

# Northwest Ports Clean Air Strategy

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**Port of Seattle  
Port of Tacoma  
Vancouver Port Authority**

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# INTRODUCTION

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## **Purpose**

This is a proposed strategy (herein referred to as the “strategy”) to reduce maritime, port-related emissions that affect air quality and climate change in the Pacific Northwest via a collaborative approach led by the Ports of Seattle and Tacoma in Washington State and Vancouver in British Columbia. The purpose of this strategy is to reduce diesel and greenhouse gas emissions in the region by achieving early reductions in advance of, and complementary to, applicable regulations. In addition, this strategy sets targets that build on the success and momentum of current emissions reduction initiatives, and suggests a range of practical actions the Ports and their industry stakeholders may choose from to achieve those targets. The Ports invite their industry stakeholders and the public to review and comment on the strategy to focus and enhance the set of high-reaching, yet achievable actions outlined within.

In creating this strategy, the Ports worked together with the Puget Sound Clean Air Agency, Environment Canada, and the United States Environmental Protection Agency (US EPA). These agencies support this collaborative approach, believing that working cooperatively is the best way to achieve significant air emissions reductions as early as possible. The success of this effort hinges on the following qualities of the three Ports: 1) All three ports make significant economic contributions to the region, 2) All three ports have plans and expect significant investments for continued development, and 3) All three ports are committed to improving the environment, public health, and the regional economy by reducing their impacts on air quality and climate change. This collaborative approach will minimize competitive pressures that might otherwise occur if each port acted on these issues independently. This strategy addresses emissions reductions with shared targets, while allowing each port to implement its own unique and appropriate emission reduction actions. The Ports intend to engage others with maritime, port operations in supporting the goals of this strategy.

## **Consultation and Outreach**

The Ports acknowledge that the success of this effort relies on the significant contributions of their tenants, customers, and other stakeholders who may be directly responsible for the equipment and operations addressed by the diesel emissions reduction actions outlined in this strategy. Doing business at ports is so interlinked that each organization can only contribute part of the solution. The Ports and air agencies have already begun engaging some stakeholders during the development of this strategy, and further discussions and outreach with industry stakeholders and the public will continue over the summer.

After integrating the feedback received via outreach and consultation, the strategy will become a final action plan. The Ports will deliver the plan to their Commissioners/Board in the fall of this year for ratification in December 2007, with the anticipation that additional maritime stakeholders will endorse the final plan.

## Geographic Scope

The geographic area covered by this Strategy includes the land and salt waters within the Georgia Basin/Puget Sound Airshed as illustrated in Figure 1. In general, the marine areas include the Strait of Juan de Fuca, the greater Puget Sound area, the Strait of Georgia, Haro Strait, Boundary Pass, Rosario Strait, and other relevant nearby waterways. In consideration of the proposed geographic scope of the Clean Air Strategy, there is an opportunity for regional ports and industry stakeholders to participate and sign on to the plan.

Figure 1: Map of Georgia Basin-Puget Sound



Map by Environment Canada

## Importance of the Clean Air Strategy

Ports are a critical part of the Pacific Northwest and North American economy, allowing people across the continent to buy and sell their products, as well as travel, all over the world. Global trade also brings good jobs and business opportunities to local communities and supports a strong quality of life. As world trade continues to grow, the Pacific Northwest stands to benefit even further from its ports.

However, many port-related activities contribute to air emissions as described in the recently released Puget Sound Emission Inventory (PSEI)<sup>1</sup> and the soon-to-be completed inventory for Greater Vancouver. Diesel engines in ships, trains, trucks, and other equipment are the primary power driving the maritime goods movement industry. While these engines are more efficient and cleaner than they used to be, they still emit significant amounts particulate matter (PM), NO<sub>x</sub>, and SO<sub>x</sub> which negatively affect human health and the environment. All three of these criteria air pollutants are addressed to varying degrees in this strategy.

Air quality in the vicinity of Northwest ports currently meets US ambient air quality standards as well as Canadian air quality objectives and standards. However, fine particulate standards have recently been tightened in the US which will bring several areas in Puget Sound out of attainment. In addition, the Canada Wide Standards include provisions for continuous improvement and keeping clean areas clean. The Ports are committed to improving maritime, port-related emissions and see substantial environmental, economic, and social benefits associated with further air quality improvements.

