U.S. Department
of Transportation
Federal Aviation
Administration

Northwest Mountain Region
Colorado · Idaho · Montana · Oregon · Utah
Washington · Wyoming

Seattle Airports District Office
2200 S. 216th Street, Room 1W-420
Des Moines, WA 98198

June 5, 2025

John Parrott, AAE
Airport Director
King County International Airport - Boeing Field
7277 Perimeter Rd. S.
Seattle, WA 98108

Dear Mr. Parrot:

This is to notify you that the Federal Aviation Administration (FAA) has evaluated your final submission of the Noise Exposure Maps (NEM) and supporting documentation transmitted by your letter of May 1, 2025, in accordance with Title 49, USC, Chapter 475, and has determined that they are in compliance with applicable requirements of 14 CFR Part 150. Further, we have determined the maps entitled "2023 Existing Condition Noise Exposure Map" and "2030 Future Condition Noise Exposure Map" fulfill the requirements for the current and the forecast year noise exposure maps.

FAA's determination that your Noise Exposure Maps are in compliance is limited to a finding that the maps were developed in accordance with the procedures contained in Appendix A of 14 CFR Part 150. Such determination does not constitute approval of your data, information or plans.

Should questions arise concerning the precise relationship of specific properties to noise exposure contours depicted on your Noise Exposure Maps, please note that the FAA will not be involved in any way in determining the relative locations of specific properties with regard to the depicted noise exposure contours or in interpreting the maps to resolve questions, such as which properties should be covered by the provisions of Title 49. These functions are inseparable from the ultimate land-use control and planning responsibilities of local government. These local responsibilities are not changed in any way under Part 150 or through FAA's determination relative to your Noise Exposure Maps. Therefore, the responsibility for the detailed overlaying of noise exposure contours onto the maps depicting properties on the surface rests exclusively with you, the airport operator, or with those public agencies and planning agencies with which consultation is required under Title 49. The FAA relies on the certification by you, under 150.21 of 14 CFR Part 150, that the statutorily required consultation has been accomplished.

The FAA will publish a notice in the Federal Register announcing its determination on the Noise Exposure Maps for the King County International Airport-Boeing Field.

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

Northwest Mountain Region
Colorado · Idaho · Montana · Oregon · Utah
Washington · Wyoming

Seattle Airports District Office
2200 S. 216th Street, Room 1W-420
Des Moines, WA 98198

Your notice of this determination and the availability of the Noise Exposure Maps, when published at least three times in a newspaper of general circulation in the county or counties where affected parties are located, will satisfy the requirements of Title 49.

As a reminder, Section 150.21(d) of 14 CFR Part 150 requires the airport sponsor to promptly prepare and submit revisions to these maps of any actual or proposed change in the operation of the King County International Airport-Boeing Field that might create any substantial, new, noncompatible use in any areas depicted on the Noise Exposure Maps.

Sincerely,

RYAN C
ZULAUF

Digitally signed by RYAN C
ZULAUF
Date: 2025.06.05 11:56:21
-07'00'

Ryan C. Zulauf
Acting Manager
Federal Aviation Administration
Seattle Airports District Office

Cc: APP-400
ANM-610

April 30, 2025

King County International Airport
Part 150 Study
Noise Exposure Maps Report

Photo Source: King County International Airport

King County International Airport
FAR Part 150 Study
Draft Noise Exposure Maps Report

VERSION 3.0
Volume No. 01
April 30, 2025
Seattle, Washington
Contract No.: KC000840
RS&H No.: 1047-0031-000

Prepared by RS&H, Inc. at the
direction of King County International Airport

King County
International Airport
Boeing Field

John Parrott, Airport Division Director
Department of Executive Services

7277 Perimeter Road South
Seattle, WA 98108

May 1, 2025

TO: Sky M. Laron
Community Engagement Officer
Airports Division, Northwest Mountain Region
Federal Aviation Administration
2200 S. 216th Street
Des Moines, WA 98198

FM: John Parrott A.A.E.
Airport Director

RE: 14 CFR Part 150 Noise Exposure Maps Submission for King County International Airport - Boeing Field

Dear Mr. Laron:

King County is pleased to submit the Noise Exposure Maps (NEMs) and supporting documentation for the King County International Airport – Boeing Field. The NEMs have been prepared in accordance with 14 CFR Part 150 Airport Noise Compatibility Planning.

The 2023 Existing NEM are based on data from calendar year 2023. Because the data used to develop the existing NEM does not match the year of the NEM submittal, the Airport has verified that the data in the documentation are representative of the existing condition as of the date of submission. Aircraft operations data from the FAA's Operations Network (OPSNET) for calendar year 2024 totaled 149,559. The total aircraft operations used to generate the existing NEM (2023) totaled 157,064, a difference of 4.8%.

The sponsor's certification, as required by 14 CFR Part 150, is included following this letter. Written comments were received during consultation and are on file with the FAA regional airports division manager.

Should you have any questions regarding the enclosed document, please do not hesitate to contact me at 206-263-3489. We appreciate your assistance in this matter.

Sincerely,

Signed by:
John Parrott
CE4745ADB98B4F9...

John Parrott A.A.E.
Airport Director
King County International Airport - Boeing Field

John Parrott, Airport Division Director
Department of Executive Services

Sponsor's Certification

1. The 2023 and 2030 Noise Exposure Maps for the King County International Airport-Boeing Field and the description of consultation and opportunity for public comment submitted to the Federal Aviation Administration under 14 CFR Part 150, Subpart B, Section 150.21(e), are true and complete, under penalty of 18 U.S.C. 1001.

2. Pursuant to 14 CFR Part 150, Subpart B, Section 150.21(b), interested persons have been afforded adequate opportunity to submit their views, data, and comments concerning the correctness and adequacy of the draft noise exposure map and descriptions of forecast aircraft operations.

3. The "2023 Existing Condition Noise Exposure Map" (located in Appendix H, 2023 Map 1 of 4) accurately represents the existing condition.

4. The "2030 Future Condition Noise Exposure Map" (located in Appendix H, 2030 Map 1 of 4) accurately represents the forecast conditions for the fifth calendar year after the date of submission.

KING COUNTY INTERNATIONAL AIRPORT – BOEING FIELD

By: John Parrott, A.A.E.
Title: Airport Director
Date: May 1, 2025
Airport: King County International Airport - Boeing Field
Owner/Operator: King County, Washington
Address: 7277 Perimeter Rd. S., Seattle, WA 98108

14 CFR PART 150 NEM CHECKLIST – PART I

AIRPORT NAME: King County International Airport-Boeing Field REVIEWER: ____________________

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
I. Submitting And Identifying The NEM:			
A. Submission is properly identified:			
1. 14 C.F.R. Part 150 NEM?	X		Cover Letter and Page 1-1
2. NEM and NCP together?			N/A – NEM submission only
3. Revision to NEMs FAA previously determined to be in compliance with Part 150?	X		Page 1-1
B. Airport and Airport Operator's name are identified?	X		Cover Letter and Page 2-1
C. NCP is transmitted by airport operator's dated cover letter, describing it as a Part 150 submittal and requesting appropriate FAA determination?			N/A – NEM submission only
II. Consultation: [150.21(b), A150.105(a)]			
A. Is there a narrative description of the consultation accomplished, including opportunities for public review and comment during map development?	X		Pages 4-9, Chapter 7, and Appendices D and E
B. Identification of consulted parties:			
1. Are the consulted parties identified?	X		Pages 4-9, Chapter 7, and Appendix D
2. Do they include all those required by 150.21(b) and A150.105(a)?	X		Pages 4-9, and Chapter 7
3. Agencies in 2, above, correspond to those indicated on the NEM?	X		Appendix H (Cities of Seattle and Tukwila)
C. Does the documentation include the airport operator's certification, and evidence to support it, that interested persons have been afforded adequate opportunity to submit their views, data, and comments during map development and in accordance with 150.21(b)?	X		Sponsor's Certification, Chapter 7, and Appendices E and G
D. Does the document indicate whether written comments were received during consultation and, if there were comments that they are on file with the FAA regional airports division manager?	X		Cover Letter and Page 7-5
III. General Requirements: [150.21]			

14 CFR PART 150 NEM CHECKLIST – PART I

AIRPORT NAME: King County International Airport-Boeing Field REVIEWER: ____________________________

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
A. Are there two maps, each clearly labeled on the face with year (existing condition year and one that is at least 5 years into the future)?	X		Appendix H
B. Map currency:			
1. Does the year on the face of the existing condition map graphic match the year on the airport operator's NEM submittal letter?		X	
2. Is the forecast year map based on reasonable forecasts and other planning assumptions and is it for at least the fifth calendar year after the year of submission?	X		Page 5-2, Future NEM year is 2030 and the future aviation activity forecast was approved by the FAA on September 19, 2024
3. If the answer to 1 and 2 above is no, the airport operator must verify in writing that data in the documentation are representative of existing condition and at least 5 years' forecast conditions as of the date of submission.	X		Cover Letter
C. If the NEM and NCP are submitted together:			
1. Has the airport operator indicated whether the forecast year map is based on either forecast conditions without the program or forecast conditions if the program is implemented?			N/A – NEM submission only
2. If the forecast year map is based on program implementation:			
a. Are the specific program measures that are reflected on the map identified?			N/A – NEM submission only
b. Does the documentation specifically describe how these measures affect land use compatibilities depicted on the map?			N/A – NEM submission only
3. If the forecast year NEM does not model program implementation, the airport operator must either submit a revised forecast NEM showing program implementation conditions [B150.3(b), 150.35(f)] or the sponsor must demonstrate the adopted forecast year NEM with approved NCP measures would not change by plus/minus 1.5 DNL? (150.21(d))			N/A – NEM submission only

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
IV. Map Scale, Graphics, And Data Requirements: [A150.101, A150.103, A150.105, 150.21(a)]			
A. Are the maps of sufficient scale to be clear and readable (they must not be less than 1" to 2,000'), and is the scale indicated on the maps? (*Note (1) if the submittal uses separate graphics to depict flight tracks and/or noise monitoring sites, these must be of the same scale, because they are part of the documentation required for NEMs.*) (*Note (2) supplemental graphics that are not required by the regulation do not need to be at the 1" to 2,000' scale*)	X		Appendix H
B. Is the quality of the graphics such that required information is clear and readable? (*Refer to C. through G., below, for specific graphic depictions that must be clear and readable*)	X		Appendix H
C. Depiction of the airport and its environs:			
1. Is the following graphically depicted to scale on both the existing condition and forecast year maps?			
a. Airport boundaries	X		Appendix H
b. Runway configurations with runway end numbers	X		Appendix H
2. Does the depiction of the off-airport data include?			
a. A land use base map depicting streets and other identifiable geographic features	X		Appendix H
b. The area within the DNL[1] 65 dB (or beyond, at local discretion)	X		Appendix H
c. Clear delineation of geographic boundaries and the names of all jurisdictions with planning and land use control authority within the DNL 65 dB (or beyond, at local discretion)	X		Appendix H (Cities of Seattle and Tukwila)
D. 1. Continuous contours for at least the DNL 65, 70, and 75 dB?	X		Appendix H

[1] CNEL for California airports

AIRPORT NAME: King County International Airport-Boeing Field REVIEWER: ____________________________

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
2. Has the local land use jurisdiction(s) adopted a lower local standard and if so, has the sponsor depicted this on the NEMs?		X	
3. Based on current airport and operational data for the existing condition year NEM, and forecast data representative of the selected year for the forecast NEM?	X		Cover Letter and Chapter 5
E. Flight tracks for the existing condition and forecast year timeframes (these may be on supplemental graphics which must use the same land use base map and scale as the existing condition and forecast year NEM), which are numbered to correspond to accompanying narrative?	X		Appendix H
F. Locations of any noise monitoring sites (these may be on supplemental graphics which must use the same land use base map and scale as the official NEMs)			N/A
G. Noncompatible land use identification:			
1. Are noncompatible land uses within at least the DNL 65 dB noise contour depicted on the map graphics?	X		Appendix H
2. Are noise sensitive public buildings and historic properties identified? (*Note: If none are within the depicted NEM noise contours, this should be stated in the accompanying narrative text.*)	X		Appendix H
3. Are the noncompatible uses and noise sensitive public buildings readily identifiable and explained on the map legend?	X		Appendix H
4. Are compatible land uses, which would normally be considered noncompatible, explained in the accompanying narrative?	X		Page 2-13

AIRPORT NAME: King County International Airport-Boeing Field REVIEWER: ____________________________

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
V. Narrative Support Of Map Data: [150.21(a), A150.1, A150.101, A150.103]			
A. 1. Are the technical data and data sources on which the NEMs are based adequately described in the narrative?	X		Chapter 5 – Noise Exposure Maps Development
2. Are the underlying technical data and planning assumptions reasonable?	X		Chapter 5 – Noise Exposure Maps Development. The future aviation activity forecast was approved by the FAA on September 19, 2024
B. Calculation of Noise Contours:			
1. Is the methodology indicated?	X		Chapter 5 – NEM Development
a. Is it FAA approved?	X		Page 5-1
b. Was the same model used for both maps? (*Note: The same model also must be used for NCP submittals associated with NEM determinations already issued by FAA where the NCP is submitted later, unless the airport sponsor submits a combined NEM/NCP submittal as a replacement, in which case the model used must be the most recent version at the time the update was started.*)	X		AEDT version 3f (the most recent version of the model when the study began)
c. Has AEE approval been obtained for use of a model other than those that have previous blanket FAA approval?			N/A
2. Correct use of noise models:			
a. Does the documentation indicate, or is there evidence, the airport operator (or its consultant) has adjusted or calibrated FAA-approved noise models or substituted one aircraft type for another that was not included on the FAA's pre-approved list of aircraft substitutions?	X		Page 5-3 (FAA approved four aircraft that were not in the model)
b. If so, does this have written approval from AEE, and is that written approval included in the submitted document?	X		Appendix C
3. If noise monitoring was used, does the narrative indicate that Part 150 guidelines were followed?			N/A

14 CFR PART 150 NEM CHECKLIST – PART I

AIRPORT NAME: King County International Airport-Boeing Field REVIEWER: ____________________

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
4. For contours below DNL 65 dB, does supporting documentation include an explanation of local reasons? (*Note: A narrative explanation, including evidence the local jurisdiction(s) have adopted a noise level less than DNL 65 dB as sensitive for the local community(ies), and including a table or other depiction of the differences from the Federal table, is highly desirable but not specifically required by the rule. However, if the airport sponsor submits NCP measures within the locally significant noise contour, an explanation must be included if it wants the FAA to consider the measure(s) for approval for purposes of eligibility for Federal aid.*)			N/A
C. Noncompatible Land Use Information:			
1. Does the narrative (or map graphics) give estimates of the number of people residing in each of the contours (DNL 65, 70 and 75, at a minimum) for both the existing condition and forecast year maps?	X		Page 6-2, Table 6-2 and Page 6-6, Table 6-4
2. Does the documentation indicate whether the airport operator used Table 1 of Part 150?	X		Page 6-1
a. If a local variation to table 1 was used:			
(1) Does the narrative clearly indicate which adjustments were made and the local reasons for doing so?			N/A - Table 1 was used
(2) Does the narrative include the airport operator's complete substitution for table 1?			N/A - Table 1 was used
3. Does the narrative include information on self- generated or ambient noise where compatible or noncompatible land use identifications consider non-airport and non-aircraft noise sources?			N/A - Table 1 was used
4. Where normally noncompatible land uses are not depicted as such on the NEMs, does the narrative satisfactorily explain why, with reference to the specific geographic areas?	X		Page 2-13

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
5. Does the narrative describe how forecast aircraft operations, forecast airport layout changes, and forecast land use changes will affect land use compatibility in the future?	X		Page 6-9
VI. Map Certifications: [150.21(b), 150.21(e)]			
A. Has the operator certified in writing that interested persons have been afforded adequate opportunity to submit views, data, and comments concerning the correctness and adequacy of the draft maps and forecasts?	X		Sponsor's Certification
B. Has the operator certified in writing that each map and description of consultation and opportunity for public comment are true and complete under penalty of 18 U.S.C. § 1001?	X		Sponsor's Certification

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Appendices

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CHAPTER 1

INTRODUCTION

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1 Introduction

King County is updating the Noise Exposure Maps (NEMs) for King County International Airport – Boeing Field (KCIA or Airport) to document compatible and non-compatible land uses in the vicinity of KCIA. This document is prepared pursuant to Title 14 of the U.S. Code of Federal Regulations Part 150, Airport Noise Compatibility Planning.

1.1 Need for NEMs Update

NEMs are essential tools for airport operators, local authorities, and communities to understand and address the impacts of aircraft noise. The NEMs clearly identify an airport's levels of aviation noise exposure and the land uses that are compatible or incompatible with the level of noise exposure received. Updates to the NEMs are necessary due to the dynamic nature of aviation operations, technological advancements, and changing community concerns. The update ensures that the NEMs accurately reflect the levels of aviation noise exposure, account for any changes in airport operations or airspace configurations and enables the implementation and/or continuation of noise mitigation measures.

King County completed the first Part 150 Study for KCIA in 2004. On December 23, 2004, the FAA determined that the NEMs complied with the applicable requirements of Part 150. The two analysis years in the 2004 NEM were 2003 (existing) and 2008 (future). This NEM update documents how the changes to the aircraft operations and fleet mix since the 2004 NEMs were published have changed the size and shape of the noise contours along with changes to compatible and non-compatible land uses in the vicinity of KCIA.

1.2 Objectives of the NEMs Update

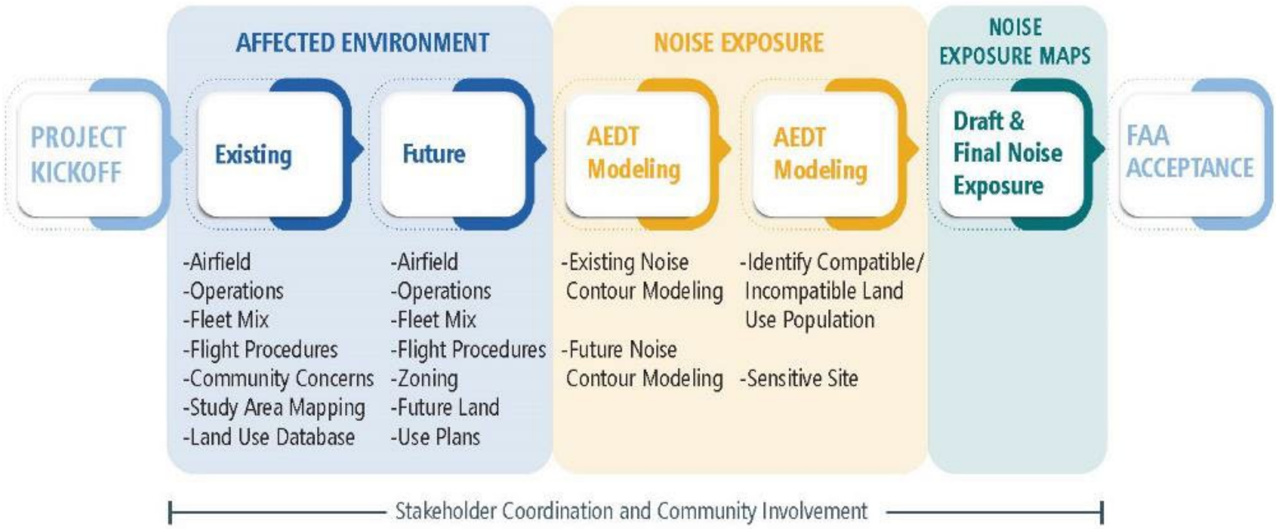
The primary objectives of the NEMs update are as follows:

1. Quantify the current and forecast noise exposure levels in the vicinity of the Airport based on the latest available data.
2. Incorporate any changes at the Airport, such as new runways, modified flight procedures, or change in the number of aircraft operations since the last NEMs.
3. Use the most current noise model to enhance the accuracy of noise calculations.
4. Engage with the community to gather input, address concerns, and ensure a transparent and inclusive update process.
5. Provide noise information to local planning agencies so they may make informed land use decisions.

1.3 Study Process

Within Part 150, there are specific requirements that govern the development of NEMs. These requirements ensure a standardized and comprehensive approach to assessing and managing aircraft noise impacts. **Figure 1-1** shows the NEM process.

Figure 1-1
NEM Study Process



Source: RS&H, 2024

1.4 NEMs Study Years

The NEMs consist of two maps of noise contours shown over land uses. The first map shows the existing condition noise contours, and the second map shows the noise contours forecast in the future. The study years for this NEMs update are 2023 and 2030.

1.5 Technical Approach to Preparing NEMs

This report describes in detail the information, data, and methods used to develop the NEMs and quantify existing and future aircraft noise impacts in the vicinity of KCIA. The process of conducting NEMs under Part 150 involves several key steps. The sections below provide a brief overview of the technical approach for the KCIA NEMs update.

1.5.1 Data Collection

Comprehensive data collection is crucial for accurate NEMs. The specific airport data collected included runway usage, flight track information, aircraft operations distributed by time of day, and aircraft fleet mix. Additionally, public data sources provide data regarding land use, population, housing units, and noise sensitive sites.

1.5.2 Aircraft Noise Modeling

Using the FAA’s Aviation Environmental Design Tool (AEDT) version 3f, noise contours were developed for the years 2023 and 2030. This process involved compiling information and generating detailed input data for using AEDT that represents aircraft activity and operating conditions at KCIA.

1.5.3 Preparation of NEMs

Based on the noise modeling results, NEMs were then developed and overlaid on an updated land use map. These maps display noise contours providing a visual representation of noise exposure levels experienced by communities around the Airport. The 2023 and 2030 NEMs were developed in accordance with the criteria found in Part 150.

1.5.4 Aircraft Noise Impact Analysis

The type and amount (acreage) of incompatible land uses were identified for the 2023 and 2030 NEMs. The analysis also determined the estimated population, households, and noise-sensitive sites that are incompatible with the aircraft noise exposure levels they receive.

1.5.5 Consultation and Public Involvement

The consultation and public involvement process included newsletters, three open houses, and four Project Advisory Committee (PAC) meetings to provide adequate opportunities for stakeholder engagement and public participation during the development of the NEMs.

1.6 Report Organization

This report provides the NEMs for KCIA and the technical documentation required by Part 150. The following section details the organization of the report:

Chapter 1 – Introduction

Chapter 2 – Airport Facilities and Airspace
This chapter provides information on the existing facilities at KCIA, describes the local airspace, and identifies the current published aircraft procedures.

Chapter 3 – Noise Fundamentals
This chapter includes the descriptors used to quantify noise exposure.

Chapter 4 – Land Use
This chapter describes the land use and municipalities in the vicinity of KCIA.

Chapter 5 – Noise Exposure Maps Development
This chapter details the noise model input data used to generate the noise contours.

Chapter 6 – 2023 and 2030 Noise Exposure
This chapter includes the 2023 and 2030 noise contours and population and land use impacts.

Chapter 7 – Consultation and Public Involvement
This chapter documents the stakeholder and public outreach efforts.

The appendices to this report contain additional information. The appendices include the following:

Appendix A – Acronyms and Glossary
Appendix B – Published Flight Procedures
Appendix C – FAA Aircraft Substitution Correspondence
Appendix D – Project Advisory Committee Meetings
Appendix E – Public Open Houses
Appendix F – Project Newsletters and Handouts
Appendix G – Public Comments and Responses
Appendix H – Official Noise Exposure Maps

CHAPTER 2

AIRPORT FACILITIES AND AIRSPACE

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2 Airport Facilities and Airspace

This chapter provides an overview of KCIA's history, location, facilities, airspace, and published aircraft arrival and departure procedures.

2.1 Airport Location and History

The aviation industry has a long history in the Pacific Northwest and Seattle, dating back to around 1910 when William E. Boeing Sr. founded The Boeing Aircraft Company on the Airport site. Boeing Field was established in 1928 when the site was developed into a functioning airport. The Airport facilitated the rapid growth of aviation and aircraft manufacturing until World War II when the U.S. military leased the Airport. During this time, the Civil Aeronautics Administration granted money to the Port of Seattle to establish the Seattle-Tacoma International Airport (SEA), leading to the relocation of all commercial operations. During the war effort, Boeing continued substantial aircraft manufacturing operations at Boeing Field, including the development and production of the B-17 and B-29 bombers. During this time, the Airport lengthened the primary runway to 10,000 feet and constructed a smaller runway to support the Airport's growing operations.

After World War II, the Airport continued to support some of the region's commercial air service. However, by the 1970s, most airlines had relocated operations to SEA. Today, the Airport primarily serves general aviation, cargo, limited small airline service, and Boeing-related test operations.

King County Department of Executive Services - Airport Division owns and manages KCIA. The Airport's ownership structure, under King County's oversight, positions it as a crucial hub that serves a broad spectrum of aviation needs.

KCIA is located six miles south of downtown Seattle and is situated within the cities of Seattle and Tukwila, Washington and entirely within King County. The Airport is a part of the Seattle metropolitan area, which encompasses the three most populous counties in Washington: King, Pierce, and Snohomish. KCIA has an elevation of 22 feet above mean sea level (MSL) and encompasses 634 acres. **Figure 2-1** shows the location of KCIA.

