

Appendix A

**EXISTING NOISE COMPATIBILITY PROGRAM
AND RECORD OF APPROVAL**

RECORD OF APPROVAL

FEDERAL AVIATION REGULATION PART 150 NOISE COMPATIBILITY PROGRAM PORTLAND INTERNATIONAL AIRPORT PORTLAND, OREGON

INTRODUCTION

The Noise Compatibility Program (NCP) for Portland International Airport (PDX) includes measures to abate aircraft noise, control land development, mitigate the impact of noise on non-compatible land uses, and implement and update the program. Title 14 Code of Federal Regulations (CFR) Part 150 requires that the Noise Exposure Maps associated with the NCP apply to a period of no less than five years into the future, although the NCP may apply to a longer period if the sponsor so desires. The airport sponsor has requested that the program measures be applied to the 2005 NEM (Figure H-2), which represents existing conditions at the airport, because it covers a larger area for potential mitigation. At such time as the NEMs do not represent the airport's noise environment, title 14 CFR Part 150 requires the airport sponsor to update the NEMs when there is a significant increase or decrease in noise over incompatible land uses (§150.21(d)).

The objective of the noise compatibility planning process has been to improve the compatibility between aircraft operations and noise-sensitive land uses in the area, while allowing the airport to continue to serve its role in the community, state, and nation. The approval actions listed herein include all those that the airport sponsor recommends be taken by the Federal Aviation Administration (FAA). It should be noted that the approvals indicate only that the actions would, if implemented, be consistent with the purposes of Part 150. These approvals do not constitute decisions to implement the actions. Subsequent decisions concerning possible implementation of these actions may be subject to applicable environmental procedures, aeronautical study, or other requirements.

The program elements below summarize as closely as possible the airport operator's recommendations in the noise compatibility program and are cross-referenced to the program. The statements contained within the summarized program elements and before the indicated FAA approval, disapproval, or other determination, do not represent the opinions or decisions of the FAA.

The Airport sponsor has certified that the existing conditions shown in the 2001 NEM and the future 2008 NEM that were presented at the public hearing are representative of the 2005 and 2010 NEMs included in the submittal. The Airport sponsor has further certified that the conditions depicted for 2005 are representative of 2006, the year of this submittal.

It should be noted that some elements of the 1997 NCP, as identified in the pertinent Record of Approval, were amended as a result of a post-aircraft-incident review to more narrowly define the category of aircraft and the wind criteria to which the operational measures are applied. In addition, some limited flexibility was introduced to address issues of operational efficiency. These changes were all fully incorporated into the 2002 Letter of Agreement (LOA) between the Port of Portland and Portland Tower/Approach Control; subject Noise Compatibility Program Implementation, which was used as the baseline for the current study.

PROGRAM ELEMENTS A complete summary of the recommended program elements can be found in Section H of the Part 150 Update. Most of the program elements have been carried forth from the existing NCP, which was approved in 1997, or from the 2002 LOA. Where noted, the new recommendations are revisions or updates of existing measures. The complete 1997 Record of Approval (ROA) of the existing program, and the 2002 LOA referenced above are in Chapter J of the document.

NOISE ABATEMENT/AIRCRAFT OPERATIONAL RECOMMENDATIONS

Recommendation 1 – Jet Aircraft Departures to the West. This recommendation is a revision of existing procedures 3(a)(1)(2), from the 1997 ROA that have jet aircraft departing to the west, intercepting the 277 degree VOR radial, and flying that heading until reaching specific altitude or distance before turning. The existing procedure was established in the 1983 Noise Abatement Plan and utilizes the Columbia River as an unpopulated “noise corridor”. The Port installed a radio beacon in 1985 that is used by pilots to guide them over the river. The new procedure is based upon satellite technology that is now available. It is anticipated that by using advanced satellite technology and on-aircraft autopilot systems, jet aircraft will likely fly more precisely over the river and to tighten the dispersion of flight paths to a more narrow pattern. Departing jets with Maximum Gross Take-off Weight (MGTOW) greater than 75,000 lbs., as well as business jet models specifically listed in the current operational Letter of Agreement (LOA) between the Port and the FAA, will remain over the river until reaching an altitude of 6,000-feet or a distance of eight (8) miles from the PDX VOR (ground-based navigational aid); other business jets will remain over the river corridor until reaching an altitude of 3,000-feet. Upon reaching the recommended altitude or distance, the pilots will turn in the direction of their intended destination (i.e. south for destinations in California, north for Seattle, etc.). See Page H24 of the NCP for more detail on this recommendation.

As outlined on page H24 of the NCP, this recommendation is predicated on the development and successful implementation of satellite-based procedures. In the interim, conventional tracks have been identified in the body of the recommendation in an attempt to achieve the goals noted above. However, conventional tracks cannot be defined to represent the numerous course corrections that would be necessary to achieve the flight tracks shown in the graphic. Therefore, the conventional tracks would only be precise within about 5 miles of the airfield. Final definition of these tracks would need to be coordinated with the FMS-based tracks developed by FAA.

FAA Determination: Approved as voluntary for purposes of Part 150, subject to weather, air traffic safety, and air traffic efficiency. Existing procedures require that turbojet aircraft continue beyond the confines of Class C airspace, and into airspace which does not require that other users maintain two-way communication with Air Traffic Control. While this is not inherently unsafe, it should be noted that Air Traffic retains the authority to direct aircraft to turn prior to the designated point when traffic conflicts require resolution. It should also be noted that this procedure places aircraft in a single stream, which significantly limits capacity at the airport. While this recommendation may be noise beneficial, it also is inherently contrary to the core mission of the ATO, as it adversely affects the efficient use and management of the navigable airspace. As of this writing, the demand at PDX does not normally exceed current capacity; however, forecasts for future demand indicate that there will be a point at which these measures will no longer be sustainable. Accordingly, the Air Traffic Organization will determine when the use of this measure is no longer appropriate.

Recommendation 2

A. Jet Aircraft Departing to the East: This recommendation is a revision to current procedures 2(b)(1)(2)(3), from the 1997 ROA, for jet aircraft departing to the east. Aircraft will continue to fly over the Columbia River, but the revised procedure will shift the flight path approximately 2,000-feet to the south. The goal of shifting departures to the south is to have jets fly a path concentrated equidistant between the residential communities both north and south of the Columbia River. Another goal is to tighten up the dispersion of flight paths by using advanced satellite technology and on-aircraft autopilot systems. Departing jets with MGTOW greater than 75,000 lbs. will remain over the river until reaching an altitude of 7,000-feet or a distance of 11 miles from the PDX VOR; louder business jets will remain over the river corridor until reaching an altitude of 6,000-feet or a distance of 11 miles, all other business jets until reaching 3,000-feet. Upon reaching the recommended altitude or distance, the pilots will turn in the direction of their intended destination. Page H27 of the NCP provides more detail on this recommendation.

FAA Determination: Approved as voluntary for purposes of Part 150, subject to weather, air traffic safety, and air traffic efficiency. Existing procedures require that turbojet aircraft continue beyond the confines of Class C airspace, and into airspace which does not require that other users maintain two-way communication with Air Traffic Control. While this is not inherently unsafe, it should be noted that Air Traffic retains the authority to direct aircraft to turn prior to the designated point when traffic conflicts require resolution. It should also be noted that this procedure places aircraft in a single stream, which significantly limits capacity at the airport. While this recommendation may be noise beneficial, it also is inherently contrary to the core mission of the ATO, as it adversely affects the efficient use and management of the navigable airspace. As of this writing, the demand at PDX does not normally exceed current capacity, however forecasts for future demand indicate that there will be a point at which these measures will no longer be sustainable. Accordingly, the Air Traffic Organization will determine when the use of this measure is no longer appropriate.

B. High-Performance Turboprops Departing to the East: This recommendation continues and refines current procedure 2(b)(1), from the 1997 ROA, for high performance turboprops departing to the east, flying over the Columbia River, or compatible land uses. This procedure will keep high-performance turboprops, with destinations northbound, along a path similar to the jet path described above. For destinations southbound, a path directed approximately 15° south of the jet path will be used. Using advanced satellite technology and on-board autopilot systems, a tighter dispersion of flight paths should result for aircraft, which have these systems. This recommendation calls for all high-performance turboprops to turn in the direction of their intended destination at 3,000-feet.

As outlined on page H27 of the NCP, this recommendation is predicated on the development and successful implementation of satellite-based procedures. Conventional tracks have been identified in an attempt to achieve the goals noted above and to serve aircraft not equipped with satellite based FMS type technology. However, conventional tracks cannot be defined to represent the numerous course corrections that would be necessary to achieve the flight tracks shown in the graphic. Therefore, the conventional tracks would only be precise within about 5 miles of the airfield. Final definition of these tracks would need to be coordinated with the FMS-based tracks developed by FAA.

FAA Determination: Approved as voluntary for purposes of Part 150, subject to weather, air traffic safety, and air traffic efficiency. As outlined in the 2002 LOA, Air Traffic will assign these aircraft a heading or track that provides appropriate divergence from the jet departure corridor, when operationally necessary during periods of peak traffic. Accordingly, Air Traffic will determine the operational circumstances for the use of this measure.

Recommendation 3

A. High-Performance Turboprops Departing to the West: This recommendation continues and refines current procedure 3(b) from the 1997 ROA, for high-performance turboprops departing to the west, flying over the Columbia River, or compatible land uses. It is hoped that by using advanced satellite technology and on-board aircraft autopilot systems, it will be possible to tighten the dispersion of flight paths to a narrower pattern for aircraft that have this technology.

- This recommendation places the south turning high-performance turboprops immediately south of Hayden Island and further north than current procedures. This path is approximately 15° south of the jet path outlined in Recommendation 1. These aircraft will remain on this course until reaching 3,000-feet before turning over residential areas.
- With routes to the north, this recommendation uses the jet path to fly longer over the river than current procedures outline. These aircraft would remain on this course until reaching 3,000-feet or five (5) miles from the PDX VOR before turning over residential areas.

As outlined on page H30 of the NCP, this recommendation is predicated on the development and successful implementation of satellite-based procedures. Conventional tracks have been identified in an attempt to achieve the goals noted above and to serve aircraft not equipped with satellite based FMS type technology. However, conventional tracks cannot be defined to represent the numerous course corrections that would be necessary to achieve the flight tracks shown in the graphic. Therefore, the conventional tracks would only be precise within about 5 miles of the airfield. Final definition of these tracks would need to be coordinated with the FMS-based tracks developed by FAA.

FAA Determination: Approved as voluntary for purposes of Part 150, subject to weather, air traffic safety, and air traffic efficiency. As outlined in the 2002 LOA, Air Traffic will assign these aircraft a heading or track that provides appropriate divergence from the jet departure corridor, when operationally necessary during periods of peak traffic. Accordingly, Air Traffic will determine the operational circumstances for the use of this measure.

B. Low-Performance Propeller Aircraft: This recommendation is a new procedure for low-performance propeller aircraft departing to the west; aircraft fly further within the Columbia River corridor before turning on course. The high-performance turboprop procedures outlined in this recommendation provide room for low-performance propeller aircraft to follow the river corridor further than current higher-performance aircraft paths during normal operations. This measure also includes a proposed nighttime procedure (10pm to 7am, when activity is low) that calls for these aircraft to fly the river corridor on the same path as the higher performance aircraft. Low-performance propeller aircraft will still have a much broader dispersion of flight paths than the other aircraft categories. See page H31 of the NCP for more detail on this recommendation.

FAA Determination: Approved as voluntary for purposes of Part 150, subject to weather, air traffic safety, and air traffic efficiency. For the nighttime portion of this recommendation, it should be noted that placing low performance aircraft in the same departure path as higher performance aircraft requires that Air Traffic provide for additional spacing for subsequent departures. Thus, when demand is present, there is a measurable impact on the airport capacity with this proposal. Because the timeframe noted in this recommendation does not equate to low activity, Air Traffic will determine the times and traffic demand periods during which this procedure could be used. Specific flight tracks for this category of aircraft will be subject to further review for compatibility with previously recommended procedures.

Recommendation 4: Jet Aircraft Arriving From the East – Updated Mill Visual Approach: This recommendation continues to use existing procedure 4(a)(2), from the 1997 ROA, for aircraft arriving from the east (currently published as the Mill Visual Approach). Under current procedures, aircraft use the Camas Paper Mill as a visual marker in order to remain over the Columbia River corridor while on approach to PDX. Use of advanced satellite technology and on-board autopilot systems will help create navigation paths to narrow the dispersion of aircraft following this approach. The goal is for

this improved procedure to be used more often, and during more varied weather conditions, than the current approach allows. Pages F157-F168 and H33 of the NCP provides more detail on this recommendation.

As outlined on page H33 of the NCP, this recommendation is predicated on the development and successful implementation of satellite-based procedures. In the interim, conventional tracks have been identified in the body of the recommendation in an attempt to achieve the goal noted above. This description is based on “old technology” that would be update once satellite-based procedures are in place and are functioning properly. Preliminary definition of the recommended tracks is defined in the NCP, and would be refined in coordination with the FAA to achieve the objectives noted earlier. Aircraft would follow a path similar to the one they follow today. However, the path would follow the Columbia River corridor more precisely, and the turn to final approach would be more centered over the river corridor than it is today. The flight path would be more concentrated within the Columbia River corridor on the approach to PDX.

FAA Determination: Approved as voluntary for purposes of Part 150, subject to weather, air traffic safety, and air traffic efficiency. To minimize the potential capacity constraints that would be introduced by designing a procedure with a single stream of arrivals to the airport, the implementation of this procedure is expected to require the identification of two distinct paths and may look slightly different than that shown in the Part 150 document. In addition, it should be emphasized that Air Traffic will determine the operational circumstances for the use of this measure.

Recommendation 5 – Jet Aircraft Arriving From the West – Runway 10L Sidestep: This recommendation is a modification of existing procedure 4(a)(1), from the 1997 ROA, for aircraft arriving from the west. When conditions allow its use, this procedure will align all aircraft in the middle of the Columbia River, more aligned with the south runway, then split-off/transition aircraft landing on the north runway at a point further east of downtown Vancouver than they do today (this is known as the “side-step” approach). Pages F169-175 and H36 of the NCP provides more detail on this recommendation.

FAA Determination: Approved as voluntary for purposes of Part 150, subject to weather, air traffic safety, and air traffic efficiency. As noted in the language in the NCP, this procedure has limited applicability, as sequencing arrival traffic into a single stream significantly limits the arrival rate at the airport. When demand is present, this would result in a negative impact on airport capacity. Thus, Air Traffic will determine the times and traffic demand periods during which this procedure could be utilized.

Recommendation 6 – Jet Aircraft Arriving between 10pm and 7am – Contra-Flow: This procedure would incorporate existing procedures 2(b)(1)(2) and (3) and elements from existing procedure 4(a)(2) from the 1997 ROA. Between the hours of 10pm and 7am or as otherwise defined by traffic conditions, and during conditions where aircraft would normally be landing and departing to the east, aircraft would be allowed to land in the opposite direction to the west (a.k.a. contra-flow). This would minimize noise exposure to surrounding populations by significantly reducing long approaches over the community during this time period. Pages F195-F207 and H38 of the NCP provides more detail on the recommendation.

FAA Determination: Approved in part as voluntary for purposes of Part 150, between the hours of 11p.m. and 5 a.m., subject to weather, air traffic safety, and air traffic efficiency. Due to local air traffic and airspace considerations, this measure may only be implemented between the hours of 11pm and 5am, **and** when traffic conditions permit, as determined by Air Traffic.

Recommendation 7 – Aircraft Operating between 10pm and 7am – Night Time Preferential Runway Use: This recommendation calls for development of a nighttime preferential runway use program, incorporating existing procedures 2(a), 2(b)(1)(2)(3) and 4(a)(1) in east flow; existing

procedures 3(a)(1)(2) and 4(a)(2) in west flow. The reference procedures are found in the 1997 ROA. Hours of operation would be between 10pm and 7am. This will place arrivals landing to the east on the south runway, reducing flights over downtown Vancouver, and arrivals landing to the west on the north runway, reducing flights over east Portland. Departing aircraft would continue to use both runways but the south runway would be preferred when conditions allow. Although encouraged, this program would be voluntary, and its application will be at the discretion of the FAA Air Traffic Control Tower and the pilot. Pages F-208-F-216 and H41 of the NCP provides more detail on this recommendation.

FAA Determination: Approved in part as voluntary for purposes of Part 150, subject to weather, air traffic safety, and air traffic efficiency. Sequencing arrival traffic into a single stream limits the arrival rate at the airport. When demand is present, this would result in a negative impact on airport capacity. Thus, Air Traffic will determine the times and traffic demand periods during which this procedure could be utilized, expected to be more closely aligned with actual nighttime periods of low activity. This measure is approved only when determined operationally feasible by Air Traffic.

Recommendation 8 – Reduced Use of Reverse Thrust on Landing: This recommendation establishes an awareness program for pilots, encouraging them to use minimal or no reverse thrust upon landing, in accordance with aircraft operating standards and safety. Reducing jet engine reverse thrust is at the sole discretion of the pilot. Pages F217-219 and Page H43 of the NCP provides more detail on this recommendation.

FAA Determination: No action required at this time pursuant to 49 USC 47504(b). The use of this measure has the potential to lengthen the runway occupancy time, which would affect Air Traffic separation requirements and airport arrival rates. As a result, this measure will require further evaluation by Air Traffic.

NOISE MITIGATION/LAND USE COMPATIBILITY RECOMMENDATIONS

Recommendation 9 - Home Sound Proofing: This recommendation would provide soundproofing for owner occupied single-family residences and develop a pilot program for multifamily residential structures at or above the 65 DNL contour, using the 2005 Noise Exposure Map. Sound proofing measure may include items such as new windows, solid core doors, and heating and cooling systems to allow windows to be kept closed. In exchange for receiving sound insulation, a homeowner would grant a noise easement to the Port, to be attached to the property and “run with the land”. Pages G11-G18 and Page H46-47 of the NCP provides more detail on this recommendation.

FAA Determination: Approved. The FAA’s policy published in the Federal Register April 3, 1998 (Volume 63, Number 64), states that the FAA will not approve Federal funding to mitigate noise-sensitive land uses constructed after October 1, 1998. Beginning October 1, 1998, the FAA will approve under part 150 only remedial noise mitigation measures for existing noncompatible development and only preventive noise mitigation measures in areas of potential new noncompatible development. As of the same date, the ability to use AIP grants to carry out such measures will be affected to the extent that such remedial measures may not be approved under part 150.

Recommendation 10 – Floating Home Sound Proofing: The recommendation would investigate sound attenuation solutions to mitigate noise for owner occupied floating homes, used as a primary residence, where moorage and/or land rights have been purchased, at or above the 65 DNL noise contour using the 2005 Noise Exposure Map. Pages G30 and H48-49 of the NCP provides more detail on this recommendation.

FAA Determination: Disapproved for purposes of Part 150. The FAA is not aware of any published studies on the feasibility of sound attenuating floating homes. The Part 150 program is not intended as a means to undertake new research.

Recommendation 11 – Noise Easement Option for Homeowners: This recommendation calls for the purchase noise easement from homeowners within the 65 DNL noise contour or above, using the 2005 Noise Exposure Map. This recommendation would apply to homeowners who do not wish to have soundproofing. Experience at other airports has shown that up to 10% of the eligible population may decline soundproofing. This recommendation provides another voluntary option for homeowners to receive some compensation in return for providing the Port of Portland a noise easement. Pages G17-G18 and H50-51 of the NCP provides more detail on this recommendation.

FAA Determination: Approved. The FAA’s policy published in the Federal Register April 3, 1998 (Volume 63, Number 64), states that the FAA will not approve Federal funding to mitigate noise-sensitive land uses constructed after October 1, 1998. Beginning October 1, 1998, the FAA will approve under part 150 only remedial noise mitigation measures for existing noncompatible development and only preventive noise mitigation measures in areas of potential new noncompatible development. As of the same date, the ability to use AIP grants to carry out such measures will be affected to the extent that such remedial measures may not be approved under part 150.

Recommendation 12 – Investigate Possible Solutions to Reduce Noise Exposure For Residents of Mobile Homes: REMOVED FROM CONSIDERATION BY THE PORT OF PORTLAND

This recommendation originally called for investigating options to reduce noise exposure for residents of mobile homes living at or above the 65 DNL contour using the 2005 Noise Exposure Map. Most mobile homes are very difficult to sound proof due to their construction. By their very nature, a mobile home could be moved out of the noise-impacted area. As a result of these factors and the fact that the residents of the only identified mobile home park (West Hayden Island) have requested the Port take no action with regard to their development, this recommendation was dropped from further consideration.

FAA Determination: No FAA action required.

Recommendation 13 – Enhance Local Government Noise Overlay Ordinances: The NCP recommends, where applicable, enhancing the City of Portland PDX Airport Noise Impact Zone and the City of Vancouver Noise Impact Overlay District by implementing the land use recommendations listed below. These cities have existing adopted ordinances that define requirements for properties that lie within the Noise Impact Zone and the Noise Impact Overlay District. The noise overlays require developers building within these areas to disclose noise and meet certain building code requirements for sound insulation. The City of Portland has a more stringent PDX Airport Noise Impact Zone, which also requires a noise easement. Pages G27-G-29 and H53 of the NCP provides more detail on this recommendation.

FAA Determination: Approved. Outside the 65 DNL, FAA as a matter of policy encourages local effort to prevent new non-compatible development immediately abutting the 65 DNL and to provide a buffer for possible growth in noise contours beyond the forecast period. The Federal government has no authority to control local land use; the local government has the authority to implement this measure.