A key goal of the joint strategy is to stay in attainment of ambient air quality standards and objectives, including continuous improvement recognizing that standards and objectives are not a limit to "pollute up to." In addition to concerns about ambient air quality, reducing risk from exposure to diesel particulate is also a primary goal of the strategy. For example, air quality agencies for the Puget Sound and Lower Fraser Valley areas estimate that PM from all diesel engines (i.e. not just port-related) accounts for more than 70% of the potential cancer risk from all air pollutants.<sup>2</sup> Exposure to diesel emissions can worsen asthma and contribute to increased rates of lung cancer, chronic respiratory and cardiovascular disease, and other health impacts. Diesel emissions also contribute to acid deposition, crop and forest damage, climate change and impaired visibility. Given these implications for public health and the environment,

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<sup>1</sup> Puget Sound Maritime Air Emissions Inventory, April 2007, available online at:

<http://www.maritimeairforum.org/EI/Puget%20Sound%20Maritime%20Air%20Emissions%20Inventory.pdf>, last visited 5/7/2007.

<sup>2</sup> Puget Sound Clean Air Agency, *Final Report: Puget Sound Air Toxics Evaluation*, October 2003, available online at:

[http://www.pscleanair.org/airq/basics/psate\\_final.pdf](http://www.pscleanair.org/airq/basics/psate_final.pdf), last visited 5/7/2007.

Draft *Air Toxics Emission Inventory and Health Risk Assessment – Summary Report*, October 2006, prepared for Greater Vancouver Regional District Policy and Planning Department and Environment Canada. This report has not yet been released for public consumption.

the reduction and minimization of these emissions are a top priority for the Ports, air agencies, and other stakeholders. By voluntarily reducing maritime, port-related emissions, this strategy helps to achieve the reduction of related health, environmental and economic impacts.

Additionally, the global climate, including in the Pacific Northwest, is changing, with potentially profound consequences that will be felt all over the world. Greenhouse gas emissions from combustion of fossil fuels are a principal contributor to climate change.<sup>3</sup> While the solution to climate change will need to be global in scope, this strategy will contribute by reducing greenhouse gas emissions from Pacific Northwest maritime, port-related activities.

The Ports are working with each other and their industry stakeholders to secure a strong economy, healthy communities, and a sustainable environment. The result is a realistic and achievable strategy that will deliver to the people of the Pacific Northwest the maritime and goods movement industries' contribution to continuous improvement for cleaner air and lessened climate change.

## GOALS AND OBJECTIVES

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The goal of this Strategy is to reduce air emissions from current maritime, port operations in the Pacific Northwest through specific strategies and actions within each category of port operation. In addition, all future port growth should be defined in terms of “green” growth, emphasizing reduced emissions and long-term sustainability. A target percent emissions reduction from the 2005 baseline will be determined during the course of consultation for inclusion in the final plan. The initial emphasis of the strategy is on the three major ports in the region, taking into account each port’s unique development plans and emissions reduction opportunities with a focus on continuous improvement. The actions identified in this strategy are meant to address two primary emissions reduction objectives:

- 1) Help the Georgia Basin – Puget Sound airshed continue to meet air quality standards and objectives and;
- 2) Reduce port-related air quality impacts on human health and climate change.

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<sup>3</sup> Intergovernmental Panel on Climate Change (IPCC), Working Group I Report, *The Physical Science Basis*, February 2007, available online at: <http://ipcc-wg1.ucar.edu/wg1/wg1-report.html>, last visited on 5/5/2007.

# EMISSIONS REDUCTION ACTIONS

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## Activities for Future Implementation

The Port's emission reduction strategies are organized by the sources of maritime emissions: ocean-going vessels; cargo handling equipment; rail; trucks and vehicles; and harbor vessels. Where possible the Port's have identified a performance standard as a means of measuring success. Following the standard, a core "menu" of emissions reduction activities is suggested for implementation over both a short (by 2010) and longer (by 2015) term timeframe. These activities would continue and augment those currently underway. A sixth category, Administration, is also included to highlight some of the various administrative actions the Ports are taking to reduce diesel and other emissions.

For ocean-going vessels and cargo handling equipment, the Ports have identified a proposed performance standard as a means of measuring success with reductions calculated using baseline 2005 emissions. The suggested activities outlined for these categories are options for achieving these standards. For the remaining three categories, proposed performance standards are still being worked out either because more information is needed, or because the Ports' relationship to and influence over those categories is less direct. More consultation and outreach is needed in all areas to solidify the performance standards.

