



City of Portland Bureau of  
Planning and Sustainability  
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# AIRPORT FUTURES

CHARTING A COURSE FOR PDX

## NOISE WORK GROUP

# FINAL REPORT

SEPTEMBER 15, 2010



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### **PROJECT WEBSITE**

[WWW.PDXAIRPORTFUTURES.COM](http://WWW.PDXAIRPORTFUTURES.COM)

## Introduction

### 1.1 Purpose of Report

The purpose of this report is to describe how a Noise Work Group, focused on addressing aircraft noise impacts<sup>1</sup> outside the PDX 65 Day-Night-Level (DNL) noise contour<sup>2</sup> (the Federal Aviation Administration designated threshold for noise mitigation<sup>3</sup>), emerged through the Airport Futures Planning Process and summarize the work process and recommendations of that group. This effort was undertaken as an acknowledgement that community aircraft noise impacts extend outside the 65 DNL noise contour. The charge of the Noise Work Group, described in this report, was to:

“Through a partnership between the City of Portland and the Port of Portland, convene a group to explore ideas related to noise strategies beyond the 65 DNL threshold of significance defined by the FAA, and recommend a comprehensive strategy mix to reduce noise impacts (outside the 65 DNL) to the greatest extent in the most cost effective manner.”

### 1.2 Airport Futures

Aircraft noise is an issue which frequently surfaces in planning processes related to airports. Aircraft noise issues were examined extensively in the Airport Futures planning process. Airport Futures was a collaborative process involving the Port of Portland, City of Portland, and the Portland-Vancouver metropolitan region which resulted in an update of the 2000 PDX Master Plan, the creation of a City Land Use Plan for PDX, and related intergovernmental agreements associated with these efforts. The planning effort was guided by a 30-member Planning Advisory Group (PAG) comprised of diverse regional representation. The PAG Vision and Values (Reference Appendix) established sustainability as an overarching goal of the project and this triple-bottom line sustainability framework (Economy, Environment, and Social Equity) was used to guide this planning effort, the work of the Noise Work Group, and follow-on work of the PDX Community Advisory Committee.

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<sup>1</sup>Noise can be defined as “unwanted sound.” Perceived noisiness is a method of rating sound. It was originally developed for the assessment of aircraft noise. Perceived noisiness is defined as “the subjective impression of the unwantedness of a not unexpected, non-pain or fear-provoking sound as part of one’s environment.” (PDX Part 150 Noise Compatibility Study)

<sup>2</sup> Day-Night Average Sound Level (DNL) is the 24 hour average sound level, in decibels, obtained from the accumulation of all noise events over the period of a year, with the addition of 10 decibels to sound levels during the FAA defined nighttime hours (10 p.m. to 7 a.m.), when background ambient noise levels are typically lower. 65 DNL is the most common noise/land use compatibility guideline or criteria used for residential land use with outdoor activity areas. For the purpose of this project, the working group focussed on mitigating noise impacts in areas where the noise levels are below DNL 65 and refer to this area as “beyond DNL 65.”  
See footnote 5

### 1.3 Airport Futures Noise Analysis and PAG Recommendations

Although Noise Analysis was anticipated at the outset of the Airport Futures planning process, the PAG expressed a strong desire to conduct a much more in depth analysis of noise, looking at a range of different forecast and operations scenarios. An extensive analysis of aircraft noise exposure was prepared for the PDX Master Plan update using both traditional noise measuring metrics (DNL) and non-traditional or supplemental metrics (Time Above/TA - the time an area would experience noise levels above a given level, and Number Above/NA - the number of operations which would exceed a given noise level). This level of analysis was completed for scenarios that represented the full range of the probabilistic forecast (10<sup>th</sup> percentile, 50<sup>th</sup> percentile and 90<sup>th</sup> percentile probability forecast – for more detail, see *PDX Master Plan Update, Technical Memorandum No. 2, Aviation Demand Forecasts*) as well a variety of runway configurations and operational conditions. See *Reference Appendix for the full Aircraft Noise Analysis from Appendix C, PDX Master Plan Update, Technical Memorandum No. 4, Alternatives and Technical Memorandum No. 2, Aviation Demand Forecasts*.