Recommendation 14 – Mobile Homes and Mobile Home Parks: The NCP recommends prohibiting new residential trailers in mobile home parks, as well as residential trailers and manufactured homes outside of the existing mobile home parks, unless they can be certified by the manufacturer that they meet appropriate sound attenuation requirements consistent with the City of Vancouver Noise Impact Overlay District and the City of Portland PDX Airport Noise Impact Zone. This is a continuation of

existing requirements within the City of Portland. Page H55 of the NCP provides more detail on this recommendation.

FAA Determination: Approved. The FAA's policy published in the Federal Register April 3, 1998 (Volume 63, Number 64), states that the FAA will not approve Federal funding to mitigate noise-sensitive land uses constructed after October 1, 1998. Beginning October 1, 1998, the FAA will approve under part 150 only remedial noise mitigation measures for existing noncompatible development and only preventive noise mitigation measures in areas of potential new noncompatible development. As of the same date, the ability to use AIP grants to carry out such measures will be affected to the extent that such remedial measures may not be approved under part 150.

The Federal government has no authority to control local land use; the local government has the authority to implement this measure. Approval of this measure does not commit the FAA to future Federal funding assistance.

Recommendation 15 – New Noise Sensitive Uses: The NCP recommends limiting, or requiring soundproofing, new noise sensitive uses within both the City of Vancouver Noise Impact Overlay District and City of Portland PDX Airport Noise Impact Zone boundaries. Noise sensitive uses are set forth in Table 7, the FAA Part 150 Land Use Compatibility Guidelines and accepted at the state and local levels. To ensure consistency, the most restrictive adopted measures should be used. For example, if state or local codes are more restrictive than federal guidelines, they should be used. Pages G23-G24 and H56 of the NCP provides more detail on this recommendation.

It is also recommended these same noise sensitive uses be limited or mitigated within a 1,000-wide corridor for one mile beyond the extended centerline of the PDX crosswind runway ends.

FAA Determination: Approved. The Federal government has no authority to control local land use; the local government has the authority to implement this measure. Approval of this measure does not commit the FAA to future Federal funding assistance.

Recommendation 16 – New Floating Homes and Moorages: The NCP recommends prohibiting new floating homes or moorages, or requiring the floating homes meet sound attenuation criteria within the City of Portland's PDX Noise Impact Zone and City of Vancouver Noise Impact Overlay District boundary. Page G34 and H58 of the NCP provide more detail on this recommendation.

FAA Determination: Approved. The Federal government has no authority to control local land use; the local government has the authority to implement this measure. Approval of this measure does not commit the FAA to future Federal funding assistance.

Recommendation 17 – Noise (Avigation) Easements: The NCP recommends requiring noise easements for new residential construction and other defined noise sensitive land uses at or above the 65 DNL contours consistent with the local city code adopted noise contours. See Page H59 of the NCP for more detail on this recommendation.

FAA Determination: Approved. The FAA's policy published in the Federal Register April 3, 1998 (Volume 63, Number 64), states that the FAA will not approve Federal funding to mitigate noise-sensitive land uses constructed after October 1, 1998. Beginning October 1, 1998, the FAA will approve under part 150 only remedial noise mitigation measures for existing noncompatible development and only preventive noise mitigation measures in areas of potential new noncompatible development. As of the same date, the ability to use AIP grants to carry out such measures will be affected to the extent that such remedial measures may not be approved under part 150.

The Federal government has no authority to control local land use; the local government has the authority to implement this measure. Approval of this measure does not commit the FAA to future Federal funding assistance.

Recommendation 18 – Noise Disclosures For Prospective Purchasers at or above the 55 DNL Noise Contour: REMOVED FOR CONSIDERATION BY THE PORT OF PORTLAND

The NCP originally recommended requiring a noise notice/disclosure to prospective purchasers for new construction between the 55 and 65 DNL noise contours based on the 2005 Noise Exposure Map. Disclosures help inform home buyers before they purchase a home that aircraft will be flying overhead and the noise may be bothersome to some individuals. This notification was recommended, in part, because of the seasonal traffic flows at PDX. The recommendation was removed because federal and state land use compatibility guidelines say residential use is compatible between the 55 and 65 DNL noise contours.

FAA Determination: No FAA action required.

Recommendation 19 – Public Policy Consideration of Aircraft Noise and Land Use Changes: The NCP recommends that cities consider aircraft noise when developing public policy or reviewing development actions or plans, at or above the 55 DNL contour. For example, while residential land use and outdoor amphitheatres are defined as compatible below the 65 DNL contours, the Port and local government officials continue to receive calls from residents living or recreating in these areas who are impacted by aircraft noise. Local jurisdictions should consider their actions in light of aircraft noise when considering land use reviews, long-term plans, rezoning, redevelopment, higher densities, understanding that while construction techniques can mitigate interior noise levels, outdoor noise levels will remain bothersome to some people. Page G35 and H61 of the NCP provide more detail on this recommendation.

FAA Determination: Approved. Since the airport sponsor adopted the Federal guidelines designating 65 DNL as the level at which aircraft noise is non-compatible with residential land uses, FAA's Part 150 approval is limited to potential non-compatible uses within the 65 DNL. Outside the 65 DNL, FAA as a matter of policy encourages local effort to prevent new non-compatible development immediately abutting the 65 DNL and to provide a buffer for possible growth in noise contours beyond the forecast period. The Federal government has no authority to control local land use; the local government has the authority to implement this measure. Approval of this measure does not commit the FAA to future Federal funding assistance.

ADMINISTRATIVE/NOISE PROGRAM RECOMMENDATIONS

Recommendation 20 – Propeller Retrofits: The NCP recommends that options to retrofit propeller aircraft with quiet technology propellers be explored. Changing from three (3) bladed to four (4) bladed propellers could reduce noise levels on some regional cargo aircraft. The cost to replace aircraft propellers is estimated to be approximately \$20,000 - \$25,000 or more per aircraft, depending on the aircraft type. This recommendation will explore methods to encourage propeller conversions along with financial options. In addition to the financial issues, aircraft are transitory and can be readily relocated, adding to the challenges of implementing this measure. Pages F228-F230 and H65 of the NCP provides more detail on this recommendation.

FAA Determination: Disapproved for purposes of Part 150. This recommendation is outside the scope of 14 CFR Part 150. The Part 150 program is not intended as a means to undertake new research. Part 150 is applied on an individual airport basis, to mitigate local incompatible land uses.

Recommendation 21 – Fly Quiet Program: This recommendation calls for the development and implementation of a Fly Quiet Program at PDX. This recommendation will provide a regular report card to the public explaining how the FAA and the airlines are doing in following noise procedures. It can also act as a positive incentive to reward the airlines for good performance. The specific parameters to be included in the reports will be defined by a follow-up noise advisory committee. Implementation of this program is dependent on Recommendation 23 below. Pages F232-233 and H67 of the NCP provides more detail on this recommendation.

FAA Determination: Approved. For purposes of aviation safety, this approval does not extend to the use of monitoring equipment for enforcement purposes by in-situ measurement of any preset noise thresholds and shall not be used for mandatory enforcement of any voluntary measure. The FAA would need to approve the language in this report prior to making it available to the public.

Recommendation 22 – Follow-up Noise Advisory Committee: This recommendation calls for the establishment of a follow-up noise advisory committee, with a balanced representation of airlines, local government, Port of Portland, FAA, and citizen stakeholders to assist and provide continuing guidance in implementing the study recommendations. This committee will utilize knowledge developed through the Part 150 Study and help build the partnerships needed to implement these measures. Page G37 and H69 of the NCP provide more detail on this recommendation.

FAA Determination: Approved.

Recommendation 23 – Upgraded Aircraft Flight Track/Noise Monitoring System: This recommendation would install an upgraded Aircraft Flight Track/Noise Monitoring System to improve the ability to monitor flights, respond to the public in a timely manner, and develop a Fly Quiet Program (see Recommendation 21). The current system uses very dated technology and does not provide the necessary automation to develop regular reports or monitor aircraft compliance with noise abatement procedures. A key component of the upgrade will be the ability for the public to view flight tracks via the Internet. Page G37 and H71 of the NCP provide more detail on this recommendation.

FAA Determination: Approved. For purposes of aviation safety, this approval does not extend to the use of monitoring equipment for enforcement purposes by in-situ measurement of any preset noise thresholds and shall not be used for mandatory enforcement of any voluntary measure.

Recommendation 24 – Subsequent Part 150 Updates: This recommendation calls for the review and update the Part 150 Study as needed to reflect changes in the noise environment. A Part 150 study is a “snapshot” in time to look at the noise conditions generated by the current fleet mix and level of operations and the five-year forecasted levels. Federal regulations require a new study be completed if there is a significant increase or decrease in noise levels resulting from changes at the airport. Page G37 and H72 of the NCP provide more detail on this recommendation.

FAA Determination: Approved. If made necessary by NEM changes, an update to the NCP would address requirements of 150.23(e)(9). Section 150.21(d), as amended, states that the NEM should be updated if there is either a substantial new noncompatible use within the DNL 65 dB contour, or if there is a significant reduction in noise over existing noncompatible land uses [69 FR 57622, dated 9/24/04].

Recommendation 25 – Develop a Noise Brochure: This recommendation would develop a noise brochure for prospective homebuyers and other audiences ranging from the general public to elected officials. The goal is to increase the awareness of aircraft noise and the possibility of noise intrusion that some people may experience and find annoying. Given the seasonal direction of aircraft flights, it is important that prospective homebuyers make informed decisions before purchasing a home in the vicinity of the airport and the flight paths. The information will be based on federal, state, and local

standards used to define noise levels and compatible uses. Page G37 and H74 of the NCP provide more detail on this recommendation.

FAA Determination: Approved.

Recommendation 26 – Develop a Noise Abatement Procedures Brochure for Pilots: This brochure would be made available for transient (visiting) pilots as well as PDX based pilots, to inform them of PDX noise abatement procedures and noise sensitive areas around the airport. Page G38 and H75 provide more detail on this recommendation.

FAA Determination: Approved. The FAA would need to approve the language in this brochure prior to providing to the pilots.

Recommendation 27 – Develop Sound Proofing Brochures for Homeowners and Homebuilders: This brochure would outline home soundproofing construction techniques and products as well as other useful information for builders constructing new homes as well as those homeowners interested in doing remodeling doing remodeling projects. See Page G38 and H76 for further information on this recommendation.

FAA Determination: Approved.

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CHAPTER H Recommendations

Noise Exposure Map Supplemental Information

The Existing and Future Noise Exposure Maps developed for this study originally reflected 2001 as the existing year and 2008 as the future year. The 2001 timeframe was selected to reflect the twelve months of activity prior to September 2001, as it represented a more reasonable number of operations than the 2001 calendar year, due to the events of September 11, 2001. The 2008 timeframe represented what was considered the fifth year after date of submission during the initial phases of the study. However, due to unexpected community interest and the desire to evaluate and analyze an extensive number of operational alternatives, the study process entailed more time than was anticipated. Thus, the study was actually submitted to the FAA in 2006. The map representing existing conditions has been changed to 2005, the future map to 2011, using the rationale described below:

The operational numbers used to generate the 2001 Noise Exposure Map were evaluated in light of actual 2005 annual operations and were very consistent with those numbers, within 15%. Additionally, there were no significant differences in the fleet mix in 2001 and 2005, so the 2001 Noise Exposure Map was considered to be a reasonable representation of conditions in 2005.

Subsequent to September 2001, operational forecasts have been reduced at all airports in the United States. As a result, the operational forecasts used to generate the original future 2008 noise exposure maps are no longer valid for that particular year. However, the operations forecast and used to generate the 2008 noise contour (future year originally) are within 10% of the FAA Terminal Area Forecast for 2011 (the fifth year after submission) and are a reasonable representation of the aircraft generated noise for that year. Therefore, the 2008 future noise contours have been re-labeled as the 2011 Future Noise Exposure Maps.

Recommendations

Introduction

This chapter presents the proposed *Noise Compatibility Program* (NCP) recommendations which are the results of this study process. The recommendations include a stated Goal and Actions necessary to achieve the Goal. The parties responsible for implementing the recommendation as well as the estimated timeframes and costs are also identified. The Noise Compatibility Program recommendations are broken into three categories:

- **Noise Abatement / Aircraft Operational Recommendations**
- **Noise Mitigation / Land Use Compatibility Recommendations, and**
- **Noise Program / Administrative Recommendations.**

The overview of the recommendations from this Part 150 Study is the culmination of all work and analysis dating back to the completion of our last Part 150 Study in 1996. The recommendations presented here have been presented to the Port of Portland Commission for their approval. Once the recommendations are approved by the FAA, the Port of Portland will work with local branches of the FAA Air Traffic Division, the cities of Portland and Vancouver, and all other necessary local and federal government offices to implement the approved procedures and recommendations.

After FAA approval, some of the recommended actions may require review under the guidelines of the National Environmental Policy Act (NEPA), before they can be implemented. This may require further review and analysis on a case-by-case basis, depending on the recommendation.

The overall goal of a Part 150 Study is to reduce the impact of aircraft noise on the surrounding communities. While significant reductions have been achieved over the last several decades by making aircraft quieter, aircraft still generate noise. Therein lies the challenge; airports must find a way to provide convenient access to air transportation while simultaneously working to reduce noise exposure to citizens living near the conveniently located airport.

Participation in a Federal Aviation Regulation (FAR) Part 150 Study program is voluntary. The benefits of completing a Part 150 Study are that it allows an airport to recommend aircraft operational measures to the FAA as well as land use measures to surrounding local governments. The FAA may also provide funding for remedial land use measures, such as sound insulation and/or purchase of homes in areas of high noise exposure. In order for the recommendations to be included in this study, they had to

reduce or mitigate the existing or future noise impacts within the highest noise contours, those at or greater than 65 DNL.

Part 150 studies provide two primary tools to make improvements to the noise environment and a secondary tool to assist in study implementation. The first tool being operational recommendations, which can change where aircraft fly or how the runways are used. While this study identified some minor improvements, as previously noted, the greatest operational gains were achieved in earlier PDX noise studies. Operational recommendations are implemented by the Port and FAA.

The second tool, land use recommendations, controls what types of development are built near airports under the flight paths. If incompatible developments such as homes already exist, there are several recommendations that can address this. Land use recommendations are designed to ensure the interior of a home meets certain standards of quietness. Recommendations can do little to address outside noise if the property or activity occurs under or near a flight path.

A third tool, noise program recommendations, is administrative in nature and provides measures which help facilitate implementation of the above recommendations. These recommendations also help provide information and educational materials to a variety of audiences.

As an overview to guide the reader, each recommendation is summarized by category in the pages that follow. The individual recommendations are described in greater detail in the respective chapters that cover each category of recommendations. All measures approved in the 1997 Record of Approval that are *not* specifically modified remain in effect.

Summary of Noise Compatibility Program Recommendations

A summary of each recommendation is presented within one of the three categories listed below. Each category is described by an overall goal, followed by a brief description of the associated recommendations. **More detailed descriptions of the recommendations and technical terms are addressed later in this chapter.** In addition, a Glossary of Terms is located at the back of this volume.

Categories of Recommendations

- **Noise Abatement/Aircraft Operational Recommendations;**
- **Noise Mitigation/Land Use Compatibility Recommendations; and,**
- **Noise Program Recommendations.**

Noise Abatement/Aircraft Operational Recommendations

DEPARTURE OPERATIONS GOAL:

Work with the FAA to establish a pattern of departure flight tracks to keep all three categories of aircraft (jets, high-performance turboprops, and low-performance propeller) over the Columbia River corridor and compatible land uses as long as possible, so aircraft are able to climb higher before flying over residential areas. Higher flying aircraft generally cause less noise than the same over flights at a lower altitude. In addition to directing aircraft over compatible land uses, develop strategies that will use advanced satellite based and in-aircraft autopilot navigation systems that will provide greater precision guidance for flight paths, particularly where the aircraft are close to the airport and climbing to the altitude or distance where they can turn to fly toward their intended destination. This technology is found more predominantly in jet aircraft; less so in low-performance propeller aircraft.

Recommendation 1

Jet Aircraft Departures to the West

This recommendation is a revision of existing procedures 3a(1)(2), from the 1997 Record of Approval, that have jet aircraft departing to the west, intercepting the 277 degree VOR radial, and flying that heading until reaching specific altitude or distance before turning. This procedure was established in the 1983 Noise Abatement Plan and utilizes the Columbia River as an unpopulated “noise corridor”. The Port installed a radio beacon in 1985 that is used by pilots to guide them over the river. New satellite technology is now available and it is hoped that by using advanced satellite technology and on-aircraft autopilot systems, it will be possible to keep jet aircraft more precisely over the river and to tighten the dispersion of flight paths to a more narrow pattern. Departing jets with Maximum Gross Take-off Weight (MGTOW) greater than 75,000 lbs., as well as business jet models specifically listed in the current operational LOA between the Port and the FAA, will remain over the river until reaching an altitude of 6,000 feet or a distance of eight (8) miles from the PDX VOR (ground based navigational aid); other

business jets will remain over the river corridor until reaching an altitude of 3,000 feet. Upon reaching the recommended altitude or distance the pilots will turn in the direction of their intended destination (i.e. south for destinations in California, north for Seattle, etc.).

Recommendation 2

Jet Aircraft Departing to the East

This recommendation is a revision to current procedures 2b(1)(2)(3), from the 1997 Record of Approval, for jet aircraft departing to the east. Aircraft will continue to fly over the Columbia River, but the revised procedure will shift the flight path approximately 2,000 feet to the south. The goal of shifting departures to the south is to have jets fly a path concentrated equidistant between the residential communities both north and south of the Columbia River. Another goal is to tighten up the dispersion of flight paths by using advanced satellite technology and on-aircraft autopilot systems. Departing jets with MGTOW greater than 75,000 lbs. will remain over the river until reaching an altitude of 7,000 feet or a distance of 11 miles from the PDX VOR; louder business jets will remain over the river corridor until reaching an altitude of 6,000 feet or a distance of 11 miles, all other business jets until reaching 3,000 feet. Upon reaching the recommended altitude or distance the pilots will turn in the direction of their intended destination.

High-Performance Turboprops Departing East

Continue and refine current procedure 2b(1), from the 1997 Record of Approval, for high-performance turboprops departing to the east, flying over the Columbia River, or compatible land uses. This procedure will keep high-performance turboprops, with destinations northbound, along a path similar to the jet path described above. For destinations southbound, a path directed approximately 15° south of the jet path will be used. Using advanced satellite technology and on-board autopilot systems, a tighter dispersion of flight paths should result for aircraft which have these systems. This recommendation calls for all high-performance turboprops to turn in the direction of their intended destination at 3,000 feet.

Recommendation 3

High-Performance Turboprops Departing to the West

Continue and refine current procedure 3b, from the 1997 Record of Approval, for high-performance turboprops departing to the west, flying over the Columbia River, or compatible land uses. It is hoped that by using advanced satellite technology and on-board aircraft autopilot systems, it will be possible to tighten the dispersion of flight paths to a narrower pattern for aircraft that have this technology.

- This recommendation places the south turning high-performance turboprops

immediately south of Hayden Island and further north than current procedures. This path is approximately 15° south of the jet path outlined in Recommendation 1. These aircraft will remain on this course until reaching 3,000 feet before turning over residential areas.

- With routes to the north, this recommendation uses the jet path to fly longer over the river than current procedures outline. These aircraft would remain on this course until reaching 3,000 feet or five (5) miles from the PDX VOR before turning over residential areas.

Low-Performance Propeller Aircraft

New procedures for low-performance propeller aircraft departing to the west; aircraft will fly further within the Columbia River corridor before turning on course. The high-performance turboprop procedures outlined in this recommendation provide room for low-performance propeller aircraft to follow the river corridor further than current conditions allow. Recommendation is to use the least possible divergence from the higher-performance aircraft paths during normal operations. The proposed nighttime procedure (10pm to 7am, when activity is low) calls for these aircraft to fly the river corridor on the same path as the higher performance aircraft. Low-performance propeller aircraft will still have a much broader dispersion of flight paths than the other aircraft categories.

ARRIVAL OPERATIONS GOAL:

Work with the FAA to identify and establish noise abatement arrival tracks that will keep aircraft over the river corridor and compatible land uses longer when conditions allow.

Recommendation 4

Jet Aircraft Arriving From the East – Updated Mill Visual Approach

Continue to use existing procedure 4a(2), from the 1997 Record of Approval, for aircraft arriving from the east (currently published as the Mill Visual Approach). Under current procedures, aircraft use the Camas Paper Mill as a visual marker in order to remain over the Columbia River corridor while on approach to PDX. Use of advanced satellite technology and on-board autopilot systems will help narrow the dispersion paths of aircraft following this approach. The goal is for this improved procedure to be used more often, and during more varied weather conditions, than the current approach allows.

Recommendation 5

Jet Aircraft Arriving From the West – Runway 10L Sidestep

This recommendation is a modification of existing procedure 4a(1), from the 1997 Record of Approval, for aircraft arriving from the west. When conditions allow its use,

this procedure will align all aircraft in the middle of the Columbia River, more aligned with the south runway, then split-off/transition aircraft landing on the north runway at a point further east of downtown Vancouver than they do today (this is known as a “side-step” approach).

Recommendation 6

Jet Aircraft Arriving between 10pm and 7am – Contra-Flow

This procedure would incorporate existing procedures 2b(1)(2)(3) and elements from existing procedure 4a(2) from the 1997 Record of Approval. Between the hours of 10pm and 7am or as otherwise defined by traffic conditions, and during conditions where aircraft would normally be landing and departing to the east, aircraft would be allowed to land in the opposite direction to the west (a.k.a. contra-flow). This would minimize noise exposure to surrounding populations by significantly reducing long approaches over the community during this time period.

