Funding Application

Competition  Regional FHWA
Application Type  Corridors Serving Centers
Status  submitted
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Prepopulated with screening form?  No

Project Information

1. Project Title
   WSF Hybrid Electric Ferry Conversion

2. Regional Transportation Plan ID
   tbd

3. Sponsoring Agency
   WSDOT Marine Division (PSRC Region Only)

4. Cosponsors
   n/a

5. Does the sponsoring agency have "Certification Acceptance" status from WSDOT?
   Yes

6. If not, which agency will serve as your CA sponsor?
   N/A

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Project Description

1. Project Scope
   Washington State Ferries (WSF), the Marine Division of the Washington State Department of Transportation (WSDOT), requests $7 million in FHWA-CMAQ Regional Funding for the Hybrid Electric Ferry Conversion Project. CMAQ funds for the WSF Hybrid Electric Ferry Conversion Project would support conversion of two Jumbo Mark II (JMII) vessels used on the Seattle-Bainbridge Island route from diesel to hybrid electric propulsion. The requested CMAQ funds will be leveraged by over $66 million in state and other funding to support the vessel conversion project.

   WSF funded and completed a feasibility study in June 2017 that evaluated varying degrees of ferry electrification and providing a concept design and Life Cycle Cost Analysis for full-electric mode conversion. The study provided an incremental approach to implementation of vessel conversion.

   The WSF Hybrid Electric Ferry Conversion Project is a game changer for the region. This is the
first step in WSDOT’s transition to a zero-carbon emissions ferry fleet. Full-time electric mode
operations will be achieved in WSDOT’s $90.7 million three-phase Hybrid Conversion
Program.
Phase 1, the subject of this CMAQ funding request, is the vessel conversion component of
the program. Construction entails purchase of equipment needed for the conversion of the two JMII (Jumbo Mark II class) vessels to hybrid electric propulsion (the third Jumbo Mark II on
the Edmonds-Kingston route would be converted afterwards) and integration of battery
storage technology into the existing diesel electric propulsion systems. Specifically, the
project scope includes the following elements:
• Installation of lithium-ion battery banks totaling 6.3 MWh in the existing shaft alley
compartments on both ends of each of two vessels;
• Removal of two of each of the vessel’s four propulsion diesel generators with that space
allocated for new electrical equipment (inverters, transformers and switchgear);
• Installation of shore tie switchgear, propulsion battery banks and associated equipment;
• Upgrades of propulsion controls, switchboards and monitoring systems; and
• Modifications to ventilation, cooling water and fire suppression systems, as well as several
auxiliary systems.
Phase 1 has independent utility in that the remaining diesel generator engines can recharge
the vessels’ lithium-ion battery banks powering the electric propulsion system. While
terminal-based recharging infrastructure will allow for shore-side charging and full-electric
propulsion, the hybrid electric conversion of diesel ferry vessels can be completed first as a
down payment on WSDOT’s emissions reduction goals.
Phase 2 encompasses installation of utility infrastructure feeding the Seattle and Bainbridge
Island terminals. Seattle City Light (SCL) and Puget Sound Energy (PSE), will design and install
shore-side service improvements that will support medium-voltage charging stations. The
Seattle terminal work includes construction of a duct-bank, three vaults, service connection,
and transformer.
On the Bainbridge Island terminal, work will include a new unit substation, duct-bank, vault,
and service connection. Phase 3 involves terminal improvements that will facilitate the ship-
to-shore interface. Work includes design and construction of an automated shore power
connection system, which will allow the vessels to fully charge batteries during dwell time at
the dock, as well as mounting and positioning equipment needed to adjust to vessel and tidal
range of motions.
WSF will begin development of Owner’s Preliminary Design and a Request for Proposals over
the next year for each phase of the program. Preliminary Engineering (PE) for Phase 1 will be
underway shortly and is anticipated to be complete by 2020. Construction will commence
soon thereafter with operations anticipated to begin as early as 2022.

2. Project Justification, Need, or Purpose
The purpose of the WSF Hybrid Electric Ferry Conversion Project is to reduce greenhouse gas
(GHG) emissions and improve air quality in the Central Puget Sound Region Designated
Maintenance areas by reducing diesel fuel consumption and diesel carbon emissions. The
project will allow WSF to continue service on the Seattle-Bainbridge Island route in a
sustainable manner in compliance with Governor Jay Inslee’s Executive Order 18-01, State
Efficiency and Environmental Performance (EO 18-01), requiring WSF to begin a transition to a
zero-carbon emissions ferry fleet, including accelerated adoption of ferry electrification, and
State law, requiring reduction of GHG emissions to 1990 levels by 2020 and 25% below 1990
levels by 2035 (RCW 70.235.020). In operating its ferries, WSF is the largest consumer of
diesel fuel in the State and its three JMII vessels are the largest emitters of GHG in the WSF
fleet, consuming more than 26% of WSF’s total fuel to support carrying capacity of up to
2,500 passengers and 202 vehicles per vessel. The two vessels on the Seattle Bainbridge
route marked for conversion consume 17% of WSFs total fuel.

A previous Puget Sound Maritime Air Emissions Inventory found that WSF emitted 71% of the
diesel particulate matter, and 66% of the GHGs from the marine Harbor Craft Sector, which
includes ferries, tugs, excursion vessels, commercial fishing vessels, and government
vessels. WSF also accounts for 63% of the State government’s GHG impacts. WSF vessels
use large two-stroke diesel engines, which burn substantial quantities of lube oil compared to
other engine types. Emissions impacts are similar to those of other devices using two-stroke
engines, such as leaf blowers, but on a massive scale. The conversion of JMII vessels to
hybrid electric propulsion (and shore-side improvements at terminals on the Seattle-
Bainbridge Island route in later phases) will, therefore, serve as a significant down payment
on WSDOT’s efforts to comply with EO 18-01 and meet the State’s 2020 GHG emissions
reduction goals.

As the nation’s largest ferry system serving nearly 24.5 million riders in 2017 and the second
largest ferry system in the world for the number of vehicles carried with 10.6 million annually,
WSF provides a vital link for commuters, recreational travel, and freight traffic, traversing marine highways that provide access between urban areas and key employment centers on the east side of Puget Sound and growing communities with more affordable housing on the west side. Regional CMAQ funding will support WSFs transition to a zero-carbon emissions ferry fleet as the first step in WSF’s Hybrid Conversion Program, converting two JMII vessels serving the WSF system’s busiest route – the Seattle and Bainbridge Island route, which served more than 6.5 million riders in 2017 and is projected to grow by 34% (over 2.2 additional passengers) by 2040.

Equipped with hybrid electric propulsion, the vessels will make a significant impact on statewide and regional air quality, GHG reduction, and other environmental goals:

- **Reducing Fuel Consumption:** The project will provide estimated diesel fuel savings of 790,000 gallons per year, and pave the way for savings of over 3.2 million gallons per year upon Program completion.
- **Reducing Operating and Maintenance Costs:** By reducing fuel consumption, the project will reduce spending on energy by an estimated $1.975 million, a wise use of taxpayer dollars that allows WSF to redirect funds towards other critical needs. Specifically, the project will lower fuel costs for operating the Seattle-Bainbridge Island route and help protect WSF from the volatility in fuel prices. Replacing older equipment increases vessel performance, prevents delays and breakdowns, and promotes life safety of the passengers and crew.
- **Reduces Harm to Marine Life:** The Project will reduce vessel noise, which is potentially harmful to the critically-endangered resident Orca whale populations.
- **Reduces Harm to Human Life:** The Project will reduce cancer risk attributable to diesel particulate matter, a fine particle in diesel engine exhaust that poses a high cancer risk in the Puget Sound region, which ranks in the highest 5th percentile for air toxics cancer risk in the country. Over 70% of this cancer risk comes from diesel sources, including WSF diesel engines, and 99% of the total diesel particulate matter emissions in the Puget Sound region comes from heavy duty on-road vehicles, construction equipment and marine vessels (Washington Department of Ecology, 2011 Air Emissions Inventory, available at: http://www.ecy.wa.gov/programs/air/EmissionInventory/AirEmissionInventory.htm).

Awarding CMAQ funding to the WSF Hybrid Electric Ferry Conversion Project aligns with PSRC’s FHWA Regional Project Evaluation Criteria in that it:

- **Supports Centers:** As detailed in the “Support for Centers” section of this application, the project supports regional growth centers (Seattle CBD, Uptown, First Hill / Capitol Hill) and manufacturing/industrial centers (Duwamish and Ballard-Interbay);
- **Improves Air Quality and Reduces GHG Emissions:** As detailed in the “Air Quality and Climate Change” section of this application, the project reduces harmful particulate by 16 Metric Tonnes (MT) annually and GHG emissions by 8,027 CO2e MT annually from the conversion of diesel to hybrid electric propulsion and reduction in fuel consumption;
- **Demonstrates Project Readiness:** The project has an anticipated operational start date for the hybrid electric vessels of 2022;
- **Is Cost-Effective:** The project will reduce operating and maintenance costs, including costs related to fuel, delays and breakdowns, and safety of passengers and crew; and
- **Leverages Significant State Funds:** $56 million (89% of future project costs) in state funds will be applied to the project.

### Project Location

1. **Project Location**
   Seattle to Bainbridge Island Route (Marine Highway 305)

2. **Please identify the county(ies) in which the project is located.**
   King, Kitsap

3. **Crossroad/landmark nearest the beginning of the project**
   Seattle Terminal (Colman Dock / Pier 52) - Alaska Way S/Marion St

4. **Crossroad/landmark nearest the end of the project**
   Bainbridge Terminal - 270 Olympic Drive SE Bainbridge Island, WA

5. **Map and project graphics**
   Appendix_B_-_Maps_Photos_Graphics_-_WSF_Hybrid_Electric_Ferry_Conversion.pdf

### Plan Consistency

1. **Is the project specifically identified in a local comprehensive plan?**
   Yes

2. **If yes, please indicate the (1) plan name, (2) relevant section(s), and (3) page number where it can be found.**
   Protecting air quality and reducing GHG emissions is a state and regional goal shared by local comprehensive plans. The WSF Hybrid Electric Ferry Conversion Project will help the State
meet this goal by reducing diesel fuel consumption and diesel carbon emissions. In this way, the project will improve air quality, reduce GHG emissions, and maintain WSF service on the Seattle to Bainbridge Island route in compliance with Executive Order 18-01, State Efficiency and Environmental Performance (EO 18-01) and State law (RCW 70.235.020).

