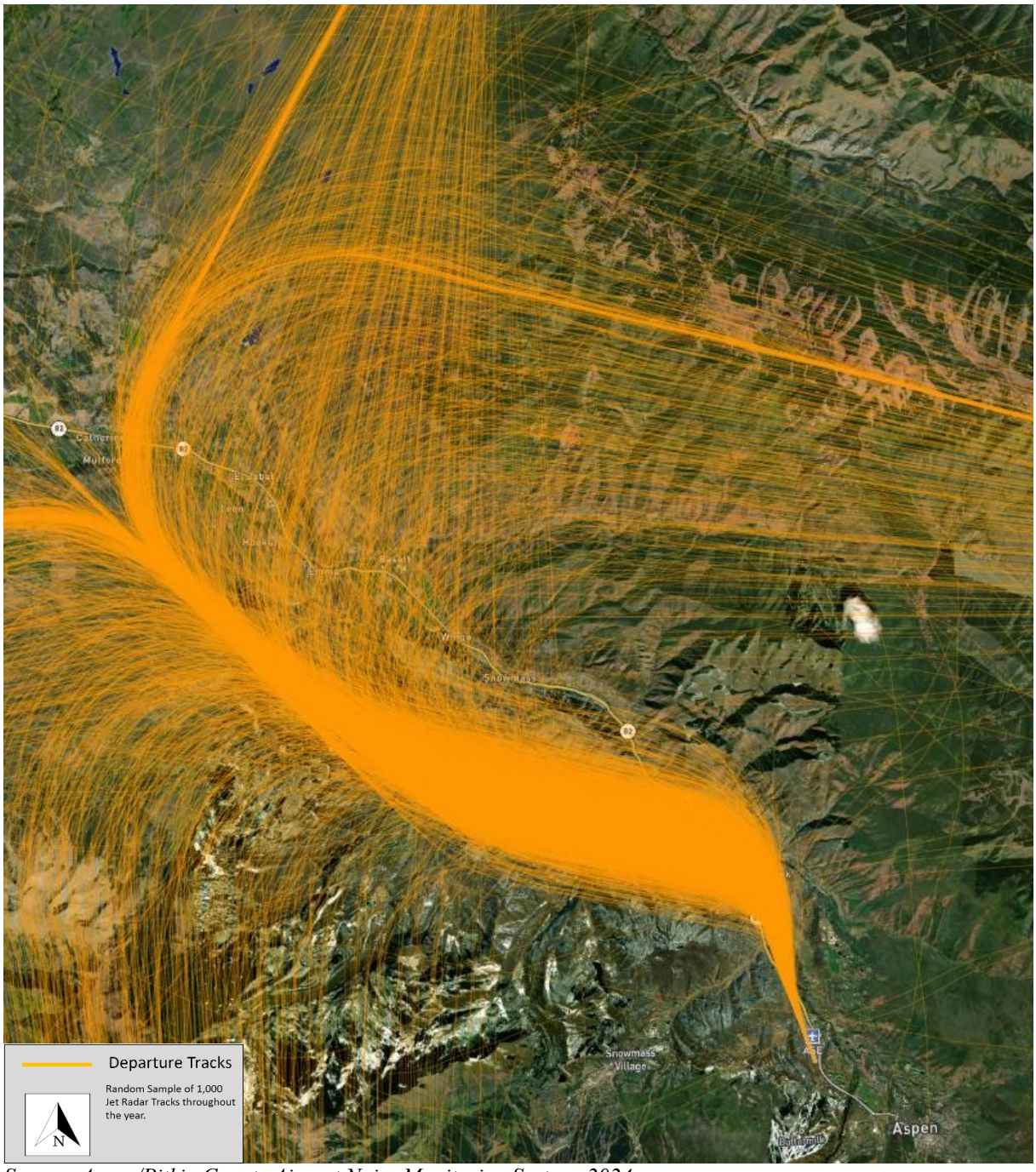
Flight Path Utilization: These paths are not precisely defined ground tracks but represent a broad area over which the aircraft will generally fly. A sample of the 2024 radar flight tracks are presented in **Figure 3-1** and **3-2**. The flight track data was used to help define the location of the aircraft flight paths.