Recommendation 7

Aircraft Operating between 10pm and 7am – Night Time Preferential Runway Use

Develop a nighttime preferential runway use program, incorporating existing procedures 2a, 2b(1)(2)(3) and 4a(1) in east flow; existing procedures 3a(1)(2) and 4a(2) in west flow. The referenced procedures are found in the 1997 Record of Approval. Hours of operation would be between 10pm and 7am. This will place arrivals landing to the east on the south runway, reducing flights over downtown Vancouver, and arrivals landing to the west on the north runway, reducing flights over east Portland. Departing aircraft would continue to use both runways but the south runway would be preferred when conditions allow. Although encouraged, this program would be voluntary, and its application will be at the discretion of the FAA Air Traffic Control Tower and the pilot.

Recommendation 8

Reduced Use of Reverse Thrust on Landing

Establish an awareness program for pilots, encouraging them to use minimal or no reverse thrust upon landing, in accordance with aircraft operating standards and safety. Reducing jet engine reverse thrust is at the sole discretion of the pilot.

Noise Mitigation / Land Use Compatibility Recommendations

REMEDIAL LAND USE: Voluntary for Existing Structures

GOAL: *Reduce the number of non-compatible land uses affected by significant aircraft noise (at or above 65 DNL).*

Recommendation 9

Home Sound Proofing

Provide sound proofing for owner occupied single family residences and develop a pilot program for multifamily residential structures at or above the 65 DNL contour, using the 2005 Noise Exposure Map. Sound proofing measures may include items such as new windows, solid core doors, and heating and cooling systems to allow windows to be kept closed. In exchange for receiving sound insulation, a homeowner would grant a noise easement to the Port that would be attached to the property and “run with the land”.

Recommendation 10

Floating Home Sound Proofing

Investigate sound attenuation solutions to mitigate noise for owner occupied floating homes, used as a primary residence, where moorage and/or land rights have been purchased, at or above the 65 DNL noise contour using the 2005 Noise Exposure Map.

Recommendation 11

Noise Easement Option for Homeowners

Purchase noise easements from homeowners within the 65 DNL noise contour or above, using the 2005 Noise Exposure Map. This recommendation would apply to homeowners who do not wish to have sound proofing. Experience at other airports has shown that up to 10% of the eligible population may decline sound proofing. This recommendation provides another voluntary option for homeowners to receive some compensation in return for providing the Port of Portland a noise easement.

Recommendation 12

REMOVED - Mobile Home Noise Exposure Reduction Measures

This recommendation originally called for investigating options to reduce noise exposure for residents of mobile homes living at or above the 65 DNL contour using the 2005 Noise Exposure Map. Most mobile homes are very difficult to sound proof due to their construction. By their very nature, a mobile home could be moved out of the noise impacted area. As a result of these factors and the fact that the residents of the only identified mobile home park (West Hayden Island) have requested the Port take no action with regard to their development, this recommendation was dropped from further consideration.

PREVENTATIVE LAND USE: Mandatory for New Construction Only

GOAL: *Prevent introduction of new non-compatible land uses in areas with significant aircraft noise exposure by strengthening existing overlay zones.*

Recommendation 13

Enhance Local Government Noise Overlay Ordinances

The plan recommends, where applicable, enhancing the City of Portland PDX Airport Noise Impact Zone and the City of Vancouver Noise Impact Overlay District by implementing the land use recommendations listed below. These cities have existing adopted ordinances that define requirements for properties that lie within the Noise Impact Zone and the Noise Impact Overlay District. The noise overlays require developers building within these areas to disclose noise and meet certain building code requirements for sound insulation. The City of Portland has a more stringent PDX Airport Noise Impact Zone which also requires a noise easement.

Recommendation 14

New Mobile Homes and Mobile Home Parks

The plan recommends prohibiting new residential trailers in mobile home parks, as well as residential trailers and manufactured homes outside of existing mobile home parks, unless they can be certified by the manufacturer that they meet appropriate sound attenuation requirements consistent with the City of Vancouver Noise Impact Overlay District and the City of Portland PDX Airport Noise Impact Zone. This is a continuation of existing requirements within the City of Portland.

Recommendation 15

New Noise Sensitive Uses

The plan recommends limiting, or requiring sound proofing, new noise sensitive uses within both the City of Vancouver Noise Impact Overlay District and City of Portland PDX Airport Noise Impact Zone boundaries. Noise sensitive uses are set forth in Table 7, the FAA Part 150 Land Use Compatibility Guidelines and accepted at the state and

local levels. To ensure consistency, the most restrictive adopted measures should be used. For example, if state or local codes are more restrictive than federal guidelines, they should be used.

It is also recommended these same noise sensitive uses be limited or mitigated within a 1,000 foot wide corridor for one mile beyond the extended centerline of the PDX crosswind runway because of the close proximity of higher density residential uses at the runway ends.

Recommendation 16

New Floating Homes and Moorages

The plan recommends prohibiting new floating homes or moorages, or requiring the floating homes meet sound attenuation criteria within the City of Portland's PDX Noise Impact Zone and the City of Vancouver Noise Impact Overlay District boundary.

Recommendation 17

Noise (Avigation) Easements

The plan recommends requiring noise easements for new residential construction and other defined noise sensitive land uses at or above the 65 DNL contours consistent with local city code adopted noise contours.

Recommendation 18

REMOVED - Disclosures for Prospective Purchasers at or above the 55 DNL

The plan originally recommended requiring a noise notice/disclosure to prospective purchasers for new construction between the 55 and 65 DNL noise contours based on the 2005 Noise Exposure Map. Disclosures help inform home buyers before they purchase a home that aircraft will be flying overhead and the noise may be bothersome to some individuals. This notification was recommended, in part, because of the seasonal traffic flows at PDX. This recommendation has been removed, because federal and state land use compatibility guidelines say residential use is compatible between the 55 and 65 DNL noise contours.

Recommendation 19

Public Policy Consideration of Aircraft Noise and Land Use Changes

Recommend cities consider aircraft noise when developing public policy or reviewing development actions or plans, at or above the 55 DNL contour. For example, while residential land use and outdoor amphitheatres are defined as a compatible below the 65 DNL contours, the Port and local government officials continue to receive calls from residents living or recreating in these areas who are impacted by aircraft noise. Local jurisdictions should consider their actions in light of aircraft noise when considering land

use reviews, long-term plans, rezoning, redevelopment, higher densities, understanding that while construction techniques can mitigate interior noise levels, outdoor noise levels will remain bothersome to some people.

Administrative / Noise Program Recommendations

ADMINISTRATIVE GOAL: *Develop administrative programs to encourage compliance with flight procedures and quiet aircraft operations.*

Recommendation 20

Propeller Retrofits

Explore options to retrofit propeller aircraft with quiet technology propellers. Changing from three (3) bladed to four (4) bladed propellers could reduce noise levels on some regional cargo aircraft. The cost to replace aircraft propellers is estimated to be approximately \$20,000 - 25,000 or more per aircraft, depending on the aircraft type. This recommendation will explore methods to encourage propeller conversions along with financial options. In addition to the financial issues, aircraft are transitory and can be readily relocated, adding to the challenges of implementing this measure.

Recommendation 21

Fly Quiet Program

Develop and implement a Fly Quiet Program at PDX. This recommendation will provide a regular report card to the public explaining how the FAA and the airlines are doing in following noise procedures. It can also act as a positive incentive to reward the airlines for good performance. The specific parameters to be included in the reports will be defined by a follow-up noise advisory committee. Implementation of this program is dependent on Recommendation 23 below.

ADMINISTRATIVE GOAL:

Develop administrative measures to aid in noise abatement or mitigation.

Recommendation 22

Follow-up Noise Advisory Committee

Establish follow-up noise advisory committee, with a balanced representation of airlines, local government, Port of Portland, FAA, and citizen stakeholders to assist and provide continuing guidance in implementing the study recommendations. This committee will utilize knowledge developed through the Part 150 Study and help build the partnerships needed to implement these measures.

Recommendation 23

Upgraded Aircraft Flight Track/Noise Monitoring System

Install an upgraded Aircraft Flight Track/Noise Monitoring System to improve the ability to monitor flights, respond to the public in a timely manner, and develop a Fly Quiet Program (see Recommendation 21). The current system uses very dated technology and does not provide the necessary automation to develop regular reports or monitor aircraft compliance with noise abatement procedures. A key component of the upgrade will be the ability for the public to view flight tracks via the internet.

Recommendation 24

Subsequent Part 150 Study Updates

Review and update the Part 150 Study as needed to reflect changes in the noise environment. A Part 150 study is a “snapshot” in time to look at the noise conditions generated by the current fleet mix and level of operations and the five year forecasted levels. Federal regulations require a new study be completed if there is a significant increase or decrease in noise levels resulting from changes at the airport.

Recommendation 25

Develop a Noise Brochure

Develop a noise brochure for prospective home buyers and other audiences ranging from the general public to elected officials. The goal is to increase the awareness of aircraft noise and the possibility of noise intrusion that some people may experience and find annoying. Given the seasonal direction of aircraft flights, it is important that prospective home buyers make informed decisions before purchasing a home in the vicinity of the airport and the flight paths. The information will be based on federal, state and local standards used to define noise levels and compatible land uses.

Recommendation 26

Develop a Noise Abatement Procedures Brochure for Pilots

This brochure would be made available for transient (visiting) pilots as well as PDX based pilots, to inform them of PDX noise abatement procedures and noise sensitive areas around the airport.

Recommendation 27

Develop Sound Proofing Brochure for Homeowners and Homebuilders

This brochure would outline home sound-proofing construction techniques and products as well as other useful information for builders constructing new homes as well as those homeowners interested in doing remodeling projects.

Recommendation 28

REMOVED - Airport Proximity Chart

This was intended to be a map that would go beyond the noise contours and serve as an informational tool to show proximity of neighborhoods/homes in relation to PDX. This recommendation has been removed.

Future 2008 (updated to 2011) Noise Exposure Map– Figure H1

As outlined in FAR Part 150, the airport operator must develop an existing and future noise exposure map. The future noise exposure map is required to show conditions five (5) years into the future. The aircraft-generated noise contours used to identify the future noise exposure map is the Future Base Case (2011) Noise Contours for Portland International Airport (PDX). These contours represent the future conditions associated with PDX with no operational, facility, or land use changes; the Future Base Case reflects the existing airport layout and noise abatement procedures assuming a higher level of activity forecast for the year 2011 (346,000 annual operations).

Table H1 presents the current number of people, the current number of residential units and other non-residential noise sensitive structures found within the INM-predicted PDX Future Base Case noise contours that represent the 2011 Future Base Case Noise Exposure Map. The Future Noise Exposure Map is illustrated on Figure H1, Future 2011 Noise Exposure Map.

TABLE H1

EXISTING POPULATION AND HOUSING UNITS WITHIN FUTURE 2011 BASE CASE NOISE EXPOSURE MAP CONTOURS

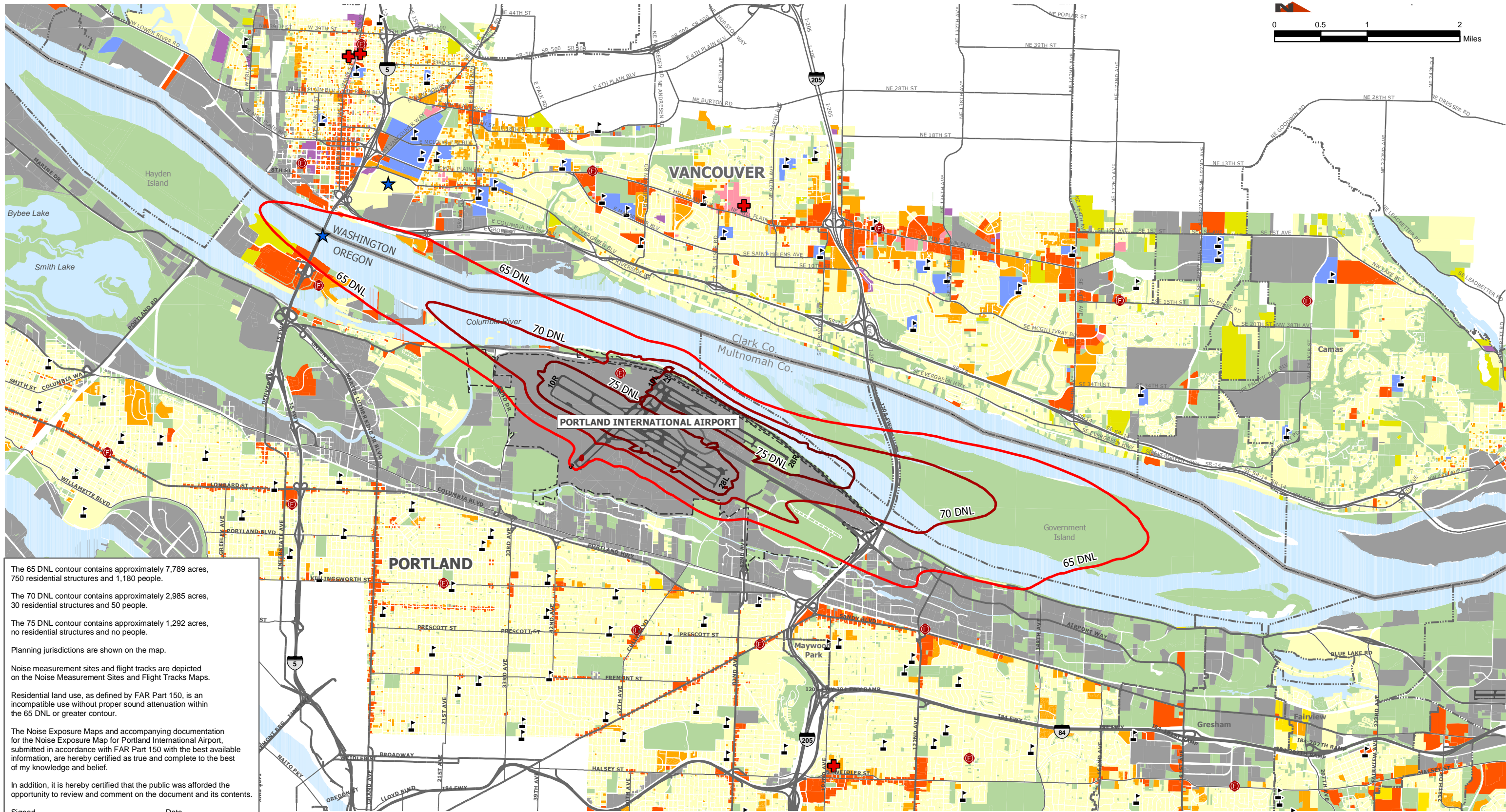
Land Use	65 DNL & Greater Contour	70 DNL & Greater Contour	75 DNL & Greater Contour
People	1,180	50	0
Housing Units	750	30	0
Schools	0	0	0
Historical Sites	0	0	0
Fire Stations	0	0	0

Source: See notes below Table 5.

Existing 2001 (updated to 2005) Base Case Noise Exposure Map – Figure H2

The noise contours used to identify areas eligible for various mitigation programs are the Existing Base Case (2005) Noise Contours for Portland International Airport (PDX). Of the conditions considered in a Part 150, the existing noise contour (2005) is the largest noise contour generated by aircraft operating at PDX. The existing contour affects the greatest number of people (in comparison to future contours) because its larger size encompasses the greater number of housing units. In addition, because there is no guarantee that all the proposed Part 150 operational (noise abatement) recommendations

will or can be implemented before 2011, it is important to address current conditions. For these reasons, the 2005 contour has been used to quantify the number of structures and people eligible for participation in recommended land use compatibility program measures.



The 65 DNL contour contains approximately 7,789 acres, 750 residential structures and 1,180 people.

The 70 DNL contour contains approximately 2,985 acres, 30 residential structures and 50 people.

The 75 DNL contour contains approximately 1,292 acres, no residential structures and no people.

Planning jurisdictions are shown on the map.

Noise measurement sites and flight tracks are depicted on the Noise Measurement Sites and Flight Tracks Maps.

Residential land use, as defined by FAR Part 150, is an incompatible use without proper sound attenuation within the 65 DNL or greater contour.

The Noise Exposure Maps and accompanying documentation for the Noise Exposure Map for Portland International Airport, submitted in accordance with FAR Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief.

In addition, it is hereby certified that the public was afforded the opportunity to review and comment on the document and its contents.

Signed _____ Date _____

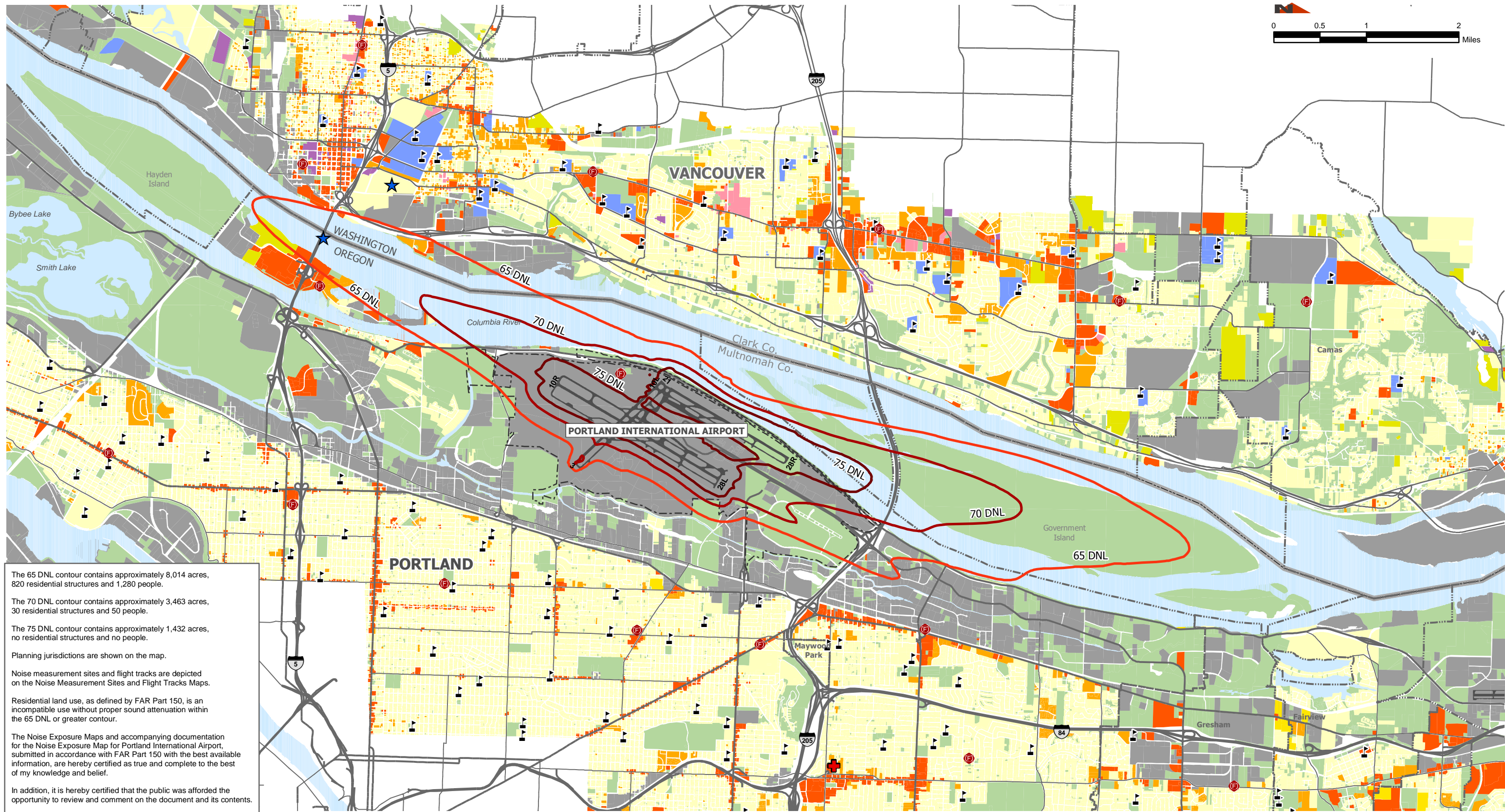
Land Use Legend

- Single Family Residential
- Multi-Family Residential
- Mobile Home Residential
- Commercial
- Industrial
- Agricultural/ Open Space/Vacant
- Educational Facility (Clark County)
- Medical Facility (Clark County)
- Public/Semipublic (Clark County)
- F Fire Station
- Schools
- + Hospitals
- National Historic Site

**FIGURE H1
FUTURE (2011) NOISE EXPOSURE MAP**

SOURCE: THE JD WHITE COMPANY, PORTLAND OREGON
BRIDGENET INTERNATIONAL, COSTA MESA, CALIFORNIA

June 2006



The 65 DNL contour contains approximately 8,014 acres, 820 residential structures and 1,280 people.

The 70 DNL contour contains approximately 3,463 acres, 30 residential structures and 50 people.

The 75 DNL contour contains approximately 1,432 acres, no residential structures and no people.

Planning jurisdictions are shown on the map.

Noise measurement sites and flight tracks are depicted on the Noise Measurement Sites and Flight Tracks Maps.

Residential land use, as defined by FAR Part 150, is an incompatible use without proper sound attenuation within the 65 DNL or greater contour.

The Noise Exposure Maps and accompanying documentation for the Noise Exposure Map for Portland International Airport, submitted in accordance with FAR Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief.

In addition, it is hereby certified that the public was afforded the opportunity to review and comment on the document and its contents.

