

Local Impacts of Industrial Development

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Appendix A: Port Case Studies

Air Quality (Diesel emissions)

The Port of Helsinki, Finland has instituted Air Pollution Controls; these include:

- reducing the sulphur content of shipping fuel;
- incentive for regularly-scheduled passenger vessels are given smaller discounts on harbor dues if they use fuel containing less than 1% sulphur while in the City of Helsinki's waters.
- advising vessels to use catalytic converters or other means in their auxiliary engines to break down nitrogen oxides.
- requiring vessels to use their equipment in such a way that smoke harms are slight.¹

The Port of Göteborg, Sweden, has already implemented shoreside power measures. Specifically, this measure calls for ports to:

- require shoreside power as a condition of new terminal leases or renewals;
- invest in infrastructure for electric power;
- develop shoreside power for port-operated facilities;
- subsidize the development of shoreside power for harborcraft; and
- provide funding to offset the costs of retrofitting vessels to accommodate shoreside power.²

Port of Seattle, Port of Tacoma and Port Metro Vancouver (Canada) have addressed air quality through a program called the Northwest Ports Clean Air Strategy. This is a regional strategy to reduce maritime and port-related diesel and greenhouse gas emissions in the Georgia Basin-Puget Sound air shed. The Strategy lays out a framework for achieving significant early emissions reductions that impact air quality and climate change in the Pacific Northwest. The approach provides a menu of voluntary options through flexible, non-regulatory means and sets aggressive goals.³

A sample of these actions includes:

- Switching to use of electricity and cleaner fuels and increasing fuel efficiency,
- setting PM emissions performance goals for heavy duty trucks
- develop Anti-idling, Decreased Congestion, and Efficiency Improvement plans
- Conduct terminal gate and roadway efficiencies for congestion relief including a "paperless gate".⁴

The Port of Long Beach and Port of Los Angeles have addressed air quality through a program called the San Pedro Bay Ports Clean Air Action Plan. This plan uses source-specific control measures for heavy-duty vehicles, ocean-going vessels, cargo-handling equipment, harbor craft, and railroad locomotives, it is estimated that in five years under the CAAP, diesel particulate matter from all port-related sources will be reduced by a

1 Port of Helsinki Service Handbook 2008.

http://www.portofhelsinki.fi/content/pdf_in_english/ymparisto/Service_handbook2008_environment.pdf?from=5316144683903634

2 NRDC: <http://www.nrdc.org/air/pollution/ports/ports2.pdf>

3 American Association of Port Authorities: <http://www.aapa-ports.org/Programs/content.cfm?PreviewContentItem=32479>

4 Northwest Ports Clean Air Strategy Port of Seattle Port of Tacoma Vancouver Port Authority December 2007

http://www.portseattle.org/downloads/community/environment/NWcleanAirStrat_200712.pdf

total of 1,200 tons per year and nitrogen oxide emissions are estimated to be reduced by 12,000 tons per year.⁵

The Port of San Pedro/Los Angeles has included electric trucks for on-dock container movement with the goal of zero emissions on the dock.⁶

In March, 2008, the Los Angeles Harbor Commission voted unanimously to approve a comprehensive and sustainable Clean Trucks Program that requires the trucking industry to buy and maintain a clean-technology fleet and shift to a system that employs truck drivers instead of misclassified "independent contractors." The Los Angeles program serves as a model for how all West coast ports can operate sustainably. These emissions reductions include:

- Banning more than 2,000 of the dirtiest, oldest polluting rigs from port terminals;
- Putting nearly 6,000 clean-burning vehicles into service;
- Moving nearly 70% of cargo in low-emissions vehicles.⁷

The Port of Tacoma addresses Air pollution by the following:

- Use ultra-low sulfur diesel;
- retrofit locomotives with anti-idling technology that reduces emissions.
- Encourage other rail road users to install idle-control mechanisms on engines, adding auxiliary power units (APU), diesel-driven heating system (DDHS), and automatic start-stop technology.



Figure 6: Truck Idling. Source: Coalition for Clean Ports (http://www.nytimes.com/imagepages/2009/10/30/us/30sftruckers_CA0.html)

The railroad works to reduce emissions at intermodal yards by:

- improving lift efficiencies by running equipment on electricity and improving traffic flows;
- implementing radio frequency identification system to reducing waiting times for trucks; and
- implementing diesel retrofit technologies verified by California Air Resources Board (CARB) and the U.S. EPA.⁸

A selection of **NRDC Recommendations** for Ports to improve air quality include the following:

- retire the oldest cargo-handling equipment, commit to replacing it with the cleanest available equipment

5 American Association of Port Authorities: <http://www.aapa-ports.org/Programs/content.cfm?ItemNumber=3454>

6 Port of Long Beach: <http://www.polb.com/environment/transplan/zecms/default.asp>

7 Clean and Safe Ports: <http://www.oakland.cleanandsafeports.org/index.php?id=126>

8 Port of Tacoma: <http://www.portoftacoma.com/Page.aspx?cid=1896>

- use alternative fuels.
- Create an incentive program for off-site trucks that encourages “fleet modernization”
- Repower or replace all switching locomotives that do not meet the EPA Tier 0 standards with electric hybrid or alternative-fuel engines.
- Require automatic engine-idling controls to minimize unnecessary idling.
- Finally, commit to using cleaner fuels, such as on-road grade diesel.⁹
- Make cleaner fuels, such as diesel emulsions or low-sulfur diesel, available to off-site trucks.¹⁰

New York/New Jersey Port Authority On-Dock Rail

Well-planned railroad infrastructure is particularly important at new port terminals. Although rail transport is environmentally preferable to truck transport, it is still a significant pollution source, and longer, less direct rail lines result in more pollution. Recognizing these issues, the Port Authority of New York and New Jersey is investing \$500 million in rail infrastructure to serve its terminals.¹¹

The Coalition for Clean and Safe Ports recommends the following:

- require all port trucking firms to enter into concession agreements that incorporate environmental, community and labor standards;
- grant "independent contractors" employee status giving them the right to join a union and organize for better working conditions;
- require trucking companies to operate only clean emission trucks;
- require trucking companies to provide off-street parking for trucks outside residential neighborhoods;
- create a strong local hire program for community residents most impacted by port pollution; and
- support small, local businesses to meet the standards.¹²

Air Quality Dust (from grain or other dry bulk material)

The Port of West Sacramento has built two new, state-of-the-art self-contained storage areas that prevent fugitive dust from escaping into the environment. This is done using technologies like a pneumatic ship unloader and other dust control mechanisms that can help essentially transport the materials from the dock to storage facility without exposure to the air.¹³



Figure 7: Port of West Sacramento Grain Elevator. Source: Port of West Sacramento.

⁹ NRDC Harboring Pollution: <http://www.nrdc.org/air/pollution/ports/ports2.pdf>

¹⁰ NRDC Harboring Pollution: <http://www.nrdc.org/air/pollution/ports/ports2.pdf>

¹¹ NRDC: Harboring Pollution: <http://www.nrdc.org/air/pollution/ports/ports2.pdf>

¹² Clean and Safe Ports: <http://www.oakland.cleanandsafeports.org/index.php?id=126>

¹³ Port of West Sacramento: http://www.supplychaindigital.com/Port-of-West-Sacramento--Green-Focused_28521.aspx

Port of Chesapeake, Perdue Terminal

This new terminal is equipped to reduce fugitive dust and improve stormwater runoff. The new system is enclosed and features dust collection, decreasing product loss. Two new grain driers are being used to reduce gas usage by 50 percent and along with new loading spouts will further reduce fugitive dust.¹⁴

Light Pollution Abatement

Port Canaveral's Light Management Plan

The Canaveral Port Authority's Light Management Plan was developed in cooperation with the United States Fish and Wildlife to mitigate the Port's overall lighting impact, including direct impacts and cumulative glow. This management plan sets standards for control of existing exterior lighting plus rules for the design of new or replacement site lighting systems.