Figure 3-1
Jet Arrival Tracks
Operation: Runway 15 South Flow



Source: Aspen/Pitkin County Airport Noise Monitoring System, 2024

Figure 3-2
Jet Departure Flight Tracks
Operation: Runway 33 North Flow



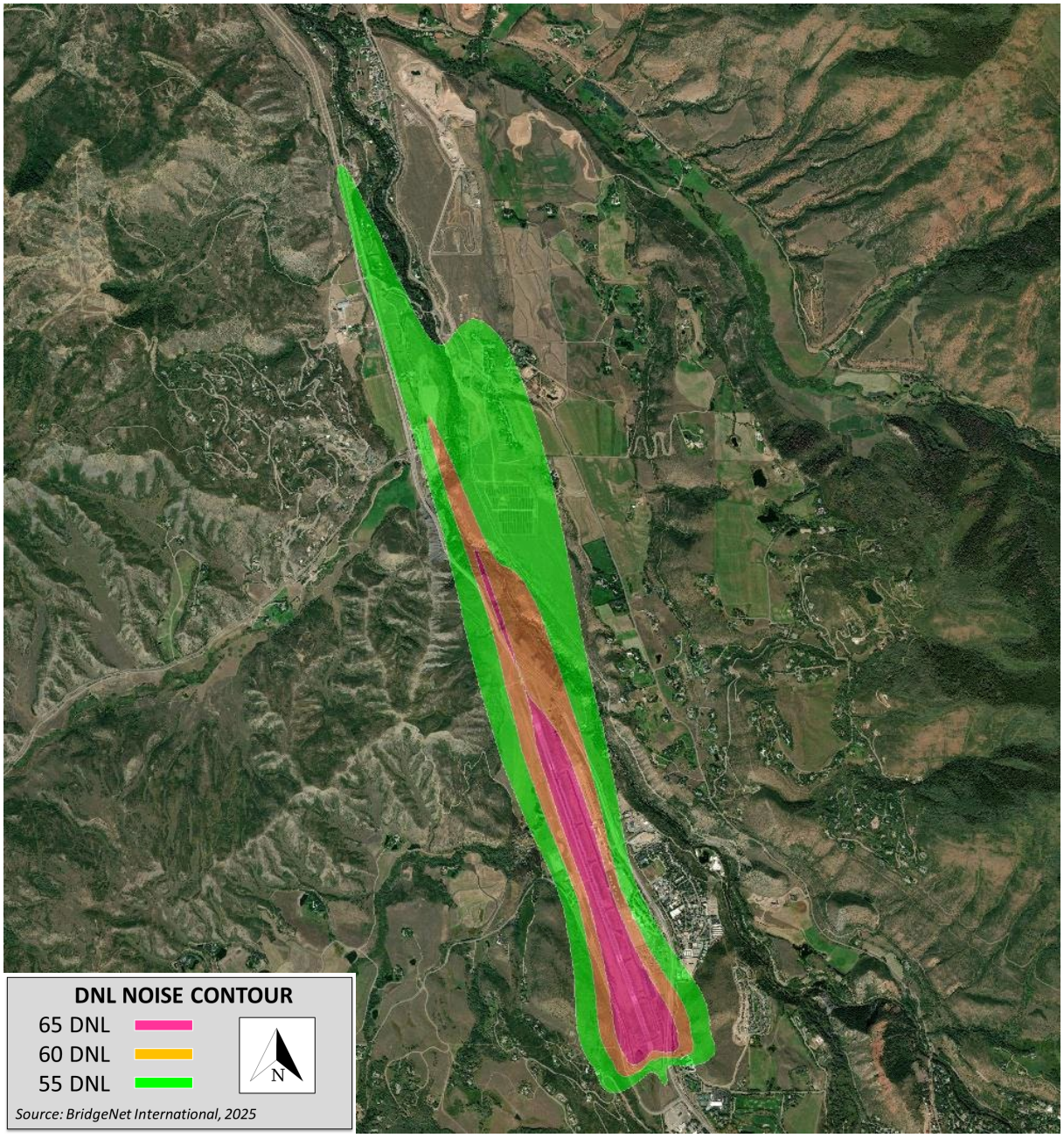
Source: Aspen/Pitkin County Airport Noise Monitoring System, 2024

3.3 DNL Noise Modeling Results

The noise metric used to assess the 2024 annual noise contour is the Day Night Average Sound Level (DNL). This model uses FAA standard modeling assumptions that would be required within an FAA-sponsored environmental study. The DNL is a 24-hour time-weighted energy average noise level based on the A-weighted decibel. It is a measure of the overall noise experienced during an entire year of flight operations. These contours were developed using AEDT version 3g, with the effects of terrain not included. These contours will be updated using terrain in Version 4, which now includes a significant enhancement to the terrain calculation. These should contours should be considered draft and will be updated before Fly with Integrity is implemented.

The 2024 AEDT contours are presented in **Figure 3-3**.