Signed _____ Date _____

- Land Use Legend**
- Single Family Residential
 - Multi-Family Residential
 - Mobile Home Residential
 - Commercial
 - Industrial
 - Agricultural/ Open Space/Vacant
 - Educational Facility (Clark County)
 - Medical Facility (Clark County)
 - Public/Semipublic (Clark County)
 - F Fire Station
 - S Schools
 - H Hospitals
 - ★ National Historic Site

FIGURE H2
EXISTING (2005) NOISE EXPOSURE MAP

SOURCE: THE JD WHITE COMPANY, PORTLAND OREGON
BRIDGENET INTERNATIONAL, COSTA MESA, CALIFORNIA

June 2006

Program Map also identifies the proposed boundaries of eligibility for the various remedial land use recommendations and identifies areas just beyond the 65 DNL that should be included in the remedial programs. The eligibility boundaries take into consideration those portions of multi-family structures which are contiguous to, but beyond the 65 DNL, multi-family structures within the 65 DNL, and several single family homes in a small contiguous “neighborhood” along the Columbia River that are just beyond the 65 DNL noise contour.

TABLE H2

**EXISTING POPULATION AND HOUSING UNITS WITHIN
2005 NOISE COMPATIBILITY PROGRAM MAP CONTOURS
(Not including additional properties within the eligibility boundary*)**

Land Use	65 DNL & Greater Contour	70 DNL & Greater Contour	75 DNL & Greater Contour
People	1,280	50	0
Housing Units	820	30	0
Schools	0	0	0
Historical Sites	0	0	0
Fire Stations	0	0	0

Note: Numbers are cumulative and rounded to the nearest ten persons or units. Housing units were refined based on actual surveys of those units. Population reflects average persons per household, based on census data, applied to the actual housing units.

Data Source: Previous land use and population counts were generalized to census data. For this more detailed analysis, Oregon aerial photos were obtained from Metro Data Resource Center, with a 4-foot pixel resolution. Washington aerial photos were downloaded from the USGS website with a one-quarter meter resolution. Aerial photos were analyzed to determine the number of manufactured (mobile) homes, houseboats, single family and multi-family dwelling units. Visual analysis was performed to identify residential units and

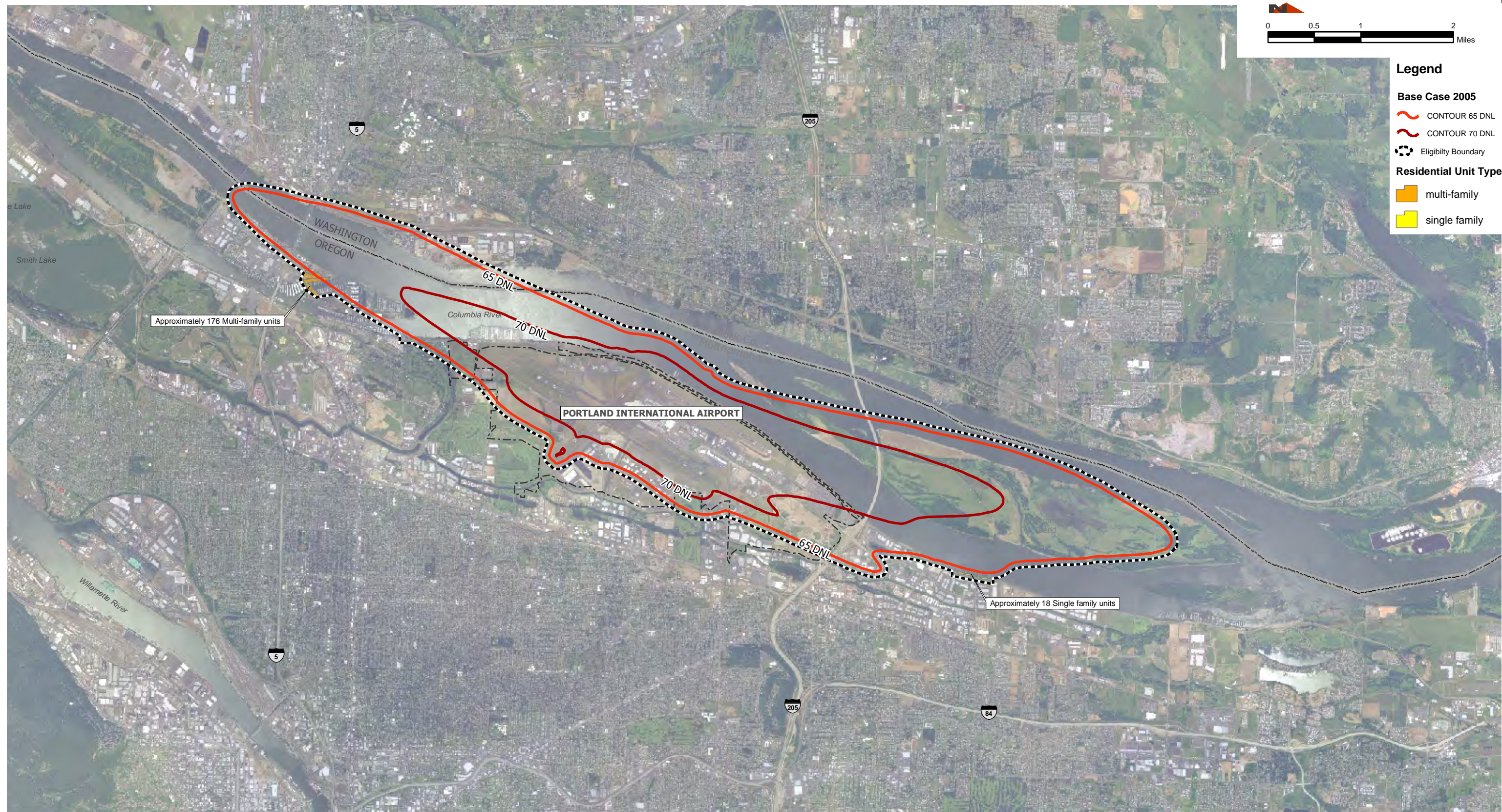


FIGURE H3
NOISE COMPATIBILITY PROGRAM MAP
 Eligibility Boundary with additional residential structures recommended for eligibility based on neighborhood and condominium complex integrity

SOURCE: THE JD WHITE COMPANY, PORTLAND, OREGON
 BRIDGENET INTERNATIONAL, COSTA MESA, CALIFORNIA

June 2006

counts. Information was cross-checked with GIS tax lot data to confirm the type of residential dwelling unit, and the date built.

To determine the number of houseboat dwellings, roofed structures in the aerial photos were counted. Because houseboats do not have a tax lot associated with them, they could not be cross-checked with GIS data. Instead, locations were field checked to verify and confirm dwelling structures, and to subtract any non-dwelling units. Empty manufactured home slots noted in the photo analysis were included into the total count. Empty houseboat slots were not counted, because it is possible only to estimate the number of houseboats that can be placed alongside a dock as they do not have slips or lot boundaries to count. Counts at or above the 2005 65 DNL contour include 162 mobile homes, up to 22 floating homes, 601 condominiums and 22 single family homes. *(During the field review to check the final data, areas with floating homes were locked and on-site inspections were not possible to distinguish between an actual residential structure and a storage structure, therefore these numbers are approximate).*

- * The actual number of units that would participate in a noise remedy program could change later in the process as boundaries are adjusted to keep neighborhoods intact. The intent of the FAR Part 150 is to keep viable neighborhoods intact and not cause unnecessary community disruption. The actual number will depend upon lot lines, neighborhood integrity, placement of condominium buildings, age of the structures, existing interior noise levels, and other factors. Based on this premise, boundaries were developed to identify areas of eligibility for structures eligible for remedial land use measures. The boundary is shown on Figure H3, Noise Compatibility Program Map. As shown on Figure H3, Noise Compatibility Program Map, and Figure H4, Residential Unit Counts, the area between 65 DNL and the eligibility boundary contains approximately 176 multi-family units and 18 single-family units. In total, the area within the proposed eligibility boundary contains approximately 40 single family homes, 800 condominiums, and up to 22 floating homes in addition to 278 mobile homes. This is summarized in Table H3 and illustrated in Figure H4.

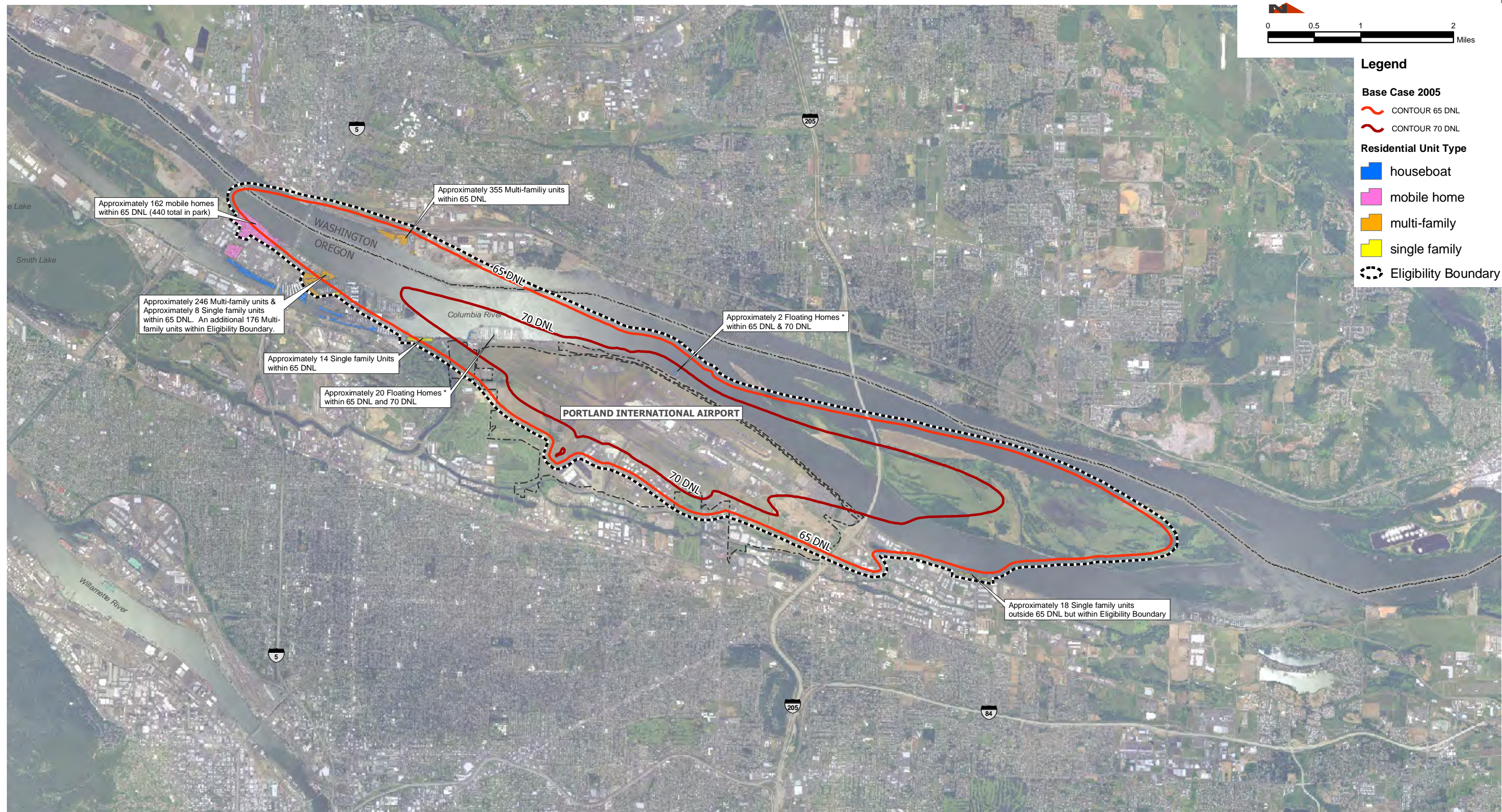
TABLE H3

EXISTING RESIDENTIAL UNIT COUNTS WITHIN 2005 NOISE EXPOSURE MAP 65 DNL CONTOURS and ADDITIONAL UNITS IN ELIGIBILITY BOUNDARY

Land Use	Within 65 DNL Contour	Additional in Eligibility Boundary	Total Number of Units
Single Family	22	18	40
Multi-family	601	176	777
Floating Homes*	22	0	22
Mobile Homes **	162	278	440

* Floating homes are approximate. Access was restricted to the areas containing the floating homes and count is based on field observations and aerial photos.

** No recommendation is included to address mobile homes.

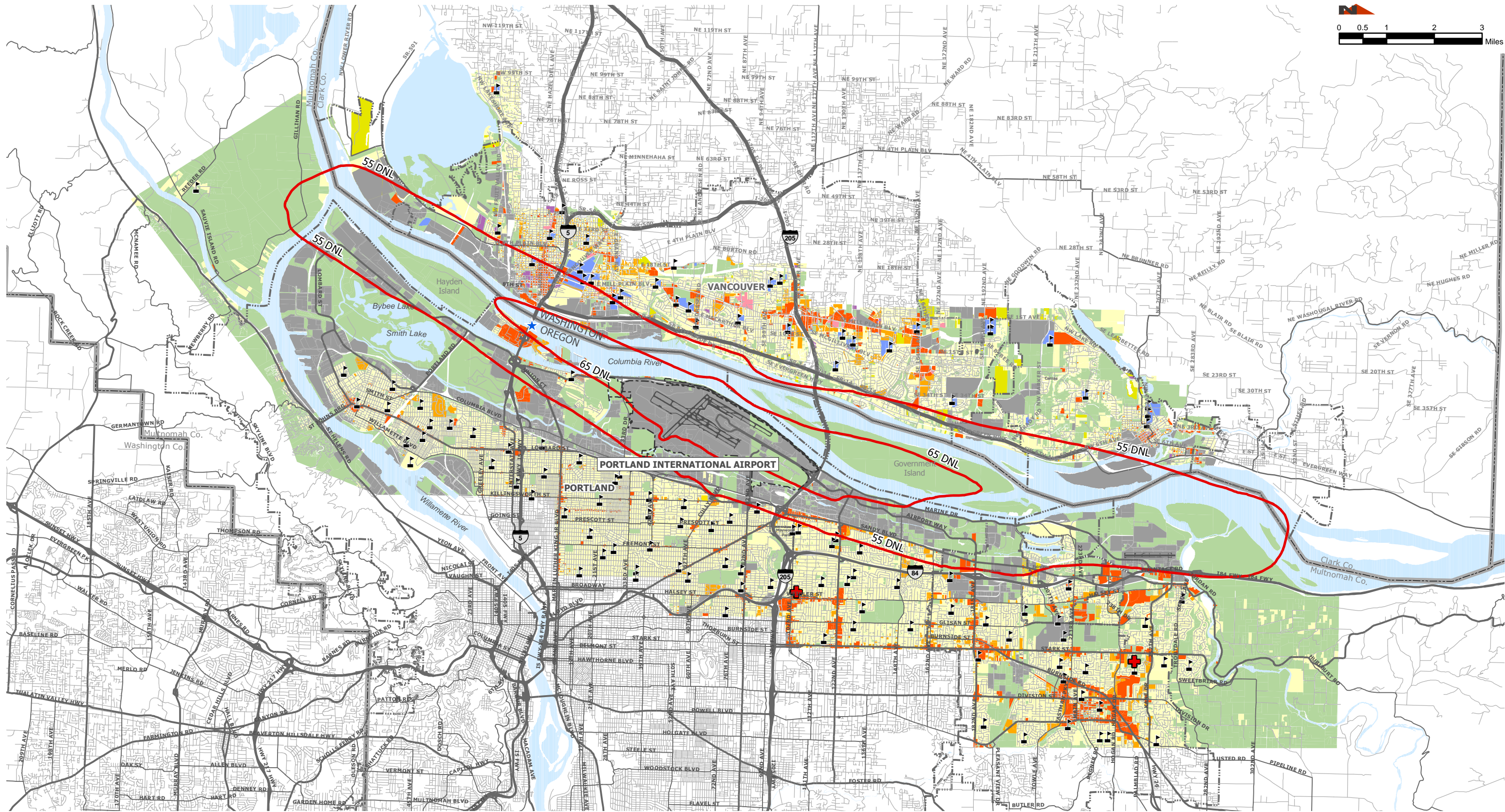


**FIGURE H4
RESIDENTIAL UNIT COUNTS WITHIN BASE CASE 2005 65 DNL AND 70 DNL WITH ELIGIBILITY BOUNDARY
Cities of Portland & Vancouver**

* Floating Homes approximated due to closed access conditions.

SOURCE: THE JD WHITE COMPANY, PORTLAND, OREGON
BRIDGENET INTERNATIONAL, COSTA MESA, CALIFORNIA

June 2006



Land Use Legend

- | | | | |
|---------------------------|---------------------------------|-------------------------------------|------------------------|
| Single Family Residential | Commercial | Educational Facility (Clark County) | Fire Station |
| Multi-Family Residential | Industrial | Medical Facility (Clark County) | Schools |
| Mobile Home Residential | Agricultural/ Open Space/Vacant | Public/Semipublic (Clark County) | Hospitals |
| | | | National Historic Site |

Figure H5
2011 NOISE CONTOURS - PORT PACKAGE OF RECOMMENDATIONS

SOURCE: THE JD WHITE COMPANY, PORTLAND OREGON
BRIDGENET INTERNATIONAL, COSTA MESA, CALIFORNIA

2011 Noise Contours – Port Package of Recommendations – Figure H5

As stated previously, the Future Noise Exposure Map is based on the Future Base Case noise contour, with none of the recommendations implemented because there is no guarantee that all of the recommendations will be implemented. The execution of the “package” of recommendations would result in a different noise contour. For informational purposes, Figure H5, 2011 Noise Contours – Port Package of Recommendations presents the future noise contour that would result from the implementation of the recommendations. The contour is smaller than the Future Noise Exposure Map and represents a reduction in population in both the 55 DNL and the 65 DNL noise contours. There is approximately an 18% reduction in population in the 55 DNL noise contour with a corresponding approximate 4% reduction in population in the 65 DNL noise contour. It is the combination of all the recommendations that results in the reduced noise exposure represented by this contour. It is the intent and desire of the Port that all of the recommendations be implemented, which would result in the reduced population numbers and smaller contour.

TABLE H4

EXISTING POPULATION AND ACRES WITHIN FUTURE 2011 PORT PACKAGE OF RECOMMENDATIONS MAP CONTOURS

Land Use	55 DNL & Greater Contour	65 DNL & Greater Contour
People	22,990	710
Acres	35,880	7,440

Noise Abatement/Aircraft Operational Recommendations

Operational recommendations can change where aircraft fly or how the runways are used. While this study identified several minor improvements, the greatest gains were achieved in earlier PDX noise studies. Operational recommendations are implemented by the Port and FAA.

The operational recommendations apply to three categories of aircraft:

- **Jets (commercial passenger and cargo airliners, two categories of business jets defined in the current LOA between the Port and FAA, and military jet aircraft);**
- **High-performance turboprops (regional commuter planes such as those flown by Horizon Air and Skywest);**
- **Low-performance Props (single- and two-engine piston driven aircraft such as the regional cargo feeder aircraft and most private general aviation aircraft).**

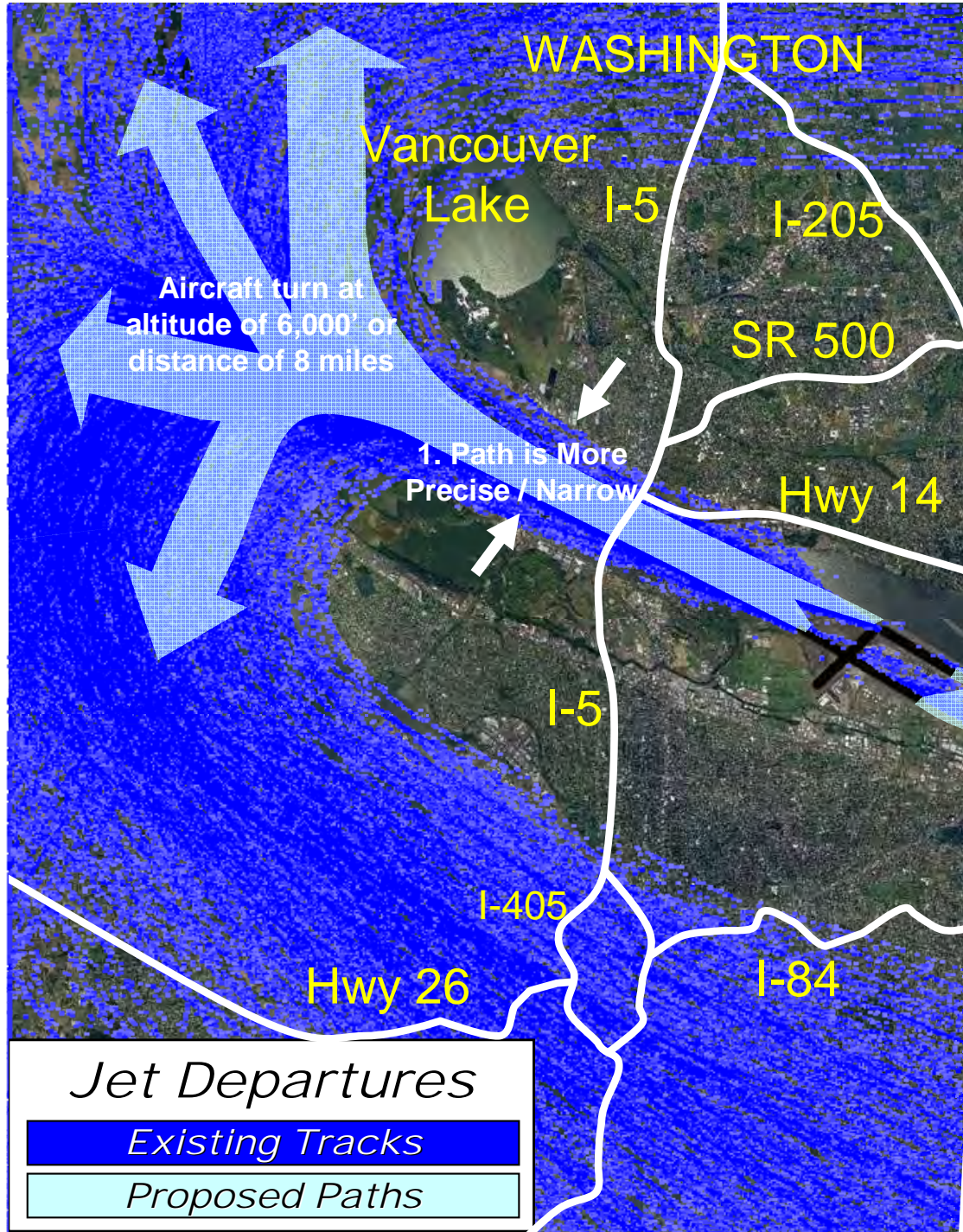
Some of the operational recommendations presented include a reference to “when conditions allow”. This phrase means under certain conditions, the ability to implement the operational procedure may not be possible. Conditions may include wind, visibility factors, general weather factors (e.g. rain, thunderstorms, etc.), airspace traffic congestion/controller workload, and pilot acceptance.

