



WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
FERRIES DIVISION

FINAL LONG-RANGE PLAN

APPENDIX P
ENVIRONMENTAL CONSIDERATIONS

ENVIRONMENTAL EVALUATION OF FERRY SYSTEM PLAN

INTRODUCTION

The purpose of the environmental evaluation is to analyze potential environmental impacts from, and the ability to meet environmental regulatory obligations through implementation of the Long-Range Plan. For the analysis, the study area was defined as the Washington State Ferries (WSF) system in Puget Sound which includes the 19 terminal locations and the maintenance facility, and serves the communities of Kitsap, King, Island, Pierce, Skagit and San Juan Counties. This environmental evaluation does not provide any National Environmental Policy Act (NEPA) or State Environmental Policy Act (SEPA) level analysis, but rather provides a qualitative assessment of the major environmental elements that could pose substantial issues on future development of any of the ferry terminals and implementation of operational solutions.

The environmental elements evaluated include land use, air quality, noise, water quality, ecosystems and protected species, earth, traffic, tribal resources and treaty rights, historical and cultural resources, park and recreational lands, and Department of Natural Resources Lands.

Linking transportation planning and NEPA is voluntary. The intent of the process is not to require NEPA studies in the transportation planning process. CFR 771.117 and TEA-21 exempt planning studies from NEPA review as reflected under 23 USC 134(o), 23 USC 135(i) and 49 USC 5305(h). WAC 468-12-800(3) also exempt transportation plans from SEPA. However, the Safe Accountable Flexible Efficient Transportation Equity Act (SAFETEA-LU) has development guidance for linking planning to NEPA. The degree to which studies analyses, or conclusions from the transportation planning process can be incorporated into the project development/NEPA-SEPA processes will depend upon how well they meet certain standards established by those regulations and guidance.

Future project level planning and environmental review for terminal projects identified to move forward in the Long Range Plan will provide more detailed project-level information on the specific projects, such as specific terminals, routes, transit enhancement locations, operational characteristics, and more detailed environmental impact assessment and mitigation plans. WSDOT's vessels are constructed in private shipyards and these shipyards are required to meet all state and federal environmental requirements.

WSF will work with local governments, resource agencies, tribes, federal agencies and the public to ensure that the plan implementation and project specific work is carried out in full compliance with environmental laws and WSDOT's policies. This section of the plan explains the areas of the environment WSF considered at the plan level.

Why include planning-level environmental review for this ferry long-range plan?

- To implement current and emerging guidelines at Federal and State levels to engage environmental discussion in transportation planning
- To provide a comprehensive, coordinated and coherent system framework for individual service and capital improvement components of the transportation plan
- To reduce costs, time and uncertainties for individual capital projects when underlying system plan policies, technical analysis and stakeholder involvement have been broadly in place
- To align “big picture” issues and mitigation strategies and provide key inputs to projects that do trigger NEPA or SEPA. This helps the comprehensive planning process to inform any subsequent project level NEPA/SEPA process, and, on the other hand, environmental considerations are incorporated in comprehensive planning at the outset

What is the role of planning-level environmental review in the decision-making process in developing the ferry plan?

- The decision process now heightens broad environmental review alongside planning decisions and stakeholder outreach
- Environmental impact considerations are integrated into ferry system structure, service program and capital project decisions
- The ferry plan draws extensively from recent terminal and vessel project-specific development and permitting processes.

LAND USE

What is the existing land use and zoning around the ferry terminals?

Land uses at the ferry terminal locations include recreational, residential and commercial. The communities in which the ferry terminals reside are linked in varying degrees to the economic conduit that the ferry system provides. In some cases this economic relationship has been an important factor in the land use development of the community.

Local comprehensive plans, zoning maps and shoreline master programs designate the ferry terminals as ferry terminal facility, commercial, industrial or urban waterfront that allow the location of the terminal facilities. The establishment of ferry terminal facilities predates the Growth Management Act and Shoreline Management Act.

What are the potential land use changes associated with the plan?

Improvements and operation of the ferry system can affect land uses in several ways. When there is a change in the size of terminal facility or location there would be near-term changes to properties being used. There may also be medium term changes in the locality if the economy realizes benefit or detriment from the changes to the terminals. In addition,

changes in ferry service can also affect local land use to the extent that the ferry service provides access to properties and as a function of facilitating movement of money and goods in the local economy.

The ferry system plan takes account of the critical interaction between local land use and the provision of ferry services. This is accomplished by:

- Relying on adopted comprehensive plans as the land use basis for ferry planning;
- Using local and regional datasets and tools in technical analyses;
- Developing ferry strategies and programs to align with adopted State and local transportation and land use goals; and
- Involving local and regional entities in plan-making.

