CHAPTER ONE
INVENTORY

Seattle-Tacoma International Airport (Sea-Tac Airport) is the primary air transportation hub of Washington State and the Northwest United States. The Airport is located within King County and the City of SeaTac, approximately 12 miles south of downtown Seattle and approximately 20 miles north of the City of Tacoma. As of May 2012, Sea-Tac Airport was served by 25 commercial passenger airlines with scheduled passenger service. There are also several scheduled all-cargo carriers serving Sea-Tac Airport. Sea-Tac Airport provides non-stop air service to 71 cities within the United States and 17 additional cities worldwide. In terms of passenger activity, in 2011 Sea-Tac Airport was the 16th busiest airport in the United States and is the primary commercial service airport for the Pacific Northwest. In terms of operations, it was the 23th busiest airport in the United States in 2011. It is the only airport that provides primary scheduled commercial service in the Puget Sound Region. The generalized location of Sea-Tac Airport is illustrated on **Exhibit 1-1, *Airport Location Map***.

Sea-Tac Airport is owned and operated by the Port of Seattle (Port), which is led by a five-member governing body called the Port of Seattle Commission (Commission). The Commission is elected at large to direct Port policy. The Port district boundaries are contiguous with those of King County. The Managing Director of the Aviation Division is responsible for the day-to-day operations of Sea-Tac Airport. While state enabling legislation provides the Port with a broad range of municipal powers over Sea-Tac Airport property and operations, the Port does not have jurisdiction over land use and zoning requirements to ensure compatible development in the noise-affected areas around Sea-Tac Airport. The Port, as operator of Sea-Tac Airport, has enacted a comprehensive program of noise abatement and mitigation measures through Port Commission Resolutions. These Resolutions are outlined in subsequent sections of this chapter.

This 14 CFR Part I50 Study will evaluate traditional Part 150 elements and time frames, which generally includes evaluating aircraft noise exposure and noise abatement measures within the five-year time frame dictated by Title 14, Part 150 of the Code of Federal Regulations (14 CFR Part 150).

1.1 14 CFR PART 150

Part 150 is a section of the Code of Federal Regulations (CFR) that sets forth rules and guidelines for airports desiring to undertake airport noise compatibility planning. The regulations were promulgated by the Federal Aviation Administration (FAA) pursuant to the Aviation Safety and Noise Abatement Act (ASNA) of 1979, Public Law 96-193. ASNA was enacted to "… provide and carry out noise compatibility programs, to improve assistance to assure continued safety in aviation and for other purposes." The FAA was vested with the authority to implement and

administer this act. This legislation required the establishment of a single system for measuring aircraft noise, determining noise exposure, and identifying land uses, which are normally compatible with various noise exposure levels.

Through 14 CFR Part 150, the FAA established regulations governing the technical aspects of aircraft noise analysis and the public participation process for airports choosing to prepare airport noise compatibility plans.

1.1.1 PURPOSE OF CONDUCTING A PART 150 STUDY

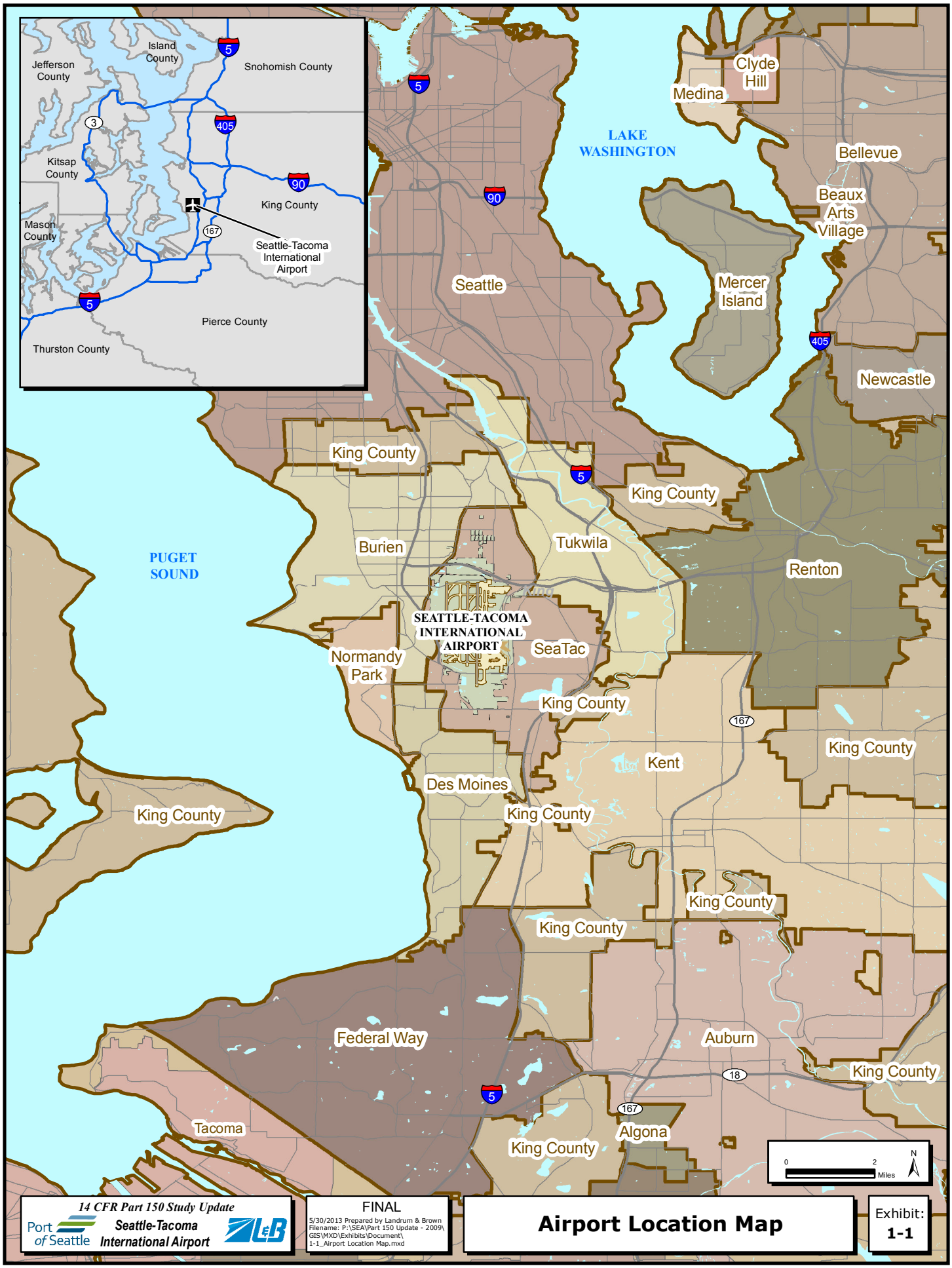
The purpose for conducting a Part 150 Study at an airport is to develop a balanced and cost-effective plan for reducing current noise impacts from an airport's operations, where practical, and to limit additional impacts in the future. By following the process, the airport operator is assured of the FAA's cooperation through the involvement of air traffic control professionals in the study and the FAA's review of the recommended Noise Compatibility Program (NCP). An airport with an FAA-approved NCP also becomes eligible for funding assistance for the implementation of measures in the NCP.

Among the general goals and objectives addressed by a Part 150 Study are the following:

- To reduce, where feasible, existing and forecasted noise levels over existing noise-sensitive land uses;
- To reduce new noise-sensitive developments near the airport;
- To mitigate, where feasible, adverse impacts in accordance with Federal guidelines;
- To provide mitigation measures that are sensitive to the needs of the community and its stability;
- To minimize the impact of mitigation measures on local tax bases; and
- To be consistent, where feasible, with local land use planning and development policies.

The previous Noise Compatibility Study for Sea-Tac Airport was approved by the FAA in June 2002. The following describes the reasons for updating the 2002 Part 150 Study. The FAA also issued acceptance of the Existing 1998 and Future 2004 Noise Exposure Maps (NEMs) prepared for that study.

- Typically, airports revise their Noise Exposure Maps (NEMs) and NCP every five years.
- Since the 2002 Part 150 Study, the third parallel runway (designated Runway 16R/34L) was opened (in November 2008).
- Through the Record of Decision (ROD) issued by the FAA for the third runway at Sea-Tac Airport, the Port committed to additional noise evaluations after the opening of the runway.


Island County
Jefferson County
Snohomish County
Kitsap County
King County
Mason County
Seattle-Tacoma International Airport
Pierce County
Thurston County
LAKE WASHINGTON
Clyde Hill
Medina
Bellevue
Beaux Arts Village
Seattle
Mercer Island
Newcastle
King County
Burien
Tukwila
Renton
PUGET SOUND
SEATTLE-TACOMA INTERNATIONAL AIRPORT
SeaTac
Normandy Park
Kent
Des Moines
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Auburn
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Airport Location Map
Exhibit: 1-1

1.1.2 PART 150 PLANNING PROCESS

The Part 150 planning process involves the methods and procedures an airport operator must follow when preparing NEMs and developing an NCP. The decision to undertake noise compatibility planning is entirely voluntary on the part of the airport operator. If an airport operator chooses to prepare an NCP, the FAA will provide funding assistance to conduct the study if the operator follows the regulations of 14 CFR Part 150. As a further encouragement to undertake noise compatibility planning, an airport operator becomes eligible to apply for Federal funding assistance for the implementation of measures in an FAA-approved NCP. See **Exhibit 1-2**, ***Noise Compatibility Planning Process***, for a flowchart showing the planning process.

A Part 150 Study involves six major steps:

- Data collection, including existing land use patterns, existing aircraft operations from radar data and other sources, and forecast development;
- Definition of existing and future noise exposure patterns and preparation of NEMs;
- Evaluation of alternative measures for abating noise, including noise abatement, land use mitigation, and program management measures;
- Development of a NCP including an implementation and monitoring plan;
- Conducting public consultation, including publishing a draft report and holding a public hearing; and
- FAA review and approval of the recommended NCP, including the analysis of alternatives, the compatibility plan, and the implementation and monitoring plan.

The Part 150 Study process is designed to identify noise incompatibilities surrounding an airport, and to recommend measures to both correct existing incompatibilities and to prevent future incompatibilities. For Part 150 Study purposes, noise incompatibilities are generally defined as residences or public use noise-sensitive facilities (churches, schools, libraries, nursing homes, and hospitals) within the Day-Night Average Sound Level (DNL) 65 dBA noise contour.

The process to update the 2002 NCP was designed to accomplish two goals:

- Update the status of the measures included in the 2002 NCP
  - Each previously approved measure was evaluated to determine if it should be continued, withdrawn, or modified, based on operational and land use changes that have occurred since the completion of the 2002 NCP.
- Identify, analyze, and recommend new measures
  - Potential new noise abatement, land use compatibility, and program management measures were evaluated, based on the existing conditions at Sea-Tac Airport and conditions expected to occur within the next five years.

The planning process has both technical and procedural components. The first component involves the preparation of NEMs, which requires the use of specific technical criteria and methods to complete analyses of aircraft noise exposure, potential noise abatement, and land use mitigation measures. NEMs show the official noise contours for an airport and are prepared for existing conditions and for five years in the future. For this Part 150 Study, 2013 is the existing year and 2018 is the future year. The NEMs must be prepared according to 14 CFR Part 150 guidelines with regard to methodology, noise metrics, identification of incompatible land uses, and public participation. More detailed information regarding the NEM process is included in **Section 1.1.3** of this chapter.

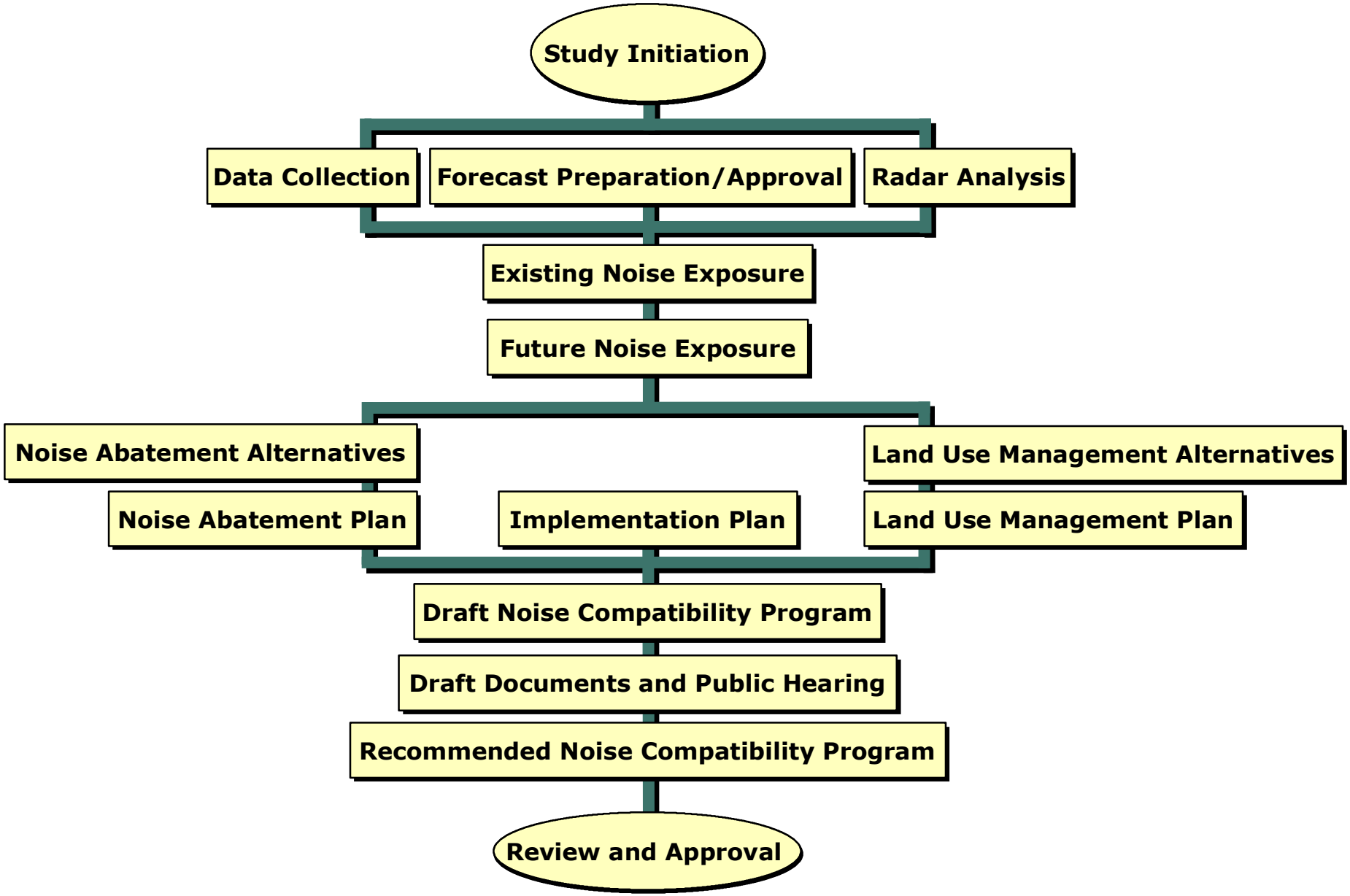
The second component of the planning process involves the development of an NCP. The NCP sets forth measures intended to mitigate the impacts of significant noise exposure on residential areas near an airport, and to limit, to the extent possible, the introduction of new incompatible land uses into locations exposed to significant noise levels. Per 14 CFR Part 150, all land uses are considered compatible with aircraft noise below DNL 65 dBA. Noise sensitive land uses, defined as residential, schools, churches, hospitals, and nursing homes, are considered incompatible at or above DNL 65 dBA without mitigation.

Part 150 regulations require that potentially affected airport users, local governments, and the public be consulted during the study, with the process culminating in the opportunity for a public hearing on the recommended NCP. More detailed information regarding the NCP process is included in **Section 1.1.4** of this chapter. Information regarding the public participation component of this Study is included in **Section 1.1.5** of this chapter and **Chapter Seven, *Consultation***.

1.1.3 NOISE EXPOSURE MAPS (NEMs)

The NEM component of a Part 150 Study presents airport noise exposure contours for the existing condition and a forecast condition five years from the date of submission of the maps for FAA review. The current year NEM is dated 2013 and is representative of 2013 conditions at Sea-Tac Airport. The data collection and analysis for this Part 150 Study Update began in 2008 and continued through May 2012. The total annual operations on which the Existing (2013) NEM is based is 313,352. The future year NEM is dated 2018 because it is five years from the date of submission.

The 2018 NEM is representative of future conditions forecasted at the Sea-Tac Airport. The NEM noise contours are superimposed on a land use map to show areas of incompatible land use. (Per 14 CFR Part 150, incompatible land uses are defined as residences, schools, churches, nursing homes, hospitals, and libraries.) **Chapter Three, *Noise Analysis***, contains detailed information on the inputs and methodology for preparing the noise exposure contours. The official (full-size printed) NEMs are located at the back of the printed version of this document. Small-scale representations of the official NEMs are located at the front of this document with the NEM and NCP checklist.



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Noise Compatibility Planning Process

Exhibit: **1-2**

14 CFR Part 150 requires the use of standard methodologies and metrics for analyzing and describing noise. It also establishes guidelines for the identification of land uses that are incompatible with noise of different levels. Section 150.21(d) of 14 CFR Part 150 states that airport proprietors are required to update NEMs when changes in the operation of the airport would create any new, substantial incompatible use. This is considered to be an increase or decrease in DNL noise levels of 1.5 decibels (dB) over incompatible land uses when the aircraft noise level exceeds DNL 65 dBA. Of course, the airport operator may update the NEMs at any time based on their own needs and concerns.

Congress has provided airport proprietors that prepare, submit, and publish FAA accepted NEMs with protection from liability for claims based on noise allegedly attributable to the airport. *See* ASNA, 49 U.S.C. §47506 (limitations on recovering damages for noise).

The FAA has defined "significant" for purposes of ASNA's safe harbor from liability for airport noise claims to mean a change in one of the four specified factors that results in an increase at a particular property in the yearly day-night average sound level of 1.5 dB DNL or greater. 14 C.F.R. Part 150, Section 150.21(d), (g). Under ASNA, the person asserting the claim must prove this increase as to the allegedly affected property. FAA officials consider the term "area surrounding an airport" to mean an area within the DNL 65 dBA contour shown on the NEM. See 14 CFR Part 150, Section 150.21(b), (d), (f), and (g). Sea-Tac Airport has previously published FAA-accepted NEMs in July 1993 and December 2001 and will publish new NEMs in a newspaper of general circulation at the conclusion of this study.

An acceptance of the NEMs by the FAA is required before the FAA will approve an NCP for the airport.

1.1.4 NOISE COMPATIBILITY PROGRAM (NCP)

An NCP includes provisions for the abatement of aircraft noise through aircraft operating procedures, air traffic control procedures, or airport facility modifications. It also includes provisions for land use compatibility planning and may include actions to mitigate the impact of noise on incompatible land uses. **Chapter Six, *Noise Compatibility Program***, includes detailed information for the Sea-Tac Airport NCP recommendations. The NCP must also contain provisions for updating and periodic revision.

14 CFR Part 150 establishes procedures and criteria for FAA evaluation of the NCP. Two criteria are of particular importance: the airport proprietor may not take any action that imposes an undue burden on interstate or foreign commerce; nor may the proprietor unjustly discriminate between different categories of airport users.

The FAA also reviews changes in flight procedures proposed for noise abatement for potential effects on flight safety, safe and efficient use of the navigable airspace, management and control of the national airspace and traffic control systems, security and national defense, and compliance with applicable laws and regulations. Because the FAA has the ultimate authority over air traffic control and flight

procedures related to air traffic control requirements, any measures relating to these subjects that are recommended in an NCP must be explicitly approved by the FAA and may not be implemented unilaterally by the airport proprietor.

The FAA reviews the NCP and may approve or disapprove each measure on its merits and adherence to the national aviation policy. The approval or disapproval of each recommended measure is documented in the FAA Record of Approval (ROA). Additionally measures that require FAA action prior to implementation must be environmentally reviewed per the National Environmental Policy Act (NEPA) and measures that may affect safety must undergo a safety assessment per FAA Order 5200.11, FAA Airports Safety Management System. Following these steps, the FAA is able to participate in actions over which it has primary implementation responsibility (e.g., air traffic modifications). With an approved NCP, an airport proprietor becomes eligible for Federal funding to implement the eligible items of the program. Approval by the FAA does not, however, commit the Agency to either a specific schedule of implementation or guarantee the allocation of Federal funds for implementation of any measure.

The culmination of a Part 150 Study is the development of NCP measures intended to reduce the impact of aircraft noise. Typically, recommended NCP measures fall into three categories:

1. **Abatement** measures – these measures are applied at the airfield or to aircraft operations and include changes in runway use or changes in flight-track location.
2. **Mitigation** measures – these measures are applied to land use to and can be further classified into two types:
    - **Preventive** measures – land use control measures to prevent the new noise-sensitive land uses from occurring in the existing and future airport noise contours; such measures include compatible land use zoning or noise overlay zoning within off-airport noise exposure areas.
    - **Corrective (Remedial)** measures – mitigation measures applied to existing incompatible land uses; such measures include acquisition or sound insulation of noise-sensitive property. (Noise-sensitive property is defined as houses, schools, churches, nursing homes, hospitals, and libraries.)
3. **Program Management** measures – address administrative and management actions to enhance the program.

1.1.5 PUBLIC INVOLVEMENT

As discussed previously, a key element in the Part 150 process is public involvement, which is designed to inform and gather input from the public regarding the data and findings of the Part 150 Study. Additional information on the public involvement process is included in Chapter Seven of this document.

1.2 AIRPORT PHYSICAL FACILITIES

Sea-Tac Airport currently consists of three parallel runways: Runways 16L/34R, 16C/34C, and 16R/34L. Runway 16L/34R is the longest runway on the airfield, at 11,901 feet in length and 150 feet in width. Runway 16C/34C is 800 feet to the west of Runway 16L/34R and is 9,426 feet in length and 150 feet in width. Runway 16R/34L is approximately 1,700 feet to the west of Runway 16C/34C and is 8,500 feet in length and 150 feet wide. There are instrument approaches installed on all six runway ends. There are dual parallel taxiways to the east of Runway 16L/34R, west of the terminal, Taxiway A and Taxiway B. Taxiway B extends the full length of Runway 16L/34R, while Taxiway A ends approximately 1,200 feet short of the south end the runway (Runway 34R). There is a full-length parallel taxiway (Taxiway T) between Runway 16C/34C and Runway 16R/34L. A series of high-speed taxiway exits connects the runways and the ramp areas. Aircraft using Runway 16C/34C must cross Runway 16L/34R and aircraft using Runway 16R/34L must cross both other runways in either an approach or departure operation.

Most ancillary landside facilities are located on the east side of Sea-Tac Airport, with the passenger terminal complex located approximately to the center and east of Runway 16L/34R. Existing cargo and other support facilities are located north of the terminal. The terminal itself consists of one main central terminal building with four attached concourses, designated A, B, C, and D. There are two satellite concourses, referred to as the north and south satellites. The existing facilities at Sea-Tac Airport are graphically presented in **Exhibit 1-3, *Existing Airport Layout***.

Major ground access to/from Sea-Tac Airport is provided by International Boulevard (Highway 99) or State Highway 518 from the north. State Highway 518 connects to Interstates 5 and 405 and State Route 509. Sea-Tac Airport is connected to the Sound Transit Link light rail via the SeaTac / Airport Station, which is connected to the fourth floor of the Airport Garage. King County Metro Transit and Sound Transit provide bus service to and from Sea-Tac Airport.

1.3 AIR TRAFFIC OPERATIONS ACTIVITY

Like many airports nationwide, Sea-Tac Airport has seen a decrease in total operations over the past several years. As shown in the **Table 1-1, *Summary of Historical Operations, 1999-2011***, total operations (an operation is either a takeoff or a landing) have decreased from 433,646 in 1999 to 313,954 in 2010; however, total operations increased slightly to 314,944 in 2011.

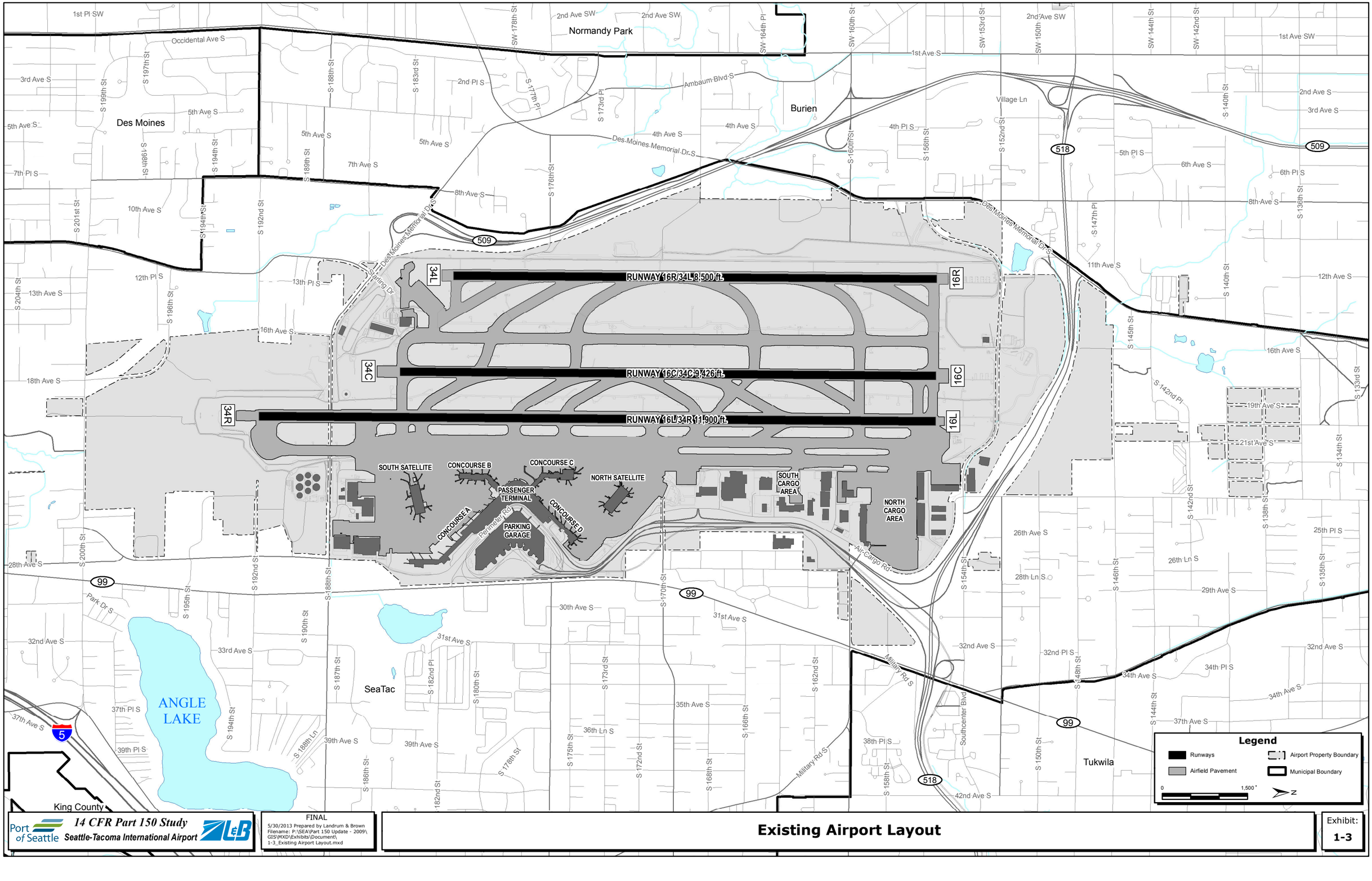
In terms of overall operations, Sea-Tac Airport was the 25th busiest airport in the United States in 2010. The airlines with the largest percentage of overall landings at Sea-Tac Airport during 2010 were: Alaska (29.3%), Horizon (25.0%), Southwest (9.1%), United (7.7% including United Express/Skywest), Delta (7.0%), American (3.1%), Continental (2.9%), US Airways (2.3%) and Virgin America (1.8%). The remainder of the airlines accounted for 11.7 percent of overall landings in 2011.

