

CHAPTER SIX

NOISE COMPATIBILITY PROGRAM

The culmination of the 14 Code of Federal Regulations (CFR) Part 150 planning process is the development of a set of measures designed to enhance the compatibility between an airport and its surrounding environs. This chapter presents previous Part 150 Noise Compatibility Program (NCP) measures for Seattle-Tacoma International Airport (Sea-Tac Airport) that are either being continued as is, continued with modification, or are not being carried forward; as well as new measures that are being recommended. Collectively, these measures are referred to as the 2013 NCP update for Sea-Tac Airport (2013 NCP update). These measures include abatement, mitigation, and program management measures designed to reduce or mitigate the impact of aircraft noise upon the surrounding community and enhance the administration of the overall program. The measures recommended for implementation at Sea-Tac Airport have resulted from the planning process described throughout this document.

Chapter Five, *Alternatives*, includes a list of all alternatives assessed for this NCP update. **Chapter Seven, *Consultation***, contains a discussion of the public consultation process that was conducted for this 2013 NCP update. This process was integral in the development and evaluation of all NCP measures.

The NCP for Sea-Tac Airport was developed in 1985 and updated in 1993 and 2002. Collectively, the 1985, 1993, and 2002 NCP included 17 abatement measures. Of those 17 abatement measures, five have been completed, five are recommended to not be carried forward, and seven are recommended to be continued in this 2013 NCP update. The previous NCPs included 16 mitigation measures. Of those 16 mitigation measures, two have been completed, seven are recommended to not be carried forward, and seven are recommended to be continued. There are two new abatement measures, four new mitigation measures, and three new program management measures recommended for inclusion in this 2013 NCP update.

6.1 NOISE COMPATIBILITY PROGRAM RECOMMENDATIONS

The following section presents the recommended measures for this 2013 NCP update, including new measures, previously approved measures that are recommended to be continued, and previously approved measures that are recommended to not be carried forward. The measures are presented as a series of 'plates' that summarize pertinent information required about each of the measures per 14 CFR Part 150 guidance. This information includes:

- A description and the background and intent of the measure;
- The relationship to the previous (2002) NCP;
- The anticipated effect on land use compatibility;
- The party (or parties) responsible for implementation;

- The steps necessary for implementation, its anticipated cost, and the projected timing for implementation; and
- The effects, if any, to other planning programs and other measures.

Where helpful for clarification, an exhibit associated with the measure is provided. **Table 6-1, Summary of 2013 Noise Compatibility Program Recommendations**, summarizes the measures recommended for this 2013 NCP update, including previously-approved measures that are being continued and recommended new measures. Note that numbering of new measures is continued from the previously-approved measures from the 1985, 1993, and 2002 NCPs. Previously-approved measures that are recommended to be continued do not require FAA re-approval and are included in the baseline condition. Measures that are recommended to not be carried forward in this NCP update require no further FAA action. More detailed information regarding each measure is included in the pages following Table 6-1. Measures that are complete, as identified in Chapter Five, are not included in this section. Several previous measures have been completed and are not discussed in this chapter. Information on completed measures can be found in Chapter One, Section 1.5 and Chapter Five, Sections 5.1 and 5.2.

Following the plates for individual program measures is an exhibit showing the 2013 NCP map which incorporates each of the recommended program measures, as well as a description of the population, housing, and noise-sensitive land use impacts associated with its full implementation by the year 2018 (see **Exhibit 6-2, Future (2018) Noise Exposure Map/Noise Compatibility Program**). This exhibit, which includes the Future (2018) NEM/NCP noise exposure contour, constitutes the official NEM for the future five-year condition.

The final section of this chapter summarizes the preliminary cost estimate of implementing the 2013 NCP update and provides an implementation schedule for the program. As discussed previously, the approval of the 2013 NCP update by the FAA does not commit the FAA or the Port of Seattle (the Port) to the costs or the implementation schedule listed in this document. This information is provided here as a planning tool to assist in the implementation of the NCP.

Implementation of the abatement, corrective land use mitigation, and program management measures is at the discretion of the Port and subject to available funding from both the FAA and the Port. Modification of local plans or zoning ordinances in accordance with the recommended modifications to the Noise Remedy Boundary is solely at the discretion of local governments.

**Table 6-1
SUMMARY OF 2013 NOISE COMPATIBILITY PROGRAM RECOMMENDATIONS
Seattle-Tacoma International Airport**

MEASURE	RESPONSIBLE PARTY	COST TO AIRPORT	COST TO LOCAL GOVERNMENTS	COST TO USERS	IMPLEMENTATION STATUS	RECOMMENDATION AND FAA REQUESTED ACTION
CURRENTLY APPROVED ABATEMENT MEASURES						
Measure A-1: Explore Limited Rescheduling of Nighttime Flights	Port of Seattle, Airport Users	None	None	None	This measure has been implemented and is ongoing	CONTINUE to encourage voluntary limited scheduling of nighttime flights <u>FAA Requested Action:</u> No action by FAA is required.
Measure A-3: Use VOR Radials to Curb Aircraft Drifting from Noise Abatement Track	FAA, Aircraft Operators	None	None	None	This measure has been implemented and is ongoing	CONTINUE measure <u>FAA Requested Action:</u> No action by FAA is required.
Measure A-7: Establish Noise Barriers/Run-up Enclosure	N/A	N/A	N/A	N/A	This measure has not been implemented	Measure Not Being Carried Forward and replaced with Measure A-18 <u>FAA Requested Action:</u> No action by FAA is required.
Measure A-8: Restrict Taxiing of Aircraft to/from Maintenance Areas during Nighttime Hours	N/A	N/A	N/A	N/A	This measure has not been implemented	Measure Not Being Carried Forward <u>FAA Requested Action:</u> No action by FAA is required.

* Measures A-2, A-4, A-5, and A-6 are completed and therefore are not included in Table 6-1 or in the discussion following the table. For more information on those measures not being carried forward see Chapter One, Section 1.5 and Chapter 5, Sections 5.1 and 5.2.

Table 6-1, Continued
SUMMARY OF 2013 NOISE COMPATIBILITY PROGRAM RECOMMENDATIONS
Seattle-Tacoma International Airport

MEASURE	RESPONSIBLE PARTY	COST TO AIRPORT	COST TO LOCAL GOVERNMENTS	COST TO USERS	IMPLEMENTATION STATUS	RECOMMENDED ACTION
CURRENTLY APPROVED ABATEMENT MEASURES (CONTINUED FROM PREVIOUS PAGE)						
Measure A-10: Maintenance Run-up Regulations	Port of Seattle, Aircraft operators	Minimal administrative costs	None	Minimal	This measure has been implemented and is ongoing	CONTINUE measure <u>FAA Requested Action:</u> No action by FAA is required.
Measure A-11: Preferential Runway Use	FAA ATC	None	None	None	This measure has been implemented and is ongoing	CONTINUE measure <u>FAA Requested Action:</u> No action by FAA is required.
Measure A-12: Development/ Implementation of a Fly Quiet Program	FAA ATC	Minimal administrative costs	None	Minimal voluntary costs	This measure has been implemented and is ongoing	CONTINUE measure <u>FAA Requested Action:</u> No action by FAA is required.
Measure A-13: Evaluate Increased Use of the Duwamish/ Elliott Bay Corridor with FMS	N/A	N/A	N/A	N/A	This measure has not been implemented	Measure Not Being Carried Forward <u>FAA Requested Action:</u> No action by FAA is required.

**Table 6-1, Continued
SUMMARY OF 2013 NOISE COMPATIBILITY PROGRAM RECOMMENDATIONS
Seattle-Tacoma International Airport**

MEASURE	RESPONSIBLE PARTY	COST TO AIRPORT	COST TO LOCAL GOVERNMENTS	COST TO USERS	IMPLEMENTATION STATUS	RECOMMENDED ACTION
CURRENTLY APPROVED ABATEMENT MEASURES (CONTINUED FROM PREVIOUS PAGE)						
Measure A-14: Nighttime Use of Commencement Bay Departure Corridor	N/A	N/A	N/A	N/A	This measure has not been implemented	Measure Not Being Carried Forward <u>FAA Requested Action:</u> No action by FAA is required.
Measure A-15: Use of FMS Procedures	FAA, Aircraft Operators	None	None	None	This measure has been implemented and is ongoing	CONTINUE measure <u>FAA Requested Action:</u> No action by FAA is required.
Measure A-16: Use of Ground Equipment	Port of Seattle, Airport Users	None	None	None	This measure is ongoing	CONTINUE measure <u>FAA Requested Action:</u> No action by FAA is required.
Measure A-17 Raise Altitude Where Aircraft Intercept Glide Slope	N/A	N/A	N/A	N/A	This measure has not been implemented	Measure Not Being Carried Forward <u>FAA Requested Action:</u> No action by FAA is required.

Table 6-1, Continued
SUMMARY OF 2013 NOISE COMPATIBILITY PROGRAM RECOMMENDATIONS
Seattle-Tacoma International Airport

MEASURE	RESPONSIBLE PARTY	COST TO AIRPORT	COST TO LOCAL GOVERNMENTS	COST TO USERS	IMPLEMENTATION STATUS	RECOMMENDED ACTION
CURRENTLY APPROVED MITIGATION MEASURES						
Measure M-2a: Standard Insulation	Port of Seattle	\$16,405,000 to \$18,335,000	None	None	This measure is ongoing	CONTINUE measure within modified noise remedy boundary (see Section 6.1.1) <u>FAA Requested Action:</u> No action by FAA is required.
Measure M-2b: Insulation of Schools	Port of Seattle	N/A - Funding previously committed	None	None	This measure is ongoing	CONTINUE measure <u>FAA Requested Action:</u> No action by FAA is required.
Measure M-2c: Multi-Family Developments	Port of Seattle	See Measures M-14 and M-15	None	None	This measure is complete	Measure Not Being Carried Forward and replaced with Measures M-14 and M-15 <u>FAA Requested Action:</u> No action by FAA is required.
Measure M-3: Transaction Assistance	N/A	N/A	N/A	N/A	This measure was updated by measures M-3a and M-3b.	Measure Not Being Carried Forward <u>FAA Requested Action:</u> No action by FAA is required.

Table 6-1, Continued
SUMMARY OF 2013 NOISE COMPATIBILITY PROGRAM RECOMMENDATIONS
Seattle-Tacoma International Airport

MEASURE	RESPONSIBLE PARTY	COST TO AIRPORT	COST TO LOCAL GOVERNMENTS	COST TO USERS	IMPLEMENTATION STATUS	RECOMMENDED ACTION
CURRENTLY APPROVED MITIGATION MEASURES (CONTINUED FROM PREVIOUS PAGE)						
Measure M-3a: Special Purchase Option	N/A	N/A	N/A	N/A	This measure has been discontinued due to lack of community response	Measure Not Being Carried Forward <u>FAA Requested Action:</u> No action by FAA is required.
Measure M-3b: Insulation Requirement	N/A	N/A	N/A	N/A	This measure has been discontinued due to lack of community response	Measure Not Being Carried Forward <u>FAA Requested Action:</u> No action by FAA is required.
Measure M-4: Easement Acquisition	N/A	N/A	N/A	N/A	This measure is ongoing, but modified. The Port does not purchase aviation easements for homes that cannot be sound insulated.	Measure Not Being Carried Forward <u>FAA Requested Action:</u> No action by FAA is required.
Measure M-5: Property Advisory Service	Port of Seattle	Minimal administrative costs	None	None	This measure is ongoing	CONTINUE measure <u>FAA Requested Action:</u> No action by FAA is required.
Measure M-6: Local Government Remedy Support	Port of Seattle	Minimal administrative costs	None	None	This measure is ongoing	CONTINUE measure <u>FAA Requested Action:</u> No action by FAA is required.