Maintaining and improving a state of good repair, reducing diesel fuel consumption, and GHG emissions on WSF vessels, including vessel preservation and fuel conservation, are identified as priorities in the WSDOT Ferries Division Final Long-Range Plan (2009-2030) available at http://www.wsdot.wa.gov/NR/rdonlyres/41834A0B-DABC-48FA-9700-DF0298A66B4/58554/FinalLRPCompleteDocument1.pdf. The plan provides a description of specific risk factors associated with fuel price volatility (p. 110) and air quality, providing that “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” (p. 106).

This project is not just consistent with the overall vision of PSRC’s Vision 2040 but gets to the core of building a framework for the future of a sustainable environment, protecting the environment by reducing air pollutants and GHG emissions, promoting environmental vitality, and contributing to better public health for both ferry passengers and workers, and the communities where the terminals are located (p. 1). Consistent with Vision 2040’s Regional Environment and Transportation goals, Environment and Transportation Overarching Goals, and the Environment, Air Quality, Climate Change, Transportation, and Public Services in the Multi County Planning Policies, the project directly reduces GHG emissions and harmful air pollutants, including diesel exhaust, air toxics and fine particulates, helping to produce a cleaner transportation system, minimizing negative impacts to human health, and protecting and enhancing the environmental and public health. Part III (Multi County Planning Policies) of Vision 2040 provides specific Multi County Planning Policies (MPP), which this project is consistent with, including:

1. Environment:
   - MPP-EN-3: Maintain and, where possible, improve air and water quality, soils, and natural systems to ensure the health and well-being of people, animals, and plants. Reduce the impacts of transportation on air and water quality, and climate change.
   - MPP-EN-16: Identify and address the impacts of climate change on the region’s hydrological systems.
   - MPP-EN-17: Maintain or do better than existing standards for carbon monoxide, ozone, and particulates.
   - MPP-EN-18: Reduce levels for air toxics, fine particulates, and greenhouse gases.
   - MPP-EN-19: Continue efforts to reduce pollutants from transportation activities, including through the use of cleaner fuels and vehicles and increasing alternatives to driving alone, as well as design and land use.
   - MPP-EN-20: Address the central Puget Sound region’s contribution to climate change by, at a minimum, committing to comply with state initiatives and directives regarding climate change and the reduction of greenhouse gases. Jurisdictions and agencies should work to include an analysis of climate change impacts when conducting an environmental review process under the State Environmental Policy Act.
   - MPP-EN-21: Reduce the rate of energy use per capita, both in building use and in transportation activities.
   - MPP-EN-22: Pursue the development of energy management technology as part of meeting the region’s energy needs.
   - MPP-EN-23: Reduce greenhouse gases by expanding the use of conservation and alternative energy sources and by reducing vehicle miles traveled by increasing alternatives to driving alone.
   - MPP-EN-24: Take positive actions to reduce carbons, such as increasing the number of trees in urban portions of the region.
   - MPP-EN-25: Anticipate and address the impacts of climate change on regional water sources.

2. Development Patterns:
   - MPP-DP-45: Promote cooperation and coordination among transportation providers, local governments, and developers to ensure that joint- and mixed-use developments are designed to promote and improve physical, mental, and social health and reduce the impacts of climate change on the natural and built environments.

3. Economy
   - MPP-EC-15: Ensure that economic development sustains and respects the region’s environmental quality.

4. Transportation
   - MPP-T-1: Maintain and operate transportation systems to provide safe, efficient, and reliable movement of people, goods, and services.
   - MPP-T-2: Protect the investment in the existing system and lower overall life-cycle costs through effective maintenance and preservation programs.
   - MPP-T-3: Reduce the need for new capital improvements through investments in operations, pricing programs, demand management strategies, and system management activities that improve the efficiency of the current system.
   - MPP-T-4: Improve safety of the transportation system and, in the long term, achieve the state’s goal of zero deaths and disabling injuries.

a. Sustainable Transportation
a. Sustainable Transportation

- MPP-T-5: Foster a less polluting system that reduces the negative effects of transportation infrastructure and operation on the climate and natural environment.
- MPP-T-6: Seek the development and implementation of transportation modes and technologies that are energy efficient and improve system performance.
- MPP-T-7: Develop a transportation system that minimizes negative impacts to human health.
- MPP-T-8: Protect the transportation system against disaster, develop prevention and recovery strategies, and plan for coordinated responses.

b. Coordination:

- MPP-T-9: Coordinate state, regional, and local planning efforts for transportation through the Puget Sound Regional Council to develop and operate a highly efficient, multimodal system that supports the regional growth strategy.
- MPP-T-10: Promote coordination among transportation providers and local governments to ensure that joint- and mixed-use developments are designed in a way that improves overall mobility and accessibility to and within such development.

c. Centers and Compact Communities:

- MPP-T-11: Prioritize investments in transportation facilities and services in the urban growth area that support compact, pedestrian- and transit-oriented densities and development.
- MPP-T-14: Design, construct, and operate transportation facilities to serve all users safely and conveniently, including motorists, pedestrians, bicyclists, and transit users, while accommodating the movement of freight and goods, as suitable to each facility’s function and context as determined by the appropriate jurisdictions.
- MPP-T-16: Promote and incorporate bicycle and pedestrian travel as important modes of transportation by providing facilities and reliable connections.

d. Context and Design:

- MPP-T-22: Implement transportation programs and projects in ways that prevent or minimize negative impacts to low-income, minority, and special needs populations.

5. Public Services

- MPP-PS-1: Protect and enhance the environment and public health and safety when providing services and facilities
- MPP-PS-12: Promote the use of renewable energy resources to meet the region’s energy needs
- MPP-PS-13: Reduce the rate of energy consumption through conservation and alternative energy forms to extend the life of existing facilities and infrastructure.

WSF, as well as the project’s purpose to reduce GHG emissions and improve the environment, is specifically identified in, and therefore consistent with, local comprehensive plans, as provided in Table 1 below.

Table 1. Consistency with Local Comprehensive Plans

<table>
<thead>
<tr>
<th>Plan Name</th>
<th>Relevant Section(s), Page #</th>
<th>Relevant Text/Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017 Adopted King County Comprehensive Plan</td>
<td>Chapter 8 (Transportation), Section I.A (Introduction), Page 8-2</td>
<td>“The following summarizes county priorities for responding to policy direction established and articulated in the King County Strategic Plan, the King County Comprehensive Plan, County transportation agencies’ functional plans, and the associated state and regional laws and planning requirements:”</td>
</tr>
<tr>
<td>2017 Adopted King County Comprehensive Plan</td>
<td>Chapter 8 (Transportation), Section III.A (Public Transportation Policies and Service Guidelines), Page 8-26</td>
<td>“T-302 The King County Marine Division should work with the Washington State Department of Transportation, Kitsap County, and other entities offering passenger ferry services, to ensure that service and capital plans for ferries are consistent with the King County Ferry District 2014 Strategic Plan, or successor plans.”</td>
</tr>
<tr>
<td>2017 Adopted King County Comprehensive Plan</td>
<td>Chapter 5 (Environment), Section II (Climate Change), Page 5-15</td>
<td>“E-201 King County should participate in and support appropriate local, regional and national efforts and organizations focused on reducing greenhouse gas emissions and preparing for climate change impacts.”</td>
</tr>
<tr>
<td>2017 Adopted King County Comprehensive Plan</td>
<td>Chapter 5 (Environment), Section II.B (Reducing GHG Emissions), Page 5-18</td>
<td>“E-205 King County shall reduce greenhouse gas emissions from all facets of its operations and actions associated with construction and management of county-owned facilities, infrastructure development, transportation, and environmental protection programs...”</td>
</tr>
<tr>
<td>2017 Adopted King County Comprehensive Plan</td>
<td>Chapter 5 (Environment), Section II.B (Reducing GHG Emissions), Page 5-18</td>
<td>“E-206 King County shall reduce total greenhouse gas emissions from government operations, compared to a 2007 baseline by at least 25% by 2020 and 50% by 2030.”</td>
</tr>
<tr>
<td>Kitsap County Comprehensive Plan 2016-2036</td>
<td>Comprehensive Plan 2016-2036 Vision, Page 1-8</td>
<td>“Transportation. An efficient, flexible, and coordinated multi-modal transportation system – including roads, bridges and highways, ferries, transit, and non-motorized travel – that provides interconnectivity and mobility for county residents and supports our urban and rural land use pattern.”</td>
</tr>
</tbody>
</table>

Public Services and Facilities. Public services and facilities – including, but not limited to, parks and recreation, law enforcement, fire protection, emergency preparedness, water/sewer, roads, transit, non-motorized facilities, ferries, stormwater management, education, library services, health and human services, energy, telecommunications, etc. – are provided in an
Kitsap County Comprehensive Plan 2016-2036 Chapter 2 (Economic Development), Page 2-31 “Our economic future is also dependent upon the availability and maintenance of strong infrastructure in transportation (roads, bridges, ferries, rail, and air) energy, communications, water and waste water; industrial and commercial land; as well as sustaining the incredible natural environment and balanced quality of life Kitsap citizens so enjoy.”