Strategies that have been developed in the long range plan are not expected to change the land uses of any of the ferry communities with exception of Mukilteo, where the terminal may be relocated. At Mukilteo, if feasible, the terminal will be relocated to an abandoned industrial property to allow active, urban water front commercial uses at the current terminal location.

AIR QUALITY

How is air quality regulated?

Air quality in the Puget Sound region is regulated by the U.S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), and the Puget Sound Clean Air Agency (PSCAA). Under the Clean Air Act, EPA has established the National Ambient Air Quality Standards (NAAQS), which specify maximum concentrations for carbon monoxide, particulate matter (PM10 and PM2.5), ozone, sulfur dioxide, lead, and nitrogen dioxide. In addition, the state has recently established statutory requirements regarding green house gas emission reductions for state agencies.

The Puget Sound Clean Air Agency's 2005 Air Quality Data Summary indicates that, with the exception of fine particulate matter (PM2.5) and ozone, criteria air pollutants concentrations are well below levels of concern for the region.

Particulate matter includes small particles of dust, soot, and organic matter suspended in the atmosphere. Particulates less than 100 micrometers in diameter are measured as total suspended particulates. Most diesel engine emissions are in the PM2.5 size range, while road and construction dust is often in the larger PM10 range. Most transportation related fine particulate emissions come from diesel engine emissions, which release fine particulates both directly, mostly as carbon compounds and indirectly in the form of sulfur dioxide, a gas that reacts in the atmosphere to form sulfate particulates.

What are the pollutants of concern in the Puget Sound region?

Criteria pollutants, as identified by the National Ambient Air Quality Standards (NAAQS) are particulate matter (PM10 and PM 2.5), carbon monoxide, ozone, sulfur dioxide, lead, and nitrogen dioxide.

- PM10 is particulate matter less than 10 micrometers in size
- PM2.5 is particulate matter less than 2.5 micrometers in size

Near the Puget Sound, PM_{2.5} and PM₁₀ concentrations tend to be highest in Fall and Winter during periods of air stagnation and high use of wood for heat. Current monitored levels of PM_{2.5} violated recently adopted (2006) federal standards in Pierce County. Other air pollutants of concern for transportation projects include mobile source air toxics and greenhouse gases.

Ozone is a highly toxic combination of oxygen atoms and is a major component of the complex chemical mixture that forms photochemical smog. Ozone is not produced directly, but is formed by a reaction between sunlight, nitrogen oxides (NO_x), and volatile organic compounds (VOCs). Ozone primarily is a product of regional vehicular traffic, point source emissions, and fugitive emissions of the ozone precursors. Tropospheric (ground-level) ozone, which results from ground-level precursor emissions, is a health risk, while stratospheric (upper-atmosphere) ozone, which is produced through a different set of chemical reactions that only require oxygen and intense sunlight, protects people from harmful solar radiation.

In the Puget Sound area, the highest ozone concentrations occur from mid-May until mid-September, when urban emissions are trapped by temperature inversions followed by intense sunlight and high temperatures. Approximately thirty percent of nitrogen oxides and volatile organic compounds come from mobile sources. Maximum ozone levels generally occur between noon and early evening, after nitrogen oxides and volatile organic compounds have had time to mix and react under sunlight, and at locations several miles downwind from the sources. Light northeasterly winds produce these conditions contribute to high ozone concentrations near the Cascade foothills, to the south and southeast of the Seattle-Tacoma Metropolitan Area.

Automobiles, ferry vessels, and other vehicles using fossil fuel also emit greenhouse gases, primarily carbon dioxide. Greenhouse gases trap solar energy in the atmosphere, warming the earth's surface. While greenhouse gases occur naturally in the atmosphere (without them the average temperature of the earth would be below freezing), human activities over the last century have released additional greenhouse gases.

Currently, approximately 49% of all greenhouse gas emissions in Washington State are from transportation, including on-road and off road vehicles, ferry vessels, rail transport, and air travel. WSF vessels burn approximately 17 million gallon of diesel fuel annually. Based on the *2007 WSDOT Greenhouse Gas Emissions Inventory*, these 17 million gallons account for approximately 69 percent of WSDOT's green house gas emissions. In the 2009-11 biennium, this amount is expected to be reduced to about 15 million gallons as a result of fuel conservation efforts.

What are the possible effects of the plan on air quality and greenhouse gas emissions?

The operation of the ferry system affects air quality and greenhouse gas emissions through both the emissions of passenger vehicles using the system and through the operation of the system itself.