For safety, aircraft land and take-off into the wind. This factor controls the direction aircraft fly when they land, and which runway they use for taking off. Aircraft change direction once airborne, but lining up and taking off on the runway most aligned with the wind is a safety factor used world wide.

Wind direction at PDX is very seasonal. Usually during the summer months, the winds favor landings and take-offs to the west. In the winter, wind conditions usually result in landings and take-offs to the east. Over a year, this results in a nearly even distribution of landings and take-offs, half the year to the east and half the year to the west.

Many of the operational recommendations for jets depend on the ability to develop satellite-based navigational procedures. The ability of aircraft to fly these procedures depends on a variety of conditions ranging from the technology in the cockpit of the aircraft to the type of navigational procedure that is developed. There are a number of satellite based systems such as global positioning system (GPS), and flight management system (FMS). The term FMS is frequently used to describe various recommendations but the term is used liberally and is generally intended to mean a satellite based procedure. The technological specifics may vary and will be determined by FAA and the aircraft in use intended to use the procedure.

FIGURE H6
RECOMMENDATION 1 JET DEPARTURES TO THE WEST



RECOMMENDATION 1:***JET DEPARTURES TO THE WEST – CONTINUE FLYING JET AIRCRAFT DEPARTING TO THE WEST DOWN THE CENTER OF THE RIVER, BUT DEVELOP A NEW SATELLITE-BASED NAVIGATIONAL PROCEDURE*****GOAL AND ACTION:**

The goal is to develop satellite-based departure procedures that concentrate aircraft along the center of the Columbia River corridor between populations on either side of the river, with turns no earlier than today, as illustrated in Figure H6. The FAA would develop the appropriate tracks, and attempt to follow the routes shown in Figure H13, located at the end of this section. This recommendation is predicated on the development and successful implementation of satellite-based procedures. Conventional tracks have been identified in an attempt to achieve the goal noted above, and to possibly be used on an interim basis and/or serve aircraft not equipped with Flight Management System (FMS) technology. However, conventional tracks cannot be defined to represent the numerous course corrections that would be necessary to achieve the routes shown in the graphic. Therefore, the conventional tracks would only be precise within about five (5) miles of the airfield. Final definition of these tracks would need to be coordinated with the FMS-based tracks developed by FAA.

- A. Using satellite technology, all departing jets in a west flow, shall be turned on a path similar to intercepting the PDX 277 degree radial.
- B. Jets with flight paths to the south shall be turned on course in a dispersed manner, similar to paths that occur today, after reaching 6,000' MSL or PDX 8 DME.
- C. Jets with flight paths to the north shall follow the Columbia River corridor and be turned west of Vancouver Lake, after reaching 6,000' MSL or PDX 8 DME.

COMMENTS:

FAA would develop the satellite-based procedures in an attempt to achieve, as close as possible, the locations of the tracks shown on Figure H13, Departure Flight Track Location goals. It is the objective of these recommendations to modify the procedures so that aircraft do not turn earlier than they do today.

COST:

The cost associated with this alternative may be approximately \$1,000,000 for NEPA review.

RESPONSIBLE PARTIES

The FAA would be responsible for implementing the procedures. The Port of Portland would be responsible for requesting the FAA Air Traffic Division to develop these

procedures and work with them to ensure that the procedures achieve the goals. The FAA would be responsible for developing and implementing the procedures that achieve the stated goals and in accordance with the safe and efficient use of the surrounding airspace. FAA would also be responsible for the environmental documentation.

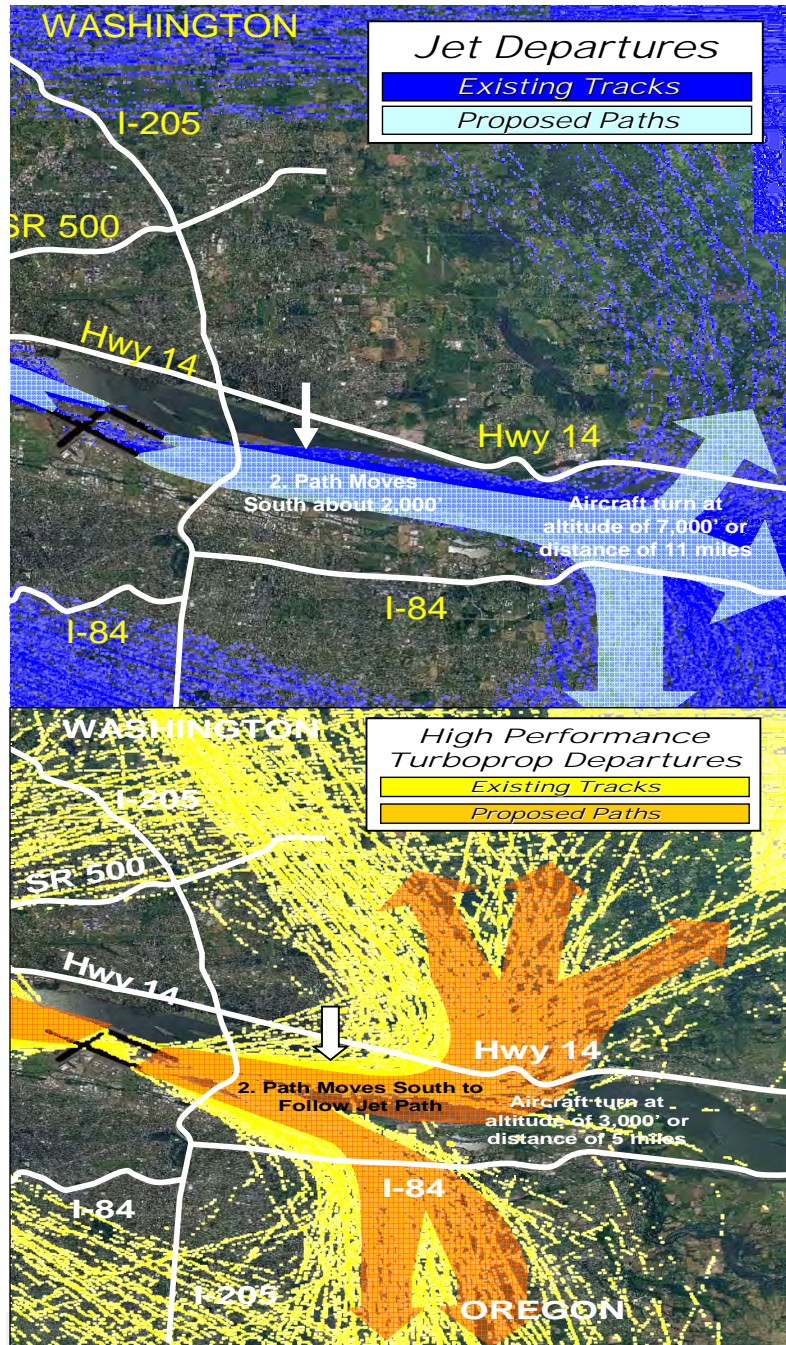
AIRPORT ACTION

The Port would coordinate with FAA Air Traffic Control Tower (ATCT) staff to assist them in developing procedures to achieve the stated goals.

TIME FRAME

These departure procedures can be initiated immediately, and are not dependent upon other recommendations, although an environmental review may be required.

FIGURE H7
RECOMMENDATION 2 JET AND HIGH-PERFORMANCE
TURBOPROP DEPARTURES TO THE EAST



JET AIRCRAFT AND HIGH-PERFORMANCE TURBOPROP DEPARTURES TO THE EAST - DEVELOP NEW SATELLITE-BASED NAVIGATIONAL DEPARTURE PATHS IN EAST FLOW

GOAL

The goal is to concentrate noise in areas closest to the airport (within five (5) miles), and disperse noise further away. Jet departures should generally follow a corridor that is equidistant between the residential areas north and south of the Columbia River corridor, with turns no earlier than exist today. High-performance turboprop aircraft with destinations northbound will follow the jet path described above, and for destinations southbound, on a divergent path approximately 15 degrees south of the jet path. This brings these paths closer together than they are today. This recommendation is necessary to open up airspace to implement Recommendation 3, which addresses lower performance propeller aircraft.

ACTION

The desire is to develop satellite-based departure tracks that place aircraft along the center of the population/housing units on either side of the Columbia River corridor. The FAA would develop the appropriate tracks, attempting to follow the location shown in Figure H13, Departure Flight Track Location goals, located at the end of this chapter. This recommendation is predicated on the development and successful implementation of satellite-based procedures. Conventional tracks have been identified in an attempt to achieve the goals noted above, and to serve aircraft not equipped with satellite based Flight Management System (FMS) type technology. However, conventional tracks cannot be defined to represent the numerous course corrections that would be necessary to achieve the flight tracks shown in the graphic. Therefore, the conventional tracks would only be precise within about five (5) miles of the airfield. Final definition of these tracks would need to be coordinated with the FMS-based tracks developed by FAA.

- A. Using satellite technology, jets should be turned on a path similar to flying runway heading for 2 DME and then intercepting the PDX 085 degree radial, jets would be turned on course after reaching 7,000' MSL or PDX 11 DME. Aircraft would then disperse similar to paths that occur today. Aircraft would follow a satellite-based procedure that intercepts that radial later in the flight, which effectively shifts the center point of the procedure south of where the aircraft generally fly today. For example, at the Glenn Jackson I-205 Bridge, the proposed path is approximately one-half mile further to the south than the current average path.
- B. Using satellite technology, northbound high-performance turboprop aircraft would be turned on a path similar to intercept the PDX 085 radial as described above, and would be turned on course after reaching 3,000' MSL.

- C. Using satellite technology, southbound high-performance turboprop aircraft would be turned on a path similar to intercept the PDX 100° radial, and would be turned on course after reaching 3,000' MSL.
- D. Northbound low-performance propeller aircraft would be turned to intercept the PDX 070 degree radial, and would be turned on course after reaching 2,000' MSL or 4 DME. This procedure is not expected to be satellite-based, as these aircraft typically are not equipped to utilize this technology.
- E. Southbound low-performance propeller aircraft would be turned to intercept the PDX 115° radial, and would be turned on course after reaching 2,000' MSL or 3 DME. This procedure is not expected to be satellite-based, as these aircraft typically are not equipped to utilize this technology.

In addition, between the hours of 10pm and 7am, when air traffic activity is lower, the low-performance propeller aircraft would fly the high-performance turboprop flight paths when operational levels permit.

COMMENTS

The goal is for FAA to develop the satellite-based procedures in an attempt to achieve, as close as possible, the location of the tracks shown on Figure H13, Departure Flight Track Location goals, located at the end of this chapter. It is the objective of these recommendations to modify the procedures so that aircraft do not make earlier turns than occur today.

COST

The cost associated with this alternative may be approximately \$1,000,000 for NEPA review.

RESPONSIBLE PARTIES

The FAA would be responsible for implementing the procedures. The Port of Portland would be responsible for requesting the FAA Air Traffic Division develop these procedures and working with them to ensure that the procedures achieve the goals. The FAA would be responsible for developing and implementing the procedures that achieve the stated goals and in accordance with the safe and efficient use of the surrounding airspace. FAA would also be responsible for the environmental documentation.

AIRPORT ACTION

The Port would coordinate with the FAA Air Traffic Control Tower (ATCT) staff to assist them in developing procedures to achieve the stated goals.

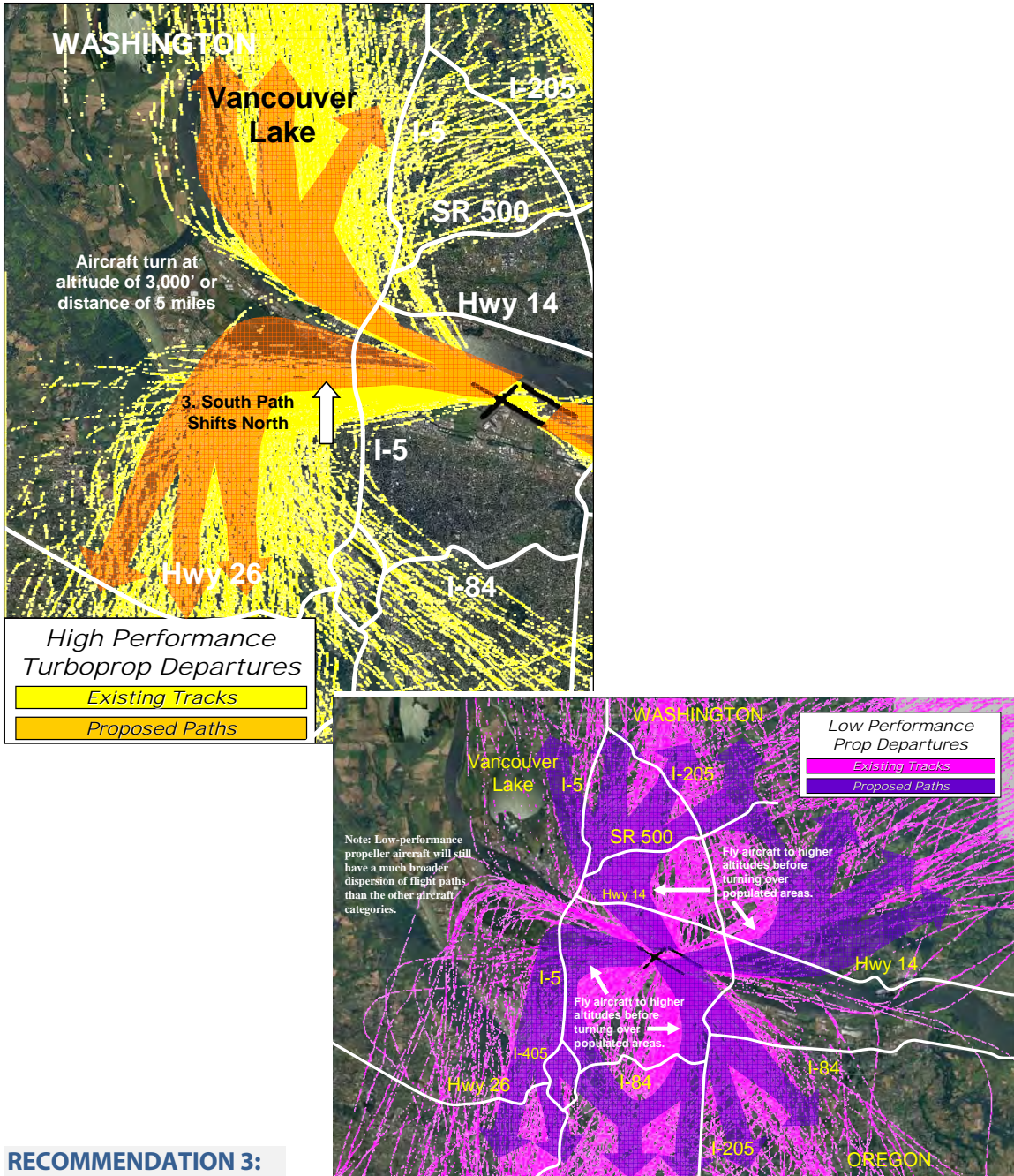
TIME FRAME

These departure procedures can be initiated immediately, and are not dependent upon other recommendations, although an environmental review will be required.



FIGURE H8

**RECOMMENDATION 3 HIGH-PERFORMANCE TURBOPROPS
DEPARTING TO THE WEST AND LOW-PERFORMANCE PROPELLER AIRCRAFT**



RECOMMENDATION 3:

DEVELOP SATELLITE BASED DEPARTURE PATHS TO TIGHTEN THE DISPERSION OF HIGH-PERFORMANCE TURBOPROPS DEPARTING TO THE WEST TO ENABLE LOW-PERFORMANCE PROPELLER AIRCRAFT TO FLY FURTHER WITHIN THE COLUMBIA RIVER CORRIDOR BEFORE TURNING ON COURSE.

GOAL

The goal is to concentrate noise in areas closest to the airport and disperse noise further away. As stated previously, jet departures should generally follow a corridor that is equidistant between the residential areas north and south of the Columbia River. High-performance turboprops departing to the west would follow the jet paths (for northern destinations) or on a path 15° south of the jet path (for southern destinations) which would be south of Hayden Island. With this new procedure, low-performance propeller aircraft would then have more room on departure to fly further within the Columbia River corridor before turning south on course. This recommendation is for development of satellite based procedures for high-performance turboprops on a path south of Hayden Island. Where possible, new procedures for the lower performance propeller aircraft are also recommended to more efficiently utilize the airspace vacated by the proposed jet and high-performance turboprop procedures.

ACTION

The desire is to develop satellite-based departure tracks that place aircraft along the center of the population/housing units on either side of the Columbia River corridor. The objective is for the FAA to develop flight paths approximating the flight track locations shown in Figure H13, Departure Flight Track Location goals, located at the end of this section. This recommendation is predicated on the development and successful implementation of satellite-based procedures. Conventional tracks have been identified in an attempt to achieve the goal noted above, and to possibly serve aircraft not equipped with FMS. However, conventional tracks cannot be defined to represent the numerous course corrections that would be necessary to achieve the tracks shown in the graphic. Therefore, the conventional tracks would only be precise within about five (5) miles of the airfield. Final definition of these tracks and the radials would need to be coordinated with the satellite-based tracks developed by the FAA.

- A. Using satellite technology, northbound high-performance turboprop aircraft would be turned on a path similar to intercept the PDX 277 radial, and would be turned on course after reaching 3,000' MSL or 5 DME. The goal is to provide a path for the high-performance turboprop aircraft to turn them northward at a location west of downtown Vancouver over Vancouver Lake. This would turn them inside the jet path which is further west but still provide separation and reduce community over flights.
- B. Using satellite technology, southbound high-performance turboprop aircraft would be turned to intercept the PDX 259 degree radial, and

would be turned on course after reaching 3,000' MSL or 5 DME. This path would place aircraft south of Hayden Island, about 15 degrees south of the jet path. The current path for these high-performance turboprops is a path that is about 30 degrees south of the existing jet path. The proposed procedure would open airspace to accommodate paths for the low-performance propeller aircraft that are described below by moving the high-performance turboprop and jet flight tracks closer together.

- C. Northbound low-performance propeller aircraft would be turned to intercept the PDX 292° radial, and would be turned on course after reaching 2,000' MSL or 2 DME. This procedure is not expected to be satellite based, as these aircraft typically are not equipped to utilize this technology.
- D. Southbound low-performance propeller aircraft would be turned to intercept the PDX 244 degree radial, and would be turned on course after reaching 2,000' MSL or 3 DME. This procedure is not satellite based in that these aircraft typically are not equipped to utilize this technology.

In addition, between 10pm and 7am (when activity is low), the low-performance propeller aircraft would fly the high-performance turboprop flight paths.

COMMENTS

The goal is for the FAA to develop the FMS procedures in an attempt to achieve, as close as possible, the locations of the tracks shown in Figure H13, Departure Flight Track Location goals, located at the end of this section. It is the objective of these recommendations to modify the procedures so that aircraft not make earlier turns than occur today.

COST

The cost associated with this alternative may be approximately \$1,000,000 for NEPA review.

RESPONSIBLE PARTIES

The FAA would be responsible for implementing the procedures. The Port of Portland would be responsible for requesting the FAA Air Traffic Division develop these procedures and working with them to ensure that the procedures achieve the goals. The FAA would be responsible for developing and implementing the procedures that achieve the stated goals and in accordance with the safe and efficient use of the surrounding airspace. The FAA would also be responsible for the environmental documentation.