Table 6-1, Continued
SUMMARY OF 2013 NOISE COMPATIBILITY PROGRAM RECOMMENDATIONS
Seattle-Tacoma International Airport

MEASURE	RESPONSIBLE PARTY	COST TO AIRPORT	COST TO LOCAL GOVERNMENTS	COST TO USERS	IMPLEMENTATION STATUS	RECOMMENDED ACTION
CURRENTLY APPROVED MITIGATION MEASURES (CONTINUED FROM PREVIOUS PAGE)						
Measure M-7: Funding for Land Use/Noise Compatibility Planning	Port of Seattle	Minimal administrative costs	None	None	This measure is ongoing	CONTINUE measure <u>FAA Requested Action:</u> No action by FAA is required.
Measure M-9: Community Planners Forum	N/A	N/A	N/A	N/A	The Planning Committee was formed and met for several years but has since disbanded	Measure Not Being Carried Forward. The Port participates in the Highline Forum <u>FAA Requested Action:</u> No action by FAA is required.
Measure M-10: Operations Review and NEM Updates	N/A	N/A	N/A	N/A	This 2013 NCP update represents the continuance of this measure	Measure Not Being Carried Forward and replaced with Measure P-2 <u>FAA Requested Action:</u> No action by FAA is required.
Measure M-11: Approach Transition Zone (ATZ) Acquisition	Port of Seattle	\$10,000,000	None	None	This measure is ongoing as a voluntary program	CONTINUE measure <u>FAA Requested Action:</u> No action by FAA is required.
Measure M-12: Prepare Cooperative Development Agreements	Port of Seattle	Minimal administrative costs	Minimal administrative costs	None	This measure is ongoing	CONTINUE measure within modified noise remedy boundary (see Section 6.1.1) <u>FAA Requested Action:</u> No action by FAA is required.

Table 6-1, Continued
SUMMARY OF 2013 NOISE COMPATIBILITY PROGRAM RECOMMENDATIONS
Seattle-Tacoma International Airport

MEASURE	RESPONSIBLE PARTY	COST TO AIRPORT	COST TO LOCAL GOVERNMENTS	COST TO USERS	IMPLEMENTATION STATUS	RECOMMENDED ACTION
RECOMMENDED NEW ABATEMENT MEASURES						
Measure A-18: Construct a Ground Run-up Enclosure (GRE) on the airport to minimize run-up noise.	Port of Seattle & Aircraft Operators	\$6,000,000 for construction plus site preparation costs to be determined by GRE Design Study	None	Minimal operating costs to use GRE facility	This is a new measure	Include in NCP <u>FAA Requested Action:</u> Approval of new measure.
Measure A-19: Expand the Fly Quiet Program	Port of Seattle & Aircraft Operators	Minimal administrative costs	None	Minimal costs to comply with new voluntary program elements	This is a new measure that modifies completed measure A-12	Include in NCP <u>FAA Requested Action:</u> Approval of new measure.
RECOMMENDED NEW MITIGATION MEASURES						
Measure M-14: Sound insulate eligible owner-occupied multi-family units (condominiums) within the modified noise remedy boundary	Port of Seattle	\$16,640,000 to \$21,440,000	None	None	This is a new measure	Include in NCP <u>FAA Requested Action:</u> Approval of new measure.

**Table 6-1, Continued
SUMMARY OF 2013 NOISE COMPATIBILITY PROGRAM RECOMMENDATIONS
Seattle-Tacoma International Airport**

MEASURE	RESPONSIBLE PARTY	COST TO AIRPORT	COST TO LOCAL GOVERNMENTS	COST TO USERS	IMPLEMENTATION STATUS	RECOMMENDED ACTION
RECOMMENDED NEW MITIGATION MEASURES (CONTINUED FROM PREVIOUS PAGE)						
Measure M-15: Sound insulate eligible tenant-occupied multi-family units (apartments) within the modified noise remedy boundary	Port of Seattle	\$34,710,000 to \$46,280,000	None	None	This is a new measure	Include in NCP
						<u>FAA Requested Action:</u> Approval of new measure.
Measure M-16: Offer avigation easements to owners of individual lots on which mobile homes are located within the modified Noise Remedy Boundary.	Port of Seattle	\$440,000	Loss of tax base	None	This is a new measure	Include in NCP
						<u>FAA Requested Action:</u> Approval of new measure.
Measure M-17: Initiate a formal study to evaluate the noise levels at churches/places of worship located within the revised noise remedy boundary for eligibility for sound insulation	Port of Seattle	\$30,000 to \$40,000 to conduct the study - cost to sound insulate eligible church structures, if feasible, will be determined by the study	None	None	This is a new measure	Include in NCP
						<u>FAA Requested Action:</u> Approval of new measure.

Table 6-1, Continued
SUMMARY OF 2013 NOISE COMPATIBILITY PROGRAM RECOMMENDATIONS
Seattle-Tacoma International Airport

MEASURE	RESPONSIBLE PARTY	COST TO AIRPORT	COST TO LOCAL GOVERNMENTS	COST TO USERS	IMPLEMENTATION STATUS	RECOMMENDED ACTION
RECOMMENDED NEW PROGRAM MANAGEMENT MEASURES						
Measure P-1: Upgrade Noise Monitoring and Flight Tracking System	Port of Seattle	\$1,500,000 to \$2,000,000	None	None	This is a new measure	Include in NCP
						<u>FAA Requested Action:</u> Approval of new measure.
						<u>FAA Requested Action:</u> Approval of new measure.
Measure P-2: Periodically review and, if necessary, update the NEMs and the NCP	Port of Seattle	NEM Update: \$400,000 to \$500,000 OR NEM/NCP Update: \$1,000,000	Minimal administrative costs to participate in study	None	This is a new measure	Include in NCP
						<u>FAA Requested Action:</u> Approval of new measure.
Measure P-3: Continue to operate the Noise Office	Port of Seattle	Minimal administrative costs	None	None	This measure has been implemented	Include in NCP: continue to operate the Noise Abatement Office.
						<u>FAA Requested Action:</u> Approval of new measure.

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NOISE COMPATIBILITY PROGRAM MEASURE: A-1

Description: Explore Limited Rescheduling of Nighttime Flights

Background and Intent: The Airport Noise and Capacity Act of 1990 limits the ability of public airports to enact involuntary use restrictions such as nighttime curfews. Proposed restrictions must be reviewed by the FAA under the provisions of 14 CFR Part 161.

This measure involves the voluntary rescheduling of aircraft flight times (earlier or later) of nighttime short-haul flights by jet aircraft. This measure primarily addresses those short-haul flights that currently are scheduled to operate between 10:00 p.m. and 12:00 a.m. or between 5:00 a.m. and 7:00 a.m. to reduce the number of operations of jet aircraft during periods of low ambient noise.

Relationship to 2002 NCP: This measure was included in the 1985 NCP, but not addressed in 2002 NCP.

Land Use Compatibility Improvement: Aircraft noise and overflights are reduced during nighttime hours.

Responsible Implementing Parties: Port of Seattle, airlines

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: The Port should periodically communicate this measure to airlines operating at Sea-Tac Airport and any new airlines that introduce service at Sea-Tac Airport.

Costs: Minimal administrative costs

Schedule: This measure is ongoing. Communication of this measure can occur at the discretion of the Port.

Effects on Other Programs/Measures: The measure is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: A-3

Description: Use VOR Radials to Curb Aircraft Drifting from Noise Abatement Track

Background and Intent: This measure uses very high frequency (VHF) omnidirectional range (VOR) radials to curb departing aircraft from drifting off the runway heading tracks as specified in the Tower Order.

Relationship to 2002 NCP: This measure was included in the 1985 NCP, but not addressed in 2002 NCP.

Land Use Compatibility Improvement: Aircraft noise and overflights are reduced for areas that are not beneath the existing departure corridors

Responsible Implementing Parties: FAA, aircraft operators

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: No additional steps

Costs: No additional costs

Schedule: This measure has been implemented and adherence to this measure is ongoing.

Effects on Other Programs/Measures: The measure is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: A-7

Description: MEASURE NOT BEING CARRIED FORWARD: Establish Noise Barriers/Run-up Enclosure

Background and Intent: The 1985 Part 150 recommended the use of airport facilities for buffering ground noise. This measure was amended in the 2002 NCP update to include the construction of a noise barrier in the North Cargo Area and conduct a siting/feasibility study for a Ground Run-up Enclosure (GRE). The Port completed a feasibility study in 2001, but since then a recommended site could not be finalized because of some serious airfield planning issues adjacent to the area that was designated for a future GRE. A GRE should be located in close proximity to the aircraft maintenance facilities of an airport's primary air carriers. The GRE is currently being reviewed again as part of the current Part 150 Study. This measure is recommended to not be carried forward and replaced with measure A-18.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: N/A

Responsible Implementing Parties: N/A

Implementation Steps, Costs, and Phasing:

FAA Requested Action: Measure is not being carried forward. No action by FAA is required.

Steps: This measure has not been implemented and is recommended to not be carried forward and replaced with measure A-18.

Costs: N/A

Schedule: N/A

Effects on Other Programs/Measures: Not carrying this measure forward is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: A-8

Description: MEASURE NOT BEING CARRIED FORWARD: Restrict Taxiing of Aircraft to/from Maintenance Areas during Nighttime Hours

Background and Intent: This measure requires that airlines tow aircraft to and from the maintenance area or when repositioning aircraft from one gate to another during nighttime hours. This measure was not implemented and is recommended to not be carried forward.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: N/A

Responsible Implementing Parties: N/A

Implementation Steps, Costs, and Phasing:

FAA Requested Action: Measure is not being carried forward. No action by FAA is required.

Steps: N/A

Costs: N/A

Schedule: N/A

Effects on Other Programs/Measures: Not carrying this measure forward is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: A-10

Description: Maintenance Run-up Regulations

Background and Intent: This measure was included in the 2002 NCP update to address maintenance run-ups. The Port of Seattle implemented restrictions to engine maintenance run-ups at Sea-Tac Airport. This measure is recommended to be modified to reflect the currently implemented run-up restrictions as outlined below:

All engine run-ups require approval of Airport Operations. No aircraft engine run-up shall be conducted during the nighttime quiet hours of 2200 and 0700 except:

Aircraft that are regularly scheduled to depart between the hours of 0600 and 0830 shall be allowed to run-up as necessary between 0600 and 0700.

Engine run-ups necessary for maintenance checks above idle power not to exceed a total of two (2) minutes duration per aircraft.

Operations not in accordance with the run-up regulations are subject to public disclosure and fees as stated in the Sea-Tac International Airport Tariff #1.

No aircraft shall conduct engine run-ups for maintenance purposes except at locations specified by the Director.¹

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: This measure can potentially reduce noise annoyance issues with run-up activity.

Responsible Implementing Parties: Port of Seattle & aircraft operators

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: This measure is ongoing. Continue to implement and monitor this measure.

Costs: Minimal administrative costs

Schedule: This measure has been implemented and can continue uninterrupted.

Effects on Other Programs/Measures: This measure is not expected to impact other measures or existing programs although Measure A-18 includes a recommendation that the existing maintenance run-up regulations be modified to include the use of the recommended hush house if constructed.

¹ Sea-Tac International Airport, Schedule of Rules & Regulations No. 4(D)(6-8).

