

Noise Exposure Map Report

14 CFR Part 150 Study

Prepared By:
Environmental Science Associates



Sponsor's Certification

The Port of Seattle has completed a comprehensive Title 14 Code of Federal Regulations (CFR) Part 150 Noise Exposure Map Report for Seattle-Tacoma International Airport, prepared with the best available information and are certified as true and complete to the best of my knowledge. This is to certify:

- (1) The 2022 and 2032 Noise Exposure Maps for Seattle-Tacoma International Airport, and the associated documentation the Port of Seattle submitted in this volume to the Federal Aviation Administration under Title 14 CFR Part 150, Subpart B, Section 150.21, are true and complete as of June 8, 2026, under penalty of 18 U.S.C. 1001.
- (2) Pursuant to Title 14 CFR Part 150, Subpart B, Section 150.21(b), all interested parties have been afforded adequate opportunity to submit their views, data, and comments concerning the correctness and adequacy of the draft noise exposure maps, and of the descriptions of forecast aircraft operations.
- (3) The "2022 Existing Conditions Noise Exposure Map" (Appendix H, 2022 Map 1 of 4) accurately represent conditions for calendar year 2022. However, there has been no change in operation at the Airport that would create any substantial new noncompatible uses or significantly reduce noise over noncompatible uses, as of June 8, 2026.
- (4) The "2032 Future Conditions Noise Exposure Map" (Appendix H, 2032 Map 2 of 4) accurately represents FAA-approved forecast conditions for calendar year 2032.

Though submittal of the document is occurring in June 2026, the operations at Seattle-Tacoma International Airport are hereby certified to currently be consistent with the fleet mix, forecast operational levels, and flight procedures used for the 2022 contained within this report, as of June 8, 2026. Further information regarding development of the fleet mix, forecast, and procedures can be found in Chapter 4, which details the NEM development, and Appendix B, *Aircraft Activity Forecast*. The NEMs were prepared in consultation with the public and planning agencies whose area of jurisdiction is within the DNL 65+ contour depicted on the NEMs. The consultation also included Federal officials having local responsibility and regular aeronautical users of the airport. It is further certified that adequate opportunity has been afforded interested persons to submit their views, data, and comments concerning the correctness and adequacy of the NEMs and the supporting documentation and forecasts.

By: Sarah Culp
Title: Director, Aviation Environment and Sustainability
Date: 6/26/26

Airport Name: Seattle-Tacoma International Airport
Airport Owner/Operator: Port of Seattle
Address: 17801 International Blvd., SeaTac, WA, 98158

FAA Checklist

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		Front cover states "Noise Exposure Map Report 14 CFR Part 150 Study".
2. NEM and NCP together?		X	Submittal is for NEM only.
3. Revision to NEMs FAA previously determined to be in compliance with Part 150?	X		See Page 1-1. This NEM is an update to the NEM previously approved for the 2014 Part 150 Study.
B. Airport and Airport Operator's name are identified?	X		Airport and Airport Operator's name are identified on the Front Cover and Page 1-1.
C. NCP is transmitted by airport operator's dated cover letter, describing it as a Part 150 submittal and requesting appropriate FAA determination?		X	Submission is NEM 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		See Section 1.5, Chapter 6, and Appendices E, F, and G for a narrative description of the consultation accomplished, including opportunities for public review and comment during map development.
B. Identification of consulted parties:			
1. Are the consulted parties identified?	X		See Chapter 6 and Appendices E and G for identification of consulted parties.
2. Do they include all those required by 150.21(b) and A150.105(a)?	X		See Chapter 6 and Appendices E and G for identification of all consulted parties required by 150.21(b) and A150.105(a).
3. Agencies in 2., above, correspond to those indicated on the NEM?	X		See Chapter 6 and Appendices E and G for identification of all consulted parties required by 150.21(b) and A150.105(a).
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		See Sponsor's Certification before Table of Contents. Sponsor's Certification indicates 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). Supporting evidence is contained in Chapter 6 and Appendices E, F, 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		See Chapter 6 and Appendix G. Written comments received during consultation are included in Appendix G and are on file with the FAA regional airports division manager.
III. General Requirements: [150.21]			
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		There are two maps, each clearly labeled on the face with year. See Figure 5-1 for existing condition year 2022 NEM and Figure 5-3 for future year 2032 NEM. Full size plots of the 2022 and 2032 NEMs are provided in Appendix H (Figure H-1 and Figure H-2).
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	Though submittal of the final document is in June 2026, the operations at Seattle-Tacoma International Airport are hereby certified to currently be consistent with the fleet

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
			mix, forecast operational levels, and flight procedures depicted for 2022. Further information regarding development of the fleet mix, forecast, and procedures can be found in Chapter 4 and Appendix B.
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		The forecast year 2032 map is based on reasonable forecasts and other planning assumptions and represents at least the fifth calendar year after the year of submission (2026). See Section 4.3.1 and Appendix B-1 for information regarding the forecast and the FAA's approval for use in developing the NEMs.
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		See Sponsor's Certification before Table of Contents. Sponsor's Certification indicates that existing year of 2022 is consistent with current fleet mix, operational levels, and flight procedures.
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?		X	Not applicable. This is an 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?		X	Not applicable. This is an NEM submission only.
b. Does the documentation specifically describe how these measures affect land use compatibilities depicted on the map?		X	Not applicable. This is an 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))		X	Not applicable. This is an NEM submission only.
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? <i>(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.)</i> <i>(Note (2) supplemental graphics that are not required by the regulation do not need to be at the 1" to 2,000' scale)</i>	X		Full size plots of the 2022 and 2032 NEMs and flight track figures are at a scale of 1 inch = 2,000 feet and are of sufficient scale to be clear and readable. The scale is indicated on the maps. The full size plots are provided in 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		The quality of the graphics is such that required information is clear and readable. Refer to NEM Checklist IV.C. through IV.G., below. Also see full sized NEMs included in this submittal in 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?	x		Full size plots of the 2021 and 2026 NEMs and flight track figures, included in Appendix H, are at a scale of 1 inch = 2,000 feet.

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
a. Airport boundaries	X		Airport boundaries are graphically depicted to scale on both the existing condition and forecast year maps. See the 2022 and 2032 NEMs in Appendix H.
b. Runway configurations with runway end numbers	X		Runway configurations with runway end numbers are depicted to scale on both the existing condition and forecast year maps. See the 2022 and 2032 NEMs in 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		The depiction of the off-airport data includes a land use base map depicting streets and other identifiable geographic features. See the 2022 and 2032 NEMs in Appendix H.
b. The area within the DNL 65 dB (or beyond, at local discretion)	X		The depiction of the off-airport data includes the area within the DNL 65 dB. See the 2022 and 2032 NEMs in 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		The depiction of the off-airport data includes a clear delineation of geographic boundaries. The NEMs include the names of the following jurisdictions that have planning and land use control authority over land within the 2022 and 2032 DNL 65 contours: King County and the Cities of Burien, Des Moines, and SeaTac. See the 2022 and 2032 NEMs in Appendix H.
D. Noise Contours			
1. Continuous contours for at least the DNL 65, 70, and 75 dB?	X		Continuous contours for the DNL 65, 70, and 75 are shown on the 2022 and 2032 NEMs provided in Appendix H.
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	The DNL 65, 70, and 75 contours are shown on the NEMs. King County and the Cities of Burien, Des Moines, and SeaTac are the sole land use agencies for the land within the 2022 and 2032 DNL 65 contours and have not adopted lower local standards.
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		The Existing NEM is based on airport and operational data for the 2022 and has been certified to be consistent with current (2026) operational conditions. The 2032 NEM is based on forecast data representative of the selected year for the forecast NEM (2032). See Section 4.3, Section 5.2, Section 5.3, and Appendix B-1.
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		Flight tracks for the existing conditions and future conditions timeframes are shown in full-size flight track plots in Appendix H. Also see Figures 4-2 through 4-7, which follows page 4-8. Flight tracks for the existing conditions and future conditions timeframes are the same, as described in Section 4.5. Flight track utilization is provided in Appendix B-2.
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)	X		Locations of noise monitoring sites are shown on all figures provided in Appendix H. Also see Figure 2-3.
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		Noncompatible land uses within the DNL 65 contour are depicted on the map graphics. See full-sized plots in Appendix H. Also see supplemental Figures 5-2, 5-4, and 5-5.

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
2. Are noise sensitive public buildings and historic properties identified? (<i>Note: If none are within the depicted NEM noise contours, this should be stated in the accompanying narrative text.</i>)	X		Noise sensitive public buildings and historic properties are identified on the NEMs in Appendix H (Figures H-1 and H-2). Also see supplemental Figures 3-2 through 3-7.
3. Are the noncompatible uses and noise sensitive public buildings readily identifiable and explained on the map legend?	X		Noncompatible uses and noise sensitive public buildings are readily identifiable on the NEMs and explained on the map legend. See full sized plots in Appendix H. Also see supplemental Figures 5-1 through 5-5.
4. Are compatible land uses, which would normally be considered noncompatible, explained in the accompanying narrative?	X		Compatible land uses that would normally be considered noncompatible are explained in Sections 5.2.2 and 5.3.2 as well as Tables 5-3 and 5-6.
V. Narrative Support of Map Data: [150.21(a), A150.1, A150.101, A150.103]			
A. Technical Data			
1. Are the technical data and data sources on which the NEMs are based adequately described in the narrative?	X		Technical data and data sources on which the NEMs are based are adequately described in the narrative. See Sections 4.3 through 4.5 and Appendix B.
2. Are the underlying technical data and planning assumptions reasonable?	X		The underlying technical data and planning assumptions are reasonable. See Sections 3 and 4.3 through 4.5 and Appendix B.
B. Calculation of Noise Contours:			
1. Is the methodology indicated?	X		The methodology is indicated. See Section 4.2.
a. Is it FAA approved?	X		The methodology is FAA-approved. AEDT 3f was used.
b. Was the same model used for both maps? (<i>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.</i>)	X		The same model was used for both maps. AEDT 3f was used for both the Existing Conditions NEM (2022) and the Future Conditions NEM (2032).
c. Has AEE approval been obtained for use of a model other than those that have previous blanket FAA approval?		X	Not applicable.
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		AEDT 3f was used for this NEM Report, and no aircraft substitutions were made. User-defined flight profiles were used for missed approach operations in the existing (2022) and future (2032) conditions. See Appendix B-2.
b. If so, does this have written approval from AEE, and is that written approval included in the submitted document?	X		Written approval from AEE is included in the submitted document. See Appendix B-2.
3. If noise monitoring was used, does the narrative indicate that Part 150 guidelines were followed?	X		Noise monitoring was conducted as part of this NEM report. See Section 2.3 and Appendix C.
4. For noise contours below DNL 65 dB, does the supporting documentation include an explanation of local reasons? (<i>Note: A narrative explanation,</i>		X	DNL 65, 70, and 75 contours are shown on the NEMs. No contours below DNL 65 were produced.

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
<i>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.)</i>			
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		The narrative gives estimates of the number of people residing in each of the DNL 65, 70, and 75 contours for both the existing condition and forecast year maps. See Tables 5-2 and 5-5.
2. Does the documentation indicate whether the airport operator used Table 1 of Part 150?	X		The documentation indicates the airport operator used Table 1 of Part 150. See Sections 3.3.1, 5.2, and 5.3; Table 3-1. However, the "Residential" land use category from Table 1 of Part 150 was divided into subcategories including Single-Family Residential, Multi-Family Residential, and Mixed-Use.
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?		X	Not applicable.
(2) Does the narrative include the airport operator's complete substitution for table 1?		X	Not applicable.
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?	X		Section 3.3.2 includes information on self-generated and ambient noise and implications for how non-airport and non-aircraft noise sources affect compatible or noncompatible land use identifications.
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	No such land uses are depicted on the official NEMs. Compatible parcels are shown on Figures 5-2 and 5-4, and described in Sections 5.2.2 and 5.3.2, respectively.
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		The narrative describes how forecast aircraft operations, forecast airport layout changes, and forecast land use changes will affect land use compatibility in the future. See Section 5.3 and Table 5-4.
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		The operator has 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. See Sponsor's Certification before Table of Contents.
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		The operator has certified in writing that each map and description of consultation and opportunity for public comment is true and complete under penalty of 18 U.S.C. § 1001. See Sponsor's Certification before Table of Contents.

SOURCE: Federal Aviation Administration Office of Airport Planning and Programming, Washington, DC, March 1989; revised June 2005; reviewed for currency 12/2007.



Contents

	<u>Page</u>
Chapter 1. Introduction	1-1
1.1 Introduction	1-1
1.2 Need for Updated NEMs	1-2
1.3 14 CFR Part 150 Process	1-2
1.4 Preparation of Noise Exposure Maps	1-4
1.4.1 NEM Study Years	1-4
1.4.2 Technical Approach to Preparing Noise Exposure Maps	1-4
1.5 Consultation and Public Involvement	1-6
1.6 NEM Report Organization	1-7
Chapter 2. Airport Overview	2-1
2.1 Airport Location and Setting	2-1
2.1.1 Airport History	2-1
2.2 Airport Overview	2-3
2.2.1 Aviation Role	2-3
2.2.2 Airport Facilities Overview	2-3
2.2.3 Future/Planned Airport Facilities	2-7
2.2.4 Regional Economic Impact	2-8
2.3 Noise-Related Initiatives	2-8
2.3.1 Sound Insulation Program (SIP)	2-8
2.3.2 SEA Stakeholder Advisory Round Table (StART)	2-9
2.3.3 Noise and Operations Monitoring System (NOMS)	2-9

	<u>Page</u>
2.3.4 Aircraft Noise Comments	2-12
2.3.5 Voluntary Noise Abatement Measures	2-14
Chapter 3. Land Use	3-1
3.1 Introduction	3-1
3.2 Land Use Data Collection	3-2
3.2.1 Land Use Data Collection Area	3-2
3.2.2 Local Agency and Government Coordination	3-2
3.3 Land Use compatibility.....	3-3
3.3.1 Aircraft Noise and Land Use Compatibility	3-3
3.3.2 Local Ambient Noise Environment.....	3-5
3.3.3 Land Uses within the Study Area	3-6
3.3.4 Noise-Sensitive Sites	3-8
3.4 Land Use Control Regulations.....	3-15
Chapter 4. NEM Development	4-1
4.1 Introduction	4-1
4.2 FAA Noise Model and Metrics	4-1
4.2.1 Aviation Environmental Design Tool.....	4-1
4.2.2 Day Night Average Sound Level	4-2
4.3 Operational Data.....	4-2
4.3.1 Forecast Annual Aircraft Operations	4-2
4.3.2 Aircraft Fleet Mix.....	4-3
4.3.3 Aircraft Operations by Time of Day	4-3
4.3.4 Departure Stage Length	4-4
4.4 Meteorological Conditions.....	4-6
4.5 Airport Operational Information.....	4-7
4.5.1 Runway Use.....	4-7
4.5.2 Flight Tracks and Utilization	4-7
4.5.3 Aircraft Flight Profiles.....	4-8
4.5.4 Aircraft Run-Ups.....	4-8
Chapter 5. 2022 and 2032 Noise Exposure.....	5-1
5.1 Introduction	5-1
5.2 2022 Noise Exposure.....	5-2
5.2.1 Land Use Compatibility – 2022	5-2
5.2.2 Population and Noise-Sensitive Sites within 2022 DNL Contours	5-4
5.3 2032 Noise Exposure.....	5-8
5.3.1 Land Use Compatibility – 2032	5-8
5.3.2 Population and Noise-Sensitive Sites within 2032 DNL Contours	5-8
5.4 Comparison of 2022 and 2032 NEMs	5-13
Chapter 6. Consultation and Public Involvement	6-1
6.1 Introduction	6-1
6.2 Technical Review Committee.....	6-2

	<u>Page</u>
6.3 Public Engagement.....	6-4
6.3.1 Study Kick-Off Public Workshops.....	6-4
6.3.2 Draft NEM Public Workshops.....	6-5
6.3.3 Public Comments	6-6
6.4 Other Public Outreach and Meetings	6-6
6.4.1 SEA Stakeholder Advisory Roundtable.....	6-6
6.4.2 Other Public Outreach	6-6
6.4.3 Elected Officials.....	6-7
6.4.4 SEA Part 150 Study Website.....	6-8

Appendices

- A. Glossary and Acronyms
- B. Aircraft and Activity Forecast
- C. Aircraft Noise
- D. Land Use
- E. Consultation and Correspondence
- F. Public Outreach
- G. Comments and Responses
- H. Official Noise Exposure Maps

Figures

Figure 1-1. NEM Update Process.....	1-3
Figure 2-1. Airport Location Map	2-2
Figure 2-2. Airport Diagram.....	2-6
Figure 2-3. Noise Monitor Locations	2-11
Figure 2-4. August 2024 to July 2025 Noise Comments.....	2-13
Figure 3-1. Generalized Existing Land Uses	3-7
Figure 3-2. Generalized Noise-Sensitive Uses – Libraries.....	3-9
Figure 3-3. Generalized Noise-Sensitive Uses – Historic Resources.....	3-10
Figure 3-4. Generalized Noise-Sensitive Uses – Long-Term Residential Care/Nursing Homes.....	3-11
Figure 3-5. Generalized Noise-Sensitive Uses – Hospitals and Medical Centers	3-12
Figure 3-6. Generalized Noise-Sensitive Uses – Places of Worship.....	3-13
Figure 3-7. Generalized Noise-Sensitive Uses – Schools, Universities, and Educational Facilities.....	3-14
Figure 4-1. Stage Length Comparison for Boeing 737-800.....	4-5
Figure 4-2. Jet Model Flight Tracks – North Flow	4-9
Figure 4-3. Jet Model Flight Tracks – South Flow	4-10
Figure 4-4. Turboprop and Propeller Model Flight Tracks – North Flow	4-11
Figure 4-5. Turboprop and Propeller Model Flight Tracks – South Flow.....	4-12
Figure 4-6. Runway 34L Missed Approach Flight Tracks – North Flow	4-13
Figure 4-7. Runway 16R Missed Approach Flight Tracks – South Flow	4-14

	<u>Page</u>
Figure 4-8. 2022 Aircraft Run-Up Locations	4-15
Figure 4-9. 2032 Aircraft Run-Up Locations	4-16
Figure 5-1. 2022 DNL Contours and Existing Land Uses	5-3
Figure 5-2. 2022 Contours and Residential Compatibility Status	5-7
Figure 5-3. 2032 DNL Contours and Existing Land Uses	5-9
Figure 5-4. 2032 DNL Contours and Residential Compatibility Status	5-12
Figure 5-5. 2022 and 2032 DNL Contours with Existing Land Uses	5-15

Tables

Table 2-1. SEA Runway Characteristics	2-5
Table 2-2. Permanent Noise Monitoring Locations	2-10
Table 2-3. Aircraft Noise Comments (2019–2025)	2-12
Table 3-1. Part 150 Land Use Compatibility Guidelines in Aircraft Noise Exposure Areas	3-4
Table 3-2. Consolidated Land Use Categories within the Study Area	3-6
Table 4-1. Annual Aircraft Operations by Operational Category	4-3
Table 4-2. Annual Aircraft Operations by Time of Day (All Aircraft)	4-4
Table 4-3. AEDT Departure Stage Length Categories	4-5
Table 4-4. Departure Stage Length Distribution (All Aircraft)	4-6
Table 4-5. AEDT Meteorological Data	4-6
Table 4-6. Arrival and Departure Runway Utilization (All Aircraft)	4-7
Table 4-7. Annual Run-Up Activity (All Aircraft)	4-8
Table 5-1. Land Use Exposed to DNL 65 and Above – 2022	5-4
Table 5-2. Noise-Sensitive Sites Exposed to DNL 65 and Above – 2022	5-5
Table 5-3. Noncompatible Housing Units and Population – 2022	5-6
Table 5-4. Land Use Exposed to DNL 65 and Above – 2032	5-10
Table 5-5. Noise-Sensitive Sites Exposed to DNL 65 and Above – 2032	5-10
Table 5-6. Noncompatible Housing Units and Population – 2032	5-11
Table 5-7. Change in Land Use Exposed to DNL 65+	5-13
Table 5-8. Change in Noise-Sensitive Sites Exposed to DNL 65 and Above – 2022 to 2032	5-14
Table 6-1. Technical Review Committee Members	6-2
Table 6-2. Kick-Off Public Workshop Locations	6-4
Table 6-3. Draft NEM Public Workshop Locations	6-5
Table 6-4. Additional Public Outreach Activities	6-7



Chapter 1. Introduction

1.1 INTRODUCTION

The Port of Seattle (the Port) has undertaken a Part 150 Study update for the Seattle-Tacoma International Airport (SEA or the Airport) based on Title 14 Code of Federal Regulations (CFR) Part 150, *Airport Noise Compatibility Planning*, to evaluate the compatibility of the Airport with the surrounding communities. Conducting a Part 150 Study is a voluntary action by the Port.¹ However, once a Part 150 Study is undertaken, an airport sponsor² is obligated to prepare an update to the Noise Exposure Maps (NEMs) whenever there is a significant change to the noise environment. The first Part 150 Study for SEA was prepared in 1985, with subsequent updates in 1992, 2002, and 2014. This current study includes updating SEA's NEMs.

The three primary objectives of the SEA Part 150 Study are listed below. This report implements Objective 1 and includes the NEMs. The Noise Compatibility Program (NCP), which will be prepared

¹ The regulations contained in 14 CFR Part 150 are voluntary and airport operators are not required to participate. However, accepted NEMs and an approved NCP are necessary for federal financial funding of 14 CFR Part 150-related measures.

² The Federal Aviation Administration (FAA) refers to those entities receiving Airport Improvement Program (AIP) grants as "sponsors."

following the adoption of the NEM, addresses Objectives 2 and 3 and will be submitted under separate cover to the FAA for approval as part of the next phase of the Part 150 Study.

1. Using SEA's existing and future noise conditions, determine land uses that are and are not compatible with aircraft noise based on the noise conditions and land use compatibility guidelines in 14 CFR Part 150, Appendix A, Table 1.
2. Identify and assess potential future operational, land use, and program management measures that could be implemented to reduce or mitigate noise impacts to noise-sensitive land uses.
3. Develop a comprehensive NCP that consists of Airport Sponsor recommendations to reduce future noise impacts to the surrounding communities.

1.2 NEED FOR UPDATED NEMS

Since the most recent NEMs were accepted by the Federal Aviation Administration (FAA) in 2014, the aircraft fleet and activity profile has changed at SEA. Operational activity in the post COVID-19 pandemic environment has rebounded to near-peak levels and, along with concerns regarding seasonal variations in operations, are driving community concerns about aircraft overflights and noise.

This current Study is needed to update the 2014 Part 150 Study NEMs to better understand current noise exposure in areas around the Airport. Updating the NEMs provides more recent and relevant noise exposure information and identify potential noncompatible land uses.