Figure 2-1
Airport Location Map

Sources: ESRI, 2024; RS&H, 2024

Legend

Airport Property

Feet 0 5,000 10,000

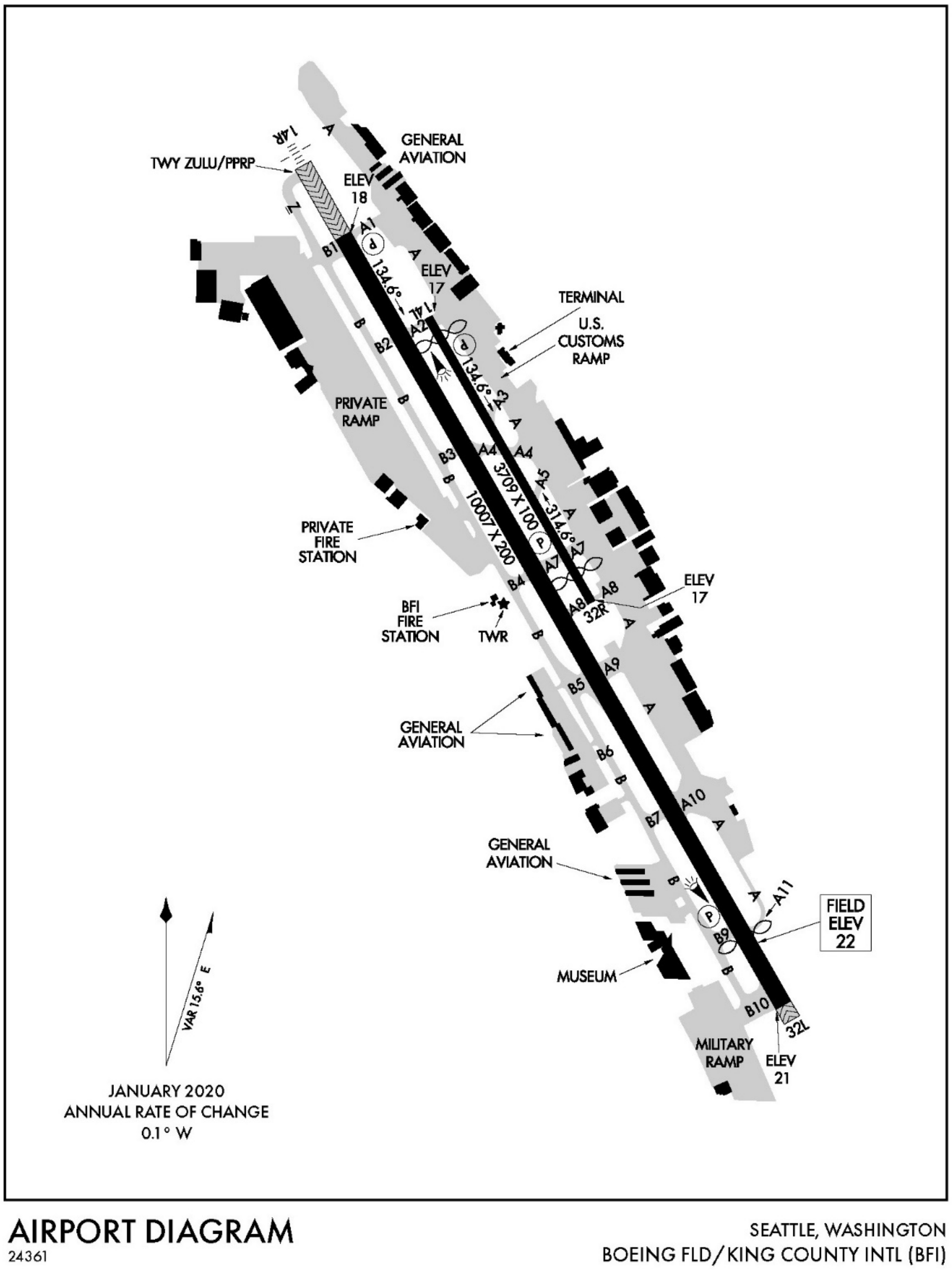
N

2.2 Airfield Facilities and Navigational Aids

2.2.1 Airfield Facilities

Figure 2-2 shows the configuration of major airfield facilities at KCIA. **Table 2-1** details these facilities.

Figure 2-2
Airport Diagram



Source: RS&H, 2024

Table 2-1
Airport Facilities

	Runway 14R	Runway 32L	Runway 14L	Runway 32R
Length	10,007 feet	10,007 feet	3,709 feet	3,709 feet
Width	200 feet	200 feet	100 feet	100 feet
Displaced Arrival Threshold	None	887 feet	250 feet	375 feet
Approach Surface Slope	50:1 for 10,000′ 40:1 for 40,000′	50:1 for 10,000′ 40:1 for 40,000′	20:1 for 5,000′	20:1 for 5,000′
Runway End Elevation (MSL)	17.8′	21.0′	17.4′	17.1′
Markings	Precision	Precision	Basic	Basic
Lighting	HIRL	HIRL	MIRL	MIRL
Visual Glide Slope Indicator	PAPI-4	PAPI-4	PAPI-2	PAPI-2
Electronic Aids (Approaches)	ILS or LOC DME, RNAV (RNP or GPS)	ILS or LOC DME, RNAV (RNP or GPS)	-	-

Definitions: DME – Distance Measuring Equipment, GPS – Global Positioning System, HIRL – High Intensity Runway Lights, ILS – Instrument Landing System, LOC – Localizer, MIRL – Medium Intensity Runway Lights, PAPI-2 – 2-Box Precision Approach Path Indicator, PAPI-4 – 4-Box Precision Approach Path Indicator, RNAV – Area Navigation, RNP – Required Navigation Performance
Source: FAA ADIP, 2024

2.2.2 Navigational Aids

The Instrument Landing System (ILS) provides precision approach guidance for aircraft approaches and landings. There are several ILS categories: Category (CAT) I, CAT II, or CAT III A, B, or C. An airport's approach category is based on airport capability (lighting, markings, etc.). The higher the category of approach, the lower the approach minimums (runway visual range [RVR] and cloud ceilings) the aircraft can fly before either having the runway in sight or executing a missed approach. The CAT I ILS is the simplest of the ILS approaches for instrument-rated pilots and aircraft to perform. The basic CAT I ILS allows aircraft to descend to an altitude, typically 200 feet above the runway, and usually requires visibility of 2,400 feet or ½ statute mile. **Table 2-2** summarizes the NAVAIDS available to pilots.

Table 2-2
Navigational Aids

Navigational Aids	Description
Instrument Landing Systems (ILS)	An ILS is a type of precision ground-based electronic landing navigation aid that has been in use in the U.S. for more than 50 years. An ILS guides pilots to runways during periods of limited visibility or inclement weather. An ILS has several components, including: • Localizer antenna (LOC) that provides lateral course guidance to the runway • Glide slope antenna (GS) that provides vertical course guidance • Marker beacons along the extended runway centerline • Approach lighting system Non-precision LOC instrument approach procedures are often available when a GS is not installed or for approaches from the opposite end of the runway (“back-course” approach).
Area Navigation (RNAV)	RNAV is a method of instrument flight rule (IFR) navigation that permits aircraft operation on any desired flight path using the combination of both GPS and ground-based navigational aids. RNAV routes and terminal procedures, including departure procedures and standard terminal arrivals, are designed with RNAV systems in mind to save time and fuel, reduce aircraft dependence on air traffic control (ATC) vectoring, and provide for more efficient use of the airspace.
Global Positioning System (GPS)	The GPS, operated by the Department of Defense, uses a network of satellites that create reference points to enable aircraft equipped with GPS receivers to determine their latitude, longitude, and altitude. GPS systems can be used during all phases of flight.

Navigational Aids	Description
Very High Frequency Omni-Directional Range (VOR) Distance Measuring Equipment (DME)	A VOR is a ground-based electronic system that provides azimuth information for high and low altitude routes and airport approaches. DME determines a slant range distance from an aircraft to the VOR. VORs can be stand-alone or equipped with DME. These navigational aids provide navigational fixes on an aeronautical chart.
Airport Beacon	Airport beacons help pilots identify an airport at night. Beacons alternately flash white and green to designate civilian land airports.
Precision Approach Path Indicator Lights (PAPI)	The PAPI system is the current standard Visual Glide Slope Indicator (VGSI) consisting of four light boxes arranged perpendicular to the edge of the runway. It projects a pattern of red and white lights that provide visual approach slope information. PAPIs provide a definite white and red light projection pattern along the desired descent path to the touchdown point.

Source: FAA, 2024

2.3 Airspace

The FAA has six classifications of airspace under the National Airspace System (NAS). **Figure 2-3** shows these classifications, which are designated Class A, B, C, D, E, and G, and are critical to the safety of all flights and to the efficient operation of all air traffic. In each of the airspace classifications, pilots and aircraft must meet specific training, equipment, and procedural requirements, from weather and visibility minimums to getting clearance from air traffic control before crossing one of these dividing lines.

Figure 2-3
Airspace Classifications

Source: FAA, 2024

SEA anchors the Class B controlled airspace, which is roughly 10 nautical miles in diameter where it touches the ground. When measured east to west, the top of the airspace, at 10,000 feet, is 60 nautical miles in diameter. The airspace at KCIA is Class D with a 2,500-foot MSL ceiling. SEA Class B airspace begins at various altitudes over KCIA ranging from 1,100 feet rising to 1,800 feet to the north and 2,000 feet to the east. **Figure 2-4** depicts the airspace in the vicinity of KCIA.

Aircraft operating within Class D airspace are required to establish two-way communications with air traffic control to enter. Adjacent to KCIA's airspace, other Class D airspace areas exist. To the east, the Class D airspace of Renton Municipal Airport (RNT) borders KCIA's and has the same ceiling height of 2,500 feet. Pilots within KCIA's airspace must exercise caution, maintain awareness of their location and direction, and be mindful of surrounding airspace to prevent unintentional entry or passage through neighboring airspace.

2.4 Approach and Departure Procedures

Seattle airspace is structured so that arriving aircraft are transitioned safely and efficiently from the enroute environment to the approach control environment and from the approach control environment to the airfield. Likewise, the airspace is structured so that departing aircraft can transition from the airfield to the terminal environment and ultimately to the enroute environment.

Standard Terminal Arrivals (STARs) and Departure Procedures (DPs) simplify and expedite the movement of aircraft in Seattle airspace. STARs and DPs are a combination of lateral, vertical, and speed commands along a set of fixes (intersections) or waypoints that are typically preprogrammed into the aircraft's flight management system (FMS) and executed upon ATC clearance.

When flying a STAR or DP, the pilot follows waypoints or fixes that are either ground-based or RNAV (GPS)-based depending on aircraft capability. In conventional procedures, waypoints are defined by the location of a navigational aid (e.g., VOR) or determined by reference to these navigational aids such as DME (Distance Measuring Equipment) intersections. The advantage of the RNAV STARs and DPs are that longitude and latitude define waypoints and allow aircraft to fly a more direct course from point to point instead of from navigational aid to navigational aid. The following sections note each of the published procedures for KCIA.

2.4.1 Approach Procedures

As of the data of preparation of this report, the Seattle Terminal Radar Approach Control (TRACON) and KCIA air traffic control use a mix of RNAV, and conventional procedures as shown in **Table 2-3**. Instrument approach procedures (IAPs) are flight procedures developed and published by the FAA that pilots use to navigate their aircraft to the runway. When aircraft enter the KCIA airspace, air traffic control generally assign aircraft to one of the procedures listed in **Table 2-3**. **Appendix B** includes the charts for each procedure.

Figure 2-4
Regional Airspace Chart

Source: FAA, 2024

Table 2-3
Published Arrival Procedures

Procedure Name	Procedure Type
CHINS FIVE	Conventional
GLASR THREE	Conventional
JAWBN SIX	Conventional
OLYMPIA TWO	Conventional
SKYKO ONE	Conventional
RNAV (RNP) Z RWY 14R	RNAV
RNAV (RNP) Z RWY 32L	RNAV
RNAV (GPS) Y RWY 14R	RNAV
RNAV (GPS) Y RWY 32L	RNAV
ILS OR LOC RWY 32L	Conventional
ILS OR LOC RWY 14R	Conventional
HARBOR VISUAL RWY 14R	Conventional

Source: FAA, December 2024

2.4.2 Departure Procedures

Air traffic control assigns aircraft departing KCIA a DP, which is a published procedure that provides a standard route from the runway to the appropriate enroute structure. In some cases, a DP may have an associated transition, which is a published procedure that connects the end of the DP to one of several enroute structures. DPs separate departing aircraft from arriving aircraft, provide for efficient interception of an outbound course, can avoid noise-sensitive areas near an airport, simplify the issuance of departure clearances, and reduce the need for radio communication. Like the published STARs, DPs at KCIA include a mix of RNAV and conventional procedures. **Table 2-4** identifies the DPs for KCIA. **Appendix B** includes these charts.

Table 2-4
Published Departure Procedures

Procedure Name	Procedure Type
CBAIN ONE	RNAV
KENT EIGHT	Conventional
NEEDLE ONE	Conventional
NRVNA ONE	RNAV

Source: FAA, December 2024

2.5 Existing Noise Abatement Measures

KCIA has been active in addressing aircraft noise concerns and currently has several programs in place to monitor aircraft noise levels and assist local communities in understanding the effects of aircraft noise. These include a noise office that collects and responds to community noise complaints, a noise monitoring/flight tracking system in the communities around KCIA, implementation of a sound insulation program, and the establishment of a "Fly Quiet Program."

2.5.1 Noise Office

The noise office is responsible for managing and implementing noise abatement programs and responding to community concerns.

2.5.2 Noise Complaints

As part of its noise program, KCIA staff collect, manage, and track noise reports and comments from the public using a system called PlaneNoise®. There are two primary means of filing an aircraft noise complaint: (1) by completing and submitting the form on the Airport's website (https://www.planenoise.com/kbfi/), or (2) by leaving a voicemail on the noise hotline at 206-316-2515.

2.5.3 Aircraft Flight Tracking

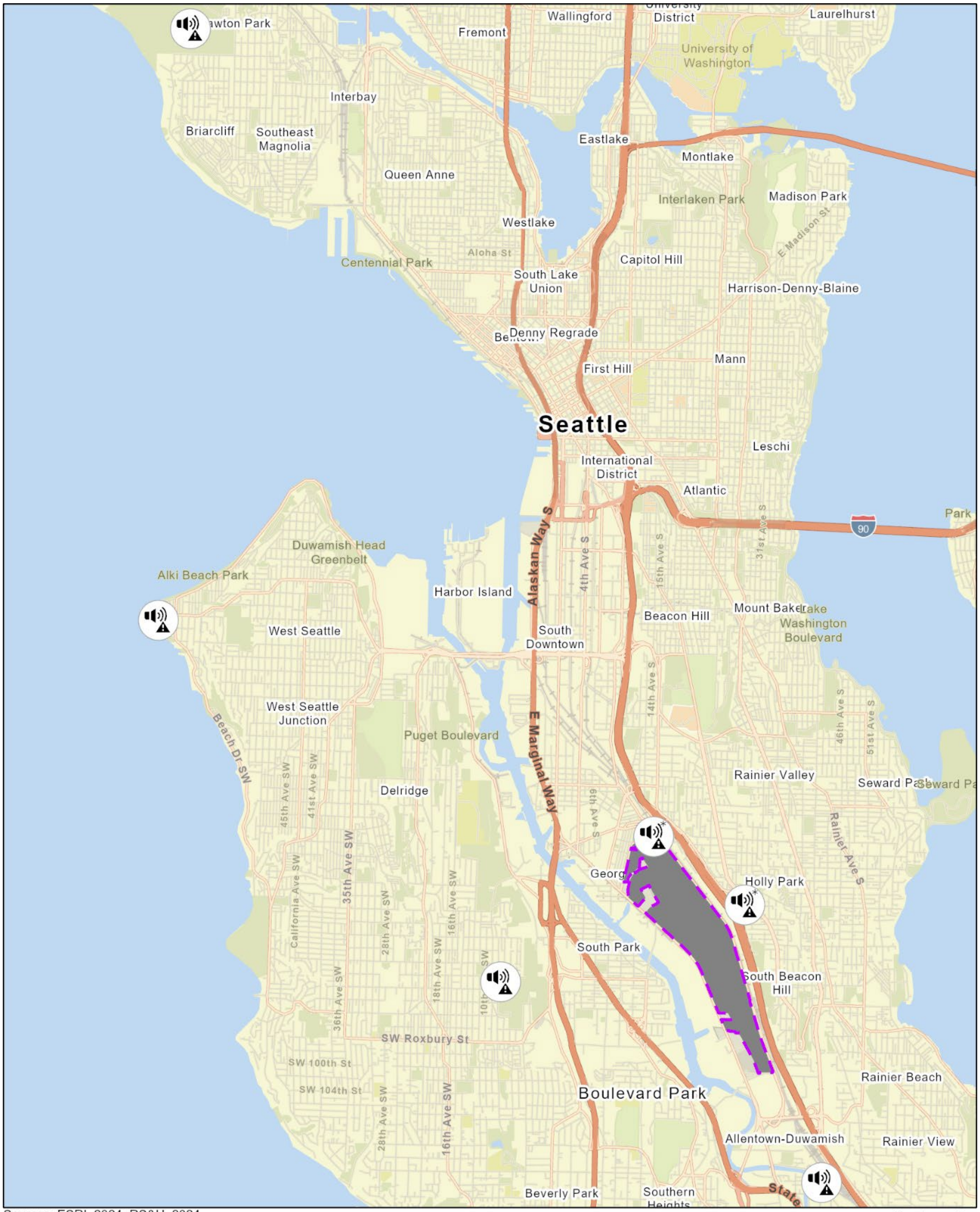
The Airport's flight tracking system, PublicVue by PASSER Aerospace, Inc., collects noise monitoring data in the vicinity of KCIA using six permanent noise monitors. The flight tracking element of the system allows the public to watch aircraft movements and view noise levels within the vicinity of KCIA via a website (https://kingcounty.gov/en/dept/executive-services/transit-transportation-roads/airport/report-noise). For each aircraft, the system provides specific information regarding aircraft type, altitude, origin/destination airports, and flight identification. The system provides actual measurement of aircraft noise levels in surrounding neighborhoods. **Figure 2-5** shows the noise monitor locations.

2.5.4 Sound Insulation

An airport residential sound insulation program (RSIP) is a remedial noise mitigation initiative in which airports develop a plan and approach for installing sound insulation treatments, such as new windows and doors, for eligible structures (e.g., homes and public buildings). Because the purpose of sound insulation treatment is to reduce the effects of aviation noise inside affected structures, in particular habitable areas, it is imperative for airport sponsors to outline the objectives and priorities of their RSIPs based on NEMs with respect to compatible and non-compatible land uses so there is a direct relationship between priorities, boundaries, and sound insulation treatment options for each eligible structure.

As recommended in KCIA's 2004 Noise Compatibility Program (NCP), a sound insulation program was implemented to reduce interior noise levels for residences within the DNL 65 dB and higher noise contour areas. The program included acoustical treatments designed to reduce aircraft noise experienced inside of residences. In total, the Airport has treated 549 residential

Figure 2-5
Noise Monitor Locations



Sources: ESRI, 2024; RS&H, 2024

Legend
Airport Property
Noise Monitor Locations

0 5,000 10,000 Feet
N

* Noise monitor was offline at time of publication.

parcels where the owner has chosen to participate in the program (a total of 663 residential units). The total number of residential units is higher than the number of treated parcels because some parcels contained multiple residential units. The sound insulation program acoustically treated several duplexes (two residential units per parcel), triplexes (three residential units per parcel), and fourplexes (four residential units per parcel). The treated residential parcels within the DNL 65 dB noise contours prepared as part of this update have been identified as a compatible land use[2] (see **Appendix H**).

2.5.5 Fly Quiet Program

KCIA has established a voluntary noise abatement program, known as the "Fly Quiet Program" that is an on-going effort to minimize the impact of noise on the communities surrounding the Airport. The program originated from the 2004 Part 150 Study recommendations crafted by the Study Advisory Committee in 2002. After many community briefings where suggestions for a noise abatement program were identified, a Fly Quiet Program was designed to reflect these ideas. Program objectives include improved:

1. Pilot awareness of flight patterns that create noise issues within noise sensitive communities.
2. Accountability from KCIA to report flight patterns and noise incidents that deviate from Fly Quiet flight procedures.
3. Access to KCIA pilot and program information that describe preferred flight patterns and procedures.
4. Community outreach to pilot audiences, tenants, and airport communities.

KCIA's Fly Quiet and Noise Abatement Procedures include:

1. Maintain FAA-advised altitude (2,000 AGL) over noise-sensitive residential neighborhoods. (Reference VFR procedures for noise-sensitive areas in FAA A/C 91-36D).
2. Use alternative approach over Elliott Bay, when feasible.
3. For safety and noise purposes, east/west nighttime flights over West Seattle are discouraged.
4. Use FAA-advised close-in flight procedure for north flow flights. (Reference standard close-in flight procedure by aircraft type in FAA A/C 91-53A).
5. Honor voluntary curfew of nighttime engine maintenance run-ups.
6. No "touch and go" landings and take-offs between 10:00 p.m. and 7:00 a.m.

[2] FAR Part 150, Subpart A-General Provisions, 150.7 Definitions identify compatible land use as the use of land that is identified under this part as normally compatible with the outdoor noise environment (or an adequately attenuated noise level reduction for any indoor activities involved) at the location because the yearly day-night average sound level is at or below that identified for that or similar use under appendix A (Table 1) of this part.

2.5.6 Published VFR Procedures

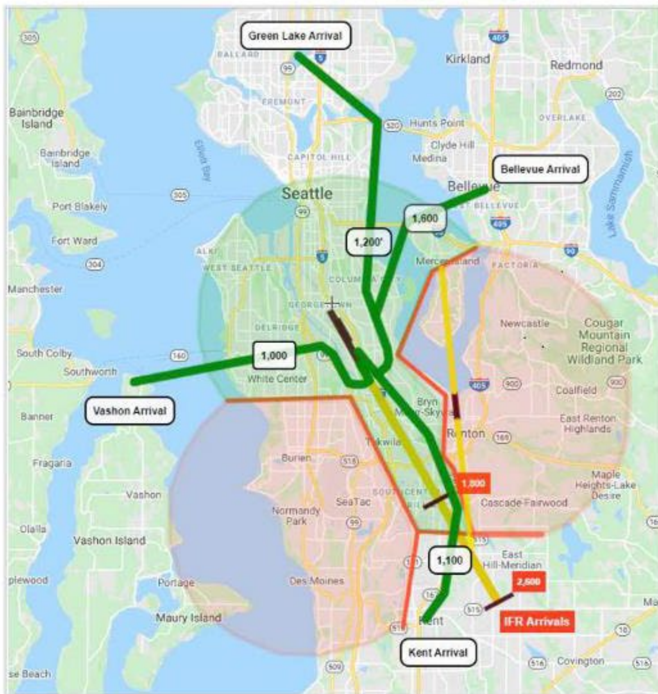
The published VFR (Visual Flight Rules) routes designed for KCIA are to reduce aircraft noise over surrounding neighborhoods while ensuring safe and efficient air traffic management. In this case, "routes" refers to a "collection of predetermined instructions" provided to VFR pilots. The routes improve safety by increasing separation between incoming and outgoing air traffic at KCIA, SEA, and RNT.

The air traffic control tower at KCIA can assign published routes instead of giving customized instructions. The VFR routes offer increased predictability, safety enhancements, and better separation of inbound and outbound aircraft at KCIA.

These routes are designed to balance safety, operational efficiency, and noise abatement, helping KCIA manage its proximity to densely populated urban areas while maintaining the safety of air navigation. These published VFR routes are a critical part of KCIA's efforts to balance the needs of aviation operations with the goal of minimizing the noise impact on nearby residential areas. **Figures 2-6** and **2-7** show the published VFR Routes.

Figure 2-6
Published VFR Routes - Runway 32 Configuration

Arrivals in a RWY 32 Configuration



North Arrivals Description *(Estimated daily operations)*

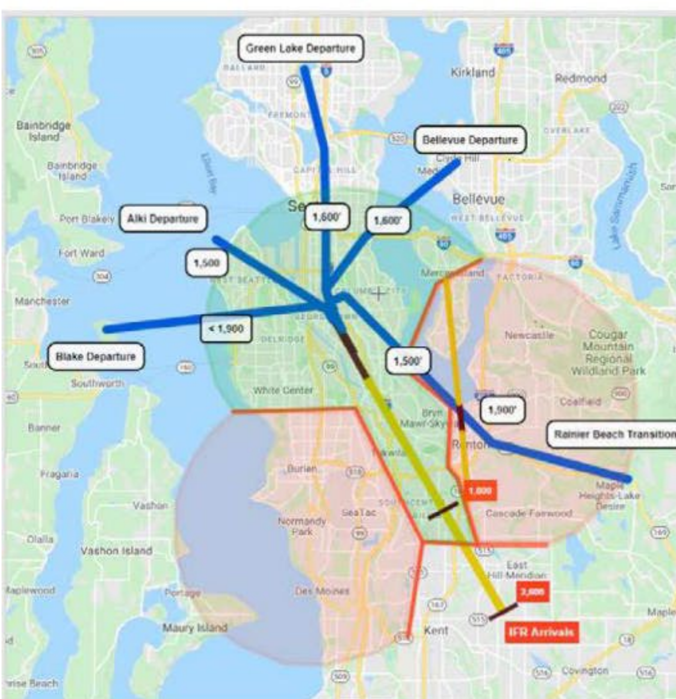
Vashon Arrival: *(15 Aircraft)*
- Contact KBFI Tower 120.6 over North Vashon Island.
- Fly eastbound (approximate ground track 080°) toward midfield Boeing airport.
- After crossing the shoreline, descend to 1,000 feet or below.
- Over the Duwamish River enter left downwind, maintain 800 feet.

Green Lake Arrival: *(15 Aircraft)*
- Contact KBFI Tower 118.3 over Green Lake.
- Fly southeast toward 520 floating bridge and western Lake Washington shoreline.
- From 520 bridge fly via the shoreline until I-90 bridge (crossing I-90 bridge at 1,200 feet)
- Enter right downwind

Bellevue Arrival: *(20 Aircraft)*
- Contact KBFI Tower 118.3 east of downtown Bellevue
- Fly toward where I-90 bridge meets Mercer Island east of Mt. Baker tunnel.
- Cross I-90 bridge at 1,600 feet, then fly direct to midfield right downwind.

Kent Arrival: *(20 Aircraft)*
- Contact KBFI Tower 118.3 over Kent.
- Fly northbound along SR-167 until abeam Valley Medical Center/IKEA at 1,100 feet.
- Fly over the east side of Renton Concrete Recyclers to make a straight-in approach.

Departures in a RWY 32 Configuration



North Departures Description *(Estimated daily operations)*

Blake Departure: *(10 Aircraft)*
- Depart runway and when able, turn westbound toward Blake Island remaining at or below 1,700 feet.
- Continue toward Blake Island and cross the shoreline at or below 1,900 feet.

Alki Departure: *(5 Aircraft)*
- Depart runway and as soon as able, turn northwest bound to Alki Beach (approximate ground track 300°).
- Cross over Alki Beach at or below 1,500 feet.

Green Lake Departure: *(15 Aircraft)*
- Depart runway and follow I-5 Northbound at 1,600 feet remaining east of downtown Seattle.
- Once abeam Lake Union, turn slightly left to pass just west of Green Lake, then on course.