- Exterior lighting must be directed, shielded or positioned so that is not directly visible off-site, minimizes lateral light spread and does not produce uplighting.
- Low-pressure sodium lighting should be used where possible.
- new lighting should be installed with multiple levels of control so that lighting levels can be matched with specific activities.
- Where lighting is not safety or security-essential, timers should be installed to switch lights off in the evening.
- Where applicable and not a threat to security, motion-detector switches may be installed.
- For piers and cargo-handling areas: The Plan requires the use of cutoff style fixtures or pole-mounted floodlighting with full visor aiming down
- For nighttime operation of cruise terminals, restaurants, offices, etc.: Exterior fixtures should be the cutoff style, with facade, sign and landscape lighting kept to a minimum and at a low elevation with no uplighting. Light sources should be low-pressure sodium where applicable. Only security lighting should be left on when these facilities are not operating.
- This also requires Tenant Light Management Plan to be submitted to the Port Authority for any new construction. This should include lighting plans and specifications plus an evaluation of lighting requirements that considers security needs, worker safety and OSHA requirements. The aim should be to use the best available technology to minimize light pollution to the greatest practical extent.¹⁵

The NRDC Recommendations for Ports to reduce light impacts include using low-profile cranes at marine terminals, avoid expanding near residential areas, and making every

¹⁴ Port of Chesapeake http://www.elizabethriver.org/PDFs/RiverStarIndustries/Jan_2010_RS_Lunch_Program.pdf

¹⁵ Port of Canaveral <http://www.portcanaveral.com/tenants/light.php>

effort to minimize noise and light pollution. For example, bright lights used at night should be minimized to the extent possible to avoid glare in the local community.¹⁶

Port of Los Angeles

The Port's 30-acre public access buffer areas will incorporate "Dark Sky" compliant lighting design.¹⁷

Noise Abatement

To keep the noise in the port down to a acceptable level, the **Port of Helsinki** will recommend adherence to the following rules regarding noise:

- Structures acting as barriers and absorbing noise and the fact that these barriers shall be implemented before port operations are initiated.
- The Port of Helsinki shall provide a plan to minimize noise emissions in good time before the second phase of the harbor is operational.¹⁸
- Sets decibel limits: during daytime the noise produced by vessels and port operations should be under 55db and during night 22-07 under 50 dB at the nearest residential area
- Avoid unnecessary noise during the night time while berthed.
- Intense noise in the harbor caused by, for example, repair or service operations is prohibited. If such an operation is necessary, dock master must be given advance notice.
- While berthed, passenger announcements may be made only in the interior of the vessel.
- A ship's whistle may only be used for giving safety signals from the ship¹⁹.

Port of Oslo, Norway

The close proximity of the port to residential areas makes noise pollution an issue of great importance for the Port of Oslo. Several measures for reducing noise pollution have been initiated, including:

- Developed program simulating noise effects
- Replaced forklifts and reach-stackers with gantry cranes with rubber tyres
- Substituted the diesel engines with electric power
- Reduced noise from the warning bells insulation of the machinery room
- Installing rubber bricks on the trailers preventing sharp noise.
- Asphalt the terminal ground to level the surface.
- Establish a noise deflection wall

Because adjacent properties are still subject to levels above the legal threshold, the Port of Oslo is considering noise reduction measures at the neighbours' premises, such as improved insulation and change of windows.²⁰

16 NRDC, Harboring Pollution: <http://www.nrdc.org/air/pollution/ports/ports2.pdf>

17 Sasaki Architects, <http://www.sasaki.com/what/portfolio.cgi?fid=437&page=6>

18 Port of Helsinki: http://www.portofhelsinki.fi/content/pdf_in_english/julkaisut/Vuosaari%20ENG_Nettiymparisto.pdf

19 Port of Helsinki: http://www.portofhelsinki.fi/content/pdf_in_english/ymparisto/Service_handbook2008_environment.pdf?from=5316144683903634

20 Port of Oslo: <http://www.oslohavn.no/english/environment/envirnonmen/noise-mana/>

NoMePorts

The main objective of Noise Management in European Ports (NoMEPorts) is the reduction of noise, noise-related annoyance and health problems of people living around port industrial areas

through demonstration of a noise mapping and management system. The Ports established a Guide to implement this goal called the *Good Practice Guide on Port Area Noise Mapping and Management*. One of the tasks of NoMEPorts was to define a good practice guide for the most efficient way to create noise maps and actions plans to reduce the noise annoyance in the (port) industrial area.²¹



Figure 8: Port of Livorno: Residential Area In Proximity To The Port. Source: Port Area Mapping and Management, NoMEPorts

Some of the general practices used in this Guide are:

- Overall port design-planning
- City planning (new residential areas)
- Infrastructure planning (roads, railways)
- Noise barriers, by bounding roads and rails
- Modelling expansion scenarios
- Use noise mapping software as a decision support tool
- Change working period
- Change in production and/or operations
- Turn the source so the noise will be directed away from residential areas
- New non residential buildings as barriers
- Yard planning, e.g. positioning of container racks so they can act as a barrier
- Relocation of most noisy activities
- Move the entrance gate away from residential areas
- Installing 24 hours noise measuring systems at residential areas (to locate and document noise peaks)

Examples of source mitigating measures from the Good Practice Guide on Port Area Noise Mapping and Management Terminals and plants:

- Covering of sound intensive components with insulation
- Use absorbing building materials
- Silent equipment (low noise versions cost little extra)
- Reducing the speed of putting down a container²²

²¹ NoMePorts: <http://nomeports.ecoports.com/ContentFiles/NoMEports%20GPG%20PANMM1.pdf>

²² NoMePorts: <http://nomeports.ecoports.com/ContentFiles/NoMEports%20GPG%20PANMM1.pdf>

Much of the analysis is done through a detailed Geographic Information System process.

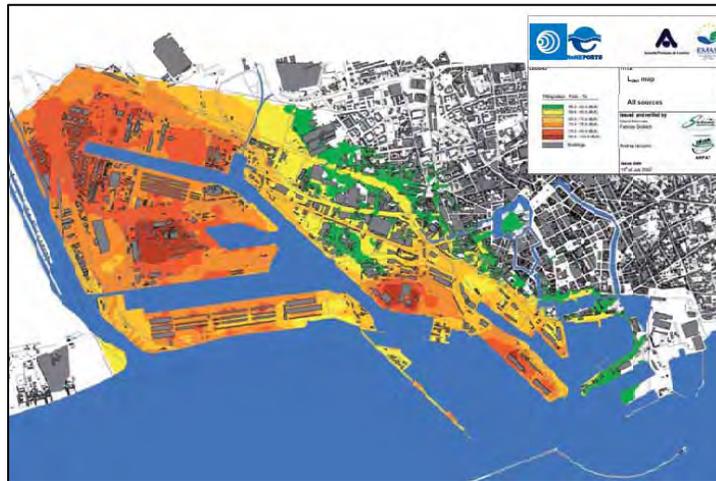


Figure 9: GIS Noise Analysis Map. Source: Port Area Mapping and Management, NoMEPorts

The NoMEPort participants are: Port of Amsterdam, Port of Hamburg, Port of Livorno, Port of Copenhagen/Malmö, Port of Civitavecchia, Port of Rotterdam, Port of Tenerife, Port of Gothenburg, and the Port of Oslo.