The aircraft that accounted for greatest number of operations at Sea-Tac Airport in 2011 were: Boeing 737 models (45.8%), de Havilland Dash 8 (25.5%), Airbus A320 Series (7.5%), Boeing 757 (5.6%), Embraer EMB-120 (2.0%), Bombardier CRJ-700 (1.9%), Boeing 767 (1.7%), Airbus A319 (1.4%), and Airbus A330 (1.2%). All other aircraft types comprised the remaining 7.5 percent of operations.

Table 1-1
SUMMARY OF HISTORICAL OPERATIONS, 1999-2011
Seattle-Tacoma International Airport

YEAR	AIR CARRIER	AIR TAXI	GENERAL AVIATION	MILITARY	TOTAL
1999	233,914	194,352	5,335	59	433,660
2000	236,355	203,723	5,504	95	445,677
2001	227,589	168,322	4,684	75	400,670
2002	220,733	139,793	4,086	59	364,671
2003	210,603	140,777	3,385	54	354,819
2004	250,605	105,377	2,788	124	358,894
2005	254,829	83,928	2,938	67	341,762
2006	253,507	82,147	4,296	108	340,058
2007	276,954	64,745	5,240	107	347,046
2008	306,425	34,453	4,059	120	345,057
2009	297,621	17,133	3,046	73	317,873
2010	292,016	18,562	3,262	114	313,954
2011	295,763	15,324	3,708	149	314,944

Source: Federal Aviation Administration, Air Traffic Activity Data System (ATADS), 2012.



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Existing Airport Layout

Exhibit: **1-3**

Operations are further broken down by the time of day they occurred. Based on a review of and radar data from February 2011 through January 2012, approximately 86 percent of total operations occur between 7:00 a.m. and 10:00 p.m., as shown in **Table 1-2, *Summary of Operations by Time of Day (in Percent)***. This ratio of daytime to nighttime operations is expected to continue at Sea-Tac Airport for the duration of the planning horizon of this Part 150 Study.

Table 1-2
SUMMARY OF OPERATIONS BY TIME OF DAY (IN PERCENT)
Seattle-Tacoma International Airport

TYPE OF AIRCRAFT	DAYTIME (7:00 A.M. TO 9:59 P.M.)	NIGHTTIME (10:00 P.M. TO 6:59 A.M.)
Large Jet (Passenger)	84.6%	15.4%
Commuter / General Aviation Jet	93.5%	6.5%
All Cargo Jet	60.9%	39.1%
Propeller Aircraft	89.3%	10.7%
Total	85.9%	14.1%

Source: FAA Radar Data, Landrum & Brown analysis.

In 2011, 32,823,220 total passengers were accommodated (enplaned and deplaned) at Sea-Tac Airport. This compares to 31,553,166 total passengers in 2010. The 2011 passenger figures include 29,838,192 domestic passengers and 2,985,028 international passengers. The number of passengers at Sea-Tac Airport has increased since 2004 when there were 28,804,553 total passengers. Sea-Tac Airport was ranked the 16th busiest airport in the United States for total passengers in 2011. The total passengers that were accommodated at Sea-Tac Airport between 2004 and 2011 is shown in **Table 1-3, *Summary of Total Passengers***.

The domestic passenger market, which accounted for approximately 90.3 percent of the total scheduled seats in 2011, was dominated by the contiguous United States, which accounted for 88.1 percent of the domestic seats available (79.6% of all seats). Alaska accounted for 8.4 percent of domestic seats (7.6 % of total seats) and Hawaii accounted for the remaining 3.5 percent of the domestic seats (3.1 percent of total seats). The top five domestic destination markets in terms of available seats were the San Francisco Bay Area (10.5%), the Los Angeles Area (10.0%), Anchorage, (45.4%), Chicago (5.0%) and Denver (4.9%).

Table 1-3
SUMMARY OF TOTAL PASSENGERS
Seattle-Tacoma International Airport

YEAR	DOMESTIC PASSENGERS	INTERNATIONAL PASSENGERS	TOTAL PASSENGERS
2004	26,368,448	2,436,106	28,804,554
2005	26,817,991	2,471,035	29,289,026
2006	27,517,599	2,478,825	29,996,424
2007	28,585,819	2,710,003	31,295,822
2008	29,274,094	2,922,434	32,196,528
2009	28,593,782	2,633,730	31,227,512
2010	28,745,014	2,808,152	31,553,166
2011	29,838,192	2,985,028	32,823,220

Note: Includes enplaned and deplaned passengers.
Source: Port of Seattle, 2012.

The international passenger market, which accounted for 9.1 percent of the total passengers at Sea-Tac Airport in 2011, was divided between Canada (3.0%), Asia (3.1%), Europe (2.4%), and Mexico (0.6%). The top five international destination markets were Vancouver, British Columbia (1.4%); Tokyo, Japan (1.1%:); Seoul, South Korea (0.9%); Victoria, British Columbia (0.7%); and Amsterdam, Netherlands (0.7%).

In 2011, Sea-Tac Airport provided for the transportation of 234,129 metric tons of cargo. Approximately 65.0 percent of this cargo, 152,211 metric tons, was domestic freight, and approximately 35.0 percent, 81,918 metric tons, was international freight. Federal Express accounted for 40.8 percent of all the air freight, Alaska Airlines accounted for 10.5 percent, Delta Airlines handled 10.1 percent, Korean Air accounted for 5.0 percent, and China Airlines accounted for 4.3 percent. The remaining cargo airlines all account for less than four percent each. **Table 1-4, *Summary of Total Cargo*,** shows the total cargo that was shipped to/from Sea-Tac Airport between 2004 and 2011.

Table 1-4
SUMMARY OF TOTAL CARGO
Seattle-Tacoma International Airport

YEAR	TOTAL CARGO IN METRIC TONS
2004	347,517
2005	338,590
2006	341,981
2007	319,013
2008	290,768
2009	270,142
2010	283,425
2011	279,625

Source: Port of Seattle, 2012.

1.4 AIRSPACE/AIR TRAFFIC CONTROL

The FAA is responsible for the safe and efficient use of the national air space. This airspace is divided into three specific types; enroute, terminal, and tower, within which air traffic controllers work to maintain separation between airborne aircraft. When an aircraft departs an airport, it is located in the airspace being handled by air traffic controllers working in an airport traffic control tower (ATCT). ATCT facilities control aircraft on the ground and within that airport's airspace.

Upon departure, when the aircraft is approximately one mile away from the airport, the aircraft is handed off to controllers working the Terminal Radar Approach Control Facility (TRACON). These controllers are responsible for the airspace extending out approximately 25 to 30 miles from the airport in all directions. TRACON facilities sequence and separate aircraft as they approach or depart the facility's airspace.

Once a departing aircraft exits TRACON airspace, it then enters the third type of airspace and becomes the responsibility of enroute controllers working in an Air Route Traffic Control Center (ARTCC). The enroute controllers retain control and continue to sequence and ensure separation of aircraft until the aircraft nears its intended destination. The Seattle ARTCC provides enroute control of the state of Washington and part of California, Idaho, Nevada, and Oregon. The air-traffic control process is then reversed for approaches.

At Sea-Tac Airport, the Seattle TRACON facility is located on the west side of the Airport and the ATCT is located on the north end of the airfield. There are several airports located in the Seattle area that are under the control of Seattle TRACON. Although Sea-Tac Airport accounts for a significant percentage of all area aircraft operations, the cumulative number of aircraft operations at the other airports also adds a significant workload for controllers at the Seattle TRACON. There are also other general aviation airports without operational control towers or published instrument procedures that contribute to the total number of area-wide aircraft operations. While aircraft using these other general aviation airports operate under visual flight rules (VFR), they must utilize the Seattle terminal airspace, and aircraft using Sea-Tac Airport must be separated from them. Seattle TRACON provides full arrival and departure services for Sea-Tac Airport, as well as the following airports:

- King County International Airport/Boeing Field (BFI),
- Gray Army Air Field (GRF)/McChord Air Force Base (TCM),
- Olympia Regional Airport (OLM),
- Renton Municipal Airport (RNT),
- Tacoma Narrows Airport (TIW),
- Bremerton National Airport (PWT),
- Auburn Municipal Airport (S50),
- Shelton/Sanderson Field (SHN), and
- Snohomish County Airport (Paine Field) (PAE).

Sea-Tac Airport has a 24-hour, continuously operating ATCT that has a designated Airport Traffic Area (ATA). Aircraft which operate within an ATA must be in contact, at all times, with the tower controllers, especially to receive approval for take-offs and landings. Standard ATAs are designated to include all airspace within five miles of an airport from the surface of the ground up to (but not including) 3,000 feet. Because of its proximity to other airports in the area, especially BFI, the Sea-Tac ATA is not completely circular. Airspace operational activities are explained in greater detail in the following paragraphs.

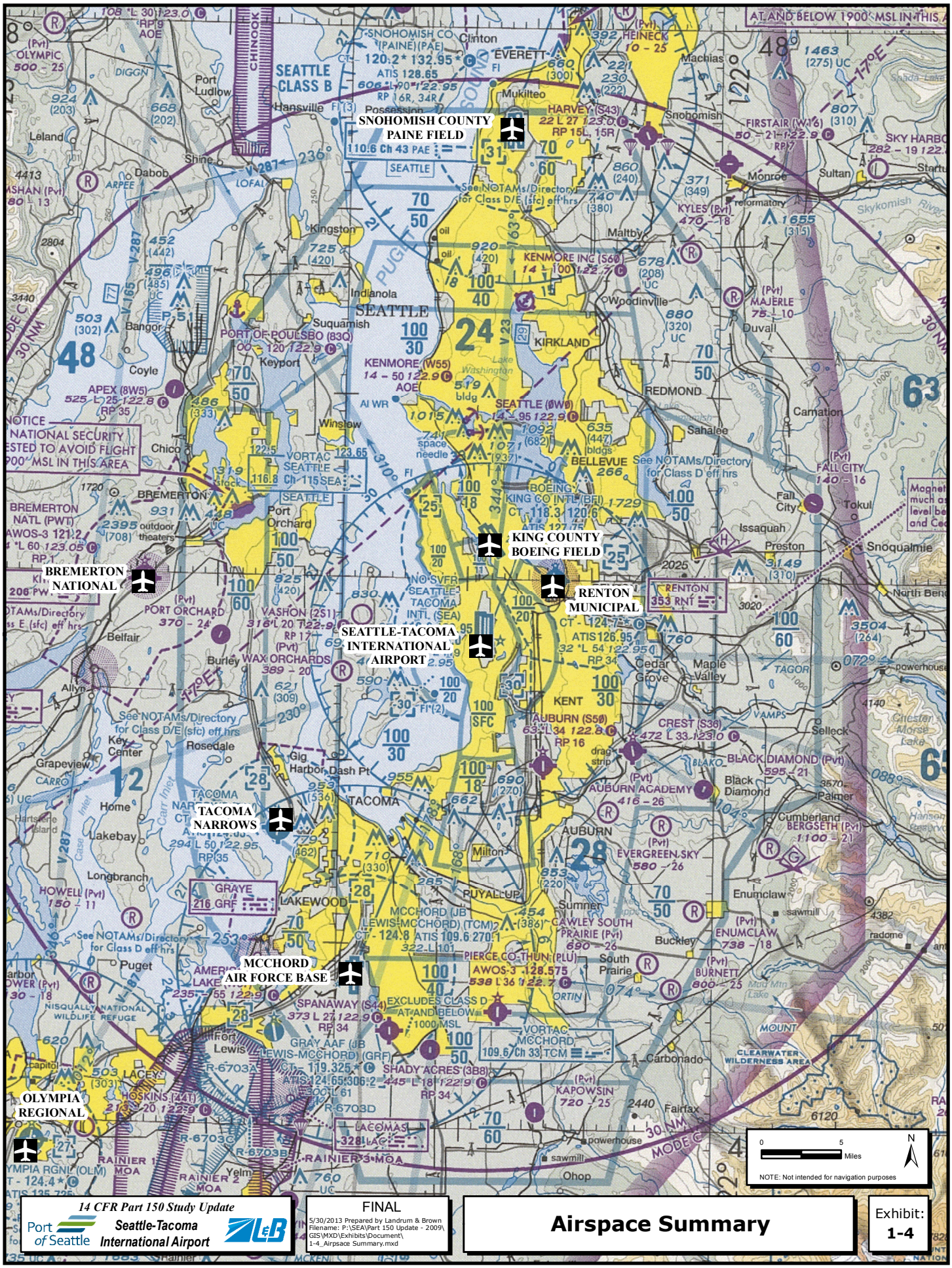
1.4.1 AIR SPACE CONFIGURATION

The Seattle TRACON area airspace is shown in **Exhibit 1-4, *Airspace Summary***. The Seattle ARTCC provides Air Traffic Control (ATC) services to aircraft between TRACON areas. The Seattle TRACON provides approach/departure control services within its delegated airspace. Seven of the busiest airports within the Seattle TRACON's airspace have ATCTs or "towers." These towers provide control within the TRACON's airspace. These seven airports are: BFI, GRF, OLM, RNT, SEA, TIW, and Snohomish County Airport/Paine Field (PAE).

The ARTCC and TRACON provide control primarily to aircraft operating under instrument flight rules (IFR). In addition, TRACON provides control or service to aircraft operating under VFR within the Seattle Class B Airspace, (Formerly TCA). An ATC clearance and control is mandatory for VFR aircraft operating within Class B airspace. The Seattle Class B Airspace Area is depicted on Exhibit 1-4.

All aircraft, both IFR and VFR, in Class B airspace are subject to positive control from ATC. Class B airspace exists at 29 high-density airports in the United States as a means of managing air traffic activity around the airport. It is designed to regulate the flow of air traffic above, around, and below the arrival and departure routes used by air carrier aircraft at major airports. Class B airspace generally includes all airspace from an airport's established elevation up to 12,000 feet MSL, and, at varying altitudes, out to a distance of about 30 nautical miles from the center of the airport. Aircraft operating in Class B airspace must have specific radio and navigation equipment, including an altitude encoding transponder, and must obtain ATC clearance.

Published instrument approach procedures exist for seven airports within the Seattle TRACON airspace as listed in **Table 1-5, *Published IFR Approach Procedures At Nearby Airports***. Table 1-5 differentiates between precision and non-precision approaches. A precision approach, by definition, provides electronic vertical guidance to the pilot as well as horizontal (azimuth) guidance. A non-precision approach provides horizontal guidance only. Generally the azimuth guidance for a precision approach is more precise. For an Instrument Landing System (ILS) approach procedure, a localizer transmitter provides the azimuth guidance and a glide-slope transmitter provides the vertical guidance.



14 CFR Part 150 Study Update

Port of Seattle — *Seattle-Tacoma International Airport*

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FINAL

5/30/2013 Prepared by Landrum & Brown
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Airspace Summary

Exhibit: **1-4**

Table 1-5
PUBLISHED IFR APPROACH PROCEDURES AT NEARBY AIRPORTS
Seattle-Tacoma International Airport

AIRPORT	RUNWAY(S)	PROCEDURE
Bremerton National Airport (PWT)	19	ILS or LOC
	01	RNAV (GPS)
	19	RNAV (GPS)
	01	NDB
Gray Army Air Field (GRF)/McChord Air Force Base (TCM)	16	ILS or LOC
	34	ILS or LOC
	34	ILS
	16	TACAN
	34	TACAN
King County International Airport/Boeing Field (BFI)	31L	ILS or LOC
	13R	ILS RWY
	13R	RNAV (GPS)
	13R	RNAV (RNP)
	13R	LOC/DME
Olympia Regional Airport (OLM)	17	ILS or LOC
	17	RNAV (GPS)
	35	RNAV (GPS)
	35	VOR/DME
Renton Municipal Airport (RNT)	16	RNAV (GPS)
	16	NDB
Sea-Tac Airport (SAE)	16L/C/R	ILS or LOC
	34L/C/R	ILS or LOC
	16R	ILS (SA CAT I)
	34L/C/R	ILS (CAT II)
	16L/C/R	ILS (CAT II)
	16L/C/R	ILS (CAT III)
	16L/C/R	RNAV (GPS)
	34L/C/R	RNAV (GPS)
	16L/C	VOR/DME
	34C	VOR/DME
Snohomish County Airport (Paine Field) (PAE)	16R	ILS OR LOC/DME
	16R	ILS (SA CAT I)
	16R	RNAV (GPS)
	34L	RNAV (GPS)
	16R	VOR/DME
Tacoma Narrows Airport (TIW)	17	ILS RWY
	17	RNAV (GPS)
	35	RNAV (GPS)
	35	NDB

Abbreviations: DME=Distance Measuring Equipment; GPS=Global Positioning System; ILS=Instrument Landing System; LOC=Localizer; NDB=Nondirectional (radio) Beacon; RNAV=Area Navigation; RNP=Required Navigation Performance; TACAN=Tactical Air Navigation; VOR=Very High Frequency Omnidirectional Range.

Source: AirNav, 2013.

1.4.2 AIRSPACE USAGE

All aircraft flights are governed by either VFR or IFR. Definitions are contained in 14 CFR Part 91 and summarized below. The basic difference between VFR and IFR is that the pilot maintains spatial orientation of an aircraft by reference to the earth's surface for VFR and by reference to aircraft instruments for IFR. Under IFR rules, a pilot can operate in poor visibility conditions within controlled airspace. Flight under VFR rules requires good visibility and maintenance of specified distances from clouds.

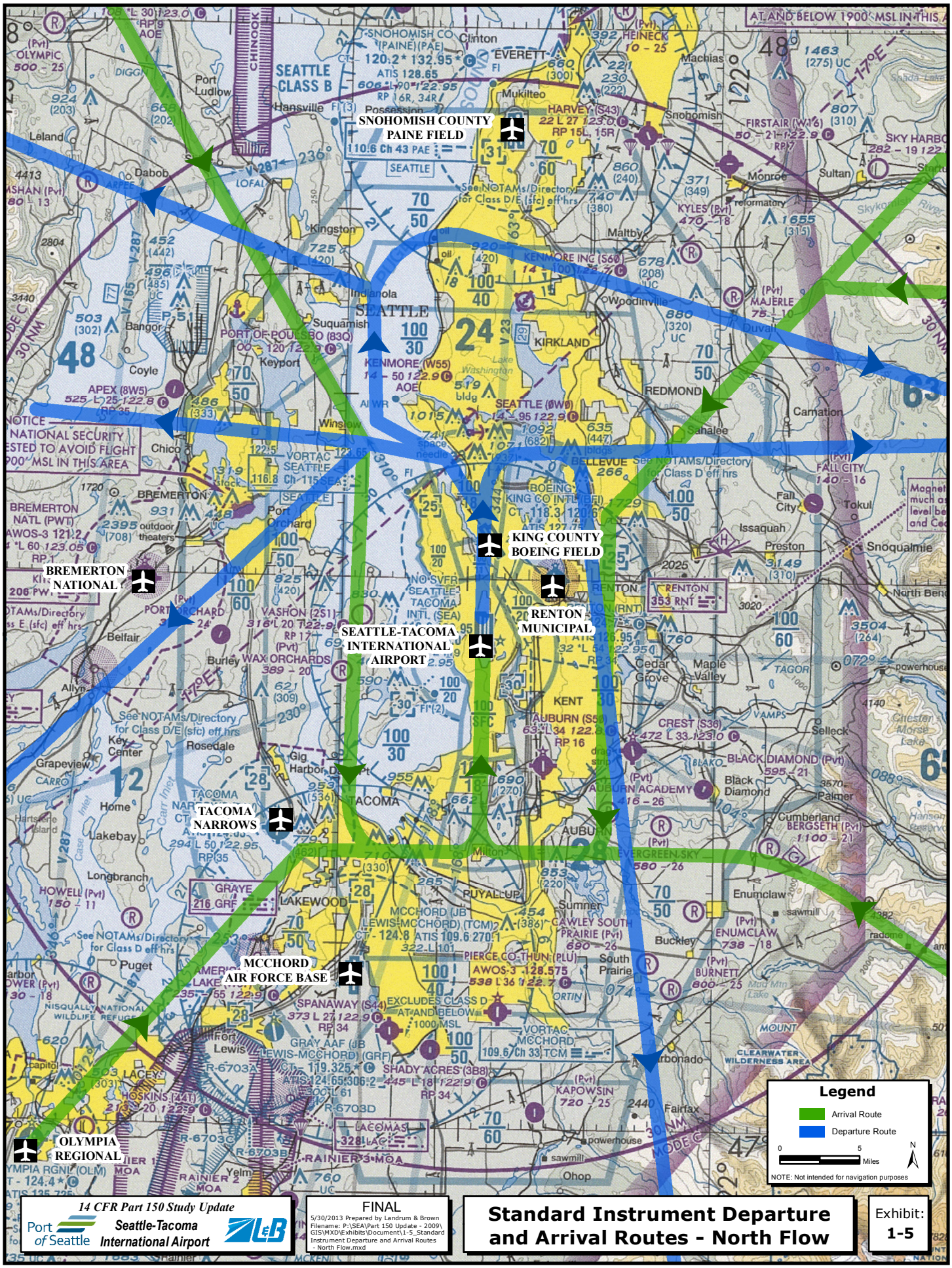
With the opening of Runway 16R/34L, during low visibility conditions, Sea-Tac Airport is restricted to dual arrival streams to Runways 16L/34R and 16R/34L. This is because of the proximity of the parallel runways. FAA Air Traffic Control guidelines require a separation of at least 2,500 feet for dual parallel approaches, which is the separation of Runways 16L/34R and 16R/34L. Sea-Tac Airport operates with a dual arrival stream approximately 44 percent of the time.

The Seattle Terminal Airspace area includes nine IFR airports and approximately 30 VFR airports. Two of the IFR airports are military (McChord AFB and Gray AAF), and 10 of the VFR airports are private or restricted and generally are not available to the public.

IFR Operations

Air carrier and many turbojet general aviation and military aircraft operating to or from Sea-Tac Airport under IFR, are reassigned coded flight routes and procedures referred to as Standard Instrument Departures (SIDS) and Standard Terminal Arrival Routes (STARS). These SID and STAR routes are depicted on **Exhibit 1-5, *Standard Instrument Departure and Arrival Routes – North Flow*,** for north flow and on **Exhibit 1-6, *Standard Instrument Departure and Arrival Routes – South Flow,*** for south flow. These figures also depict arrival and departure gates. Navigation of IFR aircraft within the Seattle TRACON airspace is generally provided by radar vectors to achieve efficient sequencing, spacing, and separation between aircraft. Therefore, actual aircraft flight tracks, particularly closer in to the airport, will not conform exactly to the SIDS, and STARS depicted.

In general, however, IFR arrival aircraft are cleared to Sea-Tac Airport by the Seattle ARTCC via these STARS while descending from enroute altitudes. These aircraft arrivals are "handed off' via radar from the Seattle ARTCC to the Seattle TRACON at various entry points, referred to as "gates". In other words, there are established arrival routes that aircraft utilize and the pilots are in contact with different controllers as they approach Sea-Tac Airport.