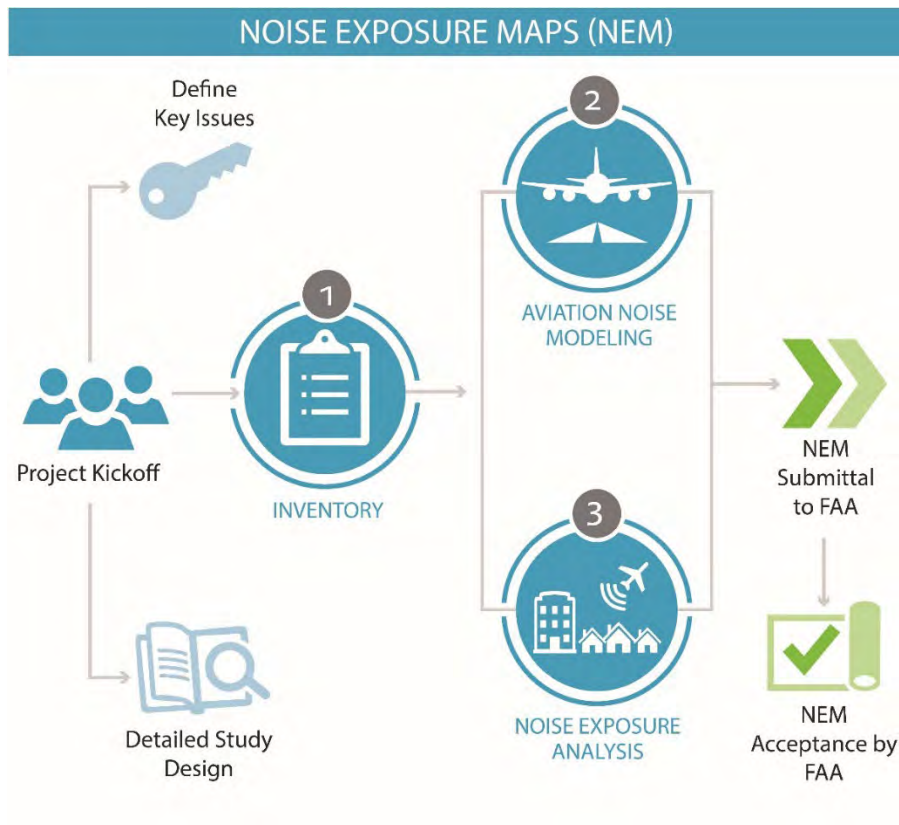
1.3 14 CFR PART 150 PROCESS

The Port initiated this updated Part 150 Study for SEA in 2024. Key issues were identified early on by the Port, as well as through public workshops held at the beginning of the Part 150 Study process. The workshops solicited input from SEA stakeholders, which included local jurisdictions, aircraft operators, local communities, and interested members of the public. Input was received throughout development of the NEMs through meetings with Port staff, public workshops/open houses, SEA Stakeholder Advisory Round Table (StART), and Technical Review Committee (TRC) meetings. **Chapter 6** provides additional information about all stakeholder engagement.

Prior to the commencement of this Part 150 Study, the Port initiated the Sustainable Airport Master Plan (SAMP) Near-Term Projects (NTP) Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The purpose and need of the SAMP NTP NEPA EA is to construct enhancements to the terminal areas, airfield infrastructure, and other Airport facilities to accommodate the projected number of passengers that would utilize the Airport at its optimal level of service. During the Part 150 Study data collection process, the FAA and Port determined that operational data generated for the SAMP NTP NEPA EA's existing (2022) and future (2032) years would serve as the basis for the Part 150 Study existing and future condition NEMs. This determination came with concurrence

from the FAA. The utilization of the 2032 contour assumes the NTPs will be completed to align with the forecasted operational increases to serve regional demand. The FAA requires NEMs to be prepared for the current year, or certified that it is representative of existing conditions, and a projected condition for the future year that must be at least five years from the date of NEM report submittal. An overview of the Part 150 process is graphically presented in **Figure 1-1**.

Figure 1-1. NEM Update Process



SOURCE: ESA, 2025.

1.4 PREPARATION OF NOISE EXPOSURE MAPS

NEMs graphically depict aircraft noise exposure levels on, and in the vicinity of, an airport by presenting lines of equal aircraft noise in Day-Night Average Sound Level (DNL) values. Aircraft noise DNL values represent the cumulative sound produced by a 24-hour period of aircraft activity. For 14 CFR Part 150 studies, this 24-hour period of aircraft activity is based on average aircraft activity over a 12-month period, and the sound energy is represented as A-weighted decibels (dBA). NEMs provide local communities and airport operators an opportunity to see aircraft noise exposure levels to make informed decisions regarding existing land uses and proposed noise-sensitive development in the vicinity of an airport.

1.4.1 NEM Study Years

The official NEMs include two maps. The first NEM depicts existing noise exposure levels and the land uses in the vicinity of the Airport. The 2022 Existing Conditions NEM was adopted from the SAMP NTP NEPA EA using an aircraft operations forecast developed for that study. The Existing Conditions NEM uses the Port's noise and operations monitoring system (NOMS) data from calendar year 2022 to determine model inputs such as day/night utilization, runway usage, model flight tracks, and stage length. The aircraft operations forecast used for this Part 150 Study is discussed further in **Chapter 4** and was approved by the FAA on April 1, 2024 (see **Appendix B**).

The 2032 Future Conditions NEM depicts noise exposure levels anticipated in the future based on the anticipated forecast conditions. The 2032 Future Conditions NEM was developed using projected levels of aircraft activity and operational conditions at SEA in 2032. In accordance with 14 CFR Part 150, the Future Conditions NEM represents conditions more than five years after the NEM date of submittal to the FAA. The 2032 NEM provides the noise exposure baseline for comparison of mitigation or noise abatement measures that will be analyzed in the NCP phase of the Part 150 Study process.

1.4.2 Technical Approach to Preparing Noise Exposure Maps

Data and operational inputs from the SAMP NTP NEPA EA were used to develop the 2022 Existing Conditions and 2032 Future Conditions NEMs. Subsequent chapters of this report describe, in detail, the information, methods, and tools used to develop the NEMs and estimate existing and future noncompatible land uses in the vicinity of SEA. A brief overview of the technical approach is provided below.

1.4.2.1 Data Collection and Verification

A wide range of data and information related to the operation of aircraft at the Airport, and used in the development of the SAMP NTP NEPA EA noise exposure analysis, was collected and verified by the Part 150 Study Team to provide a complete understanding of aircraft-related noise at SEA and its effects on local communities, including:

Approach and Departure Procedures

The Part 150 Study Team, consisting of consultants and the Airport Sponsor, reviewed the airspace structure in the vicinity of the Airport and air traffic control procedures used to direct flights by the FAA in and out of SEA.

Aircraft Activity

The Part 150 Study Team collected and verified information related to all types of aircraft that operate at the Airport; the total number of annual aircraft operations;³ the times of day that these aircraft operate; and the flight paths and profiles used by these aircraft during departures and arrivals.

Land Use

The Part 150 Study Team collected existing land use information for the established study area to develop base maps. The Part 150 Study Team also identified proposed land use changes that are anticipated to occur in the vicinity of the Airport by 2032.

1.4.2.2 Aircraft Noise Modeling

Using the FAA's Aviation Environmental Design Tool (AEDT), version 3f, noise exposure contours from the SAMP NTP NEPA EA were used for the 2022 Existing Conditions NEM and the 2032 Future Conditions NEM. AEDT version 3f was the current version of the FAA's noise model in use when the EA noise analysis was prepared. This process involved compiling information and generating detailed input data for the AEDT that represents current and forecast aircraft activity and operating conditions at SEA.

1.4.2.3 Preparation of NEMs

Geographic Information System (GIS) software was used to develop the 2022 and 2032 NEMs, in accordance with the criteria and guidelines found in 14 CFR Part 150.

1.4.2.4 Aircraft Noise Exposure Analysis

GIS software was used to identify the type and amount (acreage) of noncompatible land uses for the 2022 and 2032 NEMs. The analysis also determined the number of households, people, and noise-sensitive sites that are not compatible with existing or future aircraft noise exposure levels.

³ An aircraft operation is defined as one arrival flight or one departure flight.

1.5 CONSULTATION AND PUBLIC INVOLVEMENT

14 CFR Part 150 Sections 150.21(b) and A150.105(a) (Appendix A to Part 150) require that the NEMs and documentation submitted:

... be developed and prepared...in consultation with states, public agencies and planning agencies whose area, or any portion of whose area, of jurisdiction is within the DNL 65 contour depicted on the map, FAA regional officials, and other Federal officials having local responsibility for land uses depicted on the map. This consultation must include regular aeronautical users of the airport. The airport operator shall certify that it has afforded interested persons 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.

The consultation and public involvement process for the Part 150 Study for SEA included the following elements to provide adequate opportunities for stakeholder engagement and participation during the development of the NEMs:

- Airport operators, tenants and users, the FAA, planning agencies, local communities, elected officials, and the general public were provided an opportunity to be involved in the development of the NEMs for SEA.
- Public Workshops/Open Houses were held in June 2024 at the beginning of the Part 150 Study process to solicit input for the development of the NEMs. Additional Public Workshops/Open Houses were held in September/October 2025 to review the Draft NEMs and solicit additional input from local communities. The Port also held a virtual workshop in October 2025 for anyone unable to attend the public workshops or preferred to attend virtually. The meeting was held on the Zoom platform, and the presentation and Q&A session were conducted in English with simultaneous interpretation in Spanish.
- Meetings were conducted with the TRC members on the development of the NEMs and will continue through the NCP phase. Presentations were also given at StART meetings throughout the Study. See **Section 2.3.2** for an overview of StART and **Section 6.2** for additional information about the TRC.
- Information on the Part 150 Study was regularly shared with stakeholders, agencies, and the general public through a comprehensive public outreach effort that included e-mails, attendance at community events, and multiple presentations with communities surrounding the Airport.
- The Study webpage included study information, an online comment submittal feature, and regular project updates to keep the public informed of the Part 150 Study.

Additional information related to public outreach activities is included in **Chapter 6**.

1.6 NEM REPORT ORGANIZATION

This report provides the NEMs for SEA and the technical documentation required by 14 CFR Part 150 and is organized as follows:

Chapter 1 Introduction

This chapter includes an introduction to the Part 150 Study process.

Chapter 2 SEA Overview

This chapter provides background information regarding the Airport and its history of noise abatement.

Chapter 3 Land Use

This chapter describes the land use study area and the methods utilized for collecting data related to land uses in the study area and noise-sensitive sites.

Chapter 4 NEM Development

This chapter describes the development of the NEMs, the noise model, and noise modeling inputs.

Chapter 5 2022 and 2032 Noise Exposure

This chapter presents the 2022 and 2032 NEMs and information on land use compatibility and aircraft noise-related impacts.

Chapter 6 Consultation and Public Involvement

This chapter documents stakeholder and public outreach engagement efforts conducted during the Study.

Technical information, documentation, and maps are contained in the appendices to this report, which are organized as follows:

Appendix A Glossary and Acronyms

Appendix B Aircraft Activity Forecast

Appendix C Aircraft Noise

Appendix D Land Use

Appendix E Consultation and Correspondence

Appendix F Public Outreach

Appendix G Public Comments and Responses

Appendix H Official Noise Exposure Maps



Chapter 2.

Airport Overview

2.1 AIRPORT LOCATION AND SETTING

SEA is located on 2,500 acres in SeaTac, King County, Washington. The Airport is bounded by State Route (SR) 509 to the west, SR 518 to the north, SR 99 to the east, and S 188th St. to the south, which passes underneath the Airport via a tunnel. SEA is also located conveniently to Interstate 5 (I-5) and Interstate 405 (I-405). The Airport is located approximately 11 miles south of downtown Seattle and is in close proximity to the cities of Normandy Park, Burien, Des Moines, SeaTac, Tukwila, Federal Way, and unincorporated areas of King County. The location of the Airport and surrounding areas is depicted in **Figure 2-1**.

2.1.1 Airport History

The Port began construction of the Airport in 1942, with the first aircraft operations occurring in 1944. The Airport's initial primary use was to store military aircraft during World War II; however, scheduled commercial operations commenced shortly after the end of the war and the Airport's first passenger terminal was opened in 1949. The Airport rapidly grew into a major Pacific Northwest hub and completed numerous expansion and infrastructure projects in the 1960s and 1970s. The Port completed expansion of the central terminal in 2003 and finished construction of a third parallel runway, Runway 16R/32L, in 2008. Most recently, the Port opened a renovated North Concourse in 2021 and a new International Arrivals Facility east of Concourse A in 2022.

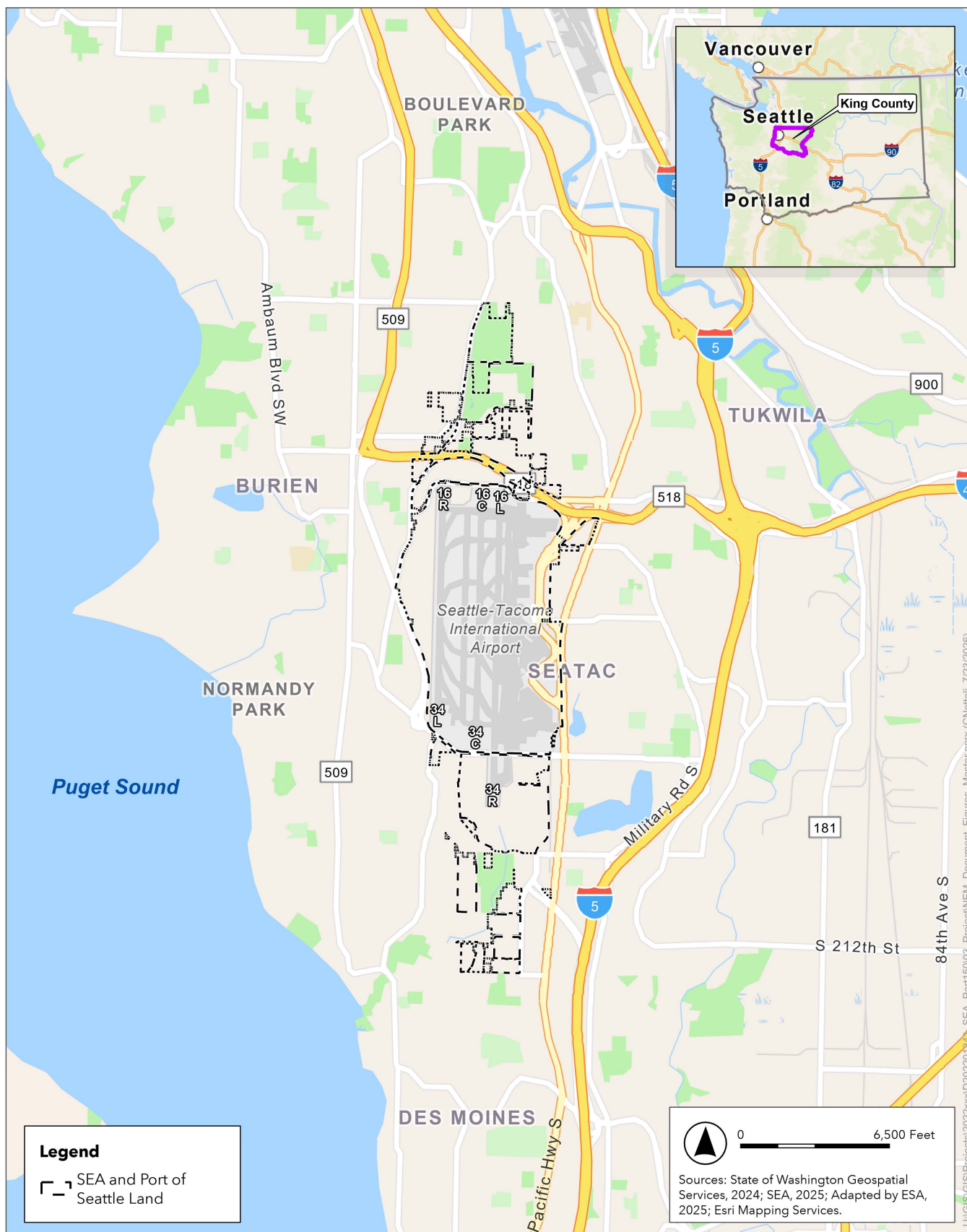


Figure 2-1
 Airport Location Map
 Seattle-Tacoma International Airport

The Airport's original passenger terminal was opened in 1949. Concourses A and D were constructed in 1961, while Concourses B and C opened in 1964 and 1966, respectively. A major expansion project in the early 1970s resulted in the completion of a new, larger central terminal building constructed around the original structure and the completion of the N and S concourses.

2.2 AIRPORT OVERVIEW

2.2.1 Aviation Role

In 2023, SEA was the busiest airport in the Pacific Northwest and eleventh busiest in the United States based on passenger traffic.⁴ SEA provides scheduled passenger and cargo airline service to a wide range of international and domestic destinations and is classified as a Large Hub Commercial Service Airport by the FAA's National Plan of Integrated Airport Systems (NPIAS).⁵ Large hubs are those airports that each account for at least one percent of total U.S. passenger enplanements.

2.2.2 Airport Facilities Overview

This section provides an overview of SEA's facilities, including terminals, runways, taxiways, and other aviation-related facilities. The configuration of the major airfield and landside facilities at SEA is described in the following sections and shown on **Figure 2-2**.

2.2.2.1 Passenger Terminal Facilities

Passenger service at SEA is conducted out of a Main/Central Terminal offering connections to four concourses (A, B, C, D) as well as two remote N and S concourses. The Airport has a total of 89 passenger gates, which are divided amongst the concourses of the Central Terminal and N and S concourses.⁶

Passengers can access the Terminal via the Airport Expressway, along the eastern side of the Airport, which also offers access to a consolidated off-site rental car facility and large parking garage. All concourses in the Main/Central Terminal are directly connected, while the N and S concourses are connected to each concourse and the main terminal via an automated people mover referred to as the SEA Underground. The Transportation Security Administration (TSA) operates six security checkpoints in the Terminal. All non-precleared international arrivals arrive at Concourse A or the S concourse. The U.S.

⁴ FAA CY2023 Enplanements at All Airports, retrieved from <https://www.faa.gov/sites/faa.gov/files/2024-06/cy23-all-enplanements-preliminary.xlsx>.

⁵ FAA National Plan of Integrated Airport Systems (NPIAS) CY2023–2027: Appendix A, retrieved from <https://www.faa.gov/sites/faa.gov/files/2022-10/ARP-NPIAS-2023-Appendix-A.pdf>.

⁶ Port of Seattle SEA Airport Basics, retrieved from <https://www.portseattle.org/page/sea-airport-basics>

Customs and Border Patrol (CBP) facility is located in the International Arrivals Facility on the southeast side of Concourse A and is connected to the S concourse via an overhead walkway.

The Airport is undergoing a major expansion project in Concourse C aimed at enhancing the passenger experience. The project includes four new floors of retail, dining, lounge and office space and is expected to be completed by mid-2026. The project does not result any additional gates at SEA.

2.2.2.2 Runways

SEA has three parallel runways, located to the west of the passenger terminal facilities:

- Runway 16L/34R
- Runway 16C/34C
- Runway 16R/34L

Runway 16L/34R is 11,901 feet long by 150 feet wide. Runway 16C/34C is 9,426 feet long by 150 feet wide. Runway 16R/34L, opened in 2008, is the westernmost runway and is 8,500 feet long by 150 feet wide. All three runways are constructed of grooved concrete and have no displaced thresholds, making the full length of the runway available for takeoff and landing.

The characteristics of each runway are shown in **Table 2-1**.

2.2.2.3 Taxiways

As shown on **Figure 2-2**, a series of taxiways connects the three runways to the passenger terminal complex, the air cargo aprons, Fixed Base Operator (FBO) facility, and aircraft parking sites. There are two primary taxiways which are located parallel to the runways, Taxiway A and Taxiway B. These primary taxiways move aircraft parallel to the active runways when departing aircraft position for takeoff, or when arriving aircraft taxi to their gates after arrival. Each of these primary taxiways also has individual connectors that connect the main runway with the parallel taxiway.

Table 2-1. SEA Runway Characteristics

Runway Characteristic	Runway 16L/34R		Runway 16C/34C		Runway 16R/34L	
	16L	34R	16C	34C	16R	34L
Runway Length (feet)	11,901		9,426		8,500	
Runway Width (feet)	150		150		150	
Displaced Arrival Threshold (feet)	—	—	—	—	—	—
Gilde Path Angle (degrees)	3	2.75	3	3	3	3
Runway End Elevation (feet above MSL)	432.3	346.7	429.4	362.9	414.8	356.2
Threshold Crossing Height (feet AGL)	76	81	71	73	69	75
Runway Markings	Precision	Precision	Precision	Precision	Precision	Precision
Runway Lighting	HIRL, PAPI	HIRL, PAPI	HIRL, PAPI	HIRL, PAPI	HIRL, PAPI	HIRL, PAPI
Part 77 Runway Category and Navigational Aids	Precision ILS	Precision ILS	Precision ILS	Precision ILS	Precision ILS	Precision ILS
Runway Approach Lighting	ALSF2	MALSR	ALSF2	MALSR	ALSF2	MALSR

SOURCES: FAA Airport IQ 5010. Accessed September 2025.

NOTES:

AGL = Above Ground Level

MSL = Mean Sea Level

HIRL = High Intensity Runway Lighting

PAPI = Precision Approach Path Indicator

MALSR = Medium Intensity Approach Light System with Runway Alignment Indicator Lights

ALSF2 = High Intensity Approach Lighting System with Sequenced Flashing Lights

ILS = Instrument Landing System

2.2.2.4 Airport Traffic Control Tower

The Airport is serviced by an FAA-staffed airport traffic control tower (ATCT) located north of the Main/Central Terminal building. The ATCT operates 24 hours a day, 365 days a year. Radar approach and departure control is operated by the FAA's Seattle Terminal Radar Approach Control (TRACON) facility located to the west of the airfield.

2.2.2.5 General Aviation Facilities

General Aviation (GA) refers to all types of aviation that are not considered military, cargo, and commercial passenger air service. GA activity at SEA is comprised of business, or corporate, activity as well as personal, private activity.

Signature Aviation, the only FBO at SEA, provides service to GA operators. This includes aircraft ground handling, aircraft fueling, pilot's lounges, passenger lounges, rental cars, and crew/service centers. The FBO is located between Runway End 34L and 34C, along Taxiway Q.

2.2.2.6 Air Cargo Facilities

The Airport supports multiple nonstop all-cargo freighter services and provides substantial belly cargo capacity on a variety of nonstop passenger flights. SEA's domestic air cargo market continues to grow, particularly in the e-commerce sector, and is supported by integrator airlines, domestic all-cargo freighter services, and passenger carriers. Most cargo facilities are situated north and east of Runway 16L, along Taxiway A, with overnight parking and remote boarding near the south ramp along Taxiway B. These facilities are illustrated in **Figure 2-2**.

2.2.2.7 Other Aviation-Related Facilities

In addition to the facilities detailed above, several aviation-related support facilities are located on Airport property, including:

- Aircraft Rescue and Fire Fighting (ARFF)
- Aircraft Fuel Storage and Distribution
- Airline Maintenance and Hangars

2.2.3 Future/Planned Airport Facilities

SEA has several planned developments under its SAMP NTP NEPA EA to accommodate future growth and improve efficiency.⁷ Some key projects include:

- A second terminal with 19 additional gates to handle increasing passenger demand.
- Expanded cargo facilities to support the growing air freight industry.
- An elevated busway and stations connecting the rental car facility, new terminal, and main terminal.
- Realigned airport roadways to improve traffic flow and accessibility.
- Airfield updates to enhance safety and operational efficiency.
- New parking infrastructure with improved accessibility and sustainability features.
- Additional facilities for sustainable aviation fuel to support environmental initiatives and increasing demand.
- West-side maintenance campus

These projects are expected to be completed or under construction by 2032. SEA is also undergoing modernization efforts under the Upgrade SEA⁸ initiative, which aims to improve passenger experience and accessibility.