Port of Auckland New Zealand, Ports of Auckland operates within strict noise limits. The Port has implemented a range of noise-control initiatives, including:

- Additional soundproofing and noise reduction features fitted to new straddle carriers and other equipment
- Elimination or reduction of the majority of warning sirens on heavy machinery
- Ship horns no longer being used to signal departure from the Fergusson container terminal; these are used only for safety such as on foggy mornings
- Elimination of rail crossing alarms
- Minimization of rail shunt moves
- Fitting of alarm mufflers to two gantry cranes
- Requiring as many container ships as can safely do so to berth bow south, minimizing the impact of generator noise on neighbors
- Working with the shipping lines to further reduce the noise from ship generators
- Seeking to ensure new developments in close proximity to the Port have adequate soundproofing.²³

²³ Port of Auckland http://www.poal.co.nz/community_environment/noise_traffic.htm

Port of Amsterdam Ceres Paragon Terminal

The following noise abatement strategy was used to reduce the Port's noise level by 10 dB(A).

- Machinery House: Sound-absorbing panels in the walls, roof, and floor; narrow insulated rope openings; isolation pads for machinery and plugs for hatch openings.
- Trolley Drive: Rope towed trolley, eight wheels to reduce wheel load, and buffers to reduce wheel noise. See Figure 3 below.
- Girder and Boom: Stiffened web panels.
- Festoon Trolley: Polyurethane wheels and isolated supports.
- The Ceres cranes are the quietest cranes capable of serving 22-wide vessels.
- The noise abatement strategy resulted in only a minor increase in the cost of each crane.²⁴

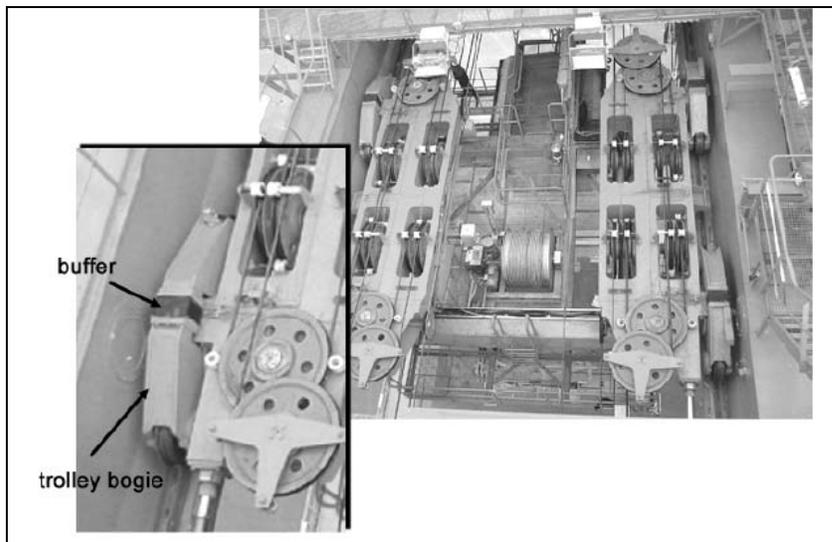


Figure 10: Ceres Trolley Buffer: Source: Port of Amsterdam

²⁴ Liftech Consultants <http://www.jwdliftech.com/LiftechPublications/1reducingimpact.pdf>

Traffic/Street Redesign To Accommodate Local Communities

Port of Miami Tunnel Project

This project consists of a twin bore, 4-lane, sub-aqueous road tunnel that connects the Port of Miami (Dodge Island) directly to route I-395. It will pass beneath a part of the Intracoastal Waterway. The new tunnel will permit truck cargo and passengers to have direct access to the Port of Miami from the Interstate highway system without going through the local streets and business community.²⁵

Port Of Seattle

Alaska Viaduct And New Tunnel

The Port depends on the Viaduct and seawall for freight mobility, Port facility access, and regional mobility. While container trucks don't travel on the Viaduct, it still carries over 100,000 vehicles which would otherwise be using the Duwamish area streets and conflicting with freight and rail lines. A Bored Tunnel Hybrid is the preferred alternative to carry forward for further study. The state, city, county and Port have outlined a funding framework to pursue, in environmental review and further design. Bored tunnel construction is estimated for 2011-15 with Viaduct demolition and waterfront reconstruction to follow.²⁶

The South Seattle Intermodal Access Project and East Marginal Way Grade

Separation will improve vehicle and freight access between I-5 and I-90 and the Seattle waterfront, including Port container terminals, the ferry dock and the Seattle International Gateway Rail Yard. The project also increases safety by separating road, pedestrian, and rail traffic. The project consists of:

- on ramps
- overpass
- a grade separated local connector and pedestrian crossing
- and intersection improvements.²⁷

Marginal Way Grade Separation Seattle, WA



Figure 10: Grade Separated Intersection. Source: Port of Seattle.

East Marginal Way Project

The Port is constructing this grade separation on Duwamish Avenue South, south of South Spokane Street. The project will relocate East Marginal Way through this corridor and improve access to Port terminals, UP and BNSF rail yards, and manufacturing and distribution centers. The track to be grade-separated connects on-dock rail at the Port's Terminals 5 and 18 (where containers are loaded directly onto trains rather than onto a

²⁵ <http://www.mrtunnel.com/page2.htm>

²⁶ Port of Seattle: <http://www.portseattle.org/community/development/regionaltransport.shtml>

²⁷ Port of Seattle: <http://www.portseattle.org/community/development/regionaltransport.shtml>

truck to be moved to a rail yard) to the rail mainline. The project also supports general purpose traffic and industrial uses in West Seattle²⁸.

I-5 - SR 509 - Freight and Congestion Relief Project

The project will ease congestion on I-5, allow industrial trucks to bypass I-5, SR 99 and local streets, and provide improved southern access to Sea-Tac International Airport.²⁹

Port of Tacoma

Lincoln Ave Grade Separation

This project will raise Lincoln Avenue over key railroad tracks in the Port area, removing the at-grade conflict between rail activities and heavy vehicular traffic.

Lincoln Avenue is a major arterial, serving as the primary connector between Interstate 5 and the Port for a high number of trucks. Rail switching operations and mainline trains cause vehicular delays of up to 30 minute every two hours.

Upon completion, the grade separation will significantly improve rail and road efficiency. It will also enhance air quality. Trucks will have direct access to APM Terminals, so they won't sit idling while trains pass³⁰.

Tacoma Road

Funding has been secured that allows for a second left turn lane to increase capacity at a highly congested intersection. In addition, the project will also include pedestrian and bicycle improvements along the full length of the project.

Los Angeles Computer Model and Intersection Controls

Several key roadway improvements in or near the Port of Los Angeles will equip intersections with the ATSAC and adaptive traffic control system (ATCS). Information from LADOT indicates that all signalized intersections in the study area will be equipped with both ATSAC and ATCS by 2015. ATCS is an enhancement to the ATSAC and uses a personal computer-based traffic signal control software program that provides fully traffic-adaptive signal control based on real-time traffic conditions. ATCS allows for the automatic adjustment to the traffic signal timing strategy and control pattern in response to current traffic demands by allowing ATCS to control all three critical components of traffic signal timing simultaneously, namely cycle length, phase split, and offset.³¹

28 Port of Seattle: <http://www.portseattle.org/community/development/regionaltransport.shtml>

29 Port of Seattle: <http://www.portseattle.org/community/development/regionaltransport.shtml>

30 Port of Tacoma Web site accessed 3/31/10 <http://www.portoftacoma.com/Page.aspx?cid=3540>

31 Port of Los Angeles: http://www.portoflosangeles.org/EIR/SPWaterfront/DEIR/3-11_Transportation_Circulation_Ground.pdf



Figure 12: Port of Los Angeles Bridge Source: Wikipedia

The Port of Los Angeles also has a port-specific bridge on State Route 47. It links Terminal Island with the rest of the port.³²

Port of Helsinki, Vuosaari Harbor

The Port of Helsinki, Vuosaari Harbor has instituted a number of traffic-related mitigation measures.