14 CFR Part 150 Study Update

Port of Seattle — *Seattle-Tacoma International Airport*

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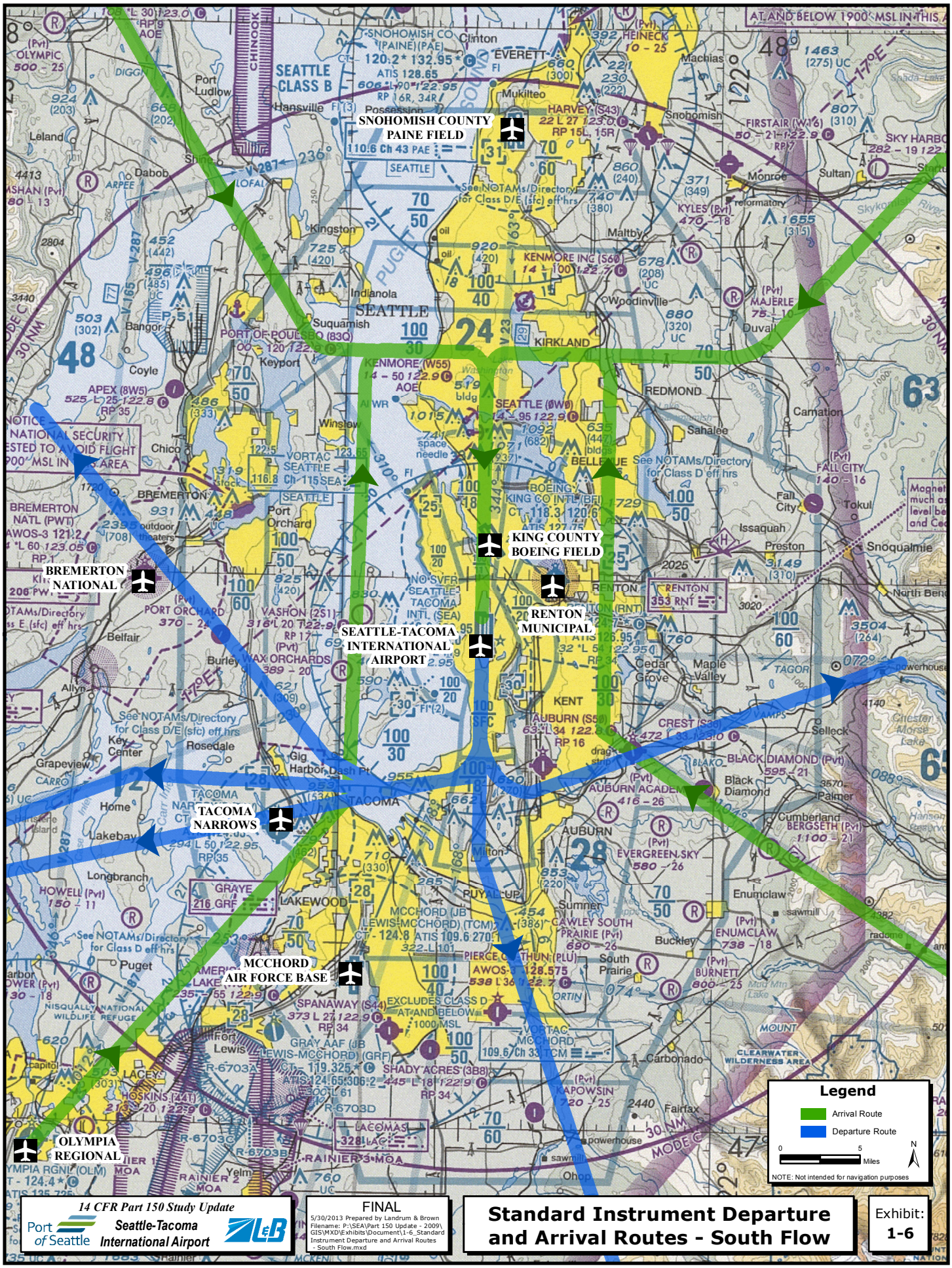
Standard Instrument Departure and Arrival Routes - North Flow

Exhibit: **1-5**



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Port of Seattle — Seattle-Tacoma International Airport

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5/30/2013 Prepared by Landrum & Brown
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Standard Instrument Departure and Arrival Routes - South Flow

Exhibit: 1-6

In April 1990 the FAA standardized the air traffic patterns for jet aircraft flying in and out of Sea-Tac Airport. The new air traffic plan, referred to as the "4-Post Plan," changed the arrival and departure procedures used by the air-traffic controllers to transfer the aircraft from the enroute to the terminal environment. The FAA determined that safety and efficiency could be improved if the procedures used to route air traffic to the terminal airspace area were designed to be the same regardless of the direction of traffic flow. Depending on the city of origin, aircraft enter the terminal airspace from one of the four "posts," or corners of the terminal airspace area. These procedures helped to alleviate difficulties associated with having two different sets of patterns that were wind dependent.

The TRACON assumes responsibility for guiding the arrival aircraft to the final approach course at the destination airport and for separating it from other aircraft. Lower performance aircraft, and some commuter/air-taxi aircraft, operate at lower altitudes allowing separation from the jet aircraft routes. The lower performance (i.e. propeller aircraft) aircraft are "placed" into the arrival routes closer in to Sea-Tac Airport to minimize the effects of the speed differentials.

When arrival aircraft are in the vicinity of their destination airport they are given descent instructions by the TRACON until they are approximately 1,500 feet above the destination airport and approximately five nautical miles from the runway threshold on the final approach. The TRACON then clears them for the approach and instructs the pilot to contact the destination airport's tower.

Similarly, departing IFR aircraft are guided by the Seattle TRACON through its delegated airspace and separated from other aircraft. Shortly after departure aircraft are airborne, the tower clears the aircraft to contact the TRACON for departure control. The TRACON then directs departing aircraft toward the departure "gates". As soon as departing aircraft either pass the departure "gate" or climb out of the TRACON airspace, they are transferred to ARTCC for enroute control.

Unless visual separation is applied, the TRACON provides all IFR aircraft with a radar separation of at least three nautical miles longitudinally, or 1,000 feet of vertical separation, throughout their terminal airspace. Additional longitudinal separation[1] to avoid wake turbulence is provided for various combinations of aircraft sizes. The minimum longitudinal separation in terminal airspace is listed below:

[1] Note: longitudinal separation refers to the longitudinal (horizontal) spacing of aircraft at the same altitude expressed in terms of distance or time. For example, an aircraft trailing another aircraft at the same altitude may have a longitudinal separation of 4, 5, or 6 miles depending on the types of aircraft.

Leading Aircraft	Trailing Aircraft	Longitudinal Separation (Nautical Miles)
Heavy	Heavy	4
Boeing 757	Large/Heavy	4
Large	Small	4
Boeing 757	Small	5
Heavy	Large	5
Heavy	Small	6

Source: FAA Order JO 7110.65U, *Air Traffic Control*, February 9, 2012

For the purpose of wake turbulence separation minimums, FAA classifies aircraft as Heavy, Large and Small as follows:

- **Heavy**: Aircraft capable of take-off weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight (Examples: B-747, B-777, DC-10).
- **Large**: Aircraft of more than 41,000 pounds, maximum certified takeoff weight, up to 300,000 pounds (Examples: B-737, MD-80, Business jets).
- **Small**: Aircraft of 41,000 pounds or less maximum certified take-off weight (Twin and single piston/turboprops).

Within the Seattle Class B airspace, the Seattle TRACON provides all VFR aircraft a radar separation of one-half nautical mile longitudinally, or 500 feet of vertical separation, from all other IFR and VFR aircraft.

VFR Operations

Flights conducted under VFR, unlike IFR flights, are not always under ATC jurisdiction. Under VFR, pilots may normally operate without an ATC clearance, except when operating within Class B airspace. When operating in visual meteorological conditions, all pilots, regardless of type of airspace flight plan or ATC clearance, are ultimately responsible to see and avoid other aircraft.

The lower altitudes of airspace to the east and west of the Seattle area are restricted by the Cascade and Olympic Mountains. These mountains and the Class B Airspace tend to channel north-south VFR traffic. One north-south channel or VFR flyway exists at approximately five-to-six miles east of Sea-Tac Airport and below 4,000 or 5,000 feet above mean sea level (MSL). The other north/south VFR flyway is somewhat wider and close to the Olympic Mountains. Those transiting under Class B Airspace in the vicinity of Sea-Tac Airport and over the Puget Sound are below 3,000 feet. Some VFR aircraft fly over the tops of Class B Airspace. The top of the Class B Airspace is at 10,000 feet above MSL.

1.4.3 FLOW CONTROL

In general, Flow Control refers to a procedure allowing TRACON to determine the maximum hourly rate of arrivals to Sea-Tac Airport. The Seattle TRACON advises Seattle ARTCC so that adjustments can be made to the rate of entries into TRACON airspace. This hourly rate of arrivals is known as the Airport Acceptance Rate (AAR). The AAR varies according to several conditions including number of runways available for landings, weather conditions, direction of traffic flow, types of approach in use, and runway operational conditions.

1.4.4 INTERACTIONS

Interactions are situations requiring special controller and/or pilot attention to ensure that adequate separation or sequencing is accomplished. Although this broad definition could include random occurrences that do not affect capacity, there are two interactions which affect capacity at Sea-Tac Airport that occur regularly during IFR weather conditions and one that occurs regularly when visual approaches are in progress. These three interactions occur during: (1) IFR south-flow conditions; (2) IFR north-flow conditions; and (3) visual approaches in south-flow conditions.

IFR Weather Conditions-South Flow

During IFR weather conditions, when Sea-Tac Airport and BFI are operating with south flows, interactions exist between the arrivals to the two airports. Although a minimum of 1,000 feet of altitude separation exists between the published ILS approaches, a need exists to protect BFI missed approach possibilities. In weather conditions that allow BFI air traffic controllers to see aircraft arriving to Sea-Tac Airport, visual separation is provided by the controllers and no loss in capacity is experienced. This operating arrangement is known as Plan Alpha. Cloud ceilings at BFI must be at least 2,500 feet for BFI ATC personnel to see aircraft arriving to Sea-Tac Airport. Based on historic weather observations, the yearly frequency of occurrence of south flow conditions, with ceilings below 2,500 feet (no Plan Alpha) is approximately 14.9 percent. This is estimated to drop to about 4.8 percent during the busiest part of the day (7:00 a.m. to 9:00 p.m.). Additionally, weather conditions below minimums (closed conditions) at Sea-Tac Airport would reduce the occurrence of the interaction by another 1 or 2 percent.

The actual time of this impact to capacity due to this interaction is decreased by special ATC procedures. Under these procedures, during certain weather conditions and with pilots who are familiar with BFI, aircraft approaching Sea-Tac Airport will be advised to maintain 3,000 feet Mean Sea Level (MSL) until BFI Tower advises TRACON that the landing of the other aircraft at BFI is assured. At this point, the pilot of the aircraft on approach to Sea-Tac Airport is given a final approach clearance and authorization to land. If the pilot approaching BFI executes a missed approach, TRACON will vector the aircraft on approach to Sea-Tac Airport back into the arrival stream and one arrival interval or slot is lost in arrival capacity at Sea-Tac Airport. However, this situation occurs very rarely.

Weather Conditions - North Flow

During north-flow IFR conditions, interactions exist between the arrivals to BFI and departures from Sea-Tac Airport. Departures from Sea-Tac are held on the ground from the time a BFI arrival nears the final approach fix located just east of Sea-Tac Airport until the BFI Tower reports the landing is assured or until visual separation can be provided. This situation can affect the departure capacity at Sea-Tac Airport. If an arrival to Sea-Tac Airport is within two nautical miles of the Runway 34R threshold, a departure from Sea-Tac Airport, in certain IFR conditions, cannot be released. As a result one to three intervals could be lost.

When SeaTac Airport and BFI are both in north flow, the TRACON typically initiates Plan Charlie, in which departures from SeaTac Airport are issued an initial heading of 20 degrees to ensure separation between the SeaTac departure and traffic on final approach to BFI.

Visual Approaches - South Flow

Visual approaches can normally be conducted to Sea-Tac Airport when the cloud ceiling is at least 5,000 feet over the Puget Sound and pilots have visual contact with the preceding aircraft or Sea-Tac Airport.

When visual approaches are being conducted, the TRACON will radar vector aircraft on three arrival routes and sequence them into a common arrival stream over Elliott Bay. This activity occurs over the top of straight-in arrivals to BFI.

During peak periods, both Runways 16L and 16R at Sea-Tac Airport are used if visual approach conditions exist. Two common arrival streams are formed over Elliott Bay. This situation requires special attention on the part of both controllers and pilots. When pilots are making the turns into Elliott Bay from the north and south, visibility from the cockpit is reduced. If two aircraft are about to make the turn at about the same time onto different arrival streams, one pilot often tends to reduce speed and fall back, in order to keep the other aircraft in sight. This reduction of speed will increase the longitudinal spacing in the arrival stream and reduce the arrival rate.

1.4.5 ANOMS RADAR DATA

The Port's Noise Abatement Office has a flight track data collection and analysis program called the Airport Noise and Operational Monitoring System (ANOMS). This program collects and processes radar data from the FAA's STARS aircraft radar tracking system. Once collected, the ANOMS program performs a number of processes, including determining if the track is a departure or arrival and assigning a runway to the track. With this system, the Port is able to analyze adherence with the Port's noise abatement program and investigate particular incidents concerning aircraft operations.

The ANOMS program exports a file that includes flight information about the aircraft that is operating on each track as well as position information regarding the location and altitude of the flight. The flight information includes data such as the aircraft type, airline code, flight number, and type of operation and runway. The position information includes the X and Y position of each radar record for the flight track for every four seconds of the flight as well as the altitude of the aircraft at each point and the time of day that the aircraft was at that point. The position information is given in distance relative to the STARS radar antenna that is on airport property.

These files have been successfully exported for analysis in this Part 150 Study. Note that the data used is based upon the information from ANOMS, which is derived from the FAA's radar system. There is always the possibility that some data are lost in these radar systems; however, every possible step is taken to ensure this does not occur. When data are lost or when gaps occur in the data, the data are typically not recoverable.

1.5 CURRENT NOISE COMPATIBILITY PROGRAM

The Port has a long history of implementing noise abatement programs at Sea-Tac Airport. These programs include both physical and operational programs. In 1976, the Port prepared the Sea-Tac Community Plan, which addressed for the first time the relationship of aircraft noise to land use development and contained recommendations for land use compatibility. This Plan was updated in 1985 when the Port completed its first Part 150 Study. This Study recommended many of the existing noise mitigation programs currently adopted by the Port and established the Noise Remedy Program Boundary. That Part 150 Study was updated in 1993 and again in 2002. Each Updated Part 150 Study produced an updated set of NEMs and updated existing measures and developed new measures included in the NCP that was adopted in the first study. This Part 150 Study Update is the fourth Part 150 Study that the Port has undertaken.

Following the first Part 150 Study, in 1985 the Port undertook a new and innovative process to address the aircraft noise issue at Sea-Tac Airport. This was called the Sea-Tac Noise Mediation process, which was a consensus-based approach that was used to address aircraft noise issues. Through that process, several measures for noise abatement and noise mitigation were recommended and adopted, resulting in a package of noise-reduction measures for Sea-Tac Airport. Many diverse interests were represented in this process, including airport users, tenants, citizens from throughout the area, the FAA, and pilots. The package contained both short-term and long-term measures to reduce aircraft noise by at least 50 percent by 2001. In 1990, the Port Commission adopted these recommendations contained in the package.

The "package" contained many elements for noise reduction, including:

- Implement a "noise budget" or allocation of noise for Sea-Tac Airport and airlines that will decrease over time. The budget limits and controls aircraft noise and accelerates the use of the new Stage III aircraft.

- Restrict nighttime use of Stage II aircraft. For the first two years of the program, no new Stage II aircraft flights were introduced between midnight and 6:00 a.m. On October 1, 1995, the restriction became fully implemented with no Stage II flights between 10:00 p.m. and 7:00 a.m.
- Double the rate of the Port's existing sound-insulation program (The Noise Remedy Program) and changing the "cost-share'' insulation area to 100-percent Port funded.
- Control of aircraft ground noise by restricting use of engine power for backing aircraft away from gates, improving run-up regulations, investigating the reduction of reverse thrusts, limiting use of auxiliary power units, and erecting a "hush" facility if a maintenance base is built at Sea-Tac Airport.
- Implement a state-of-the-art flight track monitoring system to better monitor compliance with noise abatement flight track procedures.
- Improve flight procedures through the Elliott Bay corridor and over Puget Sound to minimize jet noise to adjacent residential areas, with special attention to nighttime flights.
- Control noise from "single-event" aircraft operations that are particularly annoying by improving the Port's complaint hotline and flight track monitoring system.
- Establish a Noise Abatement Committee to ensure implementation of the agreement.

Many of the elements of these recommendations have been incorporated into the approved NCP; while other elements are beyond the scope of 14 CFR Part 150 and are implemented by Sea-Tac independently of the NCP.

The NCP measures, as outlined in the previous Part 150 studies, and the current implementation status of each measure is listed in the following sections.

1.5.1 ABATEMENT MEASURES

Measure A-1: Explore Limited Rescheduling of Nighttime Flights

Description: This measure involves the voluntary rescheduling of the 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. Since the adoption of this measure, the Federal Government issued 14 CFR Part 161, which limits the ability of airports to enact airport use restrictions that are not voluntary.

Status: This measure is ongoing. Airlines operating at Sea-Tac Airport were sent letters requesting that they voluntarily limit nighttime flights. All startup airlines are sent letters requesting that they limit nighttime flights if possible. Also prior to the year 2000, Sea-Tac Airport had restrictions on Stage 2 aircraft over 75,000 lbs. during the nighttime hours (prior to the Federally-mandated Stage 2 phase-out).

Measure A-2: Eliminate Training Activity

Description: This measure was intended to limit the use of Sea-Tac Airport for training activities (primarily practice instrument approaches by military aircraft).

Status: This measure is complete. No training activity is allowed at Sea-Tac Airport.

Measure A-3: Use VOR Radials to Curb Aircraft Drifting from Noise Abatement Track

Description: This measure uses very high frequency omnidirectional range (VOR) radials to curb departing aircraft from drifting off the runway heading tracks as specified in the Tower Order.
Status: This measure has been implemented and adherence to this measure is ongoing.

Measure A-4: Expand Noise Monitoring System

Description: This measure expanded the existing noise monitoring system at Sea-Tac Airport by adding two additional permanent noise monitors.

Status: This measure has been implemented. The Port has a state-of-the-art noise and operations monitoring system. The Port has periodically expanded and upgraded this system. The system collects and stores flight data from the FAA's automated radar terminal system, which enables staff to regularly monitor noise abatement procedures and investigate citizen inquiries. In addition to this system, the Port also provides WebTrak, which enables the public to investigate flights via the Web. The Port owns and operates 25 permanent noise monitors. The noise monitoring system measures noise levels from individual aircraft and keeps track of operations over time. As data from the monitors is accumulated and analyzed, a history of noise levels is maintained so changes can be noted and trends identified.

Measure A-5: Establish Noise Abatement Office

Description: This measure established a noise abatement office to initiate, implement, and monitor the various noise abatement actions included in the NCP.

Status: This measure has been implemented.

Measure A-6: Establish Follow-Up Public Committee

Description: This measure recommended the establishment of a committee to monitor programs implemented as a result of the Part 150 Study after its completion; and help develop and evaluate the Fly Quiet Program described in Measure A-12.

Status: This measure was approved by the FAA in the 2002 ROA. This measure is complete. The Follow-Up Committee assisted in the development of the Fly Quiet Program, which is currently in effect at Sea-Tac Airport. Committee disbanded after recommended programs were implemented.

Measure A-7: Establish Noise Barriers/Run-up Enclosure

Description: The 1985 Part 150 recommended the use of airport facilities for buffering ground noise. This measure was amended in the 2002 Part 150 Study 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).

Status: Not implemented – This measure was approved in part by the FAA in the 2002 ROA. The FAA approved the conduct of a siting/feasibility study, but noted that "…placement of any future GRE will be subject to additional FAA review determined by the results of the study." 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. The construction of a noise barrier in the North Cargo Area was disapproved by the FAA in the 2002 ROA pending submission of additional information regarding non-compatible land uses impacted and benefits to those non-compatible land uses from construction of the noise barrier.

Measure A-8: Restrict Taxiing of Aircraft to/from Maintenance Areas during Nighttime Hours

Description: 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.
Status: This measure was not implemented. Current airport rules and regulations do not prohibit taxiing aircraft for maintenance activity because it would reduce operational efficiency below acceptable levels.

Measure A-9: Encourage Voluntary Phase-out of Stage 2 Jet Aircraft under 75,000 Lbs.

Description: The 1985 Part 150 Study recommended compliance with 14 CFR Part 36 standards related to the phase-out of Stage 2 aircraft weighing over 75,000 lbs. Jet aircraft weighing less than 75,000 lbs. were exempt from the Stage 2 phase-out mandated under the Airport Noise and Capacity Act (ANCA) of 1990. This measure was amended in the 2002 Part 150 Study Update to include a voluntary phase-out of Stage 2 commercial and business jets weighing less than 75,000 lbs.

Status: This measure was disapproved by the FAA in the 2002 ROA pending submission of additional information to document the contribution Stage 2 aircraft had on the overall noise environment at Sea-Tac Airport. However, this measure is complete. Horizon Airlines has phased-out the F-28 commercial jet, which met the Stage 2 criteria and was less than 75,000 lbs.

Measure A-10: Maintenance Run-up Regulations

Description: This measure addressed maintenance run-ups and recommended several limitations to run-up related activities and fines for violations. These include:

- Prohibit run-ups during the overnight hours of 12:00 a.m. to 6:00 a.m.
- Include language that allows run-ups during the shoulder hours of 10:00 p.m. to 12:00 a.m. and 6:00 A.M. to 7:00 A.M. only if it is necessary for a departure within two-and-a-half hours of the scheduled run-up.
- Increase fines for violations to the run-up regulations to $1,000 for the first offense, doubling each time thereafter, within a 12-month timeframe, to a maximum of $8,000 per occurrence.
- Implement new fine structure once new noise monitoring system has been installed and tested for reliability.
- Include run-up monitoring in Fly Quiet Program (See Measure A-12)
- Work with airlines to restrict run-ups on weekend mornings before 9:00 a.m. unless needed for a departure within two-and-a-half hours of the scheduled run-up.

Status: This measure was disapproved by the FAA in the 2002 ROA. This measure has been implemented by the Port independent of the NCP. The Port of Seattle has established a period that restricts engine run-ups from 10:00 p.m. to 7:00 a.m. If absolutely necessary, run-ups may be conducted during these hours with the airport's permission and may not exceed two minutes in duration. Aircraft operators may conduct longer run-ups from 6:00 a.m. to 7:00 a.m. only if the aircraft is scheduled for a flight that departs between the hours of 7:00 a.m. to 8:30 a.m. and has the airport's permission. Violations to these time restrictions will result in the following tariffs being applied to the aircraft operator:

- First offense – Letter of Admonishment
- Second offense in a calendar year - $1,000
- Third offense within a calendar year from the first offense - $2,000
- Maximum fine within a calendar year from first offense - $8,000

Measure A-11: Preferential Runway Use

Description: 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.

Status: This measure was approved as voluntary by the FAA in the 2002 ROA. This measure has been implemented and adherence to this measure is ongoing.

Measure A-12: Development/Implementation of a Fly Quiet Program

Description: 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.

Status: This measure was approved as voluntary by the FAA in the 2002 ROA. This measure has been implemented. The Fly Quiet Program was implemented in 2004 and remains in place for the foreseeable future. Airline operations are carefully monitored and airlines compete to be designated as the "quietest" at Sea-Tac Airport. Winning airlines are rewarded with extensive publicity regarding their Fly Quiet efforts. Airlines are evaluated on their performance in complying with flight tracks, as well as their compliance with ground run-up regulations. An advisory committee worked in 2003 to assist the Port in developing the program, and served as the "follow-up committee" per the 2002 recommendation.

Measure A-13: Evaluate Increased Use of the Duwamish/Elliott Bay Corridor with FMS

Description: 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 Flight Management Systems (FMS) technology ensures that the rate of adherence to an optimum flight track will increase over time.

Status: This measure was disapproved by the FAA in the 2002 ROA. 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 C.F.R. part 150, section 150.35(b)(3)(iii).

Measure A-14: Nighttime Use of Commencement Bay Departure

Description: 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.

Status: This item was studied during the 2002 Part 150. Port staff coordinated/consulted with the cities of Fife, Milton, and Tacoma who firmly objected to the recommendation. Since no agreement could be made between the various cities involved, no FAA action was taken in the 2002 ROA and the recommendation was not implemented.

Measure A-15: Use of FMS Procedures

Description: 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.

Status: This measure was approved by the FAA in the 2002 ROA. This measure has been implemented and is ongoing. Following the 2002 Part 150, FMS departure procedures have been developed by the FAA for use of the Elliott Bay corridor and are routinely assigned to pilots.

Measure A-16: Use of Ground Equipment

Description: This measure recommended the installation of power and conditioned air in existing and newly constructed gates to minimize the use of auxiliary power units (APUs)/ground power units (GPUs). Once power and conditioned air are installed at gates, airlines should be required to use these services. This reduces noise from the operation of APUs/GPUs when aircraft are parked at the gate.

Status: This measure was disapproved by the FAA in the 2002 ROA; however, has been implemented by the Port independently of the NCP. The project is underway - 73 gates are anticipated to be equipped with central pre-conditioned air by April 2013 As of October 2012 there were 30 diesel/electric point of use units being utilized.

Measure A-17: Raise Altitude Where Aircraft Intercept Glide Slope

Description: Through the Fly Quiet Program, the subsequent Follow-On Committee will work 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 Sea-Tac 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 Sea-Tac 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.

Status: This measure was disapproved by the FAA. As noted in the 2002 ROA, 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 Sea-Tac Airport.

1.5.2 MITIGATION MEASURES

Measure M-1: Outright Acquisition

Description: Single-Family homes located within high noise exposure areas were recommended for outright acquisition. Acquisition programs have been in effect at Sea-Tac Airport since 1972. This NCP measure, which was included in the 1985 NCP, was intended to focus on acquisition of single-family residences exposed to aircraft noise levels of 75 DNL or higher.

Status: This measure is complete. Approximately 1,400 single-family residences were acquired and residents were relocated, including 388 units that were acquired for construction of the new third parallel runway.

Measure M-2: Sound Insulation

Description: Install sound insulation in single-family residential units within the Noise Remedy boundary established in the 1985 Part 150 Study. This measure was amended in the 1993 NCP Update by Measures M-2a, M-2b, M-2c, and M-2d described below.

Measure M-2a: Standard Insulation

Description: Continuation of original Measure M-2 for sound insulation of eligible single-family residences. This measure was again amended in the 2002 NCP Update to focus efforts on residences more highly impacted residential uses; although, overall Remedy Program Boundary set in 1985 was not changed. 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.[2]

Status: This measure was approved by the FAA in the 2002 ROA and is ongoing. As of August 2012, over 9,300 single-family homes have been sound insulated.

Measure M-2b: Insulation of Schools

Description: 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.

Status: This measure was approved by the FAA in the 2002 ROA and is ongoing. As of August 2012, sound insulation has been installed in seven schools within the Highline School District, with eight schools remaining. Thirteen of the eligible 22 buildings on the Highline Community College Campus have been sound insulated.

Measure M-2c: Multi-Family Developments

Description: 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 and the measure was amended in the

[2] 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.

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 renter-occupied units (e.g. apartments) for two 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 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.

Status: This measure was approved by the FAA in the 2002 ROA. This measure is complete. Approximately 246 units within five condominium complexes have been sound insulated.