⁷ SAMP NTP NEPA EA available at <https://www.portseattle.org/plans/sustainable-airport-master-plan-samp>.

⁸ Upgrade SEA initiative available at <https://www.portseattle.org/UpgradeSEA>.

2.2.4 Regional Economic Impact

SEA is a significant driver of the regional economy. The Airport's operating activity produced direct economic contributions and an equally significant multiplier effect on the regional economy. The Airport serves the people of the Pacific Northwest with essential services, access to hundreds of domestic and global destinations, and economic activity that supports tens of thousands of jobs and produces \$33 billion in economic activity.⁹

2.3 NOISE-RELATED INITIATIVES

The Port has a longstanding history of being active in addressing aircraft noise concerns. The Port administers programs to monitor aircraft noise levels and assist local communities in understanding the effects of aircraft noise. These include the installation of noise monitoring systems in the communities around SEA and implementation of a sound insulation program. Many of these efforts were first proposed as NCP measures in past Part 150 Study updates at SEA.

2.3.1 Sound Insulation Program (SIP)

Since the beginning of their Sound Insulation Program (SIP) in 1985, the Port has insulated over 9,400 single-family homes. In addition, the Port insulated seven condominium complexes with a combined total of 321 units. Thirteen Highline College buildings have been insulated and, in partnership with the FAA, the Port has contributed \$50 million (from a total Port of Seattle/FAA pledge of \$100 million) for sound insulation and related improvements to schools within the Highline School District. Eleven schools have received sound insulation with four remaining to be insulated. Property owner participation in the SIP is voluntary.

To date, almost all eligible single-family homes within the current noise remedy boundary have been insulated. The program is currently focused on apartments, places of worship, completion of current condominium projects, remaining eligible single-family homes, and buildings and residential units in construction or design phases. Additional residential properties are expected to become eligible to participate in the SIP after the NCP is approved by the FAA.



Source: Port of Seattle

⁹ Port of Seattle SEA Airport Statistics, retrieved from <https://www.portseattle.org/page/economic-impact>.

2.3.1.1 Port of Seattle Sound Insulation Repair and Replacement Pilot Program

The Port's Sound Insulation Repair and Replacement Pilot Program was granted approval by the Port of Seattle Commission (the Commission) on February 27, 2024. The purpose of the pilot program is to provide an initial assessment of sound insulation products that were previously installed as part of the SIP and evaluate the current condition of those installations. The assessment was completed in December 2024 and included extensive outreach, collection of information from property owners within the study area, research on the expected useful life of building materials, and acoustic testing. The assessment report was provided to the Commission in January 2025. The eligibility criteria for the repair and replacement of previously installed sound insulation materials through this pilot program includes a pre-1993 original insulation date, location within the current Noise Remedy Boundary, and interior noise levels above 45 dB DNL as determined by an acoustic test of the structure.

2.3.2 SEA Stakeholder Advisory Round Table (StART)

The Port developed the SEA Stakeholder Advisory Round Table (StART) in 2017 to provide a forum that fosters a spirit of goodwill, respect, and openness while encouraging candid discussion between the Port and residential, local government, and business community members from the Highline Forum-member cities of SeaTac, Burien, Des Moines, Normandy Park, Tukwila, and Federal Way. StART is a collaborative forum for information-sharing, discussing Highline Forum-member cities' concerns, and providing feedback to the Port on issues related to the airport. Each city designates three members, including two community members selected by their city, to serve on StART who are joined by airline representatives, an air cargo representative, and Port staff.

2.3.3 Noise and Operations Monitoring System (NOMS)

The Port's NOMS consists of two basic elements: a radar system used to acquire flight track data, and 24 permanent noise monitoring stations placed in the communities surrounding the Airport. The noise monitoring sites (see **Table 2-2** and **Figure 2-3**) were chosen with the intent of differentiating between aircraft and other noise sources by referencing programmed algorithm thresholds and correlating noise events to aircraft overflights. The NOMS main server collects data from both the Passive Secondary Surveillance Radar (PASSUR) and the permanent noise monitors. The data collected is analyzed by SEA's Noise Programs Office, which is responsible for operating and maintaining the NOMS, assisting with the implementation of voluntary noise abatement measures, and addressing public concerns regarding airport noise.

Table 2-2. Permanent Noise Monitoring Locations

Site	Location/Address	City
SEA01	Air Cargo Building/South 161st St	SeaTac
SEA03	Maple Leaf Reservoir Park/1020 NE 82nd St	Seattle
SEA4b	Catherine Blaine School/2550 34th Ave West	Seattle
SEA05	Medina Elementary/8001 NE 8th St	Medina
SEA06	Hamilton Viewpoint Park/1311 Palm Ave SW	Seattle
SEA07	Central Area Senior Center/500 30th Ave S	Seattle
SEA08	Mercer View Community Center/8236 SE 34th St	Mercer Island
SEA09	Jefferson Park/1600 Dakota St	Seattle
SEA10	Brighton Playfield/6000 39th Ave S	Seattle
SEA11	Beverly Park School/1201 S 104th St	Burien
SEA12	2260 S 126th St	Burien
SEA13	Cedarhurst Elementary/611 S 132nd St	Burien
SEA14	North Clear Zone/1530 26th Ave S	SeaTac
SEA15	Sylvester Middle School/16222 Sylvester Rd	Burien
SEA16	Chinook Middle School/18650 42nd Ave S	SeaTac
SEA17	1217 S 207th St	SeaTac
SEA18	1205 S 226th St	Des Moines
SEA19	Midway Elementary/22447 24th Ave S	Des Moines
SEA20	Parkside Elementary/2104 S 247th	Des Moines
SEA21	Mark Twain Elementary/2450 Star Lake Rd	Federal Way
SEA22	Sacajawea Jr High/1101 Dash Point Rd	Federal Way
SEA23	Meredith Hills Elementary/5830 S 300th St	Auburn
SEA25	Twin Lakes Elementary/4400 42nd Pl SW	Federal Way
SEA28	Woodmont Elementary/26454 16th Ave S	Des Moines

SOURCES: SEA, 2025; Adapted by ESA, 2025.

Temporary noise monitoring was conducted at six (6) locations in the vicinity of SEA from November 6, 2024, through November 21, 2024, and then from March 25, 2025, through April 10, 2025 (with additional measurements at one site from April 11, 2025, through May 2, 2025) to document and analyze the existing noise environment. This information is provided for informational purposes only and is presented as **Appendix C**. The data were not used in the development of noise contours because 14 CFR Part 150 does not allow noise monitoring data to be used to “calibrate” the noise model used to develop contours.

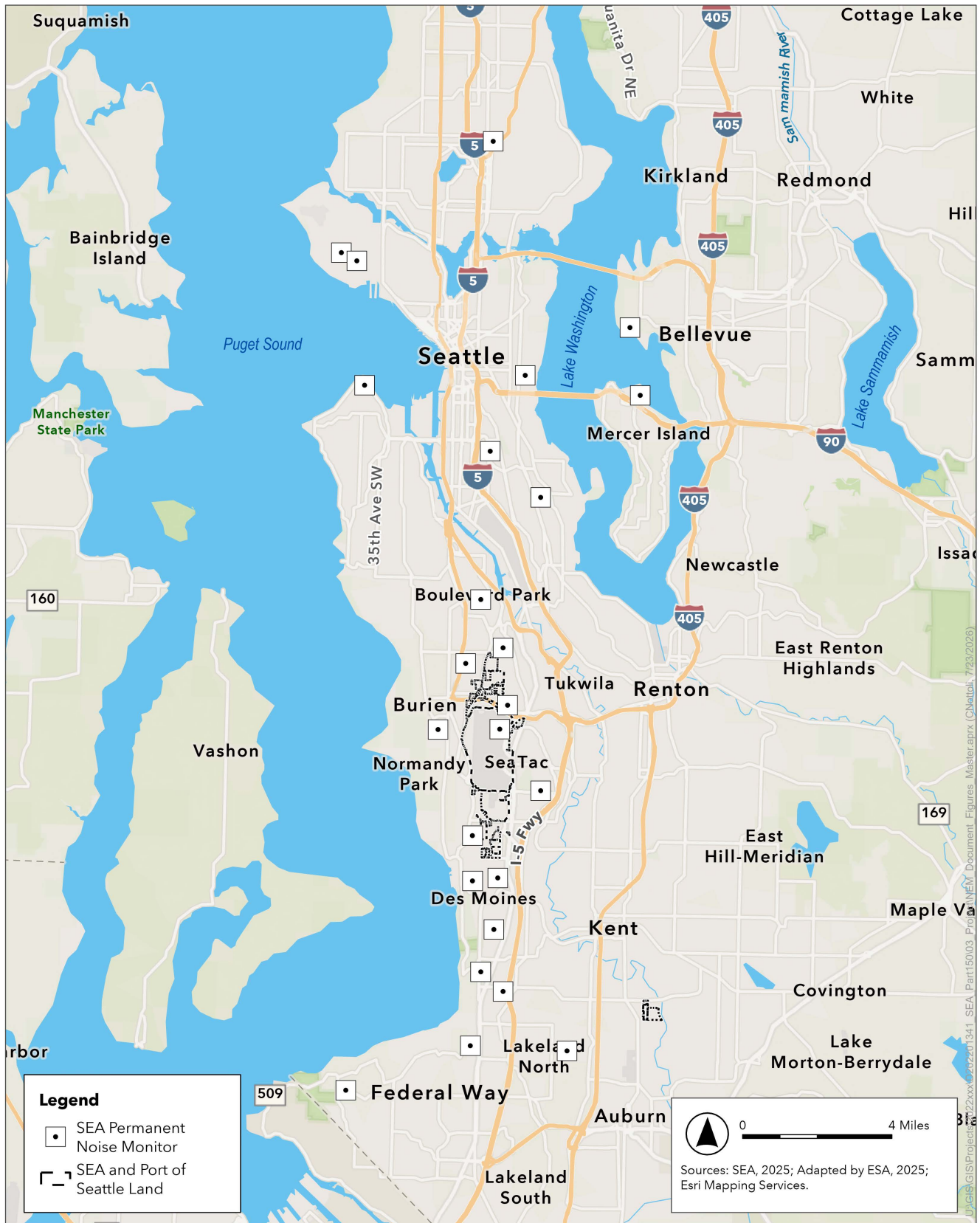


Figure 2-3
Noise Monitor Locations
Seattle-Tacoma International Airport

2.3.4 Aircraft Noise Comments

As part of its noise program, the Port collects and manages noise comment information related to SEA. There are four means of filing an aircraft noise comment: (1) by completing and submitting the form on Port’s website, (2) by leaving a voicemail on the Airport community hotline, (3) by submitting a comment via the Airport’s PublicVue online aircraft flight tracking system, or (4) by submitting a comment via PlaneNoise mobile phone app (for iPhone/Android mobile devices).¹⁰ Each noise comment received is compiled in a database, verified for accuracy, and analyzed for reporting purposes. **Table 2-3** provides the number of noise comments and individual households submitting comments for January 2019 through December 2024. **Figure 2-4** depicts the locations of comments received between July 2024 and July 2025.

Table 2-3. Aircraft Noise Comments (2019–2025)

Year	Number of Noise Comments	Number of Distinct Households
2019 ¹	195,832	1,448
2020 ¹	256,564	1,040
2021 ¹	282,701	1,141
2022 ²	210,146	917
2023 ²	130,475	796
2024 ²	193,333	1,039
2025 ²	137,178	806

SOURCES: SEA, 2025; Adapted by ESA, 2025.

NOTES:

1. Obtained from the Port’s EnvironmentalVue (NOMS) Portal, Report Subsystem.
2. Obtained from <https://www.portseattle.org/projects/noise-comment-monthly-reports>

¹⁰ The airport community hotline can be reached by calling 1-206-787-5393. The noise comment platforms can be accessed at <https://www.portseattle.org/page/submitting-comment-airport-noise-programs>.

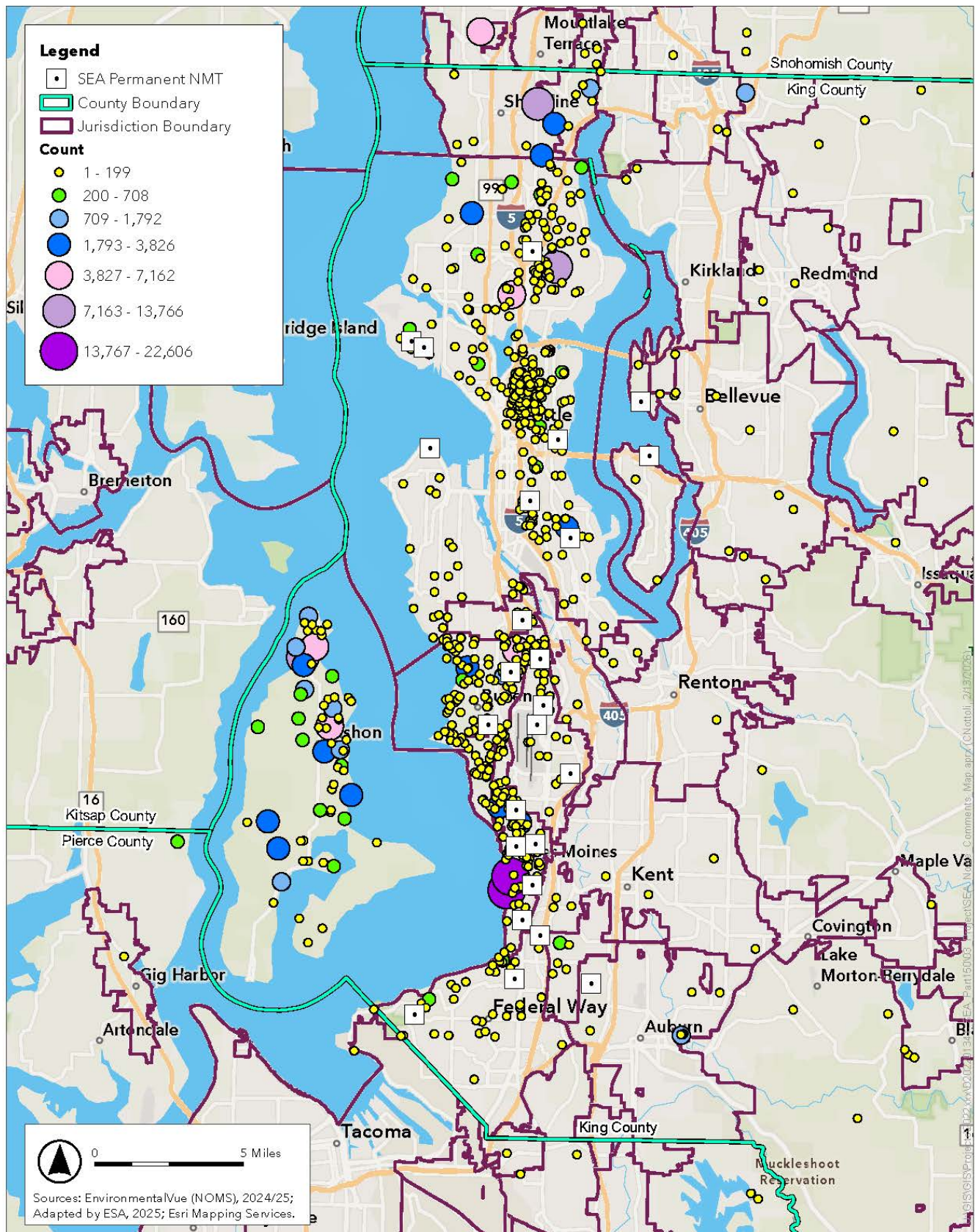


Figure 2-4
August 2024 to July 2025 Noise Comments
Seattle-Tacoma International Airport

2.3.5 Voluntary Noise Abatement Measures

SEA has implemented voluntary noise abatement measures focused on reducing noise disturbances and includes additional nighttime mitigation measures. The following sections highlight three of the Port's most prominent voluntary noise abatement measures.

2.3.5.1 Fly Quiet Incentive Program

The Fly Quiet Incentive Program¹¹ was adopted in 2002 to increase airline and pilot awareness of the effect of aircraft noise on local communities. This program includes annual Fly Quiet Awards for the top two airlines with the highest scores and the airline that shows significant improvement is given the third award. Air Canada, Frontier Airlines, and Air France are the recipients of the 2025 Fly Quiet Awards.



2.3.5.2 Late Night Noise Limitation Program

In 2019, the Port implemented the Late-Night Noise Limitation Program,¹² a voluntary program designed to reduce late night noise at the Airport by encouraging air carriers to fly during less noise-sensitive hours or transition to quieter aircraft. The program was developed to increase air carrier awareness of the impact of nighttime aircraft noise on local communities.

2.3.5.3 Aircraft Engine Runups

The Port has also designated a restricted period for engine run-ups between 10 p.m. and 7 a.m. During these hours, run-ups are permitted only in exceptional circumstances with airport approval and must not exceed two minutes. Aircraft operators requiring extended run-ups between 6 a.m. and 7 a.m. may proceed only if the aircraft is scheduled to depart between 7 a.m. and 8:30 a.m. and have received prior authorization from the Airport.¹³

¹¹ <https://www.portseattle.org/programs/fly-quiet-award>.

¹² <https://www.portseattle.org/programs/late-night-noise-limitation-program>.

¹³ <https://www.portseattle.org/page/aircraft-engine-maintenance-run-ups>.



Chapter 3.

Land Use

3.1 INTRODUCTION

Title 14 CFR Part 150 requires the review of land uses surrounding an airport to understand the relationship between those land uses and the noise exposure associated with aircraft operations. This includes delineation of land uses within the DNL 65 and above contours as depicted on the NEMs and identification of noise-sensitive uses that may be incompatible with that level of noise exposure. Identification of a noise-sensitive use within the DNL 65 contour does not necessarily mean that the use is considered incompatible or that it is eligible for mitigation. Rather, identification merely indicates that the use is generally considered incompatible and requires further investigation. Examples of factors that influence compatibility and/or eligibility may include previous sound reduction treatments, current interior noise levels, structure condition, ambient and self-generated noise levels, whether a given use is considered temporary or permanent, and the timeframe within which a given structure was constructed.¹⁴

¹⁴ On March 27, 1998, FAA issued a policy on 14 CFR Part 150 noise compatibility programs that limits approval of remedial mitigation measures (e.g., sound insulation) to land uses that were in place as of October 1, 1998.

3.2 LAND USE DATA COLLECTION

Several types of land use information were collected to provide the basis for the evaluation of compatibility and noise exposure in this study.

3.2.1 Land Use Data Collection Area

The SEA Part 150 Study required the development of a database of existing land uses surrounding the Airport. This process defined a broad data collection area in accordance with 14 CFR Part 150 criteria. The Study Area was informed by several factors, including:

- Land use within a radial distance of 30,000 feet from each runway end at SEA.
- Flight track data for arrival and departure operations at SEA in 2022.

This collection area was further refined based on jurisdictional boundaries and distinguishing man-made or natural features, such as:

- Major roadways and transportation corridors.
- Prominent geographic features include parks, shorelines and other waterways, public facilities, and open spaces.

Areas with the potential to be located within or in proximity to SEA Existing and/or Future NEMs were identified for more detailed collection and verification of land use data.

3.2.2 Local Agency and Government Coordination

The following jurisdictions and agencies were consulted to verify existing land use, discuss applicable land use studies and data, and identify future projects which may affect local land use:

- City of Burien
- City of Des Moines
- City of SeaTac
- King County
- City of Normandy Park (*no jurisdictional authority within DNL 65*)
- City of Federal Way (*no jurisdictional authority within DNL 65*)
- City of Tukwila (*no jurisdictional authority within DNL 65*)

3.3 LAND USE COMPATIBILITY

3.3.1 Aircraft Noise and Land Use Compatibility

Guidelines regarding the compatibility of land uses within various DNL contour intervals are specified in *Appendix A of 14 CFR Part 150*. These guidelines are consistent with land use guidelines developed by other federal agencies, such as the U.S. Environmental Protection Agency¹⁵ and the U.S. Department of Housing and Urban Development¹⁶. The noise metric used for land use compatibility is the DNL, which represents average noise levels over a 24-hour period. Further details on aircraft noise are presented in **Appendix C** of this report.

The FAA has determined that the major land uses listed in 14 CFR Part 150, Appendix A, Table 1 (presented here as **Table 3-1**) are normally compatible with aircraft noise below DNL 65. Therefore, when evaluating land use compatibility, attention is focused on uses in areas with noise levels of DNL 65 and above.

As shown in **Table 3-1**, noise-sensitive land uses such as single and multi-family residential, mobile home parks, transient lodging (e.g., hotels), daycares, public and private schools, and outdoor music venues are considered incompatible with noise levels of DNL 65+ without noise mitigation. Other noise-sensitive land uses such as hospitals, nursing homes, churches, auditoriums, and concert halls are considered compatible with noise levels of DNL 65 to 75, provided that appropriate noise attenuation is designed into the building's structure. Commercial, manufacturing, and recreational land (parks, amusement parks, zoos, etc.) are generally less sensitive to noise and are considered compatible with noise levels up to DNL 70 without noise attenuation and up to DNL 80 with appropriate levels of noise attenuation. For this Part 150 Study, the identification of compatible and incompatible land uses within the DNL 65+ contours is documented using the guidance provided in **Table 3-1** to the extent that it was readily applied to the area land use categories.

¹⁵ United States Environmental Protection Agency, Land Use, retrieved from <https://www.epa.gov/report-environment/land-use>.

¹⁶ U.S. Department of Housing and Urban Development, Land Use and Zoning, retrieved from <https://www.hudexchange.info/programs/environmental-review/environmental-assessment/guide/land-development/land-use-and-zoning/>.

Table 3-1. Part 150 Land Use Compatibility Guidelines in Aircraft Noise Exposure Areas

Land Use	Yearly Day Night Average Noise Level (DNL) in A Weighted decibels					
	Below 65	65–70	70–75	75–80	80–85	Over 85
Residential						
Residential, Other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient Lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail – building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade – general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing & Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
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
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in parenthesis refer to notes.

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

Table 3-1. Part 150 Land Use Compatibility Guidelines in Aircraft Noise Exposure Areas (Continued)

Key to Table	
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.

SOURCES: Title 14 Code of Federal Regulations Part 150, Appendix A, Table 1, Airport Noise Compatibility Planning.

NOTES:

- (1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB to 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an 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 of 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 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 normal noise level is low.
- (4) Measures to achieve NLR of 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 normal noise level is low.
- (5) Land use compatible provided that special sound reinforcement systems are installed.
- (6) Residential buildings require an NLR of 25 dB.
- (7) Residential buildings require an NLR of 30 dB.
- (8) Residential buildings not permitted.