- Planning and design of road and rail connections and the harbor interchange
- Traffic planning of the harbor interchange and gate area
- General environmental planning and design.
- Greater use of the railways for land traffic, involves construction of a 19 km, single-track, electrified railway to transport freight between the main Helsinki-Riihimäki line and the harbor.
- To minimize the environmental impacts, most of the railway will run through two tunnels with a total length of over 14 km. these tunnels were built specifically to not disturb wildlife areas and residences.³³
- A new 2.5 km four-lane road connecting the harbor directly to the metropolitan Ring Road 3 including three interchanges and a 1.5 km twin tunnel section under the sea. This will ease road traffic congestion in Helsinki city center and its inbound routes.³⁴

NRDC Recommendations: Traffic Mitigation Plan

Ports should create and implement a traffic mitigation plan. Ports should conduct a study of traffic on roads and highways in and around the port and then create and implement a meaningful traffic plan based on the findings to reduce congestion and impacts from the port on local roads and highways. Although traffic studies are required for expansion projects, it is important that ports study existing traffic to reduce the impacts from prior port growth. Public comment and input should be a priority throughout the process.³⁵

³² Wikipedia http://en.wikipedia.org/wiki/File:Vincent_Thomas_Bridge_aerial_view.jpg

³³ Port of Helsinki: <http://www.hel2.fi/ajankohtaista/NewsNov2008.pdf>

³⁴ WSP Group Consultants <http://www.wspgroup.com/en/Sectors/All/group-projects-transport-and-infrastructure/Vuosaari-Harbour/?mbaid=2419>

³⁵ NRDC, Harboring Pollution: <http://www.nrdc.org/air/pollution/ports/ports2.pdf>

Port Terminal Design with Recreational Access for Public Use

The Port of Los Angeles has several large recreational and public access projects. One project created the Promenade includes a variety of pedestrian and bicycle access to link the downtown via a continuous bike path, trail connections, clearly identified pedestrian crossings, and elimination of barriers to the waterfront, such as fences for freight rail operations. The Project will also complete 8.7 miles of continuous promenade along the water's edge.³⁶



Figure 13: Port of Los Angeles Town Square. Source: Port of Los Angeles

The Promenade project creates an active public waterfront, more berthing space for harbor craft and daytrip boaters, and a closer waterfront connection with downtown San Pedro. One of these public harbors will include a 1.5-acre cut to accommodate the Los Angeles Maritime Institute's TopSail Youth Program vessels, Port vessels and other visiting ships. Another berth will include a public dock for short-term berthing of visiting vessels. The third is a 5-acre cut which will bring the water to the edge of the existing Promenade.



Figure 14: Port of Los Angeles Promenade and Bike Path. Port of Los Angeles

The Town Square, a public plaza will accommodate approximately 170 people for formal seating arrangements. The Town Square will include the Downtown Civic Fountain, a water feature designed to complement the civic setting of the nearby San Pedro City Hall Building.

Approximately 27 acres of new parks will also be integrated throughout the Project including the three-acre Fishermen's Park an 18-acre "central park" designed to include an informal amphitheatre for harbor viewing, waterfront events, and concerts with lawn seating for approximately 3,000 people; and Outer Harbor Park, a six-acre park.

³⁶ Port of Los Angeles http://www.portoflosangeles.org/pdf/SPW_Fact_Sheet_093009.pdf

Banning's Landing and Harry Bridges Buffer Area: The Port of Los Angeles has also created a 30-acre community buffer from the TraPac terminal expansion. Called the Harry Bridges Boulevard buffer zone, the buffer provides some distance between the community of Wilmington and the impacts from TraPac terminal. It also provides a landscaped area to improve the aesthetics of the community of Wilmington and Banning's Landing Community Center.^{37,38} This open space will provide places for informal play, public gathering, community events, sitting and promenading. The buffer will serve as a public amenity while also buffering the Wilmington community from port operations to the south.



Figure 15 Harry Bridges Avenue Buffer Area.
Source NRDC

In order to protect the site from the port's impacts, a bermed landscape of 16 feet in height will be created. A pedestrian/bicycle walkway that will be a part of the California Coastal Trail, will link the Buffer into the larger regional context. A tree-lined promenade will provide seating for relaxing and viewing of the Buffer activities including interactive water features, an adventure playground, performances on the plazas, and picnicking. A Datum Walk will cross the buffer's length, interconnecting two pavilion buildings offering seating, a dry concession area, and restrooms.



Figure 16: Port of Los Angeles Banning's Landing Community Center. Source: Port of Los Angeles.

Sustainable design practices and innovative engineering technologies are integrated into the overall project. Dredged harbor soil may be utilized for the earthwork, demolished paving will be ground and used for paving sub-base, and all plant materials will be indigenous/salt tolerant. Also proposed is the use of titanium oxide as a surfacing for the berm retaining walls to remove pollutants from the air.³⁹



Figure 17: Port of Los Angeles Banning's Landing. Source: Sasaki.

37 NRDC http://switchboard.nrdc.org/blogs/amartinez/creating_jobs_one_community_pa_2.html

38 Port of Los Angeles <http://www.portoflosangeles.org/facilities/bannings.asp>

39 Sasaki Architects <http://www.sasaki.com/what/portfolio.cgi?fid=437&page=6>

Port of Tacoma

Creating a buffer between residential and industrial areas to improve livability, the Port of Tacoma and a local conservancy and businesses came together to purchase approximately 31 acres of land to act as a buffer between the tidal flats and a residential neighborhood. By creating a natural buffer to the Port of Tacoma and limiting more residential encroachment, the CLC is helping the Port to thrive without the need to adjust hours of operation and contend with incompatible use issues due to noise, lights, safety issues and residential traffic. The steep forested slopes will remain green through a stewardship agreement with the City of Tacoma, Schnitzer Steel Industries and Cascade Land Conservancy.

The Port of Tacoma has worked with local communities to meet green space goals and at the same time offer important buffers between residential communities and residential neighborhoods.

The Port of Tacoma also plans to purchase more than 40 acres north of Julia Gulch. The Port will set aside a small section—about seven acres—with plans to accommodate businesses that must relocate from the Blair Peninsula to make way for the new NYK terminal. A portion of the new property will join the Julia's Gulch open space, bringing the total to more than 60 acres of natural habitat and buffer between the industrial tideflats and Northeast Tacoma neighborhoods.⁴⁰ The Friend's of Julia's Gulch have significant restoration plans for the site including the planting of several native species and the installation of a loop trail at the perimeter of the site for educational purposes.