Short-term actions focus primarily on:

- 1) Switching to use of cleaner fuels and increased fuel efficiency,
- 2) Retrofitting<sup>4</sup> existing engines,
- 3) Ensuring best available engine technologies for new equipment purchased in this time frame, and continued operational efficiency improvements during port development, and;
- 4) Continued operational efficiency improvements during port development.

Exploration of emissions reduction options through feasibility studies and pilot projects is also a key component of short-term actions, with the idea that many of these options could be implemented in the long-term as they are proven feasible and viable. In many instances, the short-term actions act as interim solutions leading up to broader changes (such as major equipment upgrades; switching to non-diesel, alternative power sources; and business model shifts) in each category.

The Ports acknowledge the importance of reducing greenhouse gas emissions but have not yet developed performance standards or actions in this strategy to do so. Rather,

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<sup>4</sup> Inclusive of replace, repower, retrofit, refuel, and repair/rebuild.

many of the actions identified target both criteria air contaminants and greenhouse gases. The Ports are working to determine how best to establish greenhouse gas reduction strategies in light of the goals set forth by state, provincial, and federal government agencies and how to align those goals with actions.<sup>5</sup> In sum, the Ports are committed to working closely with their stakeholders to achieve the greatest possible diesel emissions reductions, as well as greenhouse gases, based on a combination of the following actions performed by both the Ports and their stakeholders.

## **Ocean-Going Vessels (OGV)**

In the short-term, the Ports will focus the performance target for OGV on the use of cleaner fuels at dockside and at anchor. Concurrently, other emission reducing options will be evaluated for future implementation. In the long-term, the Ports will move feasible projects from the pilot stage to implementation and continue to explore new technologies as they become available. Again, the actions in this strategy are options from which ports and their industry stakeholders can choose to achieve the performance standard.

### **Performance Standard**

By 2010: Reach the equivalent PM reduction of using distillate fuels for all auxiliary engine operations while at dockside and at anchor; or a total 70% reduction in fine particulate from a common baseline by 2010.<sup>6</sup>

By 2015: Compliance with performance standards that the International Maritime Organization (IMO) adopts. The United States has submitted a proposal to the IMO that calls for the equivalent emissions reduction that would result from use of 0.1% Sulfur fuel.<sup>7</sup> Canada has supported the elements of the US Proposal. The Ports support a flexible approach similar to the US EPA proposal to the IMO that would allow use of technology or a combination of technology and cleaner fuels to reach the proposed standards. If new performance standards are not adopted, the Ports agree

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<sup>5</sup> Governor Gregoire aims to reduce Washington State greenhouse gas emissions to 1990 levels by 2020 and to 25% below 1990 levels by 2035. This would be a reduction of 10 million and 30 million metric tons, respectively, below 2004 levels. The Government of British Columbia (B.C.) aims to reduce B.C.'s greenhouse gas emissions by at least 33% below current levels by 2020. This would be 10 per cent under 1990 levels. The Government of Canada also set a target of a 6% improvement each year from 2007 to 2010 (18% reduction in emissions from 2006 levels) and 2% annual improvements thereafter for existing facilities. Sources: State of Washington, Office of the Governor, Executive Order 02-07, Washington Climate Change Challenge, February 2007, available online at: [http://www.governor.wa.gov/execorders/eo\\_07-02.pdf](http://www.governor.wa.gov/execorders/eo_07-02.pdf), last visited 5/7/2007. Speech from the Throne given at the Opening of the Third Session, Thirty-Eighth Parliament of the Province of British Columbia, February 2007, available online at: <http://www.leg.bc.ca/38th3rd/4-8-38-3.htm>, last visited on 5/7/2007. Government of Canada Action on Climate Change and Air Pollution website: <http://www.ecoaction.gc.ca/news-nouvelles/20070426-3-eng.cfm>, last visited on 5/10/2007.

<sup>6</sup> Puget Sound Maritime Air Emissions Inventory, April 2007, available online at: <http://www.maritimeairforum.org/EI/Puget%20Sound%20Maritime%20Air%20Emissions%20Inventory.pdf>, last visited on 5/7/2007.