3.3.2 Local Ambient Noise Environment

One important consideration in evaluating land use compatibility relative to aircraft noise is the overall noise environment in proximity to the Airport. 14 CFR Part 150, Appendix A, Section 101 indicates that “if the self-generated noise from a given use and/or the ambient noise from other non-aircraft and non-airport uses is equal to or greater than the noise from aircraft and airport sources,” the land use is considered compatible.

Ambient (background) noise levels generally increase as intensity of development increases; ranging from a quiet rural setting to suburban to urban to a dense urban environment, which typically has the loudest ambient noise levels. SEA’s surrounding cities include land that can generally be classified as suburban with the exception of major highway corridors. The local ambient noise environment in proximity to the Airport can vary due to this highway noise.¹⁷ Further away from cities, such as rural areas, have lower ambient noise level. Considering the suburban nature of land uses surrounding SEA, it was not anticipated that ambient noise levels would exceed aircraft noise levels. Therefore, ambient noise is not applicable to this study.

¹⁷ Sustainable Airport Master Plan Near-Term Projects Environmental Assessment under the National Environmental Policy Act, Noise Technical Report (Appendix J), retrieved from https://www.airportprojects.net/samptpenvironmentalreview/wp-content/uploads/sites/45/2025/09/Appendix-J-Noise-and-Noise-Compatible-Land-Use_new.pdf.

3.3.3 Land Uses within the Study Area

Land in the Study Area is developed and largely urbanized. The predominant land use surrounding SEA is residential, with neighborhoods located to the east and west along the airport's sidelines, as well as to the north and south. Commercial and mixed-use developments are found along major road corridors. Land uses in the Study Area are summarized in **Table 3-2** and shown on **Figure 3-1**. Data used to identify land uses in the Study Area were collected from a number of sources including various government entities: Washington State Geospatial Portal, King County GIS Center, the Port, 2020 Census, and the American Community Survey (ACS). A more detailed discussion of land use is provided in **Appendix D**.

Table 3-2. Consolidated Land Use Categories within the Study Area

Consolidated Land Use Categories	Typical Uses	Compatibility with the DNL 65 Contour
Residential – Single-Family	Single-family homes	Generally considered incompatible
Residential – Multi-Family	Apartment buildings, cooperative apartment buildings, condominiums, public housing complexes, and assisted living facilities.	Generally considered incompatible
Residential – Mixed-Use	Development featuring multiple uses, one of which is residential.	Generally considered incompatible
Residential – Mobile Home	Mobile homes and other prefabricated homes	Generally considered incompatible
Commercial	Retail, including shopping malls, shopping centers, stores, shops, entertainment, restaurants, bars, galleries, service establishments, and professional services.	Generally considered compatible
Industrial/Manufacturing	Piers, docks and marinas, bulk fuel storage, heavy manufacturing and assembly plants, light manufacturing and processing facilities, warehouse and storage, truck terminals, junkyards, sand and gravel pits, and wholesale nurseries and greenhouses.	Generally considered compatible.
Transportation and/or Utilities	Roadways and highways (including rights-of-way), parking lots, and garages; electric power generation and transmission lines, water supply and treatment facilities.	Generally considered compatible.
Public Facilities and/or Institutions	Schools and universities, libraries, museums, cultural facilities, places of worship, government buildings, auditoriums, hospitals and hospice facilities, nursing homes, police and fire protection, post offices, correctional institutions, and animal shelters.	Generally considered compatible with the exception of specific noise-sensitive uses (schools, hospitals, churches, nursing homes).
Parks, Recreation, and/or Open Space	Parks, recreation areas (parks, amusement parks, zoos, etc.), playgrounds, athletic fields, conservation land, preserves, farms, and public land.	Generally considered compatible with the exception of outdoor music venues, and any farms (agriculture) with homes.
Vacant	No present use	Potentially incompatible if it were to be developed with an incompatible use.
Unclassified	No land use identified by King County	Potentially incompatible if developed with an incompatible use.

SOURCE: Land Use Categories derived from King County parcel data with land use information.

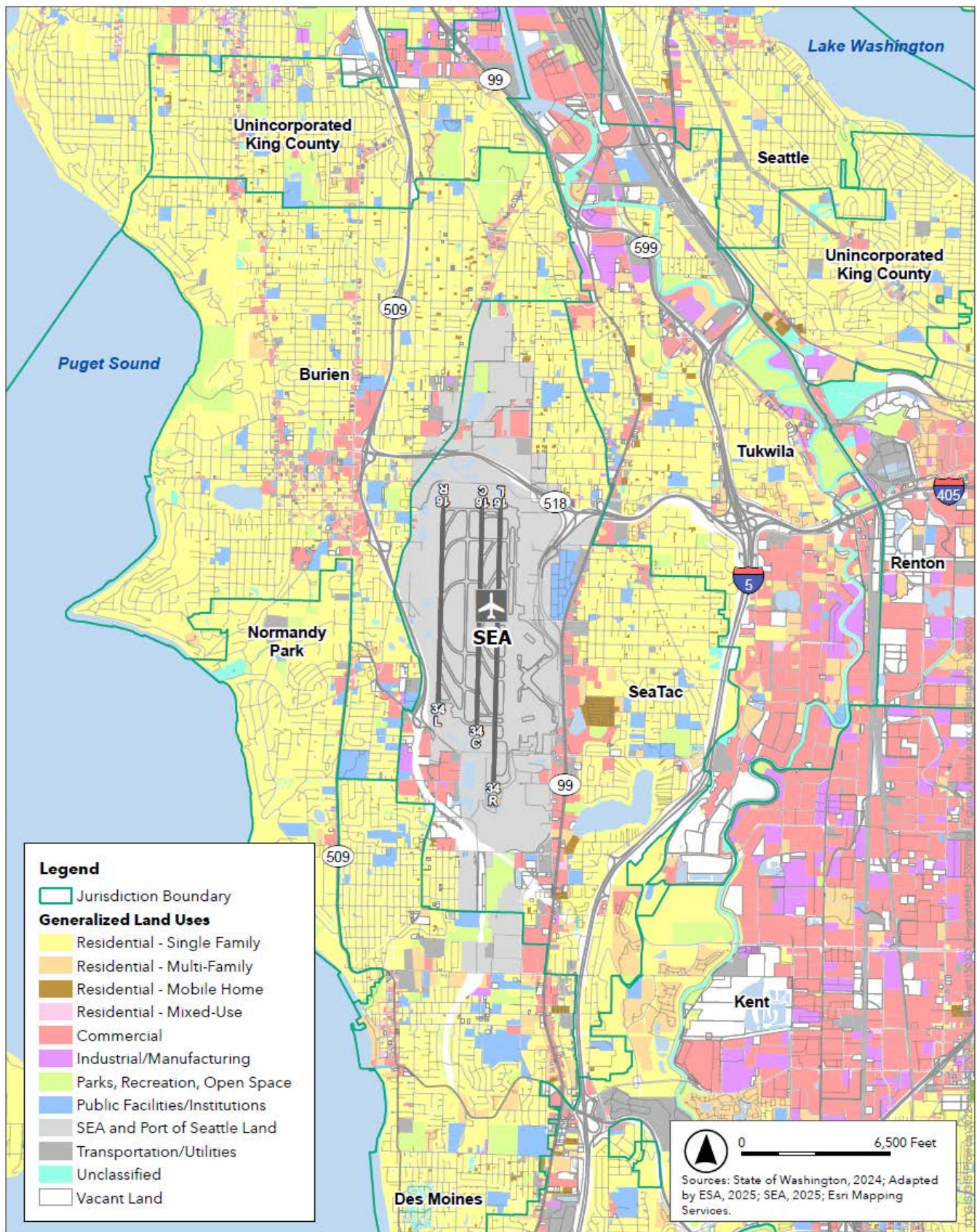


Figure 3-1
Generalized Existing Land Use
Seattle-Tacoma International Airport

Based on the criteria established in 14 CFR Part 150 and the land use compatibility guidelines shown in **Table 3-1**, eligibility for mitigation will be evaluated further in the NCP phase. Unclassified land uses shown on the figure are land uses which have no designation in the King County or local land use databases.

3.3.4 Noise-Sensitive Sites

In addition to identifying and mapping land uses, 14 CFR Part 150 also requires the identification of noise-sensitive uses, including public buildings and properties eligible for inclusion in the National Register of Historic Places. The SEA Part 150 Study identified the following noise-sensitive uses within the Study Area:

- Libraries
- Historic properties and sites
- Long-term residential care facilities
- Hospitals
- Places of worship
- Schools, Universities, and Educational Facilities

The Washington State Geospatial Portal, King County GIS Center, and various readily available on-line data and mapping sources were used to identify these noise-sensitive sites. Information sources for the identification of historic resources included the National Register of Historic Places.

The locations of noise-sensitive uses in the Study Area are shown in **Figure 3-2** through **Figure 3-7**. As indicated previously, inclusion of these properties within the DNL 65 contour does not mean that a use is considered incompatible or that it is eligible for mitigation. Inclusion merely indicates that the use is generally considered incompatible but requires further investigation during the NCP phase and subsequent implementation phase.

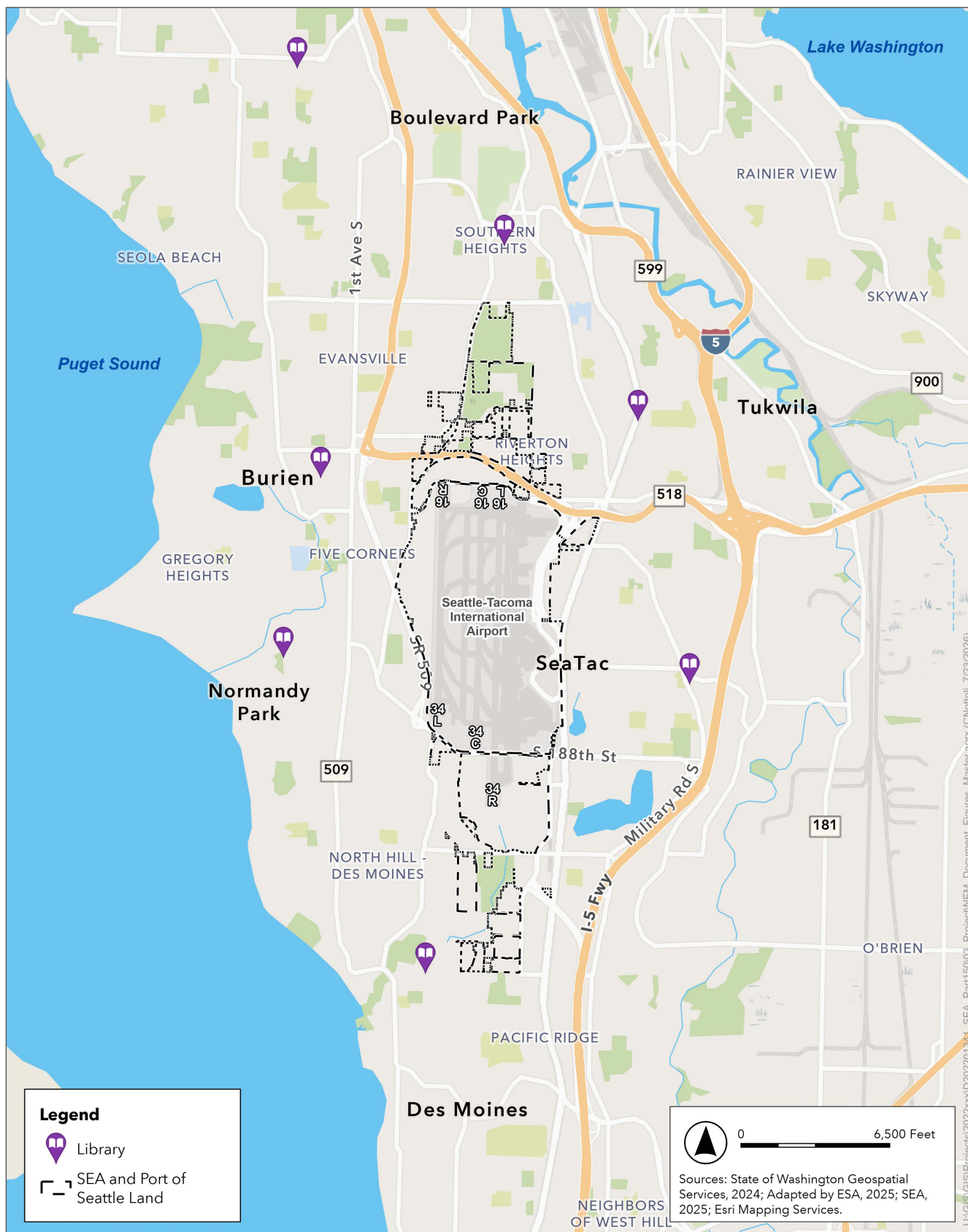


Figure 3-2
Generalized Noise Sensitive Uses - Libraries
Seattle-Tacoma International Airport



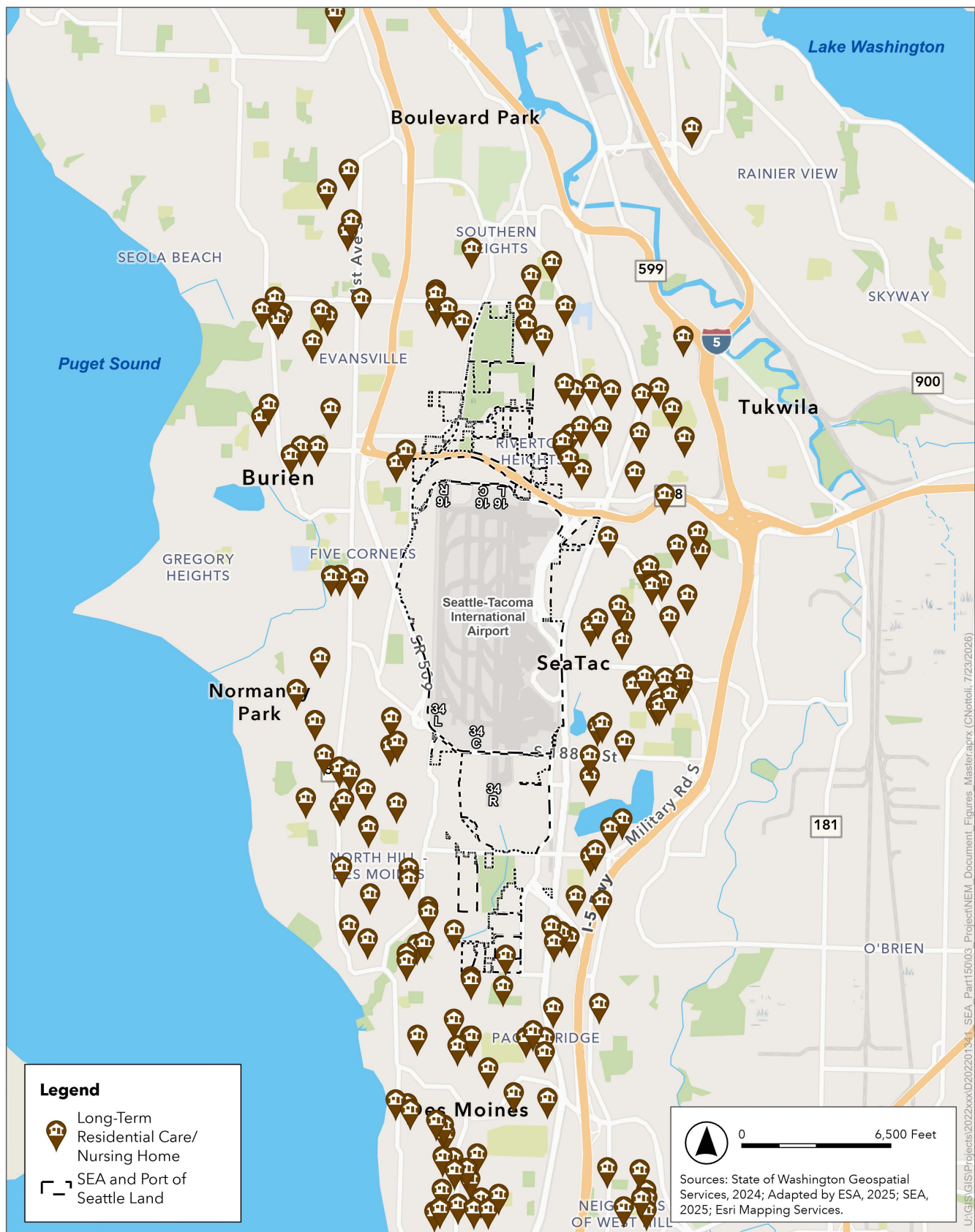


Figure 3-4
Generalized Noise Sensitive Uses - Long-Term Residential Care/Nursing Homes
Seattle-Tacoma International Airport



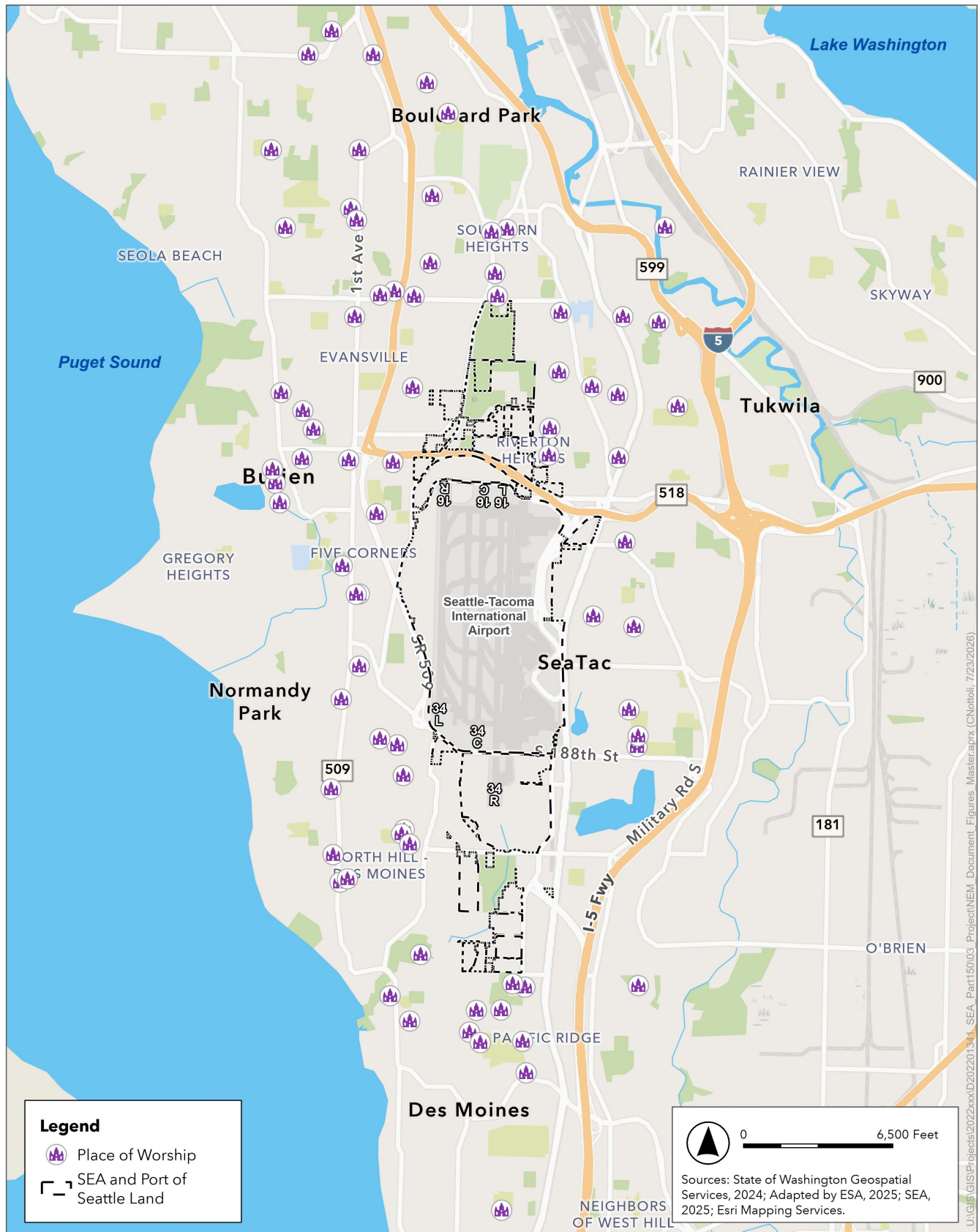


Figure 3-6
Generalized Noise Sensitive Uses - Places of Worship
Seattle-Tacoma International Airport

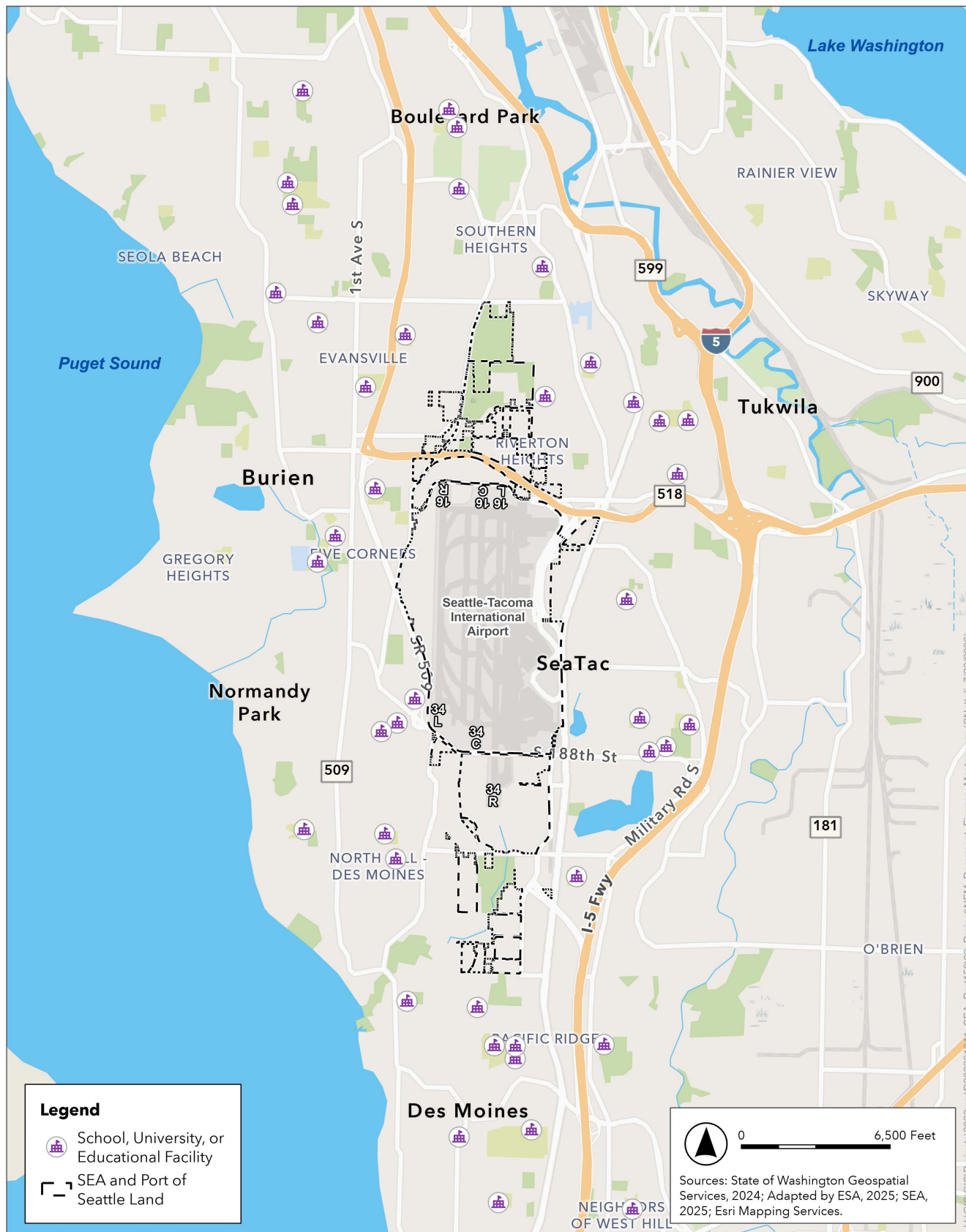


Figure 3-7
Generalized Noise Sensitive Uses - Schools, Universities, and Educational Facilities
Seattle-Tacoma International Airport

3.4 LAND USE CONTROL REGULATIONS

The identification and evaluation of land use controls were conducted to establish an understanding of existing regulatory frameworks (e.g., zoning ordinances) within each political jurisdiction encompassed by the Study Area. This review focused on permitted uses within each zoning district and revealed instances where certain allowable uses (i.e., mixed-use zones) may be potentially incompatible with aircraft noise exposure, depending on the outcomes of the noise analysis.

