

Appendix K File Structure

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Appendix K

Noise Technical Report

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Draft

Noise Technical Report

Phoenix Area Federal Aviation Administration Modernization Project Environmental Assessment

April 2026

Prepared for:

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Executive Summary

In support of the Phoenix Area Federal Aviation Administration (FAA) Modernization Project Environmental Assessment (the PHX EA), this Noise Technical Report assesses the potential changes in aircraft noise associated with the project. The study team—led by prime contractor Concept Solutions with support from Harris Miller Miller & Hanson Inc. (HMMH)—evaluated potential changes from noise resulting from the Proposed Action in accordance with the National Environmental Policy Act (NEPA) and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (FAA 2015), and FAA Order JO 7400.2R, *Procedures for Handling Airspace Matters* (FAA 2025a).

Using noise modeling, HMMH developed noise levels for the 2024 Existing Conditions and two future years: calendar year (CY) 2027, which corresponds to the year of implementation, and CY 2032, representing a five-year interval beyond the implementation year. For each future year, a Proposed Action and a No Action Alternative were assessed and evaluated.

Noise modeling grid points were used to illustrate average daily noise exposure within the project Study Areas. The evaluation of noise changes associated with the Proposed Action concluded that there are reportable changes in noise levels in three general areas over noncompatible land use, near Scottsdale Airport, near Phoenix Deer Valley Airport and north of Phoenix Sky Harbor International Airport (PHX), but these areas all remain below significance levels. There is also a small area over compatible land use just north of the runway at Chandler Municipal Airport.

When an action (compared to the No Action Alternative for the same timeframe) would cause noise-sensitive areas to have a Day-Night Average Sound Level (DNL) greater than or equal to 65 decibels (dB) and experience a change in noise of at least 1.5 dB, the impact is considered significant. The Proposed Action does not indicate any areas of significant noise changes over noncompatible land use; therefore, no mitigation is proposed or required for the Proposed Action.

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Acronyms and Abbreviations

AAD	Average Annual Day
AEDT	Aviation Environmental Design Tool
ADIP	Airport Data and Information Portal
AFE	Above Field Elevation
AGL	Above Ground Level
ARP	Office of Airports (FAA)
ATC	Air Traffic Control
CY	Calendar Year
DNL	Day-Night Average Sound Level
DVT	Phoenix Deer Valley Airport
dB	Decibel(s)
EA	Environmental Assessment
EECP	Expanded East Coast Plan
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FICON	Federal Interagency Committee on Noise
FFZ	Falcon Field Airport
GA	General Aviation
GEU	Glendale Regional Airport
GIS	Geographic Information System
GPS	Global Positioning System
GYR	Goodyear Airport
IAP	Instrument Approach Procedure
ICAO	International Civil Aviation Organization
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
IWA	Phoenix–Mesa Gateway Airport
MSL	Mean Sea Level
NASR	National Airspace System Resource
NAVAID	Navigational Aid
NEPA	National Environmental Policy Act

NM	Nautical Mile(s)
NPD	Noise-Power-Distance
NLR	Noise Level Reduction
OPSNET	Operational Network
P19	Stellar Airpark
PBN	Performance-Based Navigation
PDARS	Performance Data Analysis and Reporting System
PHX	Phoenix Sky Harbor International Airport
RNAV	Area Navigation
SDL	Scottsdale Airport
SEL	Sound Exposure Level
SID	Standard Instrument Departure
SLUCM	Standard Land Use Coding Manual
STAR	Standard Terminal Arrival Route
TAF	Terminal Area Forecast
TFMSC	Traffic Flow Management System Counts
TRACON	Terminal Radar Approach Control
USGS	United States Geological Survey
U.S.	United States
U.S.C.	United States Code
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

1. Introduction

This Noise Technical Report has been prepared in support of the Phoenix Area Federal Aviation Administration (FAA) Modernization Project Environmental Assessment (the PHX EA). The purpose of this report is to evaluate the potential changes in aircraft noise associated with the Proposed Action. The analysis was conducted by the study team, led by prime contractor Concept Solutions with support from Harris Miller Miller & Hanson Inc. (HMMH), to inform compliance with the National Environmental Policy Act (NEPA) and to meet the requirements of FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (FAA 2015), and FAA Order JO 7400.2R, *Procedures for Handling Airspace Matters* (FAA 2025a).

The PHX EA will include 2024 as the existing conditions year. The FAA plans to implement the proposed procedures that are part of the PHX EA during calendar year 2027; therefore, the implementation year and implementation year plus five forecast operations will represent 2027 and 2032, respectively. Using noise modeling, the study team assessed noise levels and changes for the following five scenarios: Existing Conditions (2024), and No Action Alternative and Proposed Action for both Forecast Years 2027 and 2032.

Section 2 of this report presents the regulatory setting. **Section 3** presents the noise analysis objectives. **Section 4** presents the noise modeling methodology. **Section 5** presents the analysis of the existing and future (2027 and 2032) scenarios and impact results. **Section 6** includes the references used herein. **Attachment A** provides the noise modeling input memorandums. **Attachment B** provides the Aviation Environmental Design Tool (AEDT) aircraft substitution requests and approvals. **Attachment C** provides the change in noise at the Census block centroids. **Attachment D** provides the change in noise at Section 4(f), Historic, and Cultural grid points. **Attachment E** provides the change in noise at the uniform grid points. **Attachment F** provides the change in noise at the noise-sensitive grid points. **Attachment G** provides the change in noise at the airport area grid points.

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2. Regulatory Setting

2.1 FAA Orders

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, serves as the FAA's policy and procedures for compliance with NEPA (FAA 2015). The provisions of this Order apply to actions directly undertaken by the FAA and to actions undertaken by a nonfederal entity where the FAA has authority to condition a permit, license, or other approval. The requirements in this Order apply to, but are not limited to, the following actions: grants, loans, contracts, leases, construction and installation actions, procedural actions, research activities, rulemaking and regulatory actions, certifications, licensing, permits, plans submitted to the FAA by state and local agencies for approval, and legislation proposed by the FAA. FAA Order 1050.1F and 1050.1 Desk Reference (FAA 2025a) provide the specific requirements for the PHX EA.

FAA Order JO 7400.2R provides guidance and establishes policy and procedures to assist air traffic personnel in applying the requirements of FAA Order 1050.1F (FAA 2025a). Establishing and implementing a new or revised performance-based navigation (PBN) Instrument Flight Procedure (IFP) constitutes a federal action under NEPA. Accordingly, the FAA must consider environmental impacts such as noise before it can take steps to implement a PBN IFP.

2.2 Noise Metrics

These orders and related guidance documents specify the use of the Day-Night Average Sound Level (DNL) as the noise metric used in all FAA aviation noise studies in airport communities. DNL, a cumulative sound level, provides a measure of total sound energy. DNL is a logarithmic average of the sound levels of multiple events at one location over a 24-hour period. A 10 decibel (dB) weighting is added to all sounds occurring during nighttime hours (between 10:00 p.m. and 6:59 a.m.). The 10 dB increase for nighttime events accounts for the added disturbance of noise during typical sleeping hours as ambient sound levels during nighttime hours are typically about 10 dB lower than during daytime hours (FAA 2015; FAA 2023a).

In practice, this requirement means that DNL levels are computed for the Average Annual Day (AAD) of operations for the year of interest. An AAD represents all the aircraft operations for each day in a study year divided by 365 or 366 for leap years, the number of days in a year. The AAD does not reflect a particular day but is meant to represent a typical day over a period of a year. Beyond requiring the 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 PHX EA. More information on noise metrics is provided in **Appendix J** of the PHX EA.

2.3 Noise Impact Criteria

The noise analysis provided in this report compares the No Action Alternative and the Proposed Action for the future years using the FAA's thresholds for significance. **Table 1** defines the FAA-defined significance thresholds for changes in aircraft noise in accordance with FAA Order 1050.1F (FAA 2015). When an action (compared to the No Action Alternative for the same timeframe) would cause noise-sensitive areas to have a DNL greater than or equal to 65 dB and experience a change in noise of at least 1.5 dB, the impact is considered significant. For example, an increase from No Action Alternative DNL 65.5 dB to Proposed Action DNL 67 dB is considered a significant impact, as is an increase from No Action Alternative DNL 63.5 dB to Proposed Action DNL 65 dB (FAA 2015).

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 (FICON 1992). Noise increases of this magnitude in areas with noise exposure levels below DNL 65 dB are not to be considered as significant impacts; however, they are considered reportable changes and warrant further evaluation. These recommendations have been adopted by the FAA and incorporated into FAA Order 1050.1F (FAA 2015).

In 1990, the FAA issued a noise screening procedure for determining whether certain airspace actions at or above 3,000 feet above ground level (AGL) could result in increases to DNL levels of 5 dB or higher (FAA 1990). This procedure was developed in response to FAA experience indicating 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 (FAA 1991). In the EECP study, the FAA determined that the DNL 45 dB level is the minimum level at which noise needed 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" (FAA 1991, 4-8).

This threshold of change was subsequently used in the Chicago Terminal Airspace Project EIS and the Potomac Consolidated Terminal Radar Approach Control (TRACON) Airspace Redesign EIS. FAA Order 1050.1F memorialized the formal guidelines for evaluating noise impacts (FAA 2015). Increases of DNL 3 dB between DNL 60 and 65 dB and of DNL 5 dB between DNL 45 and 60 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 (FAA 2015; FAA 2023a).

Table 1 lists FAA-defined reportable changes in noise levels and summarizes the criteria utilized to assess the level of change in noise exposure attributable to the future scenarios evaluated in the PHX EA.

Table 1. Aircraft DNL Thresholds and Impact Categories

Noise Exposure Levels	Incremental Change Threshold	Level of Change
DNL ≥ 65 dB	+/- 1.5 dB	Significant
DNL ≥ 60 dB and < 65 dB	+/- 3.0 dB	Reportable
DNL ≥ 45 dB and < 60 dB	+/- 5.0 dB	Reportable

Notes: DNL = Day-Night Average Sound Level, dB = Decibel

Source: FAA Order 1050.1F and 1050.1F 2023 Desk Reference (FAA 2015; FAA 2023a)

In addition to defining significant impacts, FAA Order 1050.1F includes additional reporting requirements, including:

- The location and number of noise-sensitive sites at or above DNL 65 dB.
- Change of exposure tables and maps at population centers.

FAA Order 1050.1F states, “Special consideration needs to be given to the evaluation of the significance of noise impacts on noise-sensitive areas within Section 4(f) properties (including, but not limited to, noise-sensitive areas within national parks; national wildlife and waterfowl refuges; and historic sites, including traditional cultural properties) where the land use compatibility guidelines in Title 14 Code of Federal Regulations Part 150 are not relevant to the value, significance, and enjoyment of the area in question” (FAA 2015, Exhibit 4-1). In such settings, the DNL 65 dB threshold may not adequately characterize potential noise effects, particularly where ambient noise levels are low and a quiet environment is a recognized resource attribute, such as a national park or national wildlife and waterfowl refuge.

Because the General Study Area includes portions of Kofa National Wildlife Refuge and Casa Grande Ruins National Monument, as well as several culturally significant areas—including the Gila River Indian Reservation, Salt River Pima-Maricopa Indian Community, the Ak-Chin Indian Community of the Maricopa, and the Tohono O’odham Indian Community—a Supplemental Study Area was identified. Within this Supplemental Study Area, reportable noise changes are evaluated to ensure that potential noise effects on sensitive cultural and natural resources are adequately considered (FAA 2015).

2.4 Land Use Compatibility Guidelines

NEPA requires a review of land uses surrounding an airport to determine land use compatibility associated with aircraft activity at the airport, including identification of noise-sensitive land uses within the DNL 65 dB and higher aircraft noise exposure areas (FAA 2015). The presence of noise-sensitive land use within a DNL 65 dB noise area does not necessarily mean that the use is considered noncompatible or that it is eligible for mitigation. Rather, it signals the need for

further evaluation. Factors that influence compatibility and mitigation eligibility may include, but are not limited to, existing sound reduction treatments, interior noise levels, structural condition, ambient and self-generated noise levels, land use permanence, and the date of construction.