Figure 18 Julia's Gulch Restoration Site.
Source: Friends of Julia's Gulch

⁴⁰ Julia's Gulch Organization <http://juliagulch.org/default.aspx>

Port of Seattle

The Port of Seattle owns and maintains more than 60 acres of parks and public access spaces as part of their portfolio. The parks are managed by the Port's Marine Maintenance Department. Several of their parks have been featured in the Seattle Times as great places to enjoy the outdoors while witnessing ship movements and other maritime related activities. These parks are often located immediately adjacent to working piers and terminals and provide public access for recreation and fishing. Jack Block Park includes an observation tower which allows views of operations at Terminal 5. Another example, Terminal 86 includes a pedestrian path located between the grain elevator and its dock, running directly underneath the dock loading conveyor. This path leads to Elliot Bay Park, which includes a public plaza and a 't-dock' fishing pier located between Terminal 86 and Pier 91, affording views of grain and cargo operations. Individual parks can vary in size from less than one acre to 15 acres. Overall, the port maintains 20 public shoreline access points that have been developed since 1985 as part of Comprehensive Public Access Plan.

In addition to the acreage used for park and public access, the Port owns and operates several marinas. These marinas are used both for commercial fishing fleets as well as for pleasure craft.

As mentioned above, the parks for the Port of Seattle include a variety of active and passive recreational uses. These include:

- boat moorage,
- guest dock,
- fishing pier,
- promenade,
- benches,
- bike route
- shoreline access,
- picnic tables,
- benches
- waterfront access,
- observation platforms
- public plazas with benches and telescopes,
- kids' wading pool, and
- marinas.⁴¹



Figure 19: Port of Seattle Fisherman's Terminal.
Source: Port of Seattle.

41 <http://www.portseattle.org/community/resources/publicaccess.shtml>

Below is Seattle's Terminal 86. The pedestrian walkway/bikeway runs between the grain elevator and the dock and leads to a park and plaza to the right of this photo.



Below is an overview of the locations of the Port's parks and shoreline access.



Port of Metro-Vancouver, BC

Located in North Vancouver, Maplewood Flats is a 59 acre upland site preserved by the Port as a conservation area. The Flats are located on the Pacific Flyway and are a great place for local birdwatchers to see nature up close.⁴²

Mitigation Approaches for Air, land, Water and People

Port of Charleston Pledge for Growth

In 2008 the Port developed a program called Pledge for Growth which is a campaign to engage and educate the local community and address mitigation in four areas including air, land, water and people. As the Port is in the process of constructing a new container terminal at a former Naval Base adjacent to North Charleston, the project was also designed to mitigate environmental impacts and address several neighborhoods' concerns through a community mitigation plan and \$4 million to support the activities. The Lower country Alliance for Model Communities was formed to represent members of seven neighborhoods directly impacted by the new terminal development. This group was heavily involved in the permitting process for the terminal expansion and continues to act as the liaison between the Port Authority and the neighborhood groups.

The Project has received one of EPA's 2009 Environmental Justice Achievement Award for one of the first port expansion projects to include both community revitalization and environmental protection projects as part of its formal mitigation plan. Some of the mitigation projects include:

- Funding to support the development of a master plan/community vision for the surrounding community to include landscaping, creation of parks and green space, and enhancement of interfaces between the proposed project and the community.
- Reducing Port related air emissions by switching to ultra low sulfur diesel and replacing diesel container cranes with all electric models
- Funding for placement and management of environmental receptors through the neighborhoods, adjacent to the Port, to monitor noise, air emissions and vibrations from construction.
- Off setting the direct and indirect impacts of lost aquatic and terrestrial resources by restoring 22 acres of tidal marsh, contributing \$1 million to a local trust to preserve an island of historic importance in the area, providing \$1 million to a consortium of environmental groups to protect 15,000 acres along the Cooper River.
- Funding for a regional transportation plan which will address terminal traffic and its impacts to neighboring communities.

Some of the measures used include:

- Land: 126 acres of preservation on Morris island, 22 acres of marshland.
- Air: vessel emissions standards, low sulfur diesel, reduce truck idling.
- Water: increase helicopter whale surveys, restore oyster reefs.
- People: donation to the city for traffic issues, help affordable housing, job opportunities.⁴³

⁴² Port of Seattle: <http://www.portmetrovancover.com/environment/initiatives/land.aspx>

⁴³ Port of Charleston http://www.pledgeforgrowth.com/pfg_home.asp

Port Metro Vancouver, BC

The Burrardview Community Association, City of Vancouver, CP Rail and Port Metro Vancouver together developed the [East Vancouver Port Lands Plan](#). The purpose of the Plan is to guide land-use decisions on port lands located between Victoria Drive and Second Narrows Bridge as well as the adjacent Burrardview neighbourhood. The Plan strives to address compatibility issues between industrial and residential land uses in this area.



The East Vancouver Port Lands (EVPL) Liaison Group is comprised of representatives from each organization and meets on a regular basis to monitor implementation of the EVPL Plan and advise on issues of mutual interest. These meetings provide a forum to exchange information and discuss new proposals and initiatives in the EVPL area. Any member of the public is welcome to attend a Liaison Group meeting by contacting the meeting organiser in advance⁴⁴.

⁴⁴http://www.portmetrovancover.com/projects/ongoing_projects/East_Vancouver_Port_Lands_Plan_and_Liaison_Group.aspx

Port of Helsinki

This port has addressed many environmental externalities through a wide array of measures. The Vuosaari Harbor Project moved all of Helsinki's port operations out of the downtown area to the Vuosaari Harbor but also created conscientious links to the Port.

By moving, downtown Helsinki was relieved from the pollution, noise, and traffic from its port operations. The core operations of the harbor will be 2 kilometers from the nearest residential area. The new development, however, is very close to designated natural habitat areas, and therefore a number of mitigation measures have been employed.

Most notably, plans call for:

- Rail and road tunnels, (port-specific tunnel traffic for vehicles and train, noise and air monitoring, road and rail road side by side, same alignment) and
- A special bridge to be built, in order to avoid disturbing certain sensitive wildlife areas. Bridge and tunnel designs incorporate various elements that will minimize noise, vibration, and the potential for hazardous spills and water contamination.
- The rail tunnel will be electrified, and the rail bridge will incorporate warning devices to prevent birds from flying into the cables.
- Outside of the tunnels and bridges, the rail and road corridor will be adjacent to noise barriers and native landscaping.
- Other measures include bicycle paths and footpaths, several foot bridges, noise shielding and native landscaping of the rail yard and harbor road, and groundwater monitoring.⁴⁵

The Port will also clean sea floor silt during and after construction, and add affordable housing near port for proximity of workers to port.⁴⁶



Figure 22 Port of Helsinki buffers and trails. Source Port of Helsinki

⁴⁵ Port of Helsinki: <http://www.vuosaarensatama.fi/fi/index.html>.

⁴⁶ Port of Helsinki: http://www.portofhelsinki.fi/content/pdf_in_english/julkaisut/vuosaari%20eng_nettymparisto.pdf

Appendix B: Interviews: 1) Neighborhood representatives living adjacent to existing marine terminals and 2) three representatives from marine terminal facilities

As part of this Local Impacts Analysis, City staff interviewed neighborhood groups that live adjacent to existing marine terminals in Portland as well as conducting three interviews with marine industrial facilities in Portland Harbor. The point of these interviews was to talk about successes, challenges, on-going issues and lesson learned. The neighborhood representatives and industry representatives were also asked to offer best practices for industrial and residential neighborhood working together to resolve issues.

Interviews were conducted with neighborhood Land Use Chairs in Linnton, St. John's, Cathedral Park and the Pearl. Three interviews were conducted with industrial facilities including Kinder Morgan, Toyota and Columbia Grain.