Figure 3-3
2024 Annual DNL Noise Contour



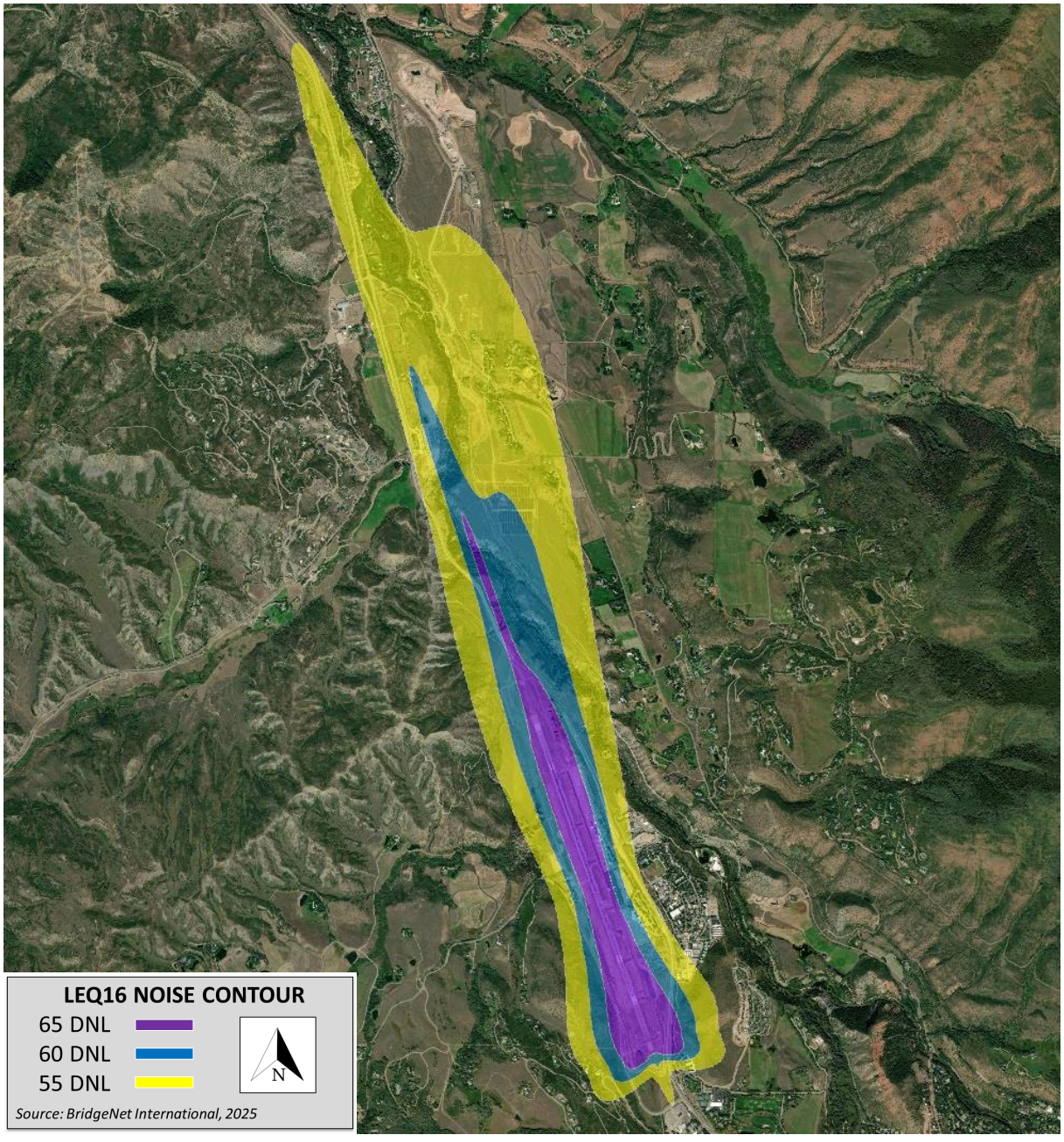
Source: BridgeNet International, 2025

3.4 LEQ Noise Modeling Results

Leq16 was used to assess the 2024 annual noise contour for the 16-hours the Airport is operational from 7 am – 11 pm. This model uses FAA standard modeling assumptions. The Leq is a time-weighted energy average noise level based on the A-weighted decibel. It is a measure of the overall noise experienced during an entire year of flight operations during the Airport's hours of operation. Note the LEQ16 contours will always be larger than the DNL contour in that the hours during the night are removed from the averaging calculation.

The 2024 Leq16 contours are presented in **Figure 3-4**.

Figure 3-4
2024 Annual LEQ16 Noise Contour



Source: BridgeNet International, 2025