

CHAPTER FOUR LAND USE ANALYSIS

This chapter presents a summary of the Federal Aviation Administration (FAA) policies regarding noise/land use compatibility, as well as the evaluation of land use impacts for both the existing and future conditions at the Seattle-Tacoma International Airport (Sea-Tac Airport) as it relates to FAA policy.

4.1 FEDERAL LAWS AND POLICIES RELATED TO NOISE/LAND USE COMPATIBILITY

The FAA adopted land use compatibility guidelines relating types of land use to airport sound levels in 1985. These guidelines were promulgated in Title 14 of the Code of Federal Regulations (14 CFR) Part 150. These guidelines, reproduced here as **Table 4-1, Land Use Compatibility Guidelines – 14 CFR Part 150**, show the compatibility parameters for residential, public (schools, churches, nursing homes, hospitals, libraries), commercial, manufacturing and production, and recreational land uses.

The Part 150 guidelines are the basis for defining areas potentially eligible for Federal funding through the Airport Improvement Program (AIP). The *Airport Improvement Handbook* states, "Noise compatibility projects usually must be located in areas where noise measured in day-night average sound level (DNL) is 65 decibel (dB) or greater."¹ Federal funding is available at noise levels below 65 DNL if the airport operator (Sponsor) determines that incompatible land uses exist below 65 DNL and the FAA concurs with the Sponsor's determination.

As shown in Table 4-1, all land uses within areas below 65 DNL are considered to be compatible with airport operations. Residential land uses are generally incompatible with noise levels above 65 DNL. In some areas, residential land use may be permitted in the 65 to 70 DNL with appropriate sound insulation measures implemented. This is done at the discretion of local communities. Schools and other public use facilities located between 65 and 75 DNL are generally incompatible without sound insulation. Above 75 DNL, schools, hospitals, nursing homes, and churches are considered incompatible land uses. The information presented in Table 4-1 is meant to act as a guideline. According to 14 CFR Part 150, "Adjustments or modifications of the descriptions of the land-use categories may be desirable after consideration of specific local conditions."²

¹ FAA Order 5300.38C, Chapter 7, paragraph 706.

² 14 CFR Part 150, Part B Noise Exposure Map Development, Section A150.101 Noise contours and land usages, paragraph (c).

Table 4-1
LAND USE COMPATIBILITY GUIDELINES - 14 CFR PART 150
Seattle-Tacoma International Airport

LAND USE	YEARLY DAY-NIGHT AVERAGE SOUND LEVEL (DNL) IN DECIBELS					
	BELOW 65	65-70	70-75	75-80	80-85	OVER 85
<u>RESIDENTIAL</u>						
Residential, other than mobile homes and transient lodgings	Y	N ¹	N ¹	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N ¹	N ¹	N ¹	N	N
<u>PUBLIC USE</u>						
Schools, hospitals, nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y ²	Y ³	Y ⁴	N ⁴
Parking	Y	Y	Y ²	Y ³	Y ⁴	N
<u>COMMERCIAL USE</u>						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail -- building materials, hardware, and farm equipment	Y	Y	Y ²	Y ³	Y ⁴	N
Retail trade, general	Y	Y	25	30	N	N
Utilities	Y	Y	Y ²	Y ³	Y ⁴	N
Communication	Y	Y	25	30	N	N
<u>MANUFACTURING AND PRODUCTION</u>						
Manufacturing, general	Y	Y	Y ²	Y ³	Y ⁴	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y ⁶	Y ⁷	Y ⁸	Y ⁸	Y ⁸
Livestock farming and breeding	Y	Y ⁶	Y ⁷	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
<u>RECREATIONAL</u>						
Outdoor sports arenas and spectator sports	Y	Y	Y ⁵	N ⁵	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

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

**Table 4-1, Continued
LAND USE COMPATIBILITY GUIDELINES - 14 CFR PART 150
Seattle-Tacoma International Airport**

Key To Table 4-1

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

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

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

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

Notes for Table 4-1

1. Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as five, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.
2. Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
3. Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
4. Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
5. Land use compatible provided special sound reinforcement systems are installed.
6. Residential buildings require a NLR of 25 dB.
7. Residential buildings require a NLR of 30 dB.
8. Residential buildings not permitted.

Source: 14 CFR Part 150 Airport Noise Compatibility Planning, Appendix A, Table 1.

4.1.1 FAA FINAL POLICY ON PART 150 NOISE MITIGATION MEASURES

The FAA issued a final policy to establish a distinction between remedial and preventive noise mitigation measures proposed by airport operators and submitted for approval by the FAA under noise compatibility planning regulations. In the notice of final policy³ effective October 1, 1998, the FAA stated the following:

- As of October 1, 1998, the FAA will approve under 14 CFR Part 150 only remedial noise mitigation measures for existing incompatible development and only preventive noise mitigation measures in areas of potential new incompatible development.
- The FAA will not approve remedial noise mitigation measures for new incompatible development that occurs in the vicinity of airports.
- The use of AIP funds will be affected to the extent that such use depends on approval under Part 150.

³ FAA Notice of Final Policy, October 1, 1998.

The Airport Noise Compatibility Planning Program (14 CFR Part 150) was established under the Aviation Safety and Noise Abatement Act of 1979 (49 U.S.C. 47501 through 47509, hereinafter referred to as ASNA). The Part 150 program allows airport operators to submit Noise Exposure Maps (NEMs) and Noise Compatibility Programs (NCPs) to the FAA voluntarily. According to the ASNA, an NCP sets forth the measures that an airport operator has taken or has proposed for the reduction of existing incompatible land uses and the prevention of additional incompatible land uses within the area covered by NEMs.

The ASNA embodies strong concepts of local initiative and flexibility. The submission of NEMs and NCPs is left to the discretion of local airport operators. Airport operators also may choose to submit NEMs without preparing and submitting an NCP. The types of measures that airport operators may include in an NCP are not limited by the ASNA, allowing airport operators substantial latitude to submit a broad array of measures--including innovative measures--that respond to local needs and circumstances.

The criteria for approval or disapproval of measures submitted in a Part 150 program are set forth in the ASNA. The ASNA directs the Federal approval of an NCP, except for measures relating to flight procedures: (1) if the program measures do not create an undue burden on interstate or foreign commerce; (2) if the program measures are reasonably consistent with the goal of reducing existing incompatible land uses and preventing the introduction of additional incompatible land uses; and (3) if the program provides for its revision if necessitated by the submission of a revised NEM. Failure to approve or disapprove an NCP within 180 days, except for measures relating to flight procedures, is deemed to be an approval under the ASNA. Finally, the ASNA sets forth criteria under which grants may be made to carry out noise compatibility projects, consistent with ASNA's overall deference to local initiative and flexibility.