<sup>7</sup> Review of MARPOL Annex VI and the NOx Technical Code: Development of Standards for NOx, PM, and SOx, submitted by the United States to IMO sub-committee on Bulk Liquids and Gases, February 2007, available online at: <http://www.arb.ca.gov/research/seca/imo07b.pdf>, last visited on 5/7/2007.

to continue to work towards meeting these goals, recognizing that technology and fuel availability will impact shipping lines ability to achieve this goal.

**The menu of appropriate actions to meet the performance standard includes, but is not limited to:**

Short Term: By 2010

#### Alternative or Cleaner Fuels

1. Widespread use of cleaner fuels<sup>8</sup> at berth and at anchor, with a focus on frequent callers.<sup>9</sup>
2. Use of shore power where currently available and evaluation of shore power at other cruise berths.
3. Conduct feasibility study for expanded shore power or other at-dock treatment infrastructure.

#### Cleaner Engines and After-Treatment

4. Identify opportunities for vessel and engine redesign or retrofit on selected/suitable engines and secure commitments where possible.
5. Complete feasibility projects such as the Holland America Line Seawater Scrubber Feasibility and Demonstration Project.

#### Efficiency, Conservation, and Incentives

6. Evaluate incentive programs, such as differentiated harbor dues or other appropriate port fees, and implement where feasible.
7. Evaluate vessel opacity program, similar to that in place at POS and VPA.
8. Review operational adjustments with vessel operators to reduce emissions such as optimized speed and transit route planning within Puget Sound and the Strait of Georgia.

#### Influence and Collaboration

9. Continue to work with the West Coast Collaborative (WCC), the US EPA, Environment Canada, International Maritime Organization (IMO), British Columbia Marine Vessel Air Quality Work Group, Puget Sound Maritime Air Forum, Pacific Ports Air Quality Collaborative, and others and to actively participate in these larger venues on issues such as ratification/implementation of amendments to MARPOL Annex VI regulations, the potential adoption of SOx Emissions Control Area (SECA) legislation, and/or vessel engine redesign.

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<sup>8</sup> Cleaner fuels are defined in terms of performance standards based on use of distillate at berth and use of 1.5% sulfur or cleaner fuels during transit and maneuvering.

<sup>9</sup> Frequent callers are defined as vessels making more than 10 calls at one or more of the three ports per year.

10. Increase operational efficiency as port development occurs resulting in reduced time at anchor and at dock.
11. Where possible provide grants, in-kind monies, and other financial support to owners/ carriers to encourage them to test new technologies on their vessels.

Long-Term: By 2015

1. Study feasibility of hybridization or electricity generation during voyage.
2. Standardize use of marine gas oil (MGO) (less than 1.5 % Sulfur (S)) fuels in the main engines during transit and maneuvering when operating inside the Straits of Georgia and Juan de Fuca, moving towards the 0.1% S standard (see “Performance Standard” above), as appropriate fuels become available.
3. 100% use of cleaner fuels, such as 0.1% S in the auxiliary engines at anchor and at dock for vessels with adequate tank capacity. Assessment of the feasibility for vessels other than frequent callers, including vessels at anchor and vessels with smaller tank capacity.
4. Installation of alternative ship-side or shore-side power at berth for cruise vessels.
5. Implement additional at-dock (e.g. stack after-treatment) and during voyage (e.g. electrification or scrubbing) emissions reduction options deemed viable from short-term feasibility studies and pilots.
6. Evaluate and update environmentally preferable vessel design considerations for future new builds and prepare a list of such vessel design features to promote with owners, carriers, yards, and the general industry.

## **Cargo Handling Equipment (CHE)**

The short-term goal for cargo handling equipment is that port operators use the cleanest available technology that meets port operational needs at the earliest possible date. The long-term goal is the use of advanced technology/near-zero emission CHE.

The Ports want to encourage fleet turnover while providing flexibility for the discovery and implementation of more efficient and cost-effective technologies in the near future. Thus, the Ports are not proposing an immediate, full-scale replacement of older engines; rather they assume that in the future, hybridization, full electrification, or other new types of technology will come into wide-scale use. Therefore, the short-term list of appropriate actions illustrates interim steps leading up to complete fleet modernization.