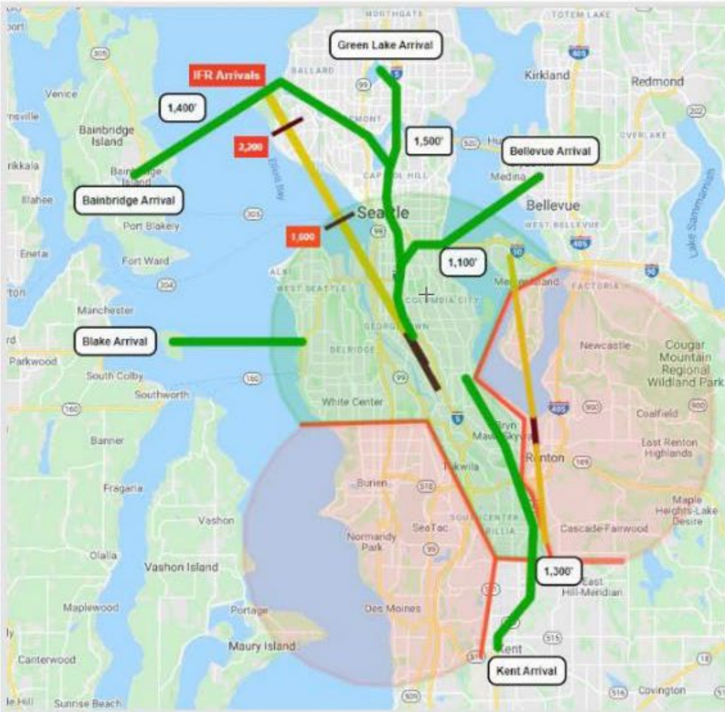
Bellevue Departure: *(20 Aircraft)*
- Depart runway, and when able, turn northeast bound to overfly Mt. Baker (I-90 bridge and western shoreline of Lake Washington) at 1,600 feet.
- Once north of I-90 bridge, fly toward the north side of downtown Bellevue, then on course.

Rainier Beach Transition: *(20 Aircraft)*
- Depart runway, and when able, make a right downwind departure to overfly Rainier Beach at 1,500 feet.
- Expect frequency change from KBFI tower to KRNT tower prior to Rainier Beach.
- At Rainier Beach, continue climb to 1,900 feet DIRECT to KRNT airport. Continue present heading to SR-169 toward Cedar Hills Landfill until outside of KRNT Class D airspace, then on course.

Source: FAA, 2021

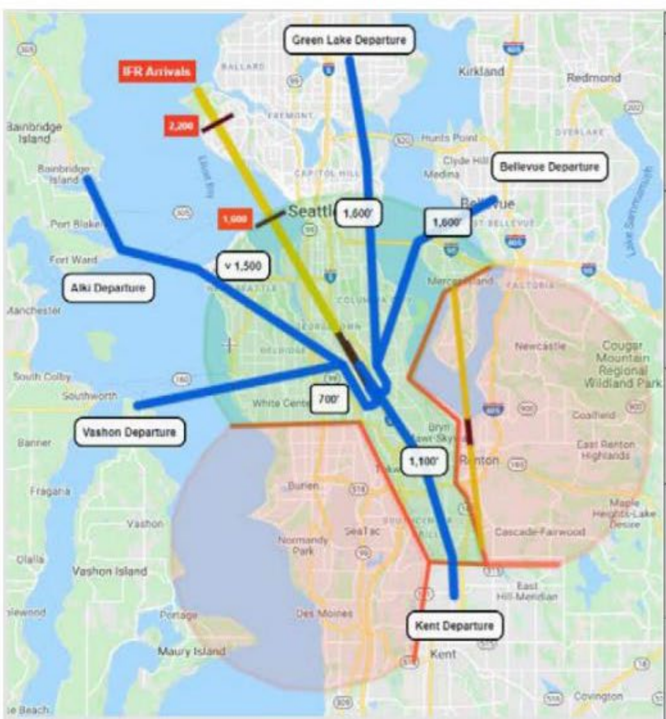
Figure 2-7
Published VFR Routes - Runway 14 Configuration

Arrivals in a RWY 14 Configuration



South Arrivals Description *(Estimated daily operations)*
Blake Arrival: (*12 Aircraft*) • Contact KBFI Tower 120.6 over Blake Island. • Fly eastbound to pass north end of Lincoln Park. • Report over Lincoln Park and expect sequence/landing instructions from KBFI Tower.
Bainbridge Arrival: (*7 Aircraft*) • Contact KBFI Tower 120.6 over Bainbridge Island • Maintain at or below 1,400 feet and fly northeast bound to West Point. • Fly east bound and join the ship canal to Lake Union. • Join I-5 southbound until turning a one-mile final.
Green Lake Arrival: (*12 Aircraft*) • Contact KBFI Tower 118.3 over Green Lake, fly via I-5 southbound. • Maintain 1,500 feet abeam 520 floating bridge. • Continue I-5 southbound until turning a one-mile final.
Bellevue Arrival: (*15 Aircraft*) • Contact KBFI Tower north of downtown Bellevue. • Fly toward Mt. Baker (I-90 bridge meets western shoreline). • Cross Mt. Baker at 1,100 feet, enter left base.
Kent Arrival: (*15 Aircraft*) • Contact KBFI Tower 118.3 over Kent. • Fly northbound along SR-167 until abeam Valley Medical Center/IKEA at 1,300 feet. • Fly over the east side of Renton Concrete Recyclers to enter left downwind.

Departures in a RWY 14 Configuration



South Departures Description *(Estimated daily operations)*
Vashon Departure: (*12 Aircraft*) • Depart full length RWY 14R straight out until reaching 700 feet. • Make a continuous right turn to the downwind at or inside of the Duwamish river while maintaining 700 feet. • After passing the white Boeing tent hangers, make a left turn westbound toward the north tip of Vashon Island (remaining south of Lincoln Park) and below the Seattle Class Bravo airspace.
Alki Departure: (*10 Aircraft*) • Depart full length, and when able, make a continuous right turn to the downwind at or inside the Duwamish river while maintaining 700 feet. • After passing the control tower, make a slight left turn toward Alki Point lighthouse (approximate ground track 300°) maintain at or below 1,500 feet. • Over the lighthouse, proceed to Restoration Point, then toward Bainbridge Island, then on course.
Green Lake Departure: (*10 Aircraft*) • Depart runway, make a left downwind departure to overfly Mt. Baker (I-90 bridge and the western shoreline) at 1,600 feet • Continue north to cross over University of Washington. Remain EAST of I-5 until passing Green Lake, then on course.
Bellevue Departure: (*15 Aircraft*) • Depart runway, then turn left downwind. • Once midfield, make a right turn to overfly where I-90 bridge meets Mercer Island maintaining 1,600 feet. • Fly northeast bound to remain north of Mercer Island and south of downtown Bellevue.
Kent Departure: (*15 Aircraft*) • Depart runway southeast bound remaining EAST of I-5 and below 1,100 feet until abeam Renton Concrete Recyclers. • Make a slight right turn to fly between Southcenter and the railroad tracks to downtown Kent.

Source: FAA, 2021

CHAPTER 3

NOISE FUNDAMENTALS

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3 Noise Fundamentals

While a great deal is known about aircraft noise, the methods used to calculate noise exposure can be difficult to understand. Noise, by definition, is simply unwanted sound. Determining aircraft noise impacts involves logarithmic averages and the noise energy from multiple aircraft events. In Part 150, the FAA-required metric for assessing aircraft noise exposure is the Day-Night Average Sound Level (DNL). The DNL combines the noise energy from all aircraft noise events occurring in one day into a 24-hour average sound level and applies a penalty to nighttime events, between the hours of 10:00 p.m. and 6:59 a.m., when noise more negatively affects people. This chapter provides details on what noise is, what metrics exist to measure noise exposure, and how certain metrics relate to one another.

3.1 Characteristics of Sound

3.1.1 Amplitude and Frequency

The measurement and human perception of sound involve two basic physical characteristics: amplitude (intensity) and frequency (pitch). Amplitude is a measure of the acoustic energy of sound vibrations expressed in terms of sound pressure. The higher the sound pressure, the more energy carried by the sound and the louder the perception of that sound. The ranges of sound pressures that occur in the environment are so large that they are expressed on a logarithmic scale. The standard unit of measurement of sound is decibels (dB). On this scale, zero dB corresponds roughly to the threshold of human hearing and 140 dB corresponds to the threshold of pain.

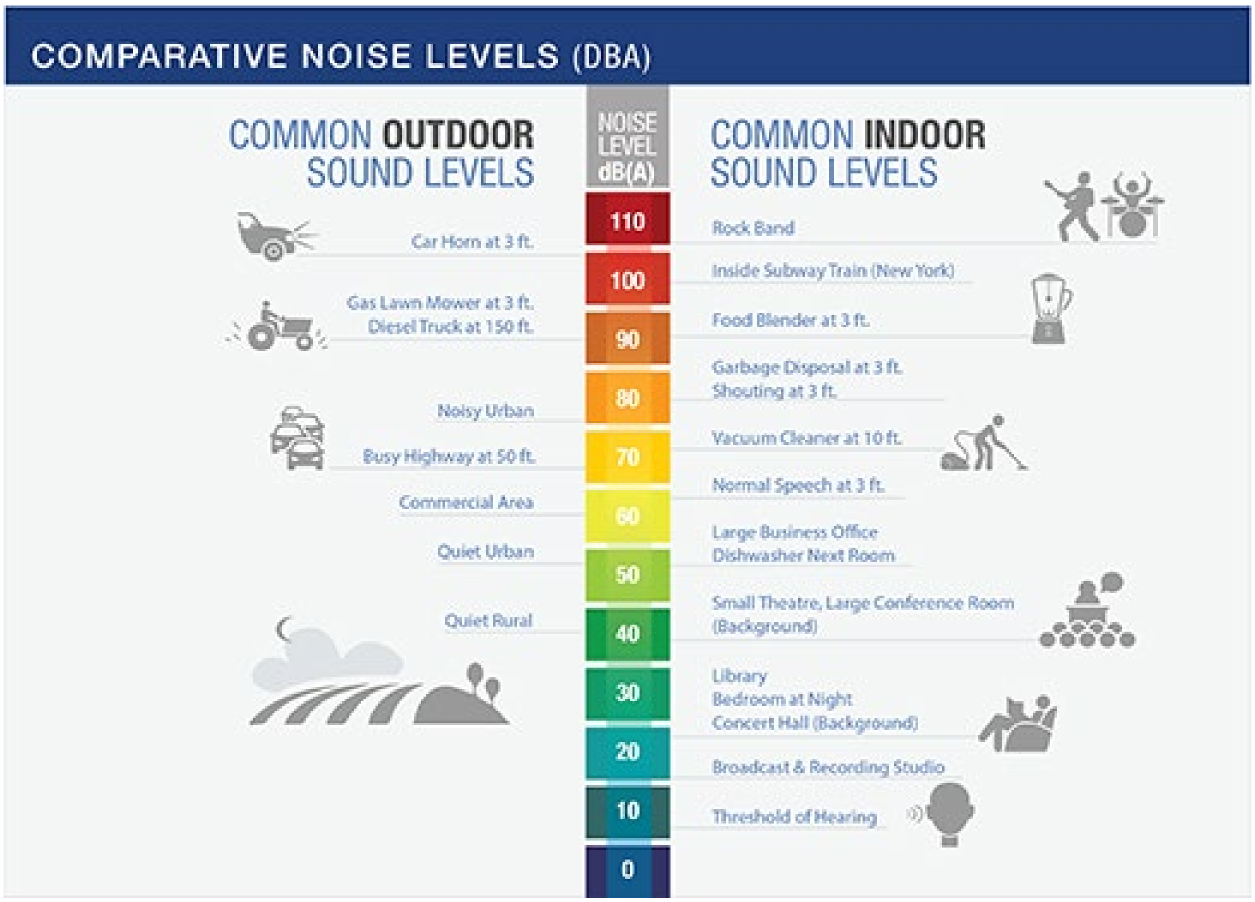
The second important physical characteristic is sound frequency, which is the number of times per second the air vibrates or oscillates. The frequency of sound is expressed as Hertz (Hz) or cycles per second. The normal audible frequency range for adults is 20 Hz to 20,000 Hz. The prominent frequency range for community noise, including aircraft, is between 50 Hz and 5,000 Hz.

Sound does not typically consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude. The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. Consequently, when assessing potential noise impacts on humans, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to extremely low and extremely high frequencies.

3.1.2 Frequency-Weighted Decibels

The human ear reacts to various sound frequencies in distinct ways. We find it more challenging to detect low frequencies, such as the rumble of thunder, while high frequencies, like a baby's cry, are perceived more acutely. To address the variations in individual sound perception, the "A-weighted" scale (dBA) is utilized. The A-weighted scale differentiates between frequencies in a way that closely resembles the sensitivity of human hearing. Community noise analyses apply an A-weighting, an international standard methodology of frequency weighting. In the A-weighted decibel, everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). **Figure 3-1** presents examples of various sound environments expressed in dBA.

Figure 3-1
Examples of Various Sound Environments



Source: FAA, 2022

3.1.3 Propagation of Sound

Outdoor sound levels decrease as a function of distance from the source and because of wave divergence, atmospheric absorption, and ground attenuation. If sound is radiated from a source in an undisturbed manner, the sound travels as spherical waves. As the sound wave travels away from the source, the sound energy is distributed over a greater area, dispersing the sound power of the wave. Spherical spreading of the sound wave reduces the sound level, for most sound sources, at a rate of 6 dB per doubling of the distance.

Atmospheric absorption also influences the sound levels over distance. The greater the distance that sound travels, the greater the influence of the atmospheric effects. Atmospheric absorption becomes important at distances greater than 1,000 feet. The degree of absorption is a function of the sound frequency, as well as the humidity and temperature of the air. For example, atmospheric absorption is lowest at high humidity and higher temperatures. Absorption effects in the atmosphere vary with frequency. The higher frequencies are more readily absorbed than the lower frequencies. Over large distances, the lower frequencies become the dominant sound as the higher frequencies are attenuated. Atmospheric conditions play a role in affecting the sound levels and how these sounds are perceived by the population.

The effects of ground attenuation on sound propagation are a function of the height of the source and/or receiver and the characteristics of the terrain. The closer the source of the sound is to the ground, the greater the ground absorption. Terrain consisting of soft surfaces, such as vegetation, provides for more ground absorption than hard surfaces such as a body of water. Ground attenuation is important for the study of noise from airfield operations (such as thrust reversals) and in the design of noise berms and aircraft engine run-up facilities.

3.1.4 Duration of Sound

Research has shown that the annoyance from a sound event increases as the duration of the event increases. The “effective duration” of a sound is the time between when a sound rises above the background sound level until it drops back below the background level. Psychoacoustic studies have determined a relationship between duration and annoyance. Duration is an important factor in describing sound in a community setting.

3.1.5 Change in Sound

Under controlled laboratory conditions, listening to a steady unwavering pure tone sound that can be changed to slightly different sound levels, a person can just barely detect a sound-level change of approximately 1 dB for sounds in the mid-frequency range. When community sounds are heard, a healthy ear can detect changes of 2 to 3 dB. Common instances of community sounds encompass: transportation noise from cars, trucks, and trains, activities from construction sites, noise produced by lawnmowers, barking dogs, and general neighborhood sounds such as conversations or recreational activities occurring outdoors. A 5 dB change is readily noticeable, while a 10 dB change is judged by most people as a doubling or halving of the loudness of sound.

3.1.6 Masking Effect

Another characteristic of sound is its ability to interfere with the ability of the listener to hear another sound. This interference is defined as the masking effect. The presence of one sound effectively raises the threshold of audibility for the hearing of a second sound. For a signal to be heard, it must exceed the threshold of hearing for that individual and exceed the masking threshold for the background noise.

The masking characteristics of sounds depend upon many factors, including the frequencies of the two sounds, the sound pressure levels, and the relative start time of the sounds. The masking effect is greatest when the masking frequency is closest to the frequency of the signal. Low frequency sounds can mask higher frequency sounds; however, the reverse is not true.

3.2 Sound Rating Scales

The description, analysis, and reporting of aircraft noise levels is made difficult by the complexity of human response to sound and the myriads of sound-rating scales and metrics that have been developed for describing acoustic effects. Various rating scales have been devised to approximate the human response to the “loudness” or “noisiness” of a sound. Noise metrics have been developed to account for additional parameters such as duration and cumulative effect of multiple events.

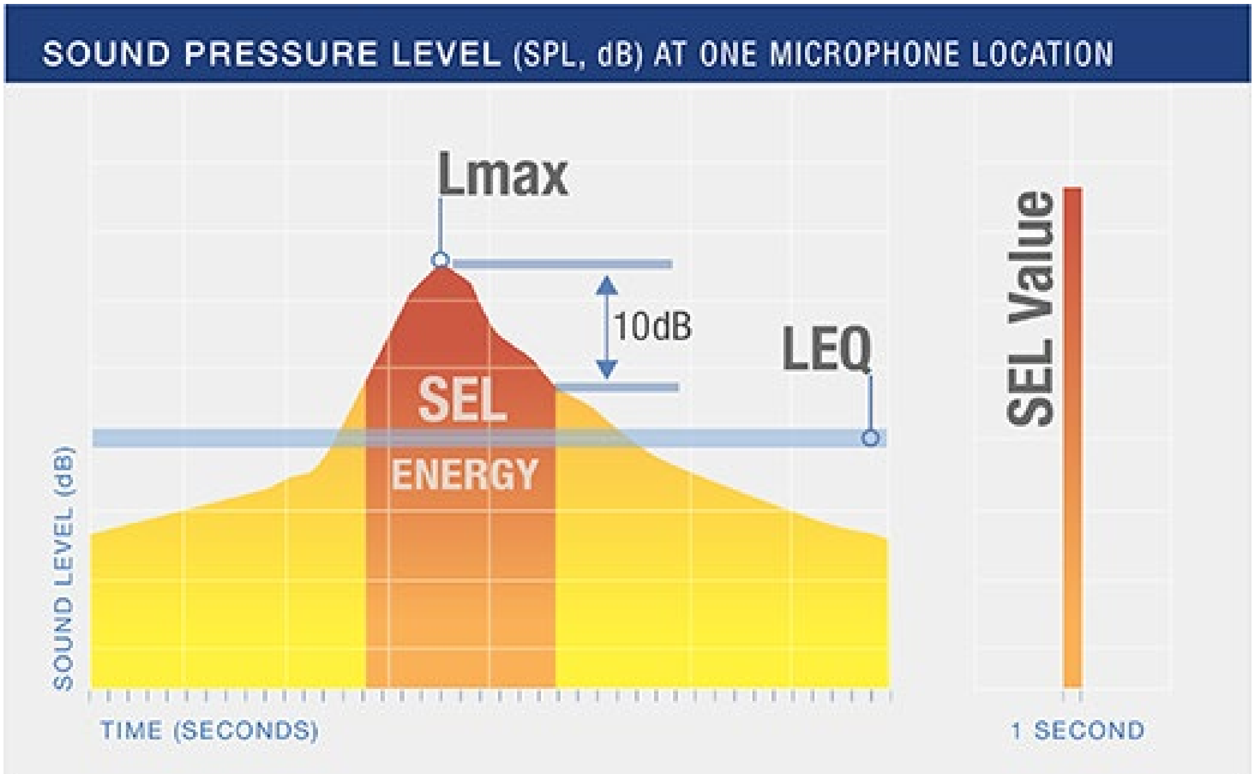
Noise metrics can be categorized as single-event metrics or cumulative metrics. Single-event metrics describe the noise from individual events, such as an aircraft flyover. Cumulative metrics describe the noise in terms of the total noise exposure over a period. The primary noise metrics that are used in this study are described below.

3.2.1 Single Event Metrics

Maximum A-Weighted Sound Level (Lmax) - is the maximum, or peak, sound level during an event. The metric only accounts for the highest A-weighted sound level measured during an event, not for the duration of the event. For example, as an aircraft approaches, the sound of the aircraft begins to rise above ambient levels. The closer the aircraft gets, the louder the sound until the aircraft is at its closest point. As the aircraft passes, the sound level decreases until the sound returns to ambient levels. It is this metric to which people primarily respond when an aircraft flyover occurs.

Sound Exposure Level (SEL) – This metric considers the maximum sound level of the event and the duration of the event. SEL is a time integrated measure, expressed in decibels, of the sound energy of a single noise event at a reference duration of one second. The sound level is integrated over the period that the level exceeds a threshold. Therefore, SEL accounts for both the maximum sound level and the duration of the sound. The standardization of sound generating events into a one-second duration allows calculation of the cumulative noise exposure of a series of events that occur over a period. For aircraft flyovers, the SEL value is typically about 10 dBA higher than the maximum noise level (see **Figure 3-2**). This metric is useful in that aircraft noise models contain aircraft noise data based upon the SEL metric.

Figure 3-2
Sound Exposure Level Illustration



Source: FAA, 2022

3.2.2 Cumulative Metrics

Cumulative noise metrics have been developed to assess community responses to noise. They are useful because these scales attempt to include the loudness of the noise, the duration of the noise, the total number of noise events, and the time of day these events occur into one single number rating scale.

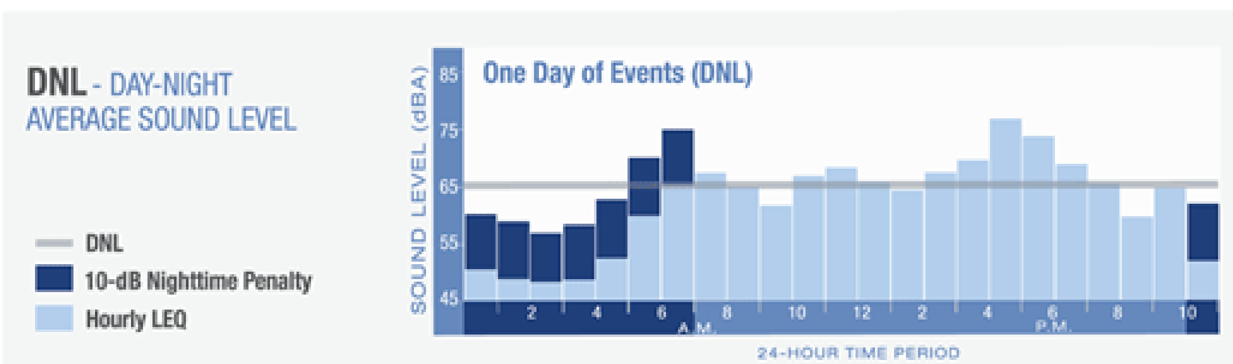
Equivalent Noise Level (Leq) – Leq is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. Leq is the "energy" average sound level during the time of the sample. It is based on the observation that the potential for a sound to impact people is dependent on the total acoustical energy content of the sound. **Figure 3-2** illustrates this concept.

Day-Night Average Sound Level (DNL) – is expressed in dBA and represents the noise level over a 24-hour period. DNL includes the cumulative effects of several sound events rather than a single event. It also accounts for increased sensitivity to noise during relaxation and sleeping hours. In the calculation of DNL, for each hour during the nighttime period (10:00 p.m. to 6:59 a.m.), the sound levels are increased by a 10 decibel-weighting penalty (equivalent to a 10-fold increase in aircraft operations) before the 24-hour value is computed. The weighting penalty accounts for the more intrusive nature of noise during the nighttime hours. **Figure 3-3** illustrates the weighting penalty.

The DNL metric is based on an average annual day of aircraft operations, generally derived from data for a calendar year. An annual-average day (AAD) activity profile is computed by adding all aircraft operations occurring during a year and dividing the result by 365. As such, AAD does not reflect activities on any one specific day but represents average conditions as they occur during the year. Therefore, at a specific location near an airport, the noise exposure on a particular day is likely to be higher or lower than the annual average noise exposure, depending on the specific operations at the airport on that day. To calculate the DNL at a specific location, the SELs at that location associated with each individual aircraft operation (landing or takeoff) are determined. Using the SEL for each noise event and applying the 10-dB penalty for nighttime operations as appropriate, a partial DNL is then calculated for each aircraft operation. The partial DNLs for each aircraft operation are added logarithmically to determine the total DNL.

DNL is widely accepted as the best available method to describe aircraft noise exposure and is the noise descriptor required for aircraft noise exposure analyses and land use compatibility planning under Part 150 and for federal environmental reviews of airport projects.

Figure 3-3
Day-Night Average Sound Level Illustration



Source: FAA, 2022

CHAPTER 4

LAND USE

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4 Land Use

Understanding the land uses within the Airport's vicinity is crucial for assessing compatibility with aircraft operations, evaluating potential noise impacts, and identifying opportunities for compatible development. Part 150 requires the review of land uses located in the airport environs to understand the relationship between those land uses and the noise exposure associated with arriving and departing aircraft. This chapter summarizes the development of the land use data collection area, the detailed land use study area, land use classifications, consolidated land use classifications, and FAA land use compatibility guidelines outlined in Table 1, Appendix A in 14 CFR Part 150.

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4.1 Land Use Data Collection Area

The land use data collection area represents the outer limits for the land use data collection efforts. A Geographic Information System (GIS) land use database was developed to facilitate the identification of land uses in this area. The database includes the land uses, jurisdictional boundaries, local roads, major highways, the Airport’s property boundary, and other geographical features. Parcel boundaries and land uses were obtained from the City of Seattle Planning GIS Department. These data were checked with aerial photography and reviewed against data from King County, the City of Tukwila, the City of Renton, the City of SeaTac, the City of Burien, and the City of Mercer Island. The limits of the land use data collection area extend out 30,000 feet off each runway end at KCIA per Part 150 requirements.

The City of Seattle maintains an Existing Land Use (10-category) database.[3] The database covers the Seattle city limits, as well as parts of unincorporated King County and the cities of Tukwila, Renton, and Burien. The City of Seattle uses the King County Assessor’s Office database of Parcels for King County with Address and Property Information to build their database.[4] The property information contains land use records for each parcel in King County from the Parcel Record Assessor extract table.[5] This database was refined into land use categories discussed in Section 4.3.4.