Measure M-2d: Mobile Homes

Description: The 1993 NCP Update recommended that the Port offer financial assistance for the removal of mobile homes for residents within a manufactured/mobile home park (MMHP) in which the owner has decided to close. In exchange for this assistance, the MMHP owner would sign an avigation easement to ensure that a noise compatible use would be developed to replace the MMHP. This measure was amended in the 2002 NCP Update in two ways: 1) the Port will purchase MMHPs within the 70+ DNL of the 1998 noise contour and provide relocation assistance to the residents in accordance with the Uniform Relocation and Property Acquisition Policies Act, as amended; and 2) the Port will continue to offer financial assistance for the removal of mobile homes for residents residing in parks, where the park owner has decided to close the park, located in the 65 to 70 DNL of the 1998 noise contour.

Status: This measure was approved by the FAA in the 2002 ROA. This measure is complete. The Port acquired five mobile home parks with a total of 359 mobile homes units. Owners of those homes were relocated with financial and advisory assistance from the Port.

Measure M-3: Transaction Assistance

Description: 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.

Status: This measure is ongoing. It was approved in the 1985 NCP and amended in the 1993 NCP (see Measures M-3a and M-3b).

Measure M-3a: Special Purchase Option

Description: This measure modified the Transaction Assistance program to include a Special Purchase Option (SPO) for residents who have owned their home for more than five years and are adjacent to Port property have the option to sell their property to the Port based on fair market value. The Port will then insulate the residence and offer it for resale. This SPO can occur only once per property.

Status: Due to the lack of community response for this program it was discontinued.

Measure M-3b: Insulation Requirement

Description: This measure modified the Transaction Assistance program to require that to be eligible for the program, a homeowner must first have the property sound insulated. If, after sound insulation is completed, the homeowner still wishes to relocate, they will be eligible for transaction assistance.

Status: Due to the lack of community response for this program it was discontinued.

Measure M-4: Easement Acquisition

Description: The Port should 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.

Status: This measure is ongoing, but has been modified from the original description. The Port does not purchase avigation easements for owner-occupied homes that cannot be effectively sound insulated. [3]

[3] Note that this provision differs from completed Measure M-2d in which the Port would offer an avigation easement to owners of mobile home lots in return for removing the mobile home.

Measure M-5: Property Advisory Service

Description: 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.

Status: This measure is ongoing.

Measure M-6: Local Government Remedy Support

Description: By insulating homes and assisting with real estate transactions, the Port can participate in making Sea-Tac 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 will encourage local jurisdictions to undertake projects, provide services, and adopt laws that reinforce neighborhoods and make them compatible with Sea-Tac Airport. The Port will also work with jurisdictions in coordinating activities and exchanging information.

Status: This measure is ongoing.

Measure M-7: Funding for Land Use / Noise Compatibility Planning

Description: 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.

Status: This measure is ongoing.

Measure M-8 was previously considered but not recommended for inclusion in the NCP.

Measure M-9: Community Planners Forum

Description: The Port will initiate 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.

Status: The Planning Committee was formed and met for several years but has since disbanded due to lack of interest by the forum.

Measure M-10: Operations Review and NEM Updates

Description: 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 will be reevaluated prior to the end of the five-year time frame.

Status: This measure was approved by the FAA in the 2002 ROA. This measure is ongoing. This Part 150 Study Update represents the continuation of this measure, which is occurring at this time due to the recent opening of the third parallel runway.

Measure M-11: Approach Transition Zone Acquisition

Description: 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.

Status: This measure was approved by the FAA in the 2002 ROA"…with respect to those areas located within the most recent official Part 150 NEMs." This measure is ongoing. A total of 69 residential parcels and two mobile home parks within the North ATZ have been purchased and residents relocated and the program is complete in this area. A reevaluation of the third runway's South Approach Transition Zone will be conducted as part of the current Part 150 Update. There are 16 single-family residences and six apartment buildings remaining in the south ATZ.

Measure M-12: Prepare Cooperative Development Agreements

Description: The Port and the surrounding jurisdictions should work towards development of cooperative development agreements concerning land use, redevelopment, and infrastructure of the ATZ, as well of other redevelopment areas as necessary.

Status: This measure was approved by the FAA in the 2002 ROA and is ongoing. As of March 2011, the Port has worked with Burien on the North East Redevelopment Area north of Runway 16R/34L and has signed a Development Agreement with the City of Des Moines on the Des Moines Creek Business Park.

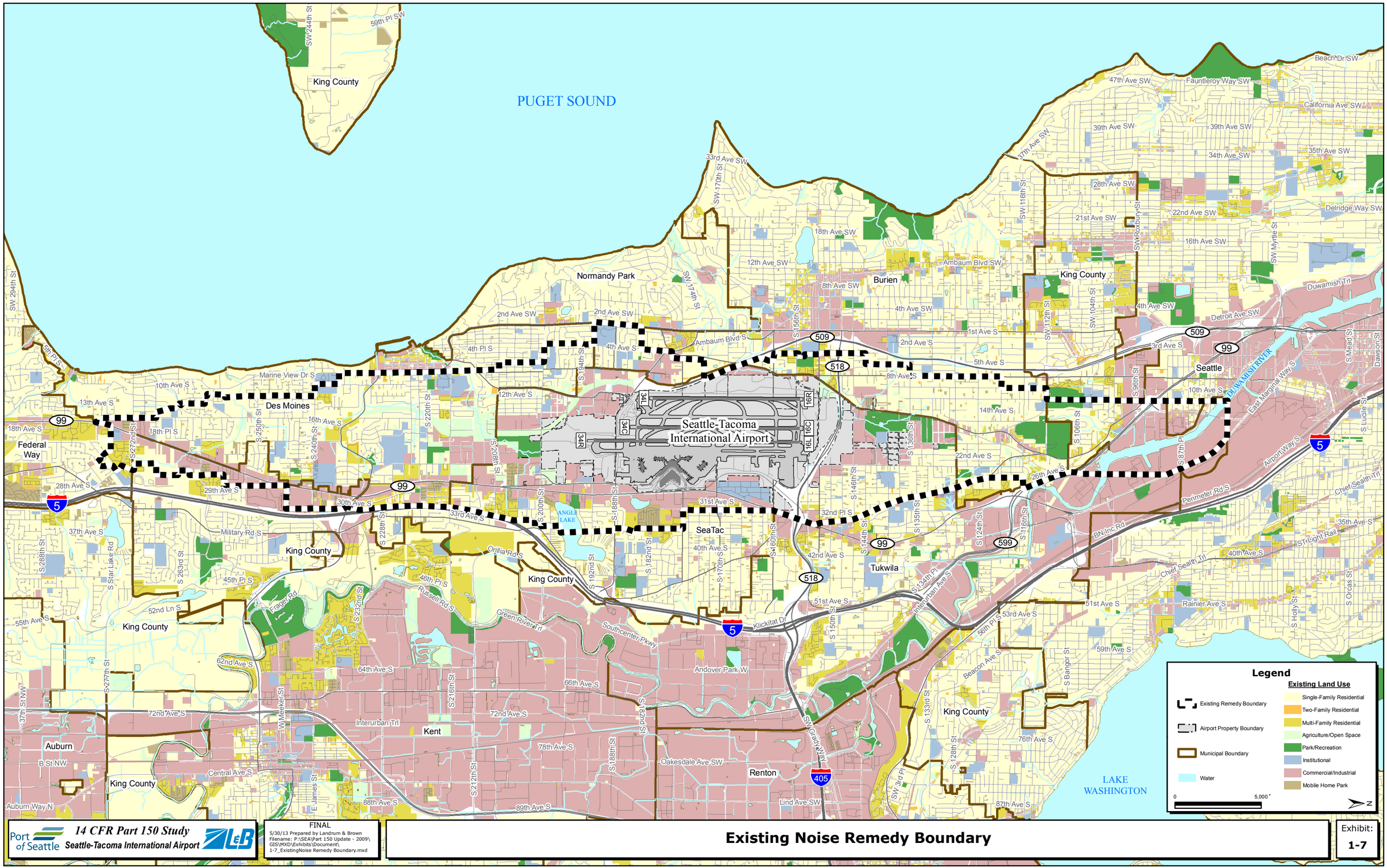
Measure M-13: Amend Community Plans and Zoning Ordinances

Description: The Port will work with the jurisdictions to amend zoning Maps, as necessary to reflect ATZ and mobile/manufactured home park recommendations that may not be consistent with existing Maps and to take into consideration 14 CFR Part 77 height requirements. Such changes shall work towards discouraging the location of additional mobile/manufactured homes that cannot be insulated within 1998 DNL 65 dBA contour.

Status: This measure was approved by the FAA in the 2002 ROA. This measure is complete. All of the residential parcels purchased by the Port have been re-zoned as "airport noise compatible," which means that if and when they are redeveloped they can only be used for industrial/commercial purposes, not residential. The Port also evaluated residential building code requirements for all jurisdictions within the 1998 DNL contour and found that they either met or exceeded the FAA's noise reduction standards.

Since the adoption of the Noise Mediation recommendations and the 2002 Part 150 Update, the Noise Acquisition Program, now completed, has resulted in the acquisition of approximately 1,328 homes and 103 vacant lots at a cost of approximately $119 million. As recommended by the 2002 Part 150 Update, more than 60 homes within the North Approach Transition Zone located in Burien were acquired and approximately 100 units within the Town & Country Mobile Home Park in the City of SeaTac were acquired and the residents relocated. An additional 388 homes were acquired for the construction of the third parallel runway.

The Noise Remedy Program offers soundproofing to approximately 10,000 homes within the existing program boundaries. By the end of 2009, 9,319 homes had been insulated for a cost of approximately $227 million. Sound insulation and other related improvements are ongoing at 15 eligible schools within the Highline School District. Building #19 at Highline Community College was sound insulated and other buildings on the campus are being evaluated for eligibility. The Noise Remedy Boundary Map is shown on **Exhibit 1-7, *Existing Generalized Noise Remedy Boundary***.



14 CFR Part 150 Study
Seattle-Tacoma International Airport

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Existing Noise Remedy Boundary

Exhibit:
1-7

1.6 NOISE COMPLAINT HISTORY

The Sea-Tac Airport Noise Abatement Office receives airport noise complaints and other inquiries from residents in communities around Sea-Tac Airport. These complaints/inquiries are received in the form of phone calls, letters, e-mails, or in person and are logged and compiled in the ANOMS database. Complaint data generally includes the name and address of the person who reports the complaint or makes an inquiry, time of the occurrence and reason for the complaint/inquiry. However, in some cases, a full household address is not provided, and therefore, the specific location cannot be found.

Table 1-6, Noise Complaints and Inquiries, lists the total annual complaints/inquiries and the number of complaints/inquiries per household from January 1, 2005 through June 1, 2012. During this timeframe, the Noise Abatement Office received 17,330 aircraft noise complaints or inquiry. **Exhibit 1-8, *Noise Complaints/Inquiries by Location***, shows the noise complaint/inquiry locations (households), by total number of complaints per household, within the Airport Environs.

In 2009, the first full year in which Runway 16R/34L was open, Sea-Tac Airport received 5,383 airport noise complaints from 869 different households. Eighty-four of these complaints/inquiries did not have a known address because either the individual did not provide an address or the address provided could not be verified. Of the 869 households that reported at least one noise complaint, 799 households reported one to five noise complaints, 59 households reported six to 50 noise complaints, 10 households reported 51 to 502 noise complaints, and one household reported 2,050 noise complaints. The average number of noise complaints reported per complaining household was approximately six. Exhibit 1-8 shows the total number of complaints/inquiries by location. **Exhibit 1-9, *Noise Complaints/Inquiries – Study Area***, graphically depicts the mapped locations of noise complaints/inquiries within the Study Area (SA).

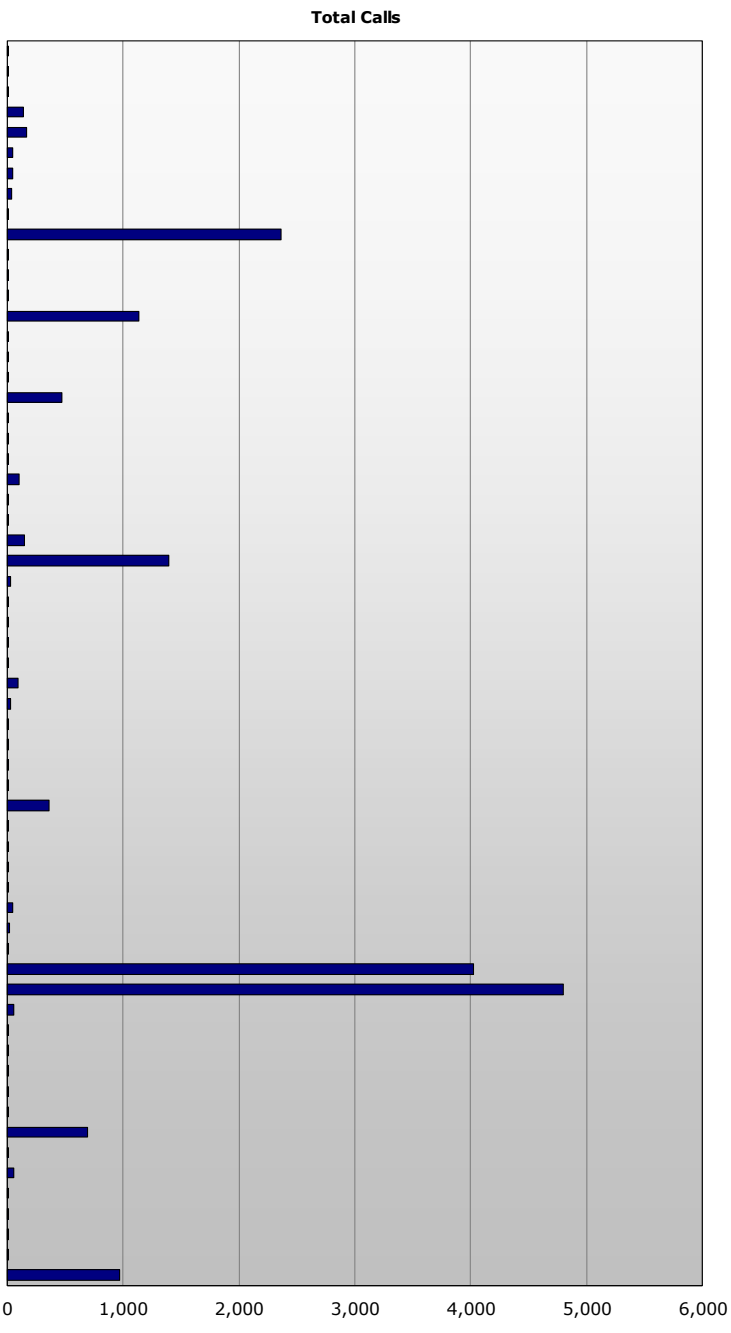
Table 1-6
NOISE COMPLAINTS AND INQUIRIES
Seattle-Tacoma International Airport

YEAR	NUMBER OF COMPLAINTS/ INQUIRIES	NUMBER OF HOUSEHOLDS THAT LOGGED COMPLAINTS[1]	COMPLAINTS FROM UNKNOWN LOCATIONS	MAXIMUM COMPLAINTS PER HOUSEHOLD
2005	1,459	215	533	222
2006	1,273	175	317	321
2007	2,170	379	291	738
2008	1,929	472	318	328
2009	5,383	869	84	2,050
2010	2,489	500	65	682
2011	1,788	117	23	484
2012	839	215	3	222

Note: Includes complaints/inquiries from January 1, 2005 through June 1, 2012.
[1/] Includes only households with known address.
Source: Seattle-Tacoma International Airport Noise Abatement Office, 2012.

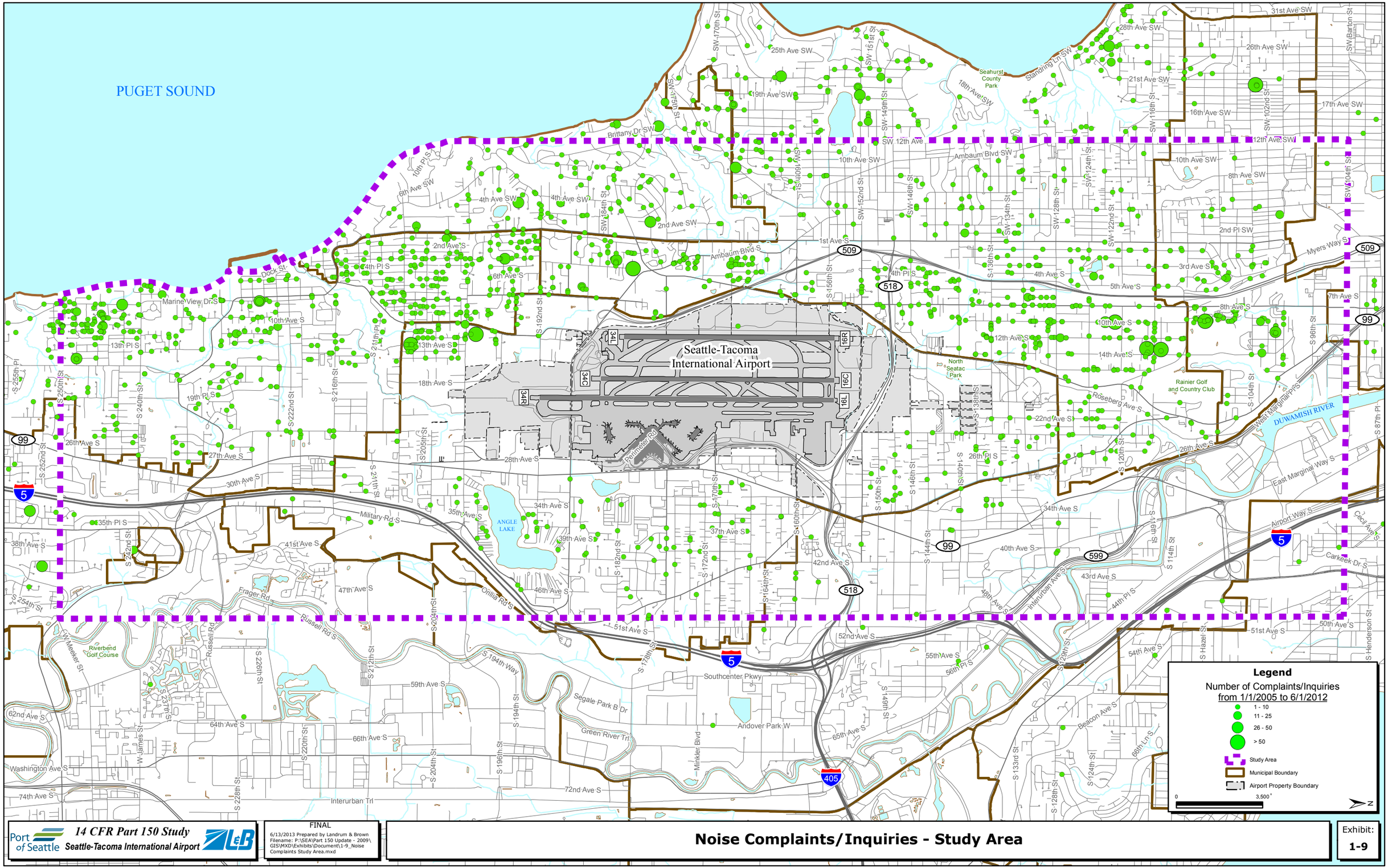
Exhibit 1-8
NOISE COMPLAINTS/INQUIRIES BY LOCATION
Seattle-Tacoma International Airport

Location	Number of Callers	Total Calls
Alderwood Manor	1	1
Allyn-Grapeview	3	3
Arlington	1	1
Artondale	129	138
Auburn	93	166
Bainbridge Island	39	43
Bellevue	49	51
Black Diamond	35	37
Bremerton	1	1
Burien	1,609	2,359
Carnation	1	1
Clyde Hill	5	5
Covington	9	9
Des Moines	999	1,132
Duvall	2	2
Edgewood	3	3
Enumclaw	2	2
Federal Way	400	468
Gig Harbor	1	1
Indianola	1	2
Island County	1	2
Issaquah	76	100
John Sam Lake	3	3
Kenmore	8	9
Kent	114	152
King County	721	1,391
Kirkland	21	28
Kitsap County	6	6
Lake Forest Park	12	14
Maltby	7	9
Maple Valley	4	5
Medina	89	94
Mercer Island	30	31
Milton	1	1
Mountlake Terrace	1	1
Mukilteo	1	1
Newcastle	3	3
Normandy Park	316	361
Paine Field-Lake Stickney	1	1
Picnic Point-North Lynnwood	1	1
Pierce County	7	7
Port Orchard	1	1
Redmond	44	44
Renton	19	23
Sammamish	3	4
SeaTac	491	4,024
Seattle	3,036	4,797
Shoreline	44	58
Silverdale	2	2
Snohomish County	2	2
South Hill	2	2
Sumner	1	1
Suquamish	1	1
Tacoma	606	696
Thurston County	3	3
Tukwila	51	56
West Lake Stevens	1	1
Whatcom County	1	1
Woodinville	1	1
Yarrow Point	2	2
Other/Unknown	914	966



Note: Includes complaints/inquiries from January 1, 2005 through June 1, 2012.

Source: Sea-Tac Airport Noise Abatement Office; Landrum & Brown analysis, 2012.



Port of Seattle — *14 CFR Part 150 Study* — Seattle-Tacoma International Airport — LEB

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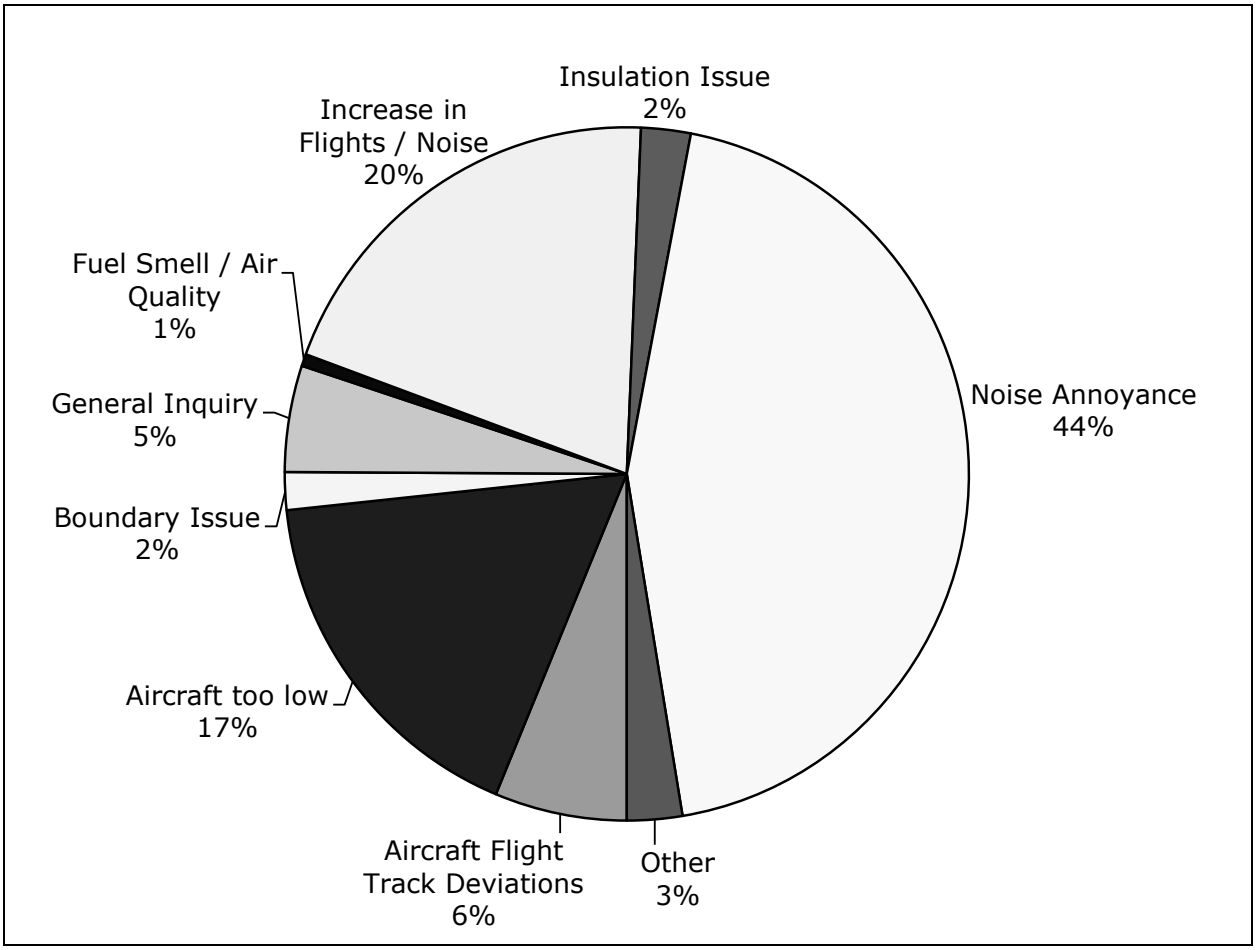
Noise Complaints/Inquiries - Study Area

Exhibit: **1-9**

Not all communication with the Noise Abatement Office is regarding noise complaints. In some cases the communication is an inquiry of some kind, such as a request for information about the airport operations or the noise remedy program or a program boundary issue. **Exhibit 1-10, *Noise Complaints/Inquiries by Type***, shows the nature of each complaint/inquiry from January 1, 2005 through June 1, 2012. The majority of the communication (44 percent) is regarding noise annoyance issues, while another 20 percent is due to concern over an increase in noise and/or aircraft operations. Concerns about aircraft at low altitude and flight track deviations comprise 17 percent and six percent of the complaints/inquiries, respectively. Other communications were related to air quality issues, sound insulation and mitigation boundary issues and other general inquiries.