Standards will be achieved through actions aimed at three categories of equipment – old equipment that needs to be replaced in the short term, new equipment purchased, and those pieces of equipment in-between which have been recently upgraded or retrofitted and still have a multiple-year life span. All remaining candidate CHE will be

retrofitted with advanced pollution control equipment and switch to ULSD fuel. Any new equipment used at the Ports will meet the cleanest standards currently available that is practicable for the anticipated use, with preference given to engines that meet the 2007 US EPA on-road standards. For the remaining in-between equipment, the Ports will work with tenants and the technology industry to periodically review the status of CHE and fleet characterization and anytime a cost-effective investment is identified which will lead to further emissions reduction, it will be made.

### **Performance Standard**

By 2010: Reach the equivalent PM reduction of using ULSD or equivalent biodiesel blend, together with the fleet-wide equivalent of Tier 2 and 3 engines.<sup>10</sup>

By 2015: The long-term performance standard is the fleet-wide equivalent of Tier 4 engines.<sup>11</sup>

**The menu of appropriate actions to meet the performance standard includes, but is not limited to:**

Short Term: By 2010

#### Cleaner Engines and Fuels

1. Begin CHE fleet modernization program: for candidate equipment, replacement with lighter, more efficient straddle carriers, rubber tired gantries (RTG), or fully-electric rail mounted gantry (RMG) cranes, and use of Tier 4 engines for yard tractor fleet.
2. Complete retrofits of suitable CHE with exhaust treatment equipment.
3. Standardize the use of ULSD and/or biofuel and promote the use of cleaner fuels and lubricants where appropriate.
4. Implement idle reduction education, technology, and policy program with provisions to assure terminal adherence to anti-idling policies and procedures.
5. Identify opportunities for and maximize the use of regenerative energy technologies for CHE.
6. Use crankcase emission reduction systems equipment.

#### Pilot Projects

1. Complete pilot test of battery electric yard hostler and implement where feasible.
2. Test diesel electric hybrid yard equipment and/or rubber tired gantry cranes.

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<sup>10</sup> Tier 2 and 3 standards are 0.15 g/hp\*hr for most CHE. See Table 1.1 in US EPA's *Final Regulatory Impact Analysis: Control of Emissions from Nonroad Diesel Engines*, August 1998, available online at: <http://www.epa.gov/nonroad-diesel/frm1998/nr-ria.pdf>, last visited on 5/10/2007.

<sup>11</sup> For Tier 4 standards, see <http://www.epa.gov/nonroad-diesel/2004fr.htm>, last visited 5/10/2007.

3. Evaluate feasibility of liquefied natural gas (LNG), compressed natural gas (CNG) and propane use.
4. Identify and evaluate other options on an on-going basis.
5. Identify a list of potential funding sources for pilot projects.

Long-Term: By 2015

1. Complete full-scale fleet upgrade to the best available technology.
2. Use CHE with hybridization or full-electrification technologies, as feasible.
3. Maximize operational efficiency and terminal design as port development occurs and negotiate cleaner alternatives at the time of major modifications and lease negotiations.
4. Use lease measures and project reviews to drive continuous improvements and emissions reductions.

## Rail

The short- and long-term goals for the rail sector require a commitment by the Ports to actively work with their partner railways in a joint effort to implement currently available, cost-effective technologies; to explore new technologies as they become available; and to work to increase operational efficiencies, especially as port volume increases.

As railways are not direct tenants or customers of ports, setting a performance standard for this category of port activities is difficult. For the long term, the Ports support reducing PM emissions from all new locomotive engines by 90%. The US EPA's Proposed April 2007 Locomotive and Marine diesel Engine Rule aims to achieve these reductions.<sup>12</sup> In the interim, the Ports and air agencies have identified the following activities as potential ways to reach an agreed upon standard once in place. A goal for this sector is agreement by the end of 2008 between the major port railways (Union Pacific (UP) and BNSF Railway Company in Washington State and Canadian National (CN), Canadian Pacific Railway (CPR), and British Columbia Railway Company (BCRC) in British Columbia), the Ports, and the air agencies in which these entities agree to work together to reduce diesel emissions from this sector. Many of the actions outlined below are currently underway via demonstration projects in this region or elsewhere in North America. Railways, similar to the other sectors, have demonstrated that they are making efforts for emissions reduction and are encouraged, via this strategy, to continue and accelerate this trajectory.

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<sup>12</sup> EPA Proposal for More Stringent Emissions Standards for Locomotives and Marine Compression-Ignition Engines, April 2007, available online at: <http://www.epa.gov/otaq/regs/nonroad/420f07015.pdf>, last visited on 5/7/2007.