For example, in the City of Burien zoning districts such as the Commercial or Mixed-Use and Residential zones permit a combination of residential and commercial uses. These zones are located within areas subject to elevated aircraft noise levels, particularly those falling within the DNL 65+. While these zones support urban density and economic development, they also introduce noise-sensitive uses (e.g., multi-family housing) into areas where ambient noise from SEA operations may exceed acceptable thresholds. Burien has adopted Chapter 15.12 of its Municipal Code, which outlines aircraft noise reduction requirements for new construction and additions within designated noise reduction areas.¹⁸ However, the zoning allowances themselves may still pose compatibility challenges if not paired with robust noise mitigation strategies.

These findings underscore the importance of land use planning in mitigating future conflicts between development and noise impacts. As part of the NCP phase of this Part 150 Study, these concerns will be further examined through the identification and assessment of land use management measures. These may include zoning amendments, overlay districts, conditional use restrictions, or other regulatory tools aimed at preventing the introduction of new incompatible land uses within areas exposed to DNL 65+.

¹⁸ The City of Burien Municipal Code Chapter 15.12 can be accessed at <https://www.codepublishing.com/WA/Burien/html/Burien15/Burien1512.html>.



Chapter 4. NEM Development

4.1 INTRODUCTION

This chapter summarizes the methods and data used to conduct the aircraft noise analysis and produce the noise exposure contours that are depicted on the NEMs. This chapter will provide information on the noise model used to calculate noise exposure, the noise metric used in this study, and information and data used as inputs into the noise model. Noise modeling inputs used in the development of the NEMs are from the 2024 SAMP NTP NEPA EA.

4.2 FAA NOISE MODEL AND METRICS

4.2.1 Aviation Environmental Design Tool

The FAA's AEDT is the required model to calculate noise exposure for federal actions that are required to comply with the National Environmental Policy Act (NEPA) and for 14 CFR Part 150 studies. AEDT 3f was released on December 13, 2023, and was the latest FAA-approved noise model available at the time of the SAMP NTP NEPA EA noise analysis. This model was used to calculate noise exposure for the Existing Conditions (2022) and the Future Conditions (2032).

AEDT uses airport-specific information (e.g., runway data); flight track information; aircraft operation levels distributed by time of day, aircraft fleet mix, and aircraft profiles to develop noise exposure contours. AEDT accounts for each aircraft flight along flight tracks departing from, or arriving to, an airport. The flight tracks are coupled with aircraft performance and noise profile information in the model's database relating to noise levels at varying distances and flight performance parameters for each type of aircraft. In general, the model computes and sums noise levels at grid locations at ground level around the airport. The cumulative values of noise exposure at each grid location are used to develop contours of equal noise exposure. AEDT can also compute noise levels at user-defined points.

4.2.2 Day Night Average Sound Level

Day-Night Average Sound Level (DNL), expressed in A-weighted decibels (dBA), accounts for the noise levels of all individual aircraft events over a year, the number of times those events occur, and the period of day/night in which they occur. The calculation of DNL logarithmically averages aircraft sound levels at grid locations over a 24-hour period, referred to as an "average annual day," with a 10-decibel adjustment added to those noise events occurring between 10 p.m. and 7 a.m. Because of the increased sensitivity to noise during normal sleeping hours and because ambient (without aircraft) sound levels during nighttime are typically lower than during daytime hours, the 10-decibel adjustment, or "weighting," represents the added intrusiveness of sounds occurring during nighttime hours.

The DNL metric is the noise descriptor required by the FAA for aircraft noise exposure analyses for NEPA studies and land use compatibility planning under 14 CFR Part 150. A more detailed discussion of AEDT and noise metrics is provided in **Appendix C**.

4.3 OPERATIONAL DATA

The following sections summarize the information used to develop the Existing and Future Condition NEMs.

4.3.1 Forecast Annual Aircraft Operations

In accordance with 14 CFR Part 150, the SEA NEMs include the Existing Conditions (2022) and Future Conditions (2032). To obtain aircraft activity levels for the development of the NEMs, an aircraft forecast is needed for the future condition. Aviation activity forecasts for air carrier operations were developed in 2023 as part of the SAMP NTP NEPA EA and approved by the FAA.¹⁹

The number of annual aircraft operations modeled for the 2022 Existing Conditions NEM was obtained from the Port's NOMS and the 2032 Future Conditions NEM annual operations were from the FAA-approved Constrained Operating Growth scenario developed for the SAMP NTP NEPA EA. A total of

¹⁹ Aviation activity forecast approved by FAA on April 1, 2024. Additional information on the aviation activity forecast can be found in Appendix B-1.

401,351 annual aircraft operations were modeled in the 2022 Existing Conditions NEM while 475,655 annual aircraft operations were modeled in the 2032 Future Conditions NEM, as identified in the approved FAA forecast as the 2022 Existing Conditions and the 2032 Proposed Action, respectively.²⁰

4.3.2 Aircraft Fleet Mix

Information on aircraft operations was collected from FAA Air Traffic Activity System (ATADS), the Port's NOMS, and airline fleets to determine the types of aircraft (fleet mix) and number of operations per aircraft type at SEA in 2022 and forecast to occur in 2032, as summarized in **Table 4-1**. This information was then used to identify the corresponding model aircraft type within AEDT. Details pertaining to AEDT aircraft operations and types are included in Table 1 and Table 15 of **Appendix B-2**.

Table 4-1. Annual Aircraft Operations by Operational Category

Operational Category	2022	2032
Commercial Jets	338,783	337,426
Cargo Jets	12,470	15,655
Regional Jets	167	117,127
Commercial Turboprop ^a	45,201	0
Cargo Propeller	2,381	2,902
General Aviation Jet	1,391	1,235
General Aviation Propeller	904	210
Other ^b	—	1,000
Military	55	100
Total^c	401,351	475,655

SOURCES: Aviation Forecast Update, prepared by Port of Seattle/LeighFisher, 2023; Sustainable Airport Master Plan Near-Term Projects, Constrained Operating Growth Scenarios, Seattle-Tacoma International Airport; Landrum & Brown, September 2023; Landrum & Brown analysis, 2024; Adapted by ESA, 2025.

NOTES:

- a. In 2023, Horizon Air completed the retirement of its Q400 turboprop fleet and transitioned to regional jet operations.
- b. Aircraft categorized under Other include the Boeing 737-900ER and Cessna 208 Caravan.
- c. Operations may not sum to total due to rounding.

4.3.3 Aircraft Operations by Time of Day

As discussed previously, aircraft operations modeled in AEDT are assigned as occurring during daytime or nighttime. **Table 4-2** summarizes day/night utilization in which aircraft arrivals and departures are expected to occur in 2022 and 2032 (by percent of total operations). The 2022 NOMS data served as the primary source for the time-of-day information because NOMS captures actual arrival and departure times, versus scheduled times. This accounts for delayed arrivals and departures that sometimes occur

²⁰ Ibid.

at SEA. While it is expected that the time-of-day splits for 2032 will be similar to the existing conditions, the anticipated fleet changes result in some small differences based on future schedule simulations, as shown in **Table 4-2**. A detailed description of operation times of day, by aircraft category, is provided in **Appendix B-2**, with 2022 data in Tables 2 and 3 and 2032 data in Tables 20 and 21.

Table 4-2. Annual Aircraft Operations by Time of Day (All Aircraft)

Study Year	Arrivals		Departures	
	Day	Night	Day	Night
2022	85.1%	14.9%	83.0%	17.0%
2032	83.3%	16.7%	84.5%	15.5%

SOURCES: SEA EnvironmentalVue (NOMS) data, January 2022-December 2022; Landrum & Brown analysis, 2024. L&B Analysis, 2023; Adapted by ESA, 2025.

4.3.4 Departure Stage Length

Noise exposure from aircraft departures varies depending on takeoff weight. For example, a fully loaded aircraft departing on a long-haul flight typically 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 (see **Figure 4-1**). A heavier aircraft typically requires higher power (thrust settings) to reach its takeoff speed and uses more runway length. Heavier aircraft also climb at a slower rate than lighter aircraft. Therefore, a larger area can be exposed to higher levels of aircraft noise by departures of heavier aircraft. To account for this variance in aircraft weight, AEDT contains up to nine departure climb profiles (corresponding to different departure weights), depending on the type of aircraft. These profiles represent aircraft origin-to-destination trip lengths from 500 nautical miles to over 11,000 nautical miles. The trip distances for each stage length are shown in **Table 4-3**.

Calendar year 2022 NOMS operations data were analyzed to determine existing departure stage lengths at SEA by aircraft type for 2022 and stage lengths in 2032 were based on future schedule simulations. **Table 4-4** summarizes the existing and forecast departure stage lengths for all aircraft at SEA in 2022 and 2032. While it is expected that the stage lengths for 2032 will be similar to the 2022 conditions, the expected fleet changes result in some small differences. A detailed description of stage length by aircraft category is provided in **Appendix B-2**, with 2022 data in Table 7-4 and 2032 data in Table 7-18.

Figure 4-1. Stage Length Comparison for Boeing 737-800



SOURCES: ESA, 2025; AEDT, 2025.

Table 4-3. AEDT Departure Stage Length Categories

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

SOURCE: FAA, 2025.

Table 4-4. Departure Stage Length Distribution (All Aircraft)

Year	Stage Length									
	1	2	3	4	5	6	7	8	9	M
2022	27.0%	34.6%	13.3%	21.6%	0.2%	2.0%	1.0%	0.0%	0.2%	0.0%
2032	21.8%	38.0%	14.2%	19.5%	0.0%	2.9%	3.6%	0.0%	0.0%	0.0%

SOURCES: SEA EnvironmentalVue (NOMS) data, January 2022-December 2022; Landrum & Brown analysis, 2023; Adapted by ESA, 2025.

NOTE: Totals may not sum due to rounding.

4.4 METEOROLOGICAL CONDITIONS

AEDT accounts for the influences of meteorological conditions on aircraft performance and atmospheric sound absorption, using temperature and relative humidity to calculate atmospheric absorption coefficients, which in turn are used to adjust standard aircraft performance noise-power-distance curve levels. For example, hotter temperatures reduce the climb performance of aircraft and result in more land area exposed to higher levels of aircraft noise by departures. For both the 2022 and 2032 NEMs, the AEDT default 10-year (2012–2001) meteorological data for SEA was used and is presented in **Table 4-5**.

Table 4-5. AEDT Meteorological Data

Meteorological Parameter	Default AEDT Value
Temperature	52.67° Fahrenheit
Sea Level Pressure	1,018.13 millibars
Static Pressure	1,001.43 millibars
Dew Point	43.82° Fahrenheit
Relative Humidity	71.79%
Wind Speed	6.74 knots

SOURCES: Landrum & Brown Noise Protocol, 2023.

4.5 AIRPORT OPERATIONAL INFORMATION

4.5.1 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. Runway utilization data were derived from NOMS data for calendar year 2022. **Table 4-6** provides a summary of arrival and departure runway utilization for both 2022 and 2032. Under the 2032 future condition, runway end utilization was based on simulations that were influenced by airfield congestion and the total number of operations occurring at the Airport, as well as the addition of several proposed taxiway improvements designed to enhance efficiency of the airfield. A detailed description of arrival and departure runway utilization by aircraft category is provided in **Appendix B-2**, with 2022 data in Tables 7 and 8 and 2032 data in Tables 32 and 33.

Table 4-6. Arrival and Departure Runway Utilization (All Aircraft)

Operation Type	Runway						
	16C	16L	16R	34C	34L	34R	Total
2022							
Arrival	1.0%	6.1%	63.1%	0.6%	26.6%	2.6%	100.0%
Departure	5.1%	65.8%	0.0%	1.1%	0.0%	28.0%	100.0%
2032							
Arrival	1.0%	10.0%	60.0%	1.0%	24.3%	3.7%	100.0%
Departure	25.7%	45.2%	0.0%	1.1%	0.0%	27.9%	100.0%

SOURCES: SEA EnvironmentalVue (NOMS) data, January 2022-December 2022; Landrum & Brown analysis, 2023; Adapted by ESA, 2025.

NOTE: Totals may not sum due to rounding.

4.5.2 Flight Tracks and Utilization

Flight tracks refer to the route an aircraft follows when arriving to or departing from a runway. To identify flight tracks that represent annual average day conditions at SEA, aircraft arrival and departure data from NOMS were reviewed for calendar year 2022. The 2022 data was used to develop representative modeled flight tracks for use in AEDT.

Representative model flight tracks approximate flight corridors utilized by arriving and departing aircraft to and from each runway end. Corridors were reviewed and a series of centerlines of the flight corridors (backbone tracks) were established. These tracks were dispersed within AEDT to generate sub-tracks in

order to distribute the aircraft within each of the primary flight corridors based on the actual distribution of radar tracks. Missed approach tracks were also created to account for aircraft that must discontinue an approach and execute a go-around. These operations typically involve a partial arrival to the runway, a go-around procedure, and a subsequent arrival upon which the aircraft lands. The AEDT model flight tracks are depicted in **Figure 4-2** through **Figure 4-7**. Additional figures that provide a more detailed depiction of SEA’s arrival and departure flight tracks are provided in **Appendix B**, and large-scale drawings are included in **Appendix H**. Flight track locations for the study years 2022 and 2032 are not expected to change. Flight track utilization is provided in Table A-1 of **Appendix B-2**.

4.5.3 Aircraft Flight Profiles

Aircraft flight profile data contained in NOMS were reviewed. Based on this review, it was determined that modifications to AEDT’s standard profiles were necessary for missed approach operations that occur at SEA. The development of user-defined profiles and missed approach flight tracks was coordinated with the FAA Office of Environment and Energy (AEE). The methodology approved by the FAA/AEE is provided in **Appendix B-2**. FAA/AEE approval of the user-defined profiles and flight tracks is also provided in **Appendix B-2**.

4.5.4 Aircraft Run-Ups

Engine run-ups are conducted after certain types of maintenance are performed on aircraft. For these procedures, aircraft are taxied to designated run-up locations on the airfield and operated at various power settings. The Airport does not have a ground run-up enclosure (GRE); therefore, run-up activities occur at two primary locations on the airfield: to the south on Taxiway B near the south apron, and to the north on Taxiway B west of the north cargo ramp, as depicted in **Figure 4-8**. Aircraft utilizing Taxiway B are oriented at 340 degrees, while those on the south ramp are oriented at 160 degrees. In 2032, changes to runup locations are anticipated due to modifications to the taxiway system and construction of new passenger terminal facilities. As a result, runup activity would shift toward the north and south ends of the airfield but would remain on Taxiway B, as depicted in **Figure 4-9**.

Table 4-7 summarizes daytime and nighttime run-ups for both 2022 and 2032. The number of 2032 engine run-up operations were scaled from 2022 levels, assuming the same distribution across aircraft types. A detailed description of run-up activity by aircraft type is provided in **Appendix B-2**, with 2022 data in Table 4 and 2032 data in Table 27.

Table 4-7. Annual Run-Up Activity (All Aircraft)

Study Year	Run ups
2022	477
2032	566

SOURCES: SEA Runup log 2022, L&B Analysis, 2023; Adapted by ESA, 2025.

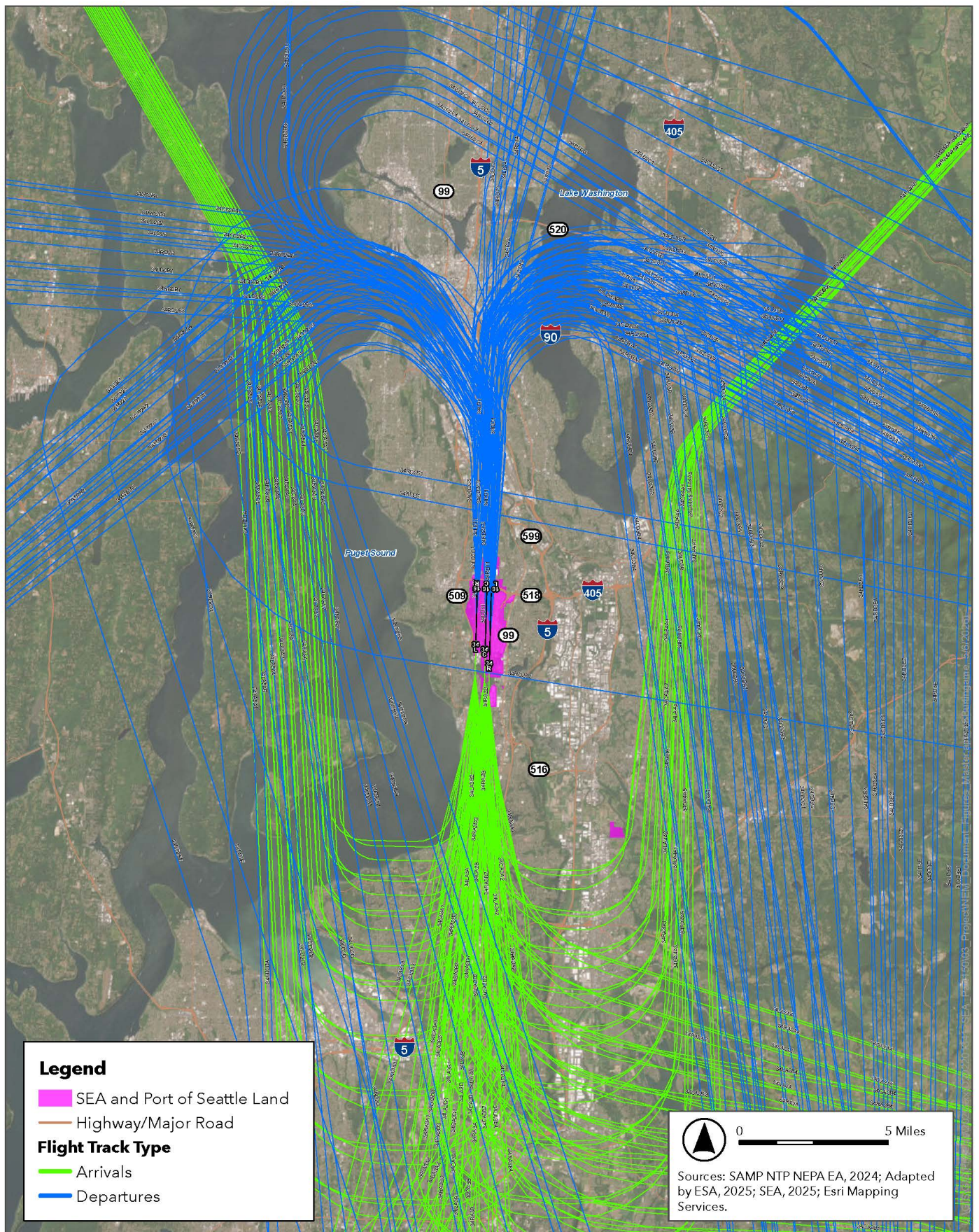


Figure 4-2
 Jet Model Flight Tracks - North Flow
 Seattle-Tacoma International Airport

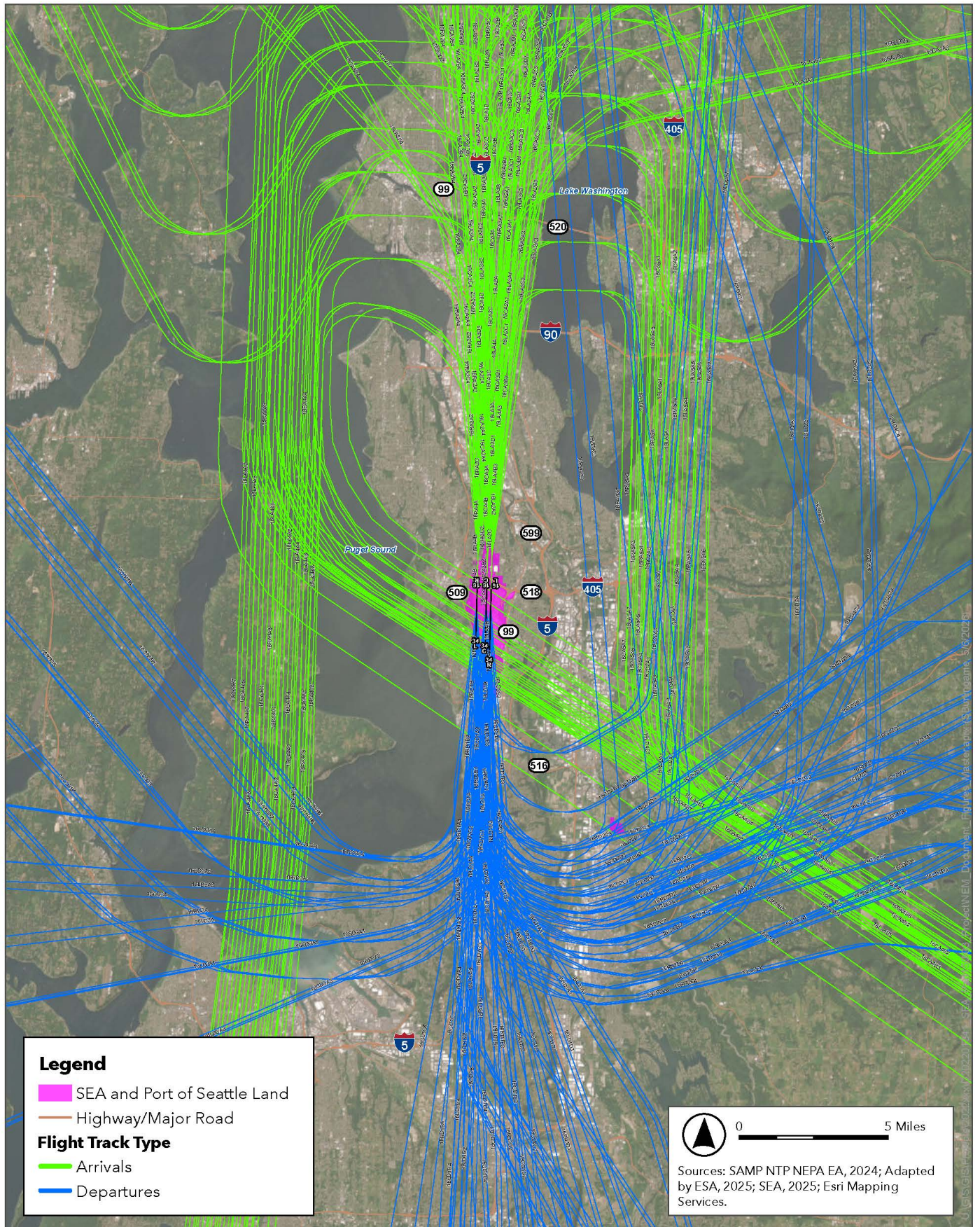


Figure 4-3
 Jet Model Flight Tracks - South Flow
 Seattle-Tacoma International Airport