AIRPORT ACTION

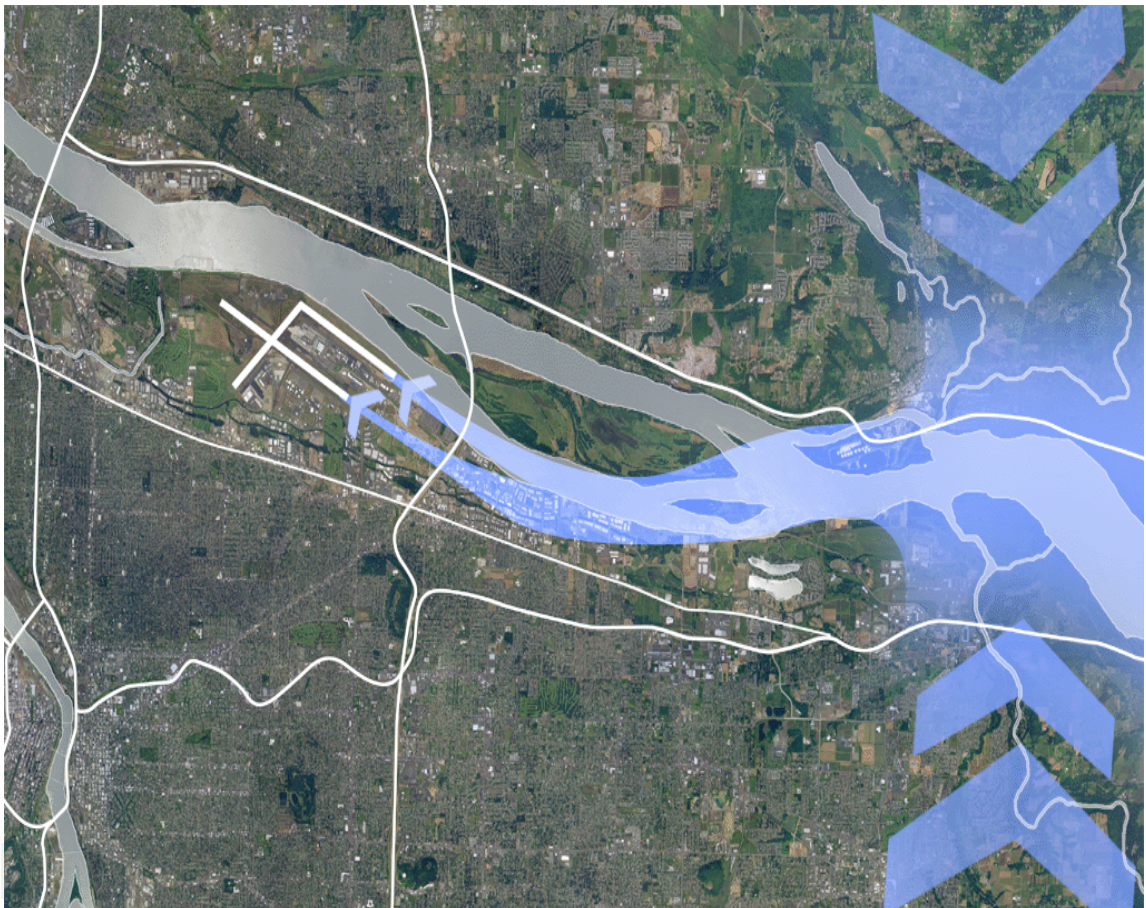
The Port would coordinate with FAA Air Traffic Control Tower (ATCT) staff to assist them in developing procedures to achieve the stated goals.

TIME FRAME

These departure procedures can be initiated immediately, and are not dependent upon other recommendations, although an environmental review will be required.

FIGURE H9

RECOMMENDATION 4 JET AIRCRAFT ARRIVALS FROM THE EAST UPDATED MILL VISUAL



RECOMMENDATION 4:***JET AIRCRAFT ARRIVING FROM THE EAST - DEVELOP AN UPDATED MILL VISUAL APPROACH USING A SATELLITE-BASED PROCEDURE*****GOAL**

The goal is to update the existing Mill Visual Procedure, shown in Figure H9, by taking advantage of advances in existing and new navigational technologies. This will allow more precise flight paths that would keep aircraft over compatible land uses adjacent to the river channel. This will reduce the application and reapplication of power on arrival and concentrate arrival paths over water and other compatible land uses. The goal is to maximize over flights of the Columbia River to reduce community over flights.

ACTION

This recommendation is predicated on the development and successful implementation of satellite-based procedures. In the interim, conventional tracks have been identified in an attempt to achieve the goal noted above. This description is based on “old technology” that would be updated once satellite-based procedures are in place and are functioning properly. Preliminary definition of the recommended tracks is as follows, and would be refined in coordination with the FAA to achieve the objectives noted earlier. Aircraft would follow a path similar to the one they follow today. However, the path would follow the Columbia River corridor more precisely, and the turn to final approach would be more centered over the river corridor than it is today. The flight path would be more concentrated within the Columbia River corridor on the approach to PDX. Altitudes of the aircraft would remain the same as with current procedures.

COMMENTS

Arrival tracks would be established, incorporating practical considerations such as the ability to fly these tracks in different weather and wind conditions (mainly, strong winds), to reduce arrival-related noise by reducing the maneuvers that aircraft execute during the existing Mill Visual arrival procedure. Reducing the need to apply power and flaps would result in reduced noise. Aircraft would fly similar paths as they do today, but would use advanced technology to fly a more precise path.

COST

The cost associated with this alternative may be approximately \$1,000,000 for NEPA review.

RESPONSIBLE PARTIES

The FAA would be responsible for implementing the procedures. The Port of Portland would be responsible for requesting the FAA Air Traffic Division to develop these procedures and working with them to ensure that the procedures achieve the goals. The FAA would be responsible for developing and implementing the procedures that achieve the stated goals and in accordance with the safe and efficient use of the surrounding airspace. FAA would also be responsible for the environmental documentation.

AIRPORT ACTION

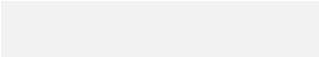
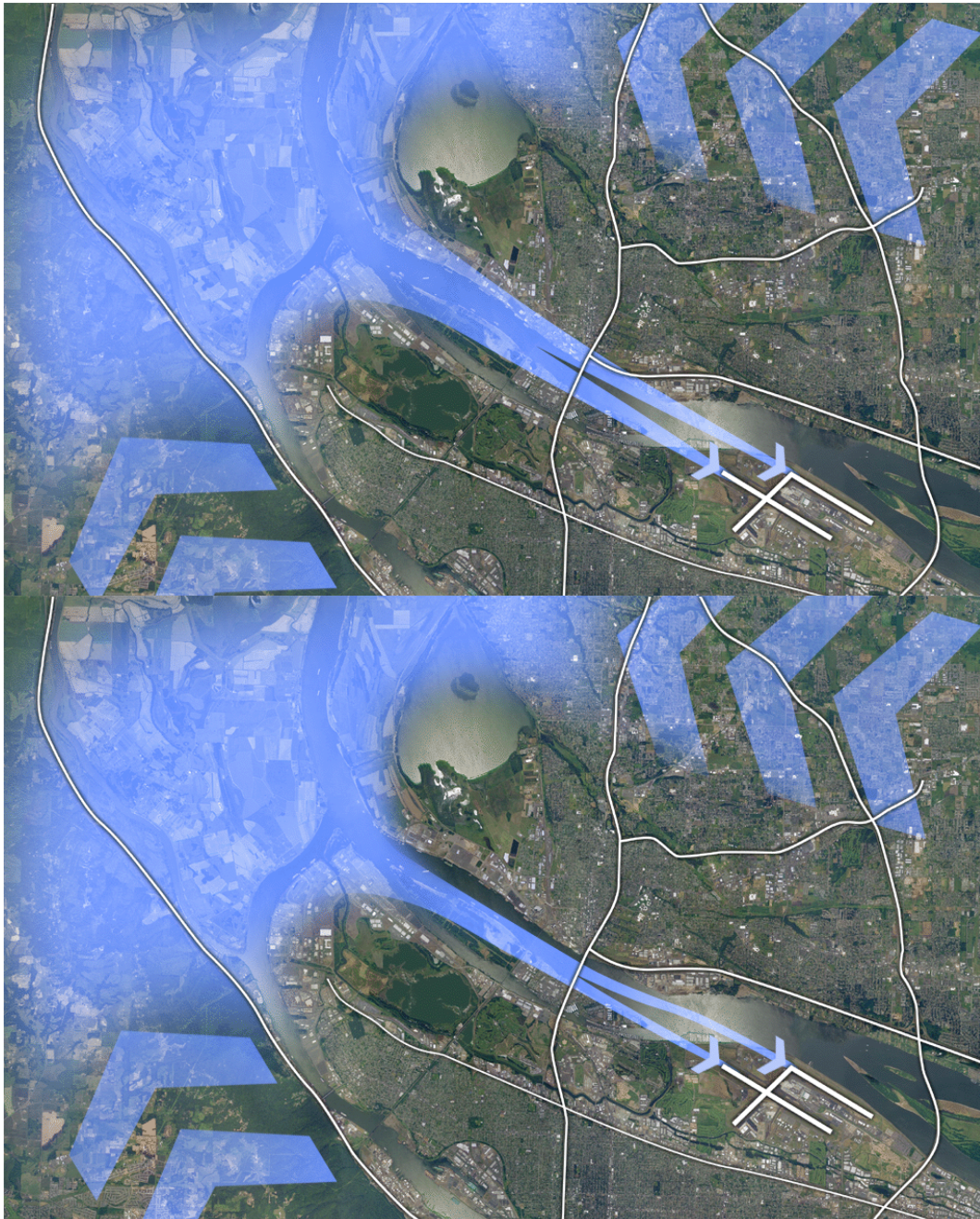
The Port would coordinate with FAA Air Traffic Control Tower (ATCT) staff to assist them in developing procedures to achieve the stated goals.

TIME FRAME

These arrival procedures can be initiated immediately and are not dependent upon other recommendations, although an environmental review will be required.

FIGURE H10

RECOMMENDATION 5 JET AIRCRAFT ARRIVALS FROM THE WESTSIDE STEP TO RUNWAY 10L



RECOMMENDATION 5:***JET AIRCRAFT ARRIVING FROM THE WEST - DEVELOP A SIDESTEP APPROACH TO RUNWAY 10L FOR ARRIVALS FROM THE WEST*****GOAL**

To concentrate arrival paths over water and other compatible land uses and to explore a new visual approach procedure, using available navigation technologies allowing for more precise flight paths, for aircraft landing on Runway 10L that would shift the flight path from downtown Vancouver to over the Columbia River channel.

ACTION

This recommendation would develop an approach to Runway 10L where aircraft would line up approximately 10-12 miles from the runway end on their final approach to PDX. Aircraft arriving on Runway 10L would align with Runway 10R for their approach; within 2-3 miles from the end of the runway, these aircraft would sidestep to approach Runway 10L, and avoid more densely populated areas lying underneath the extended centerline of Runway 10L. Preliminary definition of the recommended tracks is shown in Figure H10 and would be refined in coordination with the FAA to achieve the stated objectives.

COMMENTS

This recommendation would allow some aircraft to fly an approach that aligns the aircraft as if it were approaching the southern parallel runway during east flow conditions. It is understood that this procedure will be usable only during low traffic and visual weather conditions, resulting in fewer straight-in flights than used today to runway 10L. The remaining arrivals would continue to use the same straight-in arrival paths used today.

COST

The cost associated with this alternative may be approximately \$1,000,000 for NEPA review.

RESPONSIBLE PARTIES

The FAA would be responsible for implementing the procedures. The Port of Portland would be responsible for requesting the FAA Air Traffic Division develop these procedures and working with them to ensure that the procedures achieve the goals. The FAA would be responsible for developing and implementing the procedures that achieve the stated goals and in accordance with the safe and efficient use of the surrounding airspace. FAA would also be responsible for the environmental documentation.

AIRPORT ACTION

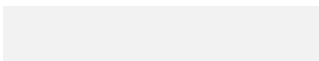
The Port would coordinate with the FAA Air Traffic Control Tower (ATCT) staff to assist them in developing procedures to achieve the stated goals.

TIME FRAME

These arrival procedures can be initiated immediately and are not dependent upon other recommendations, although an environmental review will be required.

FIGURE H11

RECOMMENDATION 6 JET AIRCRAFT ARRIVING BETWEEN 10 PM AND 7 AM CONTRA-FLOW



RECOMMENDATION 6:***NIGHT TIME JET ARRIVALS (10PM – 7AM) – DEVELOP A CONTRA-FLOW PROGRAM THAT ALLOWS AIRCRAFT TO LAND TO THE WEST IN THE OPPOSITE DIRECTION DURING NORMAL EAST FLOW OPERATIONS WHEN TRAFFIC IS LOW*****GOAL**

The goal is to minimize noise exposure to surrounding populations by significantly reducing long approaches over the community, to land on runway 10L/10R, during the nighttime hours of 10pm to 7am, or as otherwise defined by traffic conditions. During these hours, and during conditions where aircraft would normally be landing and departing to the east, aircraft would be allowed to land in the opposite direction to the west (a.k.a. contra-flow). See Figure H11 which compares the existing normal path with the proposed contra-flow. Contra-flow to and from the east would result in the lowest noise exposure, based on population density. Runway use goals encourage the use of runways that result in the smallest number of residents being over flown. During all hours, operations on the crosswind runway are to be minimized. This continues an existing policy.

ACTION

This recommendation is to develop, during the nighttime operational procedures to allow the airfield to operate in contra-flow. This program would be implemented only when wind and weather conditions allow arrivals from the east and departures to the east, and when traffic conditions permit. This would result in the lowest noise exposure to more densely populated areas, when considering east versus west population. This procedure would be used by all aircraft operating during those hours, including jets, large turboprops, and regional cargo aircraft.

COMMENTS

This procedure would establish an informal nighttime runway use program that would place arriving and departing aircraft on opposite flows, during the night time hours. When wind, weather, and activity levels allow, aircraft would arrive on Runway 28R and depart on Runway 10L/10R. It is understood that even during some night time hours this procedure could result in delay. However, because of the sensitivity of noise during the night time hours, the Port encourages the FAA to allow this minimal delay. Because aircraft would be arriving and departing in the opposite direction, called contra-flow, this procedure could not be used during high-activity periods. Aircraft normally depart and arrive in the same direction, into the wind. Contra-flow operations (sometimes referred to as “head-to-head” operations) change how aircraft arrive and depart. Instead of aircraft arriving and departing on Runway 10L, aircraft would arrive and depart using essentially the same flight path in and out of the airport. For example, aircraft would arrive from the east on Runway 28R and depart to the east on Runway 10L/10R.

Preliminary review of the operational and weather data assumes about 15-20% of the night time departures and arrivals of all aircraft could be shifted to this procedure.

COST

The cost associated with this alternative may be approximately \$1,000,000 for NEPA review.

RESPONSIBLE PARTIES

The FAA would be responsible for implementing the procedures. The Port of Portland would be responsible for requesting the FAA Air Traffic Division develop these procedures and working with them to ensure that the procedures achieve the goals. The FAA would be responsible for developing and implementing the procedures that achieve the stated goals and in accordance with the safe and efficient use of the surrounding airspace. They would also be responsible for the environmental documentation.

AIRPORT ACTION

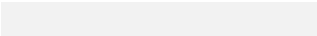
The Port would coordinate with FAA Air Traffic Control Tower (ATCT) staff to assist them in developing procedures to achieve the stated goals.

TIME FRAME

These contra-flow procedures can be initiated immediately and are not dependent upon other recommendations, although an environmental review will be required.

FIGURE H12

RECOMMENDATION 7 NIGHT TIME PREFERENTIAL RUNWAY USE



RECOMMENDATION 7:***DEVELOP A NIGHT TIME PREFERENTIAL RUNWAY USE PROGRAM (10 PM-7 AM)*****GOAL**

The goal is to alter the existing use of the parallel runway system by reducing aircraft over flights to area residents during the FAA defined nighttime hours between 10pm and 7am.

ACTION

This recommendation is to develop a preferential runway use program during night time hours. The current calm wind policy that specifies east flow is would continue. In west flow, arrivals are preferred to Runway 28R (north runway) and departures from Runway 28L (south runway). In east flow, arrivals and departures would be preferred on Runway 10R (south runway) whenever possible. Figure H12 depicts the preferential runways proposed to be used during night time hours. Due to taxiway constraints, Runway 10L (north runway) may be used for departures if needed. The night time system would apply to all aircraft, weather conditions permitting.

COMMENTS

The nighttime preferential runway system would be an informal, voluntary program and apply to all aircraft types, all jets, large turboprops and regional cargo carriers. This program would result in two plans, one for east flow and one for west flow. Preferential runway use systems are effective tools for reducing late night noise impacts by concentrating aircraft noise over compatible or lower density land uses. The lack of an east side, north-south taxiway may limit this program to some degree for west bound departures off runway 28R and 28L. It is understood that during some night hours that this procedure could result in delay. However, because of the sensitivity of night noise, the Port encourages the FAA to allow this small impact on delay.

COST

The cost associated with this alternative may be approximately \$1,000,000 for NEPA review.

RESPONSIBLE PARTIES

The FAA would be responsible for implementing the procedures. The Port of Portland would be responsible for requesting the FAA Air Traffic Division develop these procedures and working with them to ensure that the procedures achieve the goals. The FAA would be responsible for developing and implementing the procedures that achieve the stated goals and in accordance with the safe and efficient use of the surrounding airspace. They would also be responsible for the environmental documentation.

AIRPORT ACTION

The Port would coordinate with FAA Air Traffic Control Tower (ATCT) staff to assist them in developing procedures to achieve the stated goals.

TIME FRAME

These preferential runway procedures can be initiated immediately as an informal, voluntary program and are not dependent upon other recommendations. In addition, an environmental review will be required.

RECOMMENDATION 8:

ESTABLISH A PILOT AWARENESS PROGRAM THAT ENCOURAGES LIMITING USE OF REVERSE THRUST ON LANDING ON A VOLUNTARY BASIS

GOAL

The goal is to reduce the noise from reverse thrust when aircraft land at PDX. Thrust reversers redirect the flow of the jet engine thrust toward the front of the aircraft. Reversing the power in this way slows the aircraft when on the ground. The use of reverse thrust is at the pilot’s discretion/control and is based on stability and safety.

ACTION

This recommendation is two fold; one is to encourage pilots, when safe, to voluntarily make less use of reverse thrust; and two, in future airport planning, the Port would evaluate the feasibility of developing additional high-speed taxiway exits to facilitate the reduced use of reverse thrust..

COMMENTS

Aircraft currently deploy reverse thrust at the pilot’s control during landing. Use of reverse thrust is based on runway conditions, landing conditions, and weather conditions, once aircraft are on the runway. The installation of additional high-speed exit taxiways, where appropriate, could facilitate a decrease in the use of reverse thrust. In future airfield planning efforts it is appropriate to plan and design high-speed taxiways, where appropriate and feasible. The FAA Air Traffic would evaluate the impact of this recommendation on Runway Occupancy Times (ROT), which influence separation standards on final approach.

COST

Air carriers and cargo carriers would be notified and requested to notify pilots of this request to voluntarily use less reverse thrust on landing. The cost to implement this recommendation would be minimal, as it would be incorporated into the regular airfield planning process for future high-speed taxiways.

RESPONSIBLE PARTIES

Pilots would be responsible for voluntarily reducing the use of reverse thrust when safety and other conditions allow. The Port of Portland would be responsible for incorporating

potential high-speed exit taxiways into future airfield planning activities and for notifying airport users to request voluntary reduced use of reverse thrust.

AIRPORT ACTION

The Port would coordinate with airport tenants/users to achieve the stated goals and would consider high-speed exit taxiways in future airfield planning.

TIME FRAME

The voluntary reduction in the use of reverse thrust is not dependent upon other recommendations, and high-speed exit taxiways can be considered in the continuing airfield planning effort.

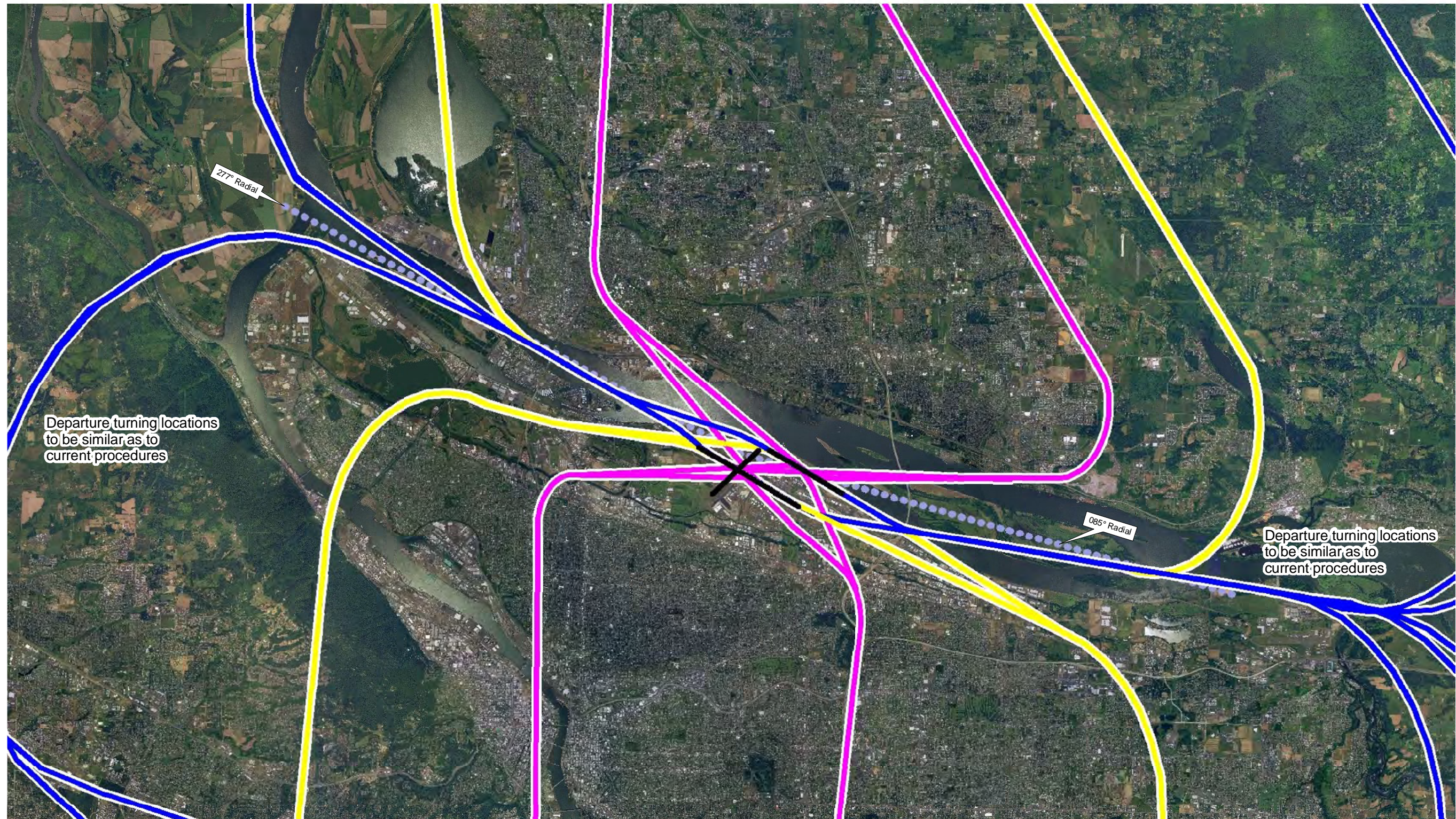


FIGURE H13
DEPARTURE FLIGHT TRACK LOCATION GOALS

SOURCE: THE JD WHITE COMPANY, PORTLAND, OREGON
BRIDGENET INTERNATIONAL, COSTA MESA, CALIFORNIA

June 2006

Flight Track Legend

- Jets
- High Performance Propeller
- Low Performance Propeller

Noise Mitigation/Land Use Compatibility Recommendations

For Recommendations 9-19, compatible land uses refers to those land use guidelines described in the FAA Land-Use Compatibility Guidelines found in 14 CFR Part 150, Chapter 1, Appendix A, Table 7. A copy of Table 7 is located at the end of this chapter. This land use compatibility table is also accepted as the basis for land use planning in Oregon and Washington states. Typical non compatible land uses at or above the 65 DNL noise contour include residences, schools and nursing homes. The decision to allow construction of, or otherwise regulate development, rests with local governments. In general, most land uses (including residential) are considered compatible below the 65 DNL level. As a result, these recommendations focus on the areas at or above the 65 DNL.