NOISE COMPATIBILITY PROGRAM MEASURE: A-11

Description: Preferential Runway Use

Background and Intent: This measure implemented a preferential runway system, during the nighttime hours, for operations through the North Flow Nighttime Noise Abatement Corridor. This would be operational when traffic and other conditions permit as determined by the FAA. When conditions permit, during nighttime hours, departures can be shifted from south to north, thus utilizing the established noise abatement corridor.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: This measure directs aircraft to follow the established noise abatement corridor during nighttime, thus reducing noise and overflights of areas outside the corridor.

Responsible Implementing Parties: FAA ATCT

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: This measure should continue.

Costs: No additional costs

Schedule: This measure has been implemented and can continue uninterrupted.

Effects on Other Programs/Measures: The measure is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: A-12

Description: Development/Implementation of a Fly Quiet Program

Background and Intent: This measure is intended to encourage greater compliance with the noise abatement procedures, work with operators to reduce single event noise levels, and continue to raise awareness of citizens' noise concerns with the FAA and aircraft operators. The Fly Quiet Program was recommended to:

- Monitor adherence to ideal noise abatement flight tracks
- Evaluate success of airlines, aircraft types, and other variables
- Establish goals and track level of improvement over time
- Offer incentives for improvement

The Fly Quiet Program was recommended to include the following elements:

- Aircraft noise should be related to its effects on people including such factors as annoyance, speech interference and sleep disturbance;
- Comparative fleet quality between airlines should also be included;
- The program should utilize measured data from the Airport's noise monitoring system;
- A method of normalizing data to account for airlines that most efficiently serve the region's air transportation needs should be developed;
- Incentives of sufficient importance that airlines will take notice of the results; and
- Pilots and air traffic controllers should be included, if possible.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: This measure encourages aircraft operators to adhere to noise abatement measures and policies, which contributes to land use compatibility.

Responsible Implementing Parties: Port of Seattle & aircraft operators

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: This measure should continue.

Costs: Minimal administrative costs

Schedule: This measure has been implemented and can continue uninterrupted.

Effects on Other Programs/Measures: The measure encourages adherence to other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: A-13

Description: MEASURE NOT BEING CARRIED FORWARD: Evaluate Increased Use of the Duwamish/Elliott Bay Corridor with FMS

Background and Intent: Through this measure, the Port encouraged the FAA to pursue options for determining the feasibility of increased use of the Duwamish/Elliott Bay Corridor. Increasing the use of FMS technology ensures that the rate of adherence to an optimum flight track will increase over time (see Measure A-15).

This measure was previously disapproved by the FAA. According to the 2002 FAA Record of Approval, implementing this action would greatly impact the efficiency of the air traffic system in the region and degrade safety, which would not be consistent with 14 CFR Part 150, section 150.35(b)(3)(iii).

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: N/A

Responsible Implementing Parties: N/A

Implementation Steps, Costs, and Phasing:

FAA Requested Action: Measure is not being carried forward. No action by FAA is required.

Steps: N/A

Costs: N/A

Schedule: N/A

Effects on Other Programs/Measures: Not carrying this measure forward is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: A-14

Description: MEASURE NOT BEING CARRIED FORWARD: Nighttime Use of Commencement Bay Departure Corridor

Background and Intent: This measure recommended that the FAA study the use of the nighttime (12:00 a.m. to 5:00 a.m.) use of the Commencement Bay corridor. This measure was studied during the 2002 Part 150. Port staff coordinated/consulted with the Pierce County staff who firmly objected to the recommendation. Since no agreement could be made between the various cities involved, the recommendation was not implemented.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: N/A

Responsible Implementing Parties: N/A

Implementation Steps, Costs, and Phasing:

FAA Requested Action: Measure is not being carried forward. No action by FAA is required.

Steps: N/A

Costs: N/A

Schedule: N/A

Effects on Other Programs/Measures: Not carrying this measure forward is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: A-15

Description: Use of FMS Procedures

Background and Intent: An on-board Flight Management System (FMS) is used to assist the pilot in navigating from point to point in flight. The systems work by identifying the geographic location of aircraft in relationship to another geographic location called a "waypoint." This FMS equipment provides the necessary information to guide the aircraft towards the desired "waypoint." FMS works with the auto-pilot system on the aircraft to automatically fly the aircraft towards the desired "waypoint." The use of FMS can reduce the width and size of departure corridors over standard navigation techniques. Aircraft must be equipped with the necessary FMS equipment to fly the procedures.

This measure is designed to encourage the use of FMS procedures over non-populated areas, to discourage the development of new FMS procedures over populated areas, and to support development of FMS procedures for all north flow departures turning west to improve compliance with the identified noise abatement corridor. FMS flight tracks have the potential to become very narrow on straight portions of the flight tracks. When turning, however, the differing operating characteristics of the aircraft will cause dispersion.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: This measure improves the ability of aircraft to fly the established flight corridors, thus reducing noise and overflights of areas outside the flight corridors.

Responsible Implementing Parties: FAA, aircraft operators

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: No additional steps

Costs: No additional costs

Schedule: This measure has been implemented and can continue uninterrupted.

Effects on Other Programs/Measures: The measure is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: A-16

Description: Use of Ground Equipment

Background and Intent: This measure recommended the installation of power and conditioned air in existing and newly constructed gates to minimize the use of auxiliary power units/ground power units APUs/GPUs. Once power and conditioned air are installed at gates, airlines should be required to use these services.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: This measure can potentially reduce noise annoyance issues from APU noise.

Responsible Implementing Parties: Port of Seattle, aircraft operators

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: The Port should continue to install power and pre-conditioned air connections at aircraft gates and request that aircraft operators maximize their use of the equipment

Costs: Cost to install the equipment – this cost is being funded through the FAA Voluntary Airport Low Emissions (VALE) Program.

Schedule: This measure is being implemented and can continue uninterrupted depending upon available funding. The project is underway – 73 gates are anticipated to be equipped with central pre-conditioned air by April 2013. As of October 2012, there are 30 diesel/electric point of use units being utilized.

Effects on Other Programs/Measures: The measure is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: A-17

Description: MEASURE NOT BEING CARRIED FORWARD: Raise Altitude Where Aircraft Intercept Glide Slope

Background and Intent: Through the Fly Quiet Program, the subsequent Follow-On Committee will worked with the operators and the FAA toward a goal of having aircraft on the glide slope as far out as possible while not adversely impacting capacity. When aircraft are on arrival to the Airport, they are utilizing the glide slope and the angle of the glide slope to line up on the runway and descend at the proper rate of speed and angle to touch down on the runway. This is usually done under instrument flying conditions, but almost all-commercial service aircraft and cargo aircraft fly the glide slope even during clear weather conditions (VFR). All glide slope angles at the Airport are at three degrees. This is consistent with almost every other airport in the country. Aircraft are designed to operate at an approximate three-degree glide slope for safety, efficiency of aircraft movement, performance of the aircraft, and comfort to the passengers.

This measure was previously disapproved by the FAA. As noted in the 2002 Record of Approval, moving aircraft further out on the glide slope would negatively impact airspace capacity and efficiency. The current procedures are needed to maintain operational efficiency at the airport.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: N/A

Responsible Implementing Parties: N/A

Implementation Steps, Costs, and Phasing:

FAA Requested Action: Measure is not being carried forward. No action by FAA is required.

Steps: N/A

Costs: N/A

Schedule: NA

Effects on Other Programs/Measures: Not carrying this measure forward is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: A-18

Description: Construct a Ground Run-up Enclosure (GRE) on the airport to minimize run-up noise.

Background and Intent: The 1985 Part 150 recommended the use of airport facilities for buffering ground noise. The 2002 NCP update recommended the construction of a noise barrier in the North Cargo Area and a siting/feasibility study for a GRE, commonly referred to as a "hush house". The Port completed a feasibility study in 2001, but since then a recommended site could not be finalized because of some serious airfield planning issues adjacent to the area that was designated for a future GRE.

Currently engine run-ups are conducted in two locations on the airfield, on Taxiway B between Taxiways D and E, and on the hold pad east of the end of Runway 34R. Neither of these locations provide for any significant buffering of engine noise.

Concurrent to this Part 150 Study update, an updated GRE Siting Study has been undertaken. This study assessed multiple GRE alternatives, including several locations on the airfield. This measure recommends the construction of a GRE based on the recommendation of the ongoing GRE Siting Study and a future GRE Design Study.

Relationship to 2002 NCP: This is a new measure which replaces measure A-7.

Land Use Compatibility Improvement: This measure can potentially reduce noise issues with run-up activity.

Responsible Implementing Parties: Port of Seattle & aircraft operators

Implementation Steps, Costs, and Phasing:

FAA Requested Action: FAA approval of new measure.

Steps: Once the GRE Siting Study is completed and the FAA issues a Record of Approval, the Port should conduct a GRE Design Study and design and construct a GRE based on the recommendations of that Study.

Costs: The cost of construction is estimated to be approximately \$6,000,000. Additional operational and maintenance costs are not included in this estimate. Additional site preparation costs may be necessary depending upon the site selected. Actual site preparation costs, which could range from \$10,000,000 to \$25,000,000 will be determined by the GRE Design Study.²

Schedule: This measure can be implemented following FAA approval in the Record of Approval (ROA) and completion of the GRE Design Study and receipt of funding. The GRE Design Study is expected to be completed by 2014 or 2015. It is recommended that if this measure is implemented, the Port investigate methods by which to modify the existing run-up regulations to include the use of the recommended GRE.

Effects on Other Programs/Measures: The measure replaces Measure A-7.

² Note that site preparation costs are likely ineligible for AIP funding.

NOISE COMPATIBILITY PROGRAM MEASURE: A-19

Description: Expand the Fly Quiet Program.

Background and Intent: The Port established a Fly Quiet program following the recommendation from the 2002 NCP update (completed Measure A-12). This measure would identify opportunities to expand the program with new elements, including:

- Use of Airport Traffic Control Tower (ATCT) reporting of operational modes for comparison to runway use goals.
- Include provisions for the use of the ground run-up enclosure recommended in Measure A-18.
- Adding different categories of airline operations.

Relationship to 2002 NCP: This is a new measure which updates measure A-12.

Land Use Compatibility Improvement: This measure can potentially improve compliance with the established voluntary noise abatement procedures in place at Sea-Tac Airport, thus reducing noise and overflights.

Responsible Implementing Parties: Port of Seattle, aircraft operators, Public Committee

Implementation Steps, Costs, and Phasing:

FAA Requested Action: FAA approval of new measure.

Steps: The Port should review and expand the Fly Quiet Program as needed. If necessary, the Port could convene a committee meeting to discuss specific elements to be added to the Fly Quiet Program. This committee could be a follow-up to the Technical Review Committee (TRC) from this Part 150 Study.

Costs: Minimal administrative costs to the Port – additional costs to aircraft operators to comply with program elements

Schedule: This measure can be implemented at the discretion of the Port.

Effects on Other Programs/Measures: The measure updates completed Measure A-12.

NOISE COMPATIBILITY PROGRAM MEASURE: M-2A

Description: Standard Insulation

Background and Intent: This measure includes sound insulation for eligible single-family residences within the revised Noise Remedy Boundary. The Port has an ongoing program to sound insulate eligible single-family residences within the current Noise Remedy Boundary that was established in the 1985 NCP. Completion of the single family sound insulation program was also an element of the July 3, 1997 Record of Decision for the Master Plan Update for the inclusion of the new third runway.³ Since that time, noise exposure has decreased at Sea-Tac Airport due to ongoing noise abatement efforts, the phase-out of older, louder aircraft and the lower number of operations. As a result the noise exposure contours developed for this Part 150 Study update are much smaller than the noise exposure contours developed for the 1985 Part 150 Study upon which the Noise Remedy Boundary was based. It is recommended that the Noise Remedy Boundary be modified to be more consistent with the Future (2018) NEM/NCP noise exposure contour developed for this 2013 Part 150 Study update (see **Section 6.1.1** and **Exhibit 6-1**).