Kitsap County Comprehensive Plan 2016-2036 Chapter 5 (Transportation), Transportation Guiding Directives, Page 5-60 “The goals and policies recognize the County residents' desire for an efficient, flexible, and coordinated multi-modal transportation system including roads, bridges and highways, ferries, transit and non-motorized travel, that provides interconnectivity and mobility and; preserves our urban and rural land use character through design standards.”

Kitsap County Comprehensive Plan 2016-2036 Chapter 5 (Transportation), Transportation Goals and Policies, Pages 5-63 - 5-64 “Transportation Goal 7. Avoid first, minimize second, and then mitigate negative environmental or use impacts due to additions to or improvements to the transportation system whether upland or on shoreline. Plan, locate and design transportation systems and essential utility facilities along shoreline areas where they will have the least possible adverse effect on shoreline ecological functions and/or processes and existing or planned water-dependent uses.”

Transportation Policy 34. Explore and evaluate costs and benefits of foot ferries as a complement to existing public transportation system in partnership with Kitsap Transit and Washington State Ferries.”

Kitsap County Comprehensive Plan 2016-2036 Chapter 7 (Capital Facilities and Utilities), Page 7-76 “Public services and facilities – including, but not limited to, parks and recreation, law enforcement, fire protection, emergency preparedness, water/sewer, roads, transit, non-motorized facilities, ferries, stormwater management, education, library services, health and human services, energy, telecommunications, etc. – are provided in an efficient, high-quality and timely manner by the County and its partner agencies. Public services and facilities are monitored, maintained and enhanced to meet quality service standards...

City of Bainbridge Island 2016 Comprehensive Plan Transportation Element, Introduction, Page TR-1 “The ferry to Seattle and the Agate Pass Bridge are the only two public options for travel to or from the Island. Many Islanders commute to work off-island by ferry or bridge. Likewise, many on-island workers commute from off-island. Lengthy commute times by ferry or being stuck in traffic on SR 305 mean spending hours away from family, friends, and activities. Speeding and cut-through traffic makes neighborhood streets feel unsafe. During commute hours, SR 305 creates a wall across the Island. Reliable and efficient transportation on and off island is important to balance jobs and housing and maintaining the quality of life for Island residents.”

Kitsap County Comprehensive Plan 2016-2036 Chapter 7 Transportation Element, Transportation Issues, Page TR-3 - TR-4 “B. Roadway Congestion – Traffic on Island roadways, particularly on SR 305 and within Winslow, can result in a variety of issues such as making it difficult to “get around” by automobile, traffic “spilling over” into adjacent neighborhoods, and making it more difficult for transit and non-motorized users to get to their destinations in a timely manner. Congestion related to ferry loading and unloading creates surges on Island roadways every 45 to 50 minutes. In the afternoon hours, impacts from ferry activities can snarl area traffic and cause traffic delays. In addition to ferry traffic, the SR 305 Corridor has experienced increasing congestion due to commuters traveling on and off island across the Agate Pass Bridge. Congestion and increased travel times are experienced during commute hours along the SR 305 Corridor.

C. SR 305 Traffic Congestion – Concern surrounds the future of the SR 305 Corridor. While the existing configuration of two lanes is adequate during off-peak hours, peak hour traffic coupled with surges from exiting ferry activities have resulted in high levels of congestion at multiple locations. This affects Island residents and off-Island commuters using the corridor and increases the difficulty of cross-Island travel, resulting in higher volumes of traffic on local streets when drivers try to avoid SR 305 congestion. Access to SR 305 is becoming increasingly difficult at the north end of the Island.

H. Transit Service – Ferry Service is vital to many residents who work in Seattle and to the local and regional economy. As automobile capacity and parking space at the ferry terminal are limited, non-motorized facilities with connectivity to the ferry and transit service are important to many Islanders for sustainably accommodating population growth. WSF forecasts significant growth of non-motorized trips in the coming decade. Kitsap Transit provides bus service connecting many areas of the Island to the ferry and Winslow. Kitsap Transit is working to expand service during non-peak hours and to inter-Island locations, and many in the
community would like to see this service maintained and expanded. This service has provided valuable mobility to the community, especially for older people, those with disabilities and younger populations.

J. Climate Change – Transportation is both a cause of climate change and provides opportunities to mitigate the effects of climate change. Creating a transit plan that reduces emission of greenhouse gases and increases our communities resilience to the effects of climate change is a priority. These criteria should be used to evaluate all transportation solutions and proposed projects.”

City of Bainbridge Island 2016 Comprehensive Plan Transportation Element, Transportation Issues, Page TR-6 “Transportation issues are among the top concerns for Bainbridge Island residents since Island roadways serve two equally important purposes. Not only do the roadways provide mobility, they also enhance the character of the Island. Much of the concern over transportation is related to the future of State Route 305, which serves not only Bainbridge Island, but also functions as a regional facility connecting Seattle and the Island ferry terminal with the Kitsap and Olympic Peninsulas.”

City of Bainbridge Island 2016 Comprehensive Plan Transportation Element, Goals & Policies, Page TR-7 “Goal TR-2 Provide a non-motorized transportation system that is a planned and coordinated network of shoulders, sidewalks, trails, footpaths, bikeways and multi-purpose trails that connect neighborhoods with parks, schools, the shoreline, the ferry terminal and commercial areas.

Policy TR 2.1 … Provide safe and appropriately scaled non-motorized access that connects designated centers, the ferry terminal, services such as a doctors’ offices, schools, parks, recreation areas, shorelines (including road-ends), and transit connections including to ferry and bus services.”

City of Bainbridge Island 2016 Comprehensive Plan Transportation Element, Goals & Policies, Page TR-10 “FERRY SERVICE

GOAL TR-3 Coordinate with Washington State Ferries (WSF) and other ferry service providers to ensure that ferries meet local service and commuter needs, are integrated with all travel modes and provide equitable regional service.

Policy TR 3.1 Advocate for ferry services to and from Bainbridge Island in order to optimize the use of each ferry service, balance peak hour travel times and provide ferry capacity in proximity to users’ origin and destination.

Policy TR 3.2 Support the ferry system efforts to maximize the convenience of pedestrian, bicycle, transit and HOV use on ferry runs through providing priority status and improvements to discourage single occupancy vehicle (SOV) use.

Policy TR 3.3 Advocate for increased service options for foot ferry passengers such as water taxi and passenger ferry service to and from various areas of the Puget Sound region.

Policy TR 3.4 Support WSF and other providers to create and incorporate best practices into ferry services that reduce greenhouse gas emissions and vulnerability of ferry transit from climate change.

Policy TR 3.5 Promote bicycle and pedestrian safety improvements near the ferry terminal.

Policy TR 3.6 Promote safe and efficient pickup and drop off from the ferry terminal. Promote safe and efficient taxi and public transportation services from the ferry terminal.”

City of Bainbridge Island 2016 Comprehensive Plan Transportation Element, Goals & Policies, Page TR-11 “Policy TR 4.2 Support actions from Metro, Sound Transit, Kitsap Transit or other appropriate agencies that:

• Improve public transit from the Seattle ferry terminal directly to popular destinations in Seattle metropolitan area as well as Sea-Tac Airport.
• Promote the availability of public transit service to ferry commuters and for special events.
• Maintain bus schedules to meet ferry arrival and departure times and improve service throughout the day and during evening hours.
• Provide information on the ferries and at the ferry terminals regarding transit options.
• Increase bus service on the Island to seven days a week.

Policy TR 4.4 Support the expansion of Island transit services that target:

• Ferry commuters

... “Transit dependent access, including addressing the access needs of all ages and abilities.”

• Maintain safe and secure county-owned infrastructure, including roads, bridges, trails, buses and passenger ferries, transit and ferry facilities, and airport facilities;”

Seattle’s Comprehensive Plan, Toward a Sustainable Seattle Transportation Element, Increasing Transportation Choices: Making Transit a Real Choice, Policies, Pages 3.6 - 3.7 “T28 Support efficient use of ferries to move passengers and goods to, from, and within Seattle. Explore route, funding and governance options for waterborne transit service,
especially those that serve pedestrians. In order to limit the expansion of automobile traffic by
to ferry travel with automobiles.

Seattle’s Comprehensive Plan, Toward a Sustainable Seattle Transportation Element,
Increasing Transportation Choices: Bicycling and Walking, Policies, Page 3.7 “T31 Integrate
pedestrian and bicycle facilities, services, and programs into City and regional transportation
and transit systems. Encourage transit providers, the Washington State Ferry System, and
others to provide safe and convenient pedestrian and bicycle access to and onto transit
systems, covered and secure bicycle storage at stations, especially for persons with
disabilities and special needs.”

Seattle’s Comprehensive Plan, Toward a Sustainable Seattle Transportation Element,
Connecting the Region, Policies, Page 3.11 “T61 Support a strong regional ferry system that
maximizes the movement of people, freight, and goods.”

Seattle’s Comprehensive Plan, Toward a Sustainable Seattle Downtown Neighborhood Plan,
Downtown Urban Center, Transportation Policies, Page 8.66 “DT-TP2 Improve and expand the
street level elements of the regional transit system to provide the primary mode of vehicular
travel among downtown activities. Integrate the system with the transit tunnel, the pedestrian
circulation network, peripheral parking facilities and other modes of travel to downtown
including the ferry system, intercity bus and intercity rail.”

Seattle’s Comprehensive Plan, Toward a Sustainable Seattle Environmental Element, Climate
Change, Page 11.6 “With the City’s long-standing commitment to environmental stewardship
and as home to the nation’s first carbon neutral electric utility, Seattle is well-positioned to be
a leader in emissions reduction. Building on this history of stewardship and leadership, in
2011 the City Council adopted carbon neutrality by 2050 as the City’s climate goal.

... Goal EG7 Reduce emissions of carbon dioxide and other climate- changing greenhouse
gases in Seattle by 30% from 1990 levels by 2020, and become carbon neutral by 2050.

... Policy E15 Work with private and public sector partners to achieve the goal of reducing
climate-changing greenhouse gas emissions.”