The FAA is authorized, but not obligated, to fund projects via the AIP to carry out measures in an NCP that are not disapproved by the FAA. Such projects also may be funded with local Passenger Facility Charges (PFC) revenue upon the FAA's approval of an application filed by a public agency that owns or operates a commercial service airport, although the use of PFC revenue for such projects does not require an approved NCP under Part 150.

In establishing the airport noise compatibility planning program, which became embodied in 14 CFR Part 150, the ASNA did not change the legal authority of state and local governments to control the uses of land within their jurisdictions. Public controls on the use of land are commonly exercised by zoning. Zoning is a power reserved to the states under the U.S. Constitution. It is an exercise of the police powers of the states that designates the uses permitted on each parcel of land. This power is usually delegated in states enabling legislation to local levels of government.

Many local land use control authorities (cities, counties, etc.) have not adopted zoning ordinances or other controls to prevent incompatible development (primarily residential) within the noise impact areas of airports. An airport noise impact area, identified within noise contours on an NEM, may extend over a number of different local jurisdictions that individually control land uses.

While airport operators have included measures in NCPs submitted under Part 150 to prevent the development of new incompatible land uses through zoning and other controls under the authorities of appropriate local jurisdictions, success in implementing these measures has been mixed.

One or more of the factors hindering effective land use controls may be of sufficient importance to preclude some jurisdictions from following through on the land use recommendations of an airport's Part 150 NCP. When either an airport sponsor's or a non-airport sponsor's jurisdiction allows additional incompatible development within the airport noise impact area, it can result in noise problems for the people who move into the area. This can, in turn, result in noise problems for the airport operator in the form of inverse condemnation or noise nuisance lawsuits, public opposition to proposals by the airport operator to expand the airport's capacity, and local political pressure for airport operational and capacity limitations to reduce noise. Some airport operators have taken the position that they will not provide any financial assistance to mitigate aviation noise for new incompatible development. Other airport operators have determined that it is a practical necessity for them to include at least some new residential areas within their noise assistance programs to mitigate noise impacts that they were unable to prevent in the first place. Over a relatively short period of time, the distinctions blur between what is "new" and what is "existing" residential development with respect to airport noise issues.

Airport operators currently may include new incompatible land uses, as well as existing incompatible land uses, within their Part 150 NCPs and recommend that remedial noise mitigation measures--usually either property acquisition or noise insulation--be applied to both situations. These measures have been considered to qualify for approval by the FAA under 49 USC 47504 and 14 CFR Part 150. The Part 150 approval enables noise mitigation measures to be considered for Federal funding under the AIP, although it does not guarantee that Federal funds will be provided.

FINAL POLICY

Therefore, as of October 1, 1998, the FAA will approve remedial noise mitigation measures under Part 150 only for incompatible development which exists as of that date. Incompatible development that potentially may occur on or after October 1, 1998, may only be addressed in Part 150 programs with preventive noise mitigation measures. This policy will affect the use of AIP funds to the extent that such funding is dependent on approval under Part 150. Approval of remedial noise mitigation measures for bypassed lots or additions to existing structures within noise impacted neighborhoods, additions to existing noise impacted schools or other community facilities required by demographic changes within their service

areas, and formerly noise compatible uses that have been rendered incompatible as a result of airport expansion or changes in airport operations, and other reasonable exceptions to this policy on similar grounds must be justified by airport operators in submittals to the FAA and will be considered by the FAA on a case-by-case basis. This policy does not affect AIP funding for noise mitigation projects that do not require Part 150 approval, that can be funded with PFC revenue, or that are included in FAA-approved environmental documents for airport development.

4.1.2 FAA PROGRAM GUIDANCE LETTERS

Program Guidance Letters (PGLs) add to or revise guidance about the administration of the AIP found in the AIP Handbook. Two PGLs that are pertinent to Part 150 Studies and NCPs are PGL 05-04 and PGL 08-02. These PGLs are described on the following pages.

4.1.2.1 Program Guidance Letter 05-04⁴

PGL 05-04 outlines three recent changes to FAA policy regarding Part 150 studies, the submittal of NEMs, and the approval of NCP measures.

SUBSECTION 05-4.1

Subsection 05-4.1 of PGL 05-04 addressed Section 189 of Vision 100 amended 49 U.S.C. section 47504(b), formerly Section 104 of the ASNA which sets forth limitations on the approval of certain NCP measures outside the DNL 65 dB of the noise exposure contour. Section 189 of Vision 100 prohibits FAA from approving NCP measures in Fiscal Years 2004 through 2007 that require the expenditure of AIP funds to mitigate noise of less than DNL 65 dB. Section 189 does not preclude the use of airport revenue or PFC funding outside DNL 65 dB nor does it:

- Preclude an airport sponsor from evaluating and recommending measures in an area less than DNL 65 dB as part of its NCP.
- Preclude FAA approval of such measures if they do not require the expenditure of AIP funds (i.e., the measure may require no expenditure of funds). An airport sponsor may use sources other than AIP, such as PFCs or airport revenue, to fund measures that FAA has disapproved under Part 150 with respect to AIP funding in accordance with Section 189.
- Halt AIP funding for measures previously approved under Part 150.
- Affect contiguous parcels to complete a project area (Section 810.b. of Order 5100.38B).

⁴ Program Guidance Letter 05-04 About §§189, 322, and 324 in *Vision 100-Century of Aviation Reauthorization Act: Guidance For Funding Mitigation Projects for Aircraft Noise less than 65 DNL, Public Availability of Noise Exposure Maps, and Determining Eligibility Of Airport Noise Compatibility Projects In Areas of Significantly Reduced Noise Exposure*, June 3, 2005.

- Affect AIP funding that does not require Part 150 approval including the soundproofing of buildings used primarily for educational or medical purposes under 49 U.S.C. section 47504(c)(2)(D). Grants to soundproof schools and hospitals are not affected because an FAA-approved NCP is not required under Section 47504.