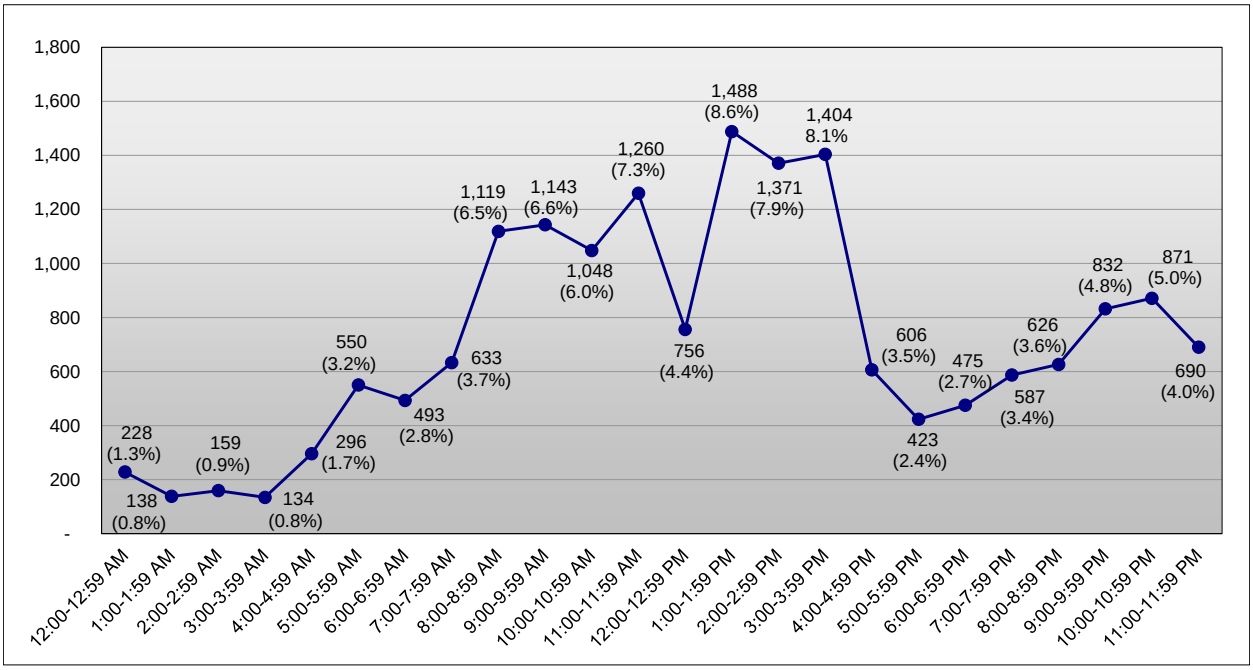
Exhibit 1-10
NOISE COMPLAINTS/INQUIRIES BY TYPE
Seattle-Tacoma International Airport



Note: Includes complaints/inquiries from January 1, 2005 through June 1, 2012.
Source: Sea-Tac Airport Noise Abatement Office; Landrum & Brown analysis, 2012.

Exhibit 1-11, *Noise Complaints/Inquiries by Time of Day*, shows times of day when people have made noise complaints and/or inquiries from January 1, 2005 through June 1, 2012. During this timeframe, the highest number of complaints/inquiries occurred in the early to mid-afternoon. A total of 1,488 complaints/inquiries (8.6%) were logged between 1:00 p.m. and 1:59 p.m. The lowest number of complaints/inquiries occurred in the early morning hours when people are typically asleep and limited aircraft activity occurs. It should be noted that in some cases the time of the complaint may not directly correspond to the time of the event that triggered the complaint. In some cases, time may pass between the event that triggered the complaint and when the person actually called the noise abatement office or submitted their complaint/inquiry.

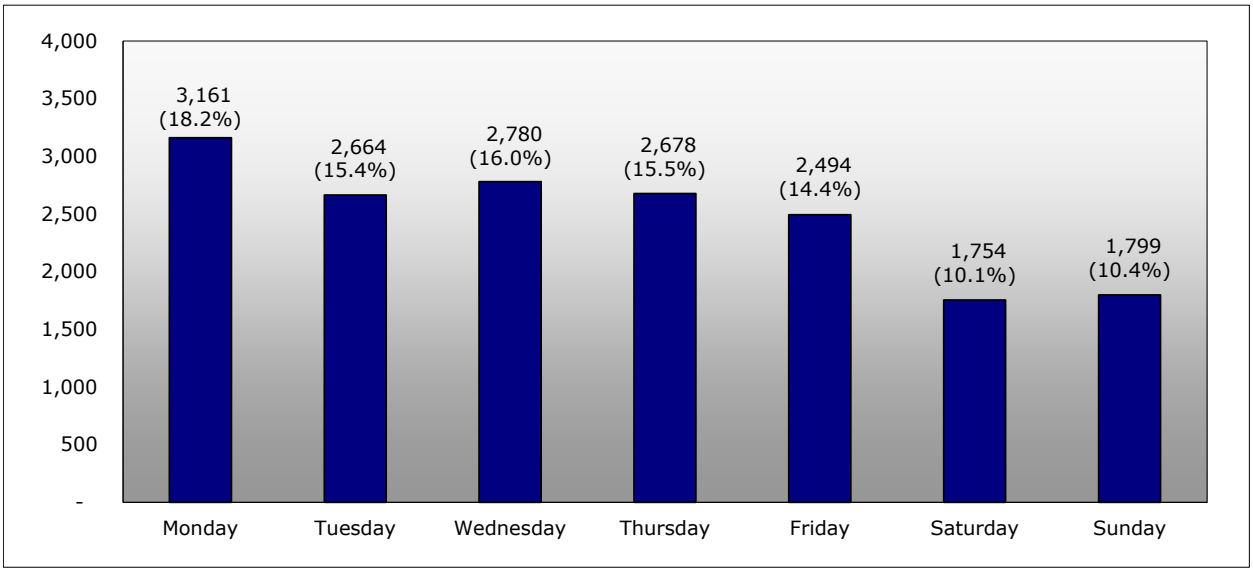
Exhibit 1-11
NOISE COMPLAINTS/INQUIRIES BY TIME OF DAY
Seattle-Tacoma International Airport



Note: Includes complaints/inquiries from January 1, 2005 through June 1, 2012.
Source: Sea-Tac Airport Noise Abatement Office; Landrum & Brown analysis, 2012.

Exhibit 1-12, *Noise Complaints/Inquiries by Day of the Week*, shows the distribution of complaints/inquiries by day of the week from January 1, 2005 through June 1, 2012. During this timeframe, more complaints/inquiries occurred on weekdays (Monday through Friday) than on weekends (Saturday and Sunday).

Exhibit 1-12
NOISE COMPLAINTS/INQUIRIES BY DAY OF THE WEEK
Seattle-Tacoma International Airport

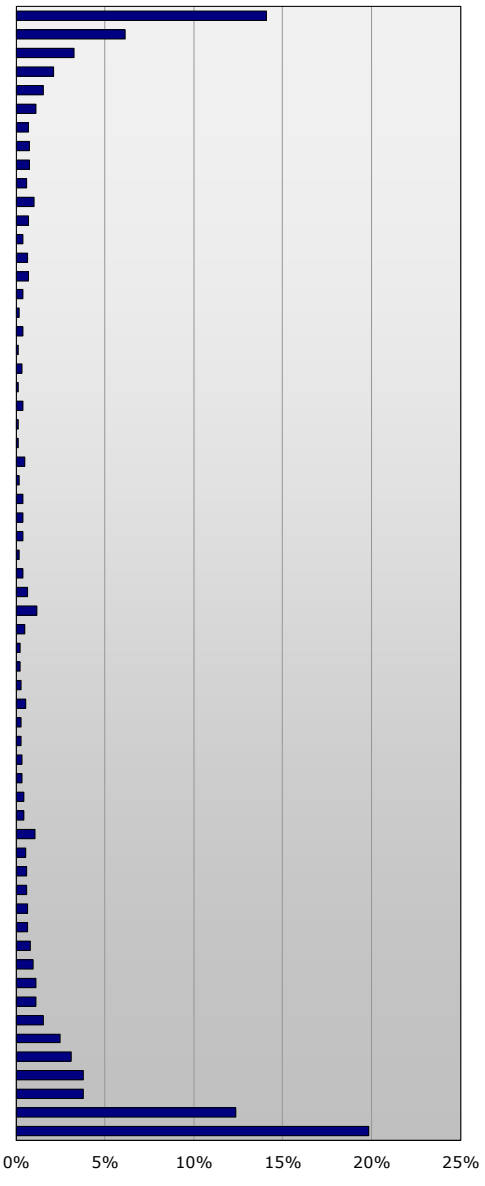


Source: Sea-Tac Airport Noise Abatement Office; Landrum & Brown analysis, 2012.

Exhibit 1-13, *Noise Complaints/Inquiries by Individual*, shows the total number of complaints/inquiries per individual. A total of 3,525 individuals have logged 17,330 complaints/inquiries from January 1, 2005 through June 1, 2012. A total of 2,446 individuals made only one complaint/inquiry (approximately 14 percent of the total 17,330 complaints/inquiries). Conversely, a small number of individuals logged repeated complaints/inquiries, including one individual who logged 3,441 total complaints/inquiries (approximately 20 percent of the total).

Exhibit 1-13
NOISE COMPLAINTS/INQUIRIES BY INDIVIDUAL
Seattle-Tacoma International Airport

Complaints/ Inquiries per Individual	Total Individuals	Total Complaints/ Inquiries	Percent of Individuals	Percent of Complaints/ Inquiries
1	2,446	2,446	69%	14%
2	534	1,068	15%	6%
3	189	567	5%	3%
4	92	368	3%	2%
5	54	270	2%	2%
6	33	198	<1%	1%
7	17	119	<1%	<1%
8	16	128	<1%	<1%
9	15	135	<1%	<1%
10	10	100	<1%	<1%
11	16	176	<1%	1%
12	10	120	<1%	<1%
13	5	65	<1%	<1%
14	8	112	<1%	<1%
15	8	120	<1%	<1%
16	4	64	<1%	<1%
17	2	34	<1%	<1%
18	4	72	<1%	<1%
19	1	19	<1%	<1%
20	3	60	<1%	<1%
21	1	21	<1%	<1%
22	3	66	<1%	<1%
25	1	25	<1%	<1%
26	1	26	<1%	<1%
28	3	84	<1%	<1%
31	1	31	<1%	<1%
32	2	64	<1%	<1%
33	2	66	<1%	<1%
34	2	68	<1%	<1%
35	1	35	<1%	<1%
36	2	72	<1%	<1%
37	3	111	<1%	<1%
40	5	200	<1%	1%
41	2	82	<1%	<1%
43	1	43	<1%	<1%
45	1	45	<1%	<1%
47	1	47	<1%	<1%
49	2	98	<1%	<1%
50	1	50	<1%	<1%
53	1	53	<1%	<1%
56	1	56	<1%	<1%
61	1	61	<1%	<1%
76	1	76	<1%	<1%
80	1	80	<1%	<1%
92	2	184	<1%	1%
99	1	99	<1%	<1%
102	1	102	<1%	<1%
103	1	103	<1%	<1%
112	1	112	<1%	<1%
113	1	113	<1%	<1%
136	1	136	<1%	<1%
165	1	165	<1%	<1%
192	1	192	<1%	1%
193	1	193	<1%	1%
269	1	269	<1%	2%
433	1	433	<1%	2%
536	1	536	<1%	3%
653	1	653	<1%	4%
655	1	655	<1%	4%
2,143	1	2,143	<1%	12%
3,441	1	3,441	<1%	20%
Total	**3,525**	**17,330**	**100%**	**100%**



Source: Sea-Tac Airport Noise Abatement Office; Landrum & Brown analysis, 2012.

1.7 AIRPORT ENVIRONS

Sea-Tac Airport is located in the City of SeaTac in King County, Washington. The Airport Environs refers to the regional area that may experience broader effects from the noise of aircraft operations beyond the DNL 65 dBA noise exposure contour. Within the Airport Environs, a Part 150 Study Area has been established as described below.

1.7.1 STUDY AREA (SA)

The SA is defined as the area that experiences direct overflights of aircraft at lower altitudes. The SA was determined by examining the boundaries of previous DNL 65 dBA noise exposure contours (the FAA-defined threshold for significant noise impacts), and by reviewing flight tracks of aircraft operating in the airport vicinity and/or under the control of the Sea-Tac ATCT. The SA, as shown in Exhibit 1-8*,* is the area in which detailed land use analysis will be conducted. The SA includes the all or parts of the cities of Burien, Des Moines, Kent, Normandy Park, Seattle, Tukwila, and portions of unincorporated King County.[4]

The SA is depicted on **Exhibit 1-14, *Study Area – Generalized Existing Land Use***. To the north of Sea-Tac Airport, the SA extends approximately four miles from the ends of Runways 16L/16R/16C to 104th Street in Seattle. To the west, the SA extends approximately 1.5 miles from the centerline of Runway 16R/34L to 12th Avenue in Burien and to the Puget Sound. To the east, the SA extends approximately 1.6 miles from the centerline of Runway 16L/34R almost to 51st Avenue in SeaTac and Tukwila. To the south, the SA extends approximately 3.7 miles from the end of Runway 34R to 250th Street in Kent and Des Moines.

1.7.2 EXISTING LAND USE

Existing land use within the Airport Environs is shown on **Exhibit 1-15, *Existing Noise-Sensitive Public Facilities***. Existing land use immediately north of Sea-Tac Airport is a mixture of airport-related development, commercial, and single- and multi-family residential development. To the south of Sea-Tac Airport there is open space, single-family residential, a number of large areas of multi-family residential, and public facilities uses. Immediately east of Sea-Tac Airport, specifically along International Boulevard, there is commercial development with a mixture of multi-family residential, further east the land use is primarily single-family residential with a mixture of multi-family residential, commercial, and institutional land uses. West of Sea-Tac Airport is predominantly single-family residential development with commercial and institutional uses to the northeast and southwest.

[4] Representatives of these communities are participating members of the Technical Review Committee (TRC) for the Sea-Tac Airport Part 150 Study. The Highline Forum, which is also a participant in this update to the Sea-Tac Airport Part 150 Study, includes a number of these same communities; Des Moines, Burien, Normandy Park, SeaTac, Tukwila and Federal Way and the Highline School District and Port of Seattle. More information regarding the public consultation process is included in Chapter Six, *Consultation*.

In summary, significant areas of potential existing incompatible land uses occur within the immediate proximity to Sea-Tac Airport and areas of aircraft overflight. These incompatible land uses are primarily residential. Off each of the runway ends and along the eastern and western airport property boundary there is a buffer area of commercial and park/recreational land uses followed by large expanses of residential land use. Many of the residential structures are included in the existing Sea-Tac Airport Noise Remedy Program.[5]

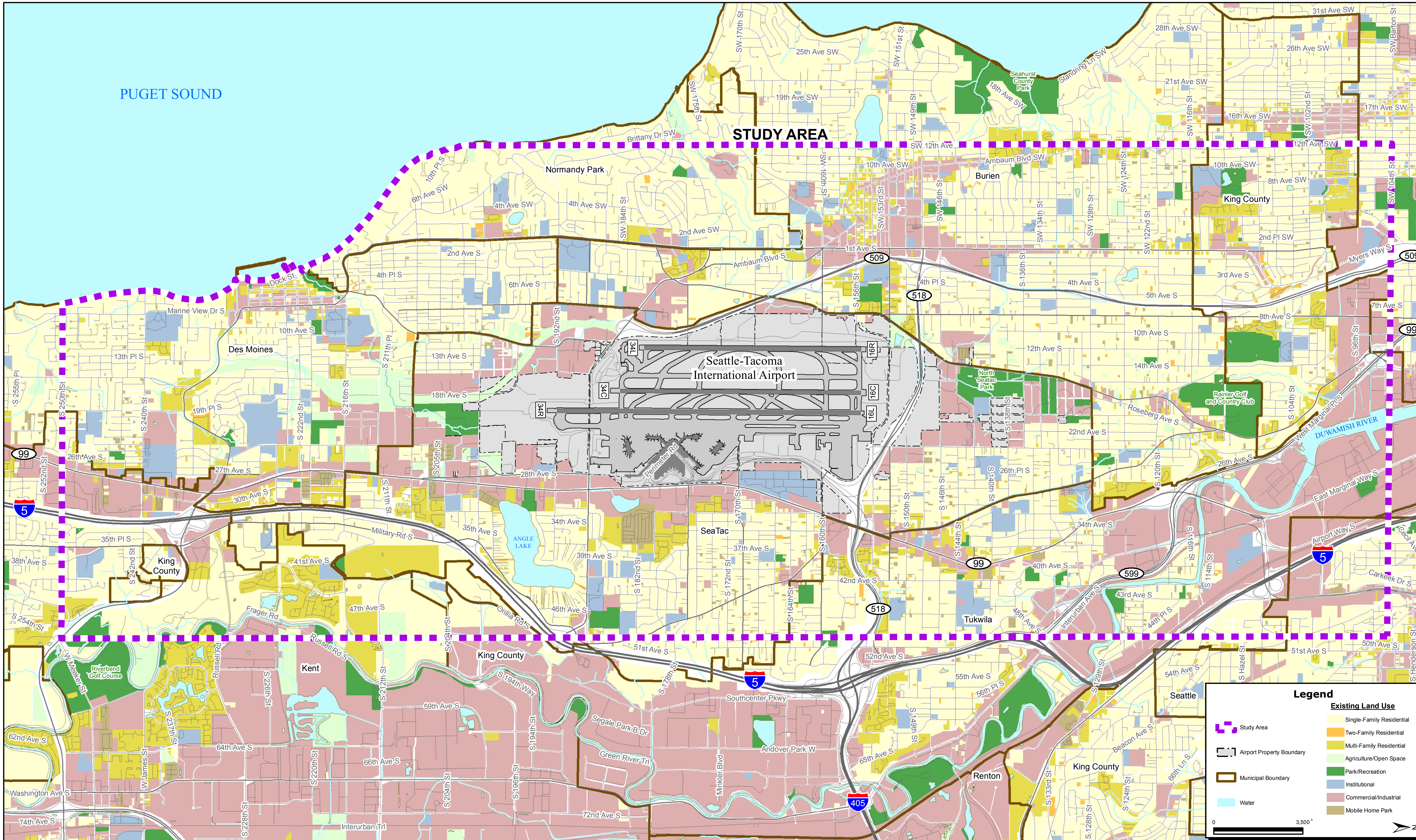
1.7.3 NOISE-SENSITIVE PUBLIC FACILITIES

Noise-sensitive public facilities, as defined by 14 CFR Part 150, include schools, churches, libraries, hospitals, and nursing homes. The number and location of noise-sensitive public facilities within the SA were derived from a number of different sources, including Port records and local jurisdictions. Noise-sensitive public facilities are shown on Exhibit 1-15. The noise-sensitive public facilities within the SA are identified in **Table 1-7, *Noise-Sensitive Public Facilities***.

1.7.4 HISTORIC SITES

Sites of historic significance within the SA are identified through a search of the National Register of Historic Places (NRHP). The NRHP is the official list of properties recognized by the Federal government as worthy of preservation for their local, state, or national significance in American history, architecture, archaeology, engineering, or culture. Although the National Register is a program of the National Park Service, it is administered at the state level by each respective state. In Washington, the National Register program is administered by the State Department of Archaeology and Historic Preservation. The location of historic sites is shown on **Exhibit 1-16, *Existing Historic Sites*** and the sites are listed in **Table 1-8, *Historic Sites***.

[5] More information on the ongoing noise remedy program is included in Section 1.5 of this chapter.



14 CFR Part 150 Study
Seattle-Tacoma International Airport

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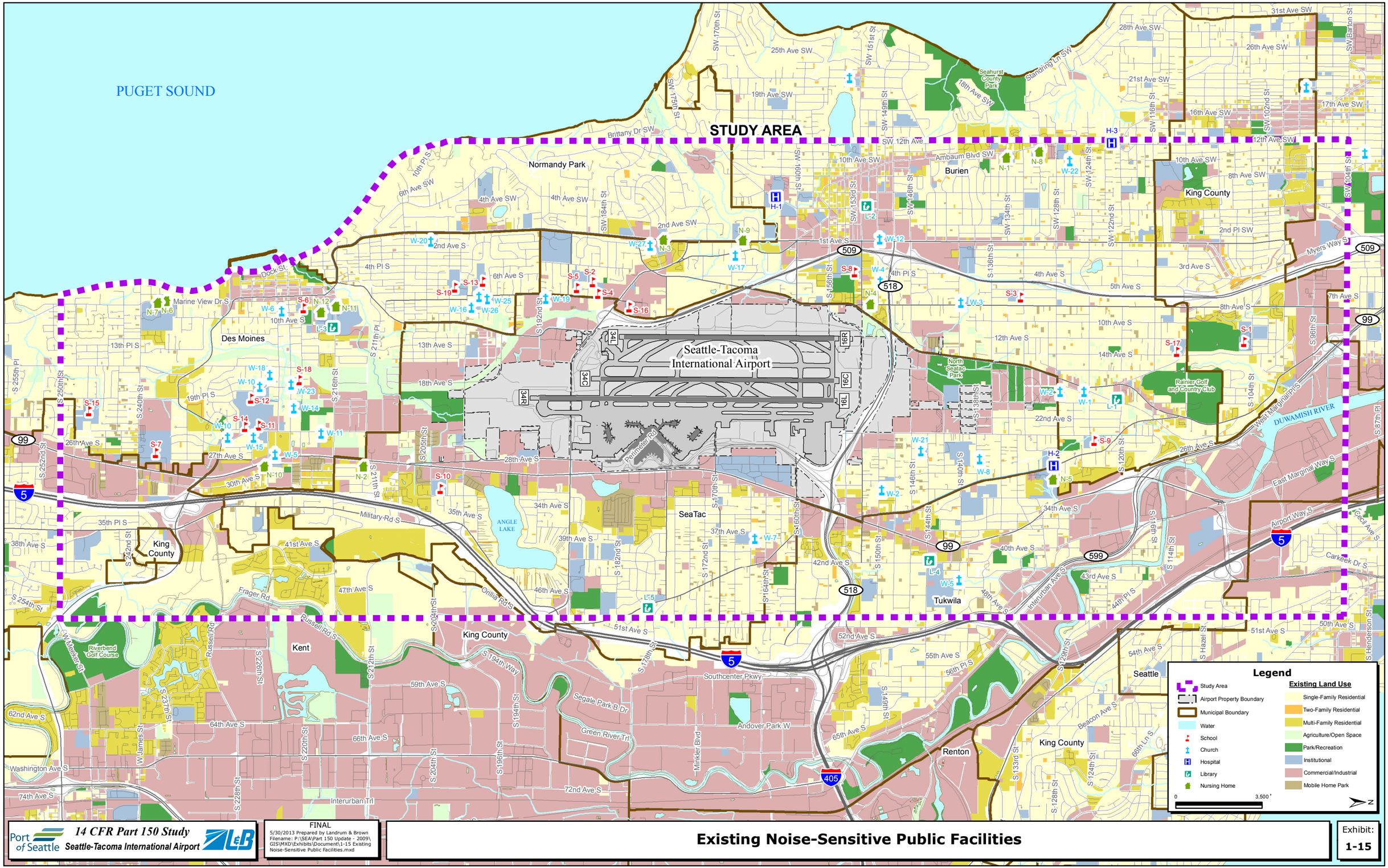
Study Area - Generalized Existing Land Use

Exhibit: 1-14



Port of Seattle — *14 CFR Part 150 Study* — *Seattle-Tacoma International Airport* — LeB

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Existing Noise-Sensitive Public Facilities

Exhibit: **1-15**

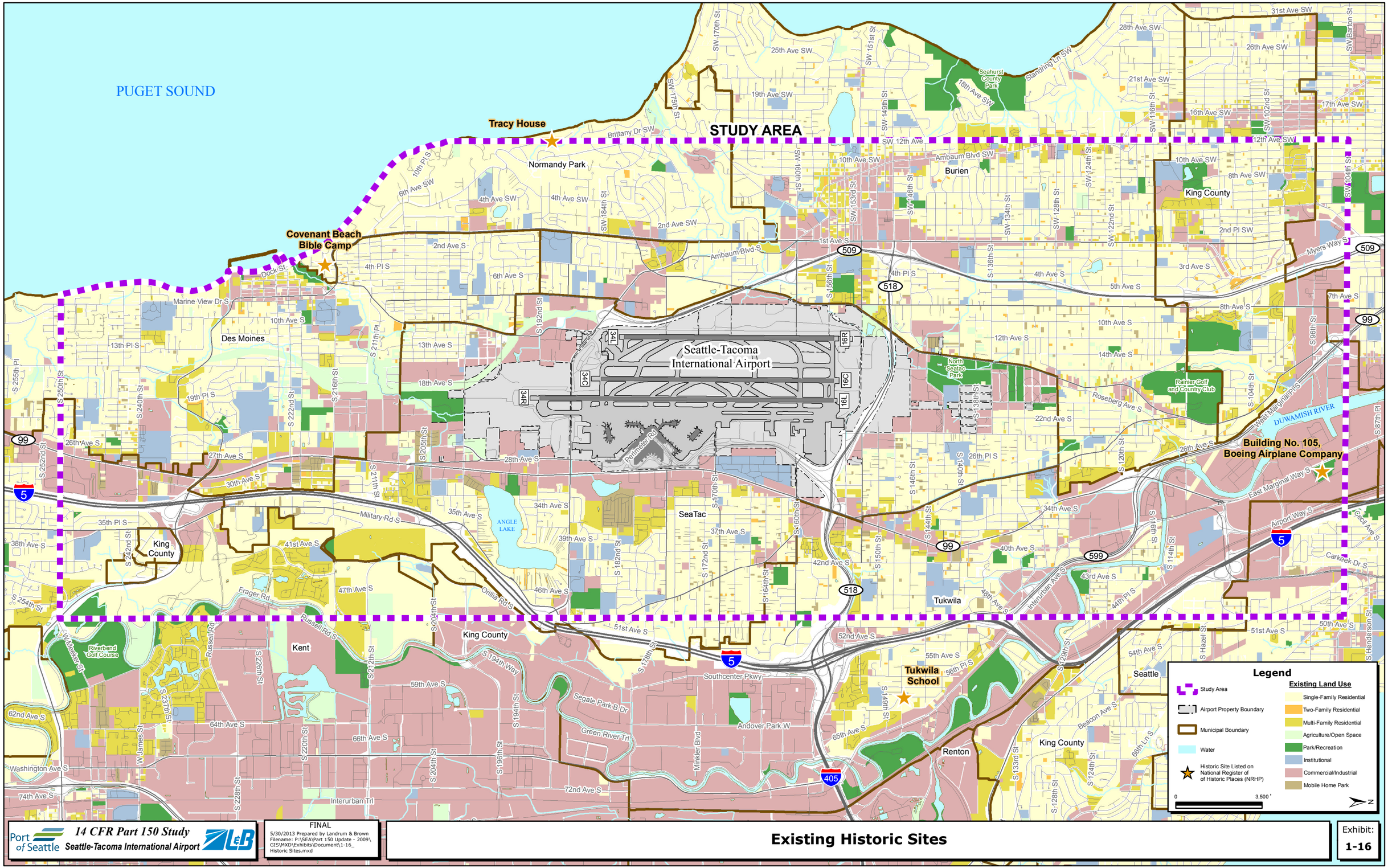
Table 1-7
NOISE-SENSITIVE PUBLIC FACILITIES
Seattle-Tacoma International Airport