The FAA’s land use compatibility guidelines are set forth in Title 14 Code of Federal Regulations Part 150, Appendix A, Table 1 (reproduced here as **Table 2**) (FAA 2007). As shown in **Table 2**, the FAA generally considers all land uses to be compatible with aircraft-related DNL below 65 dB, including residential, hotels, retirement homes, intermediate care facilities, hospitals, nursing homes, schools, preschools, and libraries. Several of these categories are referenced throughout the PHX EA. Institutional or public land uses include schools, hospitals, nursing homes, churches, auditoriums, concert halls, governmental services, transportation, and parking. While these uses are generally compatible with aircraft-related DNL below 65 dB, schools are not compatible above DNL 65 dB without mitigation and are therefore listed separately in the PHX EA (FAA 2007).

Table 2. Part 150 Land Use Compatibility with Yearly Day-Night Average Sound Levels

Land Use	Yearly Day-Night Average Sound Level [DNL] in Decibels					
	Below 65	65 – 70	70 – 75	75 – 80	80 – 85	Over 85
Residential Uses						
Residential other than mobile homes and transient lodgings	Y	N ^(a)	N ^(a)	N	N	N
Mobile home park	Y	N	N	N	N	N
Transient lodgings	Y	N ^(a)	N ^(a)	N ^(a)	N	N
Public Uses						
Schools	Y	N ^(a)	N ^(a)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y ^(b)	Y ^(c)	Y ^(d)	Y ^(d)
Parking	Y	Y	Y ^(b)	Y ^(c)	Y ^(d)	N
Commercial Uses						
Retail trade–general	Y	Y	25	30	N	N
Utilities	Y	Y	Y ^(b)	Y ^(c)	Y ^(d)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing general	Y	Y	Y ^(b)	Y ^(c)	Y ^(d)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y ^(f)	Y ^(g)	Y ^(h)	Y ^(h)	Y ^(h)
Livestock farming and breeding	Y	Y ^(f)	Y ^(g)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y

Land Use	Yearly Day-Night Average Sound Level [DNL] in Decibels					
	Below 65	65 – 70	70 – 75	75 – 80	80 – 85	Over 85
Recreational						
Outdoor sports arenas and spectator sports	Y	Y ^(e)	Y ^(e)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Source: FAA Part 150, Appendix A, Table 1 (FAA 2007)

Key:

SLUCM = Standard Land Use Coding Manual

Y(Yes): Land use and related structures compatible without restrictions.

N(No): Land use and related structures are not compatible and should be prohibited.

NLR: Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

25, 30, or 35: Land use and related structures generally compatible; measures to achieve NLR of 25 dBA, 30 dBA, or 35 dBA must be incorporated into design and construction of structure.

Notes:

The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

(a) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dBA and 30 dBA should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dBA, thus, the reduction requirements are often stated as 5 dBA, 10 dBA, or 15 dBA over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(b) Measures to achieve NLR of 25 dBA must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

(c) Measures to achieve NLR of 30 dBA must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.

(d) Measures to achieve a NLR of 35 dBA must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

(e) Land use compatible provided special sound reinforcement systems are installed.

(f) Residential buildings require an NLR of 25 dBA

(g) Residential buildings require an NLR of 30 dBA

(h) Residential buildings not permitted

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3. Noise Analysis Objectives

In support of the PHX EA, this report presents a detailed noise modeling analysis for the following airports (referred to as Study Airports):

- PHX – Phoenix Sky Harbor International Airport
- BXK - Buckeye Municipal Airport
- CHD – Chandler Municipal Airport
- DVT – Phoenix Deer Valley Airport
- FFZ – Falcon Field Airport
- GEU – Glendale Regional Airport
- GYR – Phoenix Goodyear Airport
- IWA – Mesa Gateway Airport
- P19 - Stellar Airpark
- SDL – Scottsdale Airport

PHX is considered the major Study Airport and the primary focus of the PHX EA regarding procedure and airspace optimization. In addition to the major Study Airport, the Proposed Action would affect aircraft operations at nine satellite Study Airports listed above.

The following sections describe the objectives and methodology used to ensure that the noise analysis provides a detailed and accurate assessment of noise exposure throughout the General Study Area and the Supplemental Study Area.

3.1 Study Areas

As detailed in the following sections, in consideration of the location of the Study Airports, the nature of the Project, and existing historic and cultural resources, as well as other Section 4(f) resources, both a General Study Area and Supplemental Study Area have been defined for the Proposed Action. The General Study Area represents the geographic extent of airspace where modifications to aircraft procedures may occur. The Supplemental Study Area identifies locations where environmental effects—particularly aircraft noise—could potentially occur based on preliminary procedure design and screening analyses. These Study Areas establish the geographic scope for the environmental analyses presented in this report.

3.1.1 General Study Area

To describe the background elements and existing conditions in the Project, the FAA developed a General Study Area. This area is used to evaluate the potential for environmental impacts under the Proposed Action. Three primary objectives guided its development:

1. Capture representative IFR flight tracks.

The General Study Area includes all IFR flight tracks using radar data from CY 2024,¹ which was the most recent year of data available at the start of the study. Thresholds described below are set below 100 percent. The reason the thresholds are set below 100 percent is to account for outlier operations that may not reach the prescribed altitudes within a reasonable distance of the Study Airports or at all. By excluding the flight tracks for these kinds of operations, potential distortion of the lateral boundary can be avoided, and the General Study Area is kept to the most reasonable size. The General Study Area also captures IFR flight tracks designed for the Proposed Action, where 95 percent of departing aircraft leaving PHX are below 10,000 feet Above Ground Level (AGL) and 95 percent of arriving aircraft to PHX are below 7,000 feet AGL. The threshold for capturing flight tracks at the satellite airports is set at 85 percent of all operations to account for the lower altitudes at which many aircraft operating from these airports tend to fly.

The FAA requires consideration of impacts of airspace actions from the ground surface to 10,000 feet AGL if the study area is larger than the immediate area around an airport or involves more than one airport or up to 18,000 feet AGL if the proposed action or alternative(s) are over a national park or wildlife refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute (FAA 2015, Chap. 11 and App B; United States, 49 U.S.C. § 303, para. B-1.3). Further, policy guidance issued by the FAA Program Director for Air Traffic Airspace Management states that for air traffic project environmental analyses, noise impacts should be evaluated for proposed changes in arrival procedures between 3,000 feet AGL and 7,000 feet AGL and departure procedures between 3,000 feet AGL and 10,000 feet AGL for large civil jet aircraft weighing over 75,000 pounds (FAA 2003).

2. Establish an appropriate AGL reference.

For the purposes of defining the General Study Area, the FAA applied AGL-based screening thresholds (7,000 feet AGL for arrivals and 10,000 feet AGL for departures) and converted them to equivalent Mean Sea Level (MSL) altitudes using a representative ground elevation. Ground elevation varies with local terrain and is not

¹ Radar data obtained from the FAA's PDARS was used to identify military and civilian IFR flights to and from the Study Airports for CY 2024 for the General Study Area existing conditions (FAA 2024b).

evaluated as a single surface; therefore, a constant terrain value was selected to operationalize these thresholds for boundary definition.

The initial screening used a representative elevation of 2,000 feet MSL (the highest airport elevation is SDL at approximately 1,510 feet MSL rounded up to the nearest 1,000 feet). Subsequent review identified higher terrain northeast of PHX that is relevant to the proposed procedures under review. As a result, the representative elevation was adjusted to 2,400 feet MSL. This value was used to convert the AGL screening thresholds to MSL cutoffs for mapping (i.e., 9,400 feet MSL for arrivals and 12,400 feet MSL for departures), which determined the preliminary areas.

Although terrain elevations within the broader region reach approximately 7,900 feet MSL, those areas are outside the main flight paths of the proposed procedures and are not representative of locations where aircraft operate within the applicable AGL screening bands. Using the maximum elevation would expand the study area into locations not meaningfully affected by the Proposed Action. Therefore, the selected representative elevation of 2,400 feet MSL appropriately defines the study area by capturing the airspace where aircraft are most likely to operate within the relevant AGL ranges while avoiding inclusion of extraneous areas.

3. Establish a lateral boundary that reflects air traffic flow.

The lateral boundary of the General Study Area is defined by U.S. Census block group boundaries where aircraft cross at or below the 10,000 feet/7,000 feet AGL thresholds (U.S. Census Bureau 2020). This extent is concisely defined to focus on areas of air traffic flow.

These three objectives were applied, collectively, to establish the General Study Area. First, preliminary boundaries were set to correspond with where aircraft from the Study Airports reached 10,000 feet and 7,000 feet AGL. Next, the boundary was expanded to account for the highest ground elevation near PHX (2,400 feet) within that preliminary boundary. The result was that the location where tracks passed through 12,400 feet and 9,400 feet MSL was used to establish the General Study Area boundary.

The General Study Area also includes portions of one national park (Casa Grande Ruins National Monument), one wildlife refuge (Kofa National Wildlife Refuge), and four cultural properties (the Gila River Indian Reservation, Salt River Pima-Maricopa Indian Community, the AK-Chin Indian Community of the Maricopa, and the Tohono O'odham Indian Community).

3.1.2 Supplemental Study Area

The General Study Area includes portions of a national park, a wildlife refuge, and four cultural properties. Consistent with FAA noise analysis guidance for airspace actions occurring over

such resources, a Supplemental Study Area has been identified as required under FAA Order JO 7400.2R to ensure appropriate consideration of these noise-sensitive resources (FAA 2025a). These designated areas have very low ambient noise levels, and maintaining a quiet setting is a generally recognized purpose and attribute.

Using the same evaluation process applied to the General Study Area, radar flight tracks were assessed beyond the General Study Area boundary to identify where IFR aircraft operate at or below 18,000 feet AGL (approximately 20,400 feet MSL). Based on this analysis, an 18,000-foot Supplemental Study Area was developed. The extent of the two Study Areas is shown in **Exhibit 1**.

3.2 Evaluate Changes in Noise Levels

Traditional airport noise studies use noise exposure contours—often displayed as color-coded lines on a base map delineating DNL increments of 5 dB—to describe noise impacts in the immediate vicinity of airports (3 miles to 5 miles). In contrast, wide-area air traffic noise models use georeferenced receptors, which can provide more detailed results to evaluate the effects of high-altitude airspace changes from the ground level up to 18,000 feet AGL on noise-sensitive areas and to determine if more detailed NEPA analysis may be required.

For the PHX EA, a detailed receptor grid consisting of evenly spaced points of 0.5-NM intervals was used to analyze existing and future noise exposure within the General Study Area. The Supplemental Study Area, which includes aircraft traveling up to 18,000 feet AGL, was evaluated using evenly spaced grid points at 2-NM intervals to assess potential impacts to Section 4(f), Historic and Cultural Resources, and Wildlife areas (FAA 2015). Details regarding the receptors, and groups of receptors called receptor sets, used for the PHX EA are discussed in **Sections 3.4**.

Five noise modeling scenarios were evaluated:

- **2024 Existing Conditions** – Routes as flown in the period spanning from January 1, 2024, through December 31, 2024
- **2027 Future No Action Alternative** – Routes as forecasted to be flown in the year 2027 if no Proposed Action airspace changes were implemented
- **2027 Future Proposed Action** – Routes as forecasted to be flown in the year 2027 if the Proposed Action changes are implemented
- **2032 Future No Action Alternative** – Routes as forecasted to be flown in the year 2032 if no Proposed Action changes were implemented
- **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 identifies the number of people associated with census-block centroids and other receptor locations where modeled DNL changes meet or exceed FAA reporting thresholds stated in **Table 1**.

3.3 Model All Traffic Routes

Radar data from the FAA Performance Data Analysis and Reporting System (PDARS)² for CY 2024 was obtained and processed for this analysis (FAA 2023b). A total of 581,857 IFR-filed flights to and from the Study Airports for 2024 were identified and used to develop the AAD fleet mix, time of day and night, and runway use input for AEDT 3g. From this dataset, a total of 491,494 flight tracks were used to evaluate and model typical flight routes and flows throughout the General Study Area. The dataset includes operations across all seasons and runway usage configurations.

The modeled radar flight tracks include all civilian IFR flights that operated at or below 10,000 feet AGL in the General Study Area and at or below 18,000 feet AGL within the Supplemental Study Area.

3.4 Model Aircraft Noise Levels

Aircraft noise levels were modeled at discrete receptors throughout the Study Areas for each of the five scenarios evaluated. Each scenario includes the noise generated from AAD aircraft operations from the 10 Study Airports for the grid points within the Study Areas.

3.4.1 Uniform Grid Points

A uniform grid point analysis was performed to encompass the General Study Area with grid points evenly spaced at 0.5-NM intervals. For the Supplemental Study Area, grid points were evenly spaced at 2-NM intervals to reflect higher typical aircraft altitudes in that area. The uniform grid analysis was done to capture the noise level changes in areas not covered by other grids.