Measure M-2a is recommended to be modified to consider, on a case-by-case basis, the applicability of including installation of central air conditioning for sound insulation of eligible homes that have not previously been sound insulated.

Relationship to 2002 NCP: This measure was included in the 2002 NCP. This measure is ongoing. As of August 2012, over 9,300 single-family homes have been sound insulated.

Land Use Compatibility Improvement: This measure converts incompatible land uses to uses that are compatible with aircraft noise levels.

Responsible Implementing Parties: Port of Seattle

³ United States Department of Transportation, Federal Aviation Administration, Record of Decision for the Master Plan Update Development Actions Sea-Tac International Airport, Seattle, Washington, July 3, 1997.

NOISE COMPATIBILITY PROGRAM MEASURE: M-2A, *Continued*

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: This measure should continue for eligible housing units within the recommended modified Noise Remedy Boundary (see **Section 6.1.1** and **Exhibit 6-1**)

Costs: Estimated cost to sound insulate units is approximately \$85,000 to \$95,000 per unit, but will vary significantly depending on construction, age and condition of individual residences. Approximately 193 eligible units inside the proposed Noise Remedy Boundary have not been insulated despite prior offers from the Port.⁴ Specific review of each unit has not been undertaken. Total cost using the estimated range (assuming 100 percent participation) is approximately \$16,405,000 to \$18,335,000, but will vary depending on the number of participating properties. Note that this cost estimate includes the cost to install central air conditioning, which will be considered on a case-by-case basis for eligible homes that have not previously been sound insulated.

Schedule: This measure can continue uninterrupted based on the availability of FAA funding.

Effects on Other Programs/Measures: This measure is not expected to impact other measures or existing programs.

⁴ Note that this figure differs from the count of impacted housing units located within the 65 DNL of the Future (2018) noise exposure contour reported in Table 6-2 and Chapter Four of this document. The estimated 193 units are those eligible units located within the proposed noise remedy boundary for this NCP Update. This number also does not include units within the South approach transition zone (ATZ) that are eligible for voluntary acquisition per ongoing Measure M-11.

NOISE COMPATIBILITY PROGRAM MEASURE: M-2B

Description: Insulation of Schools

Background and Intent: This measure includes a sound insulation program for eligible schools. A pilot program was initiated according to the original measure from the 1993 NCP update to determine the feasibility, procedural requirements, and costs, for sound insulating four public buildings based on the Building Committee recommendations. Following the pilot program, several private schools and classrooms at Highline Community College were insulated within the noise contour. This measure was amended in the 2002 NCP update to develop a program to insulate schools within the Highline School District that fall within the DNL 65 dBA.

This measure is ongoing. As of August 2012, sound insulation has been installed in seven schools within the Highline School District, with eight schools remaining. Fourteen of the 22 eligible buildings at the Highline Community College have also been sound insulated.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: This measure converts incompatible land uses to uses that are compatible with aircraft noise levels.

Responsible Implementing Parties: Port of Seattle

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: This measure should continue for schools that were previously identified as eligible, as funding permits.

Costs: Funding for the Highline School District has been previously committed through a Memorandum of Agreement between the FAA, the Port and the District.. The FAA and the Port are providing \$50 million each to implement this measure independently of this 2013 NCP update. The cost to sound insulate the remaining buildings on the Highline Community College campus is estimated at \$21,228,000 (See Appendix M, *Highline Community College Noise Remedy Plan*).

Schedule: This measure can continue uninterrupted based on the availability of funding.

Effects on Other Programs/Measures: This measure is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: M-2C

Description: MEASURE NOT BEING CARRIED FORWARD: Multi-Family Developments

Background and Intent: This measure includes a sound insulation program for eligible multi-family residences. The 1993 NCP update recommended a pilot project to sound insulate one multi-family unit similar to the criteria outlined in measure M-2. That pilot project was implemented and the measure was amended in the 2002 NCP update to include sound insulation for approximately 300 owner-occupied multi-family units within the 70+ DNL of the 1998 noise contour. Owner-occupied units (e.g. condominiums) were considered differently than tenant-occupied units (e.g. apartments) for three major reasons: 1) apartments are considered a business because the units are rented for a profit and 2) they are typically not a permanent residence and the residents are generally more mobile, and 3) the owner-occupied multi-family residents typically have more monetary investment in their residence. Structures must meet the same eligibility requirements as single-family homes within the noise remedy boundary.

This measure is complete. As of August 2013, approximately 236 units within six condominium complexes have been sound insulated.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: N/A

Responsible Implementing Parties: N/A

Implementation Steps, Costs, and Phasing:

FAA Requested Action: Measure is not being carried forward. No action by FAA is required.

Steps: N/A

Costs: N/A

Schedule: N/A

Effects on Other Programs/Measures: This measure is not being carried forward and replaced with Measures M-14 and M-15.

NOISE COMPATIBILITY PROGRAM MEASURE: M-3, M3A, & M3B

Description: MEASURE NOT BEING CARRIED FORWARD: Transaction Assistance

Background and Intent: Formerly referred to as “purchase assurance” this measure is now termed transaction assistance in keeping with its primary function. The intent of the measure is to provide financial and technical assistance to owner-occupants of single-family residences who desire to sell and move away from areas of relatively high noise exposure. If the various forms of assistance to be made available do not result in an acceptable sales transaction, the Port could acquire the property at fair market value as a “buyer of last resort.” Following necessary improvements (which could include sound insulation); the Port would resell the property to a willing buyer with an avigation easement attached to the deed.

Measure M-3 was modified to include a special purchase option (Measure M-3a) whereby the Port would purchase eligible housing units, install sound insulation, and resell the unit; and an insulation requirement (Measure M-3b) which required a housing unit be sound insulated before it was eligible for the Transaction Assistance program.

Due to lack of community response, Measures M-3a and M-3b were discontinued.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: N/A

Responsible Implementing Parties: N/A

Implementation Steps, Costs, and Phasing:

FAA Requested Action: Measure is not being carried forward. No action by FAA is required.

Steps: N/A

Costs: N/A

Schedule: N/A

Effects on Other Programs/Measures: Not carrying this measure forward is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: M-4

Description: MEASURE NOT BEING CARRIED FORWARD: Easement Acquisition

Background and Intent: This measure recommended that the Port obtain avigation easements in return for sound insulation or transaction assistance, as well as for situations of specialized nature. For some residences, the Port could purchase an avigation easement from an eligible owner of an owner-occupied residence who desires to continue living in the same location, even though the home cannot be satisfactorily sound insulated. Other situations in which avigation easements may be appropriate include churches. The easement fee paid by the Port could be used to provide some measure of sound insulation of noise-sensitive areas of church structures. This measure was implemented but was halted. Based on previous experience with these programs, the Port no longer purchases avigation easements for single family homes that cannot be effectively sound insulated.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: N/A

Responsible Implementing Parties: N/A

Implementation Steps, Costs, and Phasing:

FAA Requested Action: Measure is not being carried forward. No action by FAA is required.

Steps: N/A

Costs: N/A

Schedule: N/A

Effects on Other Programs/Measures: Not carrying this measure forward is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: M-5

Description: Property Advisory Service

Background and Intent: This measure provides residents and property owners within the Airport Environs with access to timely and factual information concerning 1) what noise remedies they may be eligible for, 2) assistance with making decisions when they are eligible for multiple options, 3) information regarding rumors about the mitigation program (either good or bad), and 4) assurances that the various programs are indeed aimed at improving the living, working and leisure-time environment. This two-way communication can also provide the Port with information about the concerns of residents/property owners and can provide a means by which the success or failure of programs can be monitored.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: This measure improves the success of the existing Noise Remedy Program.

Responsible Implementing Parties: Port of Seattle

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: The Port should continue this measure.

Costs: Minimal administrative costs

Schedule: This measure can continue uninterrupted.

Effects on Other Programs/Measures: This measure is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: M-6

Description: Local Government Remedy Support

Background and Intent: By insulating homes and assisting with real estate transactions, the Port can participate in making the Airport and surrounding residents better neighbors. However, the Port alone cannot accomplish all program goals. Local governments, with land use jurisdiction must also participate if the program is to be a success, especially in the long term. Under this measure, the Port encourages local jurisdictions to undertake projects, provide services, and adopt laws that reinforce neighborhoods and make them compatible with the Airport. The Port also works with jurisdictions in coordinating activities and exchanging information.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: This measure encourages planning efforts to prevent the introduction of new incompatible land uses in the vicinity of Sea-Tac Airport.

Responsible Implementing Parties: Port of Seattle

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: The Port should continue this measure.

Costs: Minimal administrative costs

Schedule: This measure can continue uninterrupted.

Effects on Other Programs/Measures: This measure is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: M-7

Description: Funding for Land Use / Noise Compatibility Planning

Background and Intent: This measure enables public agencies (defined as a state, municipality or other political subdivision, or Native American Tribe) having planning authority within the DNL 65 dBA noise contour to be able to apply for reimbursable funding of specific off-airport land use/noise compatibility planning efforts which are consistent with the principles and guidelines of 14 CFR Part 150 and the Port noise compatibility goals.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: This measure provides funding for planning efforts to prevent the introduction of new incompatible land uses in the vicinity of Sea-Tac Airport.

Responsible Implementing Parties: Port of Seattle, local jurisdictions

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: The Port should continue this measure.

Costs: Minimal administrative costs

Schedule: This measure can continue uninterrupted.

Effects on Other Programs/Measures: This measure is not expected to impact other measures or existing programs.

NOISE COMPATIBILITY PROGRAM MEASURE: M-9

Description: MEASURE NOT BEING CARRIED FORWARD: Community Planners Forum

Background and Intent: Under this measure, the Port initiated the formation of a committee to allow planning representatives from all jurisdictions within the DNL 65 dBA noise contour, or other invited jurisdictions with interest, to meet on a regular basis to share information pertaining to comprehensive planning, community and airport planning, land use issues, and noise mitigation efforts.

The Planning Committee was formed and met for several years but has since disbanded. The Port participates in the Highline Forum, which continues the intent of this measure. Since the intent of this measure is met through another venue, this measure is recommended to not be carried forward.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: N/A

Responsible Implementing Parties: N/A

Implementation Steps, Costs, and Phasing:

FAA Requested Action: Measure is not being carried forward. No action by FAA is required.

Steps: N/A

Costs: N/A

Schedule: N/A

Effects on Other Programs/Measures: Not carrying this measure forward is not expected to impact other programs or measures.

NOISE COMPATIBILITY PROGRAM MEASURE: M-10

Description: MEASURE NOT BEING CARRIED FORWARD: Operations Review and NEM Updates

Background and Intent: The Part 150 Study is a five-year program recommended to be reevaluated at the end of the five-year period. In addition, if there is a significant change in either aircraft types or numbers of operations, or significant new facilities, then it is recommended that the Study be reevaluated prior to the end of the five-year time frame.

This measure is recommended to not be carried forward and replaced with measure PM-3.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: N/A

Responsible Implementing Parties: N/A

Implementation Steps, Costs, and Phasing:

FAA Requested Action: Measure is not being carried forward. No action by FAA is required.