Potential Emissions Reductions from Passenger Vehicles

Air quality improvements are anticipated in the communities near terminals where the proposed reservation system will be implemented. Emissions from passenger vehicles using the ferry system will be reduced by shortening the cues of idling vehicles. Currently, vehicle cues frequently extend far beyond the toll booths at many terminals during peak travel periods. Vehicles beyond the toll booths are encouraged, but not required, to shut-off vehicle engines. It is unknown whether passengers will modify their sailing time to use the reservation system or will choose to drive around to travel at their preferred time. Air emissions will be affected if travelers elect to drive around southern Puget Sound to reach their destination.

In addition to the savings from passenger vehicles, implementation of the reservation system is expected to reduce the number of vessels needed to meet projected demand, and consequently avoid fleet emissions that would occur if vessels and vessels sailings were added to meet projected demand, as proposed under previous long range system planning efforts.

Potential Emissions Reductions from the Ferry System

This plan delays the installation of transit-related improvements to the terminals until increased walk-on ridership is realized, and maintains the current cost pricing ratio between vehicles and passengers. The delay to terminal transit improvements, and not changing the pricing strategy, will likely delay the shift of ferry ridership from single occupancy vehicles to alternative modes of transit. This assumption is based on the ease of use, accessibility and cost factors that affect transportation choices. If this assumption is accurate, then it may be difficult for the for the ferry system to contribute to statutory per capita vehicle miles traveled and greenhouse gas reduction targets. Delaying a greater shift to transit will also delay the realization of potential reductions in criteria pollutants associated with transit use.

The proposed new vessels are designed to maximize fuel efficiency and will meet new EPA standards for emissions control. The replacement of the fleet's oldest vessels with vessels that meet current EPA standards is expected to reduce emissions of criteria pollutants from the fleet.

The new 64 auto class ferries will have greater engine cylinder displacement than the vessels they will replace. So, although many measures have been taken on these new vessels to optimize fuel efficiency, it is possible they will burn more fuel per trip than the vessels they replace.

The implementation of this plan would support the ongoing efforts to reduce fuel consumption and air emissions of the vessel fleet. The fuel conservation strategies currently being pursued (see sidebar) are expected to lower the overall fleet fuel use, and therefore

green house gas emissions. This fleet wide fuel use reduction is expected even though the 64 auto ferries may burn more fuel on a given route than the vessels they replace.

Although total greenhouse gas emissions are expected to decrease with this plan, given currently identified fuel use reduction strategies, it is uncertain and perhaps unlikely that WSDOT will be able to meet statutory greenhouse gas reduction targets without significant changes in fuel, propulsion technology and/or operations of the vessels. See sidebar for state agency statutory green house gas reduction requirements.

State agency green house gas reduction requirements

- By July 1, 2020, to 15% below 2005 levels
- By 2035, to 37% below 2005 levels
- By 2050, to the greater of 57.5% below 2005 levels or 70% below the expected state government emissions that year.

Measures WSF is taking to reduce fuel consumption and air emissions from its vessels

Minimize the energy requirements through the ship design process

- Properly sizing ships to meet WSF's current and future operational needs.
- Designing ship hulls design to reduce overall resistance and reduce fuel requirements
- Selecting EPA compliant clean burning, fuel efficient and optimally sized diesel engines
- Ensuring that new vessels have adequate carrying capacity to accommodate future emissions control alterations

Minimize energy requirements through operational policy

- Run propulsion and auxiliary engines only when necessary, e.g., use shore power at night.
- Operate ferries at their most fuel efficient power level while maintaining published sailing schedules.
- Modify vessels to allow one-engine operation at the terminals

Minimize emissions by selecting cleaner fuels

- By 2004, the entire WSF fleet had converted from high sulfur diesel fuel (3500 ppm sulfur) to low sulfur diesel fuel (350 ppm sulfur).
- Currently WSF is using ultra low sulfur fuel (15 ppm sulfur) and biodiesel, within budget constraints.

NOISE

How is noise regulated?

As more people choose to live along the banks of the Puget Sound, noise from the loading of ferries and their engines has become a greater concern for residents near ferry terminals.

The regulation of noise typically is the responsibility of state and local governments through noise limits established by local ordinances and state regulations. For example, many cities and counties have established ordinances that limit construction noise levels at night and on weekends. WSDOT also evaluates traffic and transit noise as part of the SEPA/NEPA process when new terminals are constructed or substantial improvements are made.