3. **If no, please describe how the project is consistent with the applicable local
comprehensive plan, including specific local policies and provisions the project
supports. In addition, please describe how the project is consistent with a
transit agency plan or state plan, if applicable.**

N/A

Federal Functional Classification

1. **Functional class name**
   11 Urban Interstate

Support for Centers

1. **Describe the relationship of the project to the center(s) it is intended to support.**
   For example, is it located within a designated regional, countywide or local
center, or is it located along a corridor connecting to one of these areas?

The conversion of two JMII vessels to hybrid electric propulsion not only enhances WSF’s ferry
fleet but also the two JMII vessels will support access to and the development of centers and
corridors they serve. The JMII vessels provide access to five Regional Growth Centers and
two Regional Manufacturing Centers in the Seattle area.

As defined by the PSRC, centers are defined as Regional Growth and Regional
Manufacturing/Industrial Centers as designated by PSRC’s Executive Board. Currently, the
Seattle area has 29 designated regional growth centers (RGCs) and nine regional
manufacturing/industrial centers (MICs). Figure 9(Appendix B) below displays the map of all
RGCs and MICs in the Seattle area.

Washington State Ferries operates 10 routes between 20 terminals, connecting customers to
a wide array of destinations and connections with other modes of transportation. The
terminals are essential to the efficiency and operation of the WSF vessel fleet. The three JMII
vessels within the fleet of 23 vessels primarily serve four terminals comprising two routes: Seattle-Bainbridge Island (two JMIIs) and Edmonds–Kingston (one JMII). The WSF Hybrid Electric Ferry Conversion Project applies to the JMII vessels that serve the Seattle–Bainbridge Island route. The Seattle – Bainbridge Island route carries nearly 27% of all riders and over 18% of all vehicles in the system. The Seattle terminal plays a vital role in connecting passengers, through other transportation modes, to three RGCs and two MICs. The RGCs include Seattle’s Central Business District, Uptown, First Hill / Capitol Hill. Each RGC is located within the heart of Seattle and accommodations thousands of people for work or living. The two MICs in the Seattle area include Duwamish (access via the Seattle CBD RGC) and Ballard-Interbay (access via the Uptown RGC). Additional information about the RGC and MIC benefits are listed in the following section, Criteria: Benefit to Regional Growth or Manufacturing/Industrial Center.

The updated JMII vessels will aid accessibility to the centers and corridors in the Seattle area. Without the project, the JMII vessels will continue to consume high amounts of diesel fuel, produce criteria pollutants and GHG emissions, and require higher funding amounts to cover the vessels’ operating and maintenance costs associated with diesel engine propulsion. With the project, the JMII vessels can sustainably serve these centers, reducing diesel fuel consumption by 790,000 gallons per year and improving air quality, climate impacts, and the health of those working or living in these centers. The project will also save WSF $1.975 million annually in fuel costs, which will be redirected towards reducing the preservation backlog at WSF.

With the successful conversion of the two JMII vessels on the Seattle-Bainbridge route, WSF expects to expand the program to the third JMII vessel operating on the Edmonds-Kingston route and implement the similar supporting investments in the terminal infrastructure at Edmonds and Kingston.

Criteria: Benefit to Regional Growth or Manufacturing/Industrial Center

1. **Describe how this project will benefit or support the housing and employment development in a regional growth center(s) and/or employment growth in a manufacturing/industrial center(s). Does it support multiple centers? Please provide a citation of the relevant policies and/or specific project references in a subarea plan or in the comprehensive plan.**

The Project, conversion of two JMII vessels to hybrid electric propulsion, will provide substantial benefits and meaningful support of the development of regional growth centers (RGC) and manufacturing/industrial centers (MICs) in the Seattle area. The JMII vessels serve the Seattle-Bainbridge Island route and provide access to two WSF terminals, which serve three RGCs and two MICs.

Table 2.(Appx B) Characteristics of the three RGCs and two MICs that the JMII vessels serve
(Source: https://www.psrc.org/rdp-economy)

<table>
<thead>
<tr>
<th>Region</th>
<th>Population</th>
<th>Housing Units</th>
<th>Employment</th>
<th>Access to Transit (Employee or Resident)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duwamish MIC</td>
<td>1,376</td>
<td>523</td>
<td>58,771</td>
<td>68%</td>
</tr>
<tr>
<td>Ballard-Interbay MIC</td>
<td>1,846</td>
<td>780</td>
<td>14,237</td>
<td>68%</td>
</tr>
<tr>
<td>Seattle Downtown, RGC</td>
<td>25,920</td>
<td>19,185</td>
<td>135,285</td>
<td>100%</td>
</tr>
<tr>
<td>Seattle Uptown, RGC</td>
<td>7,641</td>
<td>6,110</td>
<td>13,910</td>
<td>100%</td>
</tr>
<tr>
<td>Seattle First Hill / Capitol Hill, RGC</td>
<td>36,502</td>
<td>25,972</td>
<td>41,645</td>
<td>100%</td>
</tr>
</tbody>
</table>

All three RGCs have experienced extreme growth in housing and employment. Since 2010, downtown has seen a 22% increase in population growth and a 30% increase in jobs. Today, the 12 neighborhoods are home to 281,000 jobs and more than 70,000 residents. There are many reasons for this fast growth, however, the tech behemoth, Amazon, has created immense change in downtown Seattle. Employment has risen, with 5,000 workers in 2010 and now 40,000 in 2018. With this growth, Seattle is one the fastest-growing cities in the country. As listed in Table 1, in total, the three RGCs and two MICs make up 12% of the total population, nearly 20% of the total housing units, and over 22% of the total employment in Seattle.

The Duwamish MIC is one of the largest and most intensely developed manufacturing/industrial areas in the Pacific Northwest. Of the total number of jobs, about half (56%) are in goods-dependent industries that are typically appropriate for regional manufacturing/industrial centers. Some of the largest employers in the center are Boeing and Starbucks. Duwamish is in the southern part of downtown Seattle, and in 2010, provided nearly 60,000 jobs. For work-based trips, the Duwamish regional center's travel characteristics are somewhat different from the region with fewer single-occupant vehicle (SOV) and slightly more transit trips. The region's SOV share is 76%, while the center's is 73%. The region's non-SOV mode share is 24% with 10% in transit and 5% in walk/bike. The center's non-SOV share is 27%, with 15% in transit and 3% in walk/bike. The total daily trips from Duwamish are highly focused on destinations in regional centers (29% of all trips); this
includes trips that stay within the center (9%) and trips that go to other centers (20%). In terms of employee access to transit, Duwamish has moderate access, with 68% of employees within a ¼-mile walk to a transit stop. For the ½-mile walkshed, the center has nearly complete levels of employee access to transit (90%), including transit routes serving the Seattle ferry terminal in downtown Seattle.

The Ballard-Interbay MIC is in the northwest corner of downtown Seattle and is a thriving urban industrial center with a diverse mix of businesses and jobs with about half (45%) in goods-dependent industries that are typically appropriate for regional manufacturing/industrial centers. This MIC includes 6,170 jobs in industry clusters, with 2,609 jobs in the Maritime cluster alone, including jobs directly supporting WSF operations. For work-based trips, the MIC's travel characteristics are different from the region as a whole with fewer SOV and more transit trips. The region's SOV share is 76%, while the center's share is 68%. The region's non-SOV mode share is 24%, with 10% in transit and 5% in walk/bike. The center's non-SOV share is 32%, with 16% in transit and 7% in walk/bike. Among the MICs, Ballard-Interbay has the lowest SOV share and the highest transit share. The total daily trips from Ballard-Interbay are highly focused on destinations in regional centers (26% of all trips); this includes trips that stay within the center (7%) and trips that go to other centers (20%). In terms of employee access to transit, Ballard-Interbay has moderate access, with 68% of employees within a 1/4 mile walk to a transit stop. For the ½-mile walkshed, the center has nearly complete levels of employee access to transit (95%), including transit services serving the Seattle ferry terminal in downtown Seattle.

WSF service benefits the regional economy by allowing travelers to bypass many circuitous miles of roadway on the region’s most congested thoroughfares, with the majority of these passengers traveling via ferry as walk-on passengers without taking their car onboard. WSF routes are an integral part of the State highway system, connecting RGCs, providing access to MICs for employees and suppliers, and facilitating movement of people and goods across the four-county region. Ferry service also provides a missing mode, filling a gap in the transportation network, and makes centers on opposite sides of Puget Sound accessible to one another, linking residential areas and commercial centers and opening labor and commercial markets to pools of potential employees and customers who would be otherwise cut off due to distance and the geographic barrier of the Puget Sound. The only alternative would be prohibitively expensive bridges, or adding millions of commute trips per year to the congested roadways leading around the Sound. Through timed transfers with connections to local feeder service, express bus and commuter rail, WSF origin/destination surveys show that these riders continue their trips to RGCs, including Seattle Downtown, and east to the MICs of Duwamish and Ballard/Interbay.

The project will benefit or support the housing and employment development in these RGCs and MICs by sustainably supporting WSF service to and from growing residential centers (Downtown, First Hill/Capitol Hill, Uptown) and job centers (First Hill / Capitol Hill, Duwamish, Ballard-Interbay) in the Central Puget Sound. Hybrid electric conversion of the two WSF JMII vessels on the Seattle-Bainbridge Island route provides a means to continue WSF service into the future in compliance with State requirements and regional policy without jeopardizing regional air quality, public health, and quality-of-life. Without the project, WSF vessel emissions would continue to degrade the local and regional environment. It is essential, therefore, to place priority on these RGCs, MICs, and their environment.

Currently, these areas are expanding due to major employers in the area, including Amazon. Amazon is known for its urban campus which provides employment for over 40,000 people in the heart of Seattle. Amazon has changed the once industrial area of Seattle’s downtown and has invested $3.7 billion on buildings and infrastructure in Seattle from 2010 to summer 2017. By improving the air quality, amongst other things, of the Seattle downtown area with the conversion of the two JMII vessels.