Steps: N/A

Costs: N/A

Schedule: N/A

Effects on Other Programs/Measures: Not carrying this measure forward is not expected to impact other programs or measures.

NOISE COMPATIBILITY PROGRAM MEASURE: M-11

Description: Approach Transition Zone Acquisition

Background and Intent: This measure recommended that the Port purchase residential properties experiencing noise levels of DNL 65 dBA or greater, and located within the Approach Transition Zones (ATZ) of Runway 16R/34L.

This measure is ongoing as a voluntary acquisition program. A total of 69 residential parcels and 2 mobile home parks within the North ATZ have been purchased and residents relocated and the program is complete in this area. There are approximately 12 single-family residences and 6 apartment buildings remaining in the south ATZ (a total of 77 residential units).

In accordance with the FAA's Airport Improvement Program (AIP) Handbook (FAA Order 5100.38C), projects that involve acquisition must conform to the provisions of the Uniform Relocation Assistance and Real Properties Acquisition Policies Act in effect at the time the land was acquired.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: This measure would potentially remove up to 77 land uses within the South ATZ that are incompatible with aircraft noise.

Responsible Implementing Parties: Port of Seattle

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: The Port should make offers to acquire the remaining residential properties within the South ATZ. The Port would be responsible for relocation assistance to the residents of these residences in accordance with FAA Order 5100.37B, Land Acquisition and Relocation Assistance for Airport Projects, and in Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects.

Costs: There are 16 single-family residences and 6 apartment buildings remaining in the south ATZ. Cost to acquire all residential properties within south ATZ is estimated to be \$10 million. Actual cost will depend on which properties actually participate.

Acquisition would remove these properties from the local tax base. Property tax revenue on these properties is an estimated \$45,000 to \$50,000, which is allocated between the State of Washington, King County, the cities of Des Moines and SeaTac, the local school district, the EMS district, and other special districts and fees.

Schedule: This measure can continue uninterrupted at the discretion of the Port.

Effects on Other Programs/Measures: This measure is not expected to impact other programs or measures.

NOISE COMPATIBILITY PROGRAM MEASURE: M-12

Description: Prepare Cooperative Development Agreements

Background and Intent: The Port and the surrounding jurisdictions should work towards development of cooperative development agreements concerning land use, redevelopment, and infrastructure of the Approach Transition Zones (ATZ), as well of other redevelopment areas as necessary.

Relationship to 2002 NCP: This measure was included in the 2002 NCP.

Land Use Compatibility Improvement: This measure encourages the redevelopment of land acquired for noise mitigation for compatible uses. Redevelopment of land for compatible uses prevents new incompatible uses from developing.

Responsible Implementing Parties: Port of Seattle & local jurisdictions

Implementation Steps, Costs, and Phasing:

FAA Requested Action: No action by FAA is required.

Steps: The process should continue to address development potentials for other areas included within the revised Noise Remedy Boundary.

Costs: Minimal administrative costs

Schedule: This measure is ongoing. As of March 2011, the Port has worked with Burien on the North East Redevelopment Area north of the third runway and has signed a Development Agreement with the City of Des Moines on the Des Moines Creek Business Park. This measure can continue uninterrupted.

Effects on Other Programs/Measures: This measure is not expected to impact other programs or measures.

NOISE COMPATIBILITY PROGRAM MEASURE: M-14

Description: Sound insulate eligible owner-occupied multi-family units (condominiums) within the modified noise remedy boundary.

Background and Intent: Measure M-2c offered sound insulation to owner-occupied multi-family units within the 70 DNL of the 1998 Noise Exposure Contour. This measure would expand the program to eligible units within the revised Noise Remedy Boundary (see **Section 6.1.1** and **Exhibit 6-1**) that were not previously mitigated.

Relationship to 2002 NCP: This is a new measure.

Land Use Compatibility Improvement: This measure has the potential to convert multi-family housing units into compatible uses.

Responsible Implementing Parties: Port of Seattle

Implementation Steps, Costs, and Phasing:

FAA Requested Action: FAA approval of new measure.

Steps: The Port should identify eligible properties and approach the owners with offers to sound insulate the structures.

Costs: There are approximately 320 condominiums that have not been sound insulated located within the proposed noise remedy boundary,⁵ assuming a cost of \$52,000 to \$67,000 to sound insulate each unit,⁶ the total cost to implement this measure if all of the units participated would be \$16,640,000 to \$21,440,000. Actual costs may vary significantly based on the construction, age and condition of the buildings and the individual units and the number of units that actually participate.

Schedule: This measure could be implemented upon receipt of the FAA Record of Approval based on the availability of funding.

Effects on Other Programs/Measures: This measure modifies Measure M-2c. This measure would be implemented within the modified Noise Remedy Boundary described in Section 6.1.1.

⁵ Note that this figure differs from the count of impacted housing units located within the 65 DNL of the Future (2018) noise exposure contour reported in Chapter Four of this document. The estimated 320 units are those eligible units located within the proposed noise remedy boundary for this NCP Update.

⁶ Note: Estimated per unit cost is based on typical costs for similar mitigation programs at other U.S. airports. Actual per unit cost could vary based on construction, age and condition of individual units.

NOISE COMPATIBILITY PROGRAM MEASURE: M-15

Description: Sound insulate eligible tenant-occupied multi-family units (apartments) within the modified Noise Remedy Boundary.

Background and Intent: Measure M-2c offered sound insulation to owner-occupied multi-family units within the 70 DNL of the 1998 Noise Exposure Contour. This measure would expand the program to include eligible tenant-occupied units within the revised Noise Remedy Boundary (see **Section 6.1.1** and **Exhibit 6-1**). The Port should consider a Pilot Project to determine feasibility of future tenant-occupied buildings.

Relationship to 2002 NCP: This is a new measure.

Land Use Compatibility Improvement: This measure has the potential to convert multi-family housing units into compatible uses.

Responsible Implementing Parties: Port of Seattle

Implementation Steps, Costs, and Phasing:

FAA Requested Action: FAA approval of new measure.

Steps: The Port should initiate a feasibility study to determine the needs for the program. The feasibility study should identify eligible properties, methods and materials for sound insulation, and specific costs for the program.

Costs: A feasibility Study is estimated to cost \$1,100,000.

There are approximately 1,157 apartments that have not been sound insulated located within the proposed Noise Remedy Boundary.⁷ Assuming all units are deemed eligible for mitigation and actually participate, and a cost of \$30,000 to \$40,000 to sound insulate each unit,⁸ the total cost to implement this measure, not including the cost of a feasibility study, would be \$34,710,000 to \$46,280,000. Actual costs may vary significantly depending upon the age, construction and condition of the building and individual units as well as the level of participation.

Schedule: This measure could be implemented following receipt of the FAA Record of Approval based on the availability of funding.

Effects on Other Programs/Measures: This measure is not expected to impact other programs or measures; although, this measure would be implemented within the modified Noise Remedy Boundary established in Section 6.1.1.

⁷ Note that this figure differs from the count of impacted housing units located within the 65 DNL of the Future (2018) noise exposure contour reported in Chapter Four of this document. The estimated 897 units are those eligible units located within the proposed noise remedy boundary for this NCP Update. This number also does not include units within the South ATZ that are eligible for voluntary acquisition per ongoing Measure M-11.

⁸ Note: Estimated per unit cost is based on typical costs for similar mitigation programs at other U.S. airports. Actual per unit cost could vary based on construction, age and condition of individual units.

NOISE COMPATIBILITY PROGRAM MEASURE: M-16

Description: Offer avigation easements to owners of individual lots on which mobile homes are located within the modified Noise Remedy Boundary.

Background and Intent: Per 14 CFR Part 150 land use compatibility guidelines, mobile homes are incompatible with aircraft noise levels at DNL 65 dBA or higher. However, most mobile homes cannot be effectively sound insulated.

Measure M-2d offered sales and relocation assistance to residents of mobile home parks that were acquired by the Port in an effort to remove incompatible structures within mobile home parks. Most mobile homes cannot be effectively sound insulated. This measure would provide avigation easements to owners of individual lots in return for removing the mobile home from the lot and/or providing air rights. There are approximately 62 mobile homes located on individual lots within the proposed noise remedy boundary.

In accordance with the FAA's Airport Improvement Program (AIP) Handbook (FAA Order 5100.38C), projects that involve acquisition must conform to the provisions of the Uniform Relocation Assistance and Real Properties Acquisition Policies Act in effect at the time the land was acquired.

Relationship to 2002 NCP: This is a new measure.

Land Use Compatibility Improvement: This measure would potentially remove land uses that are incompatible with aircraft noise.

Responsible Implementing Parties: Port of Seattle

Implementation Steps, Costs, and Phasing:

FAA Requested Action: FAA approval of new measure.

Steps: The Port should identify eligible mobile homes and offer avigation easement to the property owners. If feasible, the mobile homes should be removed. If the mobile homes are removed, the Port may be responsible for relocation assistance to the residents of those mobile homes in accordance with FAA Order 5100.37B, *Land Acquisition and Relocation Assistance for Airport Projects*, and in Advisory Circular 150/5100-17, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects*.

Most jurisdictions surrounding Sea-Tac Airport allow one accessory dwelling unit (ADU) or accessory living quarters (ALQ) on individual residential parcels. Prior to initiation of this measure, the Port should work with the surrounding jurisdictions to ensure that zoning restrictions are in place to prevent the development of new mobile homes on existing parcels. This could be accomplished by establishing an overlay zone which prevents the use of mobile homes as ADUs/ALQs on parcels within the Noise Remedy Boundary.

Costs: There are approximately 88 mobile homes located on individual lots within the proposed noise remedy boundary. Assuming a 100 percent participation in the program with a \$5,000 purchase price for the avigation easement, the total cost to implement this measure would be \$440,000. Actual costs would vary significantly depending upon levels of participation and actual consideration paid for the easement.

Schedule: This measure can be implemented following receipt of the FAA Record of Approval based on the availability of funding.

NOISE COMPATIBILITY PROGRAM MEASURE: M-16, *Continued*

<p>Effects on Other Programs/Measures: This measure is not expected to impact other programs or measures; although, this measure would be implemented within the modified Noise Remedy Boundary established in Section 6.1.1.</p>
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NOISE COMPATIBILITY PROGRAM MEASURE: M-17

Description: Initiate a formal study to evaluate the noise levels at churches/places of worship located within the modified Noise Remedy Boundary for eligibility for sound insulation.

Background and Intent: This measure is intended to address potential noise impacts resulting from daytime (in particular Sunday morning) aircraft operations. There are twelve churches located within the recommended Noise Remedy Boundary,⁹ (including St. Philomena Church, which has been previously sound insulated by the Port of Seattle). Under this measure, a formal study would be conducted to evaluate noise levels to determine eligible churches.

In order to more accurately assess the impact of aircraft noise on churches, this study would focus on the aircraft events occurring during typical service hours. The results of the analysis could lead to recommendation for the sound insulation of Grace Lutheran Church. The Airport Improvement Program (AIP) Handbook (FAA Order 5100.38c, Chapter 812(d)) states that churches, when recommended for sound insulation by an airport sponsor in an FAA-approved NCP are eligible for sound insulation. The AIP Handbook further states that the sound insulation of churches should be evaluated on a case-by-case basis involving consultation with the FAA Airports Financial Assistance Division (APP-520) and the FAA Community and Environmental Needs Division (APP-600). This consultation process and evaluation will take place prior to implementing sound insulation at a church/place of worship.