**The menu of appropriate actions to meet the performance standard includes, but is not limited to:**

Short Term: By 2010

Cleaner Engines and Fuels

1. Identify all suitable switching locomotives for re-power with cleaner and more efficient engines or retrofit with after treatment devices.
2. Use ULSD and/or biofuel in switch yard and line haul locomotive engines.
3. Complete the evaluation of switch yard electrification for long-term objectives.
4. Evaluate and pilot the use of a hybrid switching engine.
5. Standardize routine stack opacity tests on locomotives as currently practiced by BNSF Railway Company.

Anti-Idling and Efficiency Improvement

7. Retrofit locomotives with anti-idling devices and implement an education program regarding strategies to turn off the locomotives when not in use for specified periods of time.
8. Implement efficiency improvements to switchyards including electrification of lift equipment and RFID system implementation.
9. Implement freight car productivity improvements, incorporating technologies that reduce train resistance (drag).
10. Increase port-wide rail and switching yard efficiencies and identify the feasibility of on-dock rail as alternative to near dock rail.
11. Complete BNSF Railway Company North Seattle International Gateway (SIG) railyard electrification.
12. Advocate for expanded capacity at Stampede Pass to prevent mode switching (which would result in increased truck activity) and to increase operational efficiency.
13. Actively pursue pilots and demonstration projects of existing technologies such as switch-engine anti-idling and recapturing electricity during line haul.

Long-Term: By 2015

Cleaner Engines and Fuels

1. Begin switch yard electrification.
2. Implement switching locomotive hybridization.
3. Launch and complete a pilot project for re-power/ new locomotive engine redesign.
4. Pilot locomotive retrofits with advanced pollution control devices.
5. Complete switch yard electrification.
6. Implement Stampede Pass improvements.

### Anti-Idling and Efficiency Improvements

6. For future terminal improvements, implement on-dock rail in preference to near dock rail where feasible.
7. Include provisions for anti-idling technology in all locomotive engines and maximize regenerative capabilities.

## **Trucks and Vehicles**

The Ports have agreed that in order to make a significant impact on emissions from this sector, a business model is needed that provides the financial ability for truck owners and operators to purchase and implement available emissions reducing technologies and vehicles. The exact shape this business model would take and the details of a process for its implementation have yet to be defined. The Ports are committed to working with trucking industry to find a model that will produce desired emissions reductions. In addition, the Ports will begin a dialogue with other West Coast ports to develop a West Coast model for addressing port-related truck emissions. The short-term actions listed below are interim steps that would lead to a sustainable long-term business model.

This category is somewhat unique in that one of the Ports, Vancouver, has a newly established truck licensing program which the other two ports do not have in place. This program requires that container and long haul truckers accessing port terminals must have a valid Truck Licensing System (TLS) license in place. Truckers without a TLS license are not granted access to VPA property. The TLS license sets out minimum safety and environmental requirements for trucks accessing port property. In partnership, the Ports of Seattle and Tacoma will look at programs such as VPA's truck licensing program and gate reservation system.

The performance standard is still being set for this sector; however the Ports acknowledge that more actions will be needed to achieve the standard once set than what is listed below. More information is needed on the type, age, and destination of the truck fleets before a standard is set. The Ports are looking to engage in dialogue with stakeholders leading to real results with adequate standards for safety and air emissions. They are committed to find ways to share the responsibility of reducing community exposure by improving operations and raising awareness on options.

**The menu of appropriate actions to meet the performance standard includes, but is not limited to:**

Short Term: By 2010

### Anti-idling, Decreased Congestion, and Efficiency Improvement

1. Enforce cruise passenger bus anti-idling at ports and encourage retrofits and replacements with cleaner engines.
2. Maximize implementation of “paperless gate;” such as RFID in combination with web-based booking systems (next item) to prevent gate congestion and idling and use OCR for gate efficiency.
3. Implement mandatory web-based reservation systems, giving preference to trucks participating in diesel reduction strategies.
4. Implement increased gate hours (decreasing congestion).
5. Implement terminal efficiency upgrades and off-dock logistics improvements.
6. Conduct terminal efficiency studies and improvements.