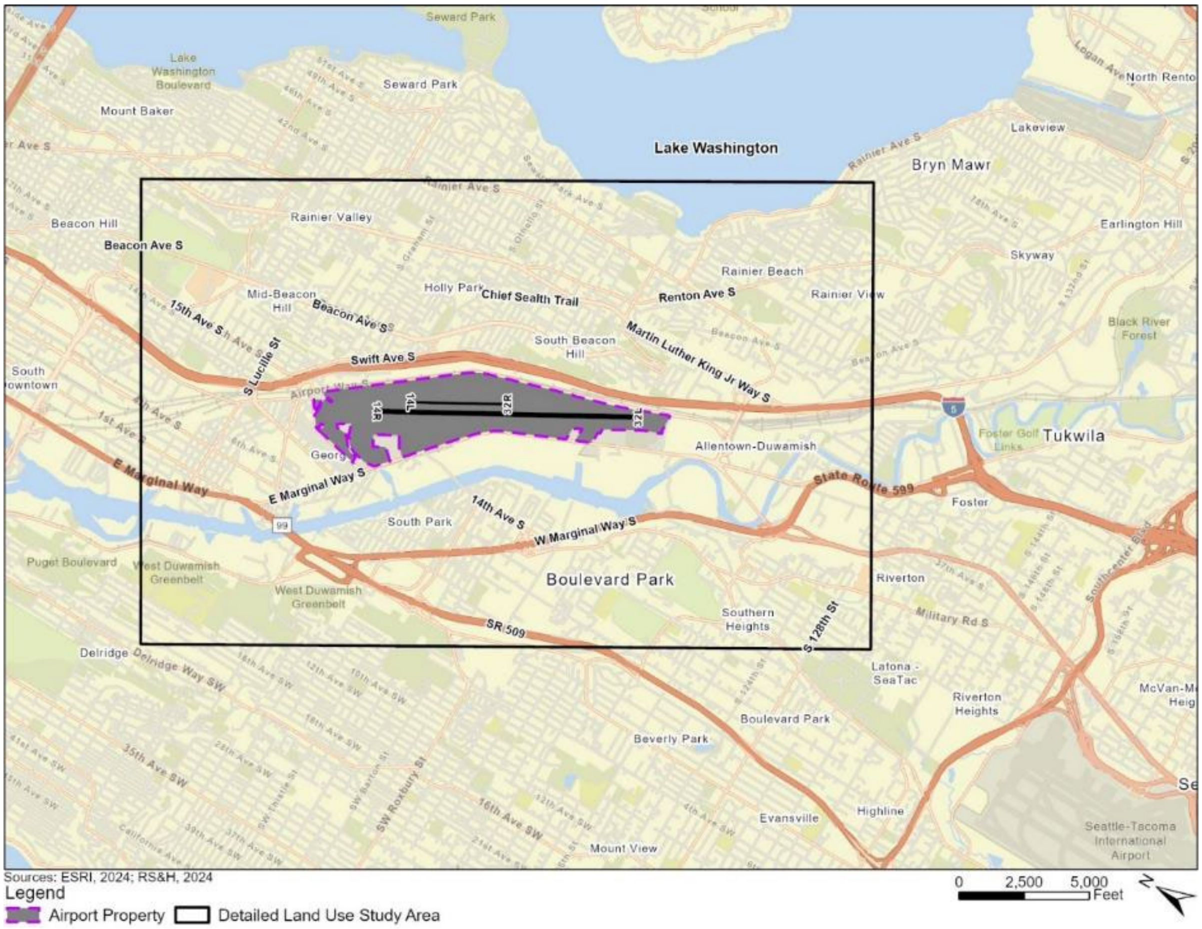
4.2 Detailed Land Use Study Area

A detailed land use study area was established for the Part 150 Study that defined the area in which a more detailed inventory of land use and review of datasets was conducted to support population, household, and land use compatibility evaluations. The study area was identified based on historic noise exposure contours prepared under previous studies at KCIA and aircraft

3 https://www.arcgis.com/home/item.html?id=8aafcdcca1bf4731b9c00b50debd4587
4 https://gis-kingcounty.opendata.arcgis.com/datasets/kingcounty::parcels-for-king-county-with-address-with-property-information-parcel-address-area/about
5 https://www5.kingcounty.gov/sdc/Metadata.aspx?Layer=parcel_extr

flight tracks. The detailed land use study area was designed to encompass the anticipated 2023 and 2030 noise contours. The detailed land use study area is located entirely within the limits of the cities of Seattle and Tukwila, and unincoprprated King County. The detatiled land use study area is shown in **Figure 4-1.**

Figure 4-1
KCIA Detailed Land Use Study Area



Source: RS&H, 2024

4.3 Land Use Classifications

Land use classifications are often found in a municipality’s comprehensive plan.[6] A comprehensive plan is a long-range document that outlines a community's vision, goals, and strategies for future development, encompassing aspects like land use, transportation, housing, recreation, and natural resources, essentially acting as a roadmap to guide the community's growth and decision-making that typically spans 20 or more years. The land use map classifications included in the comprehensive plans for the cities of Seattle and Tukwila, and unincorporated King County are described below.

[6] Comprehensive plans are also called master plans, general plans, or long-range vision plans.

4.3.1 City of Seattle

The current comprehensive plan for the city of Seattle (Seattle 2035) was originally adopted in 2016 with the current version being last amended in 2022. **Figure 4-2** includes the city-wide generalized existing land use map included in Seattle 2035. Generalized existing land uses in the KCIA detailed land use study area within the city of Seattle as identified in Seattle 2035 are as follows:

- Commercial/Mixed-Use
- Industrial
- Major Institution and Public Facilities/Utilities
- Multi-family
- Parks/Open Space/Cemeteries
- Single Family
- Vacant

4.3.2 City of Tukwila

The current comprehensive plan for the city of Tukwila was adopted in 2015. Throughout 2023 and 2024, the city has been in the process of updating the comprehensive plan. **Figure 4-3** includes the adopted city-wide Comprehensive Plan and Zoning Map. Land uses within the KCIA detailed land use study area within the city of Tukwila are as follows:

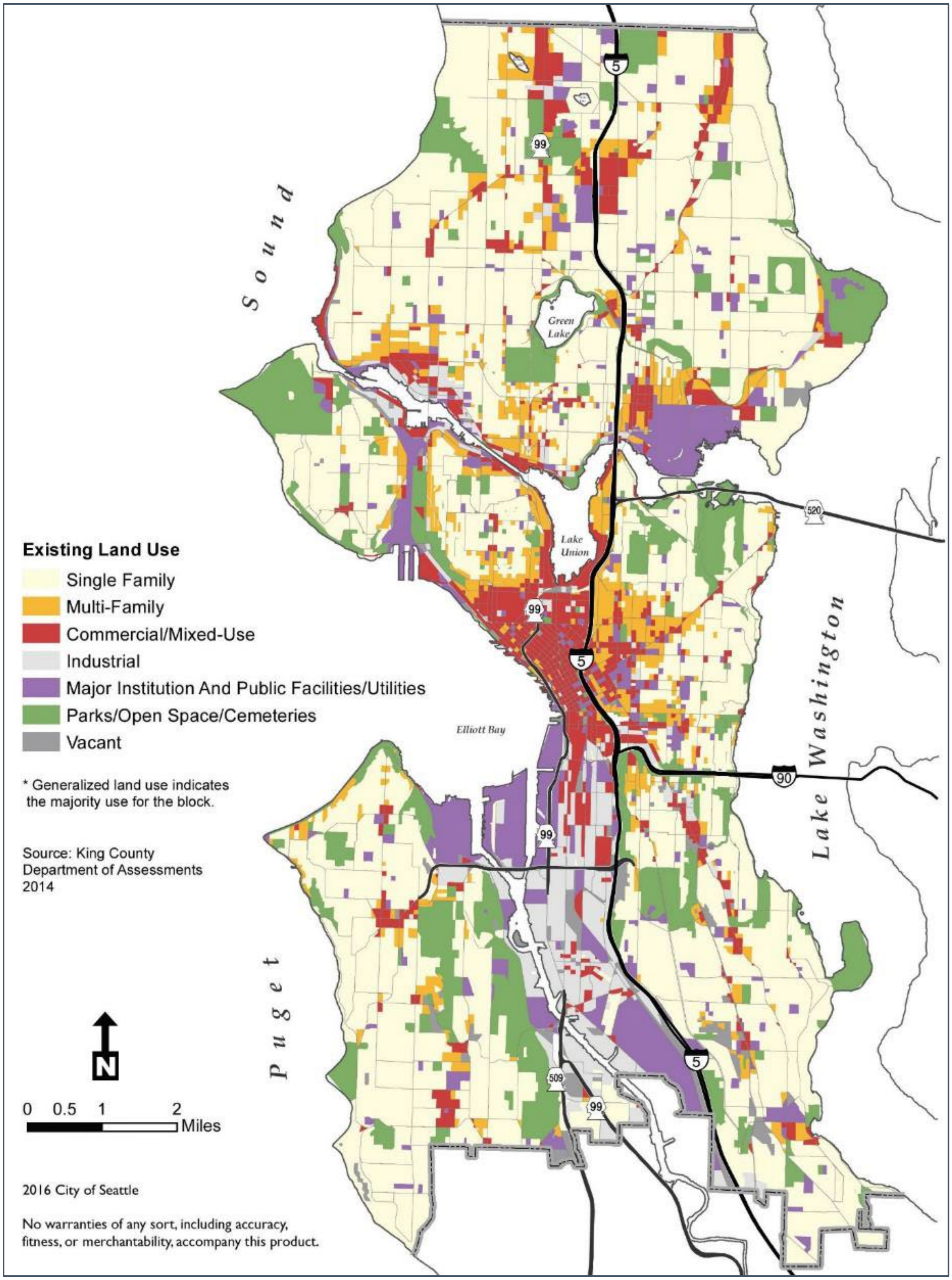
- Commercial/Light Industrial
- Low Density Residential
- Light Industrial
- Medium Density Residential
- Residential Commercial Center
- Manufacturing/Industrial Center – Light and Heavy Industrial
- Office

4.3.3 Unincorporated King County

The current comprehensive plan for the King County was originally adopted in 2016 with the current version being last amended in 2022. Throughout 2024, the county has been in the process of updating the comprehensive plan. **Figure 4-4** includes the adopted county-wide Land Use Map. Land uses within the KCIA detailed land use study area within unincorporated King County are as follows:

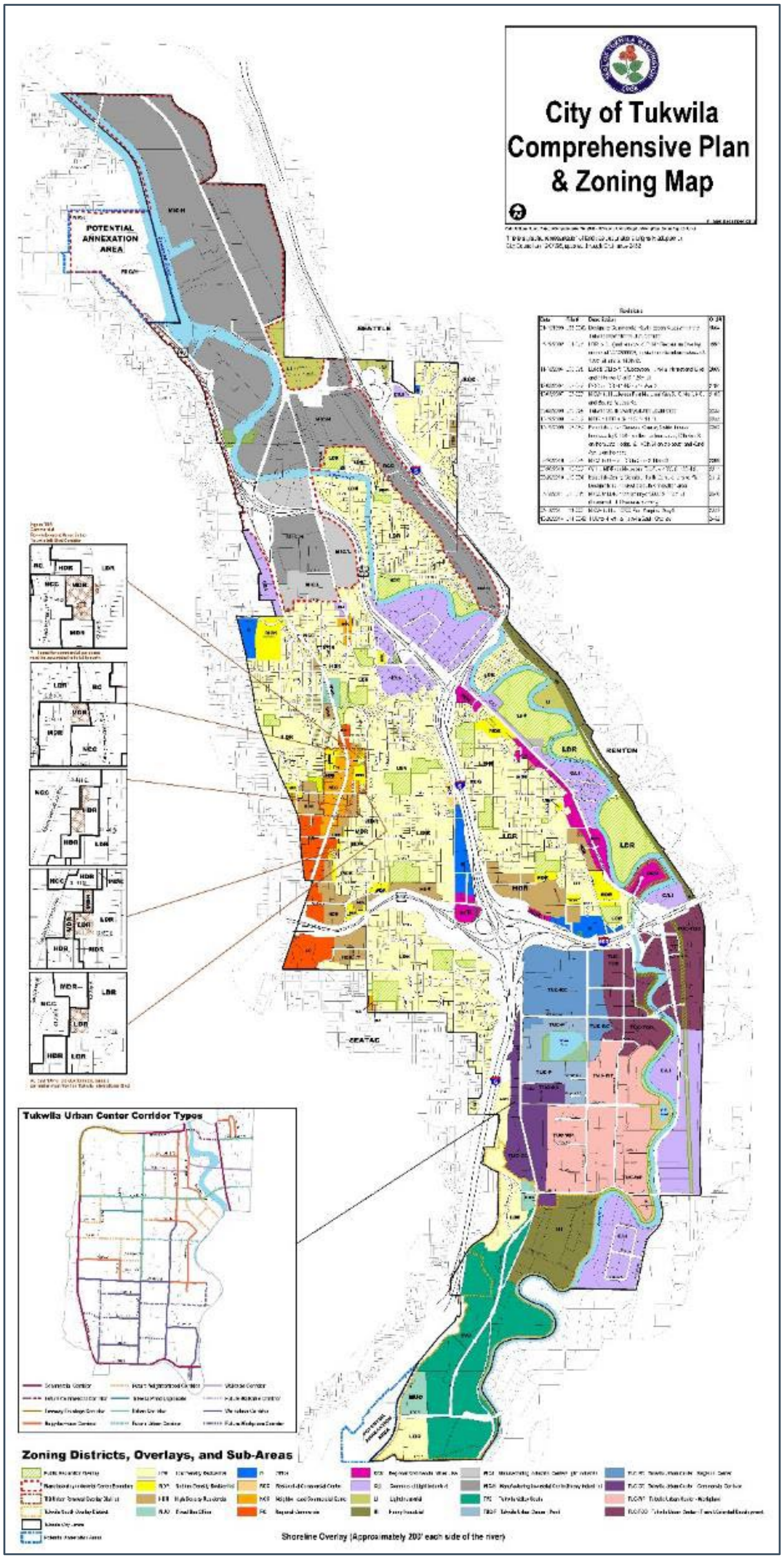
- Unincorporated Activity Center
- Community Business Center
- Commercial Outside of Centers
- Industrial
- Neighborhood Business Center
- King County Open Space System
- Urban Residential, Medium (4-12du/acre)

Figure 4-2
City of Seattle Generalized Existing Land Use



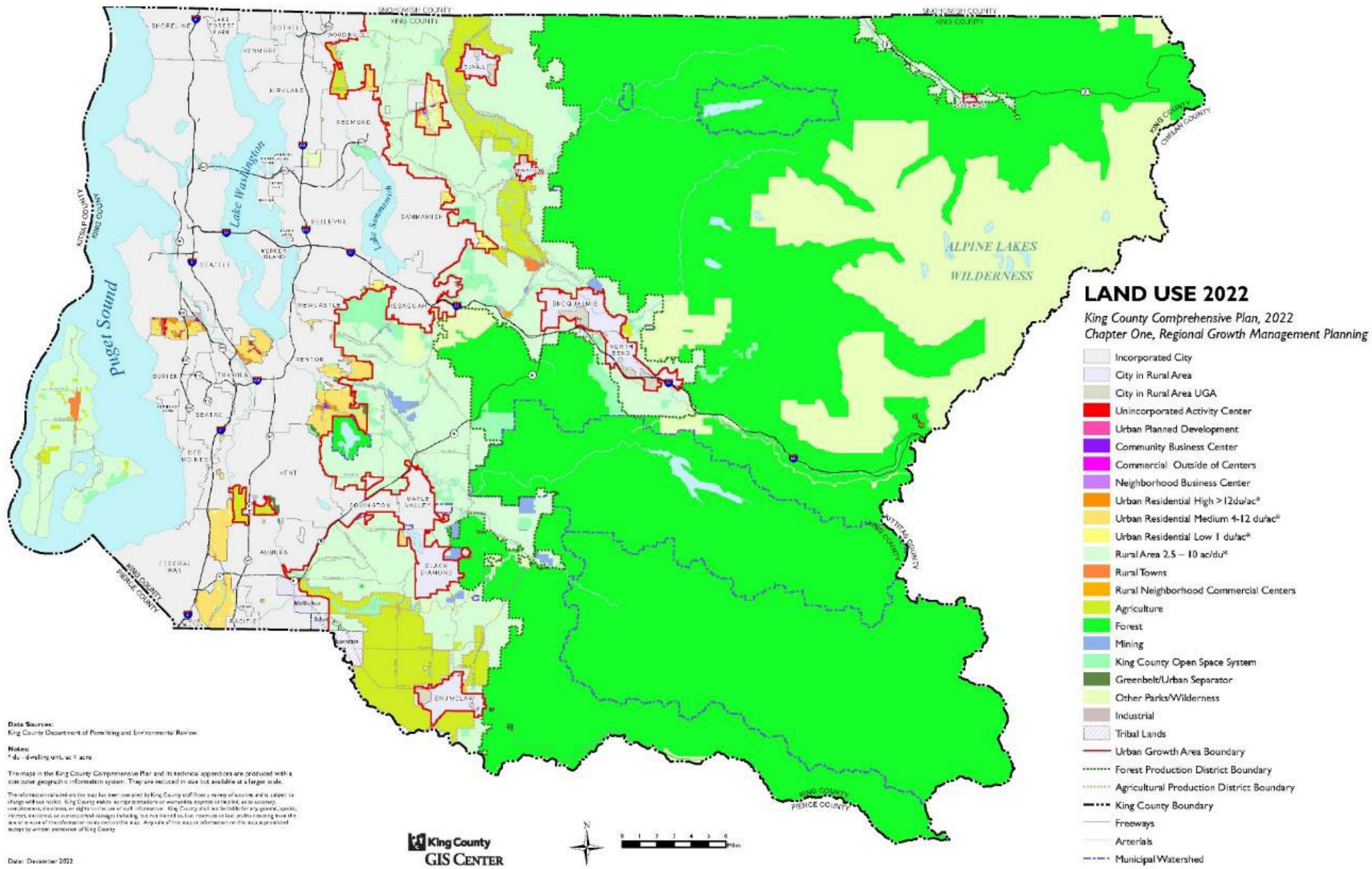
Source: https://www.seattle.gov/opcd/current-projects/seattle-2035-comprehensive-plan

Figure 4-3
City of Tukwila Comprehensive Plan & Zoning Map



Source: https://www.tukwilawa.gov/wp-content/uploads/Comp-Plan_Zoning-Map.pdf

Figure 4-4
Unincorporated King County Land Use Map



Source: https://kingcounty.gov/en/dept/executive/governance-leadership/performance-strategy-budget/regional-planning/king-county-comprehensive-plan

4.3.4 Consolidated Land Uses

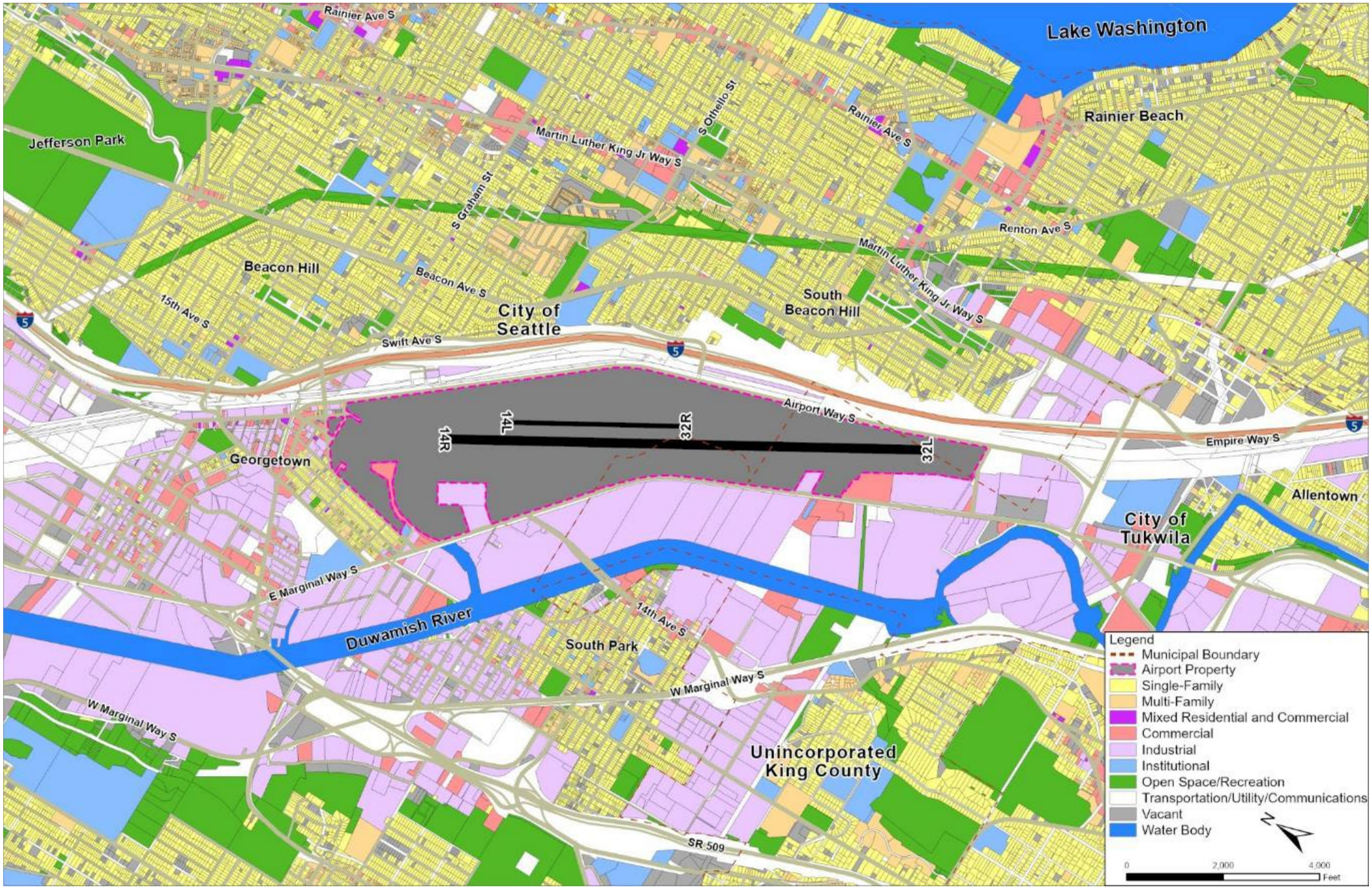
Land uses for each municipality were consolidated into one of the following categories for consistency of the land use map. The consolidated classifications are shown in **Table 4-1** and on **Figure 4-5.**

Table 4-1
Consolidated Off-Airport Land Use Classifications

Consolidated Part 150 Off-Airport Land Use Category	City of Seattle Classification(s)	City of Tukwila Classification(s)	Unincorporated King County Classification(s)
Single-Family Residential	Single-family	Low-Density Residential	Urban Residential, Medium (4-12du/acre)
Multi-Family Residential	Multi-family	Medium-Density Residential	-
Mixed Residential and Commercial	Mixed-use	-	-
Commercial	Commercial	Residential Commercial Center, Office	Unincorporated Activity Center, Community Business Center, Commercial Outside of Centers, Neighborhood Business Center
Industrial	Industrial	Commercial/Light Industrial , Light Industrial, Manufacturing/Industrial Center – Light Industrial and Heavy Industrial	Industrial
Institutional	Major Institutions, Public Facilities and Small Institutions	-	-
Open Space/ Recreation	Open Space, Parks	-	King County Open Space System
Transportation/Utility/ Communications	Transportation, Utility, Communications	-	-
Vacant	Vacant	-	-

Source: RS&H, 2024

Figure 4-5
Consolidated Land Use Map



Source: RS&H, 2024

4.4 Land Use Data Verification

During August 12 through 15, 2024, RS&H team members undertook additional field surveys to further refine the development of the detailed land use map. Parcels were identified that had changed land use from previous data updates. The detailed land use map was transmitted to cities of Seattle and Tukwila for verification and corrections.

4.5 FAA Land Use Compatibility Guidelines

The FAA has developed land use guidelines that relate the compatibility of aircraft noise to areas surrounding an airport. Table 1 in Part 150, provided as **Table 4-2**, identifies as a function of annual (365-day average) DNL values the land uses that are compatible and land uses that are incompatible in the vicinity of an airport. The FAA determined that all the land uses listed in the table are compatible with aircraft noise exposure below the DNL 65 dB noise contour. When evaluating land use compatibility, attention is therefore focused on land uses within the DNL 65 dB and higher noise contours.

The Part 150 land use compatibility guidelines identify that noise-sensitive uses, such as residential and schools, are considered incompatible with noise levels of DNL 65 dB or greater unless otherwise determined by local guidelines. Where the community determines that residential or schools must be allowed at DNL levels greater than 65, acoustical treatments designed to achieve indoor levels of 45 dB or less should be incorporated into the structures.

Other noise-sensitive uses such as hospitals, nursing homes, places of worship, auditoriums, and concert halls are generally compatible with noise levels between the DNL 65 and 75 dB when measures that achieve an outdoor-to-indoor Noise Level Reduction (NLR) of 25 to 30 dB are incorporated into the structures. Land uses that are less sensitive to noise, such as office buildings, are considered compatible with noise levels of up to DNL 70 dB without sound insulation and up to DNL 75 dB with sound insulation.

Table 4-2
Part 150 Land Use Compatibility Guidelines

Category	Land Use	Below 65 DNL	65-70 DNL	70-75 DNL	75-80 DNL	70-85 DNL	Over 85 DNL
Residential	Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Residential	Mobile home parks	Y	N	N	N	N	N
Residential	Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use	Schools	Y	N(1)	N(1)	N	N	N
Public Use	Hospitals and nursing homes	Y	25	30	N	N	N

Public Use	Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Public Use	Governmental services	Y	Y	25	30	N	N
Public Use	Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Public Use	Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use	Offices, business and professional	Y	Y	25	30	N	N
Commercial Use	Wholesale and retail - building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use	Retail trade - general	Y	Y	25	30	N	N
Commercial Use	Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use	Communication	Y	Y	25	30	N	N
Manufacturing and Production	Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Manufacturing and Production	Photographic and optical	Y	Y	25	30	N	N
Manufacturing and Production	Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Manufacturing and Production	Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Manufacturing and Production	Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational	Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Recreational	Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Recreational	Nature exhibits and zoos	Y	Y	N	N	N	N
Recreational	Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Recreational	Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Table Notes: 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, 30, or 35 dB must be incorporated into design and construction of structure.
(1) 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 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB 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. (2) Measures to achieve NLR 25 dB 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. (3) Measures to achieve NLR of 30 dB 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. (4) Measures to achieve NLR 35 dB 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 level is low. (5) Land use compatible provided special sound reinforcement systems are installed. (6) Residential buildings require an NLR of 25. (7) Residential buildings require an NLR of 30. (8) Residential buildings not permitted.