Linnton - Ed Jones, Neighborhood Association Land Use Chair

Primary industrial impacts: Light, noise, dust

Challenges: Small issues to the industries are often significant to the neighbors. As noted above most success has come from frequent meetings with local industries. Linnton has not had as much success resolving issues through the Working Waterfront Coalition. Their main approach has been to always approach the business in question directly.

Successes: Regular meetings with the neighborhood's group and industrial businesses has been key to finding solutions. The neighborhood has had success in talks with Toyota and Schnitzer Steel in efforts to reduce light from Toyota's facility at Terminal 4 and noise from Schnitzer's facility. Toyota has built some additional fencing and reduced the amount of lighting late in the evenings. In response to noise complaints Schnitzer has put up a building blinder (?) to help lessen the operation noises that travel across the river.

Lessons Learned: An important part of any planning process for new development or redevelopment should include the neighborhood. Early contact with neighborhood groups helps to resolve issues early in the process. Maintaining contact with the industry businesses is important because new people come in all the time and business priorities and uses may change that do not consider the adjacent neighborhoods.

Other comments/questions:

- Dust from the soda ash facility across the river is evident but he has not heard complaints or concerns from the neighborhood association.
- Has West Hayden Island planning project looked at redevelopment of existing marine terminal sites rather than WHI?
- Ed believes a mix of uses is possible with constant communication and early communication with the industrial business. He believes that zero impact is possible with industrial development.
- It is hard to keep up with planning process and code changes. The City liaison program is very helpful but that person cannot attend every meeting of the

neighborhood association, especially with conflicting meetings with other adjacent neighborhood groups.

St. John's – Lorelei Juntunen, Neighborhood Association Land Use Chair

Primary Industrial Impact: Truck traffic coming from industrial facilities and I-5 through St John's to the bridge.

Challenges:

- Truck traffic does not stay on Lombard and Ivanhoe to get to the St. John's bridge. One of the local neighborhood streets that is heavily impacted is Fessenden. The pedestrian environment has been heavily impacted by truck traffic on this street.
- Concerned about capacity of St. John's bridge with the potential for increased traffic if a second bridge is built over to West Hayden Island

Successes:

- Slowly trying to implement pieces of the St. John's Truck Strategy including finding funding sources for turnabouts (or some sort of traffic calming improvements) on Fessenden to stop truck traffic on the street.
- Suggestion that urban renewal area may be expanded in area to help fund truck strategy

Lessons Learned:

- Involve freight community in discussions at the beginning of the process
- Plan truck routes and limit access to local neighborhood streets

Other comments/questions:

- St. John's would like to see the results of any new/additional modeling of traffic impacts to the St. John's bridge if a new bridge is added across to West Hayden Island.
- The neighborhood association sometimes receives land use notices for changes within the industrial area and the neighborhood is not sure how to respond or if a response is necessary. It would be nice to have someone explain the implications of the changes on the adjacent residential areas.
- Has there been any additional discussion of another bridge over the Willamette to by-pass St John's and the bridge?

Cathedral Park- Barbara Quinn, Neighborhood Association Land Use Chair

Primary Industrial Impacts: Noise, light and odor

Challenges:

- Train whistle noises at crossings
- Loading and unloading of train cars with autos at Toyota facility
- Industrial lighting on 24/7 at Toyota facility
- Truck traffic through community

Successes:

- The relationship with the Port of Portland has been good and their efforts to help negotiate with Toyota on issues related to light and noise have been helpful.
- Work through the River plan is helping to support creating a large buffer between residential and industrial property. The plan is recommending continued work between the Port, PBOT and the neighborhood to establish a whistle free zone.
- While the relationship with both the Port and City has been useful, the long process to address these issues has been very frustrating and the community feels as if some of the solutions have burdened the community. For example, zoning regulations will be updated in the Plan District to require new residential structures and reconstruction to meet enhanced insulation requirements within 500 ft of an industrial, employment zone or rail line. (River Plan: Draft recommendations, 11/09, vol. 1A, pg 50)

Lessons Learned:

- Talk to new industrial client very early in the process and set up regular meetings

Other comments/questions:

- Would like more detail on how the Pearl District quickly moved through and got approval of the Whistle Free zone
- Efforts to find funding for whistle free zone will continue with the Ports help. It has been very challenging to think of solutions for the loading and unloading of train cars.
- The signing of an industrial impacts disclosure form by new residents may not be that effective. Some new residents really had no idea of the scope of the noise and light issues in the neighborhood.
- The odor issue has not been pinpointed to a specific business in the area.

Patricia Gardner: Pearl Neighborhood Association Transportation Chair

Primary Industrial impacts: cell phone towers, dust (combination of freeway, construction and terminals—stressed that freeway is # 1 culprit)

Successes:

- Neighborhood has been proactive in discussions with adjacent industrial businesses. This neighborhood started as more of an industrial area and has transitioned in places to residential. It is important to foster positive thinking in an effort to work together and resolve issues.
- Pearl is an urban renewal area which has been extremely helpful in accessing funding, for example, the whistle free was paid in part through urban renewal money.
- Forming an LID (local improvement district) has also been extremely helpful to support community projects, for example, the expansion of the street car was done through 50-50 match (PDC funds and residential/business \$).

Lessons Learned:

- Early discussions are key to finding resolutions to accommodate both industrial and residential
- Buffers between uses extremely helpful- forested, manmade (walls, fencing) very helpful.

Brent McMullin, Regional Manager of Environment and Safety for Kinder Morgan Terminals, 3/2/10.

The premise for the conversation was to talk to Kinder Morgan about their experiences in working with local communities near their facilities and how issues have been addressed. Mr. McMullin offered some specific examples of their continued relationship with a neighbor representing a Sauvie Island neighborhood group.

Kinder Morgan operates the Potash facility at Terminal Five. At the start of operations at the facility Kinder Morgan worked with Sauvie Island to address concerns related to lighting and noise. Mr. McMullin noted that there are lighting challenges at industrial facilities because they must comply with OSHA regulations and make sure there is sufficient light for the safety of those loading ships and working on the dock. Some of the changes they were able to make include:

- Adding hoods to lights and angling lights down to limit glare on neighboring communities
- Automating the timing of lights on the ship loading equipment

The neighbors also identified noise coming from Terminal 5. In order to pinpoint the sources of noise at the facilities Kinder Morgan set up monitors throughout the facility and on Sauvie Island at property lines for a 3month period of time to determine the impact of their operations. The most impactful noise events were from air traffic, the grain elevator and train car movements to and from the grain elevators. The train car noise is primarily from the train cars bumping into one another during the loading and unloading process. Kinder Morgan cannot control the railroad noise on the main line, however, on site they are working to address the train car noises in the following ways.

- Initiated training programs with the Longshoreman's association to show them how to break more appropriately to prevent train cars from colliding during loading and unloading.

Facility developed a new strategy for storing the rail cars to act as a barrier or buffer from the noise while rail cars on the interior train loop are being unloaded and moved through the dumping process.

Kinder Morgan has also received complaints of dust from their soda ash facility at Terminal 4. The permitting of and ongoing monitoring of facilities such as this one are extensive. DEQ does permit facility operations and depending on product and dust collection efficiencies there may be situations where low levels of fugitive dust may travel beyond industry property lines. In response to dust concerns by Kinder Morgan's industrial neighbor to the south Kinder Morgan proceeded in the following ways to address the issues:

- area air sampling monitors were set up at the perimeter of the facility to monitor dust leaving the site.
- Bag house and /or dust collection efficiencies were improved
- Kinder Morgan invited their neighbors to tour their facility and become familiar with the product and the operations

Mr. McMullin stressed that neighbors, both residential and industrial, have helped Kinder Morgan be a better neighbor with continued discussions and efforts to address these issues.