MAP ID	FACILITY NAME	JURISDICTION	SOUND INSULATED
SCHOOLS			
S-1	Beverly Park Elementary	King County	Scheduled
S-2	Bow Lake Elementary	Burien	
S-3	Cedarhurst Elementary	Burien	Completed
S-4	Choice Academy - Homeschool Center	Burien	
S-5	Community Chapel Christian School	Burien	
S-6	Des Moines Elementary	Des Moines	Scheduled
S-7	Highline Community College	Des Moines	
S-8	Highline High School	Burien	Scheduled
S-9	Hilltop Elementary	King County	Scheduled
S-10	Madrona Elementary	SeaTac	Completed
S-11	Midway Elementary	Des Moines	Completed
S-12	Mt Rainier High School	Des Moines	Completed
S-13	North Hill Primary	Des Moines	Completed
S-14	Pacific Middle School	Des Moines	Scheduled
S-15	Parkside Primary	Des Moines	Completed
S-16	Sea-Tac Occupational Skills Center	Burien	Scheduled
S-17	Southern Heights Elementary	King County	Scheduled
S-18	St. Philomena Primary	Des Moines	
S-19	Aviation High School (scheduled for relocation)	Des Moines	
LIBRARIES			
L-1	Boulevard Public Library	Seattle	n/a
L-2	Burien Library	Burien	n/a
L-3	Des Moines Library	Des Moines	n/a
L-4	Foster Library	Tukwila	n/a
L-5	Valley View Library	SeaTac	n/a
HOSPITALS			
H-1	Highline Medical Center	Burien	n/a
H-2	Regional Hospital Respiratory-Complex Care	Tukwila	n/a
H-3	Schick Shadel Hospital	Seattle	n/a
NURSING HOMES			
N-1	El Dorado West Retirement Community	Burien	n/a
N-2	Falcon Ridge Assisted Living	SeaTac	n/a
N-3	Fernwood at The Park	Normandy Park	n/a
N-4	High West Residence	Burien	n/a
N-5	Highline Physical Rehab Center	Tukwila	n/a
N-6	Judson Park Retirement Center	Des Moines	n/a
N-7	Landmark on The Sound	Des Moines	n/a
N-8	Life Care Center of Burien	Burien	n/a
N-9	Normandy Park Senior Living	Burien	n/a
N-10	Stafford Healthcare	Des Moines	n/a
N-11	Wesley Holmes	Des Moines	n/a
N-12	Wesley Homes Health Center	Des Moines	n/a

Table 1-7, *Continued*
NOISE-SENSITIVE PUBLIC FACILITIES
Seattle-Tacoma International Airport

MAP ID	FACILITY NAME	JURISDICTION	SOUND INSULATED
PLACES OF WORSHIP			
W-1	Apostolic Bible Church Of Jesus Christ	Burien	n/a
W-2	Boulevard Park Presbyterian	Burien	n/a
W-3	Burien Church Of Christ	Burien	n/a
W-4	Burien Free Methodist Church	Burien	n/a
W-5	Citadel Church	Des Moines	n/a
W-6	Des Moines United Methodist Church	Des Moines	n/a
W-7	Ethiopian Muslim Association Of Seattle	Seatac	n/a
W-8	Faith Deliverance Assembly	Seatac	n/a
W-9	First Baptist Church	Des Moines	n/a
W-10	Grace Lutheran Church	Des Moines	n/a
W-11	Highline 7th Day Adventist Church	Des Moines	n/a
W-12	Highline Christian Church	Burien	n/a
W-13	Islamic Center Of Seattle	Seatac	n/a
W-14	Lifepoint Foursquare Church	Des Moines	n/a
W-15	Midway Community Covenant Church	Des Moines	n/a
W-16	Normandy Christian Church	Des Moines	n/a
W-17	Our Savior's Lutheran Church	Burien	n/a
W-18	Primera Iglesia Bautista	Des Moines	n/a
W-19	Prince Of Peace Lutheran Church	SeaTac	n/a
W-20	Resurrection Lutheran Church	Des Moines	n/a
W-21	Riverton Heights Baptist Church	Seatac	n/a
W-22	Saint Bernadette Church	Burien	n/a
W-23	Saint Philomena Church	Des Moines	n/a
W-24	Saint Thomas Church	Tukwila	n/a
W-25	Samoan Christian Fellowship	Des Moines	n/a
W-26	Southminster Presbyterian Church	Des Moines	n/a
W-27	The Evergreen Church	Burien	n/a

Note: n/a = land use type was not identified as eligible for sound insulation.
Source: Port of Seattle, King County, Landrum & Brown, 2013.



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Existing Historic Sites

Exhibit: **1-16**

Table 1-8
HISTORIC SITES
Seattle-Tacoma International Airport

FACILITY NAME	CURRENT USE
Building No. 105, Boeing Airplane Company	Museum
Covenant Beach Bible Camp	Outdoor recreation facility
Tracy House	Single-family residence
Tukwila School	Museum and Cultural Center

Source: National Park Service, U.S. Department of Interior, 2011.

1.7.5 LOCAL COMPATIBLE LAND USE PLANNING

In 1990, the Washington State Legislature passed the Growth Management Act (GMA), RCW 36.70A, to create a method for comprehensive land use planning involving citizens, communities, counties, cities, and the private sector to prevent uncoordinated and unplanned growth. The GMA requires that King County, and all cities within King County prepare a comprehensive plan. According to the Washington Administrative Code (WAC) 365-196-400, a comprehensive plan must include a Comprehensive Plan (Future Land Use) Map.

Many of the jurisdictions surrounding Sea-Tac Airport have included goals and policies related to the Airport and noise/land use compatibility in their comprehensive plans. The following sections describe the comprehensive planning efforts of the jurisdictions within the SA. Where applicable, goals and policies related to Sea-Tac Airport from each jurisdiction's most recent comprehensive plan are included. The format and numbering and use of acronyms is that of each individual plan, and therefore does not necessarily follow the format of this document. For example, some jurisdictions refer to the Seattle-Tacoma International Airport as STIA.

1.7.5.1 City of SeaTac

The City of SeaTac surrounds Sea-Tac Airport and is approximately 3 square miles in area. The City adopted its Comprehensive Plan in December 1994. The Comprehensive Plan includes a Comprehensive Plan Map that shows recommended land uses within the City. Each year the City updates its Plan to meet changing conditions, and invites the public to participate in this process. At the same time, the City accepts proposals from the public for changes to the City's development regulations. Development regulations are the controls placed on development and use of land. These include the Zoning Code, the Subdivision Code, and related procedures (see Section 1.8.2.1). Updating the zoning code involves a two-step process. First, the zoning change must be consistent with the Comprehensive Plan Map. If the proposed zoning change is inconsistent, the Comprehensive Plan Map must be updated before the zone change can occur.

The *City of SeaTac Comprehensive Plan* was most recently updated by ordinance on November 22, 2011.[6] The existing Plan includes the discussion and map exhibit showing the 65+ DNL[7] noise exposure contours from the *Seattle-Tacoma International Airport FAR Part 150 Study Update (dated July 2002).* The Plan includes policies that identify land uses which are compatible or incompatible within the 65 to 75 DNL noise exposure contours and applicable construction standards for interior noise attenuation (see Goal 1.6 and Policies 1.6A and 1.6B). The Plan identifies Sea-Tac Airport as an essential public facility and contains land use and transportation policies for the area immediately surrounding the Airport. The Plan contains the following Airport-Related Land Use goals and policies:

GOAL 1.6

To achieve a reasonable level of compatibility between airport activities and adjacent land uses.

Policy 1.6A

Encourage land uses adjacent to Sea-Tac International Airport that are compatible with Airport operations.

Discussion: The FAA standards under the Part 150 identify compatible land uses for areas immediately adjacent to an airport. Improving land use compatibility in areas near the Airport enables the City to take better advantage of the job and tax revenue benefits of the Airport, maintain and enhance the Airport's role as an essential public facility, and help reduce the negative impacts to City residents.

Land uses essential to the aviation function of an airport are considered an Essential Public Facility (EPF), (*see* Goal 1.7), and are subject to provisions of the Interlocal Agreement (ILA) between the City and the Port of Seattle for Seattle-Tacoma International Airport originally signed 9/4/97 and updated and reauthorized in 2005. The parties of the ILA adopted the listed of Airport Master Plan projects and uses to settle their dispute over Airport expansion. The ILA does not determine whether the listed uses are EPFs under the Growth Management Act.[8] The ILA reserves the City's rights under prescribed circumstances to challenge whether a proposed development at the Airport is an EPF.

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6 *City of SeaTac Comprehensive Plan*, Fifteenth Seventeenth Annual Update, City of SeaTac Department of Planning and Community Development, November 22, 2011, Ordinance No. 1011-10131020.

7 The *Seattle-Tacoma International Airport FAR Part 150 Study Update* (dated July 2002) used the acronym Ldn which is the symbol for day-night average sound level (DNL). DNL is the acronym use in this study update. DNL "means the 24-hour average sound level in decibels, for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the period between midnight and 7:00 a.m. and between 10:00 p.m. and midnight, local time." Source: 14 CFR Part 150 §150.7, *Definition of Day-Night Average Sound Level*.

8 The Washington Growth Management Act (GMA) requires cities to prepare comprehensive plans that contain, at a minimum, elements pertaining to land use, housing, transportation, capital facilities, and utilities. It also requires local plans to address 13 State goals: urban growth, reduce sprawl, transportation, housing, economic development, property rights, permits, natural resource industries, open space and recreation, environment, citizen participation, public facilities and services, and historic preservation.

Policy 1.6B

Encourage the development of Airport-compatible activities in the Aviation Business Center (ABC) area.

Discussion: The ABC district, created in 1991, encourages a wide mix of Airport-related businesses southeast of the Airport. This district provides needed space for Airport-related activities, which play a key role in the City's economy. The land uses within the ABC district are intended to be compatible with Airport operations.

Policy 1.6C

Work with the Port of Seattle to implement the Interlocal Agreement (ILA) between the City and the Port of Seattle for the Airport, adopted 9/4/97.

Discussion: The City of SeaTac and Port of Seattle entered into the ILA to establish a mutually satisfactory process and set of development standards for Port projects and mitigation for the Airport Master Plan. The ILA resolves land use jurisdictional issues and establishes a basis for working toward compatibility between City and Airport land uses.

GOAL 1.7

To address the siting of essential public facilities.

Policy 1.7A

Administer a process consistent with both the Washington Growth Management Act and the Countywide Planning Policies to address the siting of essential public facilities (EPF). Any EPF facility must be consistent with the City's goals and policies.

Discussion: The Washington Growth Management Act defines essential public facilities as being "those facilities that are typically difficult to site..." King County's Comprehensive Plan defines an essential public facility as a facility that either: (a) meets the Washington Growth Management Act definition of an essential public facility; (b) is on a State, County or local community list of essential public facilities; (c) serves a significant portion of the County or metropolitan region or is part of a Countywide service system; or (d) is difficult to site or expand.

The Washington Growth Management authorizes municipalities to have some input into the siting process, but does not grant cities the right to prohibit essential public facilities. A few essential public facilities identified in the *City of SeaTac Comprehensive Plan* include: airports and State/regional transportation facilities. Differing levels of review and City involvement will be applied to different types of essential public facilities.

GOAL 2.1

To preserve SeaTac's existing residential neighborhoods and foster a high degree of pride in residency or ownership.

Policy 2.1C

Encourage the insulation of noise impacted housing units through the Port of Seattle/FAA Noise Remedy Program.

- Discussion: Homes within noise impacted areas may be eligible for insulation.

GOAL 2.3

To increase housing opportunities for all economic segments of the community.

Policy 2.3A

Identify, maintain and enhance the existing affordable housing stock in SeaTac.

Discussion: SeaTac's existing housing stock serves as one of the most affordable housing alternatives in the greater Seattle area, and its preservation is an appropriate affordable housing mechanism. This policy is particularly important since some loss of affordable stock may occur because certain residential areas of the City that are impacted by Airport noise may transition to other uses.

1.7.5.2 City of Des Moines

The City of Des Moines is located on the Puget Sound just north of Federal Way, south of Normandy Park and Burien, southwest of the City of SeaTac and south of Sea-Tac Airport. The City amended the *City of Des Moines Comprehensive Plan* on January 5, 2012.[9] The Plan identifies goals, background/context, policies, and strategies for the following elements:

1. General Planning
2. Land Use
3. Transportation
4. Conservation
5. Capital Facilities, Utilities, and Public Services
6. Parks, Recreation, and Open Space
7. Housing
8. Community Character

[9] The City of Des Moines Comprehensive Plan was adopted in 1995 and was entitled the *Greater Des Moines Planning Area Comprehensive Plan*. The original plan has been amended 12 times, most recently on January 5, 20122010 by Ordinance No. 15321499). Since 1995, the majority of potential annexation areas surrounding the City have been annexed by Des Moines and surrounding cities. To reflect this change in conditions, the name of the plan document was changed to the *City of Des Moines Comprehensive Plan*.

The Plan recognizes that "growth and development within Des Moines are influenced by activities outside the city, including: Seattle-Tacoma International Airport, regional economic trends, regional transportation systems and commuting patterns, regional development plans, development within bordering jurisdictions and state regulations." The following goals, background/context, policies, and strategies are related to ensuring compatibility with Airport operations.

General Planning Background and Context 1-02-03

Growth and development within Des Moines are influenced by activities outside the city, including: Seattle-Tacoma International Airport (STIA), regional economic trends, regional transportation systems and commuting patterns, regional development plans, development within bordering jurisdictions and state regulations.

Land Use Policy 2-03-11

Regulate the siting of incompatible uses adjacent to Sea-Tac Airport, as defined in Revised Code of Washington (RCW) 36.70.547 and the Washington State Department of Transportation's *Airports and compatible land Use Volume 1* (1999).

Capital Facilities Strategy 5-04-04

Utilize the plans of public facility and utility providers, and the Des Moines Capital Improvement Plan, to identify lands useful for public facility or utility purposes. Essential Public Facilities as defined by RCW 36.70A.200 are processed as Unclassified Use Permits (UUP) unless the use is permitted outright in a given zoning classification. Cooperatively work with surrounding municipalities and King County during the siting and development of facilities of regional significance. As permitted by state and federal law, including the lawful exercise by the City of its SEPA authority pursuant to RCW 43.21C.060, City approvals related to facilities, operations and activities within the City of Des Moines associated with Sea-Tac International Airport, including but not limited to, necessary support activities, connected-actions and projects, may include conditions which are necessary to mitigate specific adverse environmental impacts on the City of Des Moines identified in environmental documents prepared pursuant to SEPA. The City may decide not to approve such facilities or operations if the City finds: (a) the proposal would likely result in a significant adverse environmental impact(s) identified in a final or supplemental environmental impact statement prepared under SEPA, and (b) reasonable mitigation measures capable of being accomplished are insufficient to mitigate the identified impact(s).

Housing Background and Context 7-02-08

Much of Des Moines is impacted by aircraft noise related to Sea-Tac International Airport (STIA). Virtually all of the City of Des Moines is within the 65 Ldn noise contour, and large portions of the City are within the 70 or 75 Ldn noise contour (STIA Existing Noise Exposure Map, 1991).[10] Existing and projected noise contours constrain the amount of land appropriate for residential use. As part of the Port of Seattle (POS) Noise Remedy Program, hundreds of dwellings in Des Moines have been purchased and relocated outside Des Moines by the POS. While land uses within the City of Des Moines will be urban in nature as directed by Adopted Nov. 12, 2009 by Ordinance No. 1469 7-3 2009 City of Des Moines Comprehensive Plan Housing Element GMA and the Countywide Planning Policies, residential densities will be less than would occur in the absence of STIA.

Housing Background and Context 7-02-09

Environmental noise levels generated by STIA operations necessitated that Des Moines adopt Sound Transmission Control requirements (Chapter 14.08 Des Moines Municipal Code (DMMC)[11], International Building Code). These construction standards, which require interior noise reduction levels of 30-35 dBA, contribute to housing construction costs within Des Moines. As a result, opportunities to provide housing affordable to all segments of the community may be constrained by existing noise levels.

Housing Policy 7-03-07

In order to protect new dwellings from existing noise impacts associated with STIA, ensure that new residential construction includes Sound Transmission Control Requirements.

Community Character Background and Context 8-02-01: Residential Neighborhood Preservation

(3) The Environmental Protection Agency (EPA) has found environmental sound exposure levels in excess of Ldn of 55 dBA may be incompatible with residential land uses.

Community Character Background and Context 8-02-02: Historic Preservation

(6) Average noise levels above 65 dBA are incompatible with the preservation and enjoyment of historic properties and archeological sites.

[10] Housing Policy 7-02-08 of the *City of Des Moines Comprehensive Plan* should be amended upon the FAA approval of this Part 150 update to include the updated noise exposure map for existing and future conditions.

[11] City of Des Moines Municipal Code: Building Code Chapter 14.08, Article I. Sound Control Requirements.

Community Character Background and Context 8-02-04: Noise

(1) Noise can be generated from numerous sources -- sounds from musical instruments, audio sound systems, band sessions, social gatherings, motor vehicles, aircraft, industrial and construction activities, and other sources.

(2) Noise can interrupt and degrade sleep, cause stress-related psychological and physiological disorders, interfere with speech, interrupt and degrade education, reduce residential and commercial property values, reduce the use, enjoyment, and value of public recreational facilities, and reduce the use, enjoyment and value of historic and other cultural resources.

(3) Federal regulations establish that the responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise levels rests solely with the City of Des Moines.

***Community Character Policy 8-03-01*: Residential Neighborhood Preservation**

(3) To the extent permitted by state and federal law, maintain appropriate plans, zoning, development and building regulations and review procedures to ensure that designated residential neighborhoods will not be exposed to environmental noise levels that exceed an Ldn of 55 dBA, or existing noise levels as of April 20, 1995, whichever is greater. To the extent permitted by state and federal law, a reduction in the environmental noise level (greater than 55 Ldn) that existed as of April 20, 1995 should become the new maximum environmental level.

***Community Character Policy 8-03-02*: Historic Preservation**

(3) To the extent permitted by state and federal law, in order to minimize adverse impacts related to noise, protect historic properties and archeological sites of local significance from environmental noise exposure levels that exceed an Ldn of 55 dBA, or existing levels as of April 20, 1995, whichever is greater. To the extent permitted by state and federal law, a reduction in the environmental noise level (greater than 55 Ldn) that existed as of April 20, 1995 should become the new maximum environmental level.

***Community Character Policy 8-03-03*: Property Acquisition Areas**

(1) Continue to require that all land within Des Moines acquired by public entities be subject to the City's zoning and planning jurisdiction.

***Community Character Policy 8-03-04*: Noise**

(1) Discourage the introduction of noise levels that are incompatible with current or planned land uses. Encourage the reduction of incompatible noise levels, and discourage the introduction of new land uses into areas where existing noise levels are incompatible with such land uses.

(2) Encourage the reduction of noise from Seattle-Tacoma International Airport.

(3) Campaign aggressively for the development of new and quieter aircraft engines as well as modifications and/or retrofitting programs that promote the greatest reductions possible in aircraft noise emission levels.

(4) Require that noise levels generated from all land uses be restricted to the most stringent standard allowed by federal, state, or local standards.

(7) Within the North Central Neighborhood, encourage land uses and construction techniques that are tolerant of and compatible with the high noise and vibration levels generated by aircraft.

Community Character Strategy 8-04-01: Residential Neighborhood Protection

(1)(b) To the extent permitted by state and federal law, ensuring that land use changes and infrastructure improvements do not subject residential neighborhoods to environmental noise exposure levels which exceed an Ldn of 55 dBA, or existing levels as of April 20, 1995 or the date of this plan, whichever is greater.

(1)(c) To the extent permitted by state and federal law, ensuring that land use changes and infrastructure improvements do not subject residential neighborhoods to environmental noise exposure levels which exceed an Ldn of 55 dBA, or existing levels as of April 20, 1995, or the date of this plan, whichever is later.

Community Character Strategy 8-04-02: Historic Preservation

(1)(d) To the extent permitted by state and federal law, ensuring that land use and transportation proposals do not subject historic and archeological sites of local significance to environmental noise exposure levels of Ldn of 65 dBA, or existing levels as of April 20, 1995, whichever is higher. To the extent permitted by state and federal law, a reduction in the environmental noise level (greater than 65 Ldn) that existed as of April 20, 1995 or the date of this plan, whichever is later, should become the maximum environmental noise level.

(1)(e) To the extent permitted by state and federal law, requiring sponsors of any land use or transportation proposal that would expose historic and archeological properties of local significance to environmental noise levels of an Ldn of between 55 dBA and 65 dBA to submit a site-specific study addressing the uses of the particular resource, its historic or cultural significance, and the direct and indirect effect which noise may have upon the resource.

***Community Character Strategy 8-04-04*: Noise**

(1)(a) Enacting city-wide land use compatibility guidelines and criteria for the consideration of noise impacts in all planning and zoning decisions.

(1)(b) Taking appropriate legislative and regulatory action to ensure that environmental noise levels not exceed the most stringent of federal, state, and local standards.

(1)(e) Taking advantage of every opportunity to work with the Port of Seattle and the Federal Aviation Administration to promote the development and implementation of airport operational procedures that will decrease the adverse noise effects of airport operations on the City and its residents.

(1)(f) Maintaining a noise attenuation program through the incorporation of structural modifications to reduce sound transmissions from both inside and outside sources.

(1)(g) Maintaining an ordinance requiring insulation and other noise reducing construction techniques as part of the building permit process.

1.7.5.3 City of Normandy Park

The City of Normandy Park is located on the Puget Sound south of Burien, west of the City of SeaTac and Sea-Tac Airport, and north of the City of Des Moines. The City adopted the City of Normandy Park Comprehensive Plan in December 1995. It was amended and readopted as the *City of Normandy Park 2004 Comprehensive Plan* on November 9, 2004 (Ordinance No. 742). Normandy Park worked closely with neighboring jurisdictions Burien and Des Moines to coordinate planning efforts.

According to the Plan, the city has a responsibility to exercise its influence, when warranted, to protect its residents from potential impacts of land use planning and development activities in jurisdictions surrounding and adjacent to the City of Normandy Park. County-wide Planning Policy LU-35 allows jurisdictions to identify Potential Impact Areas (PIA) in other jurisdictions. In identifying PIAs, Normandy Park provides other local governments and decision makers an opportunity to review and comment on the potential impacts of the City's pending land use planning and permitting decisions. One of the City of Normandy Park PIA's is the airport related lands under the jurisdiction of the Port.

Normandy Park is a mature community in terms of land use. Most of the buildable land within the city limits has been developed and the majority of land is devoted to single-family detached housing. Due to its proximity to Sea-Tac Airport, the City has identified that unwanted noise sources can interrupt and degrade sleep, cause stress related psychological and physiological disorders, interfere with speech, interrupt and degrade education, reduce residential and commercial property values, reduce the use, enjoyment and value of public recreational facilities, and reduce the use, enjoyment and value of historic and other cultural resources. Therefore, the City has determined that the mitigation of noise should be considered for all land development.[12]

The Plan contains goals, objectives, and policies that address Sea-Tac Airport as part of the regional community. The goals, policies, and objectives related to the Airport and noise compatibility are listed below:

[12] The *City of Normandy Park 2004 Comprehensive Plan,* Land Use Element, II. INVENTORY AND ANALYSIS*,* G. Noise, p. 1-12. November 9, 2004.

Objective 1.7: Historic Preservation

The Washington State Growth Management Act (RCW 36.70A.020(13)) states that local jurisdictions are to develop comprehensive plans which "identify and encourage the preservation of lands, sites, and structures that have historical or archaeological significance." The King County Countywide Planning Policy Framework-26 states that "significant historic, archaeological, cultural, architectural and environmental features shall be respected and preserved."

As it is in the public interest to protect historic properties and sites from incompatible land uses and associated activities, and average noise levels above 55 dBA are incompatible with the preservation and enjoyment of historic properties and sites, the city should continue to identify historic properties and sites, and continue to enforce noise regulations.

> Policy 1.7.3: Protect historic properties and sites of local significance from exterior noise exposure levels which exceed an Ldn of 55 dBA, or the levels existing at the date of adoption of relevant plans or regulations, whichever is greater.

Objective 1.9: Noise

As federal regulations establish that the responsibility for determining acceptable and permissible land uses and the relationship between specific properties and specific noise levels rests with city government, the city should continue to monitor and regulate noise issues.

Policy 1.9.1: Discourage the introduction of noise levels that are incompatible with current or planned land uses, encourage the reduction of incompatible noise levels, and discourage the introduction of new land uses into areas where existing noise levels are incompatible with those land uses.

Policy 1.9.2: Encourage the reduction of noise from Seattle-Tacoma International Airport.

Policy 1.9.3: Aggressively campaign for the development of new and quieter aircraft engines as well as modifications or retrofitting programs that promote the greatest reductions possible in aircraft noise emission levels.

Policy 1.9.4: Take advantage of every opportunity to work with the Port of Seattle and the Federal Aviation Administration to promote the development and implementation of airport operational procedures that will decrease the adverse noise effects of airport operations on the city and its residents.

Policy 1.9.5: Continue to enforce noise level regulations.

Policy 1.9.6: Require buffering from noise-generating land uses through substantial berming, landscaping, setbacks, tree planting, and building construction and siting methods.

1.7.5.4 City of Burien

The City of Burien is bordered on the west by several miles of Puget Sound shoreline, bordered on the north by unincorporated King County, on the east by the City of SeaTac and Sea-Tac Airport, and on the south by Normandy Park and Des Moines. The City's first Comprehensive Plan was adopted in November 1997 and it is amended annually. Requests for amendments must be submitted by June 1 and the Planning Commission makes its recommendations on the amendments in July for City Council's consideration. The Plan was last revised in December 2010. The City of Burien is currently updating its Comprehensive Plan, which should be complete by the end of 2012.