If the airport sponsor's NCP includes recommended measures for FAA approval for areas outside the DNL 65 dB contour, then the sponsor must still meet eligibility criteria set forth in the FAA's July 25, 1995, memorandum and paragraph 810b of the *Airport Improvement Program Handbook*, FAA Order 5100.38B. That is: The airport sponsor must demonstrate that the local land use planning authority with responsibility for planning in the area surrounding the airport has adopted alternative land use compatibility guidelines, showing the changes in land use criteria, and the NEM must depict the locally determined standard. The NEM and NCP must identify the area as incompatible and recommend mitigation measures. The airport sponsor's mitigation measure(s) within any contour outside DNL 65 dB must otherwise satisfy Part 150 approval criteria (section 150.35). The sponsor's application for approval to collect and use PFCs for projects in areas outside DNL 65 dB must include evidence that, but for Section 189 of Vision 100, the measure would qualify for approval under Part 150 (see item (2), above for required evidence). Where the sponsor has prepared an NCP, the application must show that the measure was disapproved solely because of Section 189.

SUBSECTION 05-4.2

Subsection 05-4.2 modifies the required minimum map scale for NEMs and sets forth a requirement to make information available to the public on the Internet to addresses requirements in Section 322 of Vision 100.

SUBSECTION 05-4.3

Subsection 05-4.3 addresses eligibility of Part 150 noise projects after NEMs have been revised because noise impacts have been significantly reduced or increased.

Absent information to the contrary, NEMs on file with the FAA for less than five years may be presumed to be current and project eligibility may be determined using either the existing or forecast conditions NEMs on file with FAA. However, if there is information indicating that the NEMs on file with the FAA do not reflect recent significant changes that have occurred at the airport that would affect the noise contours, or if the NEMs are older than five years, the sponsor must certify the existing or forecast year NEM reflects current conditions at the airport, or the sponsor must submit updated NEMs. For significant increases in noise, you do not have to wait for the forecast year NEM update to program the project.

What if noise has reduced significantly since the NEMs were certified by the airport sponsor and accepted by the FAA and the revised NEMs demonstrate that a noise project for which funding is requested is still experiencing DNL 65 dB or greater noise levels? The following two case examples apply:

- (1) The project may be funded if the NCP shows the project was part of a measure that was recommended by the sponsor and approved by the FAA at the prevalent noise exposure level (i.e. a project to soundproof a home was part of a measure to soundproof residences located in the DNL 65 dB contour and the revised NEMs show that the project is for a home that remains within the DNL 65 dB noise level). Use the priority rating system with the new noise impact level to determine its significance in setting your funding priority.
- (2) The project needs additional justification to be funded if the project was not recommended for FAA approval within the new noise contour. The sponsor may need to revise its NEM and NCP to make it eligible. For example, the sponsor recommended acquisition of properties within the DNL 70 dB and sound attenuation within the DNL 65 dB. The area previously approved for acquisition is now located within the DNL 65 dB noise contour. The project is no longer eligible for acquisition. However, it may be eligible for sound attenuation if the sponsor consults with the public or updates its NCP. In cases of neighborhood equity, eligibility may be "grandfathered" if the remaining portion of the neighborhood within the project area is not substantial.

4.1.2.2 Program Guidance Letter 08-02: Management of Acquired Noise Land: Inventory – Reuse -- Disposal⁵

PGL 08-02, issued February 1, 2008 and updated March 26, 2009 sets forth requirements for land acquired under an airport NCP, commonly referred to as "noise land." The guidance in PGL 08-02 addresses the obligations associated with the acquisition of noise land as well as requirements for managing the land, retaining the noise land for continued noise compatibility, and disposing of the noise land if it is no longer needed for noise compatibility.

PGL 08-02 addresses the following topics pertaining to the identification of "noise land," its use, potential disposal (and use of proceeds), and report compliance:⁶

- Obligations associated with the acquisition of noise land
- Management of noise land
- Retaining noise land
- Disposal of unneeded noise land
- Use of disposal proceeds
- FAA oversight of noise land
- Compliance and reporting

⁵ Program Guidance Letter 08-02: *Management of Acquired Noise Land: Inventory – Reuse – Disposal*. Federal Aviation Administration, Office of Airport Planning and Programming, Airport Financial Assistance Branch, January 30, 2008. Circulated by Memorandum, February 1, 2008 by Barry L. Molar.

⁶ Parts of this summary of Program Guidance Letters 08-02 were obtained from the following O.R. Colan Associates website: <http://orcolan.com/cs/archived-articles/156-airport-noise-land-acquisition-management-and-disposal-an-overview-of-the-new-faa-requirements>

Airports that have used AIP funding to acquire property in areas exposed to significant aircraft noise under a Part 150 NCP must comply with grant assurances. A condition of the AIP grant is that airports agree to dispose of land when it is no longer needed for noise purposes or AIP-eligible airport development projects. An eligible project would include:

- Terminal Facilities
- Runways
- Taxiways
- Runway Protection Zones (RPZs)
- Areas for Fixed Base Operators (FBO), or
- Other eligible elements of the airport facility requiring land

In accordance with the *Airport Improvement Program Handbook*, FAA Order 5100.38C, *Noise lands*, if not needed for AIP-eligible airport development, are to be sold, leased, or exchanged for and put to compatible uses. Acceptable compatible uses are outlined in Attachment A of the FAA PGL 08-02. Any proceeds received from the disposal of noise lands are to be used for funding other noise acquisition projects or returned to the FAA's Airport and Runway Trust Fund.

The implementation of an NCP will remove or protect sensitive land uses from aircraft noise. When the acquired property is no longer needed for noise mitigation for an AIP eligible development project, the airport must consider one of the following options:

- Retain the land for AIP-eligible airport uses or
- Retain the land for non AIP-eligible airport uses and pay back the Federal share of market value, or
- Retain the land for noise compatible purposes, if disposal is not feasible and review status at least every five years, or
- Exchange the land for airport related land uses, or
- Dispose of the land by property sale, exchange, or lease for purposes that would be compatible with aircraft noise

The guidance specifies that acquired noise land areas would be planned and zoned for uses consistent with the existence of aircraft noise levels, i.e., higher than 65 dB based on average DNL.

Portions of a noise acquisition area may be suitable for retention for airport operation purposes, as noted above. Noise lands can also be retained if needed for noise compatibility purposes in that they cannot be reasonably developed. The airport sponsor should periodically assess whether there is justification to continue to retain such lands.