These recommendations refer to the average annual Day Night Level (DNL), which is synonymous with the term “Ldn” which is sometimes used. DNL is the approved measure used by the Federal Aviation Administration (FAA) for evaluating aircraft noise exposure. The DNL noise metric is also accepted by the states of Oregon and Washington for use in land use planning. In order to determine and define the DNL contours or boundaries for airports, the FAA developed the Integrated Noise Model (INM). This FAA approved model uses an array of data inputs that includes detailed information on aircraft operations, such as the number of aircraft operations by individual aircraft type, runways used to arrive and depart, time of day flights occur, flight procedures used, and direction flown. The model uses these inputs to develop the DNL noise contours.

The noise level an individual may experience from a single aircraft event overhead is typically louder than the average DNL level. However, DNL provides a noise measure that accurately reflects the highest cumulative noise levels over a year’s period of time. One of the limitations of the average annual DNL noise metric is the fact that no one is ever awakened by an annual average. People are impacted by a single aircraft over flight that wakes them up or disturbs a conversation. People’s individual sensitivity to noise also varies greatly. A noise event that one person doesn’t notice may be highly bothersome to another person. Given all these factors, the DNL noise metric remains the Federal, State and local noise standard used to measure compatible land use.

There are two types of land use recommendations. The first include remedial measures which apply to existing structures that are already built at or above the 65 DNL contour. These measures are voluntary options for homeowners – they may elect not to participate at all. The second are preventative measures which apply to future development to “prevent” new, incompatible structures from being built that would increase the number of people living in the noise contours. Preventative measures also include noise disclosure statements and noise easements to inform people about aircraft noise before

they move into an area, or when they develop or acquire property. These recommendations apply at or above the 65 DNL noise contour and would be applied to developers seeking to build new construction.

RECOMMENDATION 9:***HOME SOUND PROOFING - PROVIDE SOUND ATTENUATION FOR OWNER-OCCUPIED SINGLE FAMILY RESIDENCES AND DEVELOP A PILOT PROGRAM FOR MULTI-FAMILY, OWNER-OCCUPIED RESIDENTIAL STRUCTURES*****GOAL**

The goal is to reduce the impact of aircraft noise on residences located at or above the 65 DNL noise contours identified in the 2005 Noise Exposure Map.

ACTION

It is recommended that the Port of Portland sound attenuate, on a voluntary basis, those owner-occupied single-family houses, and develop a pilot program for owner occupied multi-family structures at or above the 65 DNL noise contours. (Floating homes are addressed in Recommendation 10). This would be a voluntary action available only to owner-occupied structures. In consideration of receiving sound attenuation, the owner(s) would grant to the Port of Portland a permanent noise easement that would encumber the property.

A pilot program would be developed for multi-family structures to determine if sound attenuation is a feasible option for these types of residential structures. If it is determined to be feasible, then multi-family structures may be sound attenuated.

COMMENTS

FAA policy prohibits use of federal funds to sound insulate homes constructed after October 1, 1998, within the 65 DNL noise contour. This recommendation would allow those homeowners whose homes were built prior to October 1, 1998 on sites at or above the 65 DNL noise contours to receive sound attenuation for their homes. FAA guidelines recommend measures to achieve an outdoor to indoor noise reduction level (NLR) of at least 25 dB. This recommendation would convert non-compatible land uses to compatible use and would reduce the noise intrusion for those residents who decide to take advantage of this program. The Port of Portland would obtain a noise easement in return for funding the sound attenuation.

Based on the experience in Seattle, homes in the Pacific Northwest located at or above the 65 DNL contour are often well constructed. As a result, when an audit is performed

of the interior levels, the homes are found to not meet FAA eligibility criteria. Interior noise levels meet FAA standards despite the high exterior noise levels.

A pilot program would be developed so that owner-occupied, multi-family units, such as condominiums, could be evaluated to determine the feasibility of sound insulation. If it is found they cannot be effectively sound attenuated, then acquiring noise easements from impacted owners would be an alternative option for eligible structures.

Figure H4 shows the location of these different residential land uses within the 65 DNL and 70 DNL noise contours for the 2005 Base Case, atop an aerial base map.

COST

The cost to implement this recommendation could be as much as \$20.8 million. This includes \$1 million (estimated at \$45,000 per unit) for single-family units. If the multi-family pilot program is found to be feasible, the cost for multi-family units (estimated at \$33,000 per unit) would be approximately \$19.8 million, for a possible total cost of approximately \$20.8 million, if all eligible structures take advantage of the programs. If the additional single-family and multi-family structures within the proposed eligibility map boundary are sound attenuated, then the total estimated cost could increase and be as high as \$30 million.

RESPONSIBLE PARTIES

The Port of Portland would be responsible for preparing an RFP for consultant selection, preparing and submitting the FAA Grant application, hiring the consultant, developing the priority system and priority manual, notifying eligible homeowners of options and implementing the program. The FAA would be responsible for helping fund such programs, if funds are available.

AIRPORT ACTION

The Port of Portland would prepare an RFP for consultant selection, prepare and submit the FAA grant application, hire the consultant, develop the priority system and priority manual, notify eligible homeowners of options and implement the program contingent upon federal funding. The Port would provide matching funds, as required for the FAA grant, and may hire an employee to manage implementation of the recommendation.

TIME FRAME

This recommendation is slated for implementation in 2006 or beyond, contingent upon FAA approval and funding.

RECOMMENDATION 10:

FLOATING HOME SOUND PROOFING - INVESTIGATE POSSIBLE SOLUTIONS TO MITIGATE NOISE FOR OWNER OCCUPIED FLOATING HOMES, USED AS PRIMARY RESIDENCES

GOAL

The goal is to reduce the impact of aircraft noise on floating homes located at or above the 65 DNL noise contours based on the 2005 Noise Exposure Map.

ACTION

There may be up to 22 floating homes (a structure, used primarily as a dwelling unit which is supported by a floatation system and held in place with piling and a mooring system) at or above the 65 DNL noise contours. It is recommended the Port research and identify any floating homes and nature of ownership interest at or above the 2005 Noise Exposure Map 65 DNL noise contours. The Port would work with these floating home owners who have purchased moorage and/or land rights, and to the extent feasible, the moorages where they are located, to identify the desirability of different mitigation options and costs. This would include a possible pilot program to determine the feasibility of sound attenuation for these structures on a voluntary basis.

COMMENTS

Based on FAA criteria, floating homes may be eligible for sound attenuation using federal funds. However, they must meet certain other criteria: the floating home must be a permanent structure (no engines); must be traditionally constructed (stick built, with the only difference being the foundation); be capable of having sound insulation installed that results in a positive benefit; and the total cost of the sound attenuation must be reasonable in relationship to the value of the property.

FAA policy prohibits use of federal funds to sound insulate homes constructed after October 1, 1998, within the 65 DNL noise contour. This recommendation would allow those floating homeowners with homes built and located at their moorage prior to October 1, 1998, at or above the 65 DNL noise contours, to receive sound attenuation for their homes. FAA guidelines recommend measures to achieve an outdoor to indoor noise reduction level (NLR) of at least 25 dB. This recommendation would convert non-compatible land uses to compatible use and would reduce the noise intrusion for those residents who decide to take advantage of this program. The Port of Portland would obtain a noise easement in return for funding the sound attenuation.

If a pilot program is determined to be feasible, two or three representative floating homes, within the 65 DNL contour (or above), used as a primary residence, would be selected for sound attenuation. Representative floating homes would be selected based on construction techniques, size, and value, compared to other floating homes. If the pilot program determines that sound attenuation is feasible, this recommendation would allow those homeowners who meet specific criteria at or above the 65 DNL noise contours to receive sound attenuation to reduce inside noise levels. If it is found that floating homes cannot be effectively sound attenuated, then acquiring noise easements from impacted owners would be an alternative option for eligible structures.

COST

Assuming the pilot program is determined to be successful, and the cost to sound attenuate would be approximately the same as a single-family residence and there are two or three “test” structures in the pilot program, the cost would be approximately \$90,000-100,000, plus administrative costs, for a total of approximately \$135,000.

RESPONSIBLE PARTIES

The Port of Portland would be responsible for doing the historical research and working with the floating home community to identify the desirability of different mitigation options. The Port would be responsible for implementing the desired sound proofing options. Implementation of sound proofing measures for floating homes assumes they are federally eligible. Any sound proofing program would be contingent on federal funding. The floating home community would be responsible for working with the Port in identifying feasible options and actions.

AIRPORT ACTION

The Port of Portland would be responsible for doing the historical research and working with the floating home community to identify the desirability of different mitigation options. The Port would be responsible for implementing the desired sound proofing options. Implementation of sound proofing measures for floating homes assumes they are federally eligible. Any sound proofing program would be contingent on federal funding. The Port would provide matching funds, as required for the FAA grant.

TIME FRAME

This recommendation is slated for implementation in 2006 or beyond, contingent upon FAA approval and funding.

RECOMMENDATION 11:

PURCHASE NOISE EASEMENTS FROM OWNERS OF SINGLE-FAMILY RESIDENTIAL DEVELOPMENTS THAT DO NOT WISH TO BE SOUND INSULATED

GOAL

The goal is to address land use compatibility issues at or above the 65 DNL noise contour by providing an alternative option for homeowners who do not wish to be sound insulated, based on the 2005 Noise Exposure Map.

ACTION

It is recommended that the Port offer to purchase Noise Easements from owners of single-family, owner-occupied homes at or above the 65 DNL noise contour that do not want to sound attenuate their homes.

COMMENTS

Some homeowners may not want the intrusion of contractors providing sound insulation for their homes, or may not be disturbed by aircraft noise. However, they may want to take advantage of the option of having the Port acquire a noise easement over their property.

The Noise Easement would allow homeowners currently residing at or above the 65 DNL noise contour to grant a noise easement to the Port, which would grant the right for aircraft to fly over their home and generate noise. The easement would permanently encumber the property and would be binding on subsequent purchasers. The noise easement would result in homeowners relinquishing their right to sue the Port for noise intrusion, within the conditions described in the easement.

This recommendation would pertain to single-family structures only. Noise easements are only available for owners of the eligible fee simple property, not renters. This may become a viable option for multi-family homes after the multi-family pilot program is completed and the results of that program are determined. This recommendation would be offered at the same time as sound attenuation. These programs are all contingent upon the availability of Federal funds.

COST

Assuming an estimate of \$4,000 per easement and three (3) homes out of the eligible 22 single family units decide to take this option, the cost to implement this recommendation would be approximately \$12,000. The assumption is based on other airport's experience; approximately 10% of eligible owners decline sound proofing and elect an easement.

RESPONSIBLE PARTIES

The Port of Portland would be responsible for preparing an RFP for consultant selection, preparing and submitting the FAA grant application, hiring the consultant, developing the priority system and priority manual, notifying eligible homeowners of options and

implementing the program. The FAA would be responsible for helping fund such programs, if funds are available.

AIRPORT ACTION

The Port of Portland would prepare an RFP for consultant selection, prepare and submit the FAA grant application, hire the consultant, develop the priority system and priority manual, notify eligible homeowners of options and implement the program upon receiving funding. The Port would provide matching funds, as required for the FAA grant, and may hire an employee to manage implementation of the recommendation.

TIME FRAME

This recommendation is slated for implementation in 2006 or beyond, contingent upon FAA funding.

RECOMMENDATION 12: REMOVED

INVESTIGATE POSSIBLE SOLUTIONS TO REDUCE NOISE EXPOSURE FOR RESIDENTS OF MOBILE HOMES

RECOMMENDATION 13:

ENHANCE LOCAL GOVERNMENT NOISE OVERLAY CODES BY IMPLEMENTING LAND USE RECOMMENDATIONS 14-19.

GOAL

The goal is to protect the health, safety, and welfare of the public through the prevention of new non-compatible land uses at or above the 65 DNL noise contours.

ACTION

It is recommended that the City of Vancouver enhance its existing Noise Impact Overlay District and the City of Portland enhance its Noise Impact Zone to include areas at or above the 65 DNL noise contour through incorporation of boundary adjustments and the land use recommendations that follow, as applicable. The Port recognizes that some of these measures are already incorporated into the applicable zoning provisions of these cities.

COMMENTS

Portland and Vancouver have existing codes that define requirements for properties that lie within the Noise Impact Zone and the Noise Impact Overlay District, respectively. The codes require developers building within these areas to disclose noise and meet certain building code requirements for sound insulation. The City of Portland also

requires a Noise Easement. City codes should be reviewed to ensure future incompatible land uses are minimized.

The 65 DNL noise contour extends beyond the City of Vancouver Noise Overlay Impact District (herein called Overlay District) boundary on the east and south sides of the District. Although this area is currently mostly industrial, the land use could be modified to permanent residential development. Therefore, this area should be contained in the Overlay District by expanding the boundary if there is any modification allowing noise sensitive land uses.

COST

Based on the package of recommendation, as many as two additional Port employees may be required to implement these programs with total annual cost of \$150,000 or more (including payroll and benefits). The two local jurisdictions may experience staff costs as well, estimated to be in the \$30,000 to \$40,000 range.

RESPONSIBLE PARTIES

The Port of Portland would be responsible for recommending to the local jurisdictions that this specific action be taken in accordance with the recommendation. The local jurisdictions would be responsible for implementing such recommendations.

AIRPORT ACTION

The Port would work with the jurisdictions to help them understand the importance and implications of not taking any action. The Port would meet with each jurisdiction's planners to establish a process, if one doesn't exist, to ensure land use applications are reviewed. No FAA action is necessary.

TIME FRAME

This recommendation is slated for implantation in 2006 or beyond.

RECOMMENDATION 14:

NEW MOBILE HOMES AND MOBILE HOME PARKS - PROHIBIT NEW MOBILE HOME PARKS, OR MOBILE HOMES OUTSIDE OF EXISTING PARKS, WITHIN THE LOCAL NOISE OVERLAY ZONES

GOAL

The goal is to protect the health, safety, and welfare of the public through the prevention of new non-compatible land uses at or above the 65 DNL noise contours.

ACTION

It is recommended that the City of Vancouver and the City of Portland prohibit new mobile home parks, and new mobile homes outside of existing mobile home parks, within their respective Noise District/Zone boundaries, if such prohibition does not already exist. The plan recommends prohibiting new residential mobile home parks, as well as prohibiting mobile homes (including residential trailers) and manufactured homes outside of existing mobile home parks, unless certified by the manufacturer that they meet appropriate sound attenuation requirements consistent with the City of Vancouver Noise Impact Overlay District and the City of Portland PDX Airport Noise Impact Zone.

COMMENTS

Mobile homes, particularly older ones, generally cannot be sound attenuated to achieve the same reduction in inside noise levels as can be achieved by other single family residential structures. An exception to this recommendation would be if the manufacturer of a mobile home could certify that the home achieves the sound attenuation required by city code or was constructed so that it could be sound attenuated.

COST

Based on the package of recommendation, as many as two additional Port employees may be required to implement these programs with total annual cost of \$150,000 or more (including payroll and benefits). The two local jurisdictions may experience staff costs as well, estimated to be in the \$30,000 to \$40,000 range.

RESPONSIBLE PARTIES

The Port of Portland would be responsible for recommending to the local jurisdictions that this specific action be taken in accordance with the recommendation. The local jurisdictions would be responsible for implementing such recommendations.

AIRPORT ACTION

The Port would work with the jurisdictions to help them understand the importance and implications of not taking any action. The Port would meet with each jurisdiction's planners to establish a process, if one doesn't exist, to ensure land use applications are reviewed. No FAA action is necessary.

TIME FRAME

This recommendation is slated for implantation in 2006 or beyond.

RECOMMENDATION 15

NEW NOISE SENSITIVE LAND USES – LIMIT OR REQUIRE SOUND PROOFING FOR NEW NOISE SENSITIVE USES AT OR ABOVE THE 65 DNL NOISE CONTOUR AND WITHIN THE EXTENDED CENTERLINE OF THE PDX CROSSWIND RUNWAY WITHIN THE LOCAL NOISE OVERLAY ZONES

GOAL

The goal is to protect the health, safety, and welfare of the public through the prevention or mitigation of new non-compatible land uses at or above the 65 DNL noise contours.

ACTION

It is recommended that the City of Vancouver and the City of Portland limit or prohibit new, noise sensitive uses (as set forth in Table 7, 14 CFR Part 150, Chapter 1, Appendix A, FAA Land Use Compatibility Guidelines) within their respective noise overlay zones. It is also recommended that noise sensitive uses, including residential, be prohibited within a 1,000' wide corridor centered on the extended centerline and extending one mile beyond each end of the crosswind runway. The FAA Land Use Compatibility guidelines identify noise sensitive uses to include but not be limited to schools, hospitals, nursing homes, etc.

COMMENTS

These types of noise sensitive uses either provide sleeping areas or require quiet conditions to provide adequate services. If sound attenuation is deemed appropriate, then these structures should be required to meet the sound attenuation standards for structures at or above the 65 DNL, as set forth in Table 7, 14 CFR Part 150, Chapter 1, Appendix A, FAA Land Use Compatibility Guidelines. A copy of Table 7 is located at the end of this chapter. Noise easements should also be required for any noise sensitive structures allowed to be constructed.

The City of Portland PDX Airport Noise Impact Zone does not extend beyond the ends of the crosswind runway to adequately address noise sensitive uses along the extended centerline of the crosswind runway. The City of Vancouver Noise Impact Overlay District does not include the extended centerline of the crosswind runway. Although it is the intent to minimize use of the crosswind runway, and there are not sufficient operations to generate a 65 DNL contour off the end of the crosswind runway, the operations that do take place on the crosswind runway can affect noise sensitive uses directly under the approach/departure paths. Compared to the Columbia River corridor, the land uses off the ends of the crosswind runway consist of significantly higher density residential uses. Therefore, it is recommended that an extended centerline area be included in the Portland and Vancouver applicable noise overlays. In addition, expansions of existing noise sensitive uses by local jurisdictions should be required to meet the sound insulation criteria set forth in the FAA Land Use Compatibility Guidelines and provide noise easements.

COST

Based on the package of recommendations, as many as two additional Port employees may be required to implement these programs with total annual cost of \$150,000 or more

(including payroll and benefits). The two local jurisdictions may experience staff costs as well, estimated to be in the \$30,000 to \$40,000 range.

RESPONSIBLE PARTIES

The Port of Portland would be responsible for recommending to the local jurisdictions that this specific action be taken in accordance with the recommendation. The local jurisdictions would be responsible for implementing such recommendations.

AIRPORT ACTION

The Port would work with the jurisdictions to help them understand the importance and implications of not taking any action. The Port would meet with each jurisdiction's planners to establish a process, if one doesn't exist, to ensure land use applications are reviewed.

TIME FRAME

This recommendation is slated for implantation in 2006 or beyond.

RECOMMENDATION 16:

NEW FLOATING HOMES AND MOORAGES - PROHIBIT NEW FLOATING HOMES OR MOORAGES THAT CAN BE USED AS A PRIMARY RESIDENCE, OR REQUIRE SOUND ATTENUATION WITHIN THE LOCAL NOISE OVERLAY ZONES

GOAL

The goal is to protect the health, safety, and welfare of the public through the prevention or mitigation of new non-compatible land uses at or above the 65 DNL noise contours.

ACTION

It is recommended that new floating homes or moorages that can be used as a primary residence be prohibited, or that sound attenuation of such floating homes be required within the City of Vancouver Noise Impact Overlay District and the City of Portland PDX Airport Noise Impact Zone.

COMMENTS

If new floating homes that will be used as a primary residence are proposed within the City of Portland or City of Vancouver noise overlays, they should be required, just as other residential uses, to achieve applicable sound attenuation during their construction, or be retrofitted for that purpose prior to being able to move to any moorage site located at or above the 65 DNL noise contour. If a floating home cannot be sound attenuated, then it should not be allowed to be placed within the 65 DNL or higher noise contour. Noise easements and noise disclosures should be required, similar to conventional housing.

COST

Based on the package of recommendation, as many as two additional Port employees may be required to implement these programs with total annual cost of \$150,000 or more (including payroll and benefits). The two local jurisdictions may experience staff costs as well, estimated to be in the \$30,000 to \$40,000 range.