The project will also support housing and employment development in RGCs and MICs by aligning with the PSRC’s VISION 2040. Part III (Multicounty Planning Policies, see https://www.psrc.org/sites/default/files/part_iii_multicounty_planning_policies.pdf) provides specific Multi Planning Policies (MPPs), which the project is consistent with, as listed below:

1. Environment:
   - MPP-EN-3: Maintain and, where possible, improve air and water quality, soils, and natural systems to ensure the health and well-being of people, animals, and plants. Reduce the impacts of transportation on air and water quality, and climate change.
   - MPP-EN-16: Identify and address the impacts of climate change on the region’s hydrological systems.
   - MPP-EN-17: Maintain or do better than existing standards for carbon monoxide, ozone, and particulates.
   - MPP-EN-18: Reduce levels for air toxics, fine particulates, and greenhouse gases.
   - MPP-EN-19: Continue efforts to reduce pollutants from transportation activities, including through the use of cleaner fuels and vehicles and increasing alternatives to driving alone, as well as design and land use.
   - MPP-EN-20: Address the central Puget Sound region’s contribution to climate change by, at a minimum, committing to comply with state initiatives and directives regarding climate
change and the reduction of greenhouse gases. Jurisdictions and agencies should work to include an analysis of climate change impacts when conducting an environmental review process under the State Environmental Policy Act.

- **MPP-EN-21**: Reduce the rate of energy use per capita, both in building use and in transportation activities.
- **MPP-EN-22**: Pursue the development of energy management technology as part of meeting the region’s energy needs.
- **MPP-EN-23**: Reduce greenhouse gases by expanding the use of conservation and alternative energy sources and by reducing vehicle miles traveled by increasing alternatives to driving alone.
- **MPP-EN-24**: Take positive actions to reduce carbons, such as increasing the number of trees in urban portions of the region.
- **MPP-EN-25**: Anticipate and address the impacts of climate change on regional water sources.

2. Development Patterns:
- **MPP-DP-45**: Promote cooperation and coordination among transportation providers, local governments, and developers to ensure that joint- and mixed-use developments are designed to promote and improve physical, mental, and social health and reduce the impacts of climate change on the natural and built environments.

3. Economy
- **MPP-EC-15**: Ensure that economic development sustains and respects the region’s environmental quality.

4. Transportation
- **MPP-T-1**: Maintain and operate transportation systems to provide safe, efficient, and reliable movement of people, goods, and services.
- **MPP-T-2**: Protect the investment in the existing system and lower overall life-cycle costs through effective maintenance and preservation programs.
- **MPP-T-3**: Reduce the need for new capital improvements through investments in operations, pricing programs, demand management strategies, and system management activities that improve the efficiency of the current system.
- **MPP-T-4**: Improve safety of the transportation system and, in the long term, achieve the state's goal of zero deaths and disabling injuries.
  a. Sustainable Transportation
  - **MPP-T-5**: Foster a less polluting system that reduces the negative effects of transportation infrastructure and operation on the climate and natural environment.
  - **MPP-T-6**: Seek the development and implementation of transportation modes and technologies that are energy efficient and improve system performance.
  - **MPP-T-7**: Develop a transportation system that minimizes negative impacts to human health.
  - **MPP-T-8**: Protect the transportation system against disaster, develop prevention and recovery strategies, and plan for coordinated responses.
  b. Coordination:
  - **MPP-T-9**: Coordinate state, regional, and local planning efforts for transportation through the Puget Sound Regional Council to develop and operate a highly efficient, multimodal system that supports the regional growth strategy.
  - **MPP-T-10**: Promote coordination among transportation providers and local governments to ensure that joint- and mixed-use developments are designed in a way that improves overall mobility and accessibility to and within such development.
  c. Centers and Compact Communities:
  - **MPP-T-11**: Prioritize investments in transportation facilities and services in the urban growth area that support compact, pedestrian- and transit-oriented densities and development.
  - **MPP-T-14**: Design, construct, and operate transportation facilities to serve all users safely and conveniently, including motorists, pedestrians, bicyclists, and transit users, while accommodating the movement of freight and goods, as suitable to each facility's function and context as determined by the appropriate jurisdictions.
  - **MPP-T-16**: Promote and incorporate bicycle and pedestrian travel as important modes of transportation by providing facilities and reliable connections.
  d. Context and Design:
  - **MPP-T-22**: Implement transportation programs and projects in ways that prevent or minimize negative impacts to low-income, minority, and special needs populations.

5. Public Services
- **MPP-PS-1**: Protect and enhance the environment and public health and safety when providing services and facilities.
- **MPP-PS-12**: Promote the use of renewable energy resources to meet the region’s energy needs.
- **MPP-PS-13**: Reduce the rate of energy consumption through conservation and alternative energy forms to extend the life of existing facilities and infrastructure.

2. Describe how the project provides or benefits a range of travel modes to users traveling to/from centers, or if it provides a missing mode.

This project provides sustainability and efficiency improvements to WSF fleet vessels on the Seattle-Bainbridge Island route in the Central Puget Sound corridor, serving three Regional Growth Centers (Seattle Downtown, First Hill / Capitol Hill, and Uptown) and two Manufacturing/Industrial Centers (Duwamish and Ballard-Interbay). The project provides a more sustainable means of access for those traveling between the RGCs and MICs on the east side of the Puget Sound and the more affordable housing on Bainbridge Island on the
WSF and the Puget Sound region prioritized multimodal connectivity in 2009 when seven Puget Sound transit agencies, including WSF, jointly developed ORCA (One Regional Card for All) for fare payment across four modes: ferry, bus, light rail, and commuter rail. Ferry riders use ORCA for multimodal connections at all terminals. Ferry schedules integrate schedules of transit partners enabling riders to connect to bus or train after departing a ferry, or vice versa.

Ferry travel tends to be multimodal in nature, with passengers linking their trips to a variety of other modes and ridesharing at a much higher rate than typical state highway users. As described in the 2010 Passenger Vessel Association study, "vehicles (cars, trucks and trailers, buses, carpools, vanpools, motorcycles, and bicycles), vehicle passengers, and walk on passengers are all significant segments of the system's ridership." A plurality of passengers utilize Transportation Network Companies (e.g., Uber, Lyft), connect to other modes as part of their ferry trip, or proceed on foot to their final destinations. Both the Seattle and Bainbridge Island terminals, as well as the JMII vessels, accommodate passenger vehicles, commercial vehicles, motorcycles, bicycles, and walk-on passengers. WSF service is a key link the region’s multimodal connections with priority loading for freight, bicycles, vanpools, and carpools. Many Seattle-Bainbridge Island ferry riders currently use a combination of walking, biking, transit, carpool, or driving alone modes to access and egress the ferry terminals on both ends of their ferry ride.

The Seattle-Bainbridge Island route has the highest ridership of the ten WSF routes with over 6.5 million riders and nearly 2.0 million vehicles carried in 2017. This route had the biggest jump in total riders from 2016 to 2017 with nearly 100,000 more passengers compared to the previous year, an increase of 1.5%. By 2040, overall ridership, as well as ridership on the Seattle-Bainbridge Island route, are projected to increase by 34%. Of the 2017 passengers on this route, 50.6% walked on without vehicles. 102,482 of these passengers were bicycle riders. These walk-on and bicycle-riding passengers are expected to increase by 44% and 76%, respectively, by 2040. Among the 1.9 million vehicles carried by the JMII vessels on this route in 2017, the average vehicle occupancy was 1.67 persons per vehicle, significantly higher than for the regional highway network as a whole, and reflects the importance of carpooling on this route.

By supporting the continuation of service on the Seattle-Bainbridge Island route in a sustainable manner, the Hybrid Electric Ferry Conversion Project will benefit all travel modes from passenger and commercial vehicles to active transportation and transit. The project will also help provide a missing mode by filling a gap in the transportation network. Making centers on opposite sides of Puget Sound accessible to one another links residential areas and commercial centers, opening labor and commercial markets to pools of potential employees and customers who would be otherwise cut off due to distance, and the geographic barrier of the Puget Sound. The only alternative would be prohibitively expensive bridges, or adding millions of commute trips per year to the congested roadways leading around the Sound.

3. Describe how the project will benefit a variety of user groups, including commuters, residents, and/or commercial users.

With this project, a variety of travelers, including commuters, tourists, residents, and commercial users, will benefit by receiving access to the centers with cleaner, reliable, and more efficient vessels as transportation, while reducing diesel fuels and diesel particulates. Converting two JMII diesel engines serving the Seattle-Bainbridge Island route to hybrid electric propulsion will provide a sustainable means of continuing this route in compliance with State law requiring the State to reduce GHG emissions to 1990 levels by 2020 and 25% below 1990 levels by 2035 (RCW 70.235.020) and Governor’s Executive Order 18-01, State Efficiency and Environmental Performance, which requires WSF to begin the transition to a zero-carbon-emission ferry fleet.

The Seattle-Bainbridge Island route has the highest ridership of the ten WSF routes with over 6.5 million riders and nearly 2.0 million vehicles carried in 2017. WSF’s 2013 Origin-
The WSF system also supports tourists and economic development. It is a major tourist attraction and icon of Washington State. Around 6 million ferry riders per year are tourists or recreational users of the ferry system. It also serves as a critical link between more affordable housing on the west side of Puget Sound and key employment centers on the east side. WSF vessels are specially constructed to accommodate commercial vehicles, serving a vital role in the movement of goods.

4. Describe how the project will benefit minority and low-income populations as identified in the President’s Order for Environmental Justice, seniors, people with disabilities, those located in highly impacted communities, and/or areas experiencing high levels of unemployment or chronic underemployment; please be specific and provide data where applicable.