The Burien Plan—The Comprehensive Plan for the City of Burien, Washington contains policies that address Sea-Tac Airport and some of the policies presented in the Burien Plan are very similar to the policies of the City of Des Moines and the City of Normandy Park. The 2010 Burien Plan states "…the airport expansion is both ill-advised and inconsistent with the requirements of the Washington State Growth Management and State Environmental Policy Acts,…" The airport expansion has occurred with the opening of Runway 16R/34L in November 2008. Some sections of the Burien Plan have not been updated to reflect the opening of Runway 16R/34L, referred to as "the third runway".

The goals and policies of the Burien Plan that are related to Sea-Tac Airport include the following:

Land Use

Goal LU.1: Establish a development pattern that is true to the vision for Burien by supporting the neighborhoods and preserving the character of the well-established neighborhoods as defined by the Neighborhood Plans, enhancing the attractiveness and vitality of the downtown core, and preserving the City's small town character.

> **Policy LU 1.9:** The City is aware that under the Growth Management Act the City may not preclude the siting of the third runway if the runway is determined by the courts to be an "essential public facility." The City also notes that the Growth Management Act, the Central Puget Sound Growth Management Hearings Board, the Countywide Planning Policies, the State Environmental Policy Act and other policies, laws and regulations authorize that there be appropriate and reasonable mitigation for communities and elements of the environment adversely impacted by the siting of an essential public facility. Under certain circumstances, permit applications can be conditioned or denied if significant adverse environmental impacts are not mitigated. If the third runway is constructed, significant adverse impacts should be mitigated to the maximum extent allowed by law.

Residential Neighborhoods

Goal RE.1: Provide a variety of attractive, well-designed housing choices that reinforce the character of the neighborhoods and meet the needs of existing and future City residents.

Policy RE 1.2: The planned densities for single family development should encourage a lower development potential in areas with development constraints.

Discussion: Within the City, potential development constraints include, but are not limited to, critical areas, such as areas along the coastline that are susceptible to landslides, areas with wetlands or areas prone to flooding; areas with stormwater drainage problems; exposure to exterior noise levels that exceed an Ldn of 55 dBA; or deficiencies in the type or level of services necessary for urban development, such as transportation facilities (roadway and pedestrian), sewer, or water.

Pol. RE 1.5 The Low Density Residential Neighborhood designation will provide for low-density residential development. Development within this designation includes existing neighborhoods that are zoned for four units per acre or less.

Allowed Uses and Description: The Low Density Residential Neighborhood designation allows single family residential uses and their accessory uses at a density of 4 units per acre or less, due to the constraints posed by critical areas. This policy may be implemented by more than one zoning category, based on the ability of the land and public facilities to support development. Development standards, for such items as impervious surfaces, streetscapes, sidewalks and stormwater drainage, may vary within each zoning category based on the existing character of the area.

Designation Criteria: Properties designated Low Density Residential Neighborhood should reflect the following criteria:

1. The area is already generally characterized by single family residential development at four units per acre or less; and
2. Relative to other residential areas within the City, the area is characterized by lower intensity development as shown on Map LU-2.
3. The land is designated as a potential landslide hazard area, steep slope area, or wetland on the City of Burien's Critical Areas Map,
4. The existing and planned public facilities for the area cannot adequately support a higher density.
5. The area is subject to existing impacts from high levels of airport-related noise.

Industrial & Manufacturing Uses

Goal IN.1: Provide opportunities for the development of attractive Business Park, Warehouse, Manufacturing and Airport-Related uses in the northeast part of the City where impacts on the surrounding environment can be minimized.

Policy IN 1.1: The Northeast Special Planning Area identified on Map LU-1 is an overlay land use designation that recognizes a potential opportunity for economic development in the northeastern part of the City, in areas affected by aircraft noise from Sea-Tac International Airport. Development of Uses in the Northeast Special Planning Area should be low scale, landscaped and buffered, have access to Des Moines Memorial Drive, meet the designation criteria under this policy and meet the performance criteria set forth in policies IN 1.3 and 1.4.

Allowed Uses and Description: Business Park, Warehouse, Manufacturing uses are storage within a building, production, light industrial, processing and distribution-related businesses with minimal environmental and land use impacts. Since the area is in close proximity to Sea-Tac International Airport, the uses in this classification could be airport-oriented. In addition, studio space for artists is also encouraged as a part of these developments, to the extent allowed by FAA restrictions.

Character: Uses in the Northeast Special Planning Area should be contained entirely within a structure. Only limited outside storage, or other external activity is appropriate. Developments should be clustered together and sited so that they have internal circulation, minimizing the number of access points to Des Moines Memorial Drive. Sites should be designed and located in a way that minimizes traffic, congestion, visual, noise or other impacts on adjacent residential uses or environmentally critical areas.

Designation Criteria: Properties designated for the Northeast Special Planning Area shall reflect the following criteria:

1. The area is located in the northeastern corner of Burien, and is currently or anticipated to be subjected to high levels of noise from airport-related activities, and therefore, less suitable for residential development.
2. The area must be a minimum of 2 acres in size, although smaller lots may be aggregated to meet this requirement.
3. The area shall be located near major transportation corridors with adequate highway access.
4. The area should be free of or able to appropriately accommodate significant amounts of environmentally critical areas.
5. The existing or planned public facilities are or will be adequate to support the level and intensity of proposed development.

Special Planning Areas

Goal SE.1: Designate Special Planning Areas to provide the City with the ability to support, encourage and achieve the community vision for specific areas of the downtown. These areas have distinctive geographic characteristics that the City's existing land use designations cannot adequately address.

Discussion: Special Planning Areas are used as a planning tool to create policies, regulations and criteria for development within defined geographic areas of the City that have special characteristics. These characteristics could include special design elements, gateways, large-lot public or semi-public facilities, or master-planned areas. A Special Planning Area can be established when the City's traditional Plan designations and zoning regulations are inadequate to address the development of an area. Within Special Planning Areas, special regulations are designed to ensure that development supports and achieves the desired character and stated goals and policies for the area.

Policy SE 1.5: The Northeast Redevelopment Area (NERA) is an approximately 158 acre area located in the northeastern part of Burien that has been affected by Sea-Tac International Airport operations. The NERA provides near and long term opportunities for economic development. Allowed Uses and Description: The NERA has been divided into two land use designations: Airport Industrial (AI) and Professional Residential (PR).

Airport Industrial: The purpose of this designation is to facilitate economic development and provide flexibility for airport-compatible uses in a campus-like setting with internal circulation to minimize the number of access points to Des Moines Memorial Drive. Allowed uses include, but are not limited to flex-tech, professional offices, light manufacturing, production, processing and distribution-related businesses; warehousing, utilities, retail, and new car auto sales developed in an auto mall configuration in designated locations. New residential uses are not allowed.

Professional Residential: The purpose of this designation is to provide flexibility by allowing both single-family homes and small businesses in an area near but not directly under Sea-Tac International Airport's third runway. Allowed uses include, but are not limited to moderate density residential, small office, small scale retail, art studios, and other similar uses that would be compatible with single-family homes.

Natural Environment

Goal EV.4: Conserve fish and wildlife resources and maintain bio-diversity.

Policy EV 4.10: In order to minimize adverse impacts related to noise, unless prohibited by federal or state law, fish and wildlife habitat conservation areas within the City should be protected from exterior noise levels which exceed 55 dBA Ldn.

Noise

Goal NO.1: Prevent community and environmental degradation by limiting noise levels, and to safeguard the health and safety of the residents of the City by ensuring that the City's physical and human environments are protected and enhanced as progress and change take place within and outside of its municipal boundaries.

Policy NO 1.1: The City shall;

1. Discourage the introduction of noise levels which are incompatible with current or planned land uses;
2. Encourage the reduction incompatible noise levels; and
3. Discourage the introduction of new land uses into areas where existing noise levels are incompatible with such land uses.

Policy NO 1.2: The City shall work with other jurisdictions and agencies to, encourage the reduction of noise from Seattle-Tacoma International Airport.

Policy NO 1.3: The City shall aggressively campaign for the development of new and quieter aircraft engines as well as modifications and/or retrofitting programs which promote the greatest reductions possible in aircraft noise emission levels.

Policy NO 1.4: The City shall take advantage of every opportunity to work with the Port of Seattle and the Federal Aviation Administration to promote the development and implementation of airport operational procedures that will decrease the adverse noise effects of airport operations on the City and its residents.

Housing

Goal HS.1: Encourage the provision of a variety of attractive, well-designed housing types and densities that reinforce and retain the character of the neighborhoods and meet the needs of existing and future City residents, while recognizing the need for a range of affordable housing.

Policy HS 1.8: The City's affordable housing strategy shall place a high priority on conserving and improving the City's existing housing stock. The City should accomplish this through code enforcement, appropriate zoning, and participation in housing rehabilitation programs.

Discussion: The comprehensive plan recognizes the existing housing stock as the most affordable form of housing within the community. Burien's existing housing stock is some of the most affordable in the Greater Seattle region, and its preservation is an appropriate mechanism for pursuing affordable housing choices for residents. This policy is particularly important because certain residential areas could transition to other uses due to airport noise, disinvestment, or other impacts.

Policy HS 1.12: Existing mobile home parks in the City provide an important affordable housing choice for low-income residents and should be protected from closures without adequate relocation plans. The City should ensure that sufficient relocation plans are in place prior to closure of any housing that serves low-income residents.

Discussion: Within Burien, mobile home parks could be closed in the future due to airport noise or redevelopment. In such cases, mobile home park residents must either sell their home or relocate it. The costs of relocating a mobile home can be prohibitive for many low and moderate income residents. By state law, mobile home park owners must give a year's notice before closing their park.

The City will require mobile home park owners to prepare a relocation plan that outlines the options available to each tenant, and includes information on locations and phone numbers of mobile home parks with vacancies, apartment complexes with rent levels equivalent to monthly housing payments in mobile home parks, and data on any available state or regional relocation funding programs. In cases where the mobile home park is noise impacted, and the park owner requests a rezone, the City will require cooperation with the Port's Noise 150 program that passes relocation funding assistance to tenants before a rezone is granted.

Historic Preservation

Goal HT 1: Ensure that historic properties and sites are identified, protected from undue adverse impacts associated with incompatible land uses or transportation facilities, and protected from detrimental exterior noise levels.

Policy HT. 1.5: In order to minimize adverse impacts related to noise, unless prohibited by federal or state law, historic properties and sites of local significance should be protected from exterior noise exposure levels that exceed a Ldn (DNL) of 55 dBA.

Neighborhood Preservation

Goal NP.1: Continue to provide the residents of the City with stable and quiet residential neighborhoods by maintaining an adequate residential tax base and assuring that:

- Residential neighborhoods are protected from undue adverse impacts associated with incompatible land uses or transportation facilities, including, but not limited to, noise, air and water pollution, glare, excessive traffic and inadequate on-street parking;
- Residential neighborhoods are identified and protected from detrimental exterior noise levels;
- Residential streets are protected from heavy commercial traffic that inhibits the free flow of traffic or that exceeds prescribed weight limits.

Policy NP 1.3: The City shall adopt appropriate plans, zoning, development and building regulations and review procedures to ensure that residential neighborhoods, to the extent allowed by federal and state law, will not be exposed to exterior noise levels which exceed an Ldn of 55 dBA at the property line.

Parks Recreation and Open Space

Goal PRO.4: Ensure that park, recreation and open space areas of local or regional significance are identified and protected. Also, ensure that existing and planned park, recreation and open space areas are protected from adverse impacts associated with incompatible land uses and/or transportation activities. Such adverse impacts may include traffic congestion, inadequate parking, surface water runoff, vibration, air and water pollution, noise among others.

Policy PRO 4.4: In order to minimize adverse impacts related to noise, unless prohibited by federal or state law, Burien's park, recreation and open space areas of local or regional significance should be protected from exterior noise exposure levels which exceed an Ldn of 55 dBA, except that outdoor amphitheaters and music shells should be protected from exterior noise exposure levels which exceed an Ldn of 50, unless prohibited by federal or state law, and except that golf courses, ball fields, outdoor spectator sports areas, amusement areas, riding stables, nature trails, wildlife refuges, auditoriums and concert halls should be protected from exterior noise exposure levels which exceed and Ldn of 60 dBA unless prohibited by federal or state law.

1.7.5.5 City of Tukwila

The City of Tukwila is located to the east/northeast of Sea-Tac Airport, north and east of the City of SeaTac, and is bisected by Interstate-5 and Interstate-405. The City adopted a Comprehensive Land Use Plan in December 1995 and updated that Plan in December 2008. The City has adopted several policies addressing aircraft noise, very similar to other communities surrounding Sea-Tac Airport. The goals, policies, and implementation strategies of the Tukwila Plan that are related to the airport operations include the following:

GOAL 7.2

Noise Abatement

Residential neighborhoods protected from undue noise impacts, in order to ensure for all residents the continued use, enjoyment and value of their homes, public facilities and recreation, and the outdoors.

Policies

7.2.1 Prevent community and environmental degradation by limiting noise levels.

7.2.2 Discourage noise levels which are incompatible with current or planned land uses, and discourage the introduction of new land uses into areas where existing noise levels are incompatible with such land uses.

7.2.3 Require building contractors to limit their construction activities to those hours of the day when nearby residents will not be unreasonably disturbed.

Implementation Strategy

- Noise regulations

7.2.4 Discourage noise levels incompatible with residential neighborhoods.

Implementation Strategies

- Coordinate with the Washington Department of Transportation
- Noise reduction and buffering regulations
- Berming, landscaping, setbacks, tree planting
- Building construction and siting methods
- Home occupations standards

7.2.5 Encourage the reduction of noise from Seattle-Tacoma International Airport and King County Airport, by promoting the development of new or the retrofit and modification of existing aircraft engines which are quieter, and operational procedures that help reduce aircraft noise emission levels.

7.2.6 Work with the Port of Seattle, King County Airport and the Federal Aviation Administration to promote the development and implementation of airport operational procedures that will decrease the adverse noise effects of airport operations on Tukwila and its residents.

Implementation Strategies

- Lobbying the Federal Aviation Administration to develop and implement airport operational procedures to reduce noise impacts.
- Coordinate with other jurisdictions surrounding airports to ensure common purpose and implementation strategies.
- Work with King County International Airport/Boeing Field to establish an appropriate noise monitoring system, including better identification of noisy flight events, counseling/education of pilots about quieter flying techniques, flight patterns that avoid noise-sensitive areas and other strategies.

7.2.7 Ensure that urbanization and development do not negatively impact current neighborhood noise levels or E.P.A. standards.

Implementation Strategy

- WSDOT coordination in advance of roadway improvements
- City-wide study on current noise levels
- Establish City program and standards

GOAL 9.2

Residential Areas

Unique residential neighborhoods and housing opportunities that serve a broad range of ages, family mixes, lifestyles and incomes.

9.2.1 Emphasize noise attenuation, pedestrian access and high quality building and landscape treatment in development review for residential uses.

1.7.5.6 City of Kent

The City of Kent adopted the City of Kent Comprehensive Plan in April 1995 by Ordinance Number 3222, with the most recent update in May 2006 (Ordinance Numbers 3794-3797). The Plan contains goals and policies for community development, and a Land Use Plan Map that depicts generalized future land uses. The Plan does not contain any goals or policies addressing Sea-Tac Airport or any noise-exposure contours associated with the Airport.

1.7.5.7 King County

King County adopted the King County Comprehensive Plan in 1964 and has updated it several times since the enactment of the Growth Management Act by the State of Washington in 1990. The Plan is typically updated annually with significant revisions being conducted every four years. The most recent significant revision occurred in 2008, with a minor update in 2010. The Plan contains the following policies pertaining to airport noise and land use compatibility:

Policy U-126: King County shall not support requests for residential density increases on lands located within the outer boundaries of the Noise Remedy Area as identified by Seattle-Tacoma International Airport.

Policy T-115: Recognizing that certain noise reduction measures are contingent on ongoing and future FAA funding, King County shall implement those actions, under its control and identified in the Part 150 Noise and Land Use Compatibility Plan. King County shall encourage other entities to implement those measures under their control and also identified in the Part 150 Noise and Land Use Compatibility Plan.

1.7.5.8 City of Seattle

The City of Seattle, the largest city in Washington State, is located north of the cities of Tukwila and Burien and Sea-Tac Airport. The City adopted the City of Seattle Comprehensive Plan, *Toward a Sustainable Seattle*, in July 1994 and has amended it annually, with major updates occurring every few years. The Plan includes goals and policies related to the protection of the environment, including noise pollution.

1.7.6 ZONING

All of the jurisdictions in the vicinity of Sea-Tac Airport have adopted traditional land use zoning ordinances to control the types of land uses within their jurisdiction. The ordinances divide a jurisdiction into zoning districts and prescribe certain requirements for allowable uses within those districts. The various elements of the zoning codes from each jurisdiction pertaining to airport-related activities are presented in the following paragraphs. **Exhibit 1-17, *Generalized Existing Zoning***, presents the zoning districts for the jurisdictions around Sea-Tac Airport, in terms of general zoning classification (e.g. residential, commercial, industrial, institutional, etc.).

The area to the immediate north of the runways at Sea-Tac Airport within the jurisdiction of the City of SeaTac is generally zoned commercial/industrial. The area to the northeast of the runways within the City of SeaTac is zoned residential. The area to the immediate east of Sea-Tac Airport, along the SR 99 corridor, is zoned commercial. The areas further east, generally east of 32nd Avenue, are zoned residential. To the south of the runways within the City of SeaTac, land is primarily zoned residential and commercial. Immediately west of the Airport, land within the City of SeaTac is zoned residential and commercial.

Burien has generally zoned the majority of its jurisdiction as single- and multi-family residential, with a commercial center generally bounded by State Route 509 to the east, SW 148th Street to the north, 10th Avenue to the west, and SW 152nd Street to the south. Land to the immediate west of the Airport within the City of Burien is primarily zoned residential, with some industrially-zoned areas located to the west and northwest of the Airport.

Des Moines is generally zoned for single-family housing except for the downtown and marina areas, and along Pacific Highway South (State Route 99), and arterial streets where commercial and multi-family development is permitted.

Tukwila permits a variety of business, industrial and residential development at various densities.

According to their 2004 Comprehensive Plan Future Land Use Map, the City of Normandy Park primarily permits residential land uses, with some areas of neighborhood commercial and mixed-use along 1st Avenue.

The zoning for each of these communities as it relates to airport operations and compatibility is discussed in the following sections.

1.7.6.1 City of SeaTac

The City of SeaTac adopted a zoning ordinance on October 17, 1992, which has been updated periodically and is included as Title 15 of the SeaTac Municipal Code. The ordinance contains two use zones that address the Airport directly, Airport Use Zone and Aviation Business Center Zone.

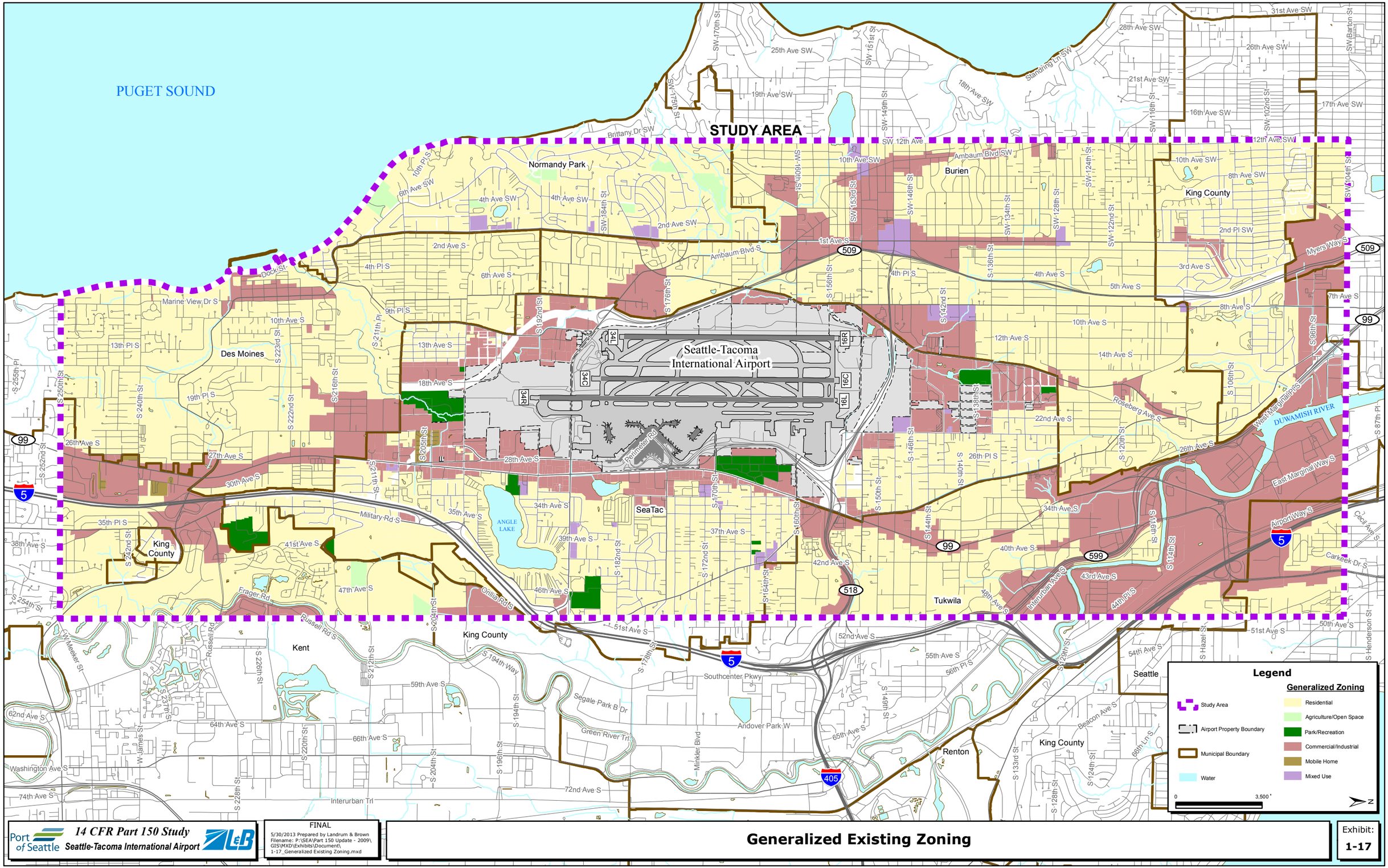
Aviation Operations (AVO): The purpose of this designation is to create a zone for development of the range of facilities that provide for safe and efficient commercial operations and support, together with security, access, the needs and convenience of the traveling public, and handling of air cargo.

Aviation Commercial (AVC): The purpose of this designation is to create a zone for development that provides support to operations of the airport, the traveling public, and air cargo, and for other development that provides economic benefit to the airport and community while maintaining compatibility with airport operations and activities.

These districts allow for and encourage aviation and aviation-related development such as aviation facilities, utilities, access roads, hotels and conference centers, and parking facilities.

The Code also contains the following General Performance Standard provision addressing noise.

Section 15.18.020(C): Due to the proximity of the Airport facilities, residential construction shall have sound attenuated or limited as consistent with adopted Port of Seattle/FAA noise remedy programs within significant DNL contours. (Ord. 92-1041 § 1)



Port of Seattle — *14 CFR Part 150 Study* — *Seattle-Tacoma International Airport* — LeB

FINAL

5/30/2013 Prepared by Landrum & Brown
Filename: P:\SEA\Part 150 Update - 2009\GIS\MXD\Exhibits\Document\1-17_Generalized Existing Zoning.mxd

Generalized Existing Zoning

Exhibit: **1-17**

In addition to the above provisions, the City of SeaTac and the Port of Seattle entered into an Interlocal Agreement concerning several issues of importance to both entities, one of which was land use and zoning. The original Agreement was adopted on September 4, 1997 and has been amended several times. The 1997 Agreement included provisions for the inclusion of the zoning districts (listed above) in the City of SeaTac's zoning ordinance. A new Agreement was adopted on February 16, 2006. The following statement related to Land Use/Zoning is included in the Agreement:

> 2. Land Use/Zoning: The City and Port adopt the planning, land use and zoning provisions set forth in Exhibit A hereto and shall implement the same. Both parties acknowledge that the Airport's 2005 Comprehensive Development Plan (CDP) is under development, and that mitigation of environmental impacts of the CDP will be addressed in the programmatic and project-specific stages of the CDP environmental process. Both parties further acknowledge that it is important City concerns of CDP implementation be addressed in the earliest stages. The Port agrees to notify the City at least three months prior to the issuance of any environmental documents or determination about any planned construction of any CDP project, and agrees to collaboratively work with the City to identify and resolve City concerns. Where differences may remain regarding the approach to be used in the proposed CDP to minimize ramifications on the City, the Dispute Resolution process described in Section 13 shall apply-

1.7.6.2 City of Des Moines

The City of Des Moines has an adopted zoning ordinance, with the latest revision being in March 2011. The code contains a Noise Levels Chapter, 18.38 with two sections dealing with noise levels in residential neighborhoods.

18.38.020: *Limit on noise impacts on residential neighborhoods* - Residential neighborhoods shall not be subject to adverse land uses, activities or traffic that generate exterior noise exposure levels exceeding 55 Ldn dBA, or existing levels as of April 20, 1995, whichever is greater. A reduction in the exterior noise level (greater than 55 Ldn) that existed as of April 20, 1995 shall become the new maximum exterior noise level.

18.38.030: *Requirement for noise mitigation plan* - Proponents of projects that will increase exterior noise levels to which residential areas are exposed to levels exceeding those existing on April 20, 1995, or to levels exceeding an Ldn of 55 dBA, whichever is greater, must submit a noise mitigation plan to the community development department of the city for review and approval before required permits are issued to allow the project to proceed.

1.7.6.3 City of Normandy Park

Title 18 of the Normandy Park Municipal Code sets forth the City's zoning regulations. Similar to the City of Des Moines, Normandy Park has specific sections that address noise levels within residential neighborhoods. In addition, the zoning code addresses noise levels at parks and other landmarks. These sections of the zoning code are outlined below.

Chapter 18.68: Residential Neighborhoods – Noise Protection

Section 18.68.030: *Limit on noise impacts* – Residential neighborhoods shall not be subject to adverse land uses, activities or traffic which generate exterior noise exposure levels exceeding an Ldn of 55 dbA, or existing levels as of the effective date of the ordinance codified in this chapter, whichever is greater.

Section 18.68.040: *Requirement for noise mitigation plan* - Proponents of projects which will increase exterior noise levels to which residential areas are exposed above those existing on the effective date of the ordinance codified in this chapter, or above an Ldn of 55 dbA, whichever is higher, must submit a noise mitigation plan to the city planning department for review and approval before required permits are issued to allow the project to proceed.