The General Study Area grid contains 47,409 grid points, and the Supplemental Study Area grid contains 5,534 grid points for a total of 52,943 grid points. **Exhibit 1** depicts the uniform grid points modeled within the Study Areas. **Attachment E** lists the noise changes at the uniform grid points exceeding thresholds within the Study Areas and reports the noise values associated with each location.

² PDARS automatically collects radar track and flight plan data from TRACONS and ARTCCs to produce daily reports used, for example, to monitor, analyze and report on National Airspace System performance.

3.4.2 Population Centroids

Within the General Study Area, a total of 57,461 individual population points were evaluated, representing a total population of 4,802,062 people. These points, each of which represents a specific number of people, are referred to as population centroids. Each centroid corresponds to a U.S. Census block, the smallest geographical unit for which the U.S. Census maintains population data. The smallest centroid has a population of one, and the largest centroid has a population of 5,578.

Centroid locations and population counts were drawn by the U.S. Census Bureau based on 2020 U.S. Census data (U.S. Census Bureau 2020). For each of the five modeling scenarios, AAD DNL values were calculated at all population centroids within the General Study Area. **Exhibit 2** depicts the census block centroid points modeled within the General Study Area. **Attachment C** lists any noise changes at the population centroids exceeding thresholds within the General Study Area and reports the noise values associated with each location.

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

Initial identification of Section 4(f) sites and Historic and Cultural Resources (Section 106) was based on single point locations within the Study Areas. These specific sites include individual Section 4(f) resources that are less than one square NM in area (such as public parks or trails), and specific historic sites listed on the National Register of Historic Places (such as individual buildings).³ In instances where Section 4(f) properties encompassed large areas—such as major parks or wilderness zones—single points were insufficient to represent noise exposure adequately. To improve spatial coverage, the uniform grid points for each study area were tagged if they fell within a resource property. **Exhibit 3** shows the grid points modeled for Section 4(f) and Historic and Cultural Resources within the Study Areas.

In addition, grid point analysis was performed to assess noise levels at national parks, national wildlife refuges, and national wilderness areas located outside the General Study Area but within the Supplemental Study Area. These grid points are also depicted in **Exhibit 3**. **Attachment D** lists any noise changes at the specific locations or uniform grid points identified Section 4(f) sites and Historic and Cultural Resources with DNL levels 65 dB or higher or exceeding any thresholds within the Study Areas and reports the noise values associated with each location.

³ Multiple state and federal databases were used, resulting in duplicates of the same point. To best capture all named resources from various federal and state sources, some points are duplicated in name but represented by and reported for the same receptor point.

3.4.4 Noise-Sensitive Sites

Order 1050.1F requires the FAA to identify the location and number of noise-sensitive uses in addition to residences, including schools, hospitals, parks, and recreation areas (FAA 2015). In addition to the U.S. Census block centroids representing residential areas within the General Study Area, noise-sensitive grid points were identified within three miles of PHX and within one mile of each satellite airport to capture potential noise-sensitive sites in areas where aircraft typically operate at lower altitudes during arrival and departure. **Exhibit 4** depicts the locations of these noise-sensitive land use areas. **Attachment F** lists any noise changes at the noise-sensitive sites with DNL levels 65 dB or higher or exceeding any thresholds in the General Study Area and reports the noise values associated with each location.

3.4.5 Airport Area Grid

Additional sets of grid points were developed around each of the runways. Each set included (1) an oval-shaped grid around the runway out to 10,000 feet and (2) a rectangular grid extending 3,000 feet on each side of the runway centerline with approximately 30,000 feet (approximately 5.8 miles) from each runway end. Each of these sets introduced 2,996 points per runway (PHX has three such sets, one each for Runway 8/26, Runway 7L/25R, and Runway 7R/25L) to supplement the other points in areas near the runways where sound levels could change over relatively small distances compared to the overall General Study Area. This results in a set of 50,952 airport area grid points. As these are focused on the runways, many of these points are located on airport property. The noise analysis will only report on grid points located off airport property. **Attachment G** lists any noise changes at the airport area grid points exceeding thresholds off airport property within the General Study Area and reports the noise values associated with each location.