If noise lands are used for AIP-eligible development approved by the FAA, there is no requirement to pay back the Federal share of the noise land acquisition costs. If lands are sold, leased, or exchanged, the payback of the Federal share is based on the market value of the property as indicated by a real estate appraisal and appraisal report. The report must be prepared in accordance with Uniform Standards of Professional Appraisal Practice and FAA requirements including PGL 08-02, Attachment D: *Appraisal Scope of Work Statement* in the guidance.

The FAA guidance also affords the offsetting of certain selling expenses incurred by the sponsor in the disposal of noise land property against the payback amount of the Federal share. Any land sale proceeds resulting from a disposal must be accounted for and held in an escrow account approved by the FAA in accordance with PGL 08-02, Attachment E, in the guidance. Such funds can be used for new noise land acquisitions or other AIP-eligible noise projects by the sponsor.

An airport sponsor is responsible for preparing an inventory of all noise lands. The inventory will include the use of maps and tables to compile the data required by the FAA guidance. The noise lands that may be eligible for use in an airport development project (using AIP funding) must be identified. Similarly any lands not suitable or needed for airport development must be identified. This data should already be included on the airport's Exhibit "A" Property Map, if it is up to date. If the Exhibit "A" is not current, it would be appropriate to update that document first as the data required for the noise land inventory can be retrieved from that source.

Once the noise land inventory is complete, the airport sponsor is required to prepare a "Reuse Plan" that explains the airport sponsor's plan for conversion of lands eligible for airport development and alternatively the disposal, lease, or exchange of lands not suitable or needed for airport development. Sponsors are expected to undertake appropriate land use planning initiatives relative to lands not needed for airport development. This action will result in informed decisions regarding what compatible land uses can be considered based on appropriate local land use planning and zoning requirements. Such planned uses must be compatible with the local land use plan and the existing aircraft noise environment. The "Noise Land Inventory" and the "Reuse Plan" are submitted to the FAA for approval, after which the sponsor can proceed to implement the approved plan.

After planning is complete and the "Reuse Plan" has been approved by the FAA, the property would be appraised by the airport and disposal options including market sale, lease, or exchange could potentially be considered. A feasibility analysis may also be undertaken to determine whether it would be better to dispose of raw land or incur certain limited development approval and permitting costs to realize the highest and best use of the property.

According to FAA PGL 08-02 all airports that have noise land grants are required to complete their "Reuse Plan" by October 2009. The Noise Land Inventory will be completed prior to the "Reuse Plan." FAA approval of the noise land inventory and the "Reuse Plan" is required before the airport proceeds with implementation.

4.1.2.3 Program Guidance Letter 12-09: AIP Eligibility and Justification Requirements for Noise Insulation Projects⁷

The FAA issued PGL 12-09 in 2012 to clarify eligibility requirements for airport noise insulation projects. The PGL notes that a property's eligibility for sound insulation is based on two criteria: 1) that the property is located within the 65 DNL, and 2) that the interior noise level must be above 45 dB. The PGL further clarifies the method for determining whether or not properties meet the requirement of an interior noise level at or above 45 dB through the use of testing to determine the interior noise levels of potentially eligible properties.⁸ The PGL includes guidance on testing methodology, equipment, and the determination of an adequate sample size, which could impact program startup and implementation costs and funding reimbursement. The guidance contained in the PGL does not apply to noise insulation projects for which construction has been completed. Furthermore, additional guidance is provided for programs that are ongoing to ensure the requirements restated in the PGL are met.

4.2 POTENTIAL PREVENTATIVE LAND USE CONTROLS

Specific land use controls are implemented at the discretion of local governments. An airport sponsor typically does not have the authority to implement local land use controls. Land use management measures used for Part 150 purposes include both preventive and corrective techniques.

Preventive land use management techniques seek to prevent the introduction of additional noise-sensitive land uses within existing and future airport noise contours. Preventive measures include two categories – regulatory and policy. These potential measures are summarized below. Details about these measures, including the extent to which they have been employed by the jurisdictions surrounding Sea-Tac Airport, is included in **Section 1.8 of Chapter One, Inventory**.

REGULATORY

- Compatible Use Zoning: commercial, industrial, or farmland zoning
- Zoning Changes, Residential Density: large-lot zoning, planned development, multi-family zoning
- Noise Overlay Zoning: special regulations within high-noise areas
- Transfer of Development Rights: zoning framework to authorize private sale of development rights to encourage sparse development in high-noise areas
- Environmental Zoning: environmental protection zoning to support airport land use compatibility

⁷ Program Guidance Letter 12-09: *AIP Eligibility and Justification Requirements for Noise Insulation Projects*. Federal Aviation Administration, Office of Airport Planning and Programming, Airport Financial Assistance Branch, August 17, 2012, Revised November 7, 2012.

⁸ Note: housing units with interior noise levels below 45 dB are considered compatible and are not generally eligible for AIP funding for sound insulation.

- Subdivision Regulation Changes: require dedication of noise and aviation easements, plat notes
- Building Code Changes: require soundproofing in new construction
- Dedicated Noise and Aviation Easements: require for development permits
- Fair Disclosure Regulations: require seller to notify buyer of aircraft noise

POLICY

- Comprehensive Planning: policies supporting land use compatibility. Can involve specific land use plans and policies to guide rezoning, variances, conditional uses, public projects
- Capital Improvement Programming: public investments which support airport land use compatibility

4.3 POTENTIAL CORRECTIVE LAND USE MITIGATION TOOLS

Corrective or remedial measures are intended to convert existing, non-compatible uses to compatible uses. Generally, corrective uses fall into two categories: modify existing use, and maintain existing use. The following is a brief discussion of typical corrective or remedial land use mitigation alternatives included in Part 150 studies.

4.3.1 MODIFY EXISTING USE

Land Acquisition to Change Land Use

If the acquisition of property results in a change in land use, from incompatible to compatible with airport operations (e.g., airport/transportation, commercial, or industrial), the property owner would be eligible for relocation assistance and moving expenses, consistent with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act*. The property would be acquired, residents would be relocated, and the property would be converted to a compatible land use. This would prevent further development of incompatible land uses. The land acquisition program should assure that the subsequent land use is consistent with local land use plans and policies, including compatibility with noise exposure levels in the area. Because the acquisition is to result in a change in land use, the local jurisdiction may decide to apply its power of eminent domain.