To satisfy FAA requirements, and achieve consistency between the PDX Master Plan Update and Part 150 Noise Compatibility Study, the Noise Analysis completed for Airport Futures was also used to update the PDX Part 150 Noise Exposure Map (accepted by the FAA in August 2010).

The key conclusions from the noise exposure analysis for PDX were:

- Increasing numbers of annual aircraft operations would likely result in larger DNL noise exposure contours.
- Removing jet aircraft departure restrictions (e.g., going from single-stream to dual-stream operations) would change the location of noise exposure, and the shape of the contours based on all metrics.
- Adding a third parallel runway would change the location of noise exposure, and the shape of all contours.
- The existing City of Portland noise overlay zone (based on the 1990 PDX noise contours) encompasses the majority of the DNL 65 exposure for future noise scenarios at high activity levels, including a potential 3rd parallel runway.<sup>4</sup>

Based on the Noise Analysis, the PAG made the following recommendations:

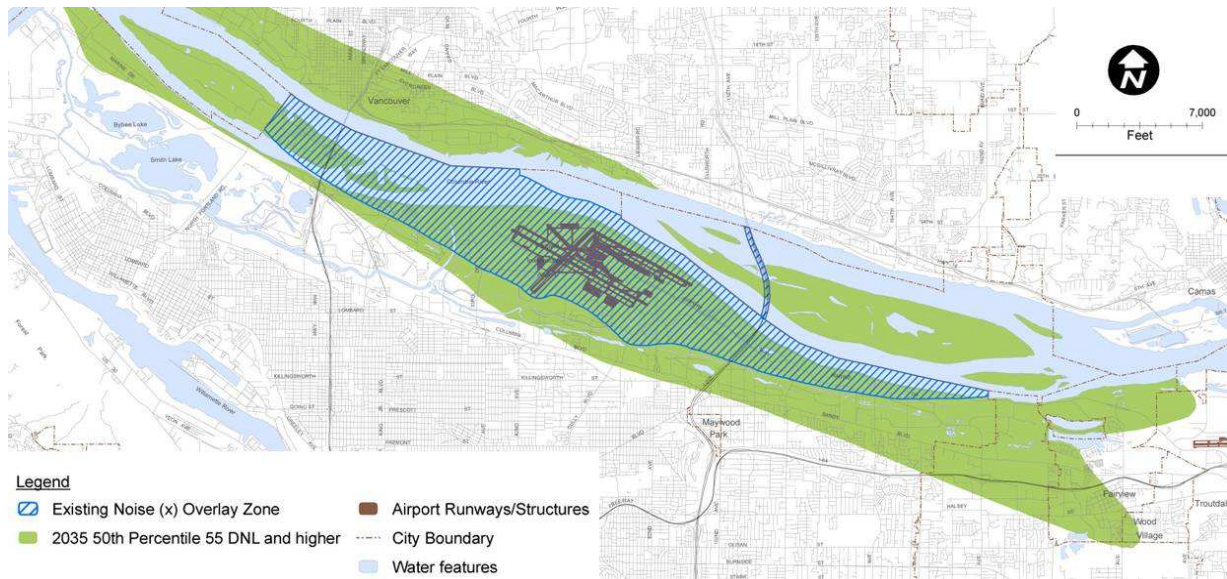
- Retain the City's noise overlay boundary where it is today including current requirements for acoustic certification, easements and noise disclosure statements.
- Create a new noise overlay extending out from the current 1990 65 DNL to include land within the 2035 50th Percentile Forecast 55 DNL<sup>5</sup> contour for the

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<sup>4</sup> A 3rd parallel runway was not identified as a required facility for the planning period ending in 2035. If conditions change which justify the runway, a legislative plan amendment will be required to amend the Airport Plan District to allow it to be built. Any such runway will be subject to Federal review under the National Environmental Policy Act (NEPA).

limited purpose of noise disclosure for new residential development and redevelopment (no easements or other provisions of the existing noise overlay – only disclosure).

The figure below illustrates the area creating a new overlay zone which extends to the 2035 50th Percentile Forecast 55 DNL noise contour from the existing 1990 65 DNL contour.