This project will benefit minority and low-income populations, seniors, people with disabilities, and those in highly impacted communities in the Puget Sound region by providing them cleaner air, better health outcomes, and continued sustainable ferry service on the Seattle-Bainbridge Island ferry route. The PSRC 2018 Project Selection Interactive Resource Map (https://www.psrc.org/sites/default/files/projectselectionresourcemap.html) shows the following regional demographic profile of populations served by the JMII vessels at each terminal on the Seattle-Bainbridge Island route:

Table 3. (Appx B) Regional Demographic Profile of Populations Served by the Project Terminals Served Minority Population Poverty Elderly Population (Age 65+) Disabled Population
Bainbridge Island 17% 7% 20% 10%
Seattle 58% 33% 20% and Above 34%
NOTE: All percentages are based on the upper range provided on the PSRC Project Selection Resource Map

Seattle’s population has relatively high proportions of minority, disabled, and elderly individuals, as well as those living in poverty. Bainbridge’s population has a relatively high proportion of elderly people.

The project will benefit these disadvantaged populations, first, by reducing harmful air pollutants discharged from WSF vessels. The project alleviates impacts to Seattle, one of the top 10% of “highly impacted communities” from an air quality and environmental justice perspective, as identified by the Puget Sound Clean Air Agency. By converting diesel engines to hybrid electric propulsion and reducing fuel consumption, harmful particulates will be reduced by 16 Metric Tonnes (MT) annually and GHG emissions by 8,027 CO2e MT annually. These reduced emissions in the corridors and at the terminals will enhance quality of life and passengers' experience, promote health and well-being, contribute to a prosperous economy and improve efforts to restore the environment.

The project will also benefit highly impacted communities by reducing cancer risk attributable to diesel particulate matter, a fine particle in diesel engine exhaust. Vehicle emissions pose a high cancer risk in the Puget Sound region, which ranks in the highest 5th percentile for air toxics cancer risk in the country. Over 70% of this cancer risk comes from diesel sources, including WSF diesel engines, and 99% of the total diesel particulate matter emissions in the Puget Sound region comes from heavy duty on-road vehicles, construction equipment and marine vessels (Washington Department of Ecology, 2011 Air Emissions Inventory, available at: http://www.ecy.wa.gov/programs/air/EmissionInventory/AirEmissionInventoryhtm). Moving towards electric propulsion and away from diesel, therefore, will drive better health outcomes for the region.

The project will also facilitate continued sustainable ferry service on the Seattle-Bainbridge Island ferry route, which effectively allows commuters to get out of their cars and bypass hundreds of miles of roadway on the region’s most congested thoroughfares and provides disadvantaged populations in the Seattle area access to jobs on the west side of Puget Sound. Centers on opposite sides of Puget Sound are accessible to one another due to the WSF system, linking residential areas and commercial centers and opening access to minority and low-income populations who would be otherwise cut off due to distance and the geographic barrier of the Puget Sound.

The ferry system provides a critical link for Kitsap County residents, many of whom use WSF from the Bainbridge Island terminal, where, in 2010, the poverty rate was 9.4% (10.2% in King County) and the unemployment rate was 5.9% (4.8% in King County). It is important that the residents of Kitsap County have continued access to reliable ferry transit services because many County residents, who have affordable housing options on the west side of the Sound, commute to jobs on the east side of the Sound (data: 5-year estimates from the US Census, 2010 American Community Survey). WSF services provide access to employment centers.
benefitting the poor and unemployed looking to access the Seattle area’s growing economy.

5. Describe how the project will support the establishment of new jobs/businesses or the retention of existing jobs/businesses including those in the industry clusters identified in the adopted regional economic strategy.

Governor Inslee’s top priority is to create an economic climate where innovation and entrepreneurship can continue to thrive and create well-paying jobs in every corner of our state. WSF services, in general, support existing and future employment by connecting people with access to the centers with cleaner, reliable, and more efficient vessels as transportation. Accordingly, WSF supports the establishment and retention of jobs and businesses through the Hybrid Electric Ferry Conversion Project. The project supports the continued, sustainable operations of WSF service on the Seattle-Bainbridge Island route, providing continued, sustainable access to family-wage jobs on both sides of the Puget Sound. The reductions in fuel consumption produced by the project help to keep the cost of ferry travel low, and sustain jobs in the region by reducing the financial impact on businesses, industry and employees that use the ferries. The project will also sustain tourism related jobs, which depend upon the high environmental quality of the region.

The project supports existing and future employment in the industry clusters identified in the 2017 PSRC Regional Economic Strategy, Amazing Place: Growing Jobs and Opportunity in the Central Puget Sound Region in the following ways:
- **Maritime** – Washington State’s Maritime sector comprises a robust and growing set of industries that contribute to achieving the Governor’s priority goal of significant GHG reductions. Long a pillar of the state’s economy, the Maritime sector continues to grow (an average of 6.4% a year), and today provides jobs with substantially better pay than the average for all industries. The average pay for a job in Washington is $52,000, while maritime workers are paid an average of $70,800 — totaling over $4.7 billion in wages. The sector contributes more than $21.4 billion in gross business income, and directly employs nearly 69,500 people. Including indirect and induced impacts, the sector is responsible for 146,000 jobs in the state and $30 billion in economic activity. Helping to support the industry, the Boat Building and Ship Repair cluster employs more than 16,000 jobs in the region, more than eight times that of the nation. The region’s strength in this cluster can be attributed to Kitsap County’s concentration of Boat Building and Ship Repair cluster jobs that is 169 times the national level. Nearly one quarter of all maritime jobs in the state are in Kitsap County. The Hybrid Electric Ferry Conversion Project is a part of the Washington Maritime BLUE 2050 strategy to ensure Washington state is home of the most sustainable maritime industry by 2050, aligned with Governor Inslee’s plans for deep de-carbonization, innovation and workforce development. The project lowers WSF’s operating costs by an estimate of $1.975 million annually from lower fuel consumption. This allows more money to be directed to the backlog of capital improvements needed to maintain service, and therefore to labor costs. WSF’s vessel work directly supports training and apprenticeship programs improving maritime workers’ professional capacity. Between 2008 and 2011, WSF projects funded 114,010 shipyard apprentice hours and 696,834 for journeyman.
- **Transportation and Logistics** – The region has a Water Passenger Transportation industry cluster that employs more than six times that of the national average (1,800 jobs in 2015). State and local ferry systems, including WSF, are part of the state’s marine highway, connecting walk-on passengers as well as passenger and commercial vehicles to jobs, services, and recreation in eight counties and British Columbia, Canada. Carrying 30% of WSF ridership in the region, the Seattle-Bainbridge Island route is the system’s busiest, so by supporting the sustainability of two vessels on the route, the project will bolster the jobs needed to operate the transit service.
- **Tourism** – WSF serves as a strong draw for tourism. Since 2012, WSF has been officially ranked on TripAdvisor, the world’s largest travel site. In 2016, WSF ranked #11 of 467 of the top attractions in Seattle. Around 6 million ferry riders per year are tourists or recreational users of the ferry system. This type of use brings substantial economic benefits to the region. Tourism is the state’s fourth largest industry, according to a 2010 Washington State Department of Commerce study, which found that travelers spent approximately $15.2 billion in the state, generating 143,000 direct jobs. The Washington Tourism Alliance reports that, in 2014, $6.4 billion was generated by tourism in the state, supporting 70,640 direct jobs. The Attractions and Entertainment industry cluster employing 25% more people than the national average (17,200 jobs in 2015). By maintaining service on WSF’s Seattle-Bainbridge Island ferry route in a sustainable manner, the project will provide continued access to the important tourism employment opportunities in the region.
- **Aerospace** – The project provides continued, sustainable access to jobs in the aerospace industries in King and Kitsap Counties. King County’s concentration of Aerospace Manufacturing jobs is over 8 times the national average. Boeing anchors a growing and diverse Aerospace ecosystem of over 507 aerospace-related companies such as AIM Aerospace Inc. Aerospace and Military & Defense are closely correlated in Kitsap County where multi-national defense firms, including BAE Systems, General Dynamics, Raytheon, and Northrop Grumman, have established an efficient manufacturing supply chain with growth potential in multiple industries.
- **Information Technology & Military** – Successful execution of Department of Defense contracts for cybersecurity is growing the Information and Communication Technology industry in Kitsap County, home to companies Critical Informatics and Paladin Data Systems.
The project will maintain service on WSF’s Seattle-Bainbridge Island ferry route, which will provide continued, sustainable access to the important cybersecurity employment opportunities in Kitsap County.

• Life Sciences and Global Health - The region’s largest Life Sciences cluster is Research Organizations, accounting for 11,800 jobs, which are 30% more concentrated than the national average. Organizations such as Seattle-based Fred Hutchinson Cancer Research Center, the Allen Institute for Brain Science, and the Infectious Disease Research Institute anchor this cluster in King County. The project will maintain service on WSF’s Seattle-Bainbridge Island ferry route, which will provide continued, sustainable access to the important research employment opportunities in Seattle and King County. As mentioned above, Amazon serves as a research employer in the Seattle area and provides 40,000 jobs in the downtown area. Additionally, the Bill & Melinda Gates Foundation, located in uptown Seattle, is famously known for its research capabilities and innovative grants.

• Business Services - King County has the highest regional concentration of corporate, subsidiary, and regional managing offices that form a strong Corporate Headquarters industry cluster with 50% more jobs than the national average. Seattle is home to six Fortune 500 companies: Amazon, Starbucks, Nordstrom, Weyerhaeuser, Expeditors, International and Alaska Airlines. Four more Fortune 500 companies are located in the metro area: Costco, Microsoft, Paccar and Expedia. It is also the home to a concentration of Marketing, Design, and Publishing cluster with nearly twice as many jobs compared to the national average that is growing at an average of 8.5% per year. The project will maintain service on WSF’s Seattle-Bainbridge Island ferry route, which will provide continued, sustainable access to the important opportunities located at corporate headquarters in King County.