Ron Corbin, Toyota Facility Manager, 3/10/10.

The premise for the conversation was to talk to Toyota about their experiences in working with local communities near their facility at Terminal 4 and how issues have been addressed. Mr. Corbin offered some specific examples of their continued relationship with Cathedral Park neighborhood group to address light and noise coming from their facility. The Toyota facility at Terminal 4 has worked with the Port, neighborhood groups and the City's noise control office to search for ways to reduce this noise.

In 2004, with the upgrade of the facility, Mr. Corbin indicated that conversations with the neighborhood were initiated prior to any changes. Some of the problems that were identified by the surrounding neighbors included horn whistle noise, loading of vehicles on to rail cars and lighting. Toyota conducted a noise study in 2008 to review the sound levels coming from their facility.

Mr. Corbin indicated that the action of loading and unloading of cars causes an impact of the steel bridge plats that result in a loud clanging noise. There is also a constant hum of the tires as they are loaded. Toyota has researched different options for padding the steel bridge plats that resulted in the testing of two different products.

- One was a plastic material that acts as a buffer between the plats, and
- A rubber coating at the ends of the bridge plats.

Unfortunately both of these efforts resulted in the products wearing off quickly. Toyota continues to research possible solutions to reduce this noise. Sound levels taken at nearby residences during the noise study were within the permissible levels per City of Portland code; however, Mr. Corbin indicated that they continue to look for options to alleviate this noise issue with the surrounding community. He also indicated that this issue seems to be seasonal. When there is leaf cover on the trees the percentage of neighborhood complaints goes down substantially.

The Port has been helpful in connecting Toyota to the surrounding community and they continue to assist with finding funding options for a quiet zone for the area. Toyota feels they are a member of the community and has a unique situation as their facility sits in middle of Cathedral Park. They've spent time with homeowners during area noise monitoring and have invited member of the community to the facility to see their operations. They attend neighborhood meetings at least twice/year and make an effort to update neighbors about potential changes very early in the process.

Toyota realized with the installation of new lights for the facility in 2004 that some of the light poles were the same height as the bluff which was the cause for many of the residential complaints. In response to the complaints, Toyota removed some of the lights, shielded others and redirected the light away from residences. Mr. Corbin noted that Toyota operates 24 hours/day and they must maintain some lighting on the facility at all times for security purposes; however, they turn off all other lights when they are not in use.

Randy Cartmill, Columbia Grain, 3/23/10

Columbia Grain facility was built in 1975 and expanded in 1985. Currently Columbia Grain maintains a permit with DEQ and provides extensive, ongoing monitoring of the facility, including the hiring a consultant who provides ongoing opacity readings at the facility. Columbia Grain is allowed 20% emissions (not to be exceeded for more than three minutes per hour)

Dust system upgrades:

- There are 18 baghouses at the facility used for dust collection.
 - Recently 6 baghouses were upgraded with more efficient filters, both for improved collection of dust emissions and also for their use of less energy. With this upgrade, Columbia Grain has met Energytrust criteria and increased efficiency of their dust collection systems.
 - Columbia Grain also uses a light application of food grade oil on the grain to reduce dust.
 - A local company is used to supply the new baghouse filters which can be laundered and reused.
-
- Columbia Grain has met with a Sauvie Island resident in the past to figure out a way to address lighting concerns from the facility. In response to this issue, Columbia Grain redirected many of the lights away from Sauvie Island which seems to have resolved the problem

Appendix C: Transportation Impacts Memo prepared by David Evans & Associates

(This memo can be found in its entirety on the WHI web page under Documents and Resources, Other Current Studies for West Hayden Island:

<http://www.portlandonline.com/bps/index.cfm?c=49816>) titled Transportation Memo by David Evans & Associates.

Appendix D: Regulatory information from existing plan districts and other relevant code sections

One of the concerns of any proposed WHI development is the residential area's proximity to any potential marine terminal development. The city has a few provisions in the zoning code, and has specifically called out for buffering of uses in some plan districts. The provisions summarized below could provide ideas for future WHI regulations.

Base Zone Standards

Several base zones as well as some special overlay zones and provisions in plan districts require lower height limits and landscaping where higher intensity zones border lower intensity residential zones. These buffer areas only tend to be about 25 – 50-feet in width. Since these standards are all similar, they are not listed individually below.

Additional Use and Development Regulations

The city has a series of special development and use standards that apply to certain uses. While these do not directly impact Marine Terminals, they may provide some ideas. Two sections that we reviewed were 33.254 – Mining and Waste Related Uses and 33.262 Off-Site Impacts

Mining and Waste Related Uses

Mining and Waste Related Uses are only allowed through a conditional use review. As part of the review, however, proposed uses need to provide a Traffic Impact Study, and a Nuisance Mitigation Plan (including conformance with offsite impacts below). Elements of these could be considered as part of a WHI plan district. In addition, these uses are required to have 100-foot landscaped setbacks from property and street lot lines and 200-foot setbacks from residentially zoned property lines.

Off-Site Impacts

This chapter assembles a list of impacts that non-residential uses need to consider when adjoining uses in residential, commercial and open space zones. These impacts include Noise, Vibration, Odor, and Glare. The noise standards actually refer to another city code, but all others have specific standards to be measured at the property line of the affected lot. Although these standards work on paper, they have been a little harder to implement in the field. However, the concept should be considered in context of WHI, both as it may affect residences, as well as wildlife/people in the OS zone. This chapter is also referenced in other parts of the code such as the Albina and North Interstate plan districts, and for regulations on wind turbines as examples.

Overlay Zones

Certain overlay zones include provisions to address impacts from one use to another. They are summarized below.

Buffer Zone

In several areas of the city where there is a direct interface between commercial, employment or industrial zones and residential zones, a buffer overlay zone has been applied along the border of the two zones. The intent is to achieve additional separation between residential and non-residential zones, by requiring landscaping, restricting

structures and storage, and limiting vehicle access through these buffers. These buffer areas vary based upon the configuration of the lot, generally ranging from 25 feet for most commercial buffers to 50 – 100 feet or more for some industrial / residential interfaces. Considering that the residents of East Hayden Island are already separated from West Hayden Island by a band of light industrial uses, the practical place to put this buffer zone would be along the interface between the light industrial uses and the manufactured housing. This wouldn't have much of an effect on development on West Hayden Island. Also, considering that there is a BES easement for the city's sewer outflow pipe, it is likely that any Port terminal facilities would be set back 500 feet or more from the railroad bridge, above and beyond most buffer zones covered under this chapter.

Environmental Zones

The city of Portland has two environmental overlay zones, the environmental conservation and environmental protections zones. While these zone's intent are to protect natural resources from development, they contain some provisions that could also be considered to address livability issues. Standards are placed in the code to ensure development is setback from resources, vehicle and truck areas and exterior storage areas are buffered from the resource with a 10-foot landscaped area and that exterior lights brighter than 200 watts are placed to not shine directly into the resource area.

Portland International Airport Noise Impact Zone

This overlay zone's intent is to reduce the impact of aircraft noise on development within the noise impact zone. To implement this, the code limits residential development in areas most affected by aircraft noise levels and requires noise insulation, a noise discloser statement and a noise easement in other areas during construction of new development or large redevelopment. Note that some of these similar measures are being proposed through the River Plan below.

Plan Districts

In addition to some height step downs listed above in the base zone section, some area neighborhood plans and plan districts have regulatory and non-regulatory means to limit negative influences from industrial development.