City of Portland Noise Impact Overlay Zone Map

In addition to the recommendation described above, the PAG recommended that the Port and City convene a limited duration Noise Work Group (NWG) to address noise impacts outside the 65 DNL noise contour. The PAG recommendation was in recognition that aircraft noise can impact residents outside the 65 DNL noise contour. Consistent with the PAG recommendation, the Port and the City committed to exploring strategies to mitigate noise impacts outside the 65 DNL contour. The PAG believed that thoroughly exploring noise mitigation strategies deserved more time and attention, than could be given within the Airport Futures planning process. (Due to unanticipated delays in completion of the planning process and the Planning Commission review, the

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<sup>5</sup> The Airport Futures Noise Analysis produced noise contours and alternative metrics for a number of different forecast scenarios. Scenarios were analyzed in comparison to the City of Portland's existing noise overlay. In a memo dated October 12, 2009, staff summarized the recommendations of the Land Use/Transportation Subcommittee on a number of issues including maintaining the existing noise overlay and creation of a new overlay for the limited purpose of noise disclosure for new residential development and redevelopment. The area subject to the new overlay is bounded by the outer limit of the existing noise overlay, based on a 1990 65 DNL noise contour, and the 2035 50<sup>th</sup> percentile Forecast 55 DNL noise contour. The new overlay acknowledges that noise impacts extend beyond the 65 DNL contour. The 2035 50<sup>th</sup> percentile forecast 55 DNL contour was chosen after comparing it to other metrics including number of events above and time above. The 2035 50<sup>th</sup> percentile forecast scenario was chosen for consistency with the master plan forecast period and long-term view considered in Airport Futures. The new overlay was unanimously approved by PAG on October 20, 2009.

Noise Work Group was able to complete their work in time to share their recommendations with the Portland City Council and Port Commission.)

## **2.0 Noise Work Group Scope and Work Plan**

Membership in the Noise Work Group was open to PAG, CNAC and other interested community members. Thirteen community members participated in the Noise Work Group, representing diverse perspectives. The Noise Work Group was supported by a core team of Port and City of Portland technical staff. The Portland Noise Officer, Portland Noise Review Board, and others participated in this effort. Sam Imperati from the Institute *for* Conflict Management facilitated these work group meetings.

The first meeting of the Noise Work Group was convened in December 2009 to work with a core team of Port and City staff to develop a proposed work scope. This work scope, unanimously recommended by the Noise Work Group, was approved by the PAG on January 19, 2010. With PAG approval, the Noise Work Group began the process of exploring new and creative approaches to addressing aircraft noise impacts.

The Noise Work Group scope of work and work plan, approved by the PAG, are included in Reference Appendix of this report.

### **2.1 Noise Work Group Background/Research**

Because aircraft noise and associated regulations is a complex, technical issue, the Noise Work Group was provided with detailed background and research in a resource binder during this study effort. The resource binder included more in depth reading on the subject of aircraft noise management, applicable (federal, state, and local) regulations, an overview of the PDX Noise Program, and other pertinent studies, reports, information, and resources. A detailed summary of this binder is included in Reference Appendix.

In preparation for work group discussion, staff conducted a survey of aircraft noise abatement and mitigation measures from around the world. The research and a detailed noise overview was provided to the Noise Working Group to inform the discussion and recommendations.

At the outset of their work, the Noise Work Group defined aircraft noise impacts including but not limited to health effects and annoyance. The following work scope assumptions were also identified and agreed to:

- PDX will not be moved.
- The population and demand for air travel will continue to grow, but more slowly than in the past.
- Technology will continue to reduce aircraft noise.
- There will be an increasing focus on greenhouse gas (GHG) emissions and potentially increased restrictions.

- Energy efficiency will be accelerated.
- Flight operations, airspace, and Part 150 Noise Compatibility Program are not the focus of this Work Group, but may be discussed.
- Land use planning and regulations are essential in effective aircraft noise impact mitigation.

The Noise Work Group met five times between January 2010 and September 2010. The final meeting of the Noise Work Group was September 15. At this meeting, the Noise Work Group reviewed and approved the draft recommendations to be shared with the Airport Futures PAG in October 2010 and then with the Portland City Council and Port Commission in November 2010.

During the course of their meetings, the Noise Work Group reviewed other airport and municipal noise mitigation programs worldwide, the role of airports v. cities and land use authorities; identified mitigation strategies to be evaluated for PDX; discussed boundaries for such mitigation strategies; prioritized mitigation strategies; and developed a work plan describing how recommendations would be implemented through Port and City noise programs.