The Federal Highway and Federal Transit Administrations provide criteria for evaluating noise impacts from transportation sources. WSDOT uses these and other applicable criteria to evaluate proposed projects during project-level environmental reviews.

How will the plan affect noise in the terminal communities?

Terminal preservation and improvements identified in the plan may have significant noise related impacts during construction. During project development and implementation, it is WSDOT's practice to work with the applicable cities and counties to minimize noise related construction impacts, as is practicable, and ensure compliance with local ordinances.

Implementation of the plan is unlikely to cause noticeable changes to the noise levels associated with system operations. WSDOT studies indicate that the loudest source of noise at the terminals during operations is from passenger vehicle loading and unloading.

Reducing vehicle noise may require noise barriers in front of homes (blocking scenic views) or converting the fleet to different vessel types, which is beyond the resources of the department. Noise compatible land use is another approach and involves cities and counties limiting new building permits and remodel approvals near ferry terminals, or requiring the incorporation of noise reduction standards in new or remodeled homes, thus transferring potential noise mitigation responsibility to owners and developers.

WATER QUALITY

What are typical water quality issues associated with transportation system projects and operations?

Stormwater runoff from highways and other paved surfaces (such as ferry terminals) has been shown to contain a range of pollutants including particulates and solids, nitrogen and phosphorus compounds, heavy metals, and oil and grease. These pollutants are directly related to vehicular use of the paved facilities and have the potential for adverse impacts on water resources that they drain into. Potential impacts resulting from these pollutants depend on a number of variables including: rainfall duration and intensity, the number of dry days preceding intense rainfall, surrounding land uses, air quality, vegetation types, spills on

roadways, improperly disposed waste and fluids, maintenance activities, and health of the surrounding ecosystem.

Most ferry terminals were built prior to stormwater regulations and have no runoff treatment or flow control facilities associated with them.

Threats to water quality from stormwater on the vehicle deck of a ferry vessel would likely be similar to that of a parking lot, as the area temporarily holds vehicles in a similar manner. These main vehicle decks of the ferry fleet are open to drain to surface waters through scuppers, which are required to maintain the stability and safety of the vessels

The importance of water quality relates directly to the health of the vegetative communities and the wildlife they support. Contaminants may accumulate in fish and other wildlife, endangering their health and potentially the health of humans that consume them.

How is water quality regulated in Washington State?

Several policies and regulations directly affect water quality and focus on the impacts of growth and development. These include the Federal Clean Water Act, the state's Water Pollution Control act, the Growth Management Act and Shoreline Management Act. Washington State Department of Ecology (Ecology) has established detailed water quality criteria (Chapter 173-201A WAC) intended to protect a variety of designated uses of state waters. Stormwater is regulated by Ecology through stormwater management regulations for construction and operations of facilities, and Ecology is responsible for implementing the National Pollutant Discharge Elimination System (NPDES) for shoreside actions. In addition the Washington Department of Fish and Wildlife have regulatory authority over specific activities such as ferry terminal cleaning, painting, general maintenance and repair, piling removal or replacement and marine geotechnical sediment test boring, through Hydraulic Project Approvals (HPA).

Ecology has recently issued a new WSDOT Municipal Stormwater General Permit that covers stormwater discharges from ferry terminals, and is scheduled to issue a new Industrial Stormwater General Permit that will cover stormwater discharges from ferry maintenance facilities later this year. These permits have or will increase the performance requirements over the previous permits.

Discharges to surface waters from vessels are governed by international laws and regulations and U.S regulations, including the Code of Federal Regulations Parts 33 and 40. The State of Washington's requirements essentially mirror the federal requirements in this area.

The NPDES regulations, implemented under the Clean Water Act, historically did not regulate discharges from vessels. However, in February of 2009 a new Vessel General NPDES permit was issued by the EPA, which covers up to 27 potential discharges from permitted vessels.

What are the potential water quality impacts from the plan implementation?

The proposed demand management strategies are expected to minimize the holding area needed at the terminals. Consequently, this is expected to avoid the need for addressing additional pollution loading surfaces in the system.

Because the mechanism for funding stormwater system upgrades is currently dependent on the development and implementation of terminal improvement projects and proposed terminal improvements have been delayed within the final plan, upgrades to the stormwater treatment at the terminals will also be delayed. The result is that stormwater runoff from many of the terminals will continue to be untreated. The plan does not address resources that will be required to comply with new stormwater permit requirements.

The plan may further reduce the already low risk of fueling spills reaching surface waters, as the new 64 auto ferry will have spill containment features built into the vessels deck. No other vessel water quality related changes are anticipated with plan implementation.