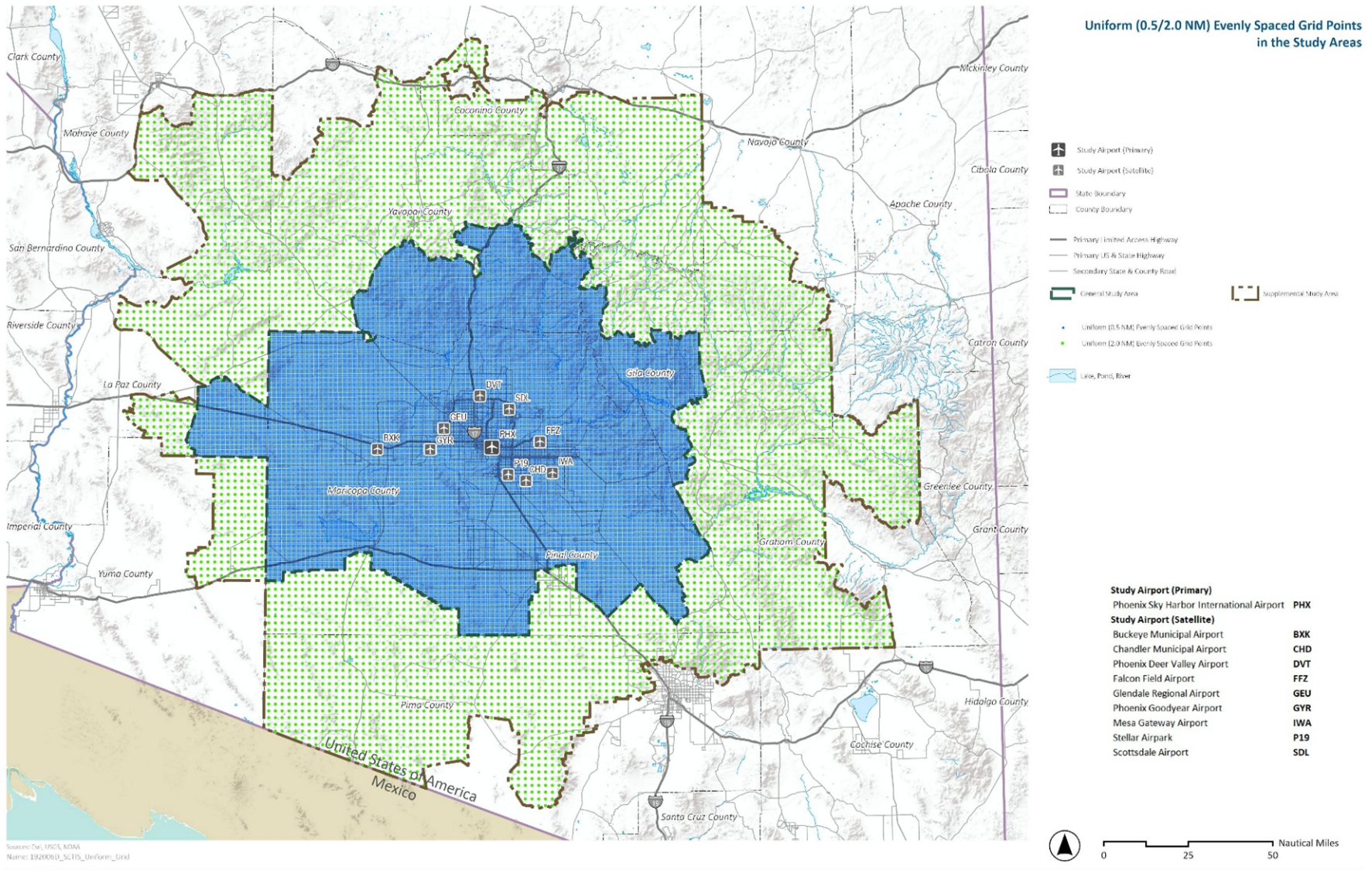


Exhibit 1. Uniform (0.5/2.0 NM) Evenly Spaced Grid Points in the Study Areas

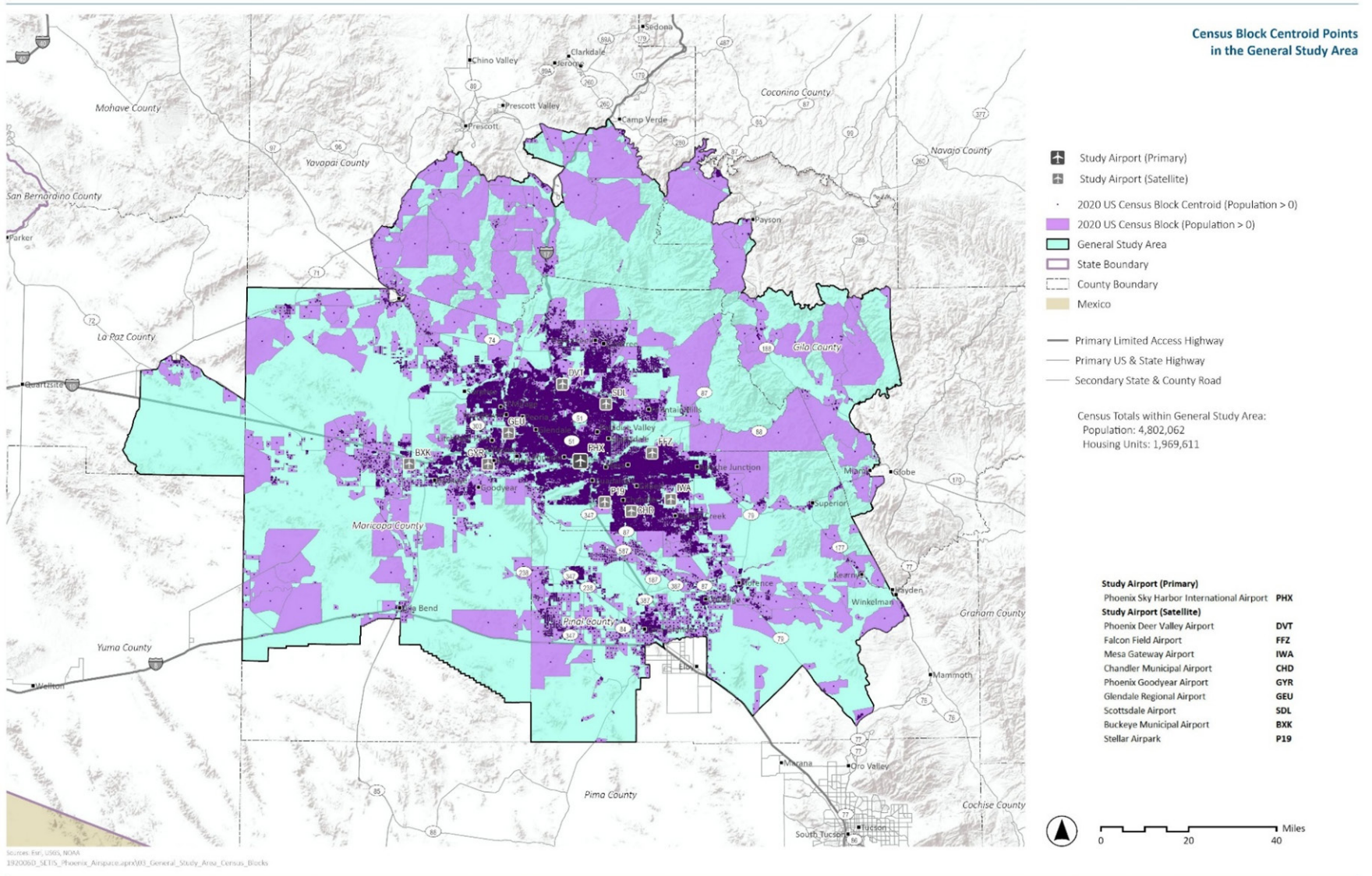


Exhibit 2. Census Block Centroid Points in the General Study Area

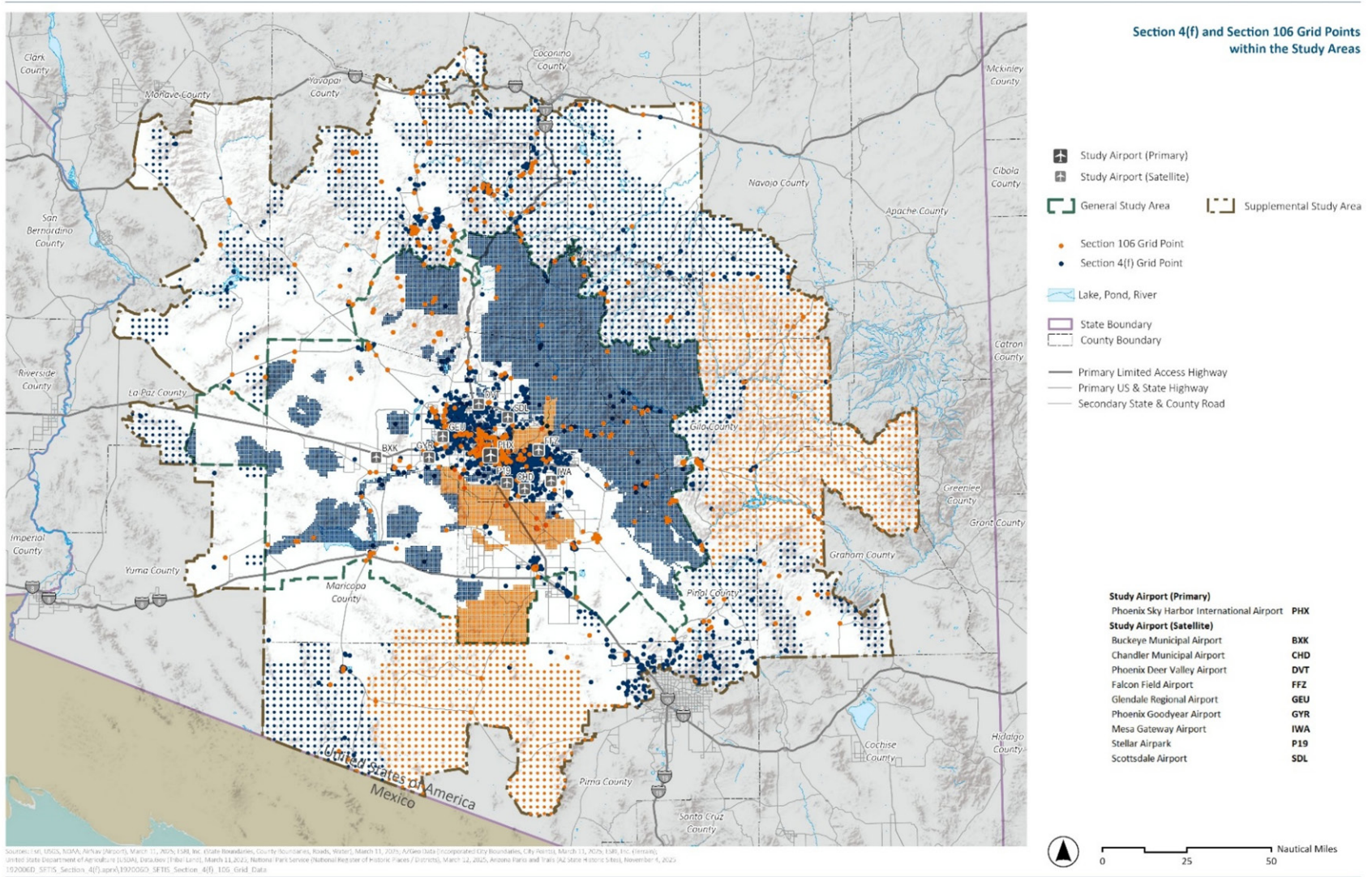


Exhibit 3. Section 4(f) and Section 106 Grid Points within the Study Areas

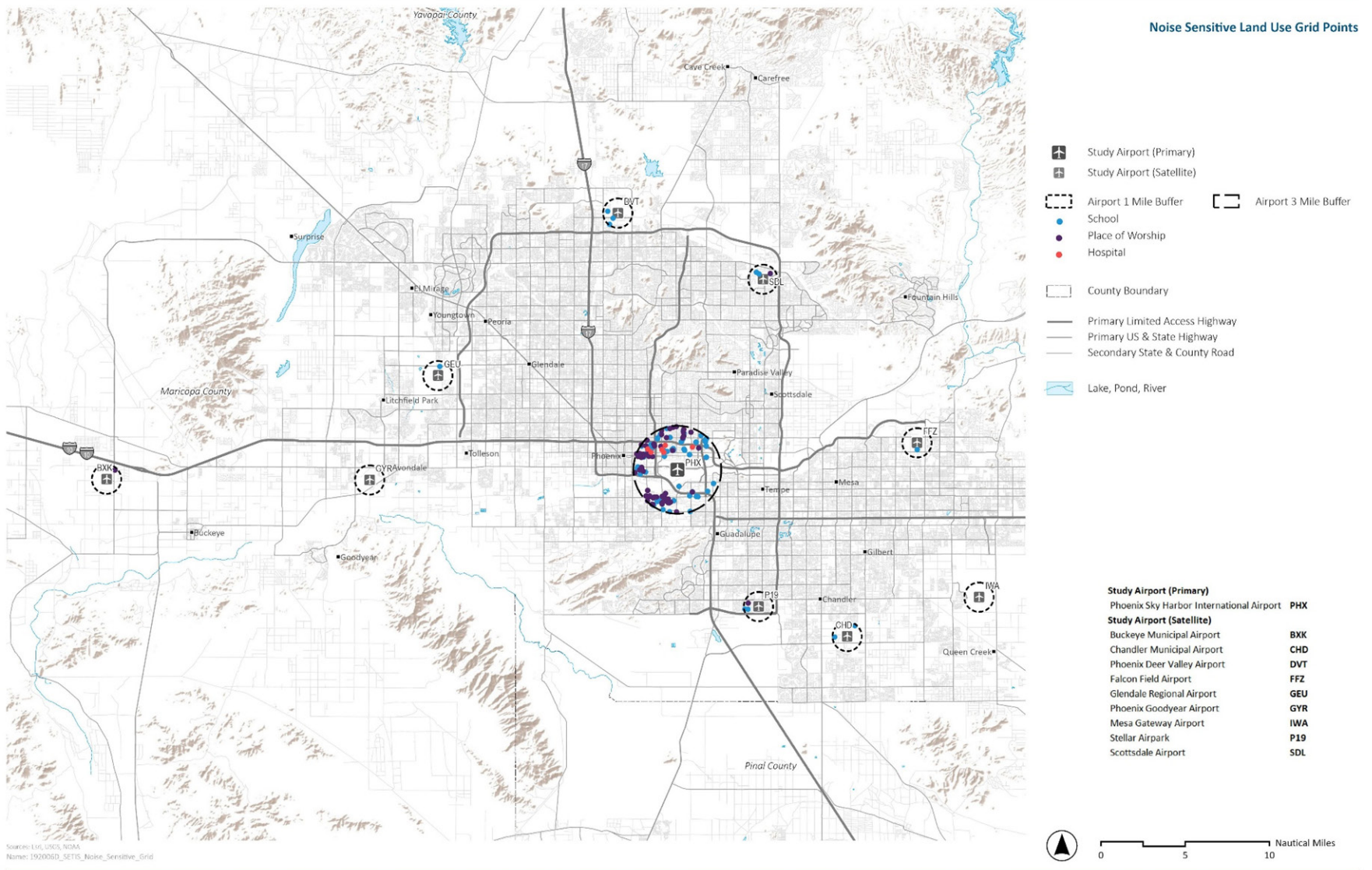


Exhibit 4. Noise-Sensitive Land Use Grid Points

3.5 Use Standard Profiles with Targeted Altitudes

Aircraft within the Study Areas operate in accordance with standardized air traffic control (ATC) procedures. To model existing and proposed procedures, aircraft profiles were designed to meet target altitudes along the flight path to the extent of the Study Areas. These targeted altitudes were determined through evaluation of the flight track data set or by either ATC, airspace procedure restrictions, or recommended and approved by subject matter experts. **Section 4.6** provides further details.

3.6 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 Alternative for each of the future analysis years were quantified. Any significant or reportable noise changes are explained in **Section 5.4**. The criteria set to meet this objective are described in **Section 2.3**.

3.7 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 public. Detailed Existing Conditions and No Action Alternative procedures modeled for each Study Airport are presented in **Appendix H** of the PHX EA, and detailed Proposed Action procedures modeled for each Study Airport are presented in **Appendix I** of the PHX EA.

4. Noise Modeling Methodology and Inputs

This section presents the modeling methodology and data inputs for the noise analysis for the Existing Conditions, future No Action Alternatives, and the Proposed Action. The Existing Conditions noise modeling input data development is described in detail in the *Phoenix Area FAA Modernization Project Environmental Assessment – Aircraft Noise and Air Quality Modeling Input Memorandum* dated August 28, 2025, and was approved by the FAA (HMMH 2025a). The future conditions noise modeling input data development is described in detail in the *Phoenix Area FAA Modernization Project Environmental Assessment – Aircraft Noise and Air Quality Modeling Input Memorandum* dated October 31, 2025, and was approved by the FAA (HMMH 2025b). The two memorandums are provided in **Attachment A** and document the aircraft noise and air quality modeling inputs supporting the PHX EA. They establish the data used for noise and emissions analyses in AEDT Version 3g for the 10 Study Airports.

The two modeling memos outline:

- **Data sources and methodology** for AEDT modeling, including use of PDARS radar data, FAA Operational Network (OPSNET) and Traffic Flow Management System Count (TFMSC) data, FAA Terminal Area Forecast (TAF) data, and United States Geological Survey (USGS) terrain data.
- **Detailed airport descriptions** and runway specifications for each facility to ensure consistency in model geometry and input parameters.
- **Aircraft operations and fleet mix** by type (air carrier, air taxi, general aviation, military) and year (2024, 2027, 2032), limited to IFR operations relevant to procedure design.
- **Noise and performance data** using AEDT standard profiles, stage length assignments, and aircraft performance parameters.
- **Runway utilization rates** derived from PDARS data, disaggregated by engine type and time of day.
- **Meteorological and terrain settings** applied uniformly across Study Airports using FAA and National Oceanic and Atmospheric Administration datasets.
- **Operational emissions methodology**, referencing FAA's *Aviation Emissions and Air Quality Handbook*, identifying seven criteria pollutants and taxi-time assumptions for emissions estimation.
- **Flight track geometry development**, including creation of representative model tracks from radar data for arrivals, departures, and circuits, with FAA concurrence on methodology.

4.1 Aviation Environmental Design Tool

AEDT is the FAA-approved tool for environmental modeling and analysis metrics (noise, fuel burn, and emissions) for regional airspace redesign/analysis projects. The aircraft noise analysis for the PHX EA uses AEDT Version 3g (released August 28, 2024) (FAA 2024a). FAA guidelines require that all FAA actions requiring noise, fuel burn, or emissions modeling and for which the environmental analysis process began on or after August 28, 2024 are required to use AEDT 3g. AEDT 4a was released on January 28, 2026; however, modeling for the PHX EA was well underway at the time of release, therefore consistent with FAA guidance, and the PHX EA continues to use AEDT 3g. All AEDT modeling conducted for this study adheres to *Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA* (FAA 2017).

AEDT is an integrated noise and emissions model that generates results for fuel consumption, emissions, noise, and air quality for evaluating environmental impacts. Using a comprehensive database of aircraft noise and performance characteristics, AEDT processes user-defined inputs such as aircraft types, AAD operations, airport configurations, and flight procedures. AEDT operates within a scalable Geographic Information System (GIS) and relational database environment, enabling regional airspace studies. Its core capabilities include:

- Automated comparison of noise impacts across alternative airspace designs
- Integration of flight track, operational, population, and community data
- Calculation of aircraft thrust and speed from user-defined ATC altitudes
- Noise prediction at population centroids or custom-defined locations
- Automated annualization of noise based on operational scenarios and runway usage
- Identification and mapping of noise exposure changes
- Generation of tables and figures for noise impact analysis and reporting
- Application of multi-layered data validation and quality control

Noise patterns generated by AEDT are influenced by several factors, including aircraft type, number of operations, time of day, flight procedures, runway use, and flight paths. Variations in these inputs can result in significant changes to modeled noise exposure (FAA 2024a; FAA 2017).

4.2 Physical Description of the Airport Layout

The PHX EA includes 10 airports within the Study Area, each with unique runway configurations and operational characteristics. Airport layout information—including runway orientation, length, width, instrumentation, and threshold details—was obtained from FAA’s Airport Data and Information Portal (ADIP) and National Airspace System Resource (NASR) databases (FAA

2024b; FAA 2024c) and is consistent with the airfield configurations used for the CY 2024 Existing Conditions.