4.3.2 MAINTAIN EXISTING USE

Sound Insulation of Homes

A program for sound insulation of residences is always voluntary on part of the homeowner and is generally focused on residences located in a 65 DNL to 70 DNL noise contour. Other than the obvious benefit of reducing interior noise levels, a sound insulation program maintains the land use of the area and generally

increases the value of the properties. Unfortunately, sound insulation treatments do not reduce the noise outside the residence and as such the benefits of the treatments are reduced when doors and windows are open.

Acquisition of Land or Interests in Land for Noise Compatibility

A program for property acquisition can be either voluntary (participation in the program is voluntary on the part of the property owner), or involve condemnation (local power of eminent domain). Acquisition as mitigation for noise impacts would always be voluntary. The intent is to acquire undeveloped land to prevent it from being developed into a non-compatible use.

Land Acquisition without Change to Land Use

The acquisition of incompatible property where no change in land use would result would be a “voluntary” acquisition program, where participation in the program would be voluntary on the part of the property owner. The reason for such a voluntary program is most often due to the owner’s inability to sell the property at fair market value. Acquisition procedures would be implemented in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act* and relocation benefits would not apply.

Purchase Guarantee

Purchase guarantee is a program whereby the airport sponsor agrees to purchase a residence for fair market value should the owner be unable to sell the property on the open market because of noise impacts. Participation in this program is voluntary on the part of the property owner and is implemented in areas where the land use is not going to change. In order to protect potential buyers a stipulation of this program requires that the seller disclose to the buyer the airport noise exposure on the property and the intention of the airport sponsor to retain an easement on the property. Acquisition procedures would be implemented in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act* and relocation benefits would not apply.

Sales Assistance

The airport sponsor guarantees that the property owner will receive the appraised value, or some increment thereof, regardless of final sales value that is negotiated with a buyer. However, unlike purchase guarantee, the airport sponsor does not take ownership of the property in the event that it does not sell. In return for the assistance, the airport sponsor retains an aviation easement on the property and will typically require sound insulation before the sale.

Avigation Easements

Acquisition of avigation easements should be used to alleviate conflicts if no other land use controls are viable or in some cases, in lieu of outright acquisition of the land. The easement would be noted on the property deed and passed on to any subsequent owners of the property.

Amending local zoning and subdivision regulations to provide for the dedication of an easement to the airport sponsor as a condition of approval for residential rezoning or subdivision plats within the 65 DNL noise contour would alert developers, lenders, and prospective purchasers to the proximity of the airport and to the existence of a potential noise issue. The avigation easement would also protect the airport from future litigation by purchasers of the rezoned or subdivided property.

There is a constitutional issue raised by requiring dedication of an easement as well as imposing more vigorous and expensive standards for construction within the airport environs. Government may not require a person to give up a constitutional right (i.e., a public use) in exchange for a discretionary benefit conferred by the government unless there is a reasonable relationship between a legitimate governmental objective and the condition that is imposed on the developer. Moreover, the exaction demanded by the permit or condition must be in proportion to the impact of the proposed development that is sought to be alleviated. Whether that balance exists requires an individualized determination. If it were determined not to meet these standards, then the legislation would either be unenforceable or its enforcement would constitute a taking requiring the payment of just compensation.

Fair Disclosure Policy

A method can be developed insuring that buyers of residential property within the airport environs receive fair disclosure of the location of the property relative to the airport by requiring that sellers of residential property in the airport environs deliver to buyers a purchase disclosure notice consisting of a copy of the Noise Overlay District Ordinance and Map with a statement that the property is located within the Airport Noise Overlay District. It may also require that all advertisements and listings for sale of residentially zoned or improved property in the Noise Overlay District include a statement about aircraft noise, such as -- "Not recommended for persons who may be easily disturbed by aircraft noise." Finally, solicitation of voluntary inclusion of the notice in Multiple Listing Services by the real estate profession alerts potential buyers of property to the noise conditions.

4.4 LAND USE ASSESSMENT METHODOLOGY

This section describes the methodology that was used to identify and assess land use as it relates to noise compatibility for this Part 150 Study.

4.4.1 LAND USE CLASSIFICATIONS

Existing land use data was collected from King County and the municipalities within the Study Area (SA). Land uses in the vicinity of Sea-Tac Airport were categorized in terms of the general land use classifications as outlined in 14 CFR Part 150 and shown in Table 4-1 of this document. These classifications include residential (single and multi-family), commercial, public/institutional, and agricultural/recreational/open space. These land uses were identified based on King County's Geographic Information Systems (GIS) database and was verified as necessary with aerial photography.

The 2000 U.S. Census data, at the tract level, was combined with the GIS land use file to calculate the population and housing incompatibilities within the noise contours. **Table 4-2, Generalized Land Use Classifications**, shows the generalized land use categories and examples of specific land use classifications included in the King County GIS data.

**Table 4-2
GENERALIZED LAND USE CLASSIFICATIONS
Seattle-Tacoma International Airport**

GENERALIZED LAND USE CATEGORY	SPECIFIC LAND USE EXAMPLES
Agricultural / Open Space	Farm
	Agricultural
	Greenhouse / Nursery / Horticulture service
	Open Space
	Timber Land / Greenbelt
	Vacant Single-family (without structure)
	Vacant Multi-family (without structure)
Single-Family Residential	Single family (residential use / zone)
	Single family (C/I use)
	Single family (C/I Zone)
	Vacant Single-family (with structure)
Two-Family Residential	Duplex
Mobile Home	Mobile home
	Condominium (Mobile Home Park)
	Mobile home park

Table 4-2, Continued
GENERALIZED LAND USE CLASSIFICATIONS
Seattle-Tacoma International Airport

GENERALIZED LAND USE CATEGORY	SPECIFIC LAND USE EXAMPLES
Multi-Family Residential	Triplex
	4-plex
	Apartment
	Apartment (Mixed use)
	Condominium (Mixed use)
	Condominium (Residential)
	Fraternity / Sorority House
	Townhouse plat
	Vacant Multi-family (with structure)
Park / Recreation	Campground
	Auditorium / Assembly Building
	Church / Welfare / Religious Services
	Golf Course
	Park, Private (Amusement Center)
	Park, Public (Zoo \ Arboretum)
	Reserve / Wilderness Area
Institutional	Hospital
	Governmental Service
	Mortuary / Cemetery / Crematory
	Nursing home
	Retirement facility
	School (Private)
	School (Public)
Commercial / Industrial	Hotel or motel
	Air Terminal and Hangers
	Auto Showroom and Lot
	Bank
	Bowling Alley
	Car Wash
	Club
	Condominium (Office)
	Convenience Store with Gas
	Convenience Store without Gas
	Daycare Center
	Driving Range
	Grocery Store
	Health Club
	High Tech / Tech Flex
	Industrial (General Purpose)
	Industrial (Heavy)
	Industrial (Light)
	Industrial Park
	Marina
	Medical or Dental office