### 3.0 RECOMMENDATIONS

#### 3.1 Noise Work Group Recommendations

The end product of the Noise Work Group's efforts was a recommendation of eight potential noise mitigation measures and a work plan for exploring implementation of these measures. Appendix A includes a detailed description of these proposed strategies, next steps, performance metrics, potential obstacles and hurdles, lead responsibility, partners, and implementation timeframe.

- Encourage participation by and broaden collaboration with industry stakeholders (e.g., aircraft operators and industry stakeholders) in the **PDX Fly Quiet Program**. Provide record of communication on deviations from the noise program and strategies to improve stakeholder performance.
- Monitor/encourage operator use of published **noise abatement procedures** and expand collaboration with industry partners to encourage participation.
- Track and provide leadership related to **ongoing research** in the areas of aviation noise impacts, health effects and noise impact mitigation.
- Partner with local municipalities to explore **Community Enhancement Programs** that may be used for projects and programs within communities impacted by aircraft noise.
- Explore feasibility of and funding for **Community Noise Mapping** showing environmental and community noise sources and exposure levels.

- Expand **Community Neighborhood Outreach** to encourage public awareness of aircraft noise exposure, potential impacts and mitigation programs.
- Publish **homeowner guide to energy efficiency and indoor noise reduction** and seek homeowner funding assistance through local, state or federal programs.
- Work with the federal delegation and FAA to monitor and encourage **new aircraft technology** and use of quieter aircraft at PDX.

### **3.2 Noise Work Group Recommendations included in PAG Report**

In addition to these mitigation strategies, the Noise Work Group provided a progress report and recommendation to include two additional recommendations in the Airport Futures PAG Final Report (see Reference Appendix for full copy of this report) at the May 25, 2010 PAG meeting. The following two Noise Work Group recommendations were included in the PAG Final Report which was approved unanimously by the PAG:

- The Port, City, and community should work collaboratively, wherever possible, on a legislative agenda and community enhancement concepts related to aircraft noise impacts.
- The Port and City should continue to support implementation of the PDX Fly Quiet Program and other recommendations from the Part 150 Noise Compatibility Study, and work to ensure good communication and coordination on noise abatement efforts among the City and Port noise programs, PDX Citizen Noise Advisory Committee, PDX Community Advisory Committee, and broader community.

The Noise Work Group recommendations and work plan will be incorporated into the ongoing work plan and work flow for the Noise Management Department. It is understood that the recommendations contained herein will require a significant amount of resources including staff time. In addition to the Noise Work Group work plan, ongoing priorities for the Noise Management Department include: ongoing support of the Citizen Noise Advisory Committee (CNAC), implementation of the PDX Noise Compatibility Program, management of the Hillsboro Airport Noise Management program including the launch of the Hillsboro Fly Friendly program, ongoing community outreach including responding to and addressing citizen noise complaints, and support of Port projects including the North Runway Extension Project at PDX and construction projects at the Hillsboro Airport.

### **3.3 Accountability – Monitoring and Reporting**

The Noise Work Group identified monitoring performance and progress as an essential next step in the work of the Noise Work Group. While implementation of the Noise Work Group work plan and other recommendations will be the primary responsibility of



the Port Noise Management Department and City of Portland Noise Office, collaboration with the PDX CNAC, key industry stakeholders and the community will be critical to the success of these efforts.

The Noise Work Group agreed that the soon-to-be-established ongoing PDX Community Advisory Committee (PDX CAC) and standing PDX Citizen Noise Advisory Committee (CNAC) would be the appropriate bodies to ensure accountability for implementing this work plan. Because the membership of the Noise Work Group included representatives from CNAC and the PAG and potential future members of the PDX CAC, there will be good historical knowledge moving forward.

CNAC will continue to meet monthly to provide oversight on PDX noise issues and receive updates on the progress in implementing the Noise Work Group recommendations.

Beginning in early 2011, on a quarterly basis, the PDX CAC will continue the collaborative process of Airport Futures with a balance of information-sharing and opportunities for input and discussion from the community in advance of Port decision-making. A key focus of the PDX CAC will be on reviewing the progress of the Port and activities across the region to ensure an airport gateway for the region that supports environmental and economic vitality and neighborhood livability. Consistent with this focus, the Port and CNAC will provide progress reports to the PDX CAC on the recommendations of the Noise Work Group.