Runway designations are based on magnetic headings rounded to the nearest 10 degrees. For modeling purposes, the 2024 airfield layouts for all airports were used. A summary of airport layout characteristics is provided below. Complete runway specifications are included in **Attachment A**.

4.2.1 Phoenix Sky Harbor International Airport (PHX)

PHX is the major Study Airport, a large-hub commercial service airport located approximately 3 miles east of downtown Phoenix. The airport contains three parallel east–west runways (8/26, 7L/25R, 7R/25L), ranging from 7,800 feet to 11,489 feet in length. Runway thresholds include displaced thresholds and Instrument Approach Procedure (IAP) based threshold crossing heights for both arrival directions.

4.2.2 Satellite Airports

The remaining nine airports serve general aviation, air taxi, military, and limited commercial service activity. Their layouts are summarized below:

- **Buckeye Municipal (BXK):** One runway (17/35), primarily General Aviation (GA) operations.
- **Chandler Municipal (CHD):** Two parallel GA runways (4L/22R, 4R/22L).
- **Phoenix Deer Valley Airport (DVT):** Two parallel runways (7L/25R, 7R/25L), serving one of the busiest GA training airports in the U.S.
- **Falcon Field (FFZ):** Two parallel runways (4L/22R, 4R/22L), supporting extensive training and corporate operations.
- **Glendale Regional Airport (GEU):** One runway (1/19) with displaced thresholds on both runway ends.
- **Phoenix Goodyear Airport (GYR):** One runway (3/21), supporting GA and training operations.
- **Phoenix Mesa Gateway (IWA):** Three parallel runways (12C/30C, 12L/30R, 12R/30L); second-largest commercial service airport in the region.
- **Stellar Airpark (P19):** Privately owned public-use airport with one runway (17/35) and displaced thresholds.
- **Scottsdale (SDL):** One runway (3/21), supporting high-end corporate aviation with displaced thresholds on both runway ends.

These airport layout characteristics define the basis for modeling aircraft performance, runway use, and flight track geometry for the PHX EA.

4.3 Aircraft Operations

Although the noise environment around major airports comes almost entirely from jet aircraft operations, the DNL calculations include noise from all types of aircraft on IFR flight plans that could be affected by the Proposed Action. When operating outside certain categories of controlled airspace, aircraft operating under Visual Flight Rules (VFR) are not required to be in contact with ATC. Because these aircraft operate at the pilot's discretion and are often not required to file flight plans, the FAA has very limited information about these operations. Consequently, aircraft type and flight path information for VFR operations can be limited in the General Study Area. However, even if complete information were available for the VFR operations, the Proposed Action would not require any changes to routing or altitudes to accommodate these operations. If they could be modeled, they would use the same flight routes and altitudes under the Proposed Action and No Action Alternative. Their operations would not be affected by the forecast conditions in 2027 (the proposed first year of implementation) and 2032 (five years after implementation) for either the Proposed Action or the No Action Alternative. Therefore, VFR aircraft were not included in the analysis.⁴

IFR operation levels for the PHX EA airports were developed using OPSNET tower counts (FAA 2024d), TFMSC data (FAA 2024e), and PDARS radar data for CY 2024 (FAA 2023b). Forecasts for 2027 and 2032 were based on the FAA-approved 2024 TAF (issued January 2025) (FAA 2025b). Only IFR operations are included because the Proposed Action affects only instrument procedures. The analysis uses average-day operations (annual/number of days) for each modeling year. The annual counts for 2024 and 2032 were divided by 366 days, and the annual count for 2027 was divided by 365 days.

Day/night splits in AEDT were assigned based on PDARS timestamp data. **Table 3** provides a summary of total IFR operations by airport and year, while the Noise Modeling Inputs Memo (**Attachment A - Table 12**) presents the detailed breakdown by operational category.

⁴ Because VFR aircraft would not be affected by the Proposed Action does not on its own mean they would not influence the No Action/Proposed Action delta. The presences of other (unchanging) aircraft noise could reduce the delta that results from what is changing and/or change the locations where DNL 45 dB and greater occurs. The omission of VFR from the analysis could mean the delta's represented from IFR only traffic is overstated/conservative.

Table 3. IFR Annual Operations Counts by Airport and Year

Airport	2024	2027	2032
PHX	474,683	536,891	584,544
DVT	14,860	16,454	17,322
FFZ	10,030	10,369	10,962
IWA	30,543	33,716	35,915
CHD	5,041	5,487	5,934
GYR	11,550	12,697	13,853
GEU	3,328	3,982	5,139
SDL	67,197	74,381	83,413
BXK	330	359	370
P19	670	729	748

Sources: PDARS Data (1/1/2024-12/31/2024) (FAA 2023b); OPSNET accessed July 2025 (FAA 2024d); TFMSC accessed July 2025 (FAA 2024e); FAA TAF accessed July 2025 (FAA 2025b)

Fleet mix derivation relied on aircraft type assignments from PDARS radar data and included day/night arrival and departure allocations. The Proposed Action does not alter annual operations; therefore, No Action Alternative and Proposed Action forecasts share identical operation totals.

4.3.1 Fleet Mix

Fleet mix assumptions were developed as part of the forecasting effort. **Table 4** shows the projected fleet mixes for the Existing Conditions (2024) and the future years (2027 and 2032) under both the No Action Alternative and the Proposed Action, using aircraft types from the AEDT model. Not all forecasted aircraft types are available in AEDT. In such cases, FAA-approved substitutions from AEDT were used. For aircraft without listed substitutions, proposed equivalents were selected based on similar operational and noise characteristics and approved by the FAA. The letter of the request and FAA's approval are provided in **Attachment B**.

To assign arrival and departure routings, aircraft are categorized according to performance characteristics:

- Category A – Jet aircraft and C-130
- Category B – Turboprop aircraft
- Category C – All other types of aircraft

The fleet mix was organized using these categories. Details of the airport fleet mix developed are provided in **Attachment A**. Since the Proposed Action will not affect airport capacity, the operations for the No Action Alternative and the Proposed Action are the same for a given modeling year in 2027 and 2032.

Table 4. Fleet Mix for Noise Modeling by Airport and Year

Aircraft Category	AEDT Type	Airport	2024 Arrivals	2024 Departures	2027 Arrivals	2027 Departures	2032 Arrivals	2032 Departures
A	737700	PHX	14.26%	14.26%	7.53%	7.53%	0.63%	0.63%
A	737800	PHX	18.04%	18.04%	15.56%	15.56%	13.57%	13.57%
A	7378MAX	PHX	11.39%	11.39%	17.50%	17.50%	27.70%	27.70%
A	757300	PHX	0.00%	0.37%	0.00%	0.33%	0.00%	0.30%
A	757PW	PHX	0.23%	0.23%	0.19%	0.19%	0.15%	0.15%
A	757RR	PHX	0.55%	0.19%	0.49%	0.16%	0.45%	0.15%
A	7673ER	PHX	1.37%	1.37%	1.35%	1.35%	1.36%	1.36%
A	767CF6	PHX	0.15%	0.15%	0.11%	0.11%	0.10%	0.10%
A	777200	PHX	0.00%	0.18%	0.00%	0.16%	0.00%	0.14%
A	777300	PHX	0.00%	0.08%	0.00%	0.08%	0.00%	0.08%
A	7773ER	PHX	0.26%	0.00%	0.24%	0.00%	0.23%	0.00%
A	7878R	PHX	0.11%	0.11%	0.09%	0.09%	0.09%	0.09%
A	7879	PHX	0.16%	0.16%	0.54%	0.54%	0.53%	0.53%
A	A300-622R	PHX	0.08%	0.08%	0.07%	0.07%	0.06%	0.06%
A	A319-131	PHX	3.52%	3.52%	3.11%	3.11%	1.60%	1.60%
A	A320-211	PHX	1.35%	1.35%	1.09%	1.09%	0.14%	0.14%
A	A320-232	PHX	2.16%	2.16%	1.86%	1.86%	0.24%	0.24%
A	A320-270N	PHX	3.14%	3.14%	2.95%	2.95%	2.90%	2.90%
A	A321-232	PHX	13.83%	13.83%	18.07%	18.07%	21.47%	21.47%
A	A330-343	PHX	0.06%	0.06%	0.00%	0.00%	0.00%	0.00%
A	A350-941	PHX	0.16%	0.16%	0.19%	0.19%	0.25%	0.25%
A	CL600	PHX	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%
A	CL601	PHX	0.24%	0.24%	0.24%	0.24%	0.23%	0.23%
A	CNA525C	PHX	0.38%	0.38%	0.36%	0.36%	0.34%	0.34%
A	CNA55B	PHX	0.56%	0.56%	0.68%	0.68%	0.71%	0.71%
A	CNA560U	PHX	0.24%	0.24%	0.16%	0.16%	0.14%	0.14%
A	CNA560XL	PHX	0.24%	0.24%	0.25%	0.25%	0.24%	0.24%
A	CNA680	PHX	0.52%	0.52%	0.60%	0.60%	0.58%	0.58%
A	CNA750	PHX	0.20%	0.20%	0.09%	0.09%	0.08%	0.08%
A	CRJ9-ER	PHX	7.36%	7.36%	8.01%	8.01%	7.36%	7.36%
A	CRJ9-LR	PHX	0.15%	0.15%	0.13%	0.13%	0.12%	0.12%
A	EMB145	PHX	0.81%	0.81%	0.71%	0.71%	0.65%	0.65%
A	EMB14L	PHX	0.06%	0.06%	0.00%	0.00%	0.00%	0.00%
A	EMB170	PHX	3.69%	3.69%	3.25%	3.25%	2.99%	2.99%
A	EMB175	PHX	8.04%	8.04%	8.26%	8.26%	9.19%	9.19%
A	GIV	PHX	0.12%	0.12%	0.07%	0.07%	0.06%	0.06%
A	GV	PHX	0.16%	0.16%	0.15%	0.15%	0.15%	0.15%
A	LEAR35	PHX	0.60%	0.60%	0.40%	0.40%	0.24%	0.24%

Aircraft Category	AEDT Type	Airport	2024 Arrivals	2024 Departures	2027 Arrivals	2027 Departures	2032 Arrivals	2032 Departures
A	MU3001	PHX	0.10%	0.10%	0.00%	0.00%	0.00%	0.00%
A	DC1030	PHX	0.21%	0.21%	0.13%	0.13%	0.03%	0.03%
A	C17	PHX	0.03%	0.03%	0.03%	0.03%	0.02%	0.02%
A	KC135R	PHX	0.28%	0.28%	0.24%	0.24%	0.22%	0.22%
B	CNA208	PHX	1.83%	1.83%	2.27%	2.27%	2.39%	2.39%
B	1900D	PHX	0.15%	0.15%	0.13%	0.13%	0.12%	0.12%
B	DHC6	PHX	1.99%	1.99%	1.71%	1.71%	1.56%	1.56%
B	EMB120	PHX	0.24%	0.24%	0.21%	0.21%	0.19%	0.19%
B	SD330	PHX	0.17%	0.17%	0.15%	0.15%	0.14%	0.14%
C	BEC58P	PHX	0.21%	0.21%	0.19%	0.19%	0.17%	0.17%
All	All	PHX	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
A	CL600	BXK	2.16%	2.16%	2.20%	2.20%	2.21%	2.21%
A	CNA55B	BXK	2.16%	2.16%	1.98%	1.98%	1.92%	1.92%
A	MU3001	BXK	2.16%	2.16%	1.98%	1.98%	1.92%	1.92%
B	CNA208	BXK	4.21%	4.21%	4.29%	4.29%	4.31%	4.31%
C	CNA172	BXK	4.28%	4.28%	3.98%	3.98%	3.94%	3.94%
C	COMSEP	BXK	4.24%	4.24%	4.18%	4.18%	4.59%	4.59%
C	GASEPF	BXK	72.79%	72.79%	74.24%	74.24%	74.51%	74.51%
C	GASEPV	BXK	8.01%	8.01%	7.14%	7.14%	6.59%	6.59%
All	All	BXK	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
A	CNA525C	CHD	9.15%	9.15%	9.25%	9.25%	8.89%	8.89%
A	CNA680	CHD	3.45%	3.45%	5.51%	5.51%	9.34%	9.34%
A	LEAR35	CHD	15.82%	15.82%	14.12%	14.12%	12.41%	12.41%
B	CNA208	CHD	4.87%	4.87%	4.77%	4.77%	4.37%	4.37%
B	DHC6	CHD	12.95%	12.95%	12.69%	12.69%	11.61%	11.61%
C	CNA172	CHD	27.67%	27.67%	27.22%	27.22%	26.78%	26.78%
C	COMSEP	CHD	8.36%	8.36%	8.96%	8.96%	9.50%	9.50%
C	GASEPF	CHD	17.73%	17.73%	17.49%	17.49%	17.09%	17.09%
All	All	CHD	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
A	CL600	DVT	3.91%	3.91%	4.25%	4.25%	4.34%	4.34%
A	CNA510	DVT	5.58%	5.58%	6.16%	6.16%	6.43%	6.43%
A	CNA525C	DVT	4.94%	4.94%	4.30%	4.30%	3.80%	3.80%
A	CNA560U	DVT	2.97%	2.97%	2.63%	2.63%	2.38%	2.38%
A	CNA560XL	DVT	3.12%	3.12%	3.38%	3.38%	3.28%	3.28%
A	CNA680	DVT	3.60%	3.60%	3.67%	3.67%	4.24%	4.24%
A	LEAR35	DVT	6.25%	6.25%	5.50%	5.50%	4.98%	4.98%
B	CNA208	DVT	10.67%	10.67%	13.18%	13.18%	14.32%	14.32%
B	DHC6	DVT	11.62%	11.62%	10.43%	10.43%	9.69%	9.69%
C	CNA172	DVT	5.73%	5.73%	5.78%	5.78%	5.27%	5.27%