Table 4-2, Continued
GENERALIZED LAND USE CLASSIFICATIONS
Seattle-Tacoma International Airport

GENERALIZED LAND USE CATEGORY	SPECIFIC LAND USE EXAMPLES
Commercial / Industrial (continued from previous page)	Mini Lube
	Mini Warehouse
	Mining / Quarry / Ore processing
	Movie Theatre
	Office building
	Parking (Commercial Lot/Garage)
	Post Office / Post Service
	Resort / Lodge / Retreat
	Restaurant (Fast Food)
	Restaurant / Lounge
	Retail (Big box)
	Retail (Discount)
	Retail (Line / Strip)
	Retail store
	Right of Way / Utility, Road
	Rooming House
	Service Station
	Shopping Center (Community)
	Shopping Center (Major retail)
	Shopping Center (Neighborhood)
	Shopping Center (Regional)
	Shopping Center (Specialty)
	Sport Facility
	Tavern / Lounge
	Terminal (Auto / Bus /Other)
	Terminal (Grain)
	Terminal (Marine / Commercial Fishery)
	Terminal (Marine)
	Terminal (Rail)
	Utility, Private (Radio / TV)
	Utility, Public
	Vacant (Commercial)
	Vacant (Industrial)
	Vet / Animal Control Service
	Warehouse

Source: King County GIS Data; Landrum & Brown analysis, 2012.

4.4.2 ZONING DATA COMPILATION

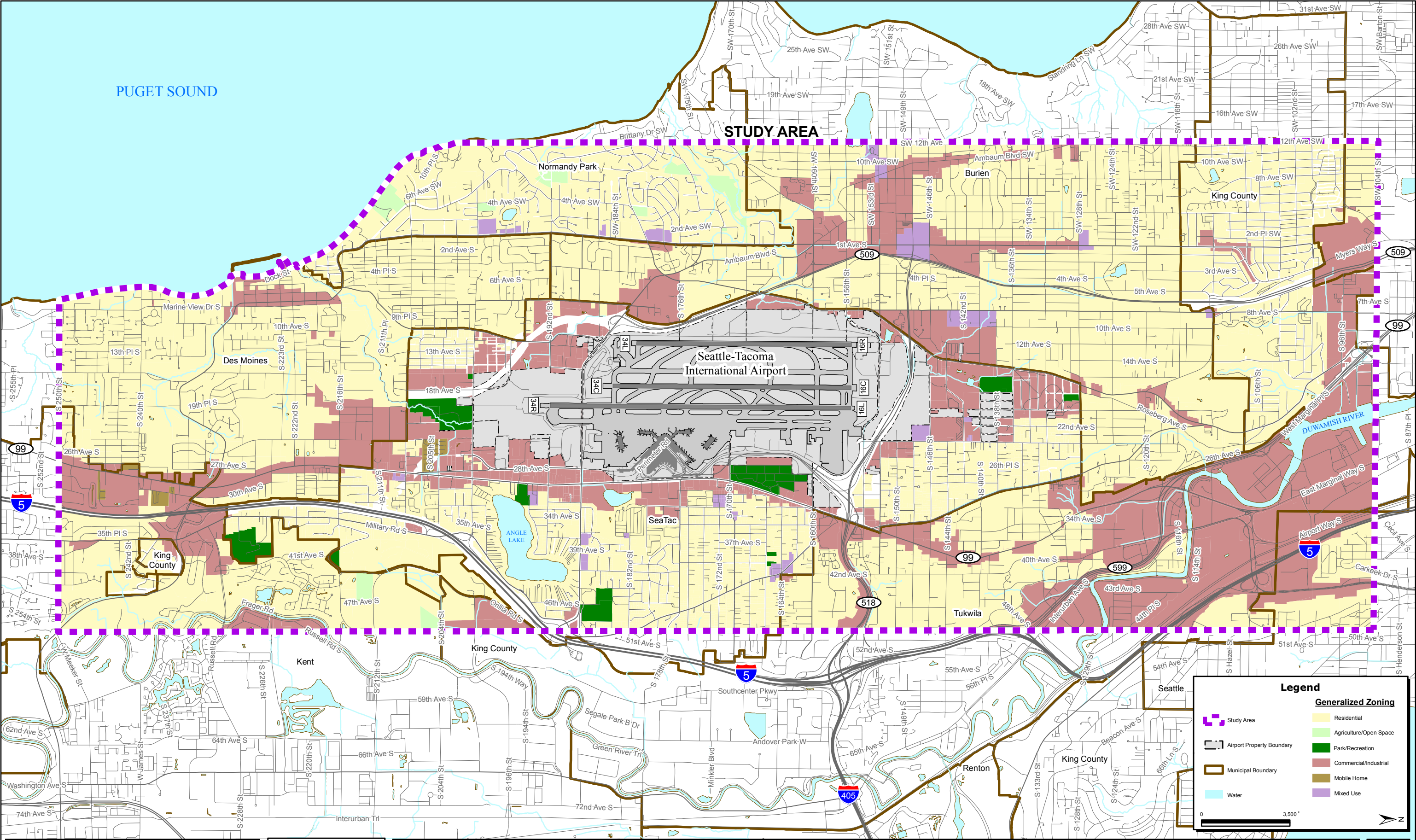
Specific zoning information from each jurisdiction within the SA was collected and reviewed in order to identify tools for prohibiting incompatible development and encouraging compatible development near the airport. **Exhibit 4-1, Generalized Existing Zoning**, graphically depicts the generalized zoning districts within the SA around Sea-Tac Airport. **Table 4-3, Generalized Zoning Classifications**, shows the generalized zoning categories, and the specific zoning classifications included in each generalized category, by jurisdiction.

4.5 BASELINE LAND USE COMPATIBILITY

This section describes the existing noise exposure on communities surrounding Sea-Tac Airport. The noise analysis presents the noise exposure for the existing conditions base year–2013. Aircraft-related noise exposure is defined through noise contours prepared using the FAA’s Integrated Noise Model (INM). This noise exposure is presented using the DNL metric according to the land use guidelines presented in Table 4-1.