Sound insulation consists of increasing the exterior-to-interior sound attenuation characteristics of a structure, i.e., reducing the level of noise intrusion from aircraft overflights and ground operations. There are several basic ways in which this can be accomplished (e.g. acoustical windows, acoustical doors, ventilation systems, additional roof/wall insulation, etc.), and variations of each would occur on a structure-to-structure basis.

Relationship to 2002 NCP: This is a new measure.

Land Use Compatibility Improvement: This alternative has the potential to convert one church from an incompatible to a compatible use.

Responsible Implementing Parties: Port of Seattle

⁹ Note that number of churches within the recommended Noise Remedy Boundary differs from the count of churches located within the 65 DNL of the Future (2018) noise exposure contour reported in Chapter Four of this document.

NOISE COMPATIBILITY PROGRAM MEASURE: M-17, *Continued*

Implementation Steps, Costs, and Phasing:

FAA Requested Action: FAA approval of new measure.

Steps: The Port should contact the potentially eligible churches to assess their interest and arrange to conduct a feasibility study if desired by church officials.

Costs: The cost for implementation of this alternative, which will be funded by the Port, would be approximately \$30,000 to \$40,000 to conduct the study. Cost to sound insulate the church structures, if feasible, would be determined by the study.

Schedule: Implementation of this measure can begin following receipt of the FAA Record of Approval and the availability of funding.

Effects on Other Programs/Measures: This measure is not expected to impact other measures or programs.

NOISE COMPATIBILITY PROGRAM MEASURE: P-1

Description: Evaluate and Upgrade Noise Monitoring and Flight Tracking System.

Background and Intent: The Port has installed a noise and operations monitoring system that collects and stores flight data from the FAA's automated radar terminal system, which enables staff to regularly monitor abatement procedures and investigate citizen inquiries. In addition to this system, the Port also provides WebTrak, which allows the public to investigate flights via the Web. The system includes 25 existing permanent noise monitors. This alternative includes evaluating these permanent noise monitors and the central system hardware/software for potential replacement with newer equipment.

Relationship to 2002 NCP: This measure replaces completed measure A-4

Land Use Compatibility Improvement: This measure does not directly improve land use compatibility; rather, it provides the Port of Seattle with additional resources to monitor the effectiveness of noise abatement measures and respond to public inquiries about noise and airport operations.

Responsible Implementing Parties: Port of Seattle

Implementation Steps, Costs, and Phasing:

FAA Requested Action: FAA approval of new measure.

Steps: The Port of Seattle should continue to evaluate their existing noise monitoring and flight tracking system and replace/upgrade the equipment as needed.

Costs: Cost to upgrade the central system hardware/software and replace 25 permanent noise monitors at their existing sites is approximately \$1.5 to \$2 million. If additional monitors are added or new sites are selected, the cost will be higher.

Schedule: The Port of Seattle can purchase and install new equipment following receipt of the FAA Record of Approval.

Effects on Other Programs/Measures: This measure is not expected to impact other measures or programs.

NOISE COMPATIBILITY PROGRAM MEASURE: P-2

Description: Periodically review and, if necessary, update the Noise Exposure Maps (NEMs) and the Noise Compatibility Program (NCP).

Background and Intent: The NEMs should be updated every five years or when there are significant changes in operating levels and patterns in accordance with the FAA's guidelines for determining what constitutes a potentially significant increase in operations (1.5 dB DNL increase in the area impacted by 65+ DNL).

The NCP should be updated every five years, or as necessary, to reflect any broader changes in the nature of aircraft noise surrounding the Airport. Should any on-airport development, such as runway extensions or significant modifications to ground facilities, enlarge the area of incompatible use exposed to aircraft noise above 65 Day-Night Average Sound Level (DNL), the NCP should be updated prior to the implementation of those improvements. A full update may not be required, but rather, a targeted assessment of the changes occasioned by specific development projects may suffice to bring the NCP to conformity and to qualify additional areas for NCP programs, if appropriate.

Relationship to 2002 NCP: This measure replaces approved Measure M-10.

Land Use Compatibility Improvement: This measure does not directly improve land use compatibility; rather, it provides for periodic review and update of the Noise Compatibility Program.

Responsible Implementing Parties: Port of Seattle

Implementation Steps, Costs, and Phasing:

FAA Requested Action: FAA approval of new measure.

Steps:

- Evaluate the need of NEM or NCP update based on conditions.
- If appropriate, retain a qualified planning consultant to conduct the update(s).
- Complete and publish the results, modifying or expanding NCP programmatic boundaries as appropriate at the time of update.

Costs: It is estimated that the NEM update could be accomplished for approximately \$400,000 to \$500,000. An NEM/NCP could be updated at an estimated cost of \$1,000,000 (assuming only a minimal review of existing abatement measures is necessary). Both updates are eligible for funding through FAA AIP grant monies at 80 percent FAA participation.

Schedule: NEM update in 2018, with NCP update as needed based on operational changes or airfield changes that affect aircraft operations.

Effects on Other Programs/Measures: Reviews all other programs and measures to assure their incorporation into the description of the noise condition at the airport.

NOISE COMPATIBILITY PROGRAM MEASURE: P-3

Description: Continue to operate the Noise Office

Background and Intent: Measure A-5, which was adopted in the 1985 Part 150 Study, recommended establishing a noise abatement office to initiate, implement, and monitor the various abatement actions included in the NCP. This measure recommends the continued operation of the Noise Office.

Relationship to 2002 NCP: This measure updates completed measure A-5.

Land Use Compatibility Improvement: This measure does not directly improve land use compatibility; although, it provides staff and resources to monitor the effectiveness of land use compatibility program measures and respond to public inquiries regarding noise and airport operations.

Responsible Implementing Parties: Port of Seattle

Implementation Steps, Costs, and Phasing:

FAA Requested Action: FAA approval of new measure.

Steps: The Port of Seattle should continue to operate the noise abatement office.

Costs: Minimal administrative costs

Schedule: This measure can continue uninterrupted.

Effects on Other Programs/Measures: The measure is not expected to impact other measures or existing programs.

6.1.1 RECOMMENDED NOISE REMEDY BOUNDARY

This section describes the recommended modification to the existing Noise Remedy Boundary at Sea-Tac Airport. This modified boundary roughly corresponds to the DNL 65 dBA of the Future (2018) NEM developed for this NCP update and defines the area within which implementation of all mitigation measures are recommended to occur.

The Noise Remedy Boundary in place at Sea-Tac Airport is based on noise exposure contours developed for the 1985 Part 150 Study and reflected the then-projected noise levels for the year 2000. This 2013 Part 150 Study update has developed noise exposure contours for Future (2018) conditions that are substantially smaller than those of previous years. This reduction in the size of the noise contours is primarily the result of the phase-out of louder Stage 2 aircraft, ongoing abatement and program management measures and decreases in operations at the airport.

As a result of the reduction in size of the noise exposure contours compared to previous years, this Study recommends the Noise Remedy Boundary be modified to reflect the DNL 65 dBA of the Future (2018) NCP noise exposure contour. The recommended modified Noise Remedy Boundary is a fixed boundary that follows physical and geographic features and is generally based on and expanded from the DNL 65 dBA of the Future (2018) NCP noise exposure contour. Per FAA Order 5100.38, "...projects within DNL 65 dB may be expanded beyond the DNL 65 dB contour to include a reasonable additional number of otherwise ineligible parcels contiguous to the project area, if necessary to achieve equity in the neighborhood. Neighborhood or street boundary lines may help determine what is reasonable..."¹⁰

Exhibit 6-1, Recommended Noise Remedy Boundary, illustrates the recommended modification to the Noise Remedy Boundary, accompanied by the location of the original Noise Remedy Boundary and the DNL 65 dBA of the Future (2018) Baseline noise exposure contour.

The Port will make one final offer to eligible property owners outside of the modified Noise Remedy Boundary that have not participated in the program and continue the insulation program for those living within the modified Noise Remedy Boundary that have not yet participated in the program. All eligible homeowners outside of the modified Noise Remedy Boundary that request participation will be notified of a cutoff date to enter into the existing program prior to the FAA's approval of the new NCP.

The Port should also provide notice of this modification to the local jurisdictions and assist local jurisdictions with updating their comprehensive plans and zoning ordinances to reflect the modified Noise Remedy Boundary where applicable.

¹⁰ U.S. Department of Transportation, Federal Aviation Administration, Order 5100.38C, Airport Improvement Program Handbook, Section 2, Noise Compatibility Projects, subsection 810(b), June 28, 2005.

6.2 NOISE COMPATIBILITY PROGRAM MAP

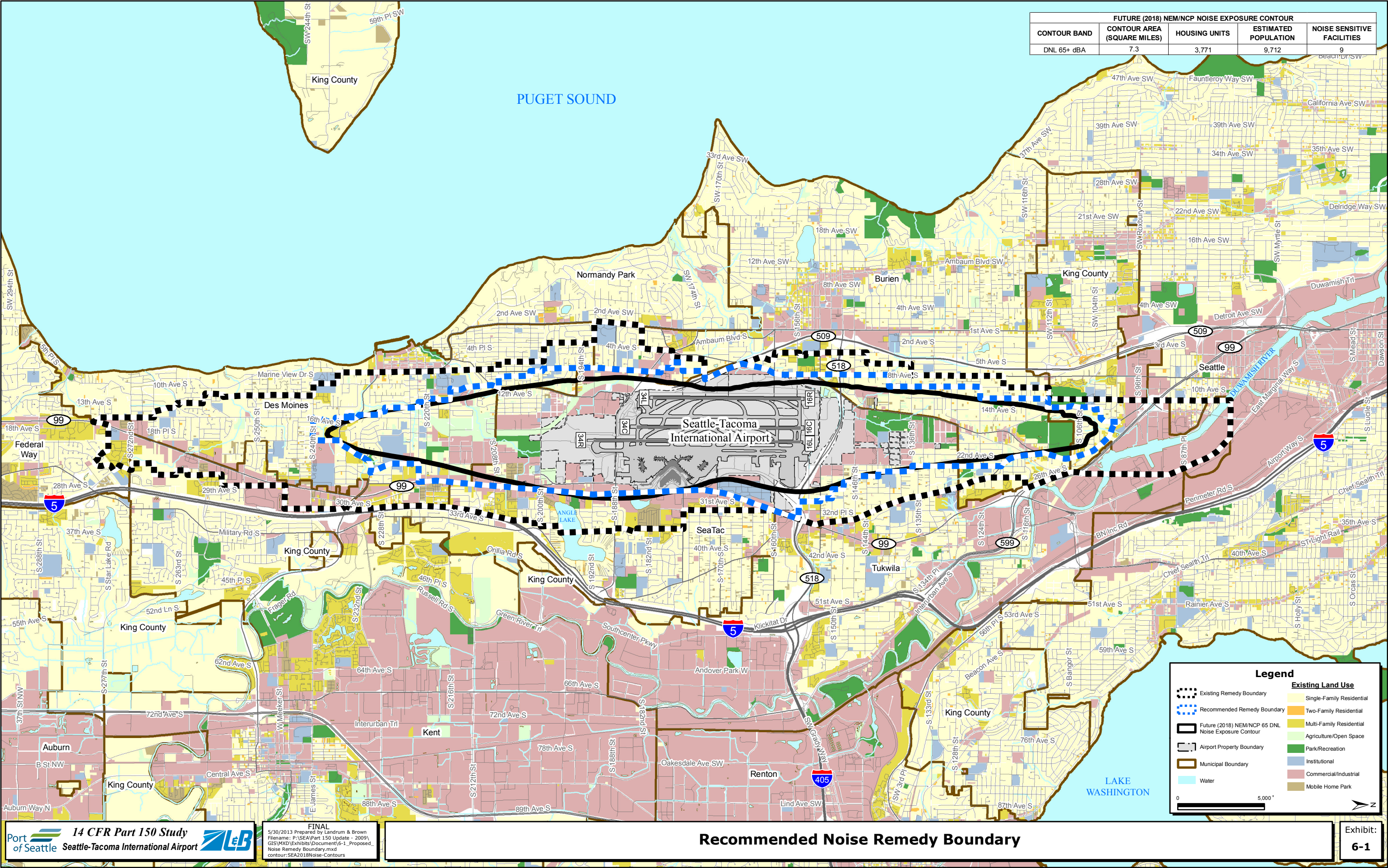
Through previous Part 150 Studies, the Port has developed and implemented several abatement measures that minimize noise impacts as much as possible without placing undue restrictions on operations at Sea-Tac Airport. This Part 150 Study update reviewed these abatement measures and determined the currently implemented measures reduce noise to the fullest extent possible. In addition, potential new abatement measures were assessed.