RESPONSIBLE PARTIES

The Port of Portland would be responsible for recommending to the local jurisdictions that this specific action be taken in accordance with the recommendation. The local jurisdictions would be responsible for implementing such recommendations.

AIRPORT ACTION

The Port would work with the jurisdictions to help them understand the importance and implications of not taking any action. The Port would meet with each jurisdiction's planners to establish a process, if one doesn't exist, to ensure land use applications are reviewed. No FAA action is necessary.

TIME FRAME

This recommendation is slated for implantation in 2006 or beyond, contingent upon FAA approval.

RECOMMENDATION 17:

NOISE EASEMENTS - REQUIRE NOISE EASEMENTS FOR NEW RESIDENTIAL CONSTRUCTION AT OR ABOVE THE 65 DNL NOISE CONTOURS, CONSISTENT WITH LOCAL CITY CODE ADOPTED NOISE BOUNDARIES

GOAL

The goal is to protect the health, safety, and welfare of the public through the prevention or mitigation of new non-compatible land uses at or above the 65 DNL noise contours.

ACTION

It is recommended that all jurisdictions with residential zoning within the 65 DNL and greater noise contours require noise easements for new residential construction and other noise sensitive land uses at or above the 65 DNL.

COMMENTS

This recommendation is to amend the City of Vancouver Noise Impact Overlay District to include the requirement that a noise easement be granted for all new residential uses at or above the 65 DNL noise contour. The City of Vancouver does not presently require the granting of such noise easements.

It has become evident through this study that noise concerns extend beyond the 65 DNL noise contour. However, federal and state guidelines only define such uses as incompatible at or above the 65 DNL noise contours. The granting of a noise easement to the Port for new construction would result in prospective homeowners having actual knowledge that they are purchasing a home in an area that is impacted by aircraft noise.

COST

Based on the package of recommendations, as many as two additional Port employees may be required to implement these programs with total annual cost of \$150,000 or more (including payroll and benefits). The two local jurisdictions may experience staff costs as well, estimated to be in the \$30,000 to \$40,000 range.

RESPONSIBLE PARTIES

The Port of Portland would be responsible for recommending to the local jurisdictions that this specific action be taken in accordance with the recommendation. The local jurisdictions would be responsible for implementing such recommendations.

AIRPORT ACTION

The Port would work with the jurisdictions to help them understand the importance and implications of not taking any action. The Port would meet with each jurisdiction's planners to establish a process, if one doesn't exist, to ensure land use applications are reviewed.

TIME FRAME

This recommendation is slated for implantation in 2006 or beyond, contingent upon FAA approval.

RECOMMENDATION 18: REMOVED

NOISE DISCLOSURES FOR PROSPECTIVE PURCHASERS AT OR ABOVE THE 55 DNL NOISE CONTOUR

RECOMMENDATION 19:

PUBLIC POLICY CONSIDERATION OF AIRCRAFT NOISE AND LAND USE CHANGES

GOAL

The goal is to recommend local jurisdictions consider aircraft noise when developing or changing short and long-term development plans, rezoning etc., at or above the 55 DNL noise contour based on the 2005 Noise Exposure Map.

ACTION

It is recommended that jurisdictions with land use authority consider aircraft noise when developing public policy or reviewing development actions or plans, at or above the 55 DNL contour. For example, while residential land use and outdoor amphitheatres are defined as a compatible below the 65 DNL contours, the Port and local government officials continue to receive calls from residents living or recreating in these areas who are impacted by aircraft noise. Local jurisdictions should consider their actions in light of aircraft noise when considering land use reviews, long-term plans, rezoning, redevelopment, higher densities, understanding that while construction techniques can mitigate interior noise levels, outdoor noise levels will remain bothersome to some people. This is an issue of particular concern during summer months when people are outdoors gardening or barbequing and PDX is in west flow operations (aircraft departing towards the west).

COMMENTS

Sometimes public policy objectives for development may conflict with noise generated by aircraft from PDX. For instance, conversion of compatible land uses (vacant industrial or commercial) to non-compatible land uses (loft apartments or townhouses) to meet the policy to “enhance downtown residential opportunities”, may place more residential units within an area affected by aircraft noise that may be bothersome to some members of the public. As cities revisit their comprehensive plans or undertake planning for sub-areas, public objectives should be reviewed to ensure development decisions would support the public objective of reducing noise impacts on underlying uses. For example, if consideration were being given to developing an outdoor concert venue, a review should be conducted to ensure that aircraft do not routinely fly overhead at a level that would be incompatible.

COST

The cost to implement this recommendation is estimated to be negligible and within staff budgets.

RESPONSIBLE PARTIES

The Port would coordinate with the various jurisdictions as they update their applicable zoning codes or land use plans. The local jurisdictions would be responsible for coordinating with airport staff and implementing the recommendations to avoid policy conflicts.

AIRPORT ACTION

The Port would work with the jurisdictions to help them understand the importance and implications of not taking any action. The port would meet regularly with each jurisdiction’s planners to review pending, major land use actions.

TIME FRAME

This recommendation is slated for implementation in 2006 or beyond.

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

Numbers in parentheses refer to NOTES.

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

TABLE KEY

SLUCM	Standard Land Use Coding Manual.
Y(Yes)	Land Use and related structures compatible without restrictions.
N(No)	Land Use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30 or 35	Land Use and related structures generally compatible; measures to achieve NLR of 25, 30 or 35 dB must be incorporated into design and construction of structure.

NOTES

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

Table H5
FAR Part 150 Land Use Compatibility Matrix

SOURCE: FAR PART 150 GUIDELINES.



Noise Program/Administrative Recommendations

The Noise Program Recommendations are instrumental to the implementation of the operational and land use recommendations. These recommendations will develop administrative programs to encourage compliance with flight procedures and quiet aircraft operations. The recommendations will help educate and inform a variety of audiences as well as provide measurable outcomes and track performance with the stated goals. Recommendations 25, 26, and 27 will develop materials to improve the awareness of various audiences affected by or involved in aircraft noise.

Several of the Recommendations, 21 - the Fly Quiet Program, and 23 - the Upgrade of the Aircraft Flight Track/Noise Monitoring System are related to one another. A system upgrade is required to automate and synthesize the vast quantities of data necessary to develop and produce a Fly Quiet Program.

The Port believes these recommendations will be an important tool to move the Noise Program forward and aide in community responsiveness.

RECOMMENDATION 20:

EXPLORE OPTIONS TO RETROFIT PROPELLER AIRCRAFT WITH QUIET TECHNOLOGY PROPELLERS

GOAL

The goal is to reduce cargo aircraft single-event propeller noise from specific turboprop and piston engine aircraft, and explore funding options to encourage propeller modifications to quieter technology, where it exists.

ACTION

The Port will explore methods to encourage propeller conversions and investigate financial options that could result in three-blade propellers being replaced with four-blade propellers for the noisier propeller aircraft. This change could reduce noise levels. The cost to replace aircraft propellers is estimated to start at \$20-25,000 or more per aircraft, depending on the aircraft type. This recommendation will explore methods to encourage propeller conversions along with financial options. In addition to the financial issues, aircraft can be readily relocated; adding to the challenges of implementing this measure and ensuring PDX retains the benefits.

COMMENTS

This recommendation would review options to modify or retrofit aircraft with quieter propellers. Four-blade propellers could replace existing three-blade propellers on the most commonly flown regional cargo aircraft. Several tests have indicated that noise

reduction up to 8dB can be achieved by moving to a four-blade propeller. Initial studies also concluded that aircraft retrofitted with the four-blade propeller might reduce operating noise levels, with minimal effect on the aircraft performance. While each aircraft performs differently given weather conditions, cargo loads, and other factors, studies show that four blades are quieter. This recommendation could be pursued by the Port in working with fixed-based operators at PDX. It is intended to affect the regular operators at PDX versus the occasional operator.

Given the current financial status of the airlines, the limitations on federal funding, and restrictions on the use of other funding sources, this may be difficult to implement.

COST

The cost to retrofit propeller aircraft is estimated to be \$20,000-25,000 or more per aircraft.

RESPONSIBLE PARTIES

The Port would be responsible for exploring options to encourage regional cargo carriers to convert to four-blade propeller aircraft, along with financial sources to aid in the conversion. The Port will coordinate efforts with air carriers, follow-up noise committee members and other airport users.

AIRPORT ACTIONS

The Port would coordinate efforts with airport users and the follow-up noise committee to investigate methods to encourage the conversion.

TIME FRAME

This recommendation can be initiated whenever feasible and is not contingent upon other recommendations.

RECOMMENDATION 21:

DEVELOP AND IMPLEMENT A FLY QUIET PROGRAM

GOAL

The goal is to increase awareness and consistency concerning the use of various noise abatement procedures, including the performance of individual aircraft types or airlines. This program will provide a regular report card to the public on how the FAA and the airlines are doing in following noise procedures. It can also act as a positive incentive to reward the airlines for good performance.

ACTION

This recommendation includes the initial development of methods to increase consistency with noise abatement procedures through a Fly Quiet Program. The Program is intended to monitor and evaluate the implementation and compliance of various noise procedures. The specific parameters to be included in the reports will be defined by a follow-up noise advisory committee. Preliminary items for consideration have been developed by a sub group of the Study Advisory Committee (SAC) (see Volume two, Technical Reports, Fly Quiet Program Appendix). The preliminary priorities identified for further discussion and study include: small regional cargo feeder aircraft altitude and flight tracks, high noise level events, fleet quality, altitude of jet departures, jet flight track location, runway use, and jet arrival altitude. Implementation of this program is dependent on Recommendation 23.

COMMENTS

A working group of this Part 150's Study Advisory Committee met initially to discuss elements and some preliminary priorities for further consideration in developing a Fly Quiet Program. The group noted the importance of cross-checking the data output to ensure program goals are being achieved along with the operational procedure noise reduction goals. They also noted the importance of upgrading the existing flight tracking system to automate the reporting. Enhancements are needed to the Port's aircraft flight tracking/noise monitoring system to enable the automated collection and reporting of fleet activity relative to noise levels.

COST

The development of the Fly Quiet Program would fall under the establishment of a follow-up advisory committee (see Recommendation 22). As a result, the cost would be minimal but would require Port staff time. The cost of a new monitoring system, however, could be up to \$2.5 million (see Recommendation 23).

RESPONSIBLE PARTIES

The Port of Portland would be responsible for formulating the criteria to be evaluated in the Fly Quiet Program and working with the follow-up noise committee and local FAA Air Traffic to develop the full program.

AIRPORT ACTION

The Port would develop the Fly Quiet Program, with input from the follow-up noise committee and FAA to achieve the stated goals.

TIME FRAME

Elements of this recommendation can be initiated immediately and are not dependent upon the other recommendations. More complex elements would require a new noise monitoring system to implement. The time frame for a new monitoring system would be in approximately 2007.

RECOMMENDATION 22:

ESTABLISH A FOLLOW-UP NOISE ADVISORY COMMITTEE

GOAL

The goal is to establish a follow-up Noise advisory committee, with a balanced representation of airlines, local government, Port of Portland, the FAA, and citizen stakeholders to assist and provide continuing guidance in implementing the study recommendations. This committee will utilize knowledge developed through the Part 150 Study and help build the partnerships needed to implement these measures.

ACTION

The Port of Portland will establish a “follow-up” committee, as described above. The Part 150 Study Advisory Committee (SAC) has been instrumental in identifying and establishing these recommendations. It is recommended that a similar committee continue to monitor programs implemented as a result of the Part 150 Study after its completion, establish the particulars of the Fly Quiet Program guidelines, review flight track change progress and provide input in developing the enhancement to the aircraft flight track/noise monitoring system.

COMMENTS

Considerable time and effort has been expended, by both the Port and the SAC, in the development of these recommendations, especially the “learning curve” effort and the building of relationships that is a valuable communication tool that should be expanded upon and not lost at the end of this process.

It is important to continue to foster a feeling of trust between the airport operator and local communities during airport planning efforts. Such feelings can be developed

through the members of this or a similar type committee who represent the various sides of most issues. This ensures all interests are heard. It is also important to include members of the parties responsible for implementing the recommendations. This is important for the continued successful implementation of the noise abatement program and operation of the airport.

COST

The cost of a follow-up committee would be included in the normal operating expenses of the airport.

RESPONSIBLE PARTIES

The Port of Portland would be responsible for developing and coordinating the establishment of the follow-up noise committee. Other parties could be responsible for appointing members to the committee. Committee members would be responsible for attending and participating in committee functions.

AIRPORT ACTION

The Port would hold committee meetings on a regular basis as a means of disseminating information and gathering input on noise abatement issues. The committee would provide guidance to the Port in developing the Fly Quiet Program and provide input, as needed, to the enhancement of the aircraft flight track/noise monitoring system. The committee could also provide a forum to address other noise issues.

TIME FRAME

This recommendation can occur within the first few months of approval of the FAR Part 150 Study. It can also be implemented without regard to any other recommendation.

RECOMMENDATION 23:***UPGRADED AIRCRAFT FLIGHT TRACK/NOISE MONITORING SYSTEM*****GOAL**

The goal is to install an upgraded aircraft flight track/noise monitoring system to improve the ability to monitor flights, respond to the public in a timelier manner, and develop a Fly Quiet Program (see Recommendation 21). A key component of the upgrade will be the ability for the public to view aircraft flight tracks and related flight information via the internet.

ACTION

Develop specifications, purchase and install an enhanced aircraft flight track/noise monitoring system which will update the current system, enabling significant increases in automation. This will enhance the Noise Management Office staff's ability to research and respond to public noise inquiries. A new system will provide the information necessary to fully monitor the success of a proposed Fly Quiet Program or other proposed operational procedures.

COMMENTS

The current PDX flight tracking/noise monitoring system is dated technology making research and response to public noise inquiries labor intensive. To improve office responsiveness to the public, and to fully institute a Fly Quiet Program, the current system requires significant upgrades that will enable increased automation and the ability to synthesize large volumes of data. Based on approval contained in the last Part 150 Update, the Noise Management office has initiated work efforts to define new/updated system requirements to meet the business needs of the program.

COST

Depending upon the number of monitors, the type of system and other business needs that may be defined by the Port, the system could cost up to \$2.5 million.

RESPONSIBLE PARTIES

The Port of Portland would be responsible for preparing the specifications, receiving bids on the system, and selecting the vendor. Purchase of the system is contingent on FAA funding.

AIRPORT ACTION

The Port would develop the specifications, select a vendor, and purchase and install the equipment.

TIME FRAME

This recommendation is slated for implementation in 2007 or beyond, contingent upon FAA approval and funding.

RECOMMENDATION 24:

SUBSEQUENT PART 150 UPDATES

GOAL

The goal will be to review and update the Part 150 Study, as needed, to reflect changes in the noise environment.

ACTION

A Part 150 study is generally a five-to-seven year program recommended to be re-evaluated at regular intervals to look at noise conditions generated by the current fleet mix, the level of operations and review the five year forecasted levels. A Part 150 study is a “snapshot” in time and should be reviewed periodically. Federal regulations require a new study be completed if there is a significant increase or decrease in noise levels resulting from changes at the airport. In addition, if there is a significant change in either aircraft types or numbers of operations, or significant new facilities, the Study is recommended to be re-evaluated earlier.

COMMENTS

PDX airport management is recommended to undertake a periodic review of the aircraft types and numbers, along with the actual number of operations occurring, and determine if they are consistent with the projections contained in the FAR Part 150 document. FAR Part 150 defines the level of change necessary to trigger a revision of the Noise Exposure Map to be when any change in the operation of the airport would create any substantial new non-compatible use in any area depicted on the map beyond that which is forecast for the fifth calendar year after the date of approval. That is, if that change results in an increase or a decrease in the yearly day-night average sound level of 1.5 DNL or greater in either an area formerly compatible but is made non-compatible, or in a land area which was previously determined to be non-compatible and whose non-compatibility is not significantly increased. The various recommendations would also be reviewed for their ability to mitigate the projected noise intrusion and the overall effectiveness of the program.

Generally, at the end of the five-year study all of the forecasts and aircraft fleet mix would be re-evaluated to determine the extent to which they have changed from those projected in this study. They would be updated to reflect the following five years. If necessary, new mitigation measures would be evaluated. Contingent upon federal funds, the Noise Compatibility Program would be re-evaluated and a public review of documents would be incorporated.

COST

The cost of monitoring the information set forth in this section would be from the normal airport operating budget. Consultant assistance for various elements could range from \$150,000 to \$500,000 or more depending on the issues and changes in the noise environment.

RESPONSIBLE PARTIES

The Port of Portland would be responsible for updating and monitoring the FAR Part 150 Study when there is a significant change in aircraft types or numbers of operations. The FAA could help fund the update if there are funds available for such planning.

AIRPORT ACTION

Based on the monitoring activities described, the Port of Portland would re-evaluate the program when there is a significant change in operations, aircraft types or as appropriate.

TIME FRAME

The Port would continue its monitoring program and plan for a full update as appropriate per FAR Part 150 guidance. The operations could be reviewed annually with a full update scheduled for some time after 2010.

RECOMMENDATION 25:

DEVELOP A NOISE BROCHURE FOR PROSPECTIVE HOME BUYERS AND A VARIETY OF OTHER AUDIENCES AFFECTED BY, OR INVOLVED IN, AIRCRAFT NOISE ISSUES

GOAL

The goal is to increase the awareness of aircraft noise and reduce the possibility of noise intrusion some people may experience and find annoying. Given the seasonal change in aircraft arrivals and departures due to changes in wind direction, it is important that prospective home buyers make informed decisions before purchasing a home in the vicinity of the airport. The information used to describe aircraft noise will be based on noise contours defined by federal, state and local standards used to define noise levels and compatible land uses.

ACTION

It is recommended the Port of Portland develop a noise brochure for prospective home buyers and a variety of other audiences ranging from the general public to elected officials. The purpose of the brochure is to explain the location of PDX and the noise influence the established noise contours may have to the region. The Port will work with appropriate entities to educate and provide information.

The noise brochure will recognize the requirement in Oregon for local jurisdictions to establish airport study boundaries for planning and zoning incorporating airport noise criteria of 55 DNL. This means the 55 DNL and greater noise contours will be used in developing the noise information brochure.

COMMENTS

It is envisioned that an educational brochure would be developed and used possibly in conjunction with an educational program to inform a variety of audiences, ranging from citizens to professionals and elected officials, about the location of properties in relation to the airport and the possible influence of aircraft noise on those properties.

COST

It is estimated that the cost of this brochure and its distribution would be approximately \$30,000.

RESPONSIBLE PARTIES

The Port would be responsible for developing and printing the brochure, and meeting with and distributing the brochure to a variety of audiences.

AIRPORT ACTION

The Port would develop and print the brochure, distribute it to tenants and FBO's and make it available to other pilots upon request.

TIME FRAME

This recommendation is slated for implementation in 2007 or beyond, upon FAA approval and funding.

RECOMMENDATION 26:

DEVELOP A NOISE ABATEMENT PROCEDURES BROCHURE FOR PILOTS

GOAL

The goal is to communicate information concerning the noise abatement program and procedures in place at the airport (including transient pilots operating propeller aircraft who are not familiar with the area).

ACTION

It is recommended that the Port of Portland in cooperation with local the FAA, prepare a brochure for distribution to both based and transient pilots communicating specifics of the airport's noise abatement program and procedures.

COMMENTS

One of the key issues identified during the study had to do with propeller-driven aircraft. Owners or operators of propeller-driven aircraft based at PDX are usually very much aware of the concerns of citizens and strive to operate in a friendly manner. However, transient operators usually are not always aware of noise sensitive areas around an airport or of the noise abatement program in place. Therefore, a method of communicating with all pilots is paramount in achieving a successful noise abatement program. One of the successful methods of communicating with pilots is to produce a specific noise abatement or educational brochure that can be placed at fixed base operators (FBO's) for transient pilots and provided to airport tenants for distribution.

COST

It is estimated that the cost of this brochure and its distribution would be approximately \$60,000.

RESPONSIBLE PARTIES

The Port would be responsible for developing the brochure with assistance from the local the FAA Air Traffic Control. The Port would also be responsible for printing and distributing the brochure to FBO's, pilots, and others as appropriate. The FBO's would be responsible for making the brochures available to pilots.

AIRPORT ACTION

The Port would develop and print the brochure, distribute it to tenants and FBO's and make it available to other pilots upon request.

TIME FRAME

This recommendation is slated for implementation in 2007 or beyond, upon FAA approval.

RECOMMENDATION 27:

DEVELOP A SOUND PROOFING BROCHURE FOR HOMEOWNERS AND BUILDERS

GOAL

The goal is to communicate with homebuilders, home remodelers, and other construction professionals about sound attenuation opportunities and product availability.

ACTION

It is recommended the Port of Portland develop a brochure that would outline home sound-proofing construction techniques and products as well as other useful information for builders constructing new homes as well as those homeowners interested in doing remodeling projects.

COMMENTS

Proper sound attenuation requires specific construction techniques and specifically designed products, such as windows, doors and ventilation systems. Many homebuilders are not familiar with the necessary techniques or the availability of specific products. An informational brochure offering a description of generalized construction techniques that can achieve required sound attenuation and that information on how to obtain the materials used in sound attenuation would be helpful in expediting the construction process.

COST

It is estimated that the cost of this brochure and its distribution would be approximately \$60,000.

RESPONSIBLE PARTIES

The Port would be responsible for developing and printing the brochure, and distributing it to the various locations for distribution. The jurisdictions would be responsible for having the brochures available for distribution to those builders desiring building permits in areas requiring sound attenuation.

AIRPORT ACTION

The Port would develop and print the brochure, distribute it and make it available to others upon request.

TIME FRAME

This recommendation is slated for implementation in 2007 or beyond, upon FAA approval.

RECOMMENDATION 28: REMOVED

DEVELOP AN AIRPORT PROXIMITY CHART