How WSF avoids and minimizes impacts to surface waters

WSF best management practices at terminals to avoid and minimize impacts to surface waters include:

- Storing hazardous materials in secondary containment
- Selecting less toxic materials (such as cleaning materials) where discharges cannot be completely eliminated, and implementing management practices that minimize the discharge of potential contaminants (such as terminal cleanup practices to protect the quality of terminals runoff)

WSF best management practices on vessels that avoid and minimize impacts to surface waters include:

- Eliminating direct discharges into Puget Sound of materials such as oily wastewater or gray water, by holding them on board and then discharging them legally to appropriate shore side facilities.
- Designing systems to minimize potential discharges, such as from shaft seals.
- Fueling in a manner that reduces risks of spills.
- Selecting less toxic materials (such as anti-fouling hull coating) where discharges cannot be completely eliminated, and implementing management practices that minimize the discharge of potential contaminants (such as deck cleanup practices to protect the quality of terminals runoff).

ECOSYSTEMS AND PROTECTED SPECIES

In what ecosystem and habitats does the ferry system operate?

Puget Sound contains a wide variety of deepwater and nearshore habitats. These include rocky shores, sandy beaches, coastal lagoons, kelp and seagrass beds, large estuaries and salt marsh wetlands. Where sunlight penetrates the nearshore environment eelgrass, seaweed and plankton grow. The eelgrass, seaweed and plankton provide important shelter and food for numerous invertebrates, herring, juvenile salmon and other fish, and diving birds.

The upland habitats adjacent to the terminals include urban city center, small towns, suburban and rural environments. A few of the more rural terminals still have remnant second or third generation stands of the Puget Trough coniferous forests that historically dominated the region.

What species are under protection in the vicinity of ferry system operations?

Species listed as endangered or threatened under the Endangered Species Act (ESA) in Puget Sound, and that could occur at WSF ferry terminals or along routes include the Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*), bull trout (*Salvelinus confluentus*), Steller sea lion (*Eumetopias jubatus*), marbled murrelets (*Brachyramphus marmoratus*), Southern Resident Puget and Sound killer whale (*Orcinus orca*). The other listed whale and sea turtle species are typically found in off-shore coastal areas and are rare or absent in the ferry terminal areas. Listed candidate species can be found in sidebar.

ESA consultation is conducted on projects that are federally funded, permitted or on federal lands. Almost all WSF terminal construction projects entail either federal funding or federal permitting. Permitting by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbor Act is required when projects involve some level of dredging or filling of navigable waters

ESA-listed and Candidate Species/Critical Habitats

Listed Species/Habitats:

- Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*)
- Puget Sound Chinook salmon critical habitat
- Hood Canal summer chum salmon (*O. keta*)
- Hood Canal summer chum salmon critical habitat
- Steelhead (*O. mykiss*)
- Humpback whale (*Megaptera novaeangliae*)
- Killer whale (*Orcinus orca*)
- Killer whale critical habitat
- Leatherback sea turtle (*Dermochelys coriacea*)
- Steller sea lion (*Eumetopias jubatus*)
- Bull trout (*Salvelinus confluentus*)
- Bull trout critical habitat
- Marbled murrelet (*Brachyramphus marmoratus*)
- Marbled murrelet critical habitat

Candidate Species

- Eulachon/Columbia River Smelt (*Thaleichthys pacificus*)
- Bocaccio Rockfish (*Sebastes paucispinis*)
- Canary Rockfish (*Sebastes pinniger*)
- Yelloweye Rockfish (*Sebastes ruberrimus*)

Bald eagles (*Haliaeetus leucocephalius*) are no longer ESA listed, however they are still protected under Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, the state's Bald Eagle Protection Law (RCW 77.12.655) and state's Bald Eagle Protection Rule (WAC 232-12-292). Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) maps indicate the presence of eagle nests in the vicinity of ferry terminals. Bald eagles build large stick nests in mature or old-growth trees, to which they return over successive years.

In addition, the Washington State Department of Fish and Wildlife maintains a priority habitats and species program, which identifies endangered, threatened, and sensitive wildlife species and their habitats (WAC 232-12-297). The Washington Natural Heritage Program (WNHP) is managed by the Washington State Department of Natural Resources, which maintains lists of rare plants and natural communities in the state (Ch. 79.70 RCW). There are no known rare plants identified near WSF terminals, and only one High Quality Ecosystem in the vicinity of a terminal, a wetland east of the terminal in Anacortes.

Many listed species are provided some level of protection by various federal, state and local regulations. Local critical areas ordinances provide protection to designated areas. State agencies also have developed management plans for some of the listed species and habitats. These management plans provide guidance on avoiding, minimizing, and mitigating impacts to the species and habitats.