No new or modified abatement measures are recommended with the exception of Measure A-18, which recommends the construction of a ground run-up enclosure to reduce noise from engine run-ups. A preferred location for the proposed ground run-up enclosure has not yet been identified and is therefore not reflected in the Future (2018) NEM/NCP noise exposure contour. Implementation of the 2013 NCP would have a minimal effect on the DNL 65 dBA noise exposure contour. Therefore, the Future (2018) NEM/NCP noise exposure contour is the same as the Future (2018) Baseline contour.

Since there are no new or modified abatement measures that would affect the operating conditions at Sea-Tac other than potential use of a ground run-up enclosure (GRE) for engine testing operations, implementation of the recommended NCP measures would not have a noticeable effect on the DNL 65 dBA noise exposure contour compared to the Future (2018) Baseline noise exposure contour. **Exhibit 6-2, Future (2018) NEM/NCP Noise Exposure Contour**, constitutes the official NEM for the year 2018, and is reflective of implementation of all of the recommended abatement measures.

Table 6-2, Future (2018) Noise Exposure Map/Noise Compatibility Program, presents the noise impacts for the Future (2018) NEM/NCP. There are 3,771 total housing units and an estimated 9,712 residents located within the 65+ DNL of the Future (2018) NEM/NCP noise contour. Of those 3,771 housing units, 2,473 units (2,293 single-family units; 108 two-, three-, or four-family units; and 72 condominiums) have received sound insulation, and therefore are not eligible for additional treatment. Another 1,037 housing units are potentially eligible for sound insulation in this 2013 NCP update. These include single-, two-, three-, or four-family units and condominiums that were previously eligible but the property owners have not responded to previous offers for sound insulation made by the Port, condominiums that were outside the 1998 70 DNL noise exposure contour, and approximately 729 apartments that were not previously eligible but are recommended to be sound insulated in this 2013 NCP update.¹¹ The remaining 261 housing units are not eligible for sound insulation because they were constructed after the date of a previously published noise contour or the structure cannot be effectively sound insulated. There are no housing units located within the 70+ DNL of the Future (2018) NEM/NCP noise contour.

¹¹ Previously-approved Abatement Measure M-2c recommended sound insulation of condominiums that were within the 70 DNL of the 1998 noise exposure contour from the 2002 Part 150 Study update. Measures M-14 and M-15 from this 2013 NCP update recommend that condominiums and apartments within the modified Noise Remedy Boundary be sound insulated based on the results of a pilot program and the availability of funding.



FUTURE (2018) NEM/NCP NOISE EXPOSURE CONTOUR				
CONTOUR BAND	CONTOUR AREA (SQUARE MILES)	HOUSING UNITS	ESTIMATED POPULATION	NOISE SENSITIVE FACILITIES
DNL 65+ dBA	7.3	3,771	9,712	9

Legend

- Existing Remedy Boundary
- Recommended Remedy Boundary
- Future (2018) NEM/NCP DNL Noise Exposure Contour
- Airport Property Boundary
- Municipal Boundary
- Water

Existing Land Use

- Single-Family Residential
- Two-Family Residential
- Multi-Family Residential
- Agriculture/Open Space
- Park/Recreation
- Institutional
- Commercial/Industrial
- Mobile Home Park

FUTURE (2018) NEM/NCP NOISE EXPOSURE CONTOUR				
CONTOUR BAND	CONTOUR AREA (SQUARE MILES)	HOUSING UNITS	ESTIMATED POPULATION	NOISE SENSITIVE FACILITIES
DNL 65-70 dBA	4.4	3,771	9,712	9
DNL 70-75 dBA	1.8	0	0	0
DNL 75+ dBA	1.1	0	0	0
DNL 65+ dBA	7.3	3,771	9,712	9

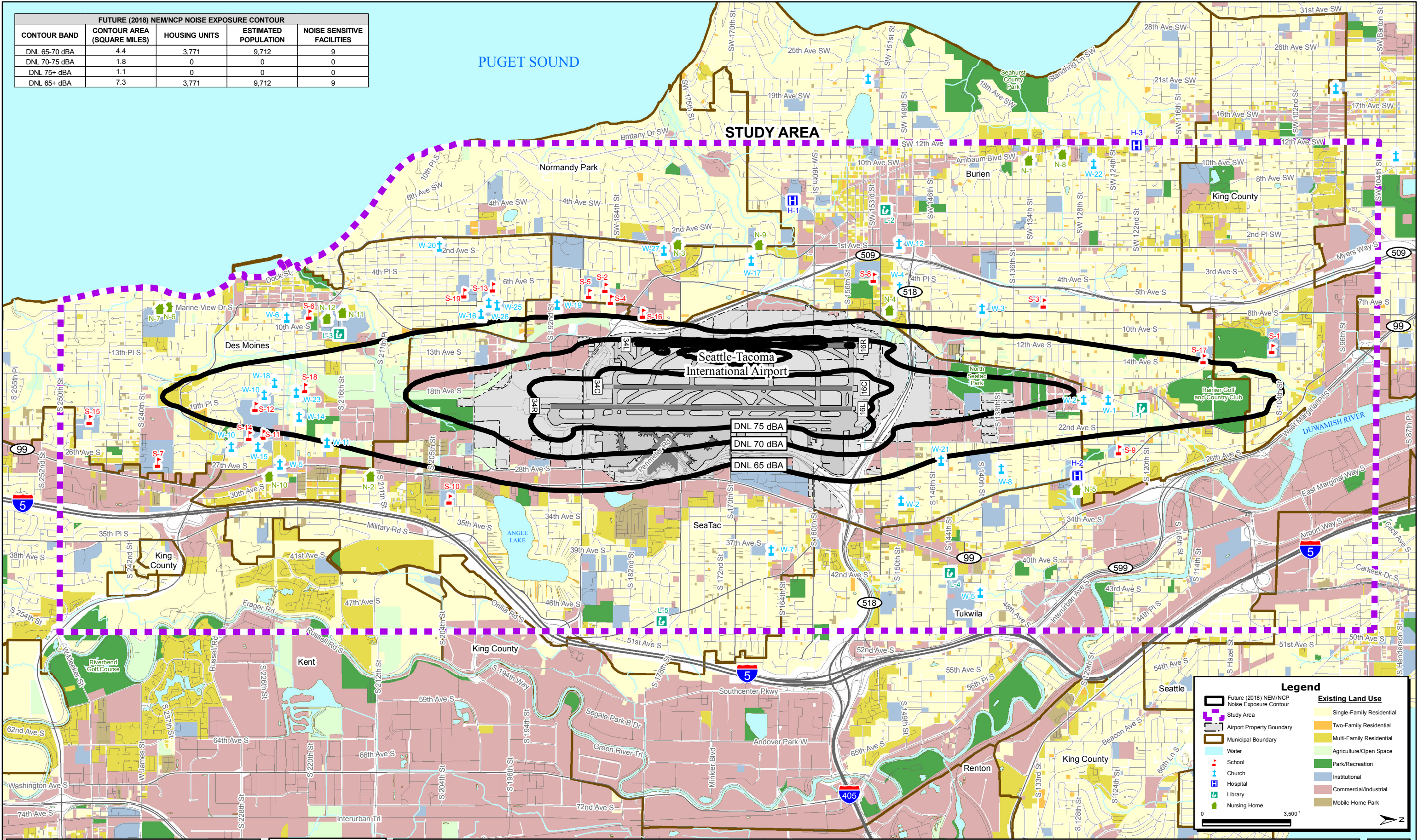


Table 6-2
FUTURE (2018) NEM/NCP LAND USE INCOMPATIBILITIES
Seattle-Tacoma International Airport

MITIGATION STATUS / LAND USE	NOISE CONTOUR BAND		
	DNL 65 - 70 dBA	DNL 70+ dBA	DNL 65+ dBA
HOUSING UNITS			
CITY OF BURIEEN			
Sound Insulation Completed			
Single-Family	953	0	953
Two-, Three-, or Four-Family Unit	72	10	72
Condominium	56	0	56
Apartment	0	0	0
Mobile Home	0	0	0
Potentially eligible but not sound insulated			
Single-Family	57	0	57
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	36	0	36
Apartment	234	0	234
Mobile Home	0	0	0
Not Eligible			
Single-Family	43	0	43
Two-, Three-, or Four-Family Unit	4	0	4
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	31	0	31
CITY OF DES MOINES			
Sound Insulation Completed			
Single-Family	568	0	568
Two-, Three-, or Four-Family Unit	26	0	26
Condominium	16	0	16
Apartment	0	0	0
Mobile Home	0	0	0
Potentially eligible but not sound insulated			
Single-Family	32	0	32
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	129	0	129
Apartment	463	0	463
Mobile Home	0	0	0
Not Eligible			
Single-Family	84	0	84
Two-, Three-, or Four-Family Unit	4	0	4
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	4	0	4

Table 6-2, Continued
FUTURE (2018) NEM/NCP LAND USE INCOMPATIBILITIES
Seattle-Tacoma International Airport

MITIGATION STATUS / LAND USE	NOISE CONTOUR BAND		
	DNL 65 - 70 dBA	DNL 70+ dBA	DNL 65+ dBA
HOUSING UNITS			
CITY OF SEATAC			
Sound Insulation Completed			
Single-Family	648	0	648
Two-, Three-, or Four-Family Unit	8	0	8
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	0	0	0
Potentially eligible but not sound insulated			
Single-Family	48	0	48
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	0	0	0
Apartment	32	0	32
Mobile Home	0	0	0
Not Eligible			
Single-Family	57	0	57
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	32	0	32
KING COUNTY			
Sound Insulation Completed			
Single-Family	124	0	124
Two-, Three-, or Four-Family Unit	2	0	2
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	0	0	0
Potentially eligible but not sound insulated			
Single-Family	6	0	6
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	0	0	0
Not Eligible			
Single-Family	0	0	0
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	2	0	2

**Table 6-2, Continued
FUTURE (2018) NEM/NCP LAND USE INCOMPATIBILITIES
Seattle-Tacoma International Airport**

MITIGATION STATUS / LAND USE	NOISE CONTOUR BAND		
	DNL 65 - 70 dBA	DNL 70+ dBA	DNL 65+ dBA
HOUSING UNITS			
TOTAL - ALL JURISDICTIONS			
Sound Insulation Completed			
Single-Family	2,293	0	2,293
Two-, Three-, or Four-Family Unit	108	0	108
Condominium	72	0	72
Apartment	0	0	0
Mobile Home	0	0	0
Potentially eligible but not sound insulated			
Single-Family	143	0	143
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	165	0	165
Apartment	729	0	729
Mobile Home	0	0	0
Not Eligible			
Single-Family	184	0	184
Two-, Three-, or Four-Family Unit	8	0	8
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	69	0	69
TOTAL HOUSING UNITS	3,771	0	3,771
ESTIMATED POPULATION			
TOTAL ESTIMATED POPULATION	9,712	0	9,712
NOISE-SENSITIVE PUBLIC FACILITIES			
Schools	2	0	2
Churches / Places of Worship	6	0	6
Libraries	1	0	1
Hospitals	0	0	0
Nursing Homes	0	0	0

Notes: Housing units that were previously not eligible for sound insulation include units that were constructed after the date of a previously published noise contour or units in which the structure cannot be effectively sound insulated.