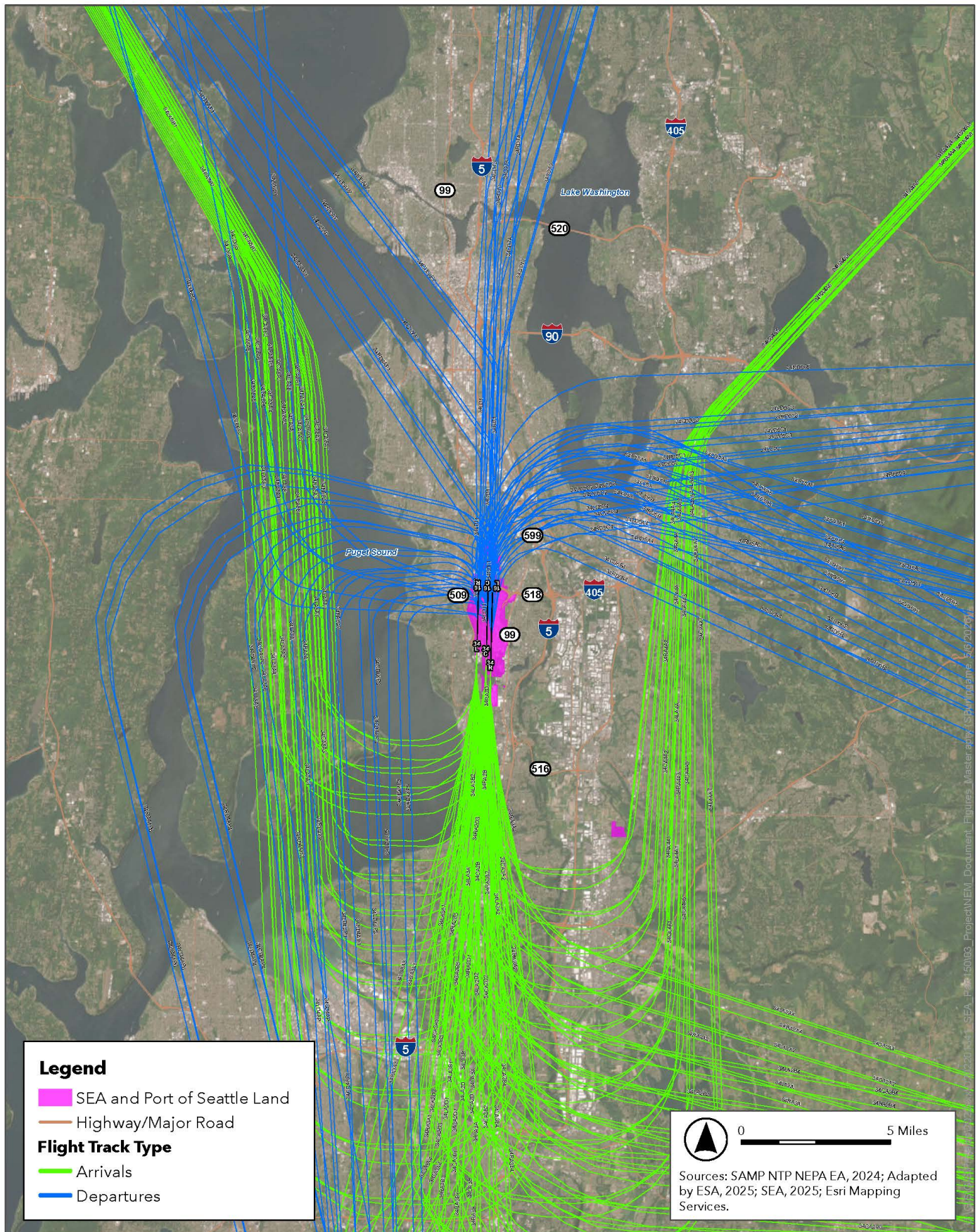


Figure 4-4
Turboprop and Propeller Model Flight Tracks - North Flow
Seattle-Tacoma International Airport

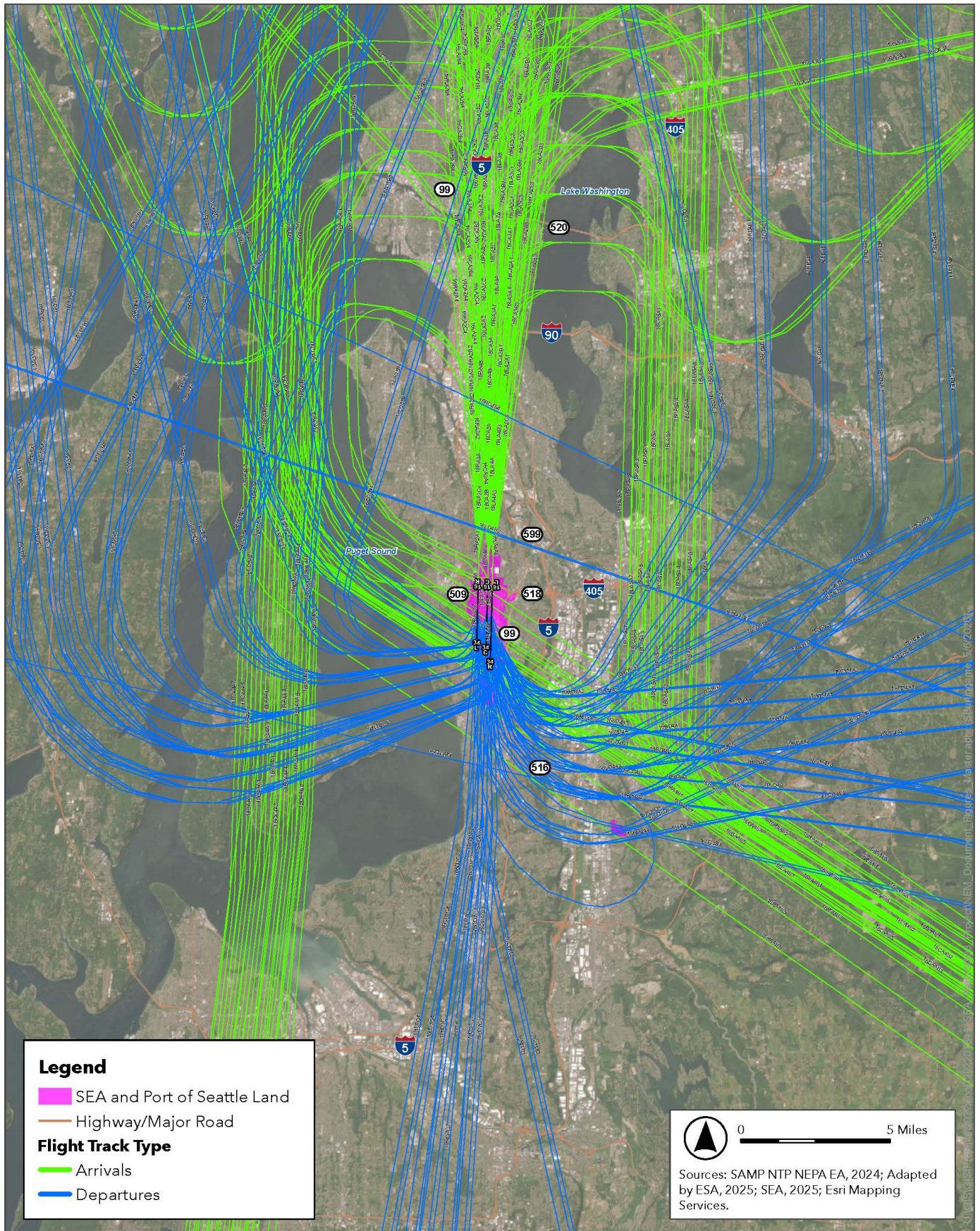


Figure 4-5
Turboprop and Propeller Model Flight Tracks - South Flow
Seattle-Tacoma International Airport

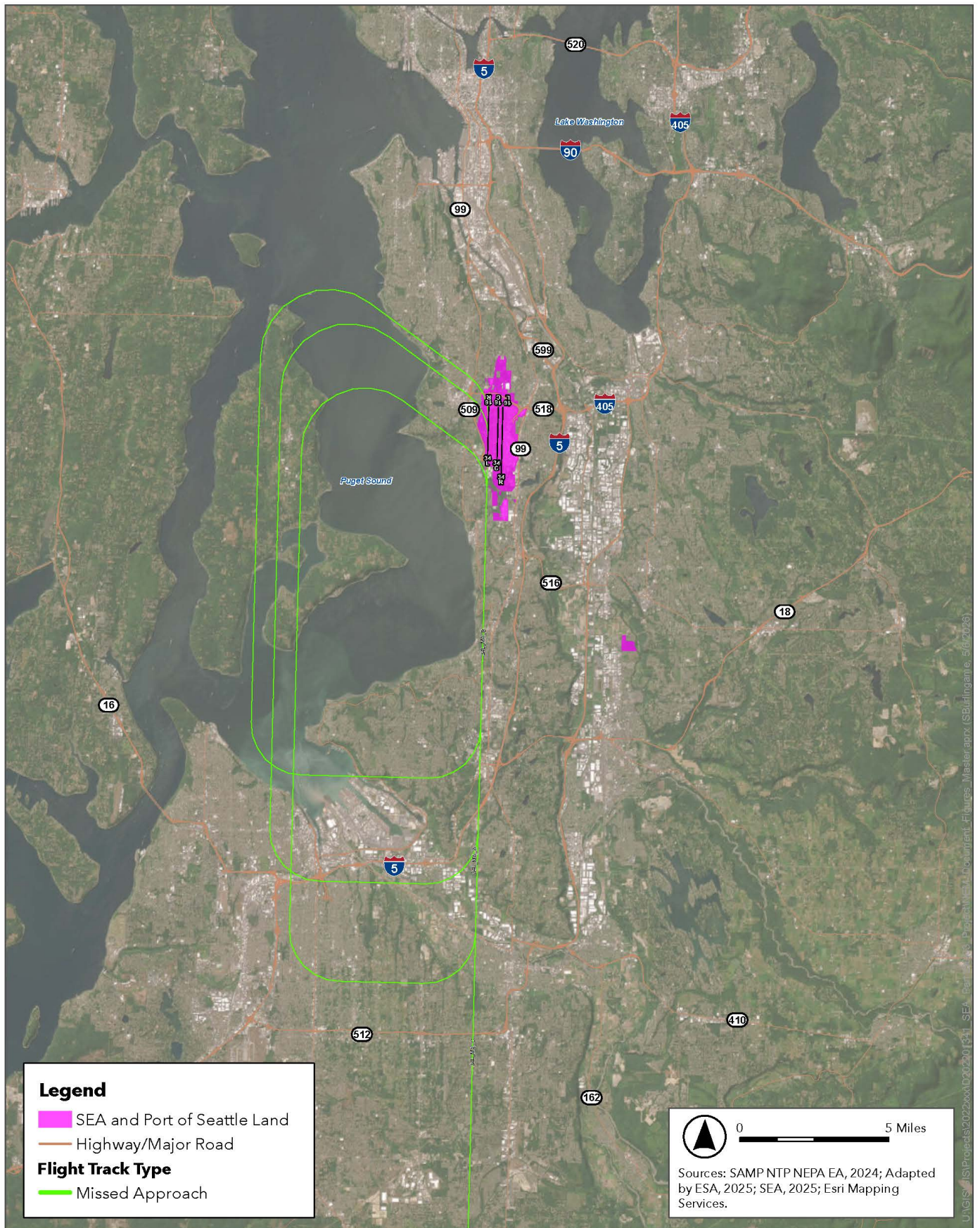


Figure 4-6
Runway 34L Missed Approach Flight Tracks – North Flow
Seattle-Tacoma International Airport

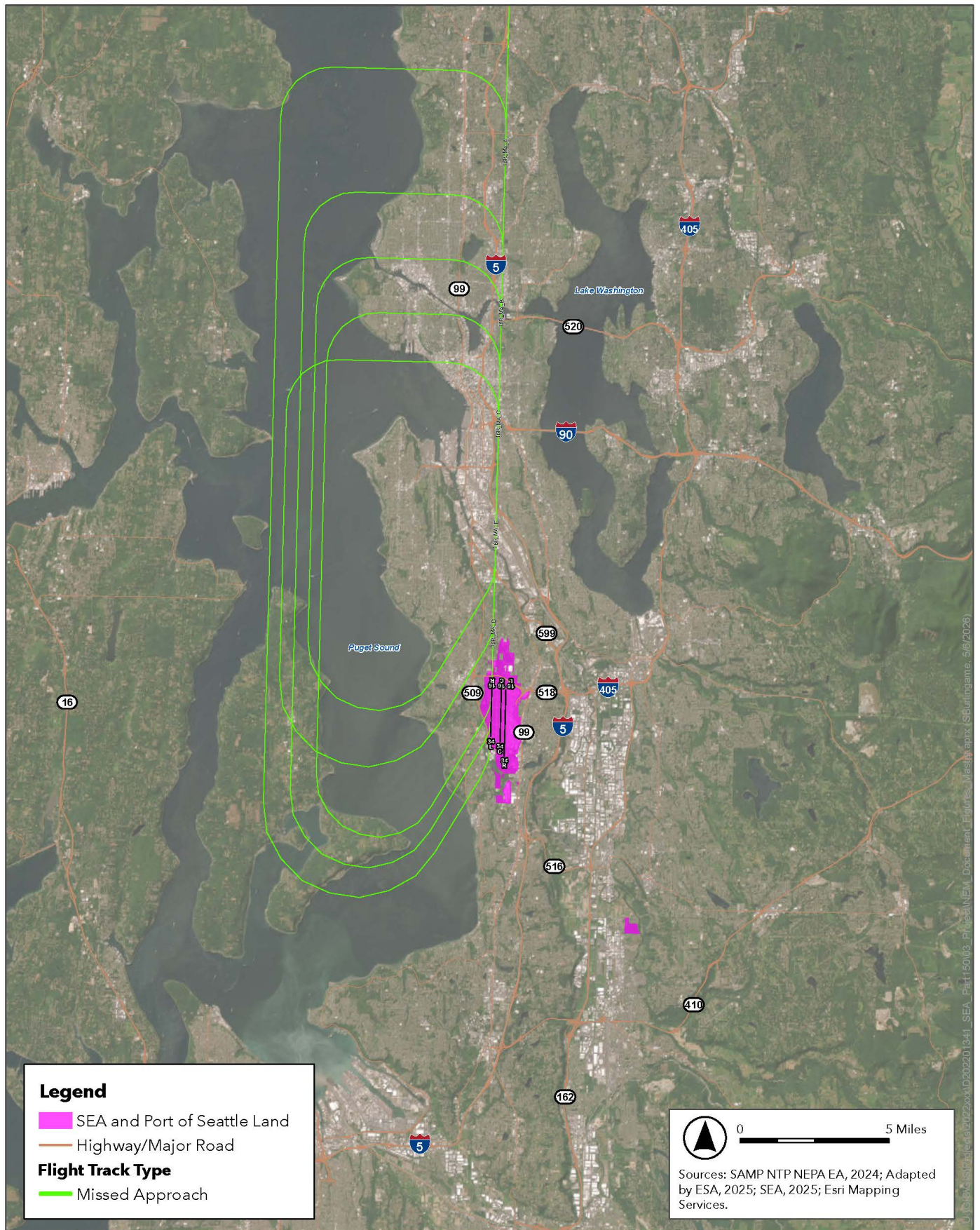


Figure 4-7
Runway 16R Missed Approach Flight Tracks – South Flow
Seattle-Tacoma International Airport



Chapter 5.

2022 and 2032 Noise Exposure

5.1 INTRODUCTION

This chapter presents the 2022 Existing Conditions and 2032 Future Conditions DNL noise contours for SEA. As discussed in **Chapter 4**, the contours show how noise from aircraft operations is distributed over the surrounding area. This chapter interprets land use compatibility using FAA guidelines, identifies noise-sensitive locations, and quantifies the types of land uses and population within the DNL 65+.

14 CFR Part 150 requires that aircraft noise exposure for the existing year (2022) and for a future year (2032) be developed.²¹ Specific elements that are required to be included in the existing and future NEMs and required supplemental graphics are identified in 14 CFR Part 150. These include depictions of noise-sensitive sites within DNL 65+. The official SEA 2022 and 2032 NEMs are included in **Appendix H** of this report. The 2032 Future Conditions NEM reflects noise exposure levels around SEA that would occur without the implementation of any potential measures that may be approved in the next phase of this Part 150 Study, the NCP.

²¹ The DNL contours utilized in this Part 150 Study were initially developed for the recent *SAMP NTP NEPA EA* and approved by FAA in September 2025.

5.2 2022 NOISE EXPOSURE

Figure 5-1 depicts the 2022 Existing Conditions DNL contours superimposed on existing land use. In accordance with 14 CFR Part 150, the DNL 65, 70, and 75 contours are shown. Furthermore, the contours accurately represent noise based on airport and operational data representative of the year 2022, as described in **Section 4.3**. The figure also depicts community and geographic reference points, such as SEA's boundary and runways, political boundaries, area roads and highways, and waterbodies. This figure assists in understanding the geographic relationship of the NEMs to the surrounding community.

The long, relatively narrow shape of the contours extending off the north ends of Runways 16L/34R, 16C/34C, and 16R/34L are consistent with runways primarily used for arrivals. The wider, more varied shape of the contours located off the south ends of the Runways are consistent with runways that are heavily used by departures. The largest concentration of arrival noise is to the north, and the largest departure noise exposure is to the south; this is indicative of predominantly south flow operations, which occur approximately 71% of the time.

5.2.1 Land Use Compatibility – 2022

The total area encompassed by the 2022 DNL 65 and above contours is approximately 5,625 acres. Land uses located within the 2022 DNL 65+ were identified by overlaying the contours on parcel-level land use data obtained from the Washington State Geospatial Portal and King County GIS Center. The types and amount of land uses were calculated using GIS software. The total acres for each land use category within the DNL 65+ are shown in **Table 5-1**. King County and the Cities of Burien, Des Moines, and SeaTac are the public agencies with zoning and planning authority for land within the 2022 NEM 65+.

The FAA's Land Use Compatibility Guidelines discussed in **Section 3.3** show that noise-sensitive land uses such as residential, mobile home parks, schools, etc. are not compatible with noise levels of DNL 65+. Other noise-sensitive land uses such as hospitals, nursing homes, churches, auditoriums, concert halls, and other institutional places of assembly are generally compatible with noise levels between DNL 65 and DNL 75 when measures that achieve an outdoor-to-indoor noise level reduction (NLR) of 25 to 30 decibels are incorporated into the structures. Commercial, industrial/manufacturing, and recreational land (parks, amusement parks, zoos, etc.) are generally less sensitive to noise and considered compatible with noise levels up to DNL 70 (parks are compatible up to DNL 75). Commercial and manufacturing properties are compatible with noise levels up to DNL 80 with NLR of 25 to 30 dB.

As shown in **Table 5-1**, the 2022 NEM DNL 65+ contains approximately 1,033 acres of land designated as Single-Family Residential, 35 acres of Mobile Home Residential, and 106 acres of Multi-Family Residential. Aside from SEA and Port of Seattle Land (approximately 2,595 acres), the majority of non-residential land uses exposed to aircraft noise of DNL 65+ in 2022 are Commercial (approximately 355 acres); Parks, Recreation, and/or Open Space (approximately 255 acres); Public Facilities and/or Institutions (approximately 188 acres); and Transportation and/or Utilities (approximately 149 acres).

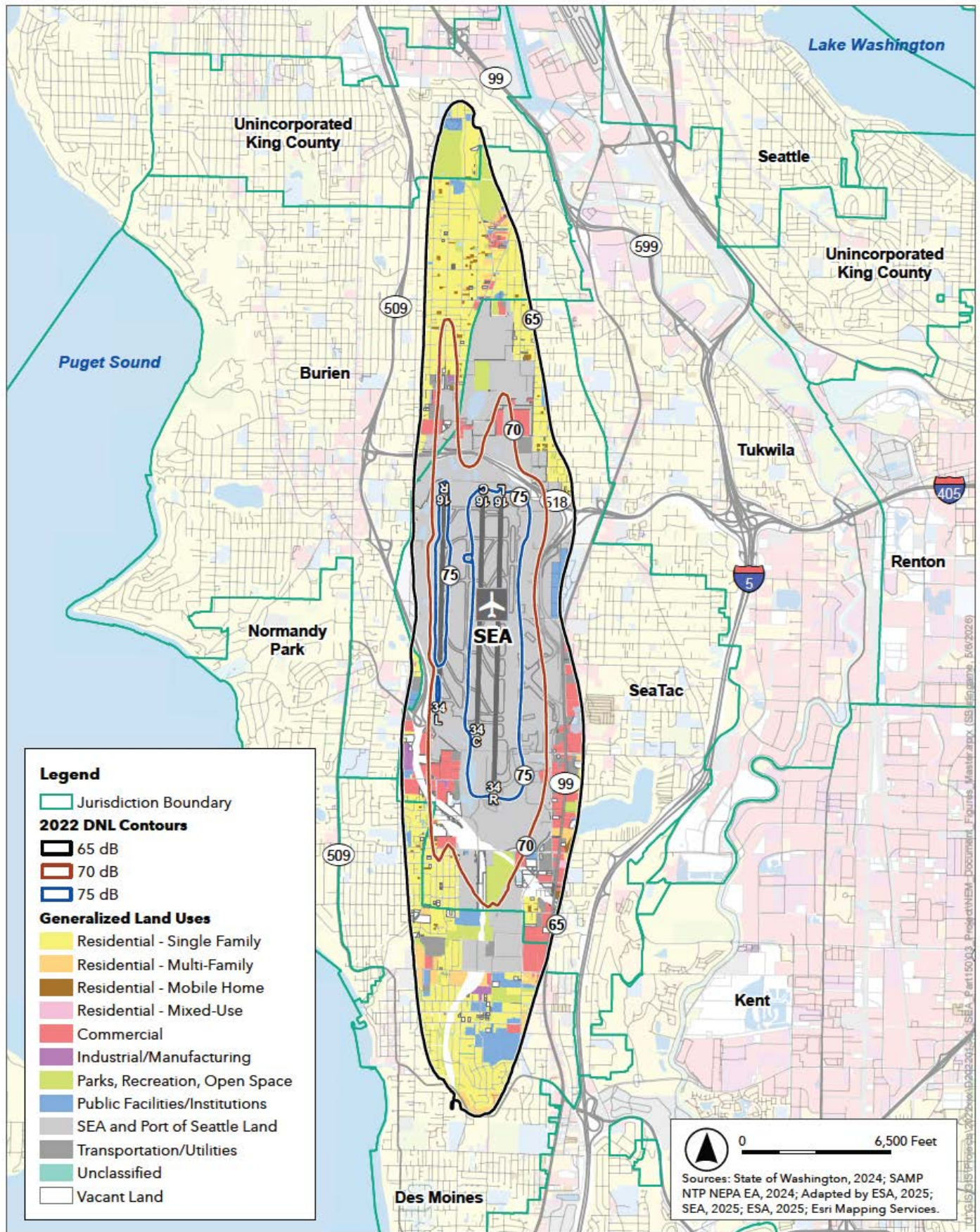


Figure 5-1
2022 DNL Contours and Existing Land Use
Seattle-Tacoma International Airport

Table 5-1. Land Use Exposed to DNL 65 and Above – 2022

Land Use Category ^a	Land Uses Exposed to DNL 65 and Above (acres)				Housing Units ^{b,c}	Population ^{b,c}
	DNL 65–70	DNL 70–75	DNL 75+	Total		
Commercial	275.4	79.4	0.0	354.8	0	0
Industrial/Manufacturing	21.0	3.3	0.0	24.3	0	0
Parks, Recreation, and/or Open Space	210.1	44.8	0.0	255.0	0	0
Public Facilities and/or Institutions	187.4	0.9	0.0	188.3	0	0
Residential – Mixed-Use	2.9	0.0	0.0	2.9	1	2
Residential – Mobile Home	32.9	2.4	0.0	35.3	157	447
Residential – Multi-Family	105.7	0.7	0.0	106.4	2,827	7,022
Residential – Single-Family	998.9	34.1	0.0	1,033.0	3,912	10,890
SEA and Port of Seattle Land	815.2	991.9	788.2	2,595.3	0	0
Transportation and/or Utilities	124.7	24.1	0.4	149.3	0	0
Unclassified	6.1	0.6	0.0	6.7	0	0
Vacant	82.6	39.5	0.1	122.1	0	0
Other ^d	599.0	148.6	4.1	751.7	0	0
Total^e	3,461.8	1,370.3	792.9	5,625.0	6,897	18,362

SOURCES: SAMP NTP NEPA EA, 2025; Washington State Geospatial Portal, 2025; King County GIS Center, 2025; U.S. Census Bureau, 2025; ESA, 2025.