What are the potential ecosystem and protected species impacts of the plan?

Implementation of a reservation system will minimize the terminal area "foot-print" requirements, on land and over water, of the ferry system. This affects the quantity and scale of terminal improvements projected for the future. The result is a minimization of likely impacts to aquatic and terrestrial natural and cultural resources, and reduction in these impacts when compared with previous long range plans.

Typical impacts from improvements to terminals include shading from overwater structures, underwater noise impacts from steel pile driving, and changes to the harbor line. The Mukilteo Multi-Modal project, which would relocate the terminal to a different location, is expected to impact nearshore habitat at the location of the new terminal.

WSDOT follows a tiered approach for minimizing adverse impacts to protected wildlife, fish and their habitats. Through project design, construction scheduling and implementation planning, WSDOT first seeks to avoid potential adverse impacts to protected species and their habitat. If impacts are unavoidable, WSDOT works to minimize the magnitude and duration of the impacts to the extent feasible. Remaining impacts that are considered significant and adverse are mitigated to the extent feasible and in accordance with local, state and federal regulations.

WSDOT conducts in-water pile driving to maintain the safety of key facilities at ferry terminals. The department is performing independent research and working jointly with other states and resource agencies to identify how noise works underwater, how fish and diving birds are affected by the noise, and what mitigation, if any, may be warranted.

WSDOT also analyzes wake-wash and propeller scour of new vessels to identify and minimize impacts to the shore and near-shore habitat. Maximum vessels speeds are identified for transit near shorelines identified as sensitive to erosion.

Engine noise is minimized through vibration dampening engine mounts and tighter clearances in gearbox assemblies. In addition, propeller noise is minimized through cavitation minimizing propeller design.

Furthermore, to avoid adverse impacts to marine mammals, the vessels are operated in accordance with National Oceanic and Atmospheric Administration's "Be Whale Wise" guidelines.

EARTH

What are the geologic hazards in the shoreline environment?

The Puget Sound region is geologically active. Numerous small earthquakes occur in the region annually. Periodically, larger earthquakes occur which, like the Nisqually earthquake of 2001, have the potential to damage manmade structures. The region also has areas with naturally occurring steep slopes or saturated unconsolidated soils. The steep bluffs along Puget Sound are susceptible to erosion from gravity, storm surges, and stormwater runoff.

Liquefaction occurs when water-saturated sandy or silty soil loses strength during earthquake shaking (similar to quicksand). It can cause major structural failure if not properly accounted for. Liquefaction only occurs in water-saturated soil. It has an impact on bridges and other large structures, which may require expensive retrofitting or replacement to meet current seismic (earthquake) standards.

The Washington State Department of Natural Resources (DNR) has developed liquefaction susceptibility maps which outline areas where liquefaction is most likely to happen. State and local governments develop hazard mitigation plans and delineate geologically hazardous areas as required by the Growth Management Act.

How climate change may affect the likelihood or impact of erosion and liquefaction is not yet well understood. However, with an expected rise in sea-level and increase in frequency of severe storm events, as described in *The Washington Climate Change Impacts Assessment* (The Climate Impacts Group, University of Washington, 2009), erosion along the shoreline would be expected to increase.

What geologic risks and mitigation measures are of concern for WSF facilities?

Terminals already identified as having erosion related problems include Fauntleroy (erosion) and Southworth (bluff erosion). Terminals that may be susceptible to seawall problems from storm surges include Mukilteo, Seattle and Fauntleroy.

The current DNR maps indicate that the several WSF terminals are within a moderate to high liquefaction susceptibility areas. And, based on the age of the facilities, some of the ferry terminal structures do not meet current design standards for earthquake or liquefaction.

The susceptibility of the area to erosion, storm surge damage, liquefaction and sub-standard design of existing structures will have to be taken into consideration during development of any terminal improvement project. Soils that are susceptible to liquefaction may require retrofit measures such as ground stabilization, selection of deeper foundations, different types of foundations, and/or selection of appropriate structural systems to accommodate anticipated displacements.

TRAFFIC/CONGESTION

What is the relationship of auto ferry operations on traffic?

Normal operation of auto ferries has an effect on congestion and circulation on local streets, and access to residents and businesses as a result of queuing on road shoulders, vehicle off-loading, parking, pedestrians and traffic safety measures in the communities where the terminals are located. Inadequate terminal sizing and configuration negatively affects traffic related impacts to the community.

How will the plan affect traffic congestion?

The proposed reservation system is expected to reduce the traffic impacts on the local communities of vehicles queuing for the ferries.