Aircraft Category	AEDT Type	Airport	2024 Arrivals	2024 Departures	2027 Arrivals	2027 Departures	2032 Arrivals	2032 Departures
C	COMSEP	DVT	9.45%	9.45%	10.54%	10.54%	10.86%	10.86%
C	GASEPF	DVT	28.84%	28.84%	27.06%	27.06%	27.27%	27.27%
C	PA30	DVT	3.32%	3.32%	3.12%	3.12%	3.14%	3.14%
All	All	DVT	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
A	CL600	FFZ	4.23%	4.23%	4.34%	4.34%	4.54%	4.54%
A	CNA510	FFZ	1.90%	1.90%	1.99%	1.99%	2.13%	2.13%
A	CNA525C	FFZ	1.75%	1.75%	1.59%	1.59%	1.36%	1.36%
A	CNA55B	FFZ	1.51%	1.51%	1.38%	1.38%	1.18%	1.18%
A	CNA560U	FFZ	1.42%	1.42%	1.34%	1.34%	1.20%	1.20%
A	CNA560XL	FFZ	1.63%	1.63%	1.69%	1.69%	1.80%	1.80%
A	GV	FFZ	2.33%	2.33%	2.45%	2.45%	3.02%	3.02%
B	CNA208	FFZ	13.80%	13.80%	14.74%	14.74%	16.29%	16.29%
B	DHC6	FFZ	9.14%	9.14%	8.78%	8.78%	8.13%	8.13%
C	CNA172	FFZ	25.71%	25.71%	24.84%	24.84%	23.20%	23.20%
C	GASEPF	FFZ	31.17%	31.17%	30.90%	30.90%	30.23%	30.23%
C	GASEPV	FFZ	5.41%	5.41%	5.96%	5.96%	6.92%	6.92%
All	All	FFZ	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
A	CNA510	GEU	16.20%	16.20%	15.26%	15.26%	14.12%	14.12%
A	CNA55B	GEU	6.73%	6.73%	11.00%	11.00%	15.65%	15.65%
A	CNA560U	GEU	6.77%	6.77%	5.49%	5.49%	4.05%	4.05%
A	CNA680	GEU	5.98%	5.98%	10.91%	10.91%	16.29%	16.29%
B	CNA208	GEU	7.92%	7.92%	6.88%	6.88%	5.68%	5.68%
B	DHC6	GEU	2.84%	2.84%	2.33%	2.33%	1.76%	1.76%
C	CNA172	GEU	37.26%	37.26%	34.15%	34.15%	31.16%	31.16%
C	COMSEP	GEU	16.30%	16.30%	13.98%	13.98%	11.30%	11.30%
All	All	GEU	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
A	737800	GYR	1.00%	1.00%	0.90%	0.90%	0.82%	0.82%
A	7378MAX	GYR	0.44%	0.44%	0.42%	0.42%	0.51%	0.51%
A	A320-232	GYR	0.77%	0.77%	0.70%	0.70%	0.64%	0.64%
A	A321-232	GYR	0.71%	0.71%	0.66%	0.66%	0.69%	0.69%
A	CL601	GYR	0.72%	0.72%	0.59%	0.59%	0.47%	0.47%
A	CNA510	GYR	1.21%	1.21%	1.57%	1.57%	1.60%	1.60%
A	CNA525C	GYR	0.69%	0.69%	0.85%	0.85%	0.82%	0.82%
A	CNA560U	GYR	0.63%	0.63%	0.55%	0.55%	0.48%	0.48%
A	CNA680	GYR	1.41%	1.41%	3.41%	3.41%	4.72%	4.72%
A	EMB14L	GYR	2.08%	2.08%	1.89%	1.89%	1.72%	1.72%
A	GIV	GYR	0.78%	0.78%	0.67%	0.67%	0.55%	0.55%
A	GV	GYR	0.12%	0.12%	0.23%	0.23%	0.40%	0.40%
A	LEAR35	GYR	5.25%	5.25%	4.46%	4.46%	3.64%	3.64%

Aircraft Category	AEDT Type	Airport	2024 Arrivals	2024 Departures	2027 Arrivals	2027 Departures	2032 Arrivals	2032 Departures
A	C17	GYR	0.75%	0.75%	0.68%	0.68%	0.63%	0.63%
B	CNA208	GYR	1.73%	1.73%	2.72%	2.72%	2.94%	2.94%
B	DHC6	GYR	1.48%	1.48%	1.33%	1.33%	1.19%	1.19%
C	CNA172	GYR	5.06%	5.06%	6.08%	6.08%	5.52%	5.52%
C	COMSEP	GYR	70.75%	70.75%	68.27%	68.27%	68.98%	68.98%
C	PA30	GYR	4.41%	4.41%	4.01%	4.01%	3.68%	3.68%
All	All	GYR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
A	737800	IWA	1.39%	1.39%	1.27%	1.27%	1.20%	1.20%
A	7378MAX	IWA	0.00%	0.00%	7.29%	7.29%	16.18%	16.18%
A	A319-131	IWA	1.01%	1.01%	0.67%	0.67%	0.12%	0.12%
A	A320-211	IWA	38.35%	38.35%	32.70%	32.70%	25.90%	25.90%
A	A320-232	IWA	3.69%	3.69%	4.64%	4.64%	4.36%	4.36%
A	CNA525C	IWA	18.85%	18.85%	18.34%	18.34%	17.74%	17.74%
A	EMB145	IWA	2.81%	2.81%	2.54%	2.54%	2.39%	2.39%
A	MD9025	IWA	0.10%	0.00%	0.08%	0.00%	0.07%	0.00%
A	T-38A	IWA	2.22%	2.22%	2.01%	2.01%	1.89%	1.89%
A	747400	IWA	0.05%	0.05%	0.04%	0.04%	0.04%	0.04%
A	MD83	IWA	0.00%	0.10%	0.00%	0.08%	0.00%	0.07%
B	CNA208	IWA	4.09%	4.09%	4.23%	4.23%	4.42%	4.42%
B	DHC6	IWA	2.54%	2.54%	2.27%	2.27%	2.07%	2.07%
C	CNA172	IWA	8.78%	8.78%	8.04%	8.04%	7.77%	7.77%
C	COMSEP	IWA	0.98%	0.98%	0.95%	0.95%	1.00%	1.00%
C	GASEPF	IWA	9.64%	9.64%	8.82%	8.82%	8.53%	8.53%
C	GASEPV	IWA	3.91%	3.91%	4.63%	4.63%	4.90%	4.90%
C	PA30	IWA	1.61%	1.61%	1.48%	1.48%	1.43%	1.43%
All	All	IWA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
A	CNA500	P19	4.78%	4.78%	4.50%	4.50%	4.45%	4.45%
A	CNA510	P19	7.45%	7.45%	6.60%	6.60%	5.89%	5.89%
A	CNA525C	P19	28.28%	28.28%	30.77%	30.77%	31.03%	31.03%
A	CNA560U	P19	10.30%	10.30%	9.41%	9.41%	8.85%	8.85%
A	CNA560XL	P19	7.85%	7.85%	8.99%	8.99%	9.87%	9.87%
B	CNA208	P19	21.72%	21.72%	21.14%	21.14%	21.32%	21.32%
B	DHC6	P19	3.64%	3.64%	3.37%	3.37%	3.25%	3.25%
C	CNA172	P19	15.97%	15.97%	15.22%	15.22%	15.36%	15.36%
All	All	P19	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
A	A7D	SDL	0.17%	0.17%	0.16%	0.16%	0.14%	0.14%
A	CL600	SDL	11.84%	11.84%	12.64%	12.64%	13.44%	13.44%
A	CL601	SDL	2.07%	2.07%	2.20%	2.20%	2.09%	2.09%
A	CNA510	SDL	3.04%	3.04%	3.12%	3.12%	3.11%	3.11%

Aircraft Category	AEDT Type	Airport	2024 Arrivals	2024 Departures	2027 Arrivals	2027 Departures	2032 Arrivals	2032 Departures
A	CNA525C	SDL	7.66%	7.66%	7.73%	7.73%	7.51%	7.51%
A	CNA55B	SDL	10.21%	10.21%	10.72%	10.72%	11.30%	11.30%
A	CNA560U	SDL	1.39%	1.39%	0.87%	0.87%	0.77%	0.77%
A	CNA560XL	SDL	6.29%	6.29%	6.80%	6.80%	7.13%	7.13%
A	CNA680	SDL	11.72%	11.72%	12.60%	12.60%	14.69%	14.69%
A	CNA750	SDL	6.05%	6.05%	5.70%	5.70%	5.58%	5.58%
A	ECLIPSE500	SDL	0.47%	0.47%	0.43%	0.43%	0.38%	0.38%
A	EMB145	SDL	1.82%	1.82%	1.64%	1.64%	1.45%	1.45%
A	EMB14L	SDL	4.78%	4.78%	4.30%	4.30%	3.82%	3.82%
A	GIV	SDL	2.10%	2.10%	1.92%	1.92%	1.60%	1.60%
A	GV	SDL	4.16%	4.16%	4.41%	4.41%	4.76%	4.76%
A	IA1125	SDL	0.47%	0.47%	0.00%	0.00%	0.00%	0.00%
A	LEAR35	SDL	7.06%	7.06%	5.84%	5.84%	4.97%	4.97%
A	MU3001	SDL	1.84%	1.84%	1.42%	1.42%	0.95%	0.95%
A	FAL900EX	SDL	0.94%	0.00%	0.86%	0.00%	0.76%	0.00%
A	COMJET	SDL	0.00%	0.94%	0.00%	0.86%	0.00%	0.76%
B	CNA208	SDL	5.78%	5.78%	6.02%	6.02%	5.37%	5.37%
B	DHC6	SDL	3.27%	3.27%	3.15%	3.15%	2.77%	2.77%
C	CNA172	SDL	1.84%	1.84%	1.91%	1.91%	1.97%	1.97%
C	COMSEP	SDL	4.16%	4.16%	4.66%	4.66%	4.64%	4.64%
C	GASEPF	SDL	0.88%	0.88%	0.91%	0.91%	0.79%	0.79%
All	All	SDL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

4.4 Runway Utilization

The primary factor affecting runway use at airports is weather; specifically, the wind direction and wind speed. An additional factor that may affect runway use includes the position of the facility or ramp the aircraft is destined for relative to the runway. Runway use assignments for each airport were developed from 12 months of PDARS radar data (January 1, 2024 – December 31, 2024). Because no airfield construction or runway configuration changes occur under the Proposed Action, runway use patterns remain unchanged between the No Action Alternative and the Proposed Action.

Table 5 presents a summary of operating configurations and airport runway operating configuration usage for each Study Airport. 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. The proposed air traffic procedures do not change runway use; therefore, the distribution of operations was held constant between the No Action Alternative and the Proposed Action.