Source: 14 CFR Part 150

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CHAPTER 5

NOISE EXPOSURE MAPS DEVELOPMENT

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5 Noise Exposure Maps Development

This chapter provides information on the noise model and the data used to develop the 2023 and 2030 DNL contours depicted on the Noise Exposure Maps (NEMs).

5.1 Aviation Environmental Design Tool

The standard methodology for evaluating noise exposure at airports involves the use of an aircraft noise model. The FAA has approved the Aviation Environmental Design Tool (AEDT) for use in Part 150 studies. The AEDT version 3f, the most current version of the model when the study began, has been used to prepare the DNL contours included on the NEMs. The DNL is a 24-hour time-weighted sound level expressed in A-weighted decibels. The FAA and other federal agencies use DNL as the primary measure of noise impact because it: correlates well with the results of attitudinal surveys regarding noise; increases with the duration of noise events; and accounts for an increased sensitivity to noise at night by increasing each noise event that occurs during nighttime hours (i.e., 10:00 p.m. to 6:59 a.m.) by 10 decibels (dB).

The AEDT works by defining a network of grid points at ground level around an airport. The model then selects the shortest distance from each grid point to each flight track and computes the noise exposure generated by each aircraft operation along each flight track. Customizations are applied for atmospheric acoustical attenuation, acoustical shielding of the aircraft engines by the aircraft itself, and aircraft speed variations. The noise exposure levels for each aircraft are then summed at each grid location. The cumulative noise exposure levels at all grid points are then used to develop aviation noise exposure contours for selected (e.g., DNL 65, 70 and 75). Part 150 requires that the annual-average day DNL contours be computed.

5.2 AEDT Input Data

In the development of DNL contours, the AEDT uses both default and airport-specific factors. The default factors included in the AEDT are engine noise levels, thrust settings, aircraft arrival and departure flight profiles, and aircraft speed. The airport-specific factors include the number of aircraft operations, the type of aircraft, runway use, the assignment of aircraft operations to flight tracks, local meteorological conditions, and operational time (day/night) data. The following describes these airport-specific data used in the development of the DNL contours for KCIA.

5.2.1 Meteorological Data

The AEDT accounts for the influences of meteorological conditions on aircraft performance and atmospheric sound absorption. Meteorological conditions affect the transmission of sound through the air. Humidity and temperature materially affect the transmission of air-to-ground sound through absorption associated with the instability and viscosity of the air.

To adjust aircraft performance and sound propagation the AEDT uses temperature and relative humidity to calculate atmospheric absorption coefficients. The 10-year (2012-2021) average meteorological conditions included in the AEDT for KCIA are from the National Oceanic and Atmospheric Administration's Integrated Surface Database and are as follows:

- Temperature: 53.7° Fahrenheit
- Relative humidity: 70.1%

The 2023 and 2030 DNL contours were prepared using these meteorological data.

5.2.2 Terrain Data

The AEDT uses terrain data to adjust the aircraft-to-ground path length, to consider locations where terrain variation relative to the airfield makes the ground closer to or farther from the aircraft. Terrain data were obtained from the National Elevation Dataset from U.S. Geological Survey.

5.2.3 Aircraft Operations and Fleet Mix

Table 5-1 provides the 2023 and 2030 modeled annual aircraft operations[7] by category. The 2023 operations were based on calendar year 2023 operations data included in the FAA's Operations Network (OPSNET). The OPSNET is the official source of FAA air traffic operations data. The data is reported to OPSNET by the Airport Traffic Control Tower (ATCT) personnel and can be viewed on the FAA Operations & Performance Data website.

The OPSNET separates operations into itinerant[8] and local[9]. Itinerant operations are separated into four categories: Air Carrier, Air Taxi, General Aviation, and Military. Local operations are separated into two categories: Civil and Military. OPSNET only provides total operations by aircraft category.

As shown in **Table 5-1**, 157,064 annual operations were modeled for 2023, which is an average of 430 operations per day. The 2030 forecast aircraft operations were obtained from the FAA-approved aviation activity forecast prepared in 2024 to support the Part 150 Study and KCIA's Vision 2045 Airport Plan. The Vision 2045 Airport Plan is being prepared per the standards of FAA Advisory Circular 5070-6B Airport Master Plans, which requires that the airport prepare and

[7] An aircraft operation is one arrival or one departure.
[8] An itinerant operation is defined as an aircraft departure where the aircraft leaves the airport vicinity and lands at another airport, or an aircraft landing where the aircraft arrives from another airport.
[9] Local operations are those operations performed by aircraft that remain in the local traffic pattern, execute simulated instrument approaches or low passes at the airport, and the operations to or from the airport and a designated practice area within a 20–mile radius.

submit to FAA a forecast of aviation activity. The 2030 forecast for aircraft operations at KCIA increases to 188,060 annual operations, which is an average of 515 operations per day.

Table 5-1
2023 and 2030 Annual Aircraft Operations

Year	Air Carrier	Air Taxi and Itinerant General Aviation	Local General Aviation	Military	Total
2023	7,117	103,257	45,735	955	157,064
2030	7,853	119,847	59,400	960	188,060

Source: FAA OPSNET; KCIA Vision 2045 Aviation Activity Forecast, 2024

For the purposes of preparing DNL contours, operational data were segregated by aircraft type. Aircraft operations and flight track data for 2023 were obtained from the Airport's PublicVue flight tracking system. PublicVue is made available by PASSER Aerospace, Inc. The data in the system includes the specific aircraft type, the actual radar flight track, and the time at which the operation occurred. The data was reviewed and each aircraft type was assigned the corresponding AEDT aircraft type. Four aircraft that operated at the Airport in 2023 were not in the AEDT database. For these aircraft, FAA-approved substitutions were used to model the aircraft with a similar type. Aircraft substitutions were submitted to FAA on October 1, 2024, with FAA approval and recommendation response received on October 20, 2024 (see **Appendix C**).

Table 5-2 provides the 2023 and 2030 aircraft operations and fleet. Future operational activity and fleet mix are based on forecasted conditions for 2030. Building on the existing operational activity and fleet mix, these forecasted conditions account for the changes in activity anticipated to occur in the future at KCIA. These changes include the phasing out of aging aircraft approaching the end of their useful lives, changing aviation markets, and the regional economy's demands on air traffic.

Table 5-2
2023 and 2030 Annual Aircraft Operations and Fleet

Aircraft	AEDT Aircraft	Operations	
		2023	2030
Air Carrier			
Boeing 737 Max 7/8/9/10	7378MAX	1,912	2,701
Boeing 767-300	7673ER	1,635	3,029
Boeing (Douglas) MD 11	MD11GE	955	-

Aircraft	AEDT Aircraft	Operations	
		2023	2030
Boeing 757-200	757PW	911	1,005
Boeing 737-800/900, P-8 Poseidon	737800	562	287
Boeing 777-9	7773ER	297	328
Boeing 737-700	737700	243	176
Airbus A320 All Series	A320-211	217	120
Boeing 767-200	767CF6	90	-
Boeing 737-400/500	737400	87	-
Airbus A300F4-600	A300-622R	65	-
Boeing 757-300	757300	20	-
Airbus A319/A319neo	A319-131	20	22
Boeing 737-300	737300	18	-
Airbus A321 All Series/neo	A321-232	18	20
Boeing 787-8	7878R	17	19
Boeing 777-200/LRF/LR	777200	12	7
Boeing (Douglas) MD 81/82/83/88	MD83	12	-
Boeing 727-200	727EM2	8	-
Airbus A320neo	A320-270N	7	127
Boeing (Douglas) DC 9-10	DC93LW	6	-
Boeing (Douglas) DC 10-10/30/40	DC1030	5	-
Boeing 787-9	7879	-	12
Air Carrier Total		7,117	7,853
Air Taxi / Itinerant General Aviation			
Cessna 170/172/177, Champion Tri-Traveler/Sky-Trac	CNA172	21,125	24,897
Pilatus PC-12, Cessna 208, Socata TBM-7/TBM-850, Piper Malibu Meridian/M600	CNA208	14,045	14,948
Cessna 140/150/152, Vans RV-4, Beech 23/24, Lancair 320, Turbo Dakota	GASEPF	10,209	12,065
Piper Cherokee/24/Malibu, Mooney M20C/M20K Beech 33/35/36, Van's RV-6/7/10, Glasair, Diamond DA40, PITTS S-1, Columbia 400, Bellanca Viking	GASEPV	7,858	9,467

Aircraft	AEDT Aircraft	Operations	
		2023	2030
Bombardier Challenger 300/600/601/604, Gulfstream G200	CL600	5,869	6,776
Cessna CJ1/CJ2/CJ3/CJ4/M2	CNA525C	3,481	4,196
Learjet 31A/B/35/40/45/60/75, Hawker 800/1000	LEAR35	3,176	3,734
Cessna Citation Sovereign/Latitude/Longitude	CNA680	3,145	3,503
Cessna 182/185	CNA182	2,996	3,603
HELICOPTER Robinson R44/66	R44	2,906	3,277
Cirrus SR20/22/22 Turbo	COMSEP	2,225	2,683
Embraer Phenom 300/Legacy 500, Cessna Citation Bravo, Pilatus PC-24, Embraer Legacy 500	CNA55B	2,012	2,305
Cessna Citation Excel	CNA560XL	1,914	2,204
Dassault Falcon 2000, Cessna Citation X	CNA750	1,752	2,108
Beech 90/99/100/200/300/350, Piaggio P-180, Gulfstream Commander, DeHavilland Twin Otter	DHC6	1,596	1,884
Cessna 340/414, Beech 55/58, Piper PA-34	BEC58P	1,495	1,806
Diamond DA42/62, Piper PA-30/44	PA30	1,398	1,645
Gulfstream G300/400, Falcon 7X	GIV	1,354	1,583
Cessna 206/T206	CNA206	1,270	1,531
Gulfstream G650/700	G650ER	1,221	1,458
Cessna Citation Mustang, Honda HA-420 Hondajet, Embraer Legacy 450/Phenom 100	CNA510	1,168	1,366
Gulfstream G500/G600	GV	1,074	1,292
HELICOPTER - Eurocopter EC-130/135	EC130	1,015	1,112
Bombardier Global Express/Global 7500	BD-700-1A10	1,001	1,158
HELICOPTER - Robinson R22	R22	933	1,084
HELICOPTER - Bell 429	B429	811	888
Gulfstream G280	CL601	713	858
Cessna Citation V/Ultra/Encore	CNA560U	702	846
Dassault Falcon 20 (Re-engined)/50/900	FAL900EX	673	808
Beech 1900D	1900D	673	736

Aircraft	AEDT Aircraft	Operations	
		2023	2030
HELICOPTER - Bell 206	B206L	594	680
HELICOPTER - Agusta A109	A109	497	548
Bombardier Global 5000	BD-700-1A11	369	428
Cirrus Vision SF50, Eclipse 500	ECLIPSE500	352	424
Cessna 421/425, Piper Cheyenne 1/2, Jetprop Commander 1000	CNA441	292	350
Raytheon Beechjet 400A	CNA560E	243	293
HELICOPTER - Bell 407	B407	195	226
IAI 1124/1125, Gulfstream G150	IA1125	174	210
Embraer 135 LR/145	EMB145	133	158
Cessna III/VI/VII	CIT3	111	134
Embraer Brasilia EMB 120	EMB120	104	114
Saab 2000	HS748A	72	87
BOE T-38	T-38A	56	68
HELICOPTER - Schweizer 269	SC300C	49	59
Bombardier CRJ-200	CRJ9-ER	47	57
HELICOPTER - Hughes 500D	H500D	43	52
HELICOPTER - Eurocopter AS-350 AStar	SA350D	33	40
HELICOPTER - Aerospatiale SA-341G/342 Gazelle	SA341G	23	27
Skyland RG Turbo	CNA20T	14	17
HELICOPTER - Bell UH-1 Iroquois	B212	13	16
De Havilland DHC-8-300	DHC830	12	14
Dornier 328 Series	DO328	11	13
Shorts 330	SD330	8	9
Saab 340	SF340	2	2
Air Taxi / Itinerant General Aviation Total		103,257	119,847
Military			
Boeing F/A-18 Hornet	F-18	315	317

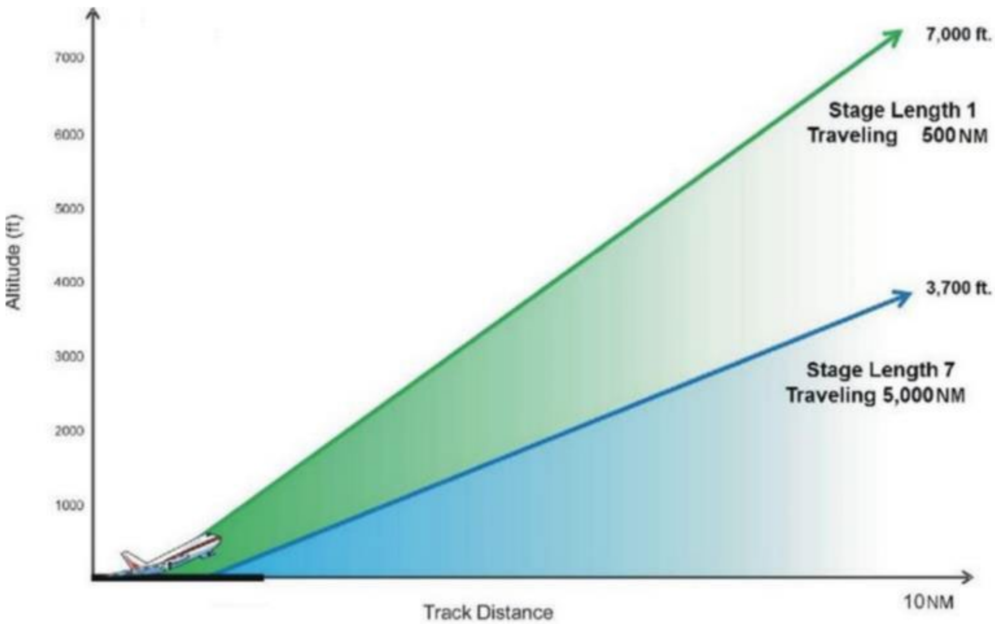
Aircraft	AEDT Aircraft	Operations	
		2023	2030
Northrop T-38 Talon	T-38A	229	230
Lockheed C-130 Hercules	C130E	202	203
Boeing KC-135R Stratotanker	KC-135	146	147
Sikorsky SH-60 Seahawk	S70	36	36
Boeing C-17 Globemaster III	C17	27	27
Military Total		955	960
Local General Aviation			
Cessna 152/170/172	CNA172	38,592	50,123
Cessna 150/Skycatcher, Piper Cherokee	GASEPF	3,643	4,731
Cirrus SR22	COMSEP	1,951	2,534
Cessna 182	CNA182	749	973
Mooney M20C, Diamond DA40, Van's RV-4, Beech Bonanza 33/36	GASEPV	375	488
Diamond DA42/62	PA30	263	341
Cessna 206	CNA206	162	210
Local General Aviation Total		45,735	59,400
Total Aircraft Operations		157,064	188,060

Source: FAA OPSNET; PublicVue, PASSER Aerospace, Inc.; KCIA Vision 2045 Aviation Activity Forecast, 2024; RS&H, 2024
Note: Totals may not sum due to rounding

5.2.4 Aircraft Departure Stage Lengths

The noise exposure from aircraft departures varies depending on takeoff weight. For example, a fully-loaded aircraft departing on a long-haul flight weighs more on departure than the same fully loaded aircraft departing on a short-haul flight due to the weight of the additional fuel needed to travel a longer distance. A heavier aircraft typically requires higher power (thrust settings) to reach its takeoff speed, uses more runway length, and climbs at a slower rate than lighter aircraft (see **Figure 5-1**). To account for this, the AEDT contains 11 departure climb profiles (corresponding to different departure weights), depending on the type of aircraft. These profiles represent aircraft origin-to-destination trip lengths from less than 500 nautical miles (nm) to over 8,500 nm. The distances for each stage length and the percentage of operations modeled for the air carrier aircraft for the NEM contours are shown in **Table 5-3**. All general aviation and military aircraft were modeled with a stage length 1.

Figure 5-1
Departure Stage Length Comparison



Source: RS&H, 2024

Table 5-3
Air Carrier Aircraft Departure Stage Lengths

AEDT AIRCRAFT	Stage Length					
	1 <500nm	2 501-1000nm	3 1001-1500nm	4 1501-2500nm	6 3501-4500nm	Total
7378MAX	77.2%	12.0%	4.2%	4.0%	2.6%	100.0%
7673ER	13.8%		39.3%	46.9%		100.0%
MD11GE		40.6%		59.4%		100.0%
757PW	22.2%	51.0%	14.8%	12.0%		100.0%
737800	57.0%	17.0%	13.9%	12.1%		100.0%
7878R	100.0%					100.0%
7773ER	89.8%		10.2%			100.0%
7879	100.0%					
737700		37.7%		52.5%	9.8%	100.0%
A320-211		100.0%				100.0%

AEDT AIRCRAFT	Stage Length					
	1 <500nm	2 501-1000nm	3 1001-1500nm	4 1501-2500nm	6 3501-4500nm	Total
767CF6	100.0%					100.0%
737400			100.0%			100.0%
A300-622R	81.8%			18.2%		100.0%
757300				100.0%		100.0%
A319-131				100.0%		100.0%
A321-232		100.0%				100.0%
737300			100.0%			100.0%
MD83				100.0%		100.0%
777200	100.0%					100.0%
727EM2				100.0%		100.0%
A320-270N				100.0%		100.0%
DC93LW			100.0%			100.0%
DC1030	100.0%					100.0%

Source: PublicVue, PASSER Aerospace, Inc.; RS&H, 2024

5.2.5 Time of Day Operations

Aircraft operations modeled in the AEDT are assigned as occurring during daytime (7:00 a.m. to 9:59 p.m.) or nighttime (10:00 p.m. to 6:59 a.m.). The calculation of DNL includes an additional weight of 10 dB for those operations occurring at night. The modeled time-of-day percentages for itinerant and local aircraft operations are shown in **Tables 5-4** and **5-5.** Given the limited data on military aircraft operations, the time-of-day for military operations were modeled using the overall average of the itinerant air taxi / general aviation category which is 93.1% day and 6.9% night.

Table 5-4
Itinerant Aircraft Operations Time of Day

Aircraft Category	AEDT Aircraft	Departures			Arrivals		
		Day	Night	Total	Day	Night	Total
Air Carrier	7378MAX	99.4%	0.6%	100.0%	98.9%	1.1%	100.0%
	7673ER	66.1%	33.9%	100.0%	58.5%	41.5%	100.0%
	MD11GE	60.3%	39.7%	100.0%	46.0%	54.0%	100.0%
	757PW	51.4%	48.6%	100.0%	43.1%	56.9%	100.0%
	737800	86.7%	13.3%	100.0%	86.9%	13.1%	100.0%
	7878R	85.0%	15.0%	100.0%	85.0%	15.0%	100.0%
	7773ER	100.0%		100.0%	100.0%		100.0%
	7879	85.0%	15.0%	100.0%	85.0%	15.0%	100.0%
	737700	87.7%	12.3%	100.0%	84.4%	15.6%	100.0%
	A320-211	64.5%	35.5%	100.0%	76.5%	23.5%	100.0%
	767CF6	97.6%	2.4%	100.0%	97.7%	2.3%	100.0%
	737400	88.9%	11.1%	100.0%	84.8%	15.2%	100.0%
	A300-622R	93.9%	6.1%	100.0%	90.9%	9.1%	100.0%
	757300	85.7%	14.3%	100.0%	100.0%		100.0%
	A319-131	71.4%	28.6%	100.0%	66.7%	33.3%	100.0%
	A321-232	87.5%	12.5%	100.0%	100.0%		100.0%
	737300	100.0%		100.0%	80.0%	20.0%	100.0%
	MD83	100.0%		100.0%	60.0%	40.0%	100.0%
	777200	100.0%		100.0%	100.0%		100.0%
	727EM2	50.0%	50.0%	100.0%	50.0%	50.0%	100.0%
	A320-270N	100.0%		100.0%	100.0%		100.0%
	DC93LW	100.0%		100.0%		100.0%	100.0%
	DC1030	100.0%		100.0%	100.0%		100.0%
Jet	CL600	94.5%	5.5%	100.0%	96.3%	3.7%	100.0%
	CNA525C	87.3%	12.7%	100.0%	87.7%	12.3%	100.0%

Aircraft Category	AEDT Aircraft	Departures			Arrivals		
		Day	Night	Total	Day	Night	Total
	LEAR35	79.4%	20.6%	100.0%	76.0%	24.0%	100.0%
	CNA680	94.8%	5.2%	100.0%	96.0%	4.0%	100.0%
	CNA55B	95.0%	5.0%	100.0%	95.6%	4.4%	100.0%
	CNA560XL	94.4%	5.6%	100.0%	96.0%	4.0%	100.0%
	CNA750	93.8%	6.2%	100.0%	97.4%	2.6%	100.0%
	GIV	92.9%	7.1%	100.0%	94.1%	5.9%	100.0%
	G650ER	93.8%	6.2%	100.0%	86.2%	13.8%	100.0%
	CNA510	88.5%	11.5%	100.0%	93.1%	6.9%	100.0%
	GV	93.8%	6.2%	100.0%	94.6%	5.4%	100.0%
	BD-700-1A10	93.1%	6.9%	100.0%	93.4%	6.6%	100.0%
	CL601	91.0%	9.0%	100.0%	96.6%	3.4%	100.0%
	CNA560U	94.1%	5.9%	100.0%	93.3%	6.7%	100.0%
	FAL900EX	94.6%	5.4%	100.0%	93.8%	6.2%	100.0%
	BD-700-1A11	96.0%	4.0%	100.0%	97.1%	2.9%	100.0%
	ECLIPSE500	96.3%	3.7%	100.0%	96.9%	3.1%	100.0%
	CNA560E	96.6%	3.4%	100.0%	97.2%	2.8%	100.0%
	IA1125	90.0%	10.0%	100.0%	92.6%	7.4%	100.0%
	EMB145	77.5%	22.5%	100.0%	90.2%	9.8%	100.0%
	CIT3	96.2%	3.8%	100.0%	88.0%	12.0%	100.0%
	T-38A	100.0%		100.0%	100.0%		100.0%
	CRJ9-ER	82.6%	17.4%	100.0%	95.0%	5.0%	100.0%
Turboprop	CNA208	83.7%	16.3%	100.0%	87.0%	13.0%	100.0%
	DHC6	92.7%	7.3%	100.0%	95.9%	4.1%	100.0%
	1900D	61.9%	38.1%	100.0%	100.0%	0.0%	100.0%
	CNA441	94.7%	5.3%	100.0%	95.7%	4.3%	100.0%
	EMB120	91.9%	8.1%	100.0%	95.8%	4.2%	100.0%
	HS748A	91.2%	8.8%	100.0%	71.9%	28.1%	100.0%

Aircraft Category	AEDT Aircraft	Departures			Arrivals		
		Day	Night	Total	Day	Night	Total
	DHC830	100.0%		100.0%	100.0%		100.0%
	DO328	100.0%		100.0%	100.0%		100.0%
	SD330	100.0%		100.0%	100.0%		100.0%
	SF340	100.0%		100.0%	100.0%		100.0%
Piston	CNA172	96.7%	3.3%	100.0%	95.9%	4.1%	100.0%
	GASEPF	98.1%	1.9%	100.0%	97.7%	2.3%	100.0%
	GASEPV	97.2%	2.8%	100.0%	97.3%	2.7%	100.0%
	CNA182	96.8%	3.2%	100.0%	97.6%	2.4%	100.0%
	COMSEP	96.7%	3.3%	100.0%	97.4%	2.6%	100.0%
	BEC58P	97.7%	2.3%	100.0%	98.2%	1.8%	100.0%
	PA30	95.9%	4.1%	100.0%	94.6%	5.4%	100.0%
	CNA206	97.2%	2.8%	100.0%	97.8%	2.2%	100.0%
	CNA20T	100.0%		100.0%	100.0%		100.0%
Helicopter	R44	99.5%	0.5%	100.0%	99.3%	0.7%	100.0%
	EC130	80.8%	19.2%	100.0%	84.4%	15.6%	100.0%
	R22	96.0%	4.0%	100.0%	96.8%	3.2%	100.0%
	B429	58.2%	41.8%	100.0%	58.5%	41.5%	100.0%
	B206L	98.0%	2.0%	100.0%	97.8%	2.2%	100.0%
	A109	70.3%	29.7%	100.0%	73.6%	26.4%	100.0%
	B407	74.0%	26.0%	100.0%	71.0%	29.0%	100.0%
	SC300C	100.0%		100.0%	100.0%		100.0%
	H500D	100.0%		100.0%	100.0%		100.0%
	SA350D	100.0%		100.0%	100.0%		100.0%
	SA341G	100.0%		100.0%	100.0%		100.0%
	B212	80.0%	20.0%	100.0%	85.7%	14.3%	100.0%

Source: PublicVue, PASSER Aerospace, Inc.; RS&H, 2024

Table 5-5
Local Aircraft Operations Time of Day

Aircraft Category	AEDT Aircraft	Local		
		Day	Night	Total
Piston	CNA172	97.4%	2.6%	100.0%
	GASEPF	98.9%	1.1%	100.0%
	COMSEP	95.7%	4.3%	100.0%
	CNA182	95.1%	4.9%	100.0%
	GASEPV	92.2%	7.8%	100.0%
	PA30	99.1%	0.9%	100.0%
	CNA206	98.5%	1.5%	100.0%

Source: PublicVue, PASSER Aerospace, Inc.; RS&H, 2024

5.2.6 Runway Use

Runway use refers to the frequency with which aircraft utilize each runway end for departures and arrivals. The more often a runway is used, the more noise is generated in areas located off each end of the runway. The regional airspace, runway length and width, and the wind direction and speed influence the runway use at an airport. The 2023 data from the Airport's PublicVue flight tracking system was used to develop the runway use. The modeled runway use for air carrier departures and arrivals are included in **Tables 5-6** and **5-7**. The modeled runway use for itinerant air taxi and general aviation operations are included in **Tables 5-8** through **5-10**. Given the limited data on military aircraft operations, the runway use for military operations were modeled operating on Runway 14R/32L using the overall average of the civilian aircraft operations which is 75.6% on Runway 14R and 24.4% on Runway 32L.