In addition to the Existing (2013) Baseline Noise conditions, this chapter provides information about the current and potential noise levels in 2018 if no action is taken to change the noise exposure pattern through noise abatement. The noise patterns are presented on exhibits included in **Chapter Three, Noise Analysis**. This chapter includes information regarding the estimated numbers of persons, housing units, and other noise-sensitive facilities that fall within the Existing (2013) and Future (2018) Baseline noise exposure contour.

An explanation of the INM and the DNL metric, along with a review of the physics of noise, noise impacts on humans, social impacts of noise, and the data required to develop noise exposure contours, is summarized in Chapter Three. Information on the forecast of aviation activity, on which the noise analysis for the Future (2018) condition is based, is included in **Chapter Two, Forecast**.



**Table 4-3
GENERALIZED ZONING CLASSIFICATIONS
Seattle-Tacoma International Airport**

GENERALIZED ZONING	ZONING CLASSIFICATION BY JURISDICTION							
	BURIEN	DES MOINES	KENT	NORMANDY PARK	SEATAC	SEATTLE	TUKWILA	KING COUNTY
Residential	RM-12 RM-18 RM-24 RM-48 RS-12,000 RS-7,200 RS-A	PR-R RA-3600 RM-1800 RM-2400 RM-900 RM-900A RM-900B RS-15000 RS-7200 RS-8400 RS-9600 R-SE R-SR	MR-G MR-H MR-M MRT-16 SR-1 SR-4.5 SR-6	R12.5 SF R15 SF R5 MF R7.2 SF RM 1800 MF RM 2400 MF	UH-1,800 UH-900 UH-UCR UL-15,000 UL-5,000 UL-7,200 UL-9,600 UM-2,400 UM-3,600	Lowrise Single Family 7200 Single Family 9600	HDR LDR MDR	R-1 R-12 R-18 R-18-P R-24 R-4 R-48 R-6 R-8
Agricultural / Open Space			A-10	Open Space				
Park / Recreation					P			

**Table 4-3, Continued
GENERALIZED ZONING CLASSIFICATIONS
Seattle-Tacoma International Airport**

GENERALIZED ZONING	ZONING CLASSIFICATION BY JURISDICTION							
	BURIEN	DES MOINES	KENT	NORMANDY PARK	SEATAC	SEATTLE	TUKWILA	KING COUNTY
Commercial / Industrial	AI-1	B-C	CC		ABC	Commercial	C/LI	CB
	AI-2	B-P	CC-MU		AVC	Industrial Buffer	LI	CB-SO
	CC-1	D-C	CM-2		AVO	Industrial General 1	MIC/H	I
	CC-2	H-C	GC		BP	Industrial General 2	MIC/L	I-P
	CI	N-C	M1		CB	Neighborhood Commercial	MUO	NB
	CR	PR-C1	MA		CB-C		NCC	NB-P
	DC	PR-C2			HWY		O	RB
	I				I		RC	
	O						RCC	
Mobile Home			MHP		MHP		TVS	
Mixed Use	CN			MU	NB			
	PR			NC	O/C/MU			
	SP1				OCM			
	SP2							
	SP3							

Note that only zoning classifications within the SA are Listed.

Source: Cities of Burien, Des Moines, Kent, Normandy Park, SeaTac, Seattle, and Tukwila, and King County; Landrum & Brown analysis, 2012.

4.5.1 EXISTING (2013) BASELINE NOISE CONTOUR EXPOSURE INCOMPATIBILITIES

A summary of the housing units, estimated population, and noise-sensitive facilities affected by noise levels exceeding 65 DNL for the Existing (2013) Baseline noise exposure contour is provided in **Table 4-4, Existing (2013) Baseline Land Use Incompatibilities**. There are 1,887 total housing units and an estimated 4,879 residents located within the 65+ DNL of the Existing (2013) Baseline noise contour. Of those 1,887 housing units, 1,322 units (1,200 single-family units; 66 two-, three-, or four-family units; and 56 condominiums) have received sound insulation, and therefore are not eligible for additional treatment. Another 458 housing units are potentially eligible for sound insulation. 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 of Seattle (Port), condominiums that were outside the 1998 70 DNL noise exposure contour, and approximately 309 apartments that were not previously eligible but are recommended to be sound insulated in this 2013 NCP update.⁹ The remaining 107 housing units are not eligible for sound insulation because they were either 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 Existing (2013) Baseline noise contour.

There are two schools, Mt. Rainier High School and St. Philomena Primary School, (which have been sound insulated by the Port) located within the 65+ DNL of the Existing (2013) Baseline 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; located within the 65+ DNL of the Existing (2013) Baseline noise contour, 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 Existing (2013) Baseline noise contour. There are no hospitals or nursing homes located within the 65+ DNL of the Existing (2013) Baseline noise contour. There are no housing units or noise-sensitive public facilities located within the 70+ DNL of the Existing (2013) Baseline noise contour.

⁹ 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.

**Table 4-4
EXISTING (2013) BASELINE 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	685	0	685
Two-, Three-, or Four-Family Unit	56	0	56
Condominium	56	0	56
Apartment	0	0	0
Mobile Home	0	0	0
<i>Subtotal</i>	<i>797</i>	<i>0</i>	<i>797</i>
Potentially eligible but not sound insulated			
Single-Family	40	0	40
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	36	0	36
Apartment	161	0	161
Mobile Home	0	0	0
<i>Subtotal</i>	<i>237</i>	<i>0</i>	<i>237</i>
Not Eligible			
Single-Family	32	0	32
Two-, Three-, or Four-Family Unit	4	0	4
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	29	0	29
<i>Subtotal</i>	<i>65</i>	<i>0</i>	<i>65</i>
CITY OF DES MOINES			
Sound Insulation Completed			
Single-Family	169	0	169
Two-, Three-, or Four-Family Unit	2	0	2
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	0	0	0
<i>Subtotal</i>	<i>171</i>	<i>0</i>	<i>171</i>
Potentially eligible but not sound insulated			
Single-Family	10	0	10
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	35	0	35
Apartment	121	0	121
Mobile Home	0	0	0
<i>Subtotal</i>	<i>166</i>	<i>0</i>	<i>166</i>
Not Eligible			
Single-Family	25	0	25
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	0	0	0
<i>Subtotal</i>	<i>25</i>	<i>0</i>	<i>25</i>