Implementation of the plan will result in minor increases in system capacity and efficiency. This will be accomplished by replacing some of the retiring vessels with vessels that are slightly larger. This vessel substitution increases normal vehicle carrying capacity on the Anacortes/San Juan Islands route, Mukilteo/Clinton, Seattle/Bremerton, Fauntleroy/Vashon/Southworth, and Point Defiance/Tahlequah routes. The increase in vessel offload traffic of the replacement vessels is expected to be minimal on most routes. On routes with potentially significant increases in offload traffic, WSDOT will evaluate the potential traffic impacts to determine if mitigation measures are necessary.

To reduce the current traffic congestion and safety concerns caused by vehicles queuing on Fauntleroy Avenue near the Fauntleroy terminal, a reservation system is being considered for the route pending future legislative action.

In the project development process, WSDOT works with the communities where the terminals are located to identify potentially significant traffic related impacts. WSDOT minimizes traffic related impacts to the communities by adequate sizing of terminals and their holding areas, configuring terminals to maintain pedestrian and vehicle safety, and by coordinating signalization and operational measures.

TRIBAL RESOURCES AND TREATY RIGHTS

What is the relationship of tribal treaty right to WSF projects?

Almost all WSF terminal construction projects entail either federal funding or federal permitting. Permitting by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act is required when projects involve

some level of dredging or filling of navigable waters. All terminal projects are also located in or adjacent to the Usual and Accustomed (U&A) fishing grounds of one or more treaty tribes.

Tribal treaty fishing rights consist of several components, including a right to share in the allowable harvest of fish with non-tribal fishers (*USA v. Washington 1974*), and rights to fish, gather and hunt in the traditional U&A areas of each tribe – a right to engage in specific activities in specific places.

The federal courts have decided that where the issuance of a 404 permit has more than a de-minimus or discountable effect on the exercise of the right to fish, gather or hunt in a U&A area, the affected tribe may object to the issuance of the permit on the grounds that the tribe has a superior right to fish or gather in the area and may not be displaced by the dredging or filling of that area without their consent (*Muckleshoot, Suquamish v. Hall 1988*). A project may not have significant impact on the environment, no adverse effect, may be NEPA/SEPA exempt, and not covered by a nationwide permit or a programmatic permit, but it may still have more than de-minimus effect on the right to fish because a tribal fisher may have fished in the area one time in the past as asserted by the tribe.

As a federal agency, the Corps has a fiduciary obligation to Treaty Tribes. This relationship has resulted in the Corps requiring extensive analysis of adverse impact(s) to these Treaty rights. When the impact(s) cannot be successfully mitigated the Corps has required a mitigated settlement to be negotiated with the Treaty Tribe(s). The successful mitigated settlement agreement has taken the form of a Memorandum of Agreement (MOA).

If required, an MOA would be negotiated with the Treaty Tribe(s), and could include funding for fisheries enhancement, salt water environment enhancement, or a cash settlement. When the Corps is given evidence of such agreement it then will move forward with issuance of a permit. An increase in overwater coverage at any of the existing terminals could also result in the same requirements.

What proposed improvements in the plan may affect Treaty Usual and Accustom fishing grounds?

The proposed terminal improvement at Mukilteo, which would involve a relocation of the terminal, may have the potential to impact Treaty U&A fishing grounds, and to relocate the Mukilteo terminal from its current location would require a United States Army Corps of Engineers (Corps) permit. Under these conditions the project team would need to determine if potential for impacts exists. If this is the case, then mitigation options would need to be assessed and it determined if a MOA is required.

HISTORICAL AND CULTURAL RESOURCES

How are historic, cultural, and archaeological resources regulated?

Historic, cultural and archaeological resources are regulated under federal, state and local laws. The National Historic Preservation Act regulates historic sites. Through Section 106 of the Act, any project that has a federal nexus (involves federal funding, federal permits or is on federal lands) is required to consider the effects of the project on historic or cultural

resources. Section 4(f) of the Department of Transportation Act also affords protection to historic sites.

In Washington State, WAC 25-12, RCW 27.34.200 and Governor Executive Order 05-05 provide protection to historic sites. SEPA and NEPA require that impact to historic and cultural resources be evaluated in the environmental review process.

In addition, local governments often maintain historical and cultural resource lists within their jurisdictions, and commonly have ordinances protecting these resources.

What are the potential effects of the plan on historical and cultural resources?

WSDOT recently completed an inventory of all WSF terminal buildings, and found none eligible for inclusion on the National Register of Historic Places under Section 106 of the National Historic Preservation Act of 1966. Based on this inventory the proposed terminal projects are not anticipated to have any impact on historical resources.