Table 5-6
Air Carrier Aircraft Runway Use – Departures

AEDT Aircraft	Departures Day			Departures Night		
	14R	32L	Total	14R	32L	Total
7378MAX	76.3%	23.7%	100.0%	66.7%	33.3%	100.0%
7673ER	65.8%	34.2%	100.0%	82.4%	17.6%	100.0%

AEDT Aircraft	Departures Day			Departures Night		
	14R	32L	Total	14R	32L	Total
MD11GE	67.4%	32.6%	100.0%	78.1%	21.9%	100.0%
757PW	66.8%	33.2%	100.0%	74.4%	25.6%	100.0%
737800	74.8%	25.2%	100.0%	77.3%	22.7%	100.0%
7878R	75.6%	24.4%	100.0%	76.5%	23.5%	100.0%
7773ER	73.4%	26.6%	100.0%	-	-	-
7879	75.6%	24.4%	100.0%	76.5%	23.5%	100.0%
737700	74.8%	25.2%	100.0%	86.7%	13.3%	100.0%
A320-211	67.5%	32.5%	100.0%	77.3%	22.7%	100.0%
767CF6	75.0%	25.0%	100.0%	100.0%	-	100.0%
737400	65.6%	34.4%	100.0%	100.0%	-	100.0%
A300-622R	93.5%	6.5%	100.0%	100.0%	-	100.0%
757300	66.7%	33.3%	100.0%	-	-	-
A319-131	60.0%	40.0%	100.0%	50.0%	50.0%	100.0%
A321-232	42.9%	57.1%	100.0%	-	-	-
737300	60.0%	40.0%	100.0%	-	-	-
MD83	66.7%	33.3%	100.0%	-	-	-
777200	90.0%	10.0%	100.0%	-	-	-
727EM2		100.0%	100.0%	100%		100%
A320-270N	100.0%		100.0%	-	-	-
DC93LW	66.7%	33.3%	100.0%	-	-	-
DC1030	100.0%		100.0%	-	-	-

Source: PublicVue, PASSER Aerospace, Inc.; RS&H, 2024

Table 5-7
Air Carrier Aircraft Runway Use – Arrivals

AEDT Aircraft	Arrivals Day			Arrivals Night		
	14R	32L	Total	14R	32L	Total
7378MAX	83.2%	16.8%	100.0%	83.3%	16.7%	100.0%
7673ER	70.3%	29.7%	100.0%	74.1%	25.9%	100.0%
MD11GE	67.3%	32.7%	100.0%	72.9%	27.1%	100.0%
757PW	73.7%	26.3%	100.0%	69.8%	30.2%	100.0%
737800	90.0%	10.0%	100.0%	72.7%	27.3%	100.0%
7878R	75.0%	25.0%	100.0%	75.6%	24.4%	100.0%
7773ER	81.6%	18.4%	100.0%	-	-	-
7879	75.0%	25.0%	100.0%	75.6%	24.4%	100.0%
737700	73.3%	26.7%	100.0%	84.2%	15.8%	100.0%
A320-211	93.7%	6.3%	100.0%	81.3%	18.7%	100.0%
767CF6	75.5%	24.5%	100.0%		100.0%	100.0%
737400	83.0%	17.0%	100.0%	80.0%	20.0%	100.0%
A300-622R	90.0%	10.0%	100.0%	100.0%		100.0%
757300	76.9%	23.1%	100.0%	-	-	-
A319-131	81.8%	18.2%	100.0%	50.0%	50.0%	100.0%
A321-232	60.0%	40.0%	100.0%	-	-	-
737300	75.0%	25.0%	100.0%	100.0%		100.0%
MD83	33.3%	66.7%	100.0%	66.7%	33.3%	100.0%
777200	100.0%		100.0%	-	-	-
727EM2	80.0%	20.0%	100.0%	100.0%		100.0%
A320-270N	100.0%		100.0%	-	-	-
DC93LW				100.0%		100.0%
DC1030	100.0%		100.0%	-	-	-

Source: PublicVue, PASSER Aerospace, Inc.; RS&H, 2024

Table 5-8
Air Taxi and Itinerant General Aviation Aircraft Runway Use – Departures

Aircraft Category	AEDT Aircraft	Departures Day				Departures Night			
		14R	32L	14L	32R	14R	32L	14L	32R
Jet	CL600	74.5%	25.5%			70.6%	29.4%		
	CNA525C	69.0%	31.0%			73.4%	26.6%		
	LEAR35	69.8%	30.2%			68.4%	31.6%		
	CNA680	71.4%	28.6%			74.4%	25.6%		
	CNA55B	71.3%	28.7%			68.7%	31.3%		
	CNA560XL	71.8%	28.2%			66.0%	34.0%		
	CNA750	72.9%	27.1%			76.4%	23.6%		
	GIV	74.4%	25.6%			77.8%	22.2%		
	G650ER	72.6%	27.4%			64.0%	36.0%		
	CNA510	68.0%	32.0%			65.2%	34.8%		
	GV	69.6%	30.4%			77.5%	22.5%		
	BD-700-1A10	70.6%	29.4%			56.1%	43.9%		
	CL601	71.9%	28.1%			76.6%	23.4%		
	CNA560U	71.4%	28.6%			57.9%	42.1%		
	FAL900EX	70.2%	29.8%			76.4%	23.6%		
	BD-700-1A11	71.7%	28.3%			71.5%	28.5%		
	ECLIPSE500	67.1%	32.9%			83.3%	16.7%		
	CNA560E	69.6%	30.4%			75.0%	25.0%		
	IA1125	69.4%	30.6%			87.5%	12.5%		
	EMB145	60.4%	39.6%			85.6%	14.4%		
	CIT3	76.0%	24.0%			50.0%	50.0%		
	T-38A	67.9%	32.1%						
	CRJ9-ER	78.9%	21.1%			75.0%	25.0%		
Turboprop	CNA208	68.4%	29.7%	0.7%	1.2%	74.8%	25.0%	0.2%	
	DHC6	71.4%	28.2%		0.4%	75.2%	24.8%		

Aircraft Category	AEDT Aircraft	Departures Day				Departures Night			
		14R	32L	14L	32R	14R	32L	14L	32R
	1900D	73.0%	27.0%			77.4%	22.6%		
	CNA441	67.0%	31.3%	1.7%		71.6%	28.4%		
	EMB120	71.1%	28.9%			100.0%			
	HS748A	74.2%	25.8%				100.0%		
	DHC830	25.0%	75.0%						
	DO328	50.0%	50.0%						
	SD330	50.0%	50.0%						
	SF340	50.0%	50.0%						
Piston	CNA172	60.0%	32.4%	4.7%	2.9%	31.8%	66.5%	0.6%	1.1%
	GASEPF	54.6%	34.4%	8.1%	2.9%	39.6%	59.4%	1.0%	
	GASEPV	54.2%	40.4%	2.6%	2.8%	36.3%	61.5%	2.2%	
	CNA182	55.3%	41.6%	1.7%	1.4%	35.9%	64.1%		
	COMSEP	56.8%	40.5%	2.7%		64.3%	35.7%		
	BEC58P	64.6%	34.1%	0.4%	0.9%	69.2%	30.8%		
	PA30	63.1%	35.6%	0.5%	0.8%	48.1%	51.9%		
	CNA206	61.7%	33.8%	3.0%	1.5%	35.7%	64.3%		
	CNA20T	62.5%	37.5%						

Source: PublicVue, PASSER Aerospace, Inc.; RS&H, 2024

Table 5-9

Air Taxi and Itinerant General Aviation Aircraft Runway Use – Arrivals

Aircraft Category	AEDT Aircraft	Arrivals Day				Arrivals Night			
		14R	32L	14L	32R	14R	32L	14L	32R
Jet	CL600	72.0%	28.0%			70.5%	29.5%		
	CNA525C	70.0%	30.0%			69.5%	30.5%		
	LEAR35	69.1%	30.9%			72.8%	27.2%		
	CNA680	69.8%	30.2%			62.8%	37.2%		

Aircraft Category	AEDT Aircraft	Arrivals Day				Arrivals Night			
		14R	32L	14L	32R	14R	32L	14L	32R
	CNA55B	68.0%	32.0%			75.6%	24.4%		
	CNA560XL	71.6%	28.4%			77.5%	22.5%		
	CNA750	70.6%	29.4%			66.7%	33.3%		
	GIV	74.6%	25.4%			83.7%	16.3%		
	G650ER	70.8%	29.2%			73.3%	26.7%		
	CNA510	66.8%	33.2%			54.1%	45.9%		
	GV	70.5%	29.5%			48.2%	51.8%		
	BD-700-1A10	71.8%	28.2%			74.4%	25.6%		
	CL601	72.5%	27.5%			100.0%			
	CNA560U	70.1%	29.9%			72.7%	27.3%		
	FAL900EX	71.1%	28.9%			84.1%	15.9%		
	BD-700-1A11	65.3%	34.7%			79.7%	20.3%		
	ECLIPSE500	62.8%	37.2%			60.0%	40.0%		
	CNA560E	70.8%	29.2%			100.0%			
	IA1125	74.7%	25.3%			83.3%	16.7%		
	EMB145	76.3%	23.7%			66.4%	33.6%		
	CIT3	63.6%	36.4%			83.3%	16.7%		
	T-38A	57.9%	42.1%						
	CRJ9-ER	73.7%	26.3%			100.0%			
Turboprop	CNA208	69.0%	30.5%	0.4%	0.1%	72.3%	27.6%	0.1%	
	DHC6	71.8%	28.1%	0.1%		72.6%	27.4%		
	1900D	66.6%	33.4%						
	CNA441	70.1%	29.9%			50.0%	50.0%		
	EMB120	62.6%	37.4%			50.0%	50.0%		
	HS748A	63.6%	36.4%			77.8%	22.2%		
	DHC830		100.0%						
	DO328	33.3%	66.7%						

Aircraft Category	AEDT Aircraft	Arrivals Day				Arrivals Night			
		14R	32L	14L	32R	14R	32L	14L	32R
	SD330		100.0%						
	SF340		100.0%						
Piston	CNA172	84.8%	14.9%	0.2%	0.1%	65.3%	34.7%		
	GASEPF	84.8%	14.5%	0.5%	0.2%	60.9%	39.1%		
	GASEPV	74.1%	24.7%	0.8%	0.4%	62.3%	37.7%		
	CNA182	75.4%	24.2%	0.3%	0.1%	71.1%	28.9%		
	COMSEP	75.1%	24.8%	0.1%		82.1%	17.9%		
	BEC58P	79.7%	20.1%	0.1%	0.1%	86.7%	13.3%		
	PA30	78.3%	21.4%	0.3%		63.6%	36.4%		
	CNA206	75.4%	23.8%	0.4%	0.4%	53.3%	46.7%		
	CNA20T	68.0%	32.0%						

Source: PublicVue, PASSER Aerospace, Inc.; RS&H, 2024

Table 5-10
General Aviation Aircraft Runway Use – Local

Aircraft Category	AEDT Aircraft	Local				
		14R	32L	14L	32R	Total
Piston	CNA172	7.0%	66.6%	23.3%	3.0%	100.0%
	GASEPF	11.6%	60.5%	23.9%	4.0%	100.0%
	COMSEP	10.1%	42.6%	37.6%	9.7%	100.0%
	CNA182	2.6%	61.1%	35.3%	1.0%	100.0%
	GASEPV	3.2%	67.5%	24.7%	4.5%	100.0%
	PA30	2.8%	77.6%	19.6%		100.0%
	CNA206	13.4%	43.3%	34.3%	9.0%	100.0%

Source: PublicVue, PASSER Aerospace, Inc.; RS&H

5.2.7 Helicopter Information

The airport's helicopter operators offer a range of services, such as maintenance, training, scenic tours, corporate and charter flights, and more. Law enforcement and medical transportation to hospitals in Seattle and the surrounding areas are examples of public services that are offered.

Three helicopter-use areas were identified for this study based on the analysis of data from the Airport's PublicVue flight tracking system. The primary operating area is located on the west side of the airport, close to Taxiway B5, (Helicopter Area 1) while the other two areas are on the east side (Helicopter Areas 2 and 3). According to PublicVue radar data, about 90% of the airport's helicopter operations are conducted in the primary operating area.

5.2.8 Flight Tracks

Flight tracks refer to the route an aircraft follows when arriving to or departing from a runway. The location of flight tracks is an important factor in determining the geographic distribution of noise on the ground. The AEDT uses airport-specific ground tracks and vertical flight profiles to compute three-dimensional flight paths for each modeled aircraft operation. The vertical profiles, which consist of altitude, speed, and thrust settings, are compiled from data provided by aircraft manufacturers, and are included in the AEDT. The 2023 radar flight tracks from the Airport’s PublicVue flight tracking system was used to develop the AEDT flight tracks and flight track utilization percentages. Flight corridors utilized by aircraft to and from each runway end were reviewed and a series of centerlines of the flight corridors (backbone tracks) were established. These tracks were dispersed within the AEDT to generate sub-tracks to distribute the aircraft within each of the primary flight corridors. **Tables 5-11** through **5-14** show the modeled flight track use percentages by aircraft category. **Figures 5-2** through **5-10** show the AEDT modeled flight tracks. Military aircraft operations were modeled following the straight-in/straight-out flight track on Runway 14R-32L.

Table 5-11
Flight Track Use Percentages - Departures

Departures								
	Day				Night			
Track ID	Air Carrier	Jet	Turboprop	Piston	Air Carrier	Jet	Turboprop	Piston
Runway 14R								
14RD1				2%				
14RD2				11%				7%
14RD3		5%		5%		20%	7%	15%

Departures								
	Day				Night			
Track ID	Air Carrier	Jet	Turboprop	Piston	Air Carrier	Jet	Turboprop	Piston
14RD4				22%				23%
14RD5	77%	79%	54%	10%	50%	56%	46%	15%
14RD6	23%	15%	24%	4%	50%	24%	47%	13%
14RD7				22%				2%
14RD8			19%	24%				20%
14RD9			35%					5%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Runway 32L								
32LD1			3%	29%				15%
32LD2	5%	30%	9%		19%	53%	18%	6%
32LD3				6%			5%	13%
32LD4	76%	65%	15%	5%	30%	47%	25%	
32LD5	19%	5%	15%	5%	51%			9%
32LD6			50%	6%			52%	13%
32LD7			8%	26%				24%
32LD8				17%				8%
32LD9				65				12%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Runway 14L								
14LD1			91%	49%				100%
14LD2				25%				
14LD3			9%	26%			100%	
Total			100%	100%			100%	100%
Runway 32R								
32RD1			76%	3%				
32RD2			21%	60%				100%

Departures								
	Day				Night			
Track ID	Air Carrier	Jet	Turboprop	Piston	Air Carrier	Jet	Turboprop	Piston
32RD3			3%	22%				
32RD4				10%				
32RD5				5%				
Total			100%	100%			100%	100%

Source: PublicVue, PASSER Aerospace, Inc.; RS&H, 2024

Table 5-12
Flight Track Use Percentages - Arrivals

Arrivals								
	Day				Night			
Track ID	Air Carrier	Jet	Turboprop	Piston	Air Carrier	Jet	Turboprop	Piston
Runway 14R								
14RA1			3%	10%				10%
14RA2				10%			1%	7%
14RA3			6%	5%			47%	46%
14RA4	100%	100%	80%	30%	100%	100%	47%	
14RA5			10%	35%				31%
14RA6			1%	5%				
14RA7				5%			5%	6%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Runway 32L								
32LA1			3%	11%				7%
32LA2				12%				6%
32LA3			2%	14%				
32LA4	100%	100%	55%	22%	100%	100%	98%	42%
32LA5				3%				11%

Arrivals								
	Day				Night			
Track ID	Air Carrier	Jet	Turboprop	Piston	Air Carrier	Jet	Turboprop	Piston
32LA6			20%	8%			2%	15%
32LA7			16%	27%				16%
32LA8				2%				
32LA9			2%					
32LA10			2%	1%				3%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Runway 14L								
14LA1			32%	13%				
14LA2			26%	5%			100%	
14LA3			32%	37%				100%
14LA4			5%	10%				
14LA5			5%	35%				
Total			100%	100%			100%	100%
Runway 32R								
32RA1				31%				60%
32RA2				46%				40%
32RA3			100%	23%				
Total			100%	100%			100%	100%

Source: PublicVue, PASSER Aerospace, Inc.; RS&H, 2024

Table 5-13
Flight Track Use Percentages – Local Touch and Go

Touch and Go							
Runway 14R	Track Use	Runway 32L	Track Use	Runway 14L	Track Use	Runway 32R	Track Use
14RT1	52%	32LT1	20%	14LT1	51%	32RT1	47%
14RT2	48%	32LT2	77%	14LT2	49%	32RT2	53%

Touch and Go							
Runway 14R	Track Use	Runway 32L	Track Use	Runway 14L	Track Use	Runway 32R	Track Use
		32LT3	3%				
Total	100%		100%		100%		100%

Source: PublicVue, PASSER Aerospace, Inc.; RS&H, 2024

Table 5-14
Flight Track Use Percentages – Helicopters

Helicopters					
Helicopter Area 1	Track Use	Helicopter Area 2	Track Use	Helicopter Area 3	Track Use
Departures					
HD1	4%	HD11	4%	HD15	13%
HD2	6%	HD12	7%	HD16	23%
HD3	4%	HD13	36%	HD17	30%
HD4	18%	HD14	53%	HD18	34%
HD5	24%				
HD6	10%				
HD7	10%				
HD8	12%				
HD9	6%				
HD10	6%				
Total	100%		100%		100%
Arrivals					
HA1	12%	HA8	50%	HA10	58%
HA2	15%	HA9	50%	HA11	6%
HA3	2%			HA12	36%
HA4	6%				
HA5	14%				
HA6	43%				

Helicopters					
Helicopter Area 1	Track Use	Helicopter Area 2	Track Use	Helicopter Area 3	Track Use
HA7	8%				
Total	100%		100%		100%

Source: PublicVue, PASSER Aerospace, Inc.; RS&H, 2024

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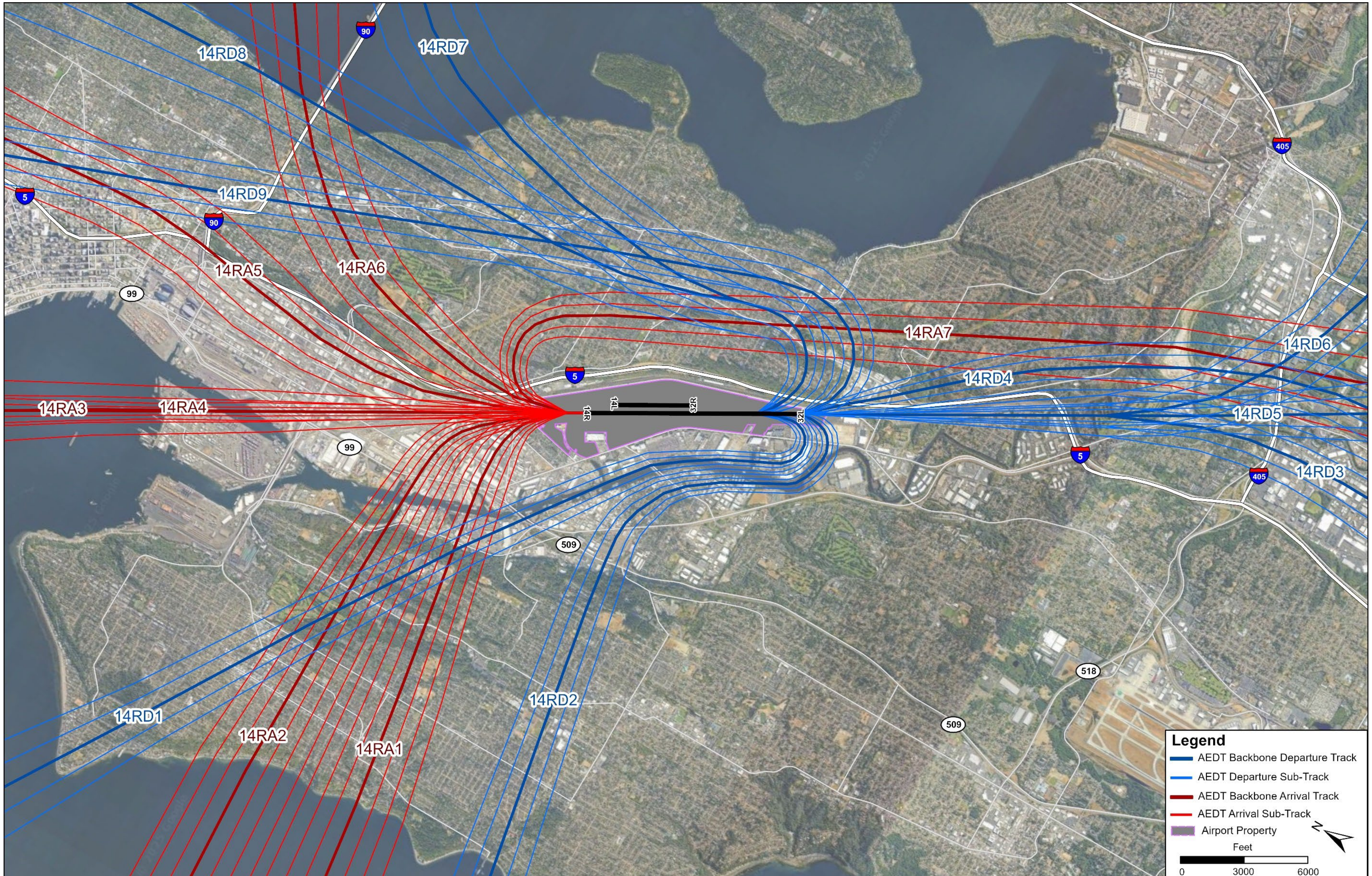
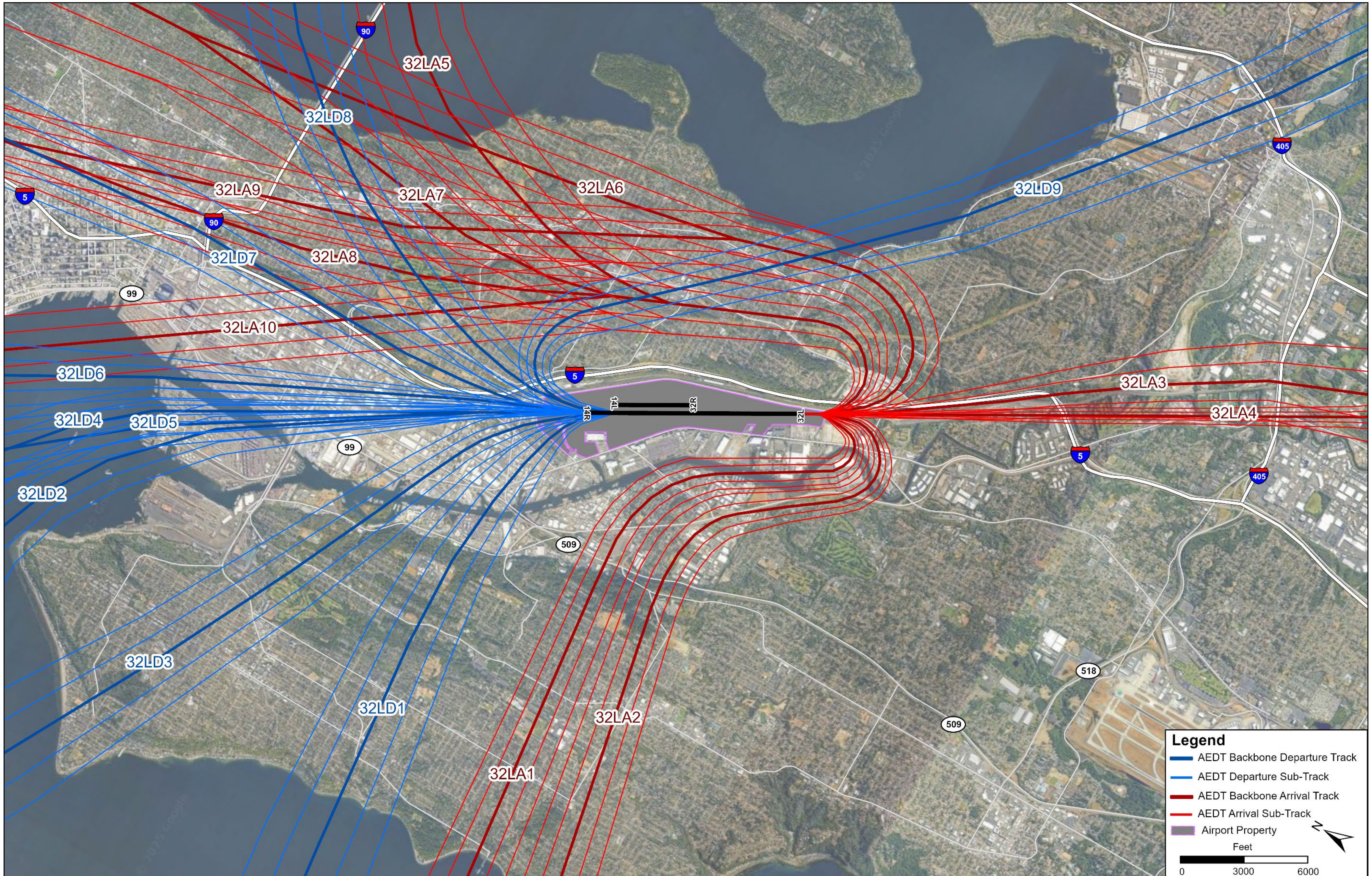
Figure 5-2
AEDT Modeled Aircraft Flight Tracks – Runway 14R