• Recreational Gear – The region has 2.5 times as many jobs in the Sporting and Athletic Goods industry cluster compared to the nation, accounting for 1,600 regional jobs. Kitsap County is the gateway to the Olympic Peninsula and Olympic National Park, with more than five times as many Recreational Gear jobs than the nation as a whole. Sage, located on Bainbridge Island, manufactures fly fishing rods, reels, and accessories. King County has more than three times as many jobs in this cluster. Cascade Designs in Seattle manufactures the popular Therm-a-Rest portable sleep pads. The project will maintain service on WSF’s Seattle-Bainbridge Island ferry route, which will provide continued, sustainable access to the important A&E employment opportunities in Kitsap and King Counties.

• Architectural and Engineering – The region’s A&E cluster employs 21,000 people, a third higher than the national average with most concentrated in King and Kitsap Counties. The project will maintain service on WSF’s Seattle-Bainbridge Island ferry route, which will provide continued, sustainable access to the important A&E employment opportunities in Kitsap and King Counties.

• Safety.

Describe how this project supports a long-term strategy to maximize the efficiency of the corridor, including TDM and activities and ITS improvements that use advanced technologies or innovative approaches to improve traffic flow. Describe the problem and how this project will remedy it.

Currently, the barriers to maximizing efficiency on the Seattle-Bainbridge Island ferry corridor include:

• Volatile fuel costs impacting operating costs and capital costs;
• Air quality at maintenance levels with diesel fuel particulates as emissions from vessels;
• Aging equipment;
• Poor vessel performance; and
• Safety.

The vessel improvements from this project directly provide access to multiple Regional Growth Centers and Manufacturing/Industrial Centers as noted in the sections above. This project supports WSF’s long-term strategy to sustain and maximize the efficiency of ferry operations in the Central Puget Sound Region. The project does this by minimizing operating costs and environmental impacts related to reducing diesel fuel consumption through innovative hybrid electric technologies and measures that will support a sustainable transportation system in compliance with State law requiring the State to reduce GHG emissions to 1990 levels by 2020 and 25% below 1990 levels by 2035 (RCW 70.235.020) and Governor’s Executive Order 18-01, State Efficiency and Environmental Performance, which requires WSF to begin the transition to a zero-carbon-emission ferry fleet.

The project will minimize environmental impacts by reducing diesel fuel use and therefore, harmful diesel emissions. The project will minimize operating costs related to diesel fuel and the replacement of aging, diesel engine equipment with newer hybrid electric equipment, which will increase vessel performance, prevent delays and breakdowns, and enhance the safety of passengers and crew.

Performance measures associated with this project are as follows:

• Reduce 790,000 gallons of diesel fuel and save $1.975 million per year in diesel fuel costs annually;
• Reduce 8,027 CO2e MT annually;
• Reduce 35,081 pounds and 16 MT of PM annually;
• Reduce 687,578 pounds of NOX annually; and
2. **Describe how this project provides a “logical segment” that links to a regional growth or manufacturing/industrial center.**

The Puget Sound region is full of bottlenecks and choke points due to its topography. WSF service provides a “logical segment” that cuts directly across the area’s major aquatic barrier, linking millions of riders per year to avoid lengthy, circuitous routes around this large body of water, while also promoting the provision of safe opportunities for transit and active transportation. WSF’s 2017 ridership data show 7.2 million total walk on passengers systemwide – 3.3 million alone on the Seattle-Bainbridge Island route – connecting with transit and non-motorization modes in the Downtown Seattle RGC. Through timed transfers with connections to local feeder service, express bus and commuter rail, WSF origin/destination surveys show that these riders continue their trips to other RGCs. The WSF system also connects and provides linkages to shared use path trails promoting active transportation.

One significant way the project’s JMII vessels serves the Downtown Seattle RGC directly is by connecting ferry travelers from Bainbridge Island and Kitsap County to the Seattle Department of Transportation’s Streetcar service. As the graphic below shows(Appx B), the City of Seattle’s modern streetcar system currently has two lines – the First Hill line, which opened in 2016, and the South Lake Union line, which opened in 2007 – that provide new urban mobility options and support economic growth in downtown Seattle. The planned Center City Connector is a segment of the Streetcar system that will link the South Lake Union and First Hill lines, with station stops several blocks from WSF’s Seattle terminal, creating a system that will connect over a dozen Seattle neighborhoods in Seattle’s Center City. The Center City Connector will serve the City of Seattle’s three intermodal hub areas including Westlake Intermodal Hub, WSF Colman Dock Intermodal Hub, and King Street Intermodal Hub. The Connector will provide convenient transfers to the 3rd Avenue Transit Spine at both ends of Downtown, to Link Light Rail via multiple Downtown Seattle Transit Tunnel (DSTT) station entries, and to Sounder Commuter Rail at King Street Station. The system is projected to accommodate more than 20,000 average weekday riders. By continuing to provide WSF service on the Seattle-Bainbridge Island route in a more sustainable manner, the project will provide a “logical segment” linking Kitsap County residents and employees who wish to access destinations in Downtown Seattle solely by transit.

3. **Describe how the project fills in a missing link or removes barriers to/from a center.**

The project fills in a missing link for residents on the west side of Puget Sound with access to the Bainbridge Island terminal, and to jobs in the three Seattle RGCs, as well as the Seattle Downtown, Uptown, and First Hill / Capitol Hill RGCs. Of the total number of jobs in both MICs, about half (45% in Ballard-Interbay and 56% in Duwamish) are in goods-dependent industries. Ballard-Interbay has 6,170 jobs in industry clusters with 2,609 jobs in the Maritime cluster alone. Total employment in the three RGCs is nearly 191,000 with Services and Government common major industry sectors and employment focused on major office headquarters, professional services, and high-tech businesses.

Of the work-based trips made to and from both MICs, non-SOV modes make up a relatively high share (32% total in Ballard-Interbay with 16% in transit and 7% walking/biking; 27% total in Duwamish with 15% in transit and 3% walking/biking). In addition, employees in both MICs have moderate access to transit with 68% in Duwamish and 62% in Ballard-Interbay employees within a ¼-mile walk to a transit stop and nearly all employees (90% in Duwamish and 95% in Ballard-Interbay) within a ½-mile of transit. Employees in the three RGCs have complete access to transit with 98 to 100% within a ¼-mile walking distance from a transit stop. The Seattle ferry terminal connects to these MICs and RGCs through transit services provided by King County Metro, Amtrak Cascades, Sound Transit, Airporter Shuttle services, and the Seattle Street Car. As such, because of the project’s ability to continue the Seattle-Bainbridge Island ferry route in a sustainable manner, residents of Kitsap County can directly access jobs in the two MICs and three RGCs via transit removing the barriers of cost and congestion associated with driving, parking, and congestion. This is on top of the geographic barrier of the Puget Sound that the Seattle-Bainbridge Island route, and the project, which supports this route, removes. Indeed, residents in the two MICs can directly access jobs in the two MICs and three RGCs via transit removing the barriers of cost and congestion associated with driving, parking, and congestion in Seattle, in addition to the geographic barrier of the Puget Sound.

4. **Describe how this project will relieve pressure or remove a bottleneck on the transit hubs – Seattle/Bainbridge Island.**

- Reduce 350,805 pounds of CO annually.
- Reduce 687,578 pounds of NOX annually; and
Describe how the project provides opportunities for active transportation that...
Describe how the project provides opportunities for active transportation that can lead to public health benefits.

Ferry travel tends to be multimodal in nature, with passengers linking their trips to a variety of other modes at a much higher rate than typical state highway users. Both the Seattle and Bainbridge Island terminals, as well as the JMI vessels, accommodate active transportation modes, including bicycles and walk-on passengers. In fact, WSF service is a key link the region’s multimodal connections with priority loading for bicycles.

The Seattle-Bainbridge Island route has the highest ridership of the ten WSF routes with over 6.5 million riders and nearly 2.0 million vehicles carried in 2017. Of the passengers on this route in 2017, the majority (3.2 million, or 50.6%) were walk-on passengers, exceeding vehicle passengers. Of these, 102,482 passengers were bicycle riders. These walk-on and bicycle-riding passengers are expected to increase by 44% and 76%, respectively, by 2040.

Replacing two diesel generators with lithium ion battery banks in the two JMII vessels serving the Seattle-Bainbridge Island route to provide hybrid electric propulsion to the electric engines will provide a sustainable means of continuing this route in compliance with State law. The Revised Code of Washington (RCW) requires the State to reduce GHG emissions to 1990 levels by 2020 and 25% below 1990 levels by 2035 (RCW 70.235.020), and the Governor’s Executive Order 18-01, State Efficiency and Environmental Performance, requires WSF to begin the transition to a zero-carbon-emission ferry fleet. Consequently, the project will allow the vessels serving the Seattle-Bainbridge Island route to meet the projected 34% growth in total passengers and 44% increase in walk-on passengers by 2040, providing further opportunities for active transportation that can lead to reduced VMT, cleaner air, lower cancer risk due to diesel particulates, and public health benefits related to walking and bicycling.

Air Quality and Climate Change: Element Selection

1. Please select one or more elements in the list below that are included in the project’s scope of work, and provide the requested information in the pages to follow.
   - Alternative Fuels or Vehicle Technology

Air Quality and Climate Change: Alternative Fuels or Technology

1. Describe the change in fuel or vehicle technology.
   A Jumbo Mark II’s propulsion system consists of four diesel generators, which supply electric power to the main propulsion motors, which, in turn, drive the propellers. Typically, three of the four generators are in use while the vessel is underway. The proposed project will replace two diesel generators with one rechargeable electric generator and a 2,225 kWh battery bank on two Jumbo Mark II Class vessels. The conversion will allow for added efficient use of the remaining diesel generators, resulting in a significant reduction in diesel fuel combustion and associated pollutant emissions.

2. How many vehicles/equipment are affected?
   The conversion would occur on two Jumbo Mark II Class vessels, each of which operate on the Seattle to Bainbridge Island route.