Project level cultural resource surveys completed at some of the terminals show there might be the presence of archaeological resources. Consultations with the Washington Department of Archaeology and Historic Places and Puget Sound Tribes have occurred on potential known sites. Further surveys and consultation will be warranted for any proposed project at potential sites.

Implementation of a reservation system will minimize the terminal area “foot-print” requirement, on land and over water, of the ferry system. This affects the quantity and scale of terminal improvements projected for the system. The result is a minimization of likely impacts to cultural resources, and reduction in the potential for these impacts when compared with previous long range system plans.

PARK AND RECREATION LANDS

How are park and recreational lands regulated?

Park and recreation resources are valued and vital to the health and livability of communities. Section 4(f) of USDOT Act of 1966 requires that transportation projects avoid, minimize or mitigate impacts to public parks and recreation areas as well as historic sites. Compliance with Section 4(f) is ensured in the SEPA/NEPA process of projects.

What are the potential effects of the plan on parks and recreational lands?

Some of the ferry terminals are located in or adjacent to parks and recreation lands, and therefore improvement projects at the terminals could have the potential to impact these areas. Actual impacts to and mitigation for parks recreational lands will be evaluated at the individual project level.

DEPARTMENT OF NATURAL RESOURCES LANDS

How do ferry terminal operations affect aquatic land management?

State aquatic lands are under the jurisdiction of the Department of Natural Resources. The aquatic lands that have been reserved for landings, wharves, streets, and other conveniences of navigation and commerce are demarcated by harbor lines. A change in shape or size of the aquatic land used for ferry terminals operations could require revisions to the harbor line. Article 15 of Washington State Constitution describes the requirements for harbor line revisions. It takes between 12 and 18 months and three public hearings to revise a harbor line.

How might the plan affect harbor line demarcations?

Implementation of the plan may require harbor line revisions at terminals where preservation or capital improvements are programmed. Identification of needed harbor line revisions will occur at the individual project level.

APPLICABLE PERMITS

Capital projects are required to comply with the following Environmental Regulations:

- National Marine Fisheries Services- Endangered Species Act (ESA)
- U.S. Fish and Wildlife Service - ESA
- Washington State Department of Fish and Wildlife - Hydraulic Project Approval
- Department of Ecology - SEPA
- Governor's Executive Order 05-05 - Department of Archaeology and Historic Preservation, Governor's Office of Indian Affairs
- City of Anacortes – Shoreline Master Program
- US Army Corps of Engineers Section 404(b) (1) of Clean Water Act
- Section 10 of Rivers and Harbors Act
- Coastal Zone Management Act
- Critical Areas Ordinance under GMA
- Local Shorelines Master Program
- Washington State Aquatic Lands Act

RESOURCE AGENCY AND TRIBAL COORDINATION

What was the process with resource agencies and tribes in developing the plan?

In addition to the groups and processes used in the public outreach section of the plan, Federal and State resources agencies with jurisdictions and funding authorities were briefed on the plan in a letter and meeting to take their comments and input. The resources agencies agreed that WSF should include a planning level environmental analysis in the plan. The agencies that were represented at the meeting were the Federal Transit Administration, National Marine Fishery Services, Washington Department of Fish and Wildlife, Washington Department of Natural Resources, Puget Sound Clean Air Agency, and Washington Department of Ecology.

Letters were also sent to Puget Sound tribes to brief them about the plan. In addition, meetings were held with the Swinomish and Suquamish tribes to get comments and input.

Each participating agency and tribe received a copy of the draft plan for review and comment.

REFERENCE DOCUMENTS AND STUDIES

- WSDOT 2007 Greenhouse Gas Inventory
- The Washington Climate Change Impacts Assessment (The Climate Impacts Group, University of Washington, 2009)

The Long-Range Plan must demonstrate consistency with or conformity to any of the following existing plans:

- Terminal master plan documents
- Referenced Biological Assessment
- Project Specific Biological Assessments for ferry terminals
- Clinton Eelgrass Mitigation and Monitoring
- Eelgrass Surveys at ferry terminals
- Tribal U&A in the Puget Sound
- Local or Regional land use or comprehensive plans
- Local Shoreline Master Programs
- Regional Transportation plans
- TIP/SIP
- WSDNR Harbor lines
- Edmonds Crossing EIS and ROD

- Mukilteo Multimodal Draft EIS
- New 144 Auto Ferry, SEPA Checklist
- Environmental Discipline Reports and Technical Memo for various ferry terminals projects.