### Cleaner Engines and Fuels

8. Evaluate and/or expand testing for drayage trucks.
9. Implement truck modernization through Cascade Sierra Solutions and other organizations such as Smart Way and the Environmental Coalition of South Seattle.
10. Identify and retrofit eligible equipment such as diesel particulate filters (DPF) or diesel oxidation catalysts (DOC) and fuel saving devices that would also reduce greenhouse gas emissions.
11. Encourage the use of biodiesel and other alternative fuels.
12. Perform feasibility study of short sea shipping as an alternative to truck transport.
13. Pass anti-idling rules and enforce anti-idling at terminal gates.

### Long-Term: By 2015

1. Implement a business model that may include programs similar to VPA’s truck licensing program and gate reservation system.
2. Develop an inspection program for safety and emissions compliance.
3. Install RFID systems for all drayage trucks and OCR for all terminals.
4. Redesign drayage truck (for Northwest region) and incorporate full-electrification and hybridization technologies.
5. Analyze the feasibility of developing a Northwest Region Virtual container yard and a Regional chassis pool and implement as practical.
6. Continue terminal gate and roadway efficiencies for congestion relief.
7. Evaluate dedicated terminal to railyard routes.

## **Harbor Vessels**

The Ports and the air agencies recognize harbor vessels (including ferries, tugs, and bunker crafts) are also a source of emissions and therefore, actions should be taken to reduce emissions in this category as well. However, the Ports have little or no

authoritative control over harbor craft, making port generated commitments to act difficult to implement. With air agencies taking the lead for this category, they and the Ports agree to work directly with the owners and operators of harbor craft to help raise awareness and support implementation of emissions reductions. With a focus on engine retrofits and the use of cleaner fuels, the air agencies and ports agree to encourage and help implement pilot projects. In addition, the Ports recognize the independent efforts by ferries in Washington State and British Columbia to reduce emissions and encourage the continuation of these actions. As voluntary emissions reduction efforts in this sector have just recently begun, the setting of a performance standard and identifying specific actions to achieve it is still underway.

**The menu of appropriate actions to meet the performance standard includes, but is not limited to:**

Short Term: By 2010

1. Use of ULSD and/or biofuel blends.
2. Support efforts to increase fuel efficiency.
3. Pilot hybridization.
4. Increase educational campaign and commitment to work with owners and operators to implement pilot projects.

Long-Term: By 2015

1. Implement hybridization for harbor vessels, where feasible.
2. Implement engine retrofits, where feasible.
3. Implement full-electrification, where feasible.

**Administration**

The Ports and the air agencies recognize that while most emissions come from equipment that the Ports do not operate themselves, they have administration related emissions, diesel or otherwise that can be reduced. Some examples of what some or all of the Ports are doing to reduce these emissions include:

- Use of cleaner technology or alternative fuelled vehicles
- Employee programs to facilitate sustainable commuting
- Leadership in Energy and Environmental Design (LEED) certification for buildings
- Energy audits and implementation of feasible improvements

The Ports are committed to continue to look for ways to reduce administrative emissions.

## Currently Ongoing and/or Recently Accomplished Activities

The references below contain a partial list of activities recently completed or currently underway at one or more of the three Ports that help to accomplish the emissions reduction goals of this strategy. These activities are far-reaching and robust in themselves, and in part lay the groundwork upon which future activities can be built. These activities, along with the existing, on-going, collaborative efforts and communication between ports, tenants, customers and other stakeholders frame the future commitments laid out in this strategy. In addition to these activities, updated maritime, port-related emissions inventories<sup>13</sup> and related analytical tools will support air program development for Puget Sound and Greater Vancouver. These inventories will help to target where to invest pollution prevention dollars to gain the biggest public health and environmental benefits for the dollar invested.

- Puget Sound Maritime Air Forum, *Emission Reduction Projects in the Puget Sound Region*, April 2007, available online at: [http://www.maritimeairforum.org/EI/PSEI\\_Projects.pdf](http://www.maritimeairforum.org/EI/PSEI_Projects.pdf), last visited 5/7/2007
- Port of Vancouver, *Integrated Air Emissions Reduction Program for the Port of Vancouver: Actions to Address Air Quality and Climate Change*, January 2007, available online at: [http://www.portvancouver.com/the\\_port/docs/2007\\_POV\\_Integrated\\_Air\\_Emissions\\_Reduction\\_Program\\_Final.pdf](http://www.portvancouver.com/the_port/docs/2007_POV_Integrated_Air_Emissions_Reduction_Program_Final.pdf), last visited 5/7/2007.