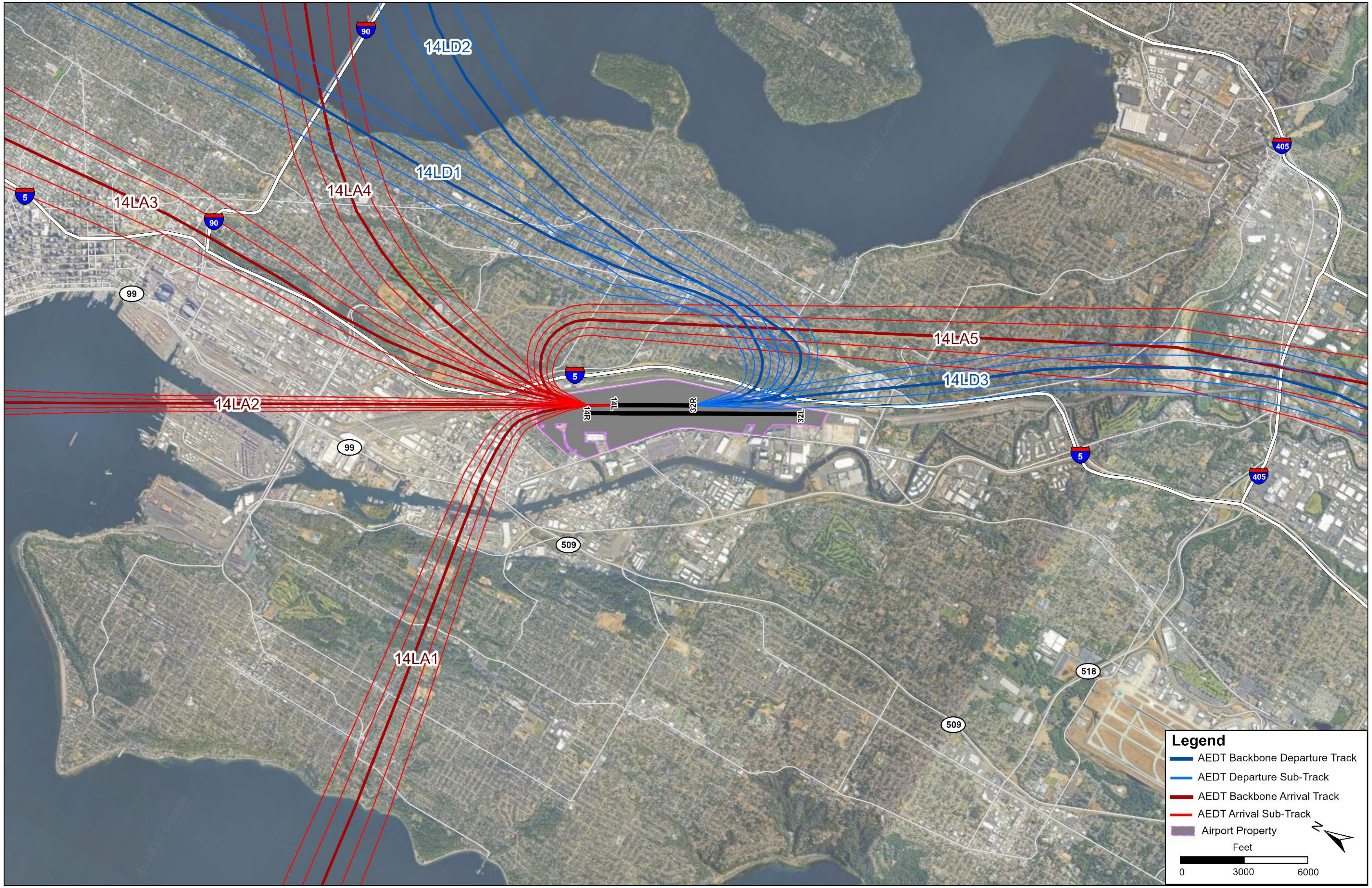
Source: Esri; Maxar; Earthstar Geographics; RS&H, 2024

Figure 5-3
AEDT Modeled Aircraft Flight Tracks – Runway 32L



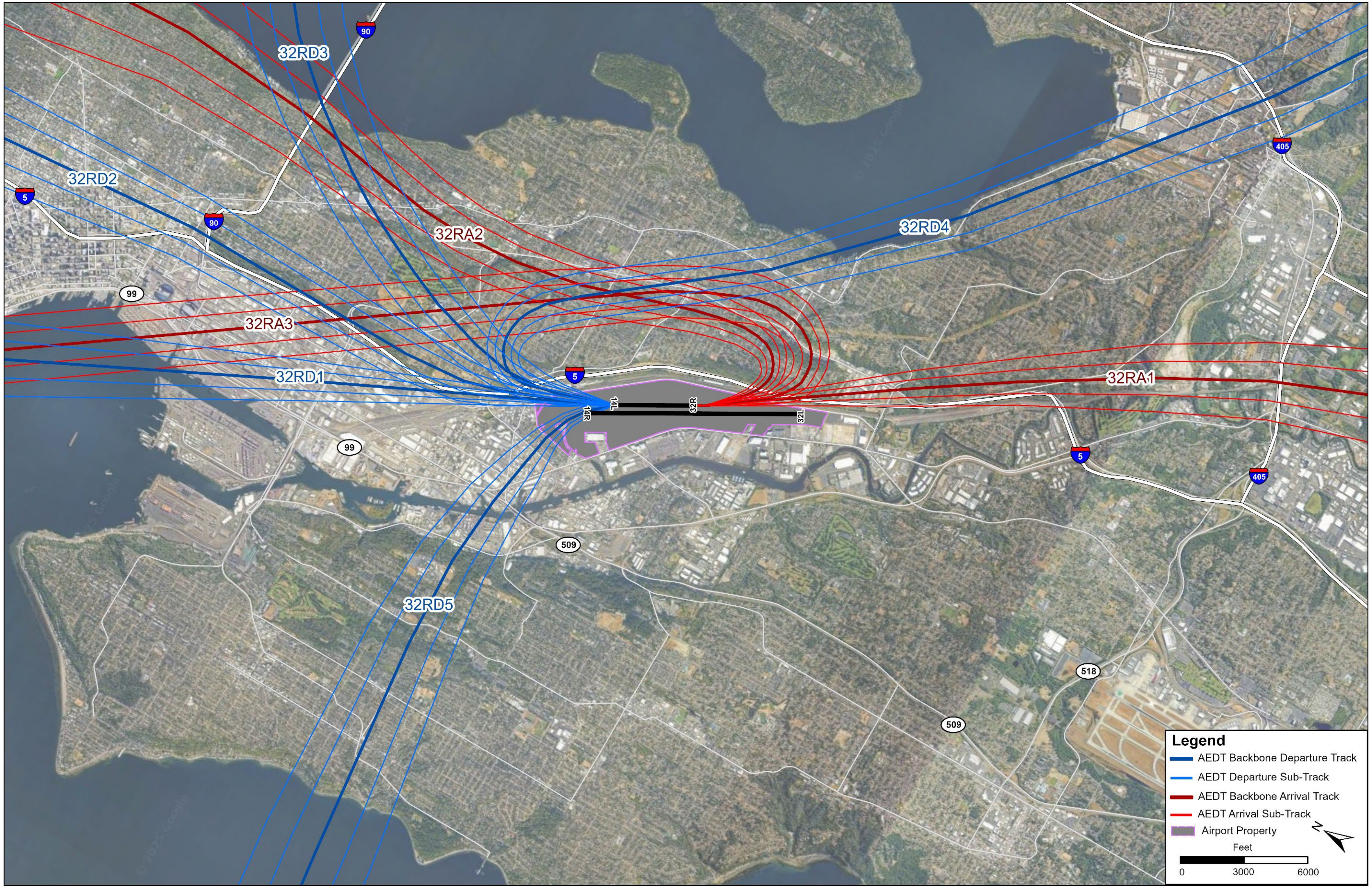
Source: Esri; Maxar; Earthstar Geographics; RS&H, 2024

Figure 5-4
AEDT Modeled Aircraft Flight Tracks – Runway 14L



Source: Esri; Maxar; Earthstar Geographics; RS&H, 2024

Figure 5-5
AEDT Modeled Aircraft Flight Tracks – Runway 32R



Source: Esri; Maxar; Earthstar Geographics; RS&H, 2024

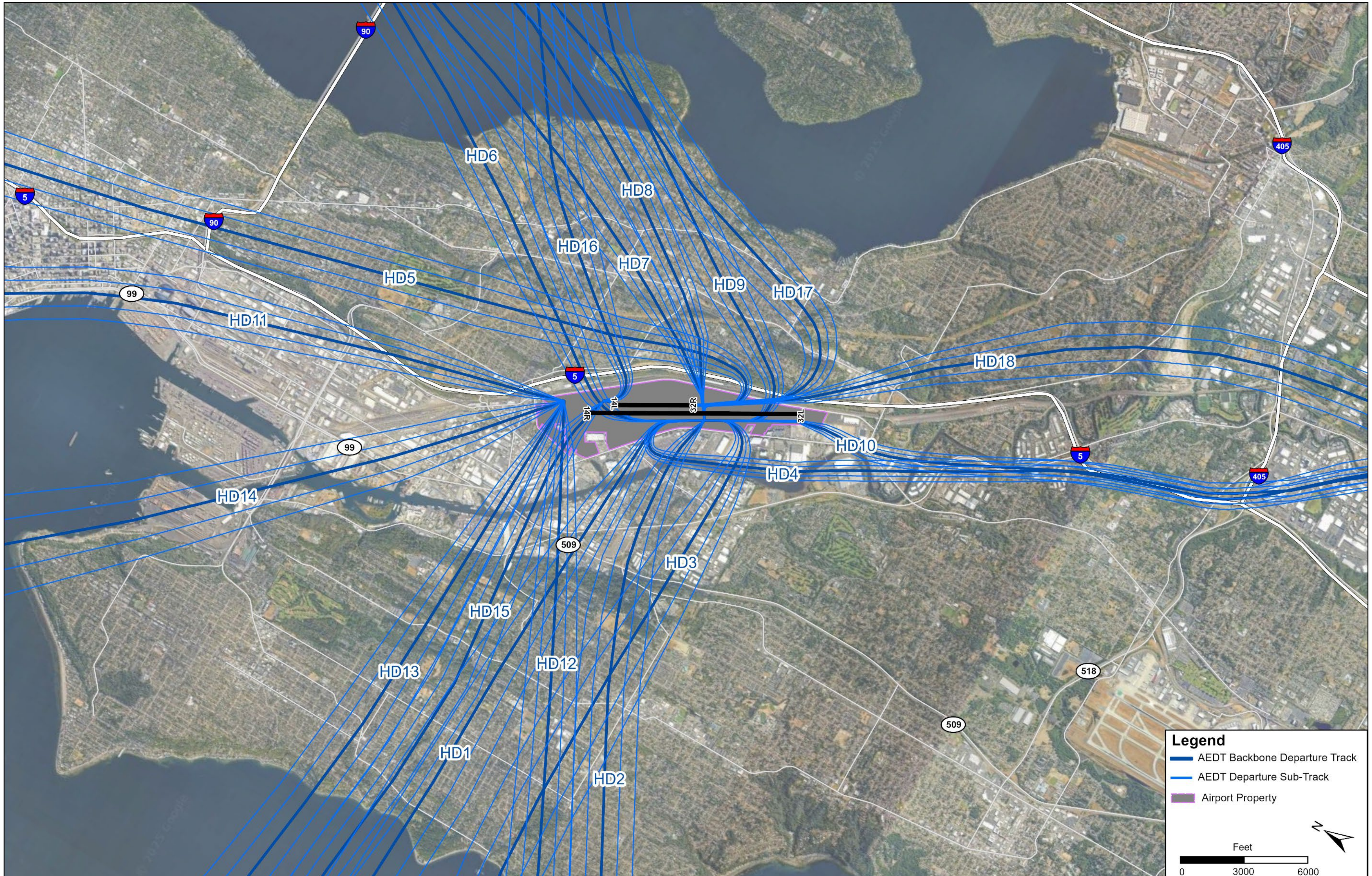
Figure 5-6
AEDT Modeled Touch and Go Aircraft Flight Tracks – Runways 14L and 14R

Source: Esri; Maxar; Earthstar Geographics; RS&H, 2024

Figure 5-7
AEDT Modeled Touch and Go Aircraft Flight Tracks – Runways 32L and 32R

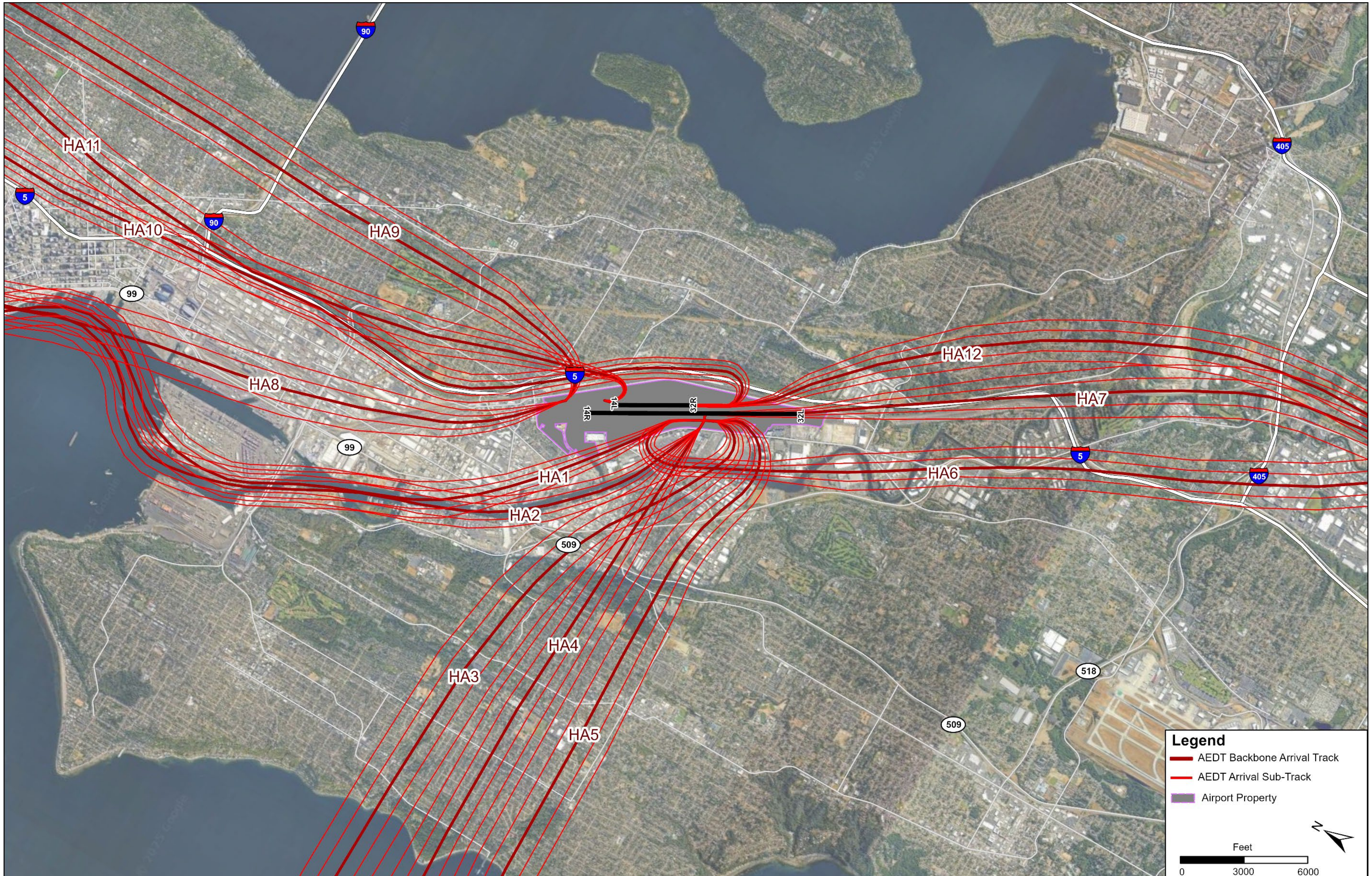
Source: Esri; Maxar; Earthstar Geographics; RS&H, 2024

Figure 5-8
AEDT Modeled Helicopter Departure Flight Tracks



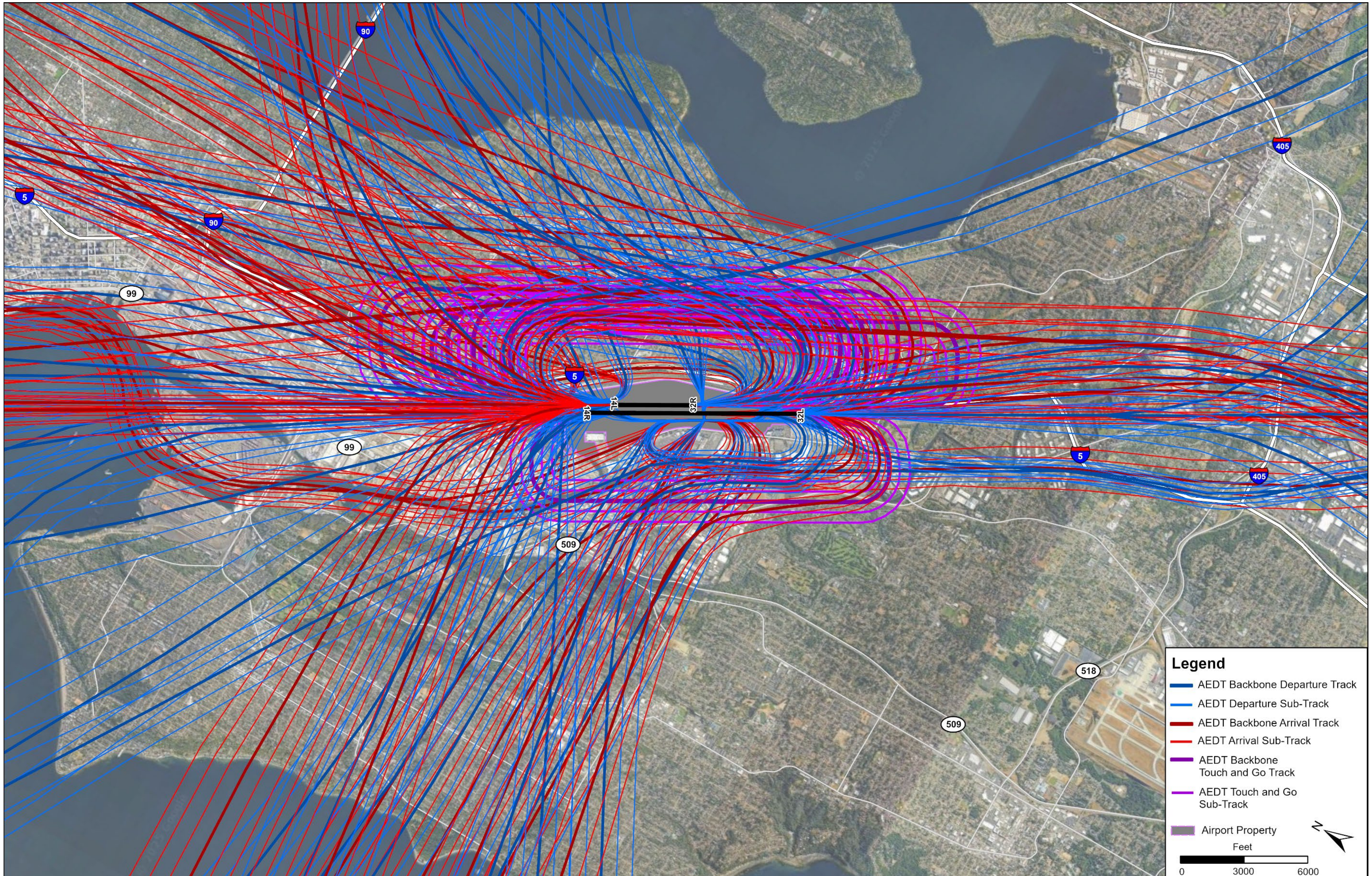
Source: Esri; Maxar; Earthstar Geographics; RS&H, 2024

Figure 5-9
AEDT Modeled Helicopter Arrival Flight Tracks



Source: Esri; Maxar; Earthstar Geographics; RS&H, 2024

Figure 5-10
All AEDT Modeled Flight Tracks



Source: Esri; Maxar; Earthstar Geographics; RS&H, 2024

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CHAPTER 6

2023 AND 2030 NOISE EXPOSURE

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6 2023 and 2030 Noise Exposure

This chapter presents the 2023 and 2030 noise contours, quantifies the land uses, population, and housing units within the contours, and identifies land use compatibility using FAA guidelines. Part 150, Appendix A Table 1 specifies the FAA guidelines regarding the compatibility of land uses within various noise contour intervals (provided previously as **Table 4-2** in Chapter 4). As the table indicates, the FAA considers that all the land uses listed in the table are compatible with aircraft noise exposure below DNL 65 dB. The DNL 65, 70, and 75 dB noise contours are the only contours required by the FAA for the agency's acceptance of the NEMs.

6.1 2023 Noise Exposure

Figure 6-1 presents the 2023 noise contours on a land use base map. The DNL 65 dB noise contour extends the farthest off the ends of Runway 14R/32L because it is the most used runway at the Airport and is the only runway that jets can use. The DNL 65 dB noise contour extends just beyond S Lucile St to the north and just short of S Boeing Access Road to the south.

Overlaying the noise contours on a parcel-level land use map identifies which land uses are within the 2023 DNL 65 dB and higher noise contours. **Table 6-1** summarizes the acreage, by land use category, located within the noise contour intervals. The total area encompassed by the 2023 DNL 65 dB noise contour is 876.2 acres.

As shown in **Table 6-1**, the 2023 DNL 65 dB and higher noise contours contain 5.0 acres of single-family residential, 0.3 acres of multi-family residential, and 0.9 acres of mixed residential and commercial all located between the DNL 65 and 70 dB. One school, the Raisbeck Aviation High School, is within the 2023 DNL 65 dB noise contour. Most of the land uses exposed to aircraft noise of DNL 65 dB and higher is airport property (533.2 acres). Other compatible land uses include 30.3 acres of commercial, 124.6 acres of industrial, 13.9 acres of open space/recreation, and 157.3 acres of transportation/utility/communications.

The number of housing units within the noise contours was determined by using parcel data, aerial photography, and field reviews. Housing units were counted if any part of the parcel was within the contour. Where a parcel was split by a contour, it was counted in the higher-level contour interval.

The population within the noise contours was determined by calculating the average number of persons per household in 2020 census blocks within the DNL 65 dB noise contour and multiplying that number by the number of housing units. **Table 6-2** presents the estimated number of housing units and population within the 2023 noise contours.

Table 6-1
Land Uses Within the 2023 Noise Contours

Land Use Category	65-70 DNL	70-75 DNL	75+ DNL	Total
	(acres)			
Single-Family Residential	5.0	-	-	5.0
Multi-Family Residential	0.3	-	-	0.3
Mixed Residential and Commercial	0.9	-	-	0.9
Airport Property	136.4	140.6	256.2	533.2
Commercial	25.8	4.5	-	30.3
Industrial	104.0	20.6	-	124.6
Institutional	1.0	-	-	1.0
Open Space / Recreation	13.9	-	-	13.9
Transportation/Utility/Communications	124.7	28.3	4.3	157.3
Vacant	9.7	-	-	9.7
Total	**421.7**	**194.0**	**260.5**	**876.2**

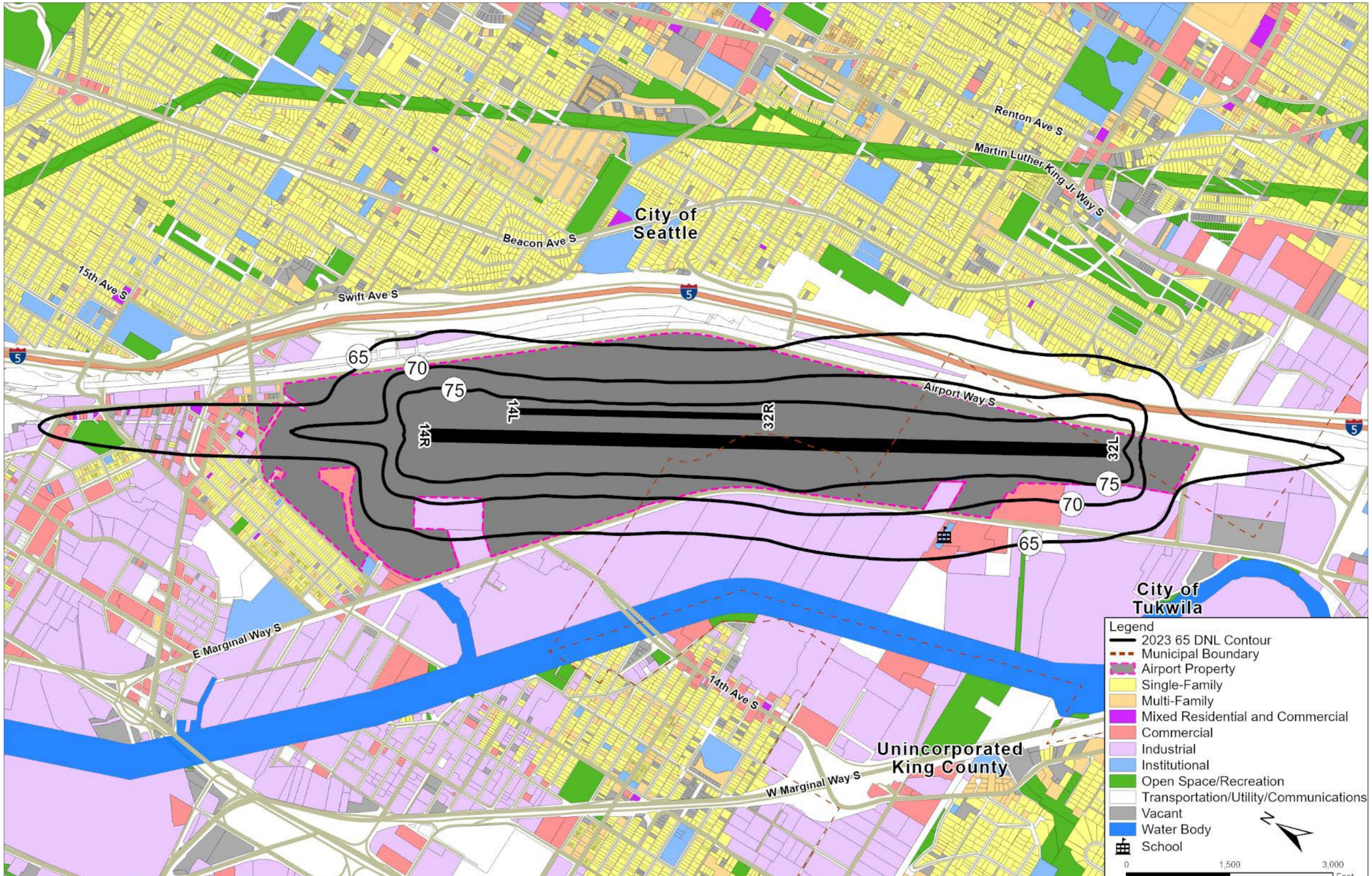
Source: RS&H, 2024

Table 6-2
Population and Housing Units Within the 2023 Noise Contours

DNL Contour Range	Single-Family Housing Units	Multi-Family Housing Units	Mixed Residential and Commercial Housing Units	Total Housing Units	Estimated Population
65-70	36*	9	22	67	144
70-75	-	-	-	-	-
75+	-	-	-	-	-
Total	**36**	**9**	**22**	**67**	**144**

Source: RS&H, 2024
* Twenty-two of the single-family housing units were sound insulated as part of KCIA's previous sound insulation program.