Table 5. Runway Use Summary by Airport

Airport	Primary Operating Configuration	Main IFR Arrival Runways (%)	Main IFR Departure Runways (%)
PHX	West Flow	26 (34.0%), 8 (25.8%)	25R (48.6%), 7L (40.6%)
BXK	North Flow Arrivals / Mixed Departures	17 (76.1%)	17 (58.3%), 35 (41.7%)
CHD	Southwest Flow	22R (49.4%), 22L (20.7%)	22R (47.8%), 4L (29.0%)
DVT	West Flow Arrivals / East Flow Departures	25L (53.0%), 7R (38.2%)	7R (49.8%), 25L (37.0%)
FFZ	Southwest Flow	22L (56.9%), 4R (28.4%)	22L (50.2%), 4R (39.7%)
GEU	South Flow	19 (62.1%)	19 (62.9%)
GYR	Southwest Flow	21 (81.0%)	21 (75.2%)
IWA	Mixed Arrivals / Southeast Flow Departures	12R (32.8%), 30L (28.7%)	12R (41.3%), 12C (23.4%)
P19	South Flow Departures	17 (79.4%)	17 (97.5%)
SDL	Southwest Flow	21 (90.6%)	21 (86.4%)

Source: PDARS (1/1/2024-12/31/2024) (FAA 2023b)

Table 6 presents the detailed runway use separated by group for each of the 10 Study Airports. The same runway use was used for all modeling scenarios.

Table 6. Detailed Runway Use by Group and Airport

Airport	Group	Runway	Arrivals Day	Arrivals Night	Departures Day	Departures Night
PHX	A	07L	1%	5%	42%	38%
PHX	A	07R	15%	21%	2%	4%
PHX	A	8	27%	24%	1%	18%
PHX	A	25L	20%	14%	2%	1%
PHX	A	25R	1%	5%	53%	30%
PHX	A	26	36%	31%	1%	9%
PHX	A	All	100%	100%	100%	100%
PHX	B	07L	0%	0%	26%	14%
PHX	B	07R	27%	46%	29%	53%
PHX	B	8	5%	4%	1%	4%
PHX	B	25L	56%	42%	22%	22%
PHX	B	25R	4%	4%	21%	3%
PHX	B	26	8%	3%	0%	3%
PHX	B	All	100%	100%	100%	100%
PHX	C	07L	0%	0%	9%	23%
PHX	C	07R	27%	0%	35%	38%
PHX	C	8	4%	0%	3%	0%
PHX	C	25L	58%	0%	46%	38%
PHX	C	25R	1%	0%	6%	0%

Airport	Group	Runway	Arrivals Day	Arrivals Night	Departures Day	Departures Night
PHX	C	26	10%	0%	0%	0%
PHX	C	All	100%	100%	100%	100%
BXK	A	17	100%	0%	78%	0%
BXK	A	35	0%	0%	22%	0%
BXK	A	All	100%	100%	100%	100%
BXK	B	17	70%	0%	89%	0%
BXK	B	35	30%	0%	11%	0%
BXK	B	All	100%	100%	100%	100%
BXK	C	17	75%	0%	52%	0%
BXK	C	35	25%	0%	48%	100%
BXK	C	All	100%	100%	100%	100%
CHD	A	04L	10%	19%	10%	21%
CHD	A	04R	17%	54%	24%	45%
CHD	A	22L	41%	19%	37%	24%
CHD	A	22R	31%	8%	29%	11%
CHD	A	All	100%	100%	100%	100%
CHD	B	04L	25%	50%	29%	55%
CHD	B	04R	0%	0%	8%	0%
CHD	B	22L	10%	17%	6%	0%
CHD	B	22R	64%	33%	57%	45%
CHD	B	All	100%	100%	100%	100%
CHD	C	04L	20%	59%	36%	76%
CHD	C	04R	8%	10%	2%	0%
CHD	C	22L	12%	5%	2%	0%
CHD	C	22R	60%	27%	60%	24%
CHD	C	All	100%	100%	100%	100%
DVT	A	07L	0%	0%	0%	0%
DVT	A	07R	45%	40%	64%	79%
DVT	A	25L	55%	60%	36%	21%
DVT	A	25R	0%	0%	0%	0%
DVT	A	All	100%	100%	100%	100%
DVT	B	07L	0%	0%	1%	1%
DVT	B	07R	43%	39%	61%	59%
DVT	B	25L	52%	61%	37%	40%
DVT	B	25R	5%	0%	0%	0%
DVT	B	All	100%	100%	100%	100%
DVT	C	07L	5%	3%	27%	11%
DVT	C	07R	26%	43%	26%	52%
DVT	C	25L	51%	52%	43%	36%

Airport	Group	Runway	Arrivals Day	Arrivals Night	Departures Day	Departures Night
DVT	C	25R	18%	1%	4%	2%
DVT	C	All	100%	100%	100%	100%
FFZ	A	04L	1%	7%	0%	0%
FFZ	A	04R	29%	50%	45%	86%
FFZ	A	22L	68%	36%	55%	14%
FFZ	A	22R	3%	7%	0%	0%
FFZ	A	All	100%	100%	100%	100%
FFZ	B	04L	3%	11%	3%	17%
FFZ	B	04R	23%	62%	31%	74%
FFZ	B	22L	62%	11%	59%	6%
FFZ	B	22R	12%	15%	7%	4%
FFZ	B	All	100%	100%	100%	100%
FFZ	C	04L	4%	15%	2%	20%
FFZ	C	04R	24%	70%	38%	66%
FFZ	C	22L	58%	11%	52%	10%
FFZ	C	22R	15%	3%	8%	3%
FFZ	C	All	100%	100%	100%	100%
GEU	A	1	38%	33%	35%	64%
GEU	A	19	62%	67%	65%	36%
GEU	A	All	100%	100%	100%	100%
GEU	B	1	42%	17%	36%	0%
GEU	B	19	58%	83%	64%	0%
GEU	B	All	100%	100%	100%	100%
GEU	C	1	37%	52%	35%	35%
GEU	C	19	63%	48%	65%	65%
GEU	C	All	100%	100%	100%	100%
GYR	A	3	30%	28%	0%	0%
GYR	A	21	70%	72%	100%	100%
GYR	A	All	100%	100%	100%	100%
GYR	B	3	42%	23%	23%	0%
GYR	B	21	58%	77%	77%	100%
GYR	B	All	100%	100%	100%	100%
GYR	C	3	16%	17%	25%	31%
GYR	C	21	84%	83%	75%	69%
GYR	C	All	100%	100%	100%	100%
IWA	A	12C	20%	25%	22%	25%
IWA	A	12R	31%	43%	42%	70%
IWA	A	30C	5%	2%	19%	0%
IWA	A	30L	44%	30%	17%	5%

Airport	Group	Runway	Arrivals Day	Arrivals Night	Departures Day	Departures Night
IWA	A	All	100%	100%	100%	100%
IWA	B	12C	20%	24%	25%	24%
IWA	B	12R	35%	40%	40%	61%
IWA	B	30C	5%	3%	0%	0%
IWA	B	30L	40%	34%	35%	15%
IWA	B	All	100%	100%	100%	100%
IWA	C	12C	9%	9%	34%	21%
IWA	C	12R	40%	33%	31%	76%
IWA	C	30C	14%	8%	0%	0%
IWA	C	30L	37%	51%	35%	3%
IWA	C	All	100%	100%	100%	100%
P19	A	17	78%	50%	100%	100%
P19	A	35	22%	50%	0%	0%
P19	A	All	100%	100%	100%	100%
P19	B	17	81%	0%	100%	100%
P19	B	35	19%	0%	0%	0%
P19	B	All	100%	100%	100%	100%
P19	C	17	81%	75%	100%	100%
P19	C	35	19%	25%	0%	0%
P19	C	All	100%	100%	100%	100%
SDL	A	3	8%	54%	11%	59%
SDL	A	21	92%	46%	89%	41%
SDL	A	All	100%	100%	100%	100%
SDL	B	3	8%	54%	0%	0%
SDL	B	21	92%	46%	100%	100%
SDL	B	All	100%	100%	100%	100%
SDL	C	3	8%	0%	0%	0%
SDL	C	21	92%	100%	100%	100%
SDL	C	All	100%	100%	100%	100%

Source: PDARS (1/1/2024-12/31/2024) (FAA 2023b)

Note: Percentages may not sum to 100% due to rounding.

4.5 Aircraft Noise and Performance Characteristics

AEDT uses standardized aircraft noise and performance data for each aircraft type operating at an airport. Each aircraft type references a set of available flight performance profiles and Noise-Power-Distance (NPD) curves. The noise data consists of Sound Exposure Levels (SELs) measured at distances ranging from 200 feet to 25,000 feet, while performance data include

thrust, speed, and altitude profiles for takeoff and landing. The AEDT database contains information for more than 300 fixed-wing aircraft types.

The NPD data is accessed during AEDT noise calculations to determine the noise levels for the appropriate metric at each receptor. 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 (FAA 2024a).

4.6 Aircraft Climb/Descent Profiles

To accurately model noise exposure, AEDT has the capability to include specified altitude control codes on flight trajectories, allowing users to constrain modeled trajectories, as necessary. These altitude controls reflect altitude information provided by air traffic procedure design. AEDT generates climb/descent profiles for each operation that are consistent with specified altitude control codes within the constraints of the allowable aircraft performance determined by AEDT.

Altitude control codes are only applied at or above altitudes of 2,000 feet MSL. This means that AEDT will use default profile data 2,000 feet MSL and below depending on the airport field elevation (PHX is at 1,135 feet MSL, therefore AEDT default data was used below 865 feet AFE). Above 2,000 feet MSL, the profile will follow the altitudes prescribed by the input trajectory in such a manner that the specified altitude control codes are adhered to. For flight tracks that do not have altitude targets, an altitude control code is applied to its highest altitude (which may be the edge of the study area).

The four enumerations of altitude control codes 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 a specified altitude control code, it was modeled without a control code. 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 by AEDT. Once modeled, the operation's performance includes parameters such as four-dimensional position, speed, and thrust.

4.7 Aircraft Stage Length

Departure profiles in AEDT are organized by stage lengths, which represent trip distances and reflect aircraft weight and fuel requirements. For the PHX EA, stage lengths are assigned using great-circle city-pair distances. **Table 7** provides the AEDT stage numbers and their corresponding trip length ranges, and the detailed distribution of stage lengths by airport and year is documented in the noise model input memo.

Table 7. AEDT Stage Number and Trip Lengths

Stage Number	Trip Length (NM)
1	0-500
2	500-1,000
3	1,000-1,500
4	1,500-2,500
5	2,500-3,500
6	3,500-4,500
7	4,500-5,500
8	5,500-6,500
9	6,500-11,000
M	Maximum range at maximum takeoff weight

Note: Stage Length is defined as the distance an aircraft travels from takeoff to landing.

Source: AEDT Version 3g User Guide, Page 138 (FAA 2024a)

AEDT also provides STANDARD and International Civil Aviation Organization (ICAO) flight profiles for takeoff, landing, and touch-and-go operations. For this analysis, STANDARD profiles were used as the basis for all civilian and military aircraft in the Existing Conditions.

4.8 Meteorological Conditions

The AEDT includes several settings that influence aircraft performance profiles and sound propagation, including average annual temperature, barometric pressure, and relative humidity. For each Study Airport, the model provides default 10-year average values for these conditions. These defaults (based on 2014–2023 data) were used for both the existing and future scenario modeling for all Study Airports (FAA 2024a).

4.9 Terrain Data

Terrain data describe ground elevation on and around the airport and are used in AEDT to adjust the ground height beneath flight paths. While terrain does not change aircraft performance or source noise levels, it affects the vertical distance between aircraft and ground receivers, which in turn influences noise propagation. For this analysis, terrain data from the USGS National Elevation Dataset (one-third arc-second resolution) were applied within AEDT's terrain feature to generate elevations for each modeled grid point.

4.10 Flight Track Geometry and Use

Flight tracks for noise modeling were developed from PDARS radar data using an industry-standard process to develop model tracks that entail analyzing all radar data for each airport by splitting the flight tracks into similar and manageable groups. The standard procedure separates tracks by operation type, runway end, aircraft type, and destination/direction, then analyzed to identify geometrically similar group patterns. These groups formed the basis for the

final radar-derived track bundles. For groups with wider lateral dispersion, a central “backbone” track and up to four dispersion tracks on each side were created, resulting in bundles of three, five, or seven model tracks that capture the full range of observed variability.