The PDX CAC and CNAC will annually review and comment on the progress made in implementing the Noise Work Group work plan. These two committees will play a key role in providing direction to the Port Noise Management Department and advocating proactive approaches to noise management/mitigation. Just as a project management approach was recommended to ensure that the Airport is developed sustainably, the Noise Work Group recommends a project management approach to ensure that the Port's Noise Management Department is successful in implementing the recommendations outlined in the work plan. Key to the process is the application of an adaptive management approach consisting of the following steps: understand, evaluate, implement, and monitor (or the more recognizable Total Quality Management/Environmental Management System phrase: "plan, do, check.")

#### **4.0 CONCLUSIONS**

The assembly of the Noise Work Group represents another milestone in the commitment the Port and City made through Airport Futures to engage the community. Similar to the efforts to incorporate sustainability into the planning process, the Noise Work Group process required open communication, willingness to listen, and an openness to allow new information to influence the process. The Noise Work Group included numerous representatives with considerable knowledge of the subject matter as well as a history of past and present involvement in noise management efforts. Just as the PAG process included representatives from the PDX CNAC, the Noise Work

Group process combined CNAC representatives with broader representation from the PAG.

At the conclusion of the study process, the observation was made by staff and shared with the Noise Work Group that the recommendations from the group closely parallel recommendations identified in the PDX Part 150 Noise Compatibility Program and current priorities of PDX CNAC and the Port's Noise Management staff. A key contribution of the Noise Work Group was that it brought a broader constituency to the discussion including not only additional citizen representation but also additional staff resources from the Port and the City. The process provided renewed focus to important existing priorities, added valuable detail and definition and served to provide clear acknowledgment of those priorities in the work plans of both the Port and the City.

## APPENDIX A

### NOISE WORK GROUP RECOMMENDATIONS AND WORK PLAN

Action Item	Description	Next Steps / Milestones	Performance Metrics	Potential Obstacles	Potential Opportunities	Lead	Partners	Timeframe
Implement PDX Fly Quiet Program	<p>As part of the PDX Fly Quiet Program, the Port should encourage participation in the PDX noise management program and use of noise abatement procedures, programs, and practices.</p> <p>The Fly Quiet Program should include expanded collaboration with industry stakeholders (e.g. aircraft operators and FAA) to ensure they are aware of the impacts associated with aviation noise and ways they can help the Port reduce noise exposure and impacts.</p> <p>The Fly Quiet Program should include communications and collaboration including identification of deviations from the noise program and strategies to improve stakeholder performance. A reporting system should be developed to advise the public about the program and operator performance.</p>	<p>Develop scored and non-scored metrics to be incorporated into the Fly Quiet program.</p> <p>Finalize metrics with input from industry and community stakeholders: Oct 2010.</p> <p>Develop program for monitoring operations and reporting/ addressing deviations from the noise abatement procedures: Nov 2010</p>	<p>Measurable metrics developed.</p> <p>Technical advisory committee developed.</p> <p>Fly Quiet report developed.</p> <p>Fly Quiet report published March 2011.</p>	<p>Participation is voluntary.</p>	<p>Public relations benefit for participants.</p>	<p>Port of Portland Noise Management Dept.</p>	<p>CNAC</p> <p>PDX Fly Quiet Industry Advisory Board</p> <p>PDX Airlines</p> <p>Other PDX Aircraft Operators</p> <p>FAA</p>	<p>Program is ongoing. Official kick off 1/1/11.</p> <p>Quarterly reporting thereafter.</p>