Figure 6-1
2023 Noise Contours



Sources: Land Use: City of Seattle ArcGIS Online; DNL Contours: RS&H, 2024

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6.2 2030 Noise Exposure

Figure 6-2 shows the 2030 noise contours. The size and shape of the 2030 noise contours are very similar to the 2023 noise contours. The 2030 contours were modeled with the expected change in the displaced arrival threshold on Runway 14L from 250 feet to 475 feet. The total area encompassed by the 2030 DNL 65 dB noise contour is 889.6 acres.

As shown in **Table 6-3**, the 2030 DNL 65 dB and higher noise contours contain 6.1 acres of single-family residential, 0.4 acres of multi-family residential, and 1.0 acre of mixed residential and commercial all located between the DNL 65 and 70 dB noise contours. One school, the Raisbeck Aviation High School, is within the 2030 DNL 65 dB noise contour. **Table 6-4** presents the estimated number of housing units and population within the 2030 noise contours.

Table 6-3
Land Uses Within the 2030 Noise Contours

Land Use Category	65-70 DNL	70-75 DNL	75+ DNL	Total
	(acres)			
Single-Family Residential	6.1	-	-	6.1
Multi-Family Residential	0.4	-	-	0.4
Mixed Residential and Commercial	1.0	-	-	1.0
Airport Property	134.8	142.3	261.1	538.2
Commercial	26.6	4.8	-	31.4
Industrial	108.4	22.7	0.2	131.3
Institutional	1.0	-	-	1.0
Open Space/Recreation	15.7	-	-	15.7
Transportation/Utility/Communications	130.3	30.0	4.7	165.0
Vacant	9.5	**-**	**-**	9.5
Total	**433.8**	**199.8**	**266.0**	**899.6**

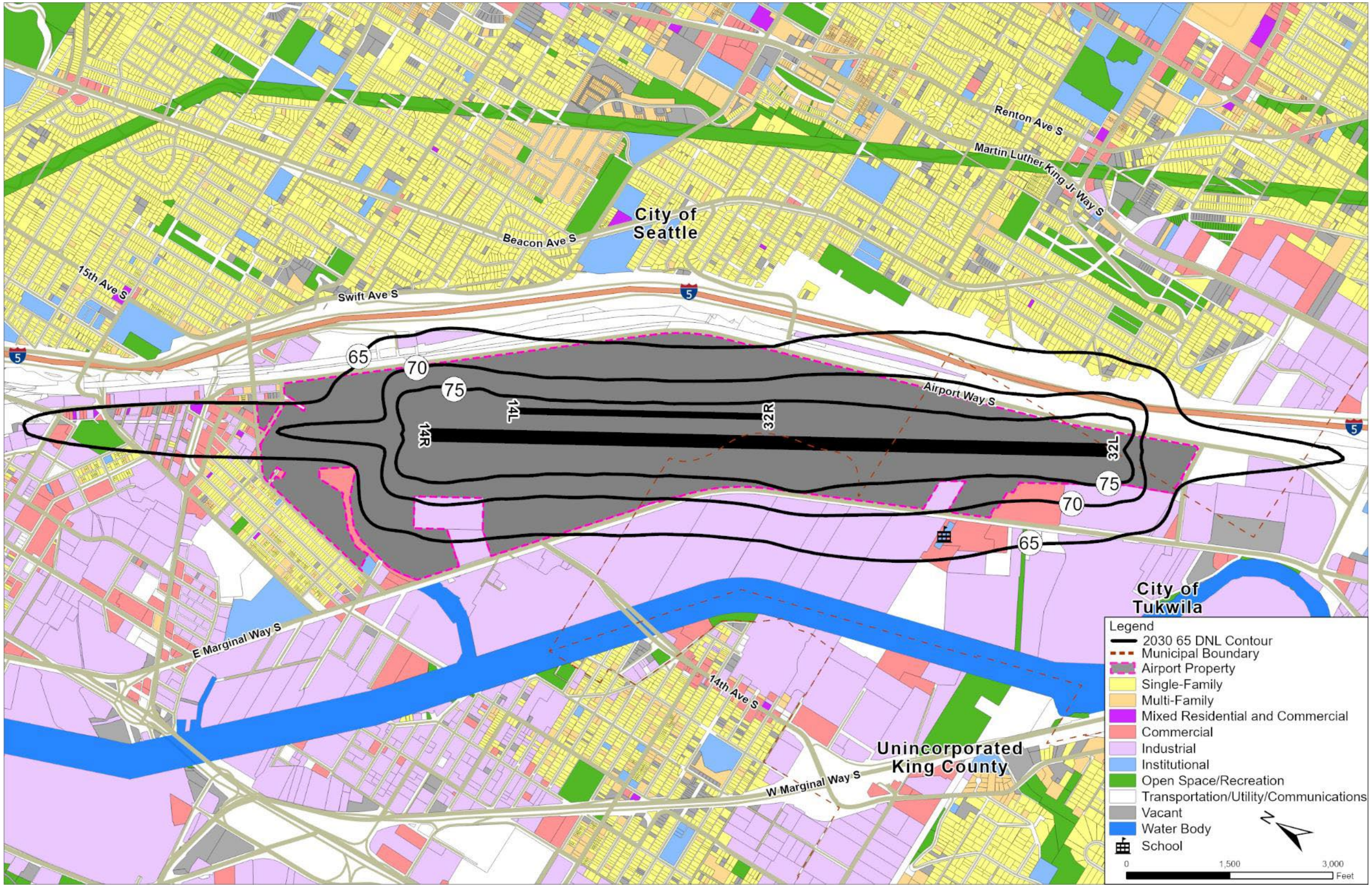
Source: RS&H, 2024

Table 6-4
Population and Housing Units Within the 2030 Noise Contours

DNL Contour Range	Sing Family Housing Units	Multi-Family Housing Units	Mixed Residential and Commercial Units	Total Housing Units	Estimated Population
65-70	42*	9	22	73	157
70-75	-	-	-	-	-
75+	-	-	-	-	-
Total	**42**	**9**	**22**	**73**	**157**

Source: RS&H, 2024
* Twenty-seven of the single-family housing units were sound insulated as part of KCIA's previous sound insulation program.

Figure 6-2
2030 Noise Contours



Sources: Land Use: City of Seattle ArcGIS Online; DNL Contours: RS&H, 2024

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6.3 Comparison of 2023 and 2030 Noise Contours

The total area within the 2030 DNL 65 dB noise contour increases by 23.4 acres when compared to the 2023 DNL 65 dB noise contour (see **Table 6-5**). This increase in size is attributed to the slight increase in aircraft operations forecast to occur in 2030. The contours maintain the same general shape from 2023 to 2030. The off-airport residential land uses (single-family, multi-family, and mixed residential and commercial) exposed to DNL 65 dB and greater increases by 1.3 acres in 2030.

With respect to housing units and population, six more housing units and 13 more people would be exposed to levels of DNL 65 dB and greater in 2030 when compared to 2023 (see **Table 6-6**). **Figures 6-3** and **6-4** depict the 2023 and 2030 noise contours north and south of KCIA.

Table 6-5

Change in Residential Land Uses From 2023 to 2030

Land Use Category	65-70 DNL	70-75 DNL	75+ DNL	Total
	(acres)			
Single-Family Residential	1.1	-	-	1.1
Multi-Family Residential	0.1	-	-	0.1
Mixed Residential and Commercial	0.1	-	-	0.1
Total	**1.3**	**0.0**	**0.0**	**1.3**

Source: RS&H, 2024

Table 6-6

Change in Population and Housing Units From 2023 to 2030

DNL Contour Range	Single - Family Housing Units	Multi-Family Housing Units	Mixed Residential and Commercial Housing Units	Total Housing Units	Estimated Population
65-70	6*	0	0	6	13
70-75	-	-	-	-	-
75+	-	-	-	-	-
Total	**6**	**0**	**0**	**6**	**13**

Source: RS&H, 2024

* Five of the single-family housing units were sound insulated as part of KCIA's previous sound insulation program.

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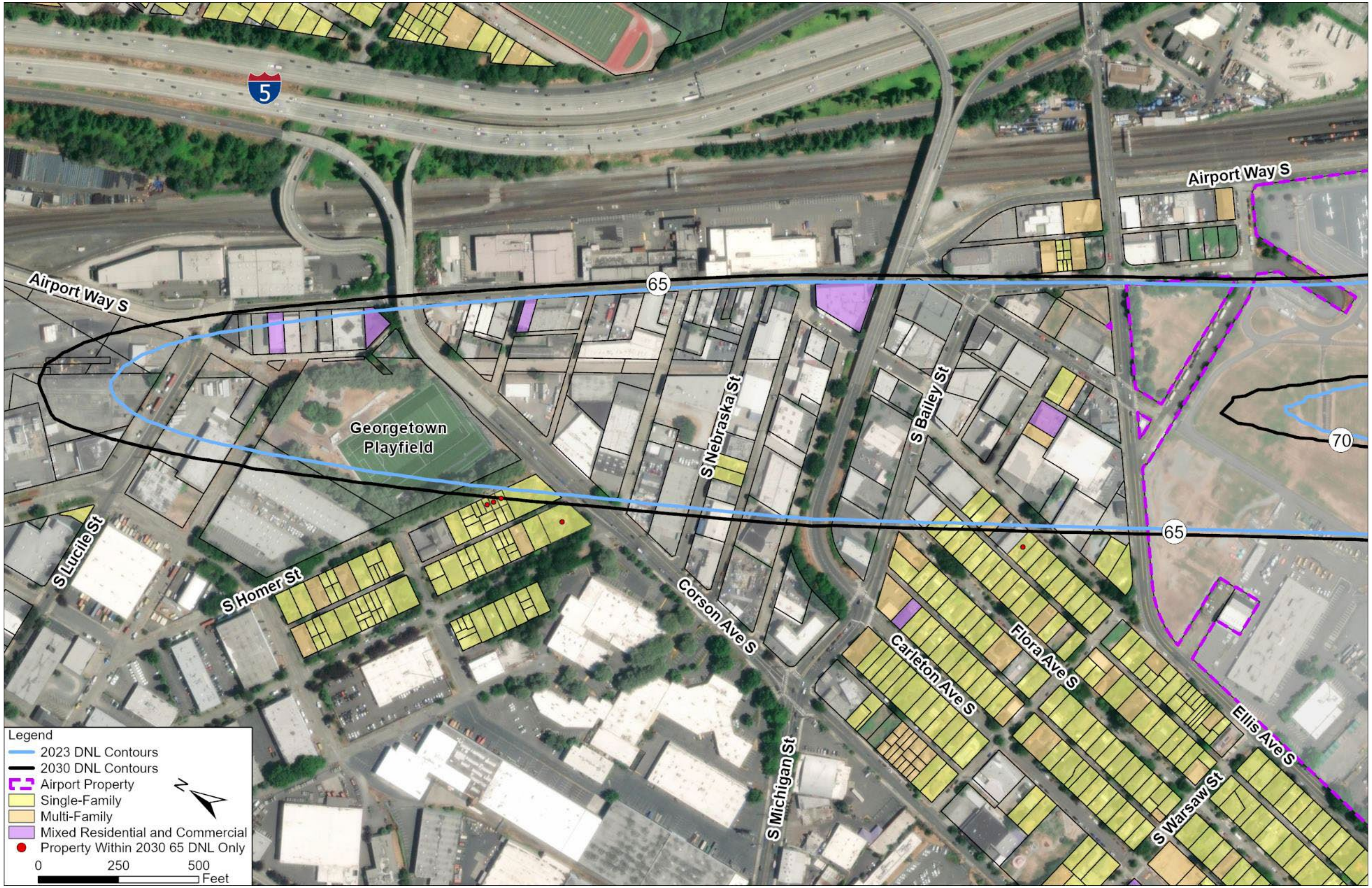
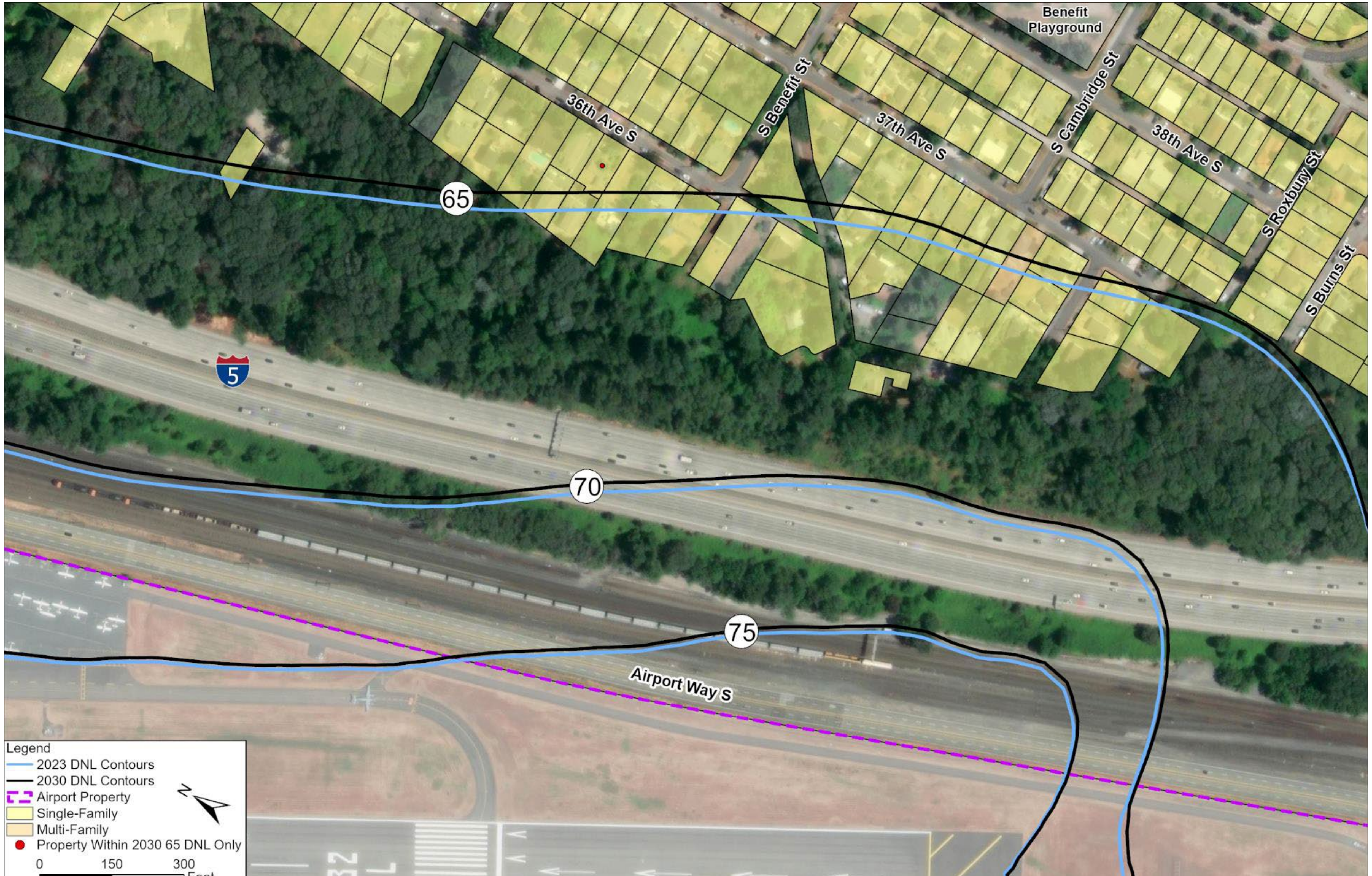
Figure 6-3
2023 and 2030 Noise Contours – North of KCIA



Sources: Land Use: City of Seattle ArcGIS Online; DNL Contours: RS&H, 2024

Figure 6-4
2023 and 2030 Noise Contours – South of KCIA



Sources: Land Use: City of Seattle ArcGIS Online; DNL Contours: RS&H, 2024

CHAPTER 7

CONSULTATION AND PUBLIC INVOLVEMENT

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7 Consultation and Public Involvement

The Part 150 Study involved proactive coordination with a wide variety of interested parties and stakeholders. The project team implemented an agency consultation and public involvement program that provided opportunities for meaningful public engagement and participation in the development of the Noise Exposure Maps (NEMs) and exceeded the requirements of the Part 150 process. The project team sought and received input from elected officials, local planning departments, citizens and community interest group representatives, the business community, airport tenants, and other users of the Airport. This chapter discusses the agency consultation and public involvement efforts undertaken for the Part 150 Study.

7.1 Project Advisory Committee

The project team organized a Project Advisory Committee (PAC) to gather input throughout the Vision 2045 Airport Plan and Part 150 Study processes. PAC members represent local jurisdictions, neighborhood councils, neighborhood business associations, special interest organizations, airport tenants, labor unions, and FAA staff. PAC meetings took place both online and in-person throughout the study. During these meetings, the project team shared status updates, progress reports, and invited input from the committee.

The list below represents the PAC entities.

- Aircraft Owners and Pilots Association
- Allentown Neighborhood
- Beacon Business Alliance
- Beacon Hill Community Council
- Boeing
- City of Tukwila
- Duwamish River Community Coalition
- Federal Aviation Administration
- Friends of Boeing Field
- Georgetown Business Association
- Georgetown Community Council
- International Association of Machinists and Aerospace Workers (IAM) District 751
- Kenmore Air Express
- King County Immigrant and Refugee Commission
- King County International Airport Community Coalition
- Modern Aviation
- Office of Representative Adam Smith
- Pacific Northwest Business Aviation Association

- Rainier Beach Action Coalition
- Signature Aviation
- Sky Service
- Society of Professional Engineering Employees in Aerospace
- South Park Neighborhood Association
- United Parcel Service, Inc.(UPS)

Below are summaries of the PAC meetings, specific to topics covered for the Part 150 Study, including dates and topics discussed. **Appendix D** includes all PAC meeting materials including list of attendees, presentations, and detailed meeting notes.

PAC Meeting #1 (May 22, 2024) – The first PAC meeting introduced both the Vision 2045 Airport Plan and the Part 150 Study and collaborated with PAC members to establish roles in the draft PAC charter.

PAC Meeting #2 (July 25, 2024) – The second PAC meeting discussed the Part 150 Study process, the upcoming deliverables, and how to participate.

PAC Meeting #3 (October 24, 2024) – The third meeting, held virtually on Zoom meeting, provided details on the approved Vision 2045 Airport Plan Aviation Demand Forecast and how the forecast will guide work on the Vision 2045 Airport Plan and Part 150 Study.

PAC Meeting #4 (December 3, 2024) - The fourth PAC meeting presented the AEDT noise model inputs and discussed the preliminary draft 2023 and 2030 noise contours.

PAC Meeting #5 (February 26, 2025) - The fifth PAC meeting primarily focused on the Vision 2045 Airport Plan. In terms of the Part 150 Study, the meeting informed the PAC members about the upcoming March 20, 2025 public open house where the draft NEMs, including the data used to develop them, would be presented. PAC members were encouraged to share this information with their communities.

7.2 Open Houses

7.2.1 Open House Format and Objectives

The project team designed the open houses to be interactive and inclusive, encouraging active participation from the attendees. They were open to all interested members of the community, including residents, community organizations, local officials, and other stakeholders. The format was an open-house style with a series of display boards and allowed the attendees to ask questions of the project team. The project team conducted the open houses in a manner that facilitated constructive dialogue and ensured that diverse viewpoints were heard and considered.

7.2.2 Open House #1

The project team held the first public open house on June 20, 2024, from 6:00 p.m. to 7:30 p.m. at the Flight Service Station (6526 Ellis Avenue S). The purpose was to have the attendees learn more about the Vision 2045 Airport Plan and the Part 150 Study, share input on the Vision 2045 draft goals and objectives, and to ask questions and share comments with the project team.

The project team promoted the open house through email and social media posts to reach community members, airport tenants, and interested parties. The team emailed invitations to the KCIA listserv (54 recipients), Everbridge Users (658 recipients), PAC members (24 members), and the Vision 2045 Airport Plan and Part 150 Study interested parties list (30 community organizations and local business recipients). **Appendix E** includes a list of organizations and businesses contacted. KCIA posted on its social media channels (Instagram and NextDoor) on June 10 and June 18, 2024. The Georgetown Community Council reshared a notification through the Georgetown Gazette Blog on June 18, 2024. See posts in **Appendix E**.

The project team gave a 20-minute presentation to share information about the Vision 2045 Airport Plan and Part 150 Study, explained what each study includes, how the two interact, and how community members, KCIA tenants, and interested parties can participate in the process for each project.

The open house consisted of display boards that featured information about each project and its process. The display boards showed draft goals for Vision 2045 Airport Plan, and attendees provided feedback depositing their written comments or suggested objectives in a collection box. The display boards also contained information on how to submit public comments electronically through email or the project website. Language interpreters were available in the room to translate information in Spanish and Vietnamese. The project website is available in Khmer, Simplified Chinese, Spanish, Tagalog, Traditional Chinese, and Vietnamese.
Fifteen community members attended the open house.

Appendix E contains copies of the advertisements, social media posts, sign-in sheets, presentation boards, handout, and detailed meeting notes.

7.2.3 Open House #2

The project team held the second open house on September 4, 2024, from 6:00 p.m. to 7:30 p.m. at the Flight Service Station (6526 Ellis Avenue S). The purpose of the open house was to build awareness of the Part 150 Study process and the Vision 2045 Airport Plan, involve partners and the community in the long-term planning and support for KCIA, and to share information and answer questions about the Part 150 Study.

The project team promoted the open house through email, website updates, paid digital media, social media posts, a news release, and a postcard mailed to households and businesses around KCIA. The team mailed a postcard to more than 4,300 homes and businesses within a half-mile radius of KCIA. The team placed digital advertisements on Spanish-speaking and English-speaking news platforms. The ad campaign received over 880,000 impressions (how often a person sees the advertisement). The project team emailed an open house invitation using the KCIA subscriber list, PAC members, and community-based organizations. KCIA posted ads on Instagram and Facebook in English and Spanish with over 1 million impressions (the number of times a user's screen displays an advertisement).

The open house consisted of display boards around the room with information about each step of the Part 150 Study process. Members of the project team engaged with attendees as they walked around the room to view project boards. Participants could talk with project team members to ask questions, share feedback, and submit handwritten comments at the open house or submit comments electronically through email or on the project website (KCIAplanning.com). Language interpreters were available in the room to translate information in Cantonese, Khmer, Mandarin, Spanish, Tagalog, and Vietnamese. Thirty-six community members attended the open house.

Appendix E contains copies of the advertisements, social media posts, sign-in sheets, presentation boards, handouts, and detailed meeting notes.

7.2.4 Open House #3

The project team held the third open house on March 20, 2025, from 5:30 p.m. to 7:30 p.m. at the Flight Service Station (6526 Ellis Avenue S). The purpose of the open house was to solicit public comments on the draft NEMs, including the data used to develop them, and introduce the Noise Compatibility Program (NCP).

The NEMs are used to show the current and projected aircraft noise levels in and around KCIA. They also show how the land is used near KCIA and if it is compatible with the projected level of noise exposure from aircraft operations. The NCP will identify measurable actions to reduce aircraft noise and promote compatible land uses near KCIA.

Project information was presented on display boards at the open house. Members of the project team were available for consultation with attendees as they reviewed the materials. Participants had the opportunity to pose questions, provide feedback verbally or in written form at the open house, or submit comments through email or the project website (KCIAplanning.com). Language interpreters were available in the room to translate information in Cantonese, Khmer, Mandarin, Spanish, Tagalog, and Vietnamese. Around 50 community members and airport tenants attended the open house.

Appendix E contains copies of the advertisements, social media posts, sign-in sheets, presentation boards, handouts, and detailed meeting notes.

7.3 Website

The project team created a website for the Vision 2045 Airport Plan and Part 150 Study (KCIAplanning.com) providing agencies, stakeholders, and the public with access to relevant information and documents including:

- Project schedule;
- Project meetings materials and upcoming meeting dates;
- Project documents, including the PAC meeting materials, open house materials, and project eNewsletters
- Frequently asked questions;
- Study goals and terminology;
- Opportunity to submit comments;
- Link to the Seattle-Tacoma International Airport's Part 150 Study website; and
- A sign-up to receive Vision 2045 Airport Plan, Part 150 Study, and other updates on KCIA activities.

The project website is available in Khmer, Simplified Chinese, Spanish, Tagalog, Traditional Chinese, and Vietnamese.

7.4 Newsletters

Another component of the public outreach program included periodic newsletters published in electronic form (eNewsletters) that kept the public and interested parties informed about the Vision 2045 Airport Plan and Part 150 Study. The project team posted the newsletters on the project website. The July 2024 eNewsletter contained an overview of the Part 150 Study process, upcoming meetings, and how to provide feedback. The October 2024 eNewsletter provided project updates, upcoming meetings, and public comments received to date on the Part 150 Study. The January 2025 eNewsletter included project updates and announced the upcoming public open house on March 20, 2025, where the draft NEMs, including the data used to develop them, would be presented and the NCP would be introduced.

The project team made the eNewsletters available in Khmer, Simplified Chinese, Spanish, Tagalog, Traditional Chinese, and Vietnamese. **Appendix F** includes copies of the newsletters.

7.5 Public Comments

The public submitted comments to the project team via e-mails, comment forms provided at the open houses, and through the website. **Appendix G** contains all public comments the project team has received on the Part 150 Study and responses to those comments.