**Table 4-4, Continued
EXISTING (2013) BASELINE 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	346	0	346
Two-, Three-, or Four-Family Unit	8	0	8
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	0	0	0
<i>Subtotal</i>	<i>354</i>	<i>0</i>	<i>354</i>
Potentially eligible but not sound insulated			
Single-Family	28	0	28
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	0	0	0
Apartment	27	0	27
Mobile Home	0	0	0
<i>Subtotal</i>	<i>55</i>	<i>0</i>	<i>55</i>
Not Eligible			
Single-Family	7	0	7
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	10	0	10
<i>Subtotal</i>	<i>17</i>	<i>0</i>	<i>17</i>
KING COUNTY			
Sound Insulation Completed			
Single-Family	0	0	0
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	0	0	0
<i>Subtotal</i>	<i>0</i>	<i>0</i>	<i>0</i>
Potentially eligible but not sound insulated			
Single-Family	0	0	0
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	0	0	0
<i>Subtotal</i>	<i>0</i>	<i>0</i>	<i>0</i>
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	0	0	0
<i>Subtotal</i>	<i>0</i>	<i>0</i>	<i>0</i>

**Table 4-4, Continued
EXISTING (2013) BASELINE LAND USE INCOMPATIBILITIES
Seattle-Tacoma International Airport**

MITIGATION STATUS / LAND USE	NOISE CONTOUR BAND		
	DNL 65 - 70 dBA	DNL 70+ dBA	DNL 65+ dBA
TOTAL – ALL JURISDICTIONS			
Sound Insulation Completed			
Single-Family	1,200	0	1,200
Two-, Three-, or Four-Family Unit	66	0	66
Condominium	56	0	56
Apartment	0	0	0
Mobile Home	0	0	0
<i>Subtotal</i>	<i>1,322</i>	<i>0</i>	<i>1,322</i>
Potentially eligible but not sound insulated			
Single-Family	78	0	78
Two-, Three-, or Four-Family Unit	0	0	0
Condominium	71	0	71
Apartment	309	0	309
Mobile Home	0	0	0
<i>Subtotal</i>	<i>458</i>	<i>0</i>	<i>458</i>
Not Eligible			
Single-Family	64	0	64
Two-, Three-, or Four-Family Unit	4	0	4
Condominium	0	0	0
Apartment	0	0	0
Mobile Home	39	0	39
<i>Subtotal</i>	<i>107</i>	<i>0</i>	<i>107</i>
TOTAL HOUSING UNITS	1,887	0	1,887
ESTIMATED POPULATION			
TOTAL ESTIMATED POPULATION	4,879	0	4,879
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.

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

4.5.2 FUTURE (2018) BASELINE NOISE CONTOUR EXPOSURE INCOMPATIBILITIES

A summary of the housing units, estimated population, and noise-sensitive facilities affected by noise levels exceeding 65 DNL for the Future (2018) Baseline noise exposure contour is provided in **Table 4-5, Future (2018) Baseline Land Use Incompatibilities**. There are 3,771 total housing units and an estimated 9,712 residents located within the 65+ DNL of the Future (2018) Baseline 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. 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 of Seattle (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.¹⁰ The remaining 261 housing units are not eligible for sound insulation because they were either 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) Baseline noise contour.

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) Baseline 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; located within the 65+ DNL of the Future (2018) Baseline noise contour, (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) Baseline 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.

¹⁰ 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.

Table 4-5
FUTURE (2018) BASELINE 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 BURIEN			
Sound Insulation Completed			
Single-Family	953	0	953
Two-, Three-, or Four-Family Unit	72	0	72
Condominium	56	0	56
Apartment	0	0	0
Mobile Home	0	0	0
<i>Subtotal</i>	<i>1,081</i>	<i>0</i>	<i>1,081</i>
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
<i>Subtotal</i>	<i>327</i>	<i>0</i>	<i>327</i>
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
<i>Subtotal</i>	<i>78</i>	<i>0</i>	<i>78</i>
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
<i>Subtotal</i>	<i>610</i>	<i>0</i>	<i>610</i>
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
<i>Subtotal</i>	<i>624</i>	<i>0</i>	<i>624</i>
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
<i>Subtotal</i>	<i>92</i>	<i>0</i>	<i>92</i>

**Table 4-5, Continued
FUTURE (2018) BASELINE 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
<i>Subtotal</i>	656	0	656
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
<i>Subtotal</i>	80	0	80
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
<i>Subtotal</i>	89	0	89
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
<i>Subtotal</i>	126	0	126
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
<i>Subtotal</i>	6	0	6
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
<i>Subtotal</i>	2	0	2

**Table 4-5, Continued
FUTURE (2018) BASELINE 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
<i>Subtotal</i>	<i>2,473</i>	<i>0</i>	<i>2,473</i>
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
<i>Subtotal</i>	<i>1,037</i>	<i>0</i>	<i>1,037</i>
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
<i>Subtotal</i>	<i>261</i>	<i>0</i>	<i>261</i>
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.

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

Table 4-6, Existing (2013) Baseline Compared to Future (2018) Baseline Land Use Incompatibilities, provides a comparative summary of the impacts for the Existing (2013) and Future (2018) Baseline noise exposure contours. Due to the projected increase in size of the noise contours as a result of the projected increase in aircraft operations at Sea-Tac Airport by 2018, the total number of housing units within the 65 DNL of the Future (2018) Baseline noise exposure contour increases compared to the Existing (2013) Baseline. As shown in Table 4-4 and Table 4-5, a large percentage of the housing units located within the 65 DNL of the Existing (2013) Baseline and Future (2018) Baseline either have been sound insulated or are eligible for but have not yet received sound insulation.

**Table 4-6
EXISTING (2013) BASELINE COMPARED TO FUTURE (2018) BASELINE
LAND USE INCOMPATIBILITIES
Seattle-Tacoma International Airport**

NOISE CONTOUR BAND	EXISTING (2013) BASELINE	FUTURE (2018) BASELINE
HOUSING UNITS		
65-70 DNL	1,887	3,771
70+ DNL	0	0
65+ DNL	1,887	3,771
ESTIMATED POPULATION		
65-70 DNL	4,884	9,718
70+ DNL	0	0
65+ DNL	4,884	9,718
NOISE SENSITIVE FACILITIES (CHURCHES, SCHOOLS, LIBRARIES, HOSPITALS AND NURSING HOMES)		
65-70 DNL	9	9
70+ DNL	0	0
65+ DNL	9	9

Notes: Estimated population based on average household size by U.S. Census tract data.

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

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