Action Item	Description	Next Steps / Milestones	Performance Metrics	Potential Obstacles	Potential Opportunities	Lead	Partners	Timeframe
Monitor/encourage operator use of noise abatement procedures	The Noise Management Department should enhance efforts to monitor use of published noise abatement procedures and expand collaboration with industry partners (e.g., FAA, airlines) to encourage participation.	Establish protocols for monitoring operator use of PDX noise abatement procedures and Continuous Descent Overhead Approach (CDAOH).  CDAOH 6-Month report to be presented at CNAC meeting in October 2010.	Develop a program for monitoring operations and reporting/ addressing deviations from the noise abatement procedures.	Staff resources (analysis can be very time-consuming).	Relationships with aircraft operators including airlines and ORANG.  Potential to develop tools for tracking and monitoring of flight operations.	Port of Portland Noise Management Department	PDX Airlines  FAA  ORANG  Airline Transport Association  National Business Aviation Association  Helicopter Association International	Ongoing
Track and provide leadership related to ongoing research in the areas of aviation noise impacts, health effects, and mitigation.	The science surrounding the relationship between noise and human health effects is continuously evolving. There currently exists a broad range of opinions on this complicated subject.  The Port and City should continue to track the emerging research and report to the community. Nevertheless, managing and mitigating noise will be addressed in the context of balancing the related economic, environmental, and social issues presented.  Explore opportunities to work with health departments to conduct area-specific analysis of health issues related to noise (including the Portland Plan and Multnomah County initiatives currently under consideration).  The Port should monitor	Compile list of sources for health impacts information: Nov 2010.  Monitor research in the area by following the sources identified.  Establish a resource library and provide access to information by interested stakeholders: March 2010.	Create mailing list(s) to provide updates and sources of new information related to specific topics to subscribers (e.g. health effects of noise).  Expanded accessibility to information and increased understanding by Port staff and stakeholders, including the public.	Funding	Staff relationships and involvement with organizations including ICBEN and ACRP as well as experts from around the world.	Port of Portland Noise Management Department	City of Portland  Local university/academic partners  CNAC	Ongoing

	<p>(and support) domestic and international research related to the impacts and health effects of airport/aviation noise exposure and provide reports to the PDX Citizen Noise Advisory Committee, PDX Community Advisory Committee, and other interested stakeholders on at least an annual basis.</p> <p>The Port should share information with the local governments to sponsor timely and relevant education and outreach programs (e.g., speakers, symposia).</p> <p>The Port should partner with industry groups including the FAA, Air Transport Association, National Business Aircraft Association and Helicopter Association International, to advocate for impacted communities and encourage operator and FAA awareness of noise impacts.</p> <p>The Port should maintain industry awareness by following appropriate trade journals and publications, research groups (e.g., PARTNER, ACRP) as well as attending symposiums and conferences.</p>							
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Action Item	Description	Next Steps / Milestones	Performance Metrics	Potential Obstacles	Potential Opportunities	Lead	Partners	Timeframe
Develop Community Enhancement Programs	<p>The Port should partner with local municipalities (e.g., Vancouver, Portland), to explore community enhancement programs that may be used for projects and programs within communities impacted by aircraft noise.</p> <p>In an effort to enhance neighborhoods and communities impacted by aircraft noise, community volunteering by Port and other organizations' in impacted communities should be encouraged.</p>	<p>Quantify and report the annual investments made in community enhancement projects.</p> <p>Report this investment including specific project information and investment amounts via the Port's website and outreach programs.</p> <p>Identify new community enhancement/investment opportunities that are consistent with federal regulations.</p> <p>Develop a program to ensure community investment is fair, equitable, and transparent.</p> <p>Formal program established.</p>	<p>Current federal regulations.</p> <p>Availability of funding through Port and/or local governments.</p> <p>Staff resources.</p> <p>Staff interest.</p>	<p>The Port should continue to monitor the regulatory environment and legislation and identify potential opportunities should they arise.</p> <p>Staff able/willing to engage in this effort.</p>		<p>OR/WA Local governments</p> <p>City of Portland ORANG CNAC PCAC</p> <p>Aircraft operators/airlines</p> <p>FAA</p>	<p>Semi-annual reporting to CNAC and PDX CAC, etc., starting in January 2011.</p>	<p>Identify community investment program measures that are consistent with applicable federal regulations.</p> <p>Solicit community feedback regarding program measures that the Port and local governments can implement that would enhance neighborhoods and communities impacted by aircraft and other noise sources.</p>