Linnton Village Plan and Linnton Hillside Plan

Initially, this plan called for creating a vibrant mixed use area between the Linnton commercial district and the Willamette waterfront. The village plan considered using a 400 foot "buffer" of light industrial uses to lay between the petroleum tank farms and the commercial and residential uses originally proposed as part of a small town center. Due to concern over access, safety, and industrial land issues, the plan was never approved by City Council. The Linnton Hillside plan was mostly concerned with infill hillside development exceeding existing infrastructure.

St. Johns / Lombard Plan

The St. Johns / Lombard Plan included action items to limit the transportation impacts to the town center. Some of these items included creating mechanisms to encourage trucks to use designated truck routes, and discourage 'cut through' traffic. This effort was coordinated with the St Johns Truck Strategy. A long term solution was identified as a new Willamette River crossing north of the St. Johns bridge which could divert truck

traffic from the Rivergate Industrial area away from the town center. It should be noted that a new bridge connecting any WHI terminal with Marine Drive could worsen St. John's situation by encouraging traffic from the terminals to cut through using N. Portland Rd. to N. Columbia Way and N. Fessenden to get to St. Johns and the Bridge. A second Willamette bridge crossing would also alleviate this issue. Code created to address the residential/industrial interface was limited to a prohibition on residential uses in the EG2 zone. Additional changes are being proposed with the River Plan (below).

Guilds Lake Industrial Sanctuary Plan / Northwest District Plan

The intent of this plan was to ensure the continued viability of the industrial uses in the Guilds Lake area and protect it from encroachment from non-industrial uses. Part of that strategy involved creating a buffer area along its southern boundary where a transition between the industrial and mixed uses were allowed. This boundary area is about one block wide north of NW Vaughn. Although zoned for industrial, the area does allow a wider flexibility of office and retail uses and contains design standards to relate to the mixed use area to the south. North of the buffer area, additional controls make it more difficult for non-industrial uses to locate in the plan district. South of the buffer area, provisions limiting residential development were added to the Northwest Plan District's northern boundary to reduce conflicts with the industrial areas.

Hayden Island (East) Plan

The intent of this plan was to coordinate future development and re-development on the island with planned infrastructure improvements (Columbia River Crossing, Light Rail Station, etc). As part of this review, the plan considered future scenarios for West Hayden Island. To increase the livability on the island, consideration was made for future infrastructure on WHI such as streets and parks that could benefit residents on the east half, while also acknowledging potential negative impacts that any development on WHI might have. However, specific implementation was left to the WHI planning process. The code language contained a provision to ensure new development steps down in height adjacent to residential zones. It did not create any new standards for existing industrial development.

Portland International Raceway (PIR) Plan District

This plan district was created to manage the distinct resources in West Delta Park. The plan district was created to ensure development at PIR is sensitive to surroundings and to the environmental features found in the Peninsula Drainage District Natural Resource Management Plan. This plan district does not offer any specific livability related standards, but requires most development to engage in an extensive Master Plan review process that would engage the surrounding community and stakeholders. This process could also be used on WHI in a planning district 'light' scenario where certain key decisions on development could be delayed. The PIR master plan process requires the provision of key information including proposed events, attendance, area of expansion, review of environmental issues, transportation impacts, etc. It also requires notice of the proposal across a greater range (recognized organizations within 1 mile). Approval criteria also address visual and lighting affects that could be incorporated into future livability criteria on WHI.

Kenton Plan

The Kenton plan district implements the Kenton Downtown plan approved in 2001, which was, itself, an update on the Kenton Neighborhood plan from 1993. The main intent was to foster a pedestrian friendly revitalization of the Denver Avenue commercial corridor,

and areas around the future light rail station. Livability issues were not directly addressed, although some use limitations and development standards were created in the business core, to encourage more pedestrian-friendly and employer-intensive businesses to locate. Additional height was allowed on certain sites that would not negatively impact surroundings.

Cascade Station / Portland International Center plan district

The intent of this plan district is to encourage mixed use growth around the areas two light rail stations, while protecting significant environmental resources, and not overloading adjacent transportation infrastructure. To achieve the first, special environmental regulations apply in sensitive areas. To achieve the second, district-wide limits on uses and overall square footage have been applied to comply with transportation forecasts.

River Plan North Reach

The current River Plan proposal moving through City Council has considered several issues related to the interface between industrial uses (including rail noise concerns) and nearby residential uses. Specific sections addressing livability were considered in the Linnton, St. Johns, and Cathedral Park neighborhoods. In addition, overarching concerns with noise were considered, although it was acknowledged that city-wide policies will need to be strengthened in the future. Current code proposals include requiring noise insulation and noise disclosure statements for new and significant redevelopment in parts of St. Johns and Cathedral Park within about 500 feet of industrial zones.

Previous Planning Efforts for West Hayden Island

In the late 1990's the Port of Portland underwent an extensive planning process for West Hayden Island that went as far as creating a draft plan district for the potentially annexed property. Although this plan district did not address livability concerns directly, it did create some standards for buffering and lighting (similar to our environmental zones) which would have the result of jointly minimizing impacts on adjacent neighbors (human and animal). Lighting standards were set up to reduce the amount of light shining directly into the Columbia River and to focus the light downward. 25-foot sand fill slopes with landscaping adjacent to the natural resource. Trails within the recreation area were required to be built prior to the issuance of any building permit for the terminal area. This would allow the recreational amenities to be completed prior to the rest of the development.

Summary

While some aspects of the above regulations may be applicable to a future WHI plan, many of the provisions attempt to address impacts of immediately adjoining properties, up to about 500 feet in distance. Any proposed marine terminal development on WHI would likely be located much further away from the closest residences (the manufactured home and house boat communities). There is already existing industrial development at the west end of Hayden Island plan district, and a BES sanitary sewer facility located west of the BNSF railroad tracks. Any proposed terminal would likely be located about ½ mile or further away. However, it is feasible that some areas adjacent to any terminal could receive open space (OS) zoning which also could be affected by adjoining impacts.

Another option would be to consider the merits of creating a master planning process similar to Portland International Raceway or Waste Related/Mining Uses, where specific off-site impacts could be addressed as part of a report submitted with master plan/conditional use review. This would also allow greater flexibility in the review based upon the type of development proposed.

Appendix E: Bibliography of Resources

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- 3) Baxter Engineering Company <http://www.baxair.com/>
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- 2) West Hayden Island Area Plan (Draft) 1999, W&H Pacific
- 3) Army Corps of Engineers, Environmental Impact Statement (Draft) , 1999
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- 2) The National Lighting Bureau : www.nlb.org
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- 4) International Dark Sky Association:
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3) BDS Noise Control

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4) Noise Management in European Ports (NoMEPorts): <http://nomeports.ecoport.com>

National and International Ports researched for this report:

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- 1) Port of Seattle
- 2) Port of Tacoma
- 3) Port of Long Beach
- 4) Port of Los Angeles
- 5) Port of San Pedro/Los Angeles
- 6) New York/New Jersey Port Authority
- 7) Port of West Sacramento
- 8) Port of Chesapeake
- 9) Canaveral Port Authority
- 10) Port of Miami
- 11) Port of Charleston

International Ports:

- 1) The Port of Helsinki, Finland
- 2) The Port of Göteborg, Sweden
- 3) Port Metro Vancouver BC
- 4) Port of Oslo, Norway
- 5) Port of Auckland New Zealand
- 6) Port of Amsterdam Ceres Paragon Terminal