NOTES:

- Land Use Categories derived from King County parcel data with land use information.
- Housing units and population estimates derived from 2020 Census block level data and American Community Survey 5-year Estimates Detailed Tables 2023.
- Since development of the contours for the SAME NTP NEPA EA, some single- and multi-family residential parcels have transitioned to vacant status or converted to commercial use. There has also been new construction in this area, including both single-family and multi-family residential developments.
- “Other” category includes surface area associated with road rights-of-way, water bodies, and any otherwise undevelopable land not reflected in King County Assessor parcel data.
- Totals may not sum due to rounding.

5.2.2 Population and Noise-Sensitive Sites within 2022 DNL Contours

Table 5-2 presents the estimated number of households, population, and the noise-sensitive sites exposed to DNL 65+ in 2022. Based on demographic data by census block from the U.S. Census Bureau’s American Community Survey (ACS) and parcel data, 6,897 housing units are exposed to aircraft noise of DNL 65+ in the 2022 NEM. **Table 5-2** also presents noise-sensitive facilities (e.g., schools, places of worship, hospitals, and nursing homes) exposed to noise levels of DNL 65+. These noise-sensitive facilities are comprised of 30 nursing homes, 20 places of worship, 9 schools, two hospital facilities, and two libraries.

Table 5-2. Noise-Sensitive Sites Exposed to DNL 65 and Above – 2022

DNL Range	Total Area (Acres)	Housing Units ^a	Population ^a	Religious ^b	Schools ^b	Hospitals ^b	Historic Resources ^c	Libraries ^b	Nursing Homes ^b
65–70	3,461.8	6,775	18,030	20	9	2	0	2	29
70–75	1,370.3	122	331	0	0	0	0	0	1
75+	792.9	0	0	0	0	0	0	0	0
Total^d	5,625.0	6,897	18,362	20	9	2	0	2	30

SOURCES: SAMP NTP NEPA EA, 2025; Washington State Geospatial Portal, 2025; King County GIS Center, 2025; U.S. Census Bureau, 2025; ESA, 2025.

NOTES:

- a. Housing units and population estimates derived from 2020 Census block level data and ACS 5-year Estimates Detailed Tables 2023.
- b. Noise-sensitive site data obtained from King County GIS Center.
- c. Information published by the National Park Service regarding the National Register of Historic Places (NRHP) was referenced.
- d. Total may not sum due to rounding.

The population exposed to aircraft noise of DNL 65+ was calculated by assigning dwelling units, or households, to the contour interval range in which they are located, then determining the average number of persons per household according to the associated U.S. Census Bureau census block group estimates and multiplying that number by the number of households within each contour range). The total population exposed to aircraft noise of DNL 65+ was estimated to be approximately 18,362 people.

Of the 6,897 housing units exposed to aircraft noise of DNL 65+ in 2022, there are 1,194 housing units that are noncompatible. Based upon past Part 150 practices, any residential structure built before December 3, 1986, in the City of Des Moines and in all other areas built prior to September 6, 1987, are considered noncompatible and therefore eligible for noise mitigation measures (**Table 5-3**). In addition, housing units that have been insulated through the Port’s SIP or have undergone acoustic testing and demonstrated compliance with FAA interior noise standards are considered compatible and are not included in the noncompatible count. The noncompatible units within the DNL 65+ include a mix of single-family, multi-family, mixed use, and mobile homes. These dwelling units are distributed relatively uniformly throughout the interior of the 2022 Existing Conditions DNL 65 contour area, as depicted in **Figure 5-2**.

Table 5-3. Noncompatible Housing Units and Population – 2022

DNL Range	Housing Units	Population
65–70	1,187	4,989
70–75	7	17
75+	0	0
Total	1,194	5,006

SOURCE: 2020 US Census Bureau and ACS 5-year Estimates Detailed Tables 2023; SEA Sound Insulation Program housing unit data from the Port of Seattle; ESA, 2025

NOTES:

- a. Housing units and population estimates derived from 2020 Census block level data and American Community Survey 5-year Estimates Detailed Tables 2023.
- b. There have been additional homes insulated since the SAMP NTP NEPA EA analysis; this table reflects the most current data.

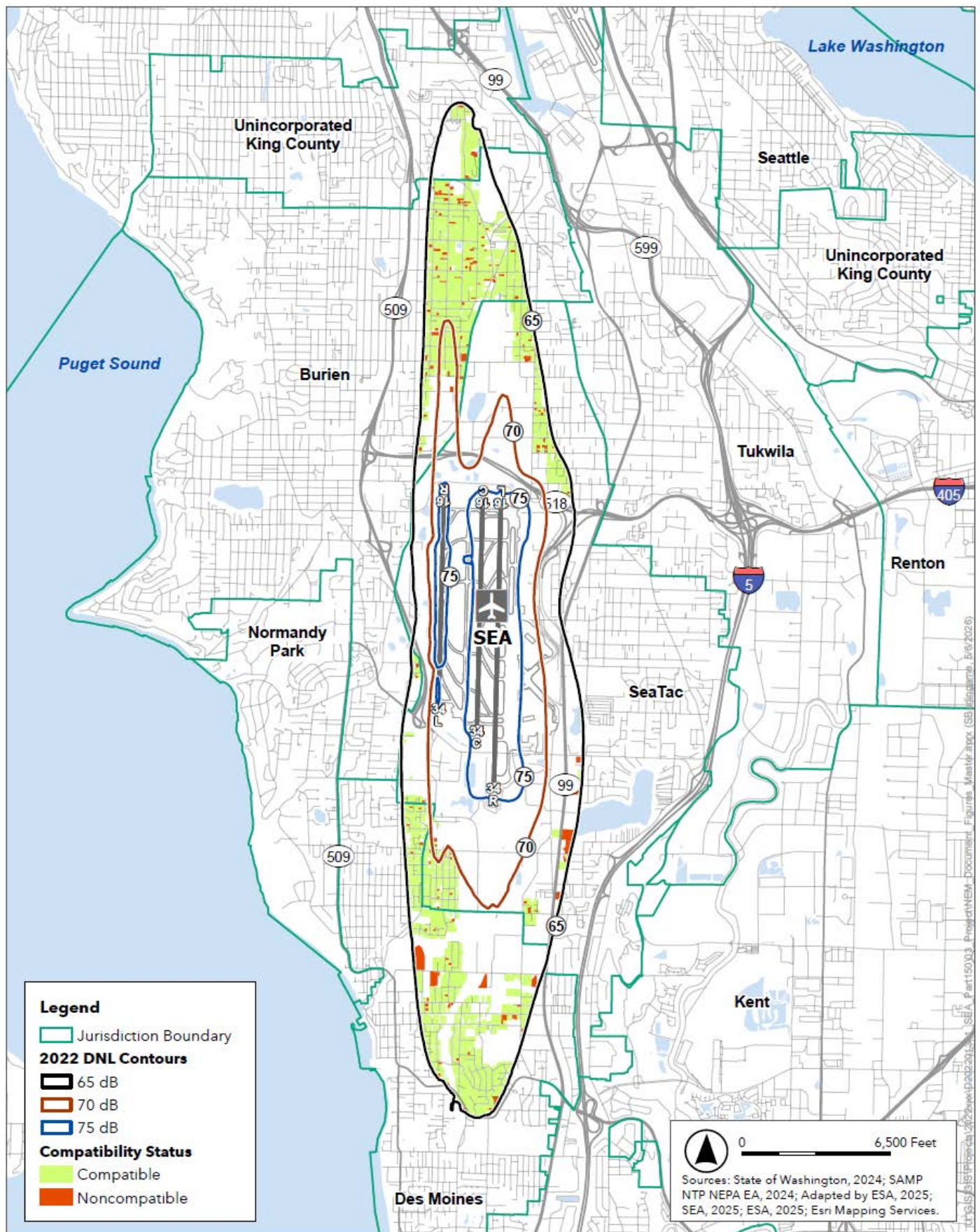


Figure 5-2
2022 DNL Contours and Residential Compatibility Status
Seattle-Tacoma International Airport

5.3 2032 NOISE EXPOSURE

The 2032 Future Conditions DNL contours are depicted on **Figure 5-3**. Like **Figure 5-1**, the 2032 contours are superimposed over existing land use. A discussion on future land use is included in **Appendix D** of this report. In accordance with 14 CFR Part 150, the 2032 contours reflect the anticipated noise conditions based on the future airport layout (see **Section 1.3**) and forecast operational data that are representative of the year 2032, as described in **Section 4.3**. Compared to the 2022 contours, the size and shape of the 2032 contours are similar but reflect an increase in noise exposure relative to increased use of the western and centermost runways as well as an increase in forecasted aircraft operations. The increase in contour size is primarily associated with arrivals to Runway 16R and departures from Runway 16C, which extend the contours to the north and south, respectively.

Land uses within the NEM are identified as potentially non-compatible based on the predicted noise exposure levels and land use classification. A non-compatible designation does not determine mitigation eligibility and requires further evaluation in the NCP phase.

5.3.1 Land Use Compatibility – 2032

The total area encompassed by the 2032 DNL 65+ contours is approximately 6,560 acres. The type and amount of land uses within DNL 65+ are provided in **Table 5-4**. As indicated in the table, the 2032 NEMs contain approximately 1,374 acres of land designated as Single-Family Residential, 42 acres of Mobile Home Residential, and 190 acres of Multi-Family Residential. Excluding SEA and Port of Seattle Land (approximately 2,625 acres), the majority of the non-residential land uses exposed to aircraft noise of DNL 65+ in 2032 are Commercial (384 acres); Public Facilities and/or Institutions (259 acres); Parks, Recreation, and/or Open Space (343 acres); and Transportation and/or Utilities (165 acres).

5.3.2 Population and Noise-Sensitive Sites within 2032 DNL Contours

Table 5-5 presents the estimated number of households, population and the noise-sensitive sites exposed to DNL 65+ in 2032. Based on demographic data from the U.S. Census Bureau, and parcel data from the Washington State Geospatial Portal and King County GIS Center, the total number of households and population exposed to aircraft noise of DNL 65+ would be 9,918 and 26,240 respectively. When compared to 2022, this represents an increase of approximately 3,021 housing units and 7,879 people, resulting from the growth shown in the 2032 NEM. **Table 5-5** also presents the noise-sensitive facilities, which are comprised of 43 nursing homes, 23 places of worship, 13 schools, two hospital facilities, and two libraries exposed to DNL 65+ in 2032.

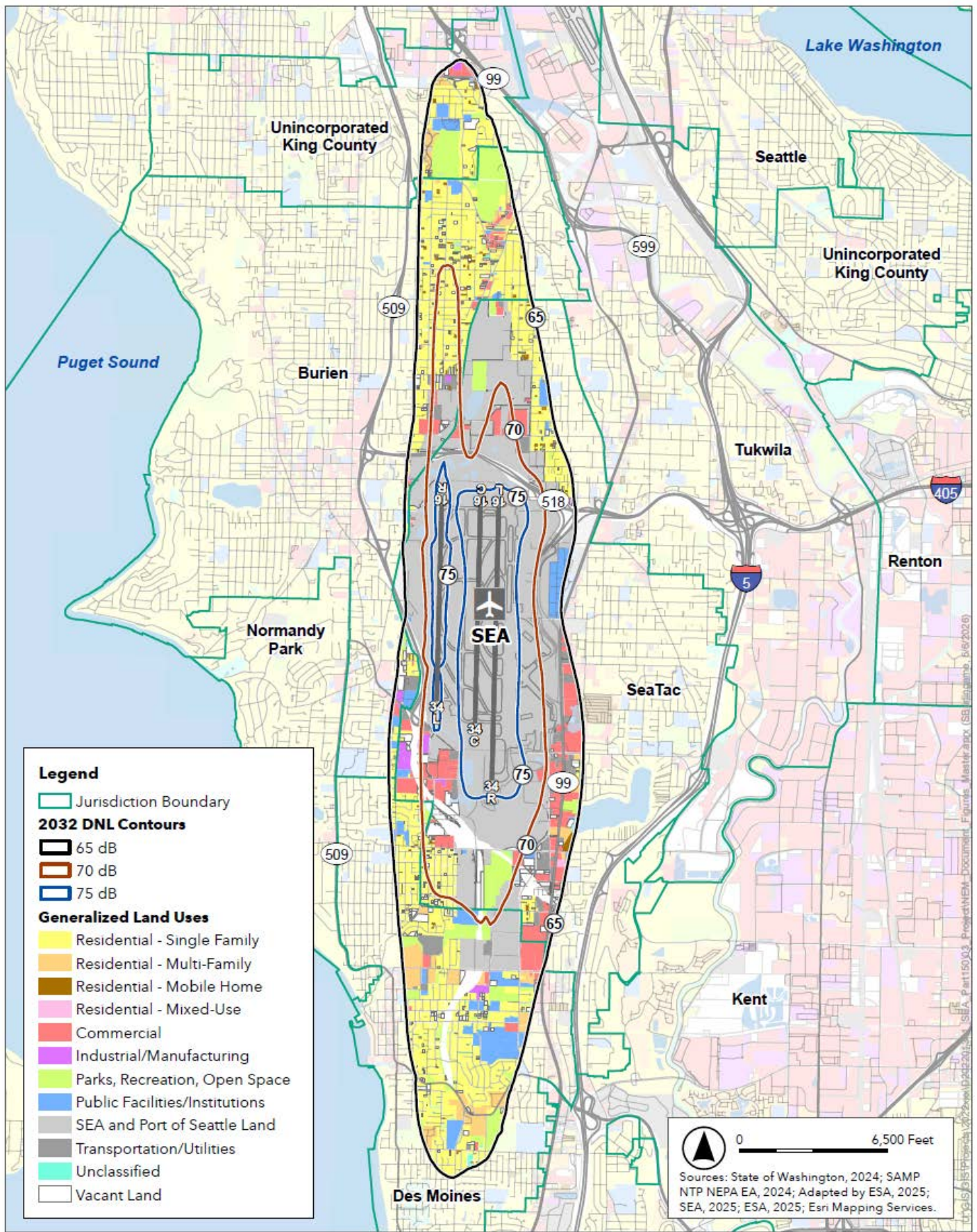


Figure 5-3
2032 DNL Contours and Existing Land Use
Seattle-Tacoma International Airport

Table 5-4. Land Use Exposed to DNL 65 and Above – 2032

Land Use Category ^a	Land Uses Exposed to DNL 65 and Above (acres)				Housing Units ^{b,c}	Population ^{b,c}
	DNL 65–70	DNL 70–75	DNL 75+	Total		
Commercial	286.0	98.3	0.0	384.3	0	0
Industrial/Manufacturing	31.4	10.2	0.0	41.6	0	0
Parks, Recreation, and/or Open Space	290.7	51.9	0.0	342.6	0	0
Public Facilities and/or Institutions	255.1	3.5	0.0	258.7	0	0
Residential – Mixed-Use	3.0	0.0	0.0	3.0	1	2
Residential – Mobile Home	36.9	5.3	0.0	42.2	184	526
Residential – Multi-Family	189.2	0.7	0.0	190.0	4,426	10,982
Residential – Single-Family	1,246.6	126.9	0.0	1,373.5	5,307	14,730
SEA and Port of Seattle Land	722.8	970.0	932.1	2,624.9	0	0
Transportation and/or Utilities	131.5	32.9	0.6	165.0	0	0
Unclassified	12.8	1.2	0.0	14.0	0	0
Vacant	164.9	54.9	0.1	219.8	0	0
Other ^d	682.9	212.4	5.4	900.6	0	0
Total^e	4,053.8	1,568.1	938.2	6,560.2	9,918	26,240

SOURCES: SAMP NTP NEPA EA, 2025; Washington State Geospatial Portal, 2025; King County GIS Center, 2025; U.S. Census Bureau, 2025; ESA, 2025.

NOTES:

- Land Use Categories derived from King County parcel data with land use information.
- Housing units and population estimates derived from 2020 Census block level data and ACS 5-year Estimates Detailed Tables 2023.
- Since development of the contours for the SAMP NTP NEPA EA, some single- and multi-family residential parcels have transitioned to vacant status or converted to commercial use. There has also been new construction in this area, including both single-family and multi-family residential developments.
- “Other” category includes surface area associated with road rights-of-way, water bodies, and any otherwise undevelopable land not reflected in King County Assessor parcel data.
- Totals may not sum due to rounding.

Table 5-5. Noise-Sensitive Sites Exposed to DNL 65 and Above – 2032

DNL Range	Total Area (Acres)	Housing Units ^a	Population ^a	Religious ^b	Schools ^b	Hospitals ^b	Historic Resources ^c	Libraries ^b	Nursing Homes ^b
65–70	4,053.8	9,300	24,584	23	13	2	0	2	42
70–75	1,568.1	618	1,656	0	0	0	0	0	1
75+	938.2	0	0	0	0	0	0	0	0
Total^d	6,560.2	9,918	26,240	23	13	2	0	2	43

SOURCES: SAMP NTP NEPA EA, 2025; Washington State Geospatial Portal, 2025; King County GIS Center, 2025; U.S. Census Bureau, 2025; ESA, 2025.

NOTES:

- Housing units and population estimates derived from 2020 Census block level data and ACS 5-year Estimates Detailed Tables 2023.
- Noise-sensitive site data obtained from King County GIS Center.
- Information published by the National Park Service regarding the National Register of Historic Places (NRHP) was referenced.
- Totals may not sum due to rounding.

Of the 9,918 housing units exposed to aircraft noise of DNL 65+ in 2032, there are 2,511 housing units that are noncompatible. These housing units include a combination of single-family, multi-family, mixed use, and mobile homes as shown in **Table 5-6**. Among the 2,511 homes, 1,317 are dwelling units not previously intersected by the 2022 NEM. As depicted in **Figure 5-4**, the noncompatible dwelling units are distributed relatively uniformly throughout the interior of the contour area.

Table 5-6. Noncompatible Housing Units and Population – 2032

DNL Range	Housing Units	Population
65–70	2,477	6,500
70–75	34	93
75+	0	0
Total	2,511	6,593

SOURCE: 2020 US Census Bureau and ACS 5-year Estimates Detailed Tables 2023; SEA Sound Insulation Program; ESA, 2025.

NOTES:

- a. Housing units and population estimates derived from 2020 Census block level data and American Community Survey 5-year Estimates Detailed Tables 2023.
- b. There have been additional homes insulated since the SAME NTP NEPA EA analysis; this table reflects the most current data.

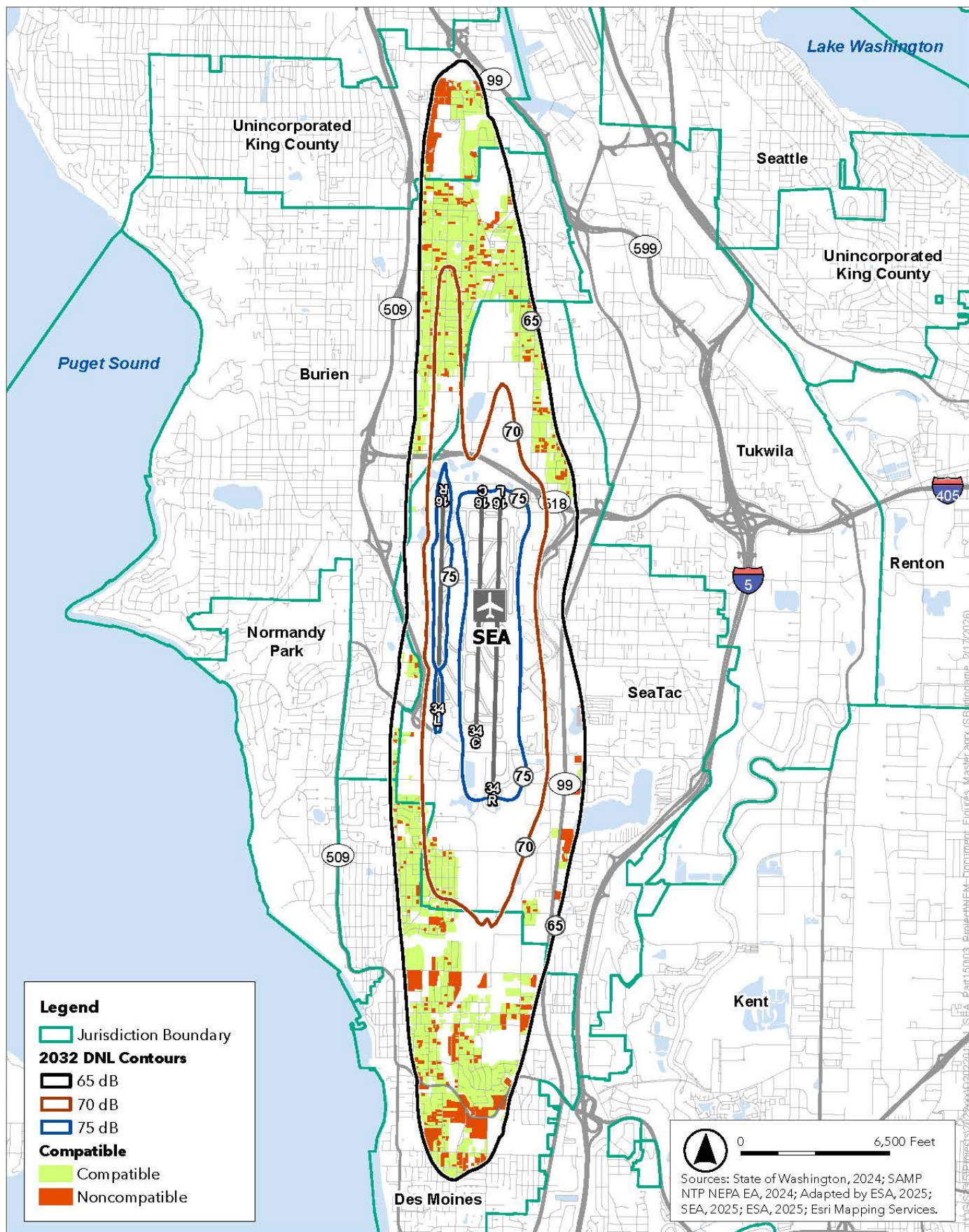


Figure 5-4
2032 DNL Contours and Residential Compatibility Status
Seattle-Tacoma International Airport

5.4 COMPARISON OF 2022 AND 2032 NEMS

A comparison of the 2032 to the 2022 NEMs shows that the land area encompassed by the DNL 65+ in 2032 would be approximately 935.1 acres greater than the area encompassed by the 2022 contours (see **Table 5-7**). The amount of residential land uses exposed to aircraft noise levels of DNL 65+ would increase by approximately 431 acres in 2032. With respect to housing units, approximately 3,000 more units and 7,900 more people would be exposed to noise levels of DNL 65+ in 2032, when compared to 2022 (see **Table 5-8**). **Figure 5-5** shows a comparison of the 2022 and 2032 contours overlaid on the same land use map.