Action Item	Description	Next Steps / Milestones	Performance Metrics	Potential Obstacles	Potential Opportunities	Lead	Partners	Timeframe
Develop Community Noise Mapping	<p>Explore concept, determine support, and look for funding. If the concept is viable, develop regional mapping showing environmental and community noise sources and exposure levels (e.g., transportation noise, Portland International Raceway, aircraft noise, trains).</p> <p>Depending on the results, need, and an analysis of property value impacts, determine the advantages and disadvantages of working with the appropriate State officials and City bureaus to adopt legislation requiring the notification of community noise sources and exposure level at time of sale.</p>	City of Portland is lead on this project.	Development of Neighborhood Profiles.	Availability of Funding. Work would be completed outside Port/City of Portland; therefore significant financial resources may be required.	<p>Local university/academic partners.</p> <p>Collaboration between City of Portland Noise Office and Port Noise Management Department.</p>	City of Portland	<p>Local university/academic partners</p> <p>Port of Portland</p>	1-5 years

Action Item	Description	Next Steps / Milestones	Performance Metrics	Potential Obstacles	Potential Opportunities	Lead	Partners	Timeframe
Expand Community/Neighborhood Outreach	<p>In an effort to encourage public awareness of aircraft noise exposure, potential impacts, and mitigation programs, Noise Management staff should expand outreach efforts to include neighborhood/community briefings, providing outreach materials (e.g., newsletter and web content), etc.</p> <p>Educate the public about the legal, technical, practical, and economic aspects of noise and noise management so they can become more informed and effective advocates in their communities.</p> <p>In an effort to enhance transparency and community awareness, the Port should explore ways to enhance our community stakeholder outreach to ensure neighbors are aware of current and future projects, programs, and conditions which may have an impact (related to operations or noise). This exploration should include review of available medium including web, multimedia, print, presentations, and community events.</p> <p>Use supplemental metrics to enhance communication and the public's understanding of noise exposure level. Day-Night Level (DNL) is the metric required by federal regulations for measuring and assessing aircraft noise exposure. Although this metric may be appropriate for land-use and airport planning, it is not necessarily the best metric for other decision-making and public outreach.</p> <p>In addition, the Port should integrate use of the Transparent Noise Information Package (TNIP) in analyses and reporting. TNIP was developed in Australia as a supplement to the Integrated Noise Model (INM). TNIP produces a variety of "supplemental" metrics to enhance communication with the public by providing a number of measurements including "Time Above (TA)" and "Number Events Above (NA)" which improve public understanding and decision-making.</p> <p>The Port should work to encourage FAA acceptance/use of supplemental metrics.</p>	<p>Develop mailing lists or noise alerts/advisories for PDX and HIO, and offer notifications about topics such as health-effects, new technologies, etc.</p> <p>Identify sources of TNIP training for staff.</p>	<p>Expanded awareness and accessibility to the Noise Management Department (by community and neighborhood groups).</p> <p>Increased outreach events (compared to previous years).</p> <p>Increased awareness by Port staff of noise-related community impacts.</p> <p>Increased awareness of City of Portland staff of noise-related community impacts.</p> <p>Expand tools used in community outreach. Maximize value of new/evolving technologies such as social media.</p> <p>Supplemental metrics are used as part of project impact (noise) analyses, in communication with the public, and in decision-making.</p> <p>Staff receives training in the use of TNIP. TNIP is used to supplement noise analyses and annual reporting.</p>	<p>Availability of staff resources.</p> <p>Availability of Port Resources and Priorities (Media - web, multimedia, print).</p> <p>Federal regulations.</p> <p>Availability of funding and/or staff resources.</p>	<p>Input from CNAC.</p> <p>Improved relationships with local governments.</p> <p>Ongoing relationship building with neighborhood groups/associations, local schools, business organizations, etc.</p> <p>Relationship with the Australian Government and the developers of TNIP.</p> <p>Access to Federal Interagency Committee on Aviation Noise (FICAN) and industry partners involved in developing supplemental metrics.</p>	Port of Portland Noise Management Dept	<p>Local governments</p> <p>Local university/academic partners</p> <p>Public Utilities</p> <p>State and Federal Government Agencies</p>	Ongoing