All model flight tracks are intended to be modeled to at least 18,000 feet AGL. If a model track does not reach 18,000 feet AGL in altitude, then the model track endpoint was determined at its intersection with a defined trim line (due to the irregular shape of the Supplemental Study Area) just beyond the extent of the Supplemental Study Area (so fuel consumption and noise are generated up to the Supplemental Study Area boundary). If a model track does not reach 18,000 feet AGL or intersect the trim line, then the model track’s endpoint was determined such that the cruise portion of the flight is modeled as much as possible. The backbones (and all associated sub-tracks) serve as inputs into AEDT, which then calculates noise and emissions based on entire input tracks as described above.

The radar data analysis resulted in the development of 2,258 unique AEDT departure tracks for AEDT model input (backbones and sub-tracks). **Exhibit 5** presents the PHX EA AEDT departure tracks shown in blue used in the modeling of the 2024 Existing Conditions. The analysis also resulted in the development of 1,442 AEDT unique arrival tracks (backbones and sub-tracks). **Exhibit 6** presents the PHX EA AEDT arrival tracks shown in maroon used in the modeling of 2024 Existing Conditions scenario.

The routing for No Action Alternative airspace procedures in 2027 and 2032 is anticipated to be identical to the routing in the 2024 Existing Conditions. This assumption excludes the addition of previously developed procedures identified as having independent utility and separately analyzed for environmental effects (**Section 5.9** of the PHX EA). As a result, the model tracks created from 2024 Existing Conditions were used directly in the modeling of No Action Alternative, except for arrivals to BXX. Arrivals to BXX were updated to include Area Navigation (RNAV) approaches to both Runway 17 and Runway 35 that will be implemented in March 2026.

The final step in developing the flight track input data for the AEDT model is the assignment of aircraft to specific flight tracks. The flight data associated with each radar data bundle were used to develop the usage for each AEDT backbone and sub-track. The AAD operations were then applied to each runway and each model track bundle using these usage values. As a result, each AEDT model input track does not necessarily represent one flight operation; it could represent many operations or a small fraction of an operation.

4.10.1 T-Routes

T-Routes are low altitude, RNAV-based routes that provide global positioning system (GPS)-defined navigation paths for aircraft operating primarily under IFR below 18,000 feet MSL. They

serve as modern replacements or supplements to Victor Airways that depend on ground-based navigational aids.

The study area includes one T-Route (T-306) in the Existing Conditions. T-306 enters the Supplemental Study Area in the southeast near Tucson and heads north to PHX through the General Study Area. The T-Route turns west over PHX and exits the Supplemental Study Area near Blythe, Arizona.

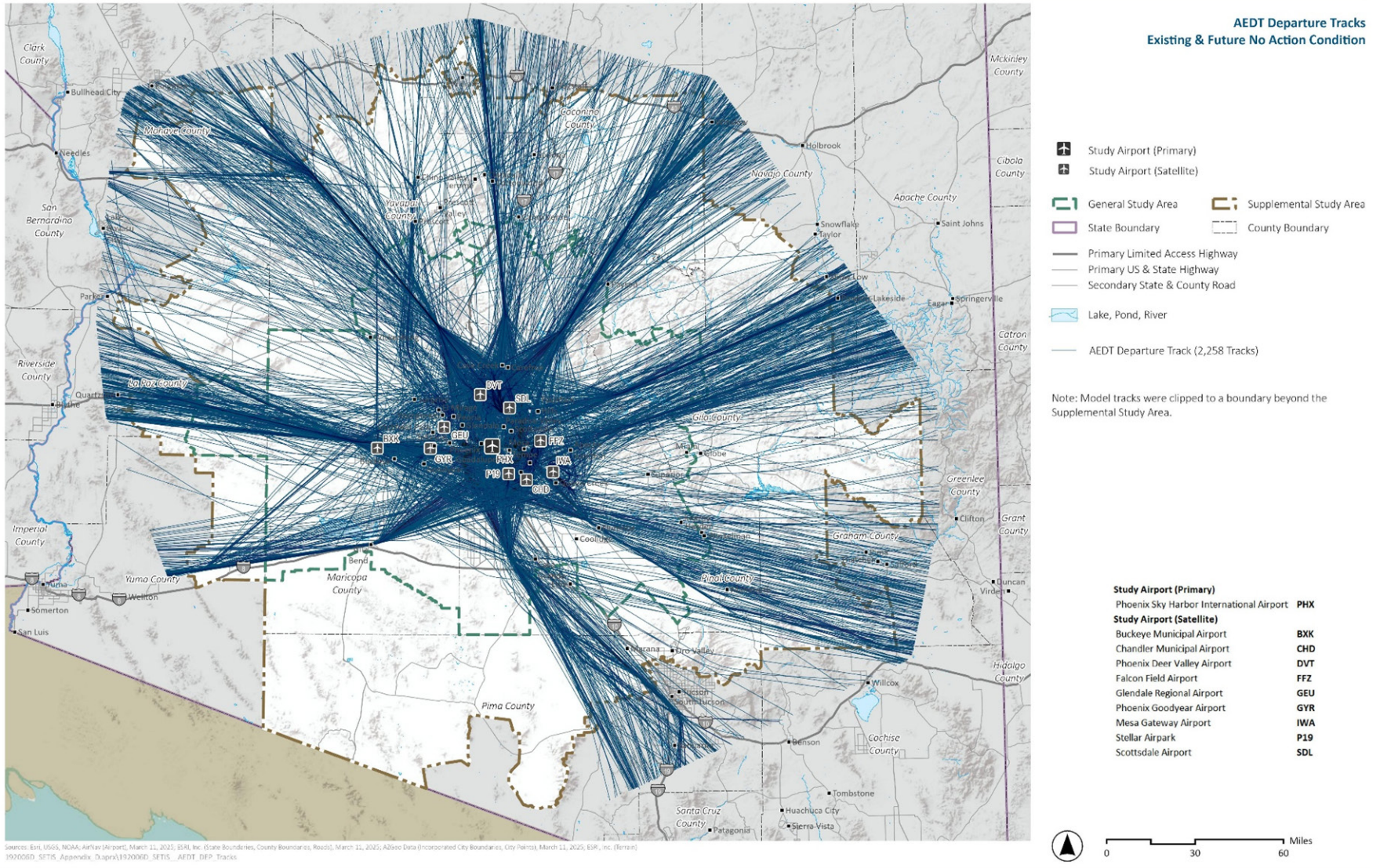


Exhibit 5. AEDT Departure Tracks – Existing & Future No Action Condition

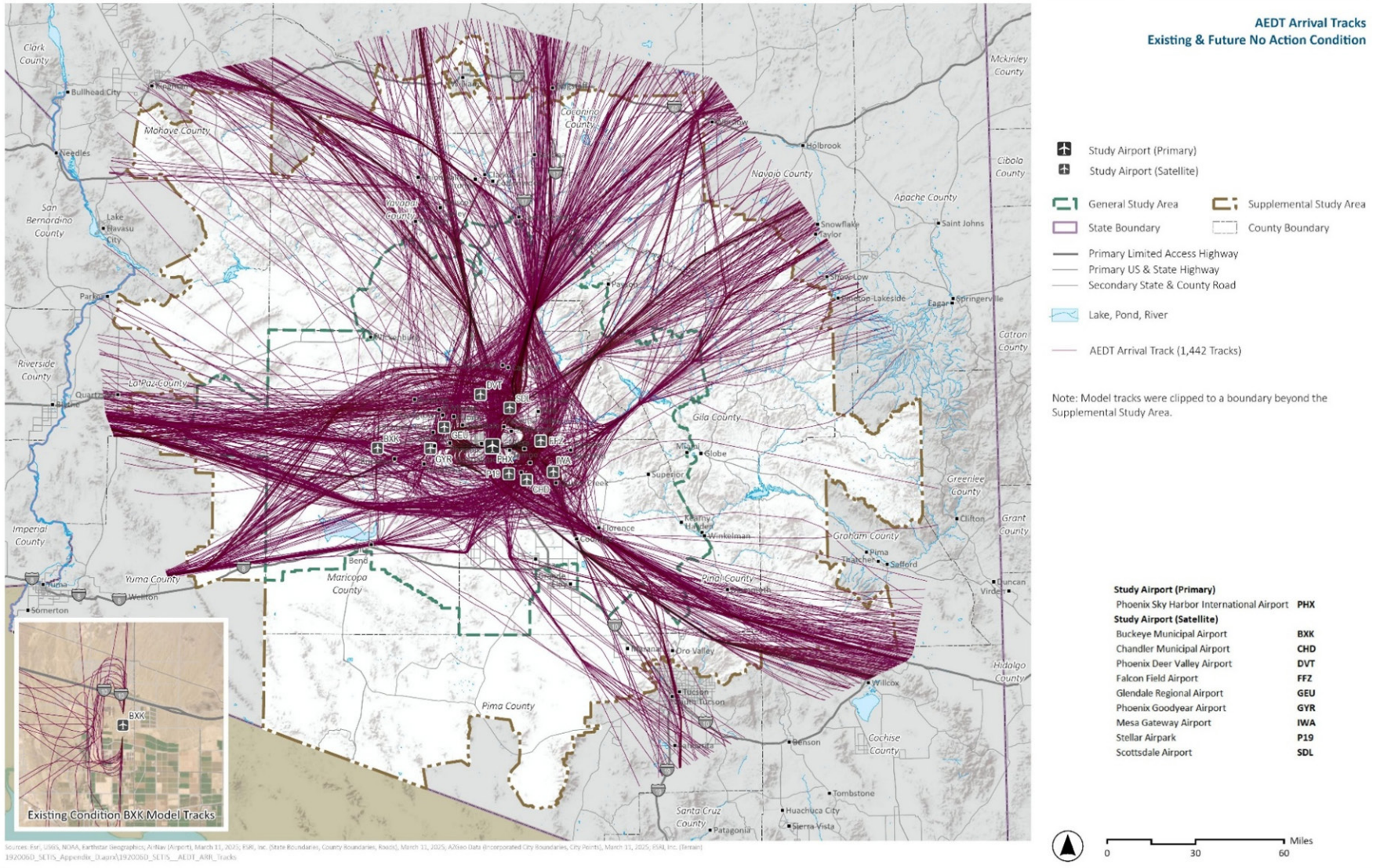


Exhibit 6. AEDT Arrival Tracks – Existing & Future No Action Condition

4.11 Grid Point Noise Calculations

AEDT calculates DNL and other noise metrics at discrete grid points to show noise levels at specific locations. Grid point analysis is useful for identifying where notable or reportable noise changes may occur. Noise values for the No Action Alternative and Proposed Action for all of the grid points with reportable changes are provided in **Attachment C** through **Attachment G** of this report.

4.12 Operational Fuel Burn/Emissions Methodology

The analysis of aircraft emissions for the PHX EA follows FAA's *Aviation Emissions and Air Quality Handbook Version 4* (FAA 2024) and uses AEDT, the FAA-required model for airport emissions assessments. Because the No Action Alternative and the Proposed Action involve the same number of aircraft operations, there are no changes in runway use. As a result, differences in emissions are limited to changes in the flight tracks and procedures. The fleet mix and landing and takeoff activity used for emissions modeling are consistent with those used in the noise analysis.

AEDT requires inputs related to aircraft engine types and taxi times to estimate fuel burn and pollutant emissions. Default taxi-in and taxi-out times from AEDT version 3g were used for each Study Airport. Because total operations remain unchanged, emissions from ground support equipment and auxiliary power unit usage were not modeled. Taxiing emissions were calculated based on landing-takeoff operation cycles, aircraft and engine types, and time spent taxiing. The taxi times used for each airport are provided in the modeling input memos in **Attachment A**.

4.13 Data Quality and Integrity Checks

To ensure AEDT accepts all inputs, data integrity checks were conducted before modeling. For the noise analysis, the following steps were taken:

- Adjusted flight trajectories to remove climbs in arrivals and descents in departures
- Corrected unrealistic turn angles in flight paths
- Verified and corrected runway end coordinates
- Ensured input profiles matched those available in AEDT
- Cross-checked operation counts before and after import to confirm all were loaded

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. These checks included:

- Verifying the correct runway use and operations data was modeled
- Verifying successful performance calculations for each operation
- Confirming completion of all planned noise and emissions outputs

4.14 Determine Noise Changes

After all noise calculations were completed, potential noise impacts were determined by locating and categorizing changes in noise values between modeling scenarios. Using FAA threshold criteria for significant impacts and reportable noise changes, as described in **Section 2.3**, maps depicting zones of annualized DNL noise exposure change between scenarios were produced for the entire General Study Area and Supplemental Study Area.