Table 5-7. Change in Land Use Exposed to DNL 65+

Land Use Category ^a	Net Change in Acreage by Land Use			
	DNL 65–70	DNL 70–75	DNL 75+	Total
Commercial	10.6	18.9	0.0	29.5
Industrial/Manufacturing	10.4	6.9	0.0	17.3
Parks, Recreation, and/or Open Space	80.6	7.0	0.0	87.6
Public Facilities and/or Institutions	67.8	2.6	0.0	70.4
Residential – Mixed-Use	0.1	0.0	0.0	0.1
Residential – Mobile Home	4.0	2.9	0.0	6.9
Residential – Multi-Family	83.5	0.1	0.0	83.6
Residential – Single-Family	247.7	92.8	0.0	340.5
SEA and Port of Seattle Land	-92.4	-21.9	143.9	29.6
Transportation and/or Utilities	6.8	8.7	0.2	15.7
Unclassified	6.7	0.6	0.0	7.3
Vacant Land	82.3	15.4	0.0	97.7
Other ^b	83.9	63.8	1.3	148.9
Total^c	592.0	197.8	145.3	935.1

SOURCES: SAMP NTP NEPA EA, 2025; Washington State Geospatial Portal, 2025; King County GIS Center, 2025; U.S. Census Bureau, 2025; ESA, 2025.

NOTES:

- a. Land Use Categories derived from King County parcel data with land use information.
- b. "Other" category includes surface area associated with road rights-of-way, water bodies, and any otherwise undevelopable land not reflected in King County Assessor parcel data.
- c. Totals may not sum due to rounding.

Table 5-8. Change in Noise-Sensitive Sites Exposed to DNL 65 and Above – 2022 to 2032

DNL Range	Total Area (Acres)	Housing Units^{a,b}	Population^{a,b}	Religious^c	Schools^c	Hospitals^c	Historic Resources^d	Libraries^c	Nursing Homes^c
65–70	592.0	2,525	6,553	3	4	0	0	0	13
70–75	197.8	496	1,325	0	0	0	0	0	0
75+	145.3	0	0	0	0	0	0	0	0
Total^e	935.1	3,021	7,879	3	4	0	0	0	13

SOURCES: SAMP NTP NEPA EA, 2025; Washington State Geospatial Portal, 2025; King County GIS Center, 2025; U.S. Census Bureau, 2025; ESA, 2025.

NOTES:

- a. Housing units and population estimates derived from 2020 Census block level data and ACS 5-year Estimates Detailed Tables 2023.
- b. Since development of the contours for the SAMP NTP NEPA EA, some single- and multi-family residential parcels have transitioned to vacant status or converted to commercial use. There has also been new construction in this area, including both single-family and multi-family residential developments.
- c. Noise-sensitive site data obtained from King County GIS Center.
- d. Information published by the National Park Service regarding the National Register of Historic Places (NRHP) was referenced.
- e. Totals may not sum due to rounding.

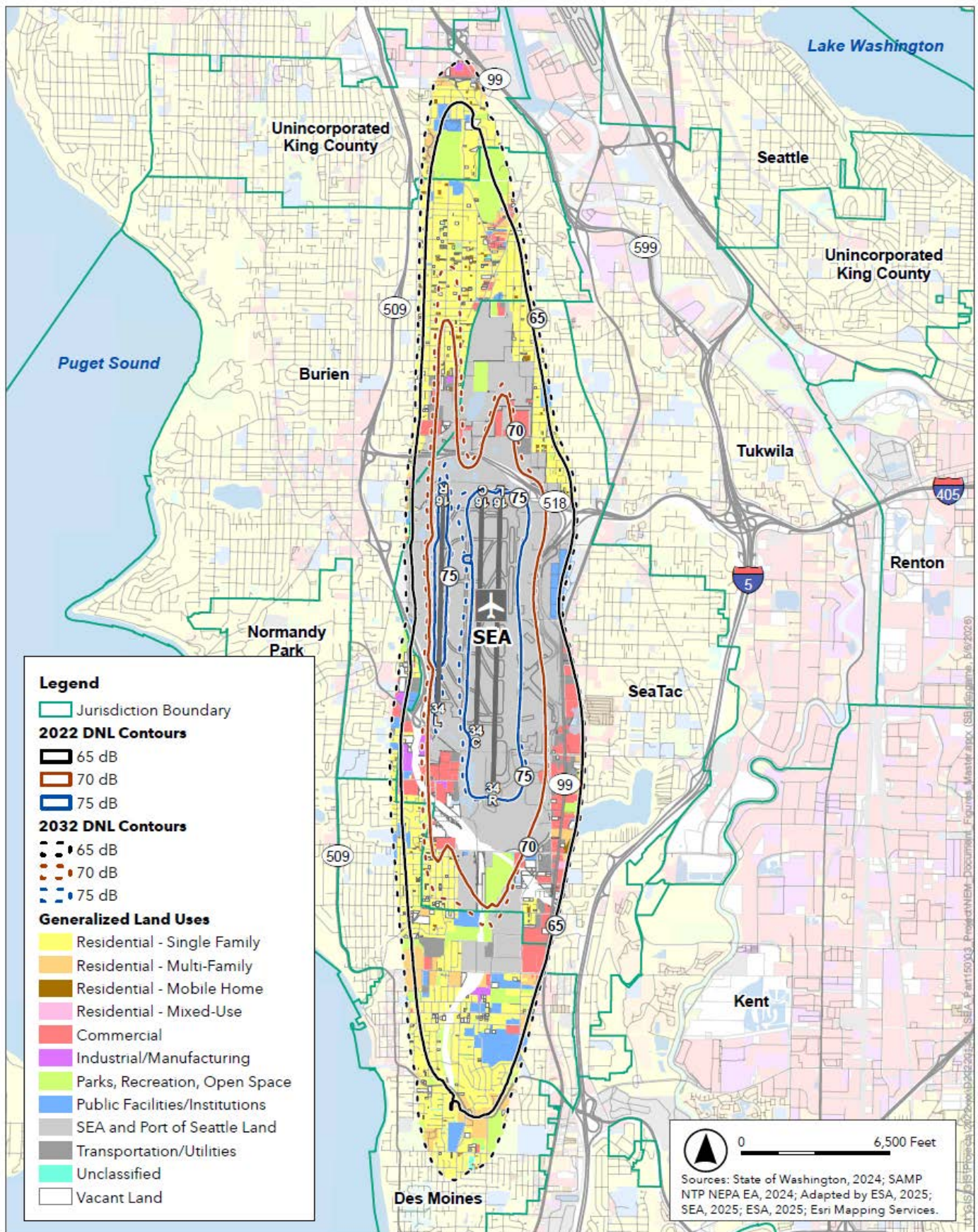


Figure 5-5
2022 and 2032 DNL Contours with Existing Land Use
Seattle-Tacoma International Airport



Chapter 6.

Consultation and Public Involvement

6.1 INTRODUCTION

14 CFR Part 150 §150.21(b) and §150.105(a) require that NEMs and documentation submitted be developed and prepared:

... in consultation with states, public agencies and planning agencies whose area, or any portion of whose area, of jurisdiction is within the DNL 65 dB contour depicted on the map, FAA regional officials, and other Federal officials having local responsibility for land uses depicted on the map. This consultation must include regular aeronautical users of the airport.

Consultation required by 14 CFR Part 150 includes the following entities:

- Aviation users (e.g., airlines, fixed base operators, based aircraft operators);
- Jurisdictional authorities with land located within the DNL 65+; and
- Interested parties (i.e., the public).

The Port implemented a proactive agency consultation and public involvement program that exceeded the requirements of 14 CFR Part 150 and provided opportunities for meaningful public engagement and

participation in the development of the NEMs. Agency consultation and public involvement efforts undertaken for this Part 150 Study are discussed in this chapter.

6.2 TECHNICAL REVIEW COMMITTEE

At the onset of the Study process, the Port formed a Technical Review Committee (TRC), the purpose of which is to provide input into the Part 150 Study prepared for SEA. The TRC is comprised of members representing the Port, local communities and land use jurisdictions, airlines, and the FAA. The TRC members for the Part 150 Study are listed in **Table 6-1**.

Table 6-1. Technical Review Committee Members

Organization Represented	Representative
Port of Seattle	
Airport Noise Programs Airport Planning	Tom Fagerstrom Ryan McMullan Paris Edwards Tom Hooper
Local Jurisdictions	
City of Des Moines	Jason Woycke
City of Burien	Liz Stead
City of Federal Way	Josh Hoff
City of Normandy Park	Jeremy Hammar
City of SeaTac	Zack Shields
City of Tukwila	Neil Tabor
King County	Susan McLain
Airlines	
Alaska Airlines	Lynae Craig
Delta Air Lines	Kalena Glover
Federal Agencies	
Seattle ATO	Rodney Lindbeck
Western Service Center ATO	Joe Bert and Jason Poole
FAA Seattle ADO	Sky Laron

SOURCE: Environmental Science Associates, 2025

The TRC's role is advisory in nature, and its purpose is solely limited to this Study. The TRC may offer opinions, advice, and guidance to the Study Team, but the Port has the sole discretion to accept or reject any TRC recommendations. In addition to providing input and technical advice for the Study, TRC members are responsible for informing their respective organizations of the Committee's discussions.

While membership on the TRC is focused on key stakeholders, the TRC meetings were noticed in advance and open to the public. To promote balanced and constructive interaction among the TRC members, non-members observed during member-only discussion segments. Meeting notes were made available to document the TRC meeting discussions.

A summary of the TRC meetings, including dates and topics discussed, is provided below. Meeting announcements were sent to all TRC members (see **Table 6-1** for a list of members) and posted on the Study website. All TRC meeting materials including agendas, sign-in sheets, presentations, and meeting notes are provided in **Appendix G**.

TRC Meeting #1 (June 10, 2024) – Introduction to the Part 150 Process

This meeting focused on the role of the TRC as well as an introduction to the Part 150 Study process. Meeting topics included an introduction to the TRC and member responsibilities, an overview of the Part 150 Study process and history of Part 150 studies at SEA, regulation of airport noise, airport noise modeling, and schedule.

TRC Meeting #2 (October 14, 2024) – Public Engagement and Land Use Compatibility

This meeting focused on summarizing the Part 150 Study Kick-Off Public Workshops held in June 2024 as well as land use compatibility guidelines described in 14 CFR Part 150. The Study Team overviewed each Kick-Off Public Workshop and described comments and questions raised by community members. The Study Team also discussed land use compatibility and data collection efforts as well as the role of noise monitoring in the Study.

TRC Meeting #3 (June 9, 2025) – Study Progress and Noise Exposure Maps

TRC #3 included a brief review of the prior two TRC meetings and an update on the Part 150 Study progress. This included presenting an alignment with the SAMP NTP NEPA EA and presenting the NEMs that will be included in the NEM Report. This meeting also included a discussion related to land use information and the upcoming coordination with TRC land use jurisdictions.

TRC Meeting #4 (August 11, 2025) – Update on Noise Exposure Maps and Introduction to Noise Compatibility Program

This meeting included a brief review of TRC #3 along with a quick status update on the NEMs. Tentative dates were announced for a second set of public workshops related to the anticipated publication of the NEM Report. The remainder of the meeting was used to introduce the NCP phase of the Study and to encourage the parties to begin thinking about the types of mitigation strategies they may want to be analyzed as part of the Study.

TRC Meeting #5 (December 8, 2025) – Update on Noise Exposure Maps and Noise Compatibility Program Collaboration

This meeting included a brief review of TRC #4 along with a status update on the NEMs and the public and virtual workshops held in September/October 2025 related to the Draft NEMs. This meeting also

included a brief overview of the NCP process and solicited feedback from stakeholders of mitigation strategies that they may want to be considered as part of the NCP.

6.3 PUBLIC ENGAGEMENT

Over the course of the Part 150 Study, the Port held several public workshops and accepted comments from the public. The first round of public workshops was held at the beginning of the Study process, and additional public workshops were held to present the development of the NEMs, including the NEMs and housing/population information. Details of the workshops, other opportunities for engagement, and public comments are provided below.

6.3.1 Study Kick-Off Public Workshops

The first round of public workshops for the Part 150 Study was held throughout the week of June 3, 2024. Due to the number of communities involved and anticipated public attendance, a series of workshops were conducted to provide opportunities to attend on a variety of dates at multiple locations. **Table 6-2** lists the location and time of each workshop:

Table 6-2. Kick-Off Public Workshop Locations

Date	Location	Time
Wednesday, June 5, 2024	Gregory Heights Elementary School 16216 19th Ave. SW, Burien, WA 98166	6 p.m. to 8 p.m.
Thursday, June 6, 2024	Mount Rainier High School 22450 19th Ave S., Des Moines, WA 98198	6 p.m. to 8 p.m.
Saturday June 8, 2024	Glacier Middle School 2450 S. 142nd St., SeaTac, WA 98168	9 a.m. to 11 a.m.

In attendance were community members, press, and public officials (see sign-in sheets included in **Appendix F**). The purpose of the first round of public workshops was to inform the public about the Part 150 Study being initiated for SEA, discuss the Study process and requirements, and solicit input to be considered during the Study by inviting the public to submit written comments at the workshops, via e-mail to the SEA Part 150 Study e-mail address, regular mail, or the Study website.

The information presented provided an overview of the Study process, the purpose of the Study, what the potential outcomes could be, how to provide comments and stay involved, and other relevant information related to the Study. Workshop informational materials included presentation boards and a handout. Copies of the public workshop notice, sign-in sheets, presentation materials, and handouts are provided in **Appendix F**.



A SEA Part 150 Team member discusses the Part 150 process with a member of the public at the first workshop.



An overview of the third workshop held at Glacier Middle School in SeaTac.

6.3.2 Draft NEM Public Workshops

Notice of Public Workshops were published in area publications, including through Sound Publishing, South King Media, and Westside Seattle in September 2025 (see **Appendix F** for specific publications and dates). The Notice was also placed on the Study website at: <https://seapart150.com/> and the events were published on the Port’s Community Events calendar at <https://www.portseattle.org/community/events-at-the-port> as well on social media and newsletters.

Public Workshops were held during the week of September 29, 2025. **Table 6-3** lists the location and time of each workshop. The workshops were “open house” format and included displays and information related to the Part 150 Study process, data inputs and development of the NEMs, project schedule, and the next phase of the Study (NCP). No formal presentation was given during the workshops. This workshop format provided attendees with the opportunity for one-on-one interaction and sharing of information and concerns with the Port. Attendees were welcome to attend at any time during the workshop hours. Comment forms were available at the workshop for those that wished to submit comments in writing, and were available on the Study website, as well.

Table 6-3. Draft NEM Public Workshop Locations

Date	Location	Time
September 30, 2025	Parkside Elementary School 2104 S 247th St., Des Moines, WA, 98198	6 p.m. to 8 p.m.
October 2, 2025	Seahurst Elementary School 14603 14th Ave. SW, Burien, WA 98166	6 p.m. to 8 p.m.
October 4, 2025	Glacier Middle School 2450 S. 142nd St., SeaTac, WA 98168	10 a.m. to 12 p.m.
October 15, 2025	Virtual	Began at 6 p.m.

In addition to the in-person workshops, a virtual public meeting was held on October 15, 2025, beginning at 6 p.m. This virtual meeting provided content consistent with the in-person workshops,

including information on the Part 150 Study process, the NEMs, and the NCP process. To ensure accessibility for all community members, translation services were available upon request.

6.3.3 Public Comments

All public comments received to date, and responses, are included in **Appendix G**. Over 95 comments have been submitted since the Part 150 Study commenced, including comments received at the Kick-off Public Workshops in June 2024, the Draft NEM Public Workshops in September 2025, and comments submitted through regular mail, the Study website, or the Study e-mail address throughout the NEM phase of the Study. The most common topics (unranked) of the public comments include the following concerns:

- Increase in the frequency of operations
- Early morning and late-night flights
- Cargo operations
- Residential sound insulation, including the Repair and Replace Program
- Ground noise
- Usage of the third runway
- Quality of life
- Noise outside the DNL 65 contour

6.4 OTHER PUBLIC OUTREACH AND MEETINGS

Additional elements of the public outreach program implemented by the Port are summarized below.

6.4.1 SEA Stakeholder Advisory Roundtable

The SEA Stakeholder Advisory Roundtable (StART) provides a forum for community members from member cities of SeaTac, Burien, Des Moines, Normandy Park, Tukwila, and Federal Way to discuss SEA-related issues and relay community concerns to the Port. The Study Team has provided updates on the Part 150 Study process at StART meetings throughout the life of the Study. Presentations given to StART can be found in **Appendix E**.

6.4.2 Other Public Outreach

Additional outreach to discuss the Part 150 Study was held with local jurisdictions and neighboring communities throughout the development of the NEMs, detailed in **Table 6-4**.

Table 6-4. Additional Public Outreach Activities

Date	Activity	Entities Present
Wed., May 22, 2024	Highline Forum Briefing	City of Burien, City of Des Moines, City of Federal Way, City of Normandy Park, City of SeaTac, City of Tukwila, Highline College, Highlight School District
Wed., July 31, 2024	SeaTac Summer Market	Community/Open to the Public
Thu., August 1, 2024	Des Moines City Council meeting	Des Moines City Council, Public
Sat., August 10, 2024	Boulevard Park Block Party (Burien)	Community/Open to the Public
Sat., August 10, 2024	Federal Way Community Festival	Community/Open to the Public
Wed., August 14, 2024	Des Moines Waterfront Farmers Market	Community/Open to the Public
Sat., September 21, 2024	Burien B-Town Fiesta	Community/Open to the Public
Sat., June 14, 2025	Discover Burien Strawberry Festival	Community/Open to the Public
Wed., July 9, 2025	City of SeaTac Summer Night Market	Community/Open to the Public
Sat., July 12, 2025	Des Moines Waterfront Farmers Market	Community/Open to the Public
Sat., August 9, 2025	Federal Way Community Festival	Community/Open to the Public
Fri., August 15, 2025	KEXP Summer BBQ	Community/Open to the Public
Sun., August 17, 2025	Tukwila Farmers Market	Community/Open to the Public
Wed., September 10, 2025	Community Based Organization Briefing	SeaTac Airport Community Coalition for Justice (STACC4J) Fix the Harm
Sat., September 13, 2025	Discover Burien Welcoming Burien Event	Community/Open to the Public
Sat., September 20, 2025	City of SeaTac Welcoming Event	Community/Open to the Public
Thu., September 25, 2025	Community Based Organization Briefing	Serve Ethiopians
Thu., October 2, 2025	Community Based Organization Briefing	Para Los Ninos
Fri., October 3, 2025	Community Based Organization Briefing	Congolese Integration Network
Sat., December 6, 2025	Normandy Park Winterfest	Community/Open to the Public

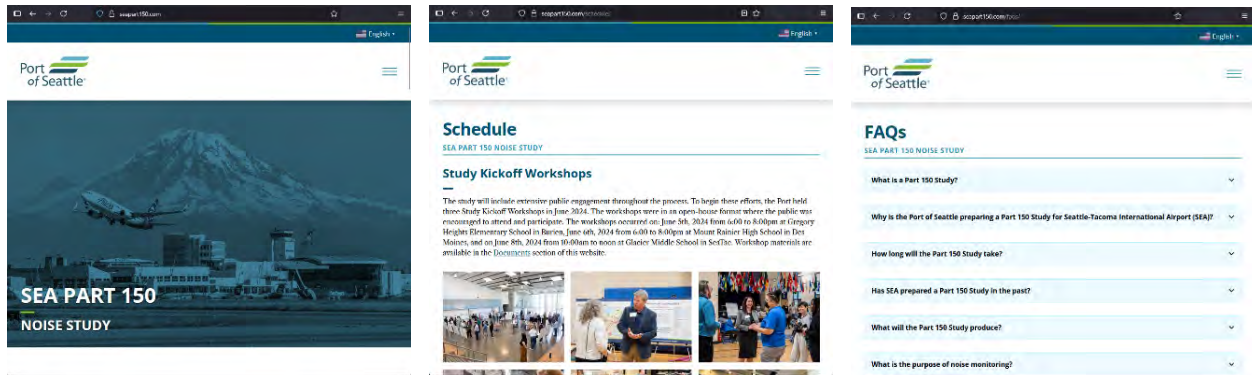
6.4.3 Elected Officials

The Port Project Team coordinated with the Port Commissioners and elected officials throughout development of the NEM Report. Coordination included information about the Part 150 Study, alignment with the SAMP NTP NEPA EA, and provided elected officials opportunities to ask questions or provide feedback on the Study.

6.4.4 SEA Part 150 Study Website

A website was developed and published for the SEA Part 150 Study (seapart150.com). The website contains Study-related information and documents available to stakeholders, agencies, and the general public. Information and documents available on the website include:

- Part 150 Study and Airport information
- Upcoming project meetings and project schedule
- Study documents, including TRC meeting materials, public workshop materials, NEMs and NEM Report, and historical Part 150 Study documentation
- Relevant links
- Frequently Asked Questions
- Port contact information
- Comment Form



Sample pages from the SEA Part 150 Study Website.