## NEXT STEPS

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### Partnering

As the plan is finalized, industry stakeholders can sign onto the plan expressing their commitment to pursue the activities appropriate to their sector listed in the plan, joining the effort to reach the goals as outlined in the plan. The Ports are developing a mechanism for these stakeholders to sign on the plan and a recognition program for those who do so.

### The Action Plan

It is expected that the final plan will be similar in nature to this strategy, with more complete performance standards identified for each category and a refined list of actions for achieving those standards based on outreach and consultation with industry stakeholders and the public. The final plan will include reasonably simple provisions to

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<sup>13</sup> Puget Sound Maritime Air Emissions Inventory, April 2007, available online at: <http://www.maritimeairforum.org/EI/Puget%20Sound%20Maritime%20Air%20Emissions%20Inventory.pdf>, last visited on 5/7/2007. The Chamber of Shipping, *2005-2006 BC Ocean-Going Vessel Emissions Inventory*, January 2007, available online at: [http://www.chamber-of-shipping.com/index/air\\_main](http://www.chamber-of-shipping.com/index/air_main), last visited on 5/7/2007.

be approved by plan signatories for documenting, auditing and reporting progress toward the goals on an annual basis, including consideration of third party participation in verifying progress. The plan will include the opportunity for further engaging other air agencies, ports, and organizations with maritime operations in the Northwest. In addition, the plan will have a high degree of transparency and accountability. The plan will be updated as new options for emissions reductions become clearer based on emission inventories and assessment of technical opportunities and/or studies that may not be completed until after the plan is finalized. Annual meetings between the Ports and air agencies will be held to track progress under the plan and to discuss updates as new technologies and information becomes available.

## CONCLUSION

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This strategy emphasizes four main categories of actions for reducing emissions from port-related activities: utilization of cleaner fuels, development of better engines and technology to work in concert with the cleaner fuels, more efficient operations, and innovative thinking around the ways in which a specific port or other maritime activity might be carried out. This document is a framework of what the three Ports believe needs to be achieved in order to operate sustainably and outlines the pathways, activities, and commitments needed to get there. The Ports are committed to responsible environmental stewardship to help protect public health and the environment. The Ports also recognize that there are some areas where more work needs to be completed in order to set a measurable, achievable performance standard and are committed to complete this work. Where the Ports can not take direct action, the Ports will work collaboratively with tenants and customers to decide how best to achieve the goals and meet the performance standards outlined in this strategy. The Ports and air agencies will conduct outreach over the summer, the results of which will be incorporated into the final plan to be ratified by the end of 2007.

# APPENDIX A

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## Acronym List

- APU – auxiliary power units
- ARB – (California) Air Resources Board
- BC – British Columbia
- BCR- British Columbia railway
- BNSF – formally, Burlington Northern Santa Fe railway, officially now known as BNSF
- CHE – cargo handling equipment
- CN – Canadian National railway
- CP – Canadian Pacific railway
- DDHS – diesel-driven heating system
- DOC – diesel oxidation catalyst
- DPF – diesel particulate filter
- EPA – (United States) Environmental Protection Agency
- EV – electric vehicle
- FWA – fleet weighted average
- IMO – International Maritime Organization
- LEED – Leadership in Energy and Environmental Design
- LNG – liquefied natural gas
- MARPOL – International Convention for the Prevention of Pollution from Ships
- MGO – marine gas oil
- MOU - Memorandum of Understanding
- NOx – nitrogen oxides
- NWCA – Northwest CruiseShip Association
- OCR – Optical Character Recognition
- OGV – ocean going vessels
- OOCL – Orient Overseas Container Line
- PM – particulate matter

POS – Port of Seattle  
POT – Port of Tacoma  
RFID - radio frequency identification  
RMG – rail mounted gantry  
RTG – rubber tired gantry  
S – Sulfur  
SECA – SO<sub>x</sub> Emissions Control Area  
SIG – Seattle International Gateway  
SO<sub>x</sub> – sulfur oxides  
TLS – Truck Licensing System  
ULSD – ultra-low sulfur diesel (< 15 ppm)  
UP – Union Pacific railway  
US – United States  
VPA – Vancouver Port Authority  
WCC – West Coast Collaborative  
WSF – Washington State Ferries