Action Item	Description	Next Steps / Milestones	Performance Metrics	Potential Obstacles	Potential Opportunities	Lead	Partners	Timeframe
<p>Publish homeowner guide to energy efficiency and indoor noise reduction and seek homeowner funding assistance.</p>	<p>Develop and distribute information packets which provide homeowners with information related to noise mitigation and sound insulation strategies and enhancements, as well as information about local, state, and federal programs promoting energy efficiency and sustainability enhancements.</p> <p>Additionally, the Port and City partners should explore local, state, and federal programs to identify potential opportunities to assist with homeowner funding of residential enhancements to energy efficiency enhancements including sound insulation (e.g., Clean Energy Works Program and Energy-Star).</p> <p>Encourage local governments to consider sound insulation requirements for future construction in noise-impacted areas.</p>	<p>Review of related literature produced by other agencies and airports.</p> <p>Develop outline for guide including key messages, intended audience, goals and objectives, etc.</p>	<p>Information packet developed and distributed.</p> <p>Completed assessment/synthesis of sustainability programs.</p>	<p>Federal regulations.</p> <p>Availability of funding and/or staff resources.</p>	<p>Partnership with existing local/state/federal programs.</p>	<p>Port of Portland Noise Management Department</p>	<p>City of Portland</p> <p>City of Vancouver</p> <p>Local university/academic partners</p> <p>Public Utilities</p> <p>State and Federal Government Agencies</p>	<p>1-2 Years</p>
<p>Monitor and encourage new aircraft technology and use of quieter aircraft at PDX.</p>	<p>Through ongoing communication with the federal delegation, encourage FAA to consider encouraging the development and use of the quietest aircraft at PDX.</p> <p>The Port should explore operational/noise abatement flight deck procedures (not currently in use at PDX) and collaborate with aviation stakeholders to implement them. Examples include the optimized arrivals, Required Navigation (RNAV), and unrestricted climb profiles.</p>		<p>Current Noise Abatement Procedures are the most effective possible based on current technology and FAA requirements.</p> <p>Revise/refine noise abatement procedures as opportunities arise (based on newer aircraft, navigation technologies, and FAA regulations, policies and procedures).</p> <p>Noise Management Department maintain awareness of current and evolving technologies</p>	<p>Federal regulations.</p> <p>Cost to airlines.</p> <p>Impacts to air traffic control (safety/delay).</p>	<p>Relationships with Boeing, airline partners and FAA.</p> <p>Relationships with aircraft operators including airlines and ORANG.</p> <p>Involvement with ACRP, Boeing, and other experts in the field of navigation and noise abatement.</p>	<p>Port of Portland Noise Management Dept</p>	<p>FAA</p> <p>PDX Aircraft Operators</p> <p>ORANG</p>	<p>Ongoing</p>

## REFERENCE APPENDICES

Note: The reference material included in the Appendices was provided to the Noise Work Group to inform their discussion and recommendations, but did not necessarily serve as the basis for the recommendations.

Airport Futures PAG Vision and Values	<a href="http://www.pdxairportfutures.com/Documents/PDX_Airport_Ftrs_VisVlsWfootnotesFNL.pdf">http://www.pdxairportfutures.com/Documents/PDX_Airport_Ftrs_VisVlsWfootnotesFNL.pdf</a>
Aircraft Noise Analysis, Appendix C, PDX Master Plan Update, Technical Memorandum No. 4, Alternatives	<a href="http://www.pdxairportfutures.com/Documents/PDX_Airport_ftrs_Tech_Memo4_Altrntvs.pdf">http://www.pdxairportfutures.com/Documents/PDX_Airport_ftrs_Tech_Memo4_Altrntvs.pdf</a>
Aviation Demand Forecasts, PDX Master Plan Update, Technical Memorandum No. 2	<a href="http://www.pdxairportfutures.com/Documents/PDX_Airport_Ftrs_Avtn_Dmnd_Frcst.pdf">http://www.pdxairportfutures.com/Documents/PDX_Airport_Ftrs_Avtn_Dmnd_Frcst.pdf</a>
Noise Work Group Reference Materials	Post on website as a single reference (Noise Work Group Scope of Work is already posted)
<ul style="list-style-type: none"><li>• Noise Work Group Process Proposal, Scope of Work and Work Plan</li><li>• Noise 101, Understanding Aircraft Noise</li><li>• Noise Work Group Resource Binder</li><li>• Global Survey of Noise Abatement and Mitigation Measures</li></ul>	
Airport Futures PAG Final Report	<a href="http://www.pdxairportfutures.com/Documents/PDX_Airport_Ftrs_PAG_Final_Rprt.pdf">http://www.pdxairportfutures.com/Documents/PDX_Airport_Ftrs_PAG_Final_Rprt.pdf</a>