Estimated population based on average household size by U.S. Census tract data.
Eligibility for mitigation programs will be determined as program implementation moves forward.

Sources: King County Geographic Information System data; Port of Seattle Noise Remedy Program records; U.S. Census Bureau; Landrum & Brown analysis, 2013.

There are two schools, Mt. Rainier High School and St. Philomena Primary School (both of which have been sound insulated by the Port), located within the 65+ DNL of the Future (2018) NEM/NCP noise contour. There are six places of worship: The Apostolic Bible Church, Boulevard Park Presbyterian, First Baptist Church, Lifepoint Foursquare Church, Primera Iglesia Bautista, and St. Philomena Church (of which St. Philomena Church has been sound insulated by the Port). There is one library, Boulevard Public Library, located within the 65+ DNL of the Future (2018) NEM/NCP noise contour. There are no hospitals, or nursing homes located within the 65+ DNL of the Future (2018) Baseline noise contour. There are no housing units or noise-sensitive public facilities located within the 70+ DNL of the Future (2018) Baseline noise contour.

6.3 NOISE COMPATIBILITY PROGRAM COSTS

The Port, supplemented by funding from the FAA, would incur the direct costs associated with the recommended NCP measures. The majority of the costs are associated with sound insulation of eligible housing uses within the recommended Noise Remedy Boundary. Table 6-2 above provided the number of housing units located within the DNL 65 dBA of the Future (2018) NEM/NCP noise exposure contour. However, as noted in the table, some of these housing units have already received sound insulation and others are ineligible for sound insulation. Furthermore, the Port has committed to mitigate eligible housing units in the vicinity of the DNL 65 dBA of the Future (2018) NEM/NCP noise exposure contour that are within the recommended Noise Remedy Boundary. The estimated number of eligible housing units within the recommended Noise Remedy Boundary is included in **Table 6-3, Potentially Eligible Housing Units within the Recommended Noise Remedy Boundary**.

**Table 6-3
POTENTIALLY ELIGIBLE HOUSING UNITS AND ESTIMATED POPULATION
WITHIN THE RECOMMENDED NOISE REMEDY BOUNDARY.
Seattle-Tacoma International Airport**

LAND USE	OUTSIDE SOUTH ATZ	INSIDE SOUTH ATZ	TOTAL HOUSING UNITS	ESTIMATED POPULATION
Burien				
Single-Family	85	0	85	226
Two-, Three-, or Four-Family Unit	0	0	0	0
Condominium	36	0	36	89
Apartment	234	0	234	587
<i>Subtotal</i>	<i>355</i>	<i>0</i>	<i>355</i>	<i>901</i>
Des Moines				
Single-Family	45	0	45	111
Two-, Three-, or Four-Family Unit	0	0	0	0
Condominium	239	0	239	579
Apartment	770	0	770	1,887
<i>Subtotal</i>	<i>1,054</i>	<i>0</i>	<i>1,054</i>	<i>2,577</i>
SeaTac				
Single-Family	53	3	56	154
Two-, Three-, or Four-Family Unit	0	0	0	0
Condominium	0	0	0	0
Apartment	5	27	32	86
<i>Subtotal</i>	<i>58</i>	<i>30</i>	<i>88</i>	<i>240</i>
King County				
Single-Family	10	0	10	25
Two-, Three-, or Four-Family Unit	0	0	0	0
Condominium	45	0	45	111
Apartment	148	0	148	366
<i>Subtotal</i>	<i>203</i>	<i>0</i>	<i>203</i>	<i>501</i>
Total - All Jurisdictions				
Single-Family	193	3	196	515
Two-, Three-, or Four-Family Unit	0	0	0	0
Condominium	320	0	320	779
Apartment	1,157	27	1,184	2,926
Grand Total	1,670	30	1,700	4,220

Notes: Estimated population based on average household size by U.S. Census tract data.
Eligibility for mitigation programs will be determined as program implementation moves forward.

Sources: King County Geographic Information System data; Port of Seattle Noise Remedy Program records; U.S. Census Bureau; Landrum & Brown analysis, 2013.

Costs for completion of the program have been estimated in 2012 dollars and are presented in **Table 6-4, Noise Compatibility Program Implementation Costs**. These cost estimates are based on the consultant team's preliminary assessment and are subject to change once the measures are further evaluated prior to implementation. These costs include one-time expenditures plus additional annual costs for administrative, operational, and maintenance costs. The Port carries the vast majority of responsibility for the costs of the program measures. The Port-funded mitigation actions recommended for implementation are eligible; however, for Federal matching funds amounting to approximately 80 percent of the total program cost.

The costs of each individual measure are detailed earlier in this chapter. The total estimated cost for all NCP recommendations, which includes the continuation of some program measures from the 2002 NCP Update, is between \$87,225,000 and \$106,635,000 plus additional operational, maintenance, and administrative costs. Note that this cost includes completion of the residential sound insulation program. Completion of the single family sound insulation program was also an element of the July 3, 1997 Record of Decision (ROD) for the Master Plan Update for the inclusion of the new third runway.¹² This cost estimate assumes 100 percent participation in the Noise Remedy Program by eligible property owners. This cost estimate does not include additional site preparation work which may be required for construction of a hush house (see Measure A-18), depending upon the site selected. This cost estimate does not include funding that has already been committed to sound insulate schools within the Highline School District in the vicinity of Sea-Tac Airport and the Highline Community College Campus, for which funding has been previously committed through a Memorandum of Agreement between the FAA, the Port and the District.

¹² United States Department of Transportation, Federal Aviation Administration, Record of Decision for the Master Plan Update Development Actions SEA-TAC International Airport, Seattle, Washington, July 3, 1997.

**Table 6-4
NOISE COMPATIBILITY PROGRAM IMPLEMENTATION COSTS
Seattle-Tacoma International Airport**

TYPE OF MEASURE	DIRECT COST TO AIRPORT	DIRECT COST TO LOCAL GOVERNMENT	DIRECT COST TO USERS
ABATEMENT MEASURES			
Construction of a ground run-up enclosure	\$6,000,000 plus additional site preparation and operational and maintenance costs	None	Operating costs to use the ground run-up enclosure will be primarily a function of distance to taxi to and from the facility. The final location is not yet known; therefore, operating costs cannot be estimated. However, it is not anticipated that operating costs will be increased significantly at any of the locations.
- Other measures	Administrative costs	Minimal	Minimal
Subtotal	\$6,000,000 (not including GRE site preparation and operational costs) plus other administrative costs	Minimal	Minimal
MITIGATION MEASURES			
Sound insulate eligible single-family housing units (including installation of central air conditioning for sound insulation of eligible homes that have not previously been sound insulated)	\$16,405,000 to \$18,335,000	None	None
Formal Study to Evaluate Noise Levels at eligible churches/places of worship	\$30,000 to \$40,000	None	None
Sound insulate eligible owner-occupied multi-family units (condominiums)	\$16,640,000 to \$21,440,000	None	None
Conduct feasibility study to sound insulate eligible tenant-occupied multi-family units (apartments)	\$1,100,000	None	None
Sound insulate eligible tenant-occupied multi-family units (apartments)	\$34,710,000 to \$46,280,000	None	None

**Table 6-4, Continued
NOISE COMPATIBILITY PROGRAM IMPLEMENTATION COSTS
Seattle-Tacoma International Airport**

TYPE OF MEASURE	DIRECT COST TO AIRPORT	DIRECT COST TO LOCAL GOVERNMENT	DIRECT COST TO USERS
MITIGATION MEASURES (CONTINUED FROM PREVIOUS PAGE)			
Purchase avigation easements for individual mobile homes	\$440,000	Loss of tax base	None
South ATZ Acquisition	\$10,000,000	Loss of tax base	None
Other Land Use Management Measures	Administrative costs	Minimal administrative costs	None
Subtotal	\$79,325,000 to \$97,655,000 plus administrative costs	Minimal administrative costs; loss of tax base	None
PROGRAM MANAGEMENT MEASURES			
Evaluate and Expand Noise Monitoring and Flight Tracking System	\$1,500,000 to \$2,000,000	None	None
Update NEM or NEM/NCP - Update NEM ONLY Or - Update NEM AND NCP	\$400,000 to \$500,000 \$1,000,000	None	None
Subtotal	\$1,900,000 to \$3,000,000 plus administrative costs	None	None
TOTAL – ALL MEASURES			
TOTAL – ALL MEASURES	\$87,225,000 to \$106,635,000 plus other administrative, operational, and maintenance costs	Minimal administrative costs; loss of tax base	Minimal

Notes: Total cost for remedial land use mitigation measures assumes 100 percent participation in program by eligible property owners.
Total cost for remedial land use mitigation measures excludes housing units that were constructed after October 1, 1998, which are considered ineligible for mitigation per FAA guidelines.
Costs for Measure M-2a does not include sound insulation of previously eligible units outside the recommended Noise Remedy Boundary in which the Port has committed to sound insulate per the 2002 NCP.
Cost to conduct a feasibility study to sound insulate eligible tenant-occupied multi-family units (apartments) assumes the implementation of a pilot project to conduct sound attenuation testing and sound insulate selected units to determine appropriate program methods.
All costs are in 2013 dollars

Source: Landrum & Brown, 2013 based on data provided by the Port of Seattle and King County and other comparable mitigation programs at other U.S. airports.

6.4 NOISE COMPATIBILITY PROGRAM IMPLEMENTATION

As shown in Table 6-1 the existing abatement measures A-1, A-3, A-6, A-10, A-15, and A-16, and existing mitigation measures M-2a, M-2b, M-5, M-6, M-7, M-11, and M-12 are from the previously approved 2002 Part 150 NCP and can continue uninterrupted. The recommended abatement measures A-18 and A-19 will require FAA approval to become part of the NCP. Measure A-18 will also require an environmental analysis per the National Environmental Policy Act (NEPA) prior to FAA implementation and will be subject to Safety Risk Management provisions as outlined in FAA Order 5200.11.

The implementation of the recommended mitigation measures M-14, M-15, M-16, and M-17 will require FAA approval to become part of the NCP. New mitigation measures that are implemented using Federal funding will be required to undergo an analysis per NEPA prior to implementation. Land use include property acquisition must adhere to the provisions of the Uniform Relocation Assistance and Real Properties Acquisition Policies Act.

Recommended Program Management Measure P-1 can be implemented at the discretion of the Port; however, this measure will require FAA approval of the NCP in order to be eligible for Federal funding. It is anticipated that the FAA will issue a Record of Approval. Recommended Measure P-2 includes periodic review of the NEMs and NCP and can be implemented as needed. Recommended Measure P-3 is an administrative action and can be implemented at the discretion of the Port.

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