Chapter 18.72: Landmark Protection and Preservation

18.72.040: *Limit on noise impacts to significant sites, districts, buildings, structures and objects* - Significant sites, districts, buildings, structures and objects shall not be subject to adverse land uses which generate exterior noise exposure levels exceeding an Ldn of 55dbA, or existing levels as of the effective date of the ordinance codified in this chapter, whichever is greater.

18.72.050: *Requirement for noise mitigation plan* - Proponents of projects that will increase exterior noise levels to which significant sites, districts, buildings, structures are exposed to levels exceeding those existing on the effective date of the ordinance codified in this chapter, or above an Ldn of 55 dBA, whichever is higher, must submit a noise mitigation plan to the city planning department for review and approval before required permits are issued to allow the project to proceed.

Chapter 18.76: Parks of Local Significance

Section 18.76.020 Exterior noise levels.

(1) Except for golf courses, ball fields, outdoor spectator sports areas, amusement areas, riding stables, nature trails and wildlife refuges, park and recreation areas designated as being of local significance as specified by the city shall not be subjected to adverse land uses which result in exterior noise level exposures which exceed an Ldn of 55 dBA, or the existing Ldn level as of the effective date of the ordinance codified in this chapter, whichever is greater.

(2) Golf courses, ball fields, outdoor spectator sports areas, amusement areas, riding stables, nature trails and wildlife refuges designated as being of local significance as specified by the city shall not be subjected to adverse land uses which result in exterior noise level exposures which exceed an Ldn of 60 dBA or the existing Ldn level as of the effective date of the ordinance codified in this chapter, whichever is greater.

(3) Proponents of projects which will increase noise levels to which park and recreation areas are exposed above those existing on the effective date of the ordinance codified in this chapter, or above an Ldn of 55 dBA (or 60 dBA for golf courses, ball fields, outdoor spectator sports areas, amusement areas, riding stables, nature trails and wildlife refuges), whichever is higher, must submit a noise mitigation plan to the city for review and approval before the required permits may be issued to allow the project to proceed.

1.7.6.4 City of Burien

The City of Burien last updated its zoning code in December 2010. The code contains provisions for Airport Industrial Zones, height limitations, and noise restrictions as described below:

Section 19.15.070: *Airport Industrial Zones* – The Airport Industrial (AI) zone implements the Airport Industrial Comprehensive Plan designation within the Northeast Redevelopment Area. The purpose and intent of this designation is to facilitate economic development and provide flexibility for airport-compatible uses in a campus-like setting with internal circulation to minimize the number of access points to Des Moines Memorial Drive.

Section 19.17.140: *Height Limits near major airports* – No building or structure shall be erected nor shall any tree be allowed to grow to a height in excess of the height limit established by the airport height maps for the Seattle-Tacoma International Airport.

Section 19.85.020: *Limit on noise impacts to significant sites, districts, buildings, structures, and objects* – Significant sites, districts, buildings, structures, and objects shall not be subject to adverse land uses which generate exterior noise exposure levels exceeding 55 dbA Ldn.

Section 19.85.030: *Requirement for noise mitigation plan* – Proponents of projects which will increase exterior noise levels to which significant sites, districts, buildings, structures, and objects are exposed above an Ldn of 55 dbA must submit a noise mitigation plan to the city of Burien department of community development for review and approval before required permits are issued to allow the project to proceed. The city manager, with the assistance of the director of the department of community development, is authorized and directed to develop criteria for such review and approval. Such criteria shall be available in writing to applicants and shall, at minimum, require that the best available technology be employed to achieve no more than the maximum allowable noise standard set forth in this section.

1.7.6.5 City of Tukwila

The City of Tukwila has adopted a zoning ordinance; however, it does not include provisions that address aircraft-related noise issues in relationship to land uses.

1.7.6.6 City of Kent

The City of Kent has an adopted zoning ordinance which addresses noise in general but does not specifically address aircraft noise levels.

1.7.6.7 King County

King County has an adopted zoning ordinance that addresses land use development within unincorporated areas of King County, which is included as Title 21A of the King County Code. The Code was last amended in December 2010. The Code contains the following provisions related to airports and land use compatibility.
21A.38.160: *Special District Overlay - Aviation Facilities*

A. The purpose of the aviation facilities special district overlay is to protect existing non-commercial airports from encroaching residential development. An aviation facilities special district overlay shall only be established in the area up to 1/4 mile around airports and shall be zoned UR or RA.

B. The following development standards shall apply to uses locating in aviation facilities special overlay districts:

    On the title of all properties within pending short subdivisions or subdivisions and binding site plans, the following statement shall be recorded and be shown to all prospective buyers of lots or homes:

    "This property is located near the (name of airport) which is recognized as a legitimate land use by King County. Air traffic in this area, whether at current or increased levels, is consistent with King County land use policies provided it conforms to all applicable state and federal laws."

21A.12.190: *Height limits near major airports* - No building or structure shall be erected nor shall any tree be allowed to grow to a height in excess of the height limit established by the Airport Height Maps for the Seattle-Tacoma International Airport and the King County Airport (Boeing Field).

21A.37.030: *Transfer of development rights (TDR) program - receiving sites*

D. Property located within the outer boundaries of the Noise Remedy Areas as identified by the Seattle-Tacoma International Airport may not accept development rights.

1.7.6.8 City of Seattle

The City of Seattle has an adopted zoning ordinance which addresses noise in general but does not specifically address aircraft noise levels.

1.7.7 SOUND ATTENUATION REQUIREMENTS

The Cities of Burien, Des Moines, and SeaTac, and King County have building code provisions for sound attenuation of new structures within the vicinity of Sea-Tac Airport. Copies of these provisions are in Appendix J, *Sound Reduction Codes*.

1.7.7.1 City SeaTac

The City of SeaTac enacted a Sound Transmission Code,[13] which establishes sound attenuation requirements for new construction and additions to existing structures within the Port's Noise Remedy Area Boundary. Within the Noise Remedy Boundary, two sub-areas have been established, a Neighborhood Reinforcement Area and a Standard Insulation Area. The requirements in the Neighborhood Reinforcement Area are for bedrooms to achieve a 35-decibel reduction and all other areas must achieve a 30-decibel reduction. In the Standard Insulation Area, bedrooms must achieve a 30-decibel reduction and all other areas must achieve a 25-decibel reduction. The code identifies specific construction methods and materials to achieve the prescribed interior sound attenuation requirements.

1.7.7.2 City of Des Moines

The City of Des Moines adopted sound control requirements for new construction or additions to existing structures intended for human occupancy.[14] The ordinance identifies two different sound transmission control areas. Area 1 includes all portions of the City north of S 252nd Street; and Area 2 includes all areas south of S 252nd Street. Area 1 requires a 35-decibel reduction and Area 2 requires a 30-decibel reduction of interior noise levels for new construction. The City has adopted specific requirements to achieve these reductions.

1.7.7.3 City of Normandy Park

The City of Normandy Park does not have provisions in its building code related to sound attenuation for aircraft noise compatibility.

1.7.7.4 City of Burien

The City of Burien adopted an aircraft noise reduction ordinance establishing minimum requirements regulating the design, construction, and/or setting on site of buildings for human occupancy in the vicinity of Sea-Tac Airport.[15] The code

[13] City of SeaTac Municipal Code, Chapter 13.240; (Ord. 04-1008 § 3).
[14] City of Des Moines Municipal Code, Chapter 14.08; (Ord. 1407 § 43, 2007)
[15] City of Burien Municipal Code, Chapter 15.12, *Aircraft Noise Reduction*; (Ordinance 408 § 1, 2004)

divides the City into three sections, in which new construction and additions of all inhabited structures must meet certain interior noise reduction standards. New construction within those portions of the city, east of First Avenue South extended from the northern to the southern city limits and to the eastern city limits must achieve a 35 dB interior noise level reduction. New construction within those portions of the City, between First Avenue South and 12th Avenue S.W. extending from the northern to the southern City limits must achieve a 30 dB interior noise level reduction. New construction within all remaining areas must achieve a 25 dB interior noise level reduction. The code contains specific construction materials and methods to meet the interior noise level reduction standards.

1.7.7.5 City of Tukwila

The City of Tukwila does not have provisions in its building code related to sound attenuation for aircraft noise compatibility.

1.7.7.6 City of Federal Way

The City of Federal Way does not have provisions in its building code related to sound attenuation for aircraft noise compatibility.

1.7.7.7 King County

King County requirements are similar to the City of SeaTac and reference the same Noise Remedy Boundary. Within the Noise Remedy boundary, the following requirements have been established:

(a) Neighborhood Reinforcement Area:

1) Bedrooms must comply with standards designed to achieve a noise reduction of 35 dB.

2) All other living and working areas must comply with standards designed to achieve a noise reduction level of 30 dB.

(b) Cost-Share Insulations Area:

1) Bedrooms must comply with standards designed to achieve a noise reduction of 30 dB.

2) All other living and working areas must comply with standards designed to achieve a noise reduction level of 25 dB.

1.7.7.8 City of Seattle

The City of Seattle does not have provisions in its building code related to sound attenuation for aircraft noise compatibility.

1.8 LAND USE CONTROLS EVALUATION

The evaluation of land use planning techniques is intended to address the potential for future development in areas located inside and in the vicinity of the DNL 65 dBA noise exposure contour where aircraft overflights continue.[16] The responsibility for controlling and managing the development and redevelopment of land outside the airport boundary is the responsibility of each community. Therefore, it is incumbent upon the local planning and elected officials to monitor and plan for new development in a manner that is compatible with aircraft operations.

According to an FAA land use guidance manual, *Land Use Compatibility and Airports*,[17] the FAA recognizes that aircraft noise does not stop at the DNL 65 dBA noise exposure contour.

> *"While the FAA can provide assistance and funding to encourage compatible land development around airports, it has no regulatory authority for controlling land uses that would protect airport capacity. The FAA recognizes that state and local governments are responsible for land use planning, zoning and regulation, including that necessary to provide land use compatibility with airport operations. However, pursuant to the Federal Airport and Airway Development Act, as a condition precedent to approval of an FAA-funded airport development project, the airport sponsor must provide the FAA with written assurances that "…appropriate action, including the adoption of zoning laws have been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations including the landing and takeoff of aircraft…"*
>
> *FAA has required the phasing out of noisy Stage 1 and Stage 2 aircraft consequently, the aviation industry has spent substantial monies to meet this requirement. To assist in the compatible land use efforts, the FAA, local airport sponsors, and state aviation agencies have expended significant funds related to airport planning and off-airport noise and land use compatibility planning throughout the United States. Airport master plans have been prepared to identify the near-term and long-range projections for airport activity and the development necessary to meet these activity demands. In addition, noise and land use studies (Part 150 studies) have been conducted to evaluate ways to minimize impacts of aircraft noise, and the FAA and airport sponsors have financed land acquisitions and other noise compatibility measures throughout the United States."*

[16] Note that per Part 150 regulations, all land uses are compatible with outdoor noise levels below DNL 65 dBA; however, local planning efforts may, at the discretion of local jurisdictions, consider noise below DNL 65 dBA independent of the Part 150 process.

[17] *Land Use Compatibility and Airports: A Guide for Effective Land Use Planning*, FAA Airports Division, Southern Region Office, Atlanta, Georgia, Jacqueline Sweatt-Essick, et al, July 1999. http://www.faa.gov/about/office_org/headquarters_offices/aep/planning_toolkit/media/III.B.pdf

Therefore, the FAA encourages airport sponsors and local governments to work together to establish local land use controls in areas adjacent to an airport and within the flight corridors that extend beyond the DNL 65 dBA contour.[18] A brief discussion of typical preventive land use management techniques, and their application by the jurisdictions within the Airport Environs, is provided in the following sections.

1.8.1 COMPREHENSIVE PLANNING

A comprehensive plan sets the land use and development policies and goals for a community and is the guide for land use policy implementation. King County and the communities surrounding Sea-Tac Airport have adopted future land use plans to guide development based on Washington Statutes.

Washington cities and counties have prepared comprehensive plans for many years. With the passage of the GMA by the Washington Legislature in 1990, growth management took on new meaning.[19] The GMA addresses the issues of rapid population growth and uncoordinated planning efforts throughout the state. The legislation seeks to ensure that population growth and planning for transportation, housing, open space, and other essential services and infrastructure make sense and are compatible. The Act provides a process for siting "Essential Public Facilities" including airports. Two principles of the Act are "consistency" and "concurrency." This means that not only consistent planning policies are required among various county and regional jurisdictions, but that the timing of such planning must occur in a manner that promotes the policies.

King County is one of 29 counties in the State of Washington that are either required to fully plan under the GMA or have chosen to do so. The GMA provides a framework for regional coordination and county-wide planning policies to establish urban growth areas. Local comprehensive plans must include the following elements: land use, housing, capital facilities, utilities, transportation, and, for counties, a rural element. Shoreline master program policies are also an element of local comprehensive plans.

The GMA establishes the primacy of the comprehensive plan. The comprehensive plan is the starting point for any planning process and the centerpiece of local planning. Development regulations (zoning, subdivision, and other controls) must be consistent with comprehensive plans. State agencies are required to comply with comprehensive plans and development regulations of jurisdictions planning

[18] Note that per Part 150 regulations, all land uses are compatible with outdoor noise levels below DNL 65 dBA; however, local planning efforts may, at the discretion of local jurisdictions, consider noise below DNL 65 dBA independent of the Part 150 process.

[19] Municipal Research and Services Center of Washington, *Comprehensive Planning and Growth Management*, website updated 05/09; Source: http://www.mrsc.org/subjects/planning/compplan.aspx

under the GMA. The Port participates as an ex-officio member of the King County Growth Management Policy Council to facilitate coordination of land use and transportation planning.[20]

A comprehensive plan in and of itself does not and cannot control development or relieve noise impacts/incompatibilities without implementing a development plan, but there are other tools available, which are discussed subsequently.

1.8.2 LAND USE PLANNING

The formal adoption of a local land use plan by the jurisdictions within the Airport Environs provides the basis for zoning determinations and evaluations regarding the suitability of various development proposals for implementation. The land use plan element of the comprehensive community plan should take into account the compatibility of proposed development and the identification of developable lands taking into account the existing and anticipated aircraft noise levels and plan future land uses accordingly. The land use plan should serve as the basis to guide the development of the community's Capital Improvement Program.

1.8.3 GENERAL PURPOSE ZONING

Zoning is one of the primary tools available to local communities to ensure land use compatibility. Zoning ordinances and regulations are intended to promote public health, safety, and welfare by regulating the use of the land within a jurisdiction based on factors such as land use compatibility and existing and expected socioeconomic conditions.

The regulation of land through a zoning ordinance is premised as part of the police power inherent in the state and delegated to the local jurisdiction through state enabling legislation. King County and various communities surrounding Sea-Tac Airport do have the statutory authority to adopt zoning ordinances and maps.[21] The communities surrounding Sea-Tac Airport have adopted zoning ordinances and do control the land use within their respective boundaries.

Zoning is useful for controlling land use development and promoting compatibility while supporting private land ownership. Zoning cannot be relied upon as a "corrective land use management measure" as it can only be applied prospectively and not retroactively. Also, because zoning is a creature of a political body and subject to changing conditions and situations, the zoning classification of any particular tract of land is always subject to change and its implementation and enforcement must be monitored to ensure continuing compatibility.

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[20] *King County Countywide Planning Policies*, King County Department of Development and Environmental Services, updated October, 2008. Source: http://your.kingcounty.gov/ddes/compplan/CPP-current.pdf

[21] Revised Code of Washington, Title 36 *Counties*, §36.70.010, §36.70A.040 and Title 35 *Cities and towns* §35.63.080; and Washington State Constitution, Article XI *County, City, and Township Organization* Section 5 County Government, Amendment 12—Article 11 Section 5 COUNTY GOVERNMENT.

Zoning can be used to regulate the height of objects around airports to prevent hazards to navigation. Washington Statutes specifically allow airport sponsors to implement height hazard zoning in certain designated areas within an airport's environs to prevent the establishment of hazards[22] and the Attorney General has stated that zoning of building heights near an airport is a proper use of police power.[23] The State of Washington has no specific enabling legislation to allow airports or airport sponsors to enact zoning ordinances based on aircraft noise or noise contours.

Master Planned Development District

A Master Planned Development (MPD) district is intended to accommodate development that may be difficult if not impossible to carry out under otherwise applicable zoning district standards. Examples of MPD include Enhanced Protection of Natural Resources Areas, in which a planned development offers enhanced protection of natural resources and sensitive environmental features, and Mixed-use Development Areas, in which developments contain a complementary mix of residential and nonresidential uses. The different types of MPDs are intended to promote different planning goals. In general MPDs are intended to promote flexibility and creativity in responding to changing social, economic, and market conditions and could results in greater public benefits than could be achieved using conventional zoning and development regulations. MPD zoning is typically for proposed developments that cannot be reasonably accommodated by other available regulations of a development ordinance, and would result in a greater benefit to the city as a whole than would development under conventional zoning district regulations. Such greater benefit may include the implementation of adopted planning policies, neighborhood/community amenities, urban design, natural resource preservation, or a general level of development quality.

Airport Overlay Zoning District

An Airport Noise Overlay Zone or District establishes a set of development guidelines on areas designated as highly sensitive to aircraft noise. Such a district would lie as an overlay of the underlying land use zoning and would impose various guidelines on the development of land within its boundaries. These constraints may include a requirement for the sound insulation of new or rehabilitated properties, disclosure of the susceptibility of the property to elevated aircraft noise levels, the dedication of an avigation easement for new development, the requirement of development densities for incompatible uses in concordance with the level of noise exposure, the coordinated review of development proposals, etc. The boundaries of the district may be established by the local jurisdiction having land use control at any level deemed to be appropriate to the management of the risk of adverse effects and incompatibility between aircraft and noise-sensitive development.

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[22] Revised Code of Washington, Title 14 *Aeronautics*, Chapter 14.12 Airport zoning.

[23] Washington State Office of the Attorney General, AGO 53-55 No. 298; Opinions—Don Eastvole—1953-1956—Attorney General of Washington; MUNICIPAL CORPORATIONS – ZONING – HEIGHT LIMITATIONS – AIRPORTS. Zoning of building heights near an airport is a proper exercise of the police power. Source: http://atg.wa.gov/AGOOpinions/Opinion.aspx?section=archive&id=11310

1.8.4 COORDINATED PROJECT REVIEW PROCESS (DISCRETIONARY REVIEW)

The coordinated review of proposals for zoning changes, subdivision development, or building permits may be activated as a means for consideration of the potential effects of aircraft noise on proposed development actions. The coordination assumes the review by both airport and land use management personnel of project compatibility, and may result in a report on each item under consideration which is attached to the project file and reported to the governing bodies as part of their consideration of the suitability of the project action for approval or denial. Such measures may be included in a NCP as separate measures or incorporated into a broader measure such as an Airport Overlay Zoning District.

1.8.5 FULL DISCLOSURE POLICY

A program can be developed to insure that the buyers of residential property within the airport environs receive full disclosure of the location of the property relative to the airport. This would require that the 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 easily be disturbed by aircraft noise." Finally, solicitation of the voluntary inclusion of the notice in the Multiple Listing Services by the real estate profession alerts potential buyers of property to aircraft noise conditions.

1.8.6 SUBDIVISION REGULATIONS

Subdivision regulations apply in cases where a parcel of land is proposed to be divided into lots or tracts. They are established to ensure the proper arrangement of streets, adequate and convenient open space, efficient movement of traffic, adequate and properly-located utilities, access for fire-fighting apparatus, avoidance of congestion, and the orderly and efficient layout and use of land.

Subdivision regulations can be used to enhance noise-compatible land development by requiring developers to plat and develop land so as to minimize noise impacts or reduce the noise sensitivity of new development. The regulations can also be used to protect the airport proprietor from litigation for noise impacts at a later date. The most common requirement is the dedication of a noise or avigation easement to the local government by the land subdivider as a condition of the development approval. The easement authorizes overflights of the property with the noise levels attendant to such operations. Subdivision regulations may also require the developer to disclose the aircraft noise levels over the property or to provide information on noise insulation criteria to be used in the construction of any building on the property.

Subdivision regulations for each of the jurisdictions within the Study Area for Sea-Tac Airport were examined. None of the jurisdictions require notice of any kind on subdivision plats that the subdivision is within the vicinity of an airport and may experience aircraft noise and/or overflight. In addition, there is no requirement to grant an avigation easement for aircraft overflights as a condition of approval for land subdivision/development in any of the subdivision regulations.

1.8.7 BUILDING CODES

Building codes regulate building construction and construction practices ensuring that all safety standards are met and resulting in the issuance of a building permit from the local governing body. (A building code is most easily enforced through a local building permit process.) Sound insulation may be required in new homes, offices, and institutional buildings to mitigate the effects of high aircraft noise levels. Building code requirements intended for energy efficiency may also provide acoustical insulation benefits. Caulking of joints, continuous sheathing, dead air spaces, ceiling and wall insulation, solid core doors, and double-pane windows can attenuate aircraft noise while conserving energy used for home heating and cooling.

Not all sound insulation needs are met by typical energy-conserving building methods. For example, field research has found that some modern and highly energy-efficient storm window designs are less efficient for sound insulation than some older designs that allow for larger dead air spaces. Other sound insulation measures that may not be justifiable for energy efficiency are vent baffling and year-round, closed-window ventilation systems.

Building codes apply to existing buildings only when remodeling or expansion is contemplated. Amendments to building codes do not help to correct noise problems in developed areas. Within the Study Area, the cities of Burien, SeaTac, and Des Moines, and King County have specific building code provisions addressing sound attenuation for airport noise compatibility.

1.8.8 TRANSFER OF DEVELOPMENT RIGHTS

The Transfer of Development Rights (TDR) is a land use regulatory tool under which development rights can be severed from a tract of land and sold in a market transaction. The parcel from which the rights are transferred is then permanently restricted as to future development, and the purchaser of the rights may assign them to a different parcel to gain additional density. A TDR program would allow landowners in a designated "sending" area to transfer the development rights assigned to their property to a landowner in a designated "receiving" area where the community would like to concentrate development. In this case, the designated "sending" district would be residentially-zoned land located in areas substantially affected by aircraft noise. The designated "receiving" district would be in a location not greatly affected by airport noise. The designated "receiving" area would be allowed to develop at a higher density than would be permitted by the underlying zoning. Though the community defines the requirements and parameters

associated with establishing the sending and receiving districts, any actual transfer is negotiated between the landowner in the sending district and landowner in the receiving district.

1.8.9 CAPITAL IMPROVEMENTS PROGRAMS

Capital improvements programs are multi-year plans typically covering five or six years that list major capital improvements planned to be undertaken during each year. Most capital improvements have no direct bearing on noise compatibility; few municipal capital improvements are noise-sensitive. The obvious exceptions to this are schools and, in certain circumstances, libraries, medical facilities, and cultural/ recreational facilities.

Some capital improvements may have an indirect, but more profound, relationship to noise compatibility. For instance, the development of new sewer and water facilities may open up large vacant areas for the private development of noise-sensitive residential uses.

In contrast, the same types of facilities, sized for industrial users, could commit to industrial development in a noise-impacted area that might otherwise be attractive for residential development.

1.8.10 GROWTH RISK ASSESSMENT

Before evaluating the impact of aircraft noise within the airport environs, it is important to understand the likelihood for the future development of residential and other noise-sensitive land uses, especially in the planning timeframe. Understanding development trends in the airport vicinity is of critical importance in noise compatibility planning, because future residential growth can potentially constrain airport operations, if that growth occurs beneath aircraft flight tracks and within areas subject to high noise levels.

The growth risk analysis focuses primarily on undeveloped land which is planned and zoned for residential use. It is recognized that additional development may occur through in-filling and redevelopment of currently developed areas.

The methodology for analyzing potential growth risk is as follows:

- Identify all vacant, unplatted tracts of land zoned for future residential development with the greatest potential for being developed within the next five years.
- Calculate the area of the tracts; apply a factor accounting for development inefficiencies and the platting of streets; multiply by dwelling unit densities specified in the zoning ordinance; and multiply by household size to obtain the population holding capacity of presently vacant, unplatted land.
- Sum the above population holding levels to determine the total population holding capacity of the study area.

The final step in the growth risk analysis is to estimate whether the development is likely to occur before or after the year for which future noise exposure has been calculated. This tends to be quite speculative and should be regarded only as a general indicator of the potential risk of increases in land use incompatibility.

1.8.11 STATE LEGISLATION

The following are State of Washington statutes included in the WAC that may affect land use planning and compatibility with aircraft operations and airports. It should be noted that the statute specifically notes that aircraft noise levels are exempt from these regulations; therefore, the following is provided for informational purposes only for use in future land use planning.

Maximum Permissible Environmental Noise Levels

LAND USE OF NOISE SOURCE	LAND USE OF RECEIVING PROPERTY		
	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
Residential	55 dBA	57 dBA	60 dBA
Commercial	57 dBA	60 dBA	65 dBA
Industrial	60 dBA	65 dBA	70 dBA

Notes: The maximum permissible levels are:
- Reduced by 10 decibels at night (10 pm to 7 am) when the receiving land use is residential.
- Increased by 15 dBA for up to 1.5 minutes, 10 dBA for up to 5 minutes and 5 dBA for up to 15 minutes.

Sounds created by aircraft in flight are exempt.
Sounds from engine testing and maintenance are exempt between the hours of 7:00 a.m. and 10:00 p.m., provided that aircraft testing and maintenance shall be conducted at remote sites whenever possible.

Source: State of Washington, Chapter 173-60 WAC

State of Washington WAC 246-366-030: *Site Approval (Schools)*

1. Before a new school facility is constructed, an addition is made to an existing school facility, or an existing school facility is remodeled, the board of education shall obtain written approval from the health officer that the proposed development site presents no health problems. The board of education may request the health officer make a survey and submit a written health appraisal of any proposed school site.
2. School sites shall be of a size sufficient to provide for the health and safety of the school enrollment.
3. Noise from any source at a proposed site for a new school, an addition to an existing school, or a portable classroom shall not exceed an hourly average of 55 dBA (Leq 60 minutes) and shall not exceed an hourly maximum (Lmax) of 75 dBA during the time of day the school is in session; except sites exceeding these sound levels are acceptable if a plan for sound reduction is included in the new construction proposal and the plan for sound reduction is approved by the health officer.