3. What are the current conditions (model year, fuel type, etc.) of the vehicles/equipment?
   There are three Jumbo Mark II vessels in the WSF fleet built between 1997 and 1999. All vessels currently utilize a medium voltage (4,160 V) diesel-electric propulsion system. The system consists of four 3,000 kW propulsion diesel generators and four 4,475 kW electric propulsion motors (two per shaft).

4. Describe the annual activity per vehicle/equipment (e.g. miles traveled per vehicle, amount of fuel used per engine, etc.)
   Activity for engine use was quantified as annual gallons of diesel consumed. As described in the Jumbo Mark II Class Hybrid Conversion Feasibility Study, the project would result in a reduction of 790,000 gallons of diesel per year (p. 3). This savings will be realized by operating the engines at their peak efficiency, and by augmenting engine power with stored battery power.

Conversion of two vessels is the first step in a program to fully transition to full time electric-mode operation through the installation of rapid-charging equipment at each of the two terminals (Seattle and Bainbridge Island). The additional investment in shore-side charging facilities will greatly increase fuel savings for two vessels to 3,278,000 gal/yr.

The table below summarizes the annual diesel consumption with and without the project, and applies CO2 emission factors from the US Energy Information Association (EIA), as well as EPA particulate matter (PM) emission factors. As of 2013, all WSF vessels use B5 biodiesel, which is a blend of 5% biodiesel and 95% ultra low sulfur diesel. The relative emissions
savings were calculated assuming 100% ultra low sulfur diesel for the purposes of applying industry standard emission factors.

<table>
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<tr>
<th>Table 4(Appx B). Annual Fuel and Emissions Reductions Calculations</th>
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<td><strong>Annual Fuel and Emissions Reductions for Conversion of 2 JMII Vessels</strong></td>
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<tr>
<td><strong>Current Conditions Proposed Project Reduction</strong></td>
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<td><strong>Annual Diesel Consumption (gallons)</strong></td>
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<tr>
<td><strong>Annual PM emissions (g/year)</strong></td>
</tr>
<tr>
<td><strong>Annual PM emissions (pound/year)</strong></td>
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1 Hybrid Conversion Feasibility Study, Table 1, Baseline and Increment 2
2 EIA Carbon Dioxide Emissions Coefficients by Fuel
https://www.eia.gov/environment/emissions/co2_vol_mass.php
3 Federal Marine Compression-Ignition (CI) Engines: Exhaust Emission Standards
https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA0B.pdf
4 https://www.eia.gov/energyexplained/print.cfm?page=about_energy_units

This table is provided in the Appendix C, attached, as an Excel file ("Appendix C - WSF Hybrid Conversion Emissions Calculations.xlsx") showing emissions calculations for the project. It includes formulas, as well as calculations for other pollutants (CO, NOx), as well as CO2 and PM, for use in scoring the project’s air quality cost effectiveness.

5. Please describe the source of the alternative fuel or technology data provided above (e.g. manufacturer data, EPA/DOE data, previous projects, etc.)

Estimates of gallons of diesel saved were included in the Jumbo Mark II Class Hybrid Conversion Feasibility Study, completed by Elliot Bay Design Group in June, 2017(http://www.wsdot.wa.gov/NR/rdonlyres/6C78A08B-19A1-4919-B6E6-E9EF83E6376D/123052/HybridSystemIntegrationStudy.pdf). The proposed project corresponds to the scenario called Increment 2 – Transit with One Generator and 2,225 kWh of Batteries (p. 2).

The CO2 emission factor was obtained from a table provided by the US Energy Information Administration (EIA) using this link
https://www.eia.gov/environment/emissions/co2_vol_mass.php

The PM emission factor was assumed to be the standard for a Category 2, Tier 2, marine compression-ignition (CI) engine. The vessels have Tier 1 engines, but Tier 1 standards do not address PM. Using the Tier 2 standards is a conservative assumption because the vessels have Tier 1 engines. Actual PM emissions may be higher than the presented values, which could demonstrate an even higher emissions reduction due to the project. Tables of marine CI engine emission standards can be accessed using this link
https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA0B.pdf

Conversion factors for energy units were obtained from an EIA webpage located at this link
https://www.eia.gov/energyexplained/print.cfm?page=about_energy_units

PSRC Funding Request

1. What is the PSRC funding source being requested?
CMAQ

2. Has this project received PSRC funds previously?
No

3. If yes, please provide the project’s PSRC TIP ID
N/A

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Total Request: $7,000,000.00

Total Estimated Project Cost and Schedule
**PE**

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**Expected year of completion for this phase:** 2020

**Construction**

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**Expected year of completion for this phase:** 2022

**Summary**

1. **Estimated project completion date**
   12/2022

2. **Total project cost**
   $73,340,000.00

**Funding Documentation**

1. **Documents**
   - Appendix D - Funding Documentation - WSF Hybrid Electric Ferry Conversion.pdf,
   - App_E_CVRA_Funding_for_Vsl_Hybrid__Elec_Conversion.xlsx

2. **Please describe the secure or reasonably expected funds identified in the supporting documentation. For funds that are reasonably expected, an explanation of procedural steps with milestone dates for completion which will be taken to secure the funds for the project or program should also be included.**

   Documents verifying secured and reasonably expected funds are provided in Appendix D and E and include:
   1. Documentation of Secured $250,000 for PE (feasibility studies)
   2. Documentation of Secured $600,000 for PE (Owner's Preliminary Design/RFP Development)
   4. Documentation of Reasonably Expected $35,000,000 available from debt financing (Certificates of Participation) funded from the Capital Vessel Replacement Account to be used for preliminary engineering $9,490,000 and construction $25,510,000.

   Unlike local and regional transportation or transit agencies, secured funding for WSDOT’s WSF capital investment program is obtained through the legislative biennial budget process. Washington State Ferries will request legislative spending authority for the 2019-2021 biennium through WSDOT’s agency budget request to the Governor in September 2018. The Governor presents his proposed budget to the Legislature in December 2018. The Legislature convenes in January 2019 and passes an appropriations act with the concurrence of the Governor by late Spring. This enacted appropriations act provides legislative spending authority to agencies. The Governor allots the spending authority and agencies allocate it to agency programs, including the WSF Construction Program. This process puts secured funding in place by July 2019—the start of the state fiscal period.

   In general, the process for funding state agency projects occurs once year. It does not always coincide with grant competitions. Proposed new projects may not be able to show secured funding at the time of the competition. However, reasonable expectation of secured funding can be shown.

   • **Secured State Funding:** $850,000 is secured in the 2017-19 biennium by legislatively appropriated funds from the Puget Sound Capital Construction Account. This funding has already gone through the legislative appropriation process. The $250,000 of these funds are
already gone through the legislative appropriation process. The $250,000 of these funds are being used for the initial pre-design study of the WSF Hybrid Electric Conversion Program and $600,000 for Owner's Preliminary Design/RFP Development. Documentation of these secured state funds is attached as Appendix D to this Application.

- Reasonably Expected State Funding: $35 million is reasonably expected to be available through the 2019 legislative appropriations process. The 2018 Legislature left approximately $5.5 million per biennium available in WSF’s Capital Vessel Replacement Account. These funds can leverage $35 million though 12-year Certificates of Participation assuming an interest rate of 3.5%. See Attachment E to this application for the financial plan demonstrating the feasibility of funding the project from this fund source.

- Reasonably Expected State Funding: $30.49 million is reasonably expected to be available from other state funds including the Volkswagen Settlement Funds. The Draft State of Washington Proposed Volkswagen Beneficiary Mitigation Plan proposes to prioritize up to 45% of the settlement funds (or $50.7 million) for “electrification of public [marine] vessels, especially ferry vessels” (see funding allocation table below (Appx B) from page 15 of the State of Washington Proposed Volkswagen Beneficiary Mitigation Plan.

- Unsecured Federal Funding: $7 million is unsecured but this situation would change if WSF is successful in the pending CMAQ grant competition.

Project Readiness: PE

1. Are you requesting funds for ONLY a planning study or preliminary engineering?
   No

2. Is preliminary engineering complete?
   No

3. What was the date of completion (month and year)?
   N/A

4. Have preliminary plans been submitted to WSDOT for approval?
   No

5. Are there any other PE/Design milestones associated with the project? Please identify and provide dates of completion. You may also use this space to explain any dates above.
   N/A

6. When are preliminary plans expected to be complete?
   06/20

Project Readiness: NEPA

1. What is the current or anticipated level of environmental documentation under the National Environmental Policy Act (NEPA) for this project?
   Categorical Exclusion (CE)

2. Has the NEPA documentation been approved?
   No

3. Please provide the date of NEPA approval, or the anticipated date of completion (month and year).
   02/2019

Project Readiness: Right of Way

1. Will Right of Way be required for this project?
   No

2. How many parcels do you need?
   N/A

3. What is the zoning in the project area?
   N/A

4. Discuss the extent to which your schedule reflects the possibility of condemnation and the actions needed to pursue this.
5. **Does your agency have experience in conducting right of way acquisitions of similar size and complexity?**
   N/A

6. **If not, when do you expect a consultant to be selected, under contract, and ready to start (month and year)?**
   N/A

7. **In the box below, please identify all relevant right of way milestones, including the current status and estimated completion date of each.**
   N/A

**Project Readiness: Construction**

1. **Are funds being requested for construction?**
   Yes

2. **Do you have an engineer's estimate?**
   No

3. **Engineers estimate document**
   N/A

4. **Identify the environmental permits needed for the project and when they are scheduled to be acquired.**
   No Environmental Permits Required. Vessels construction are completed in shipyards and dry-docked.

5. **Are Plans, Specifications & Estimates (PS&E) approved?**
   No

6. **Please provide the date of approval, or the date when PS&E is scheduled to be submitted for approval (month and year).**
   03/2020

7. **When is the project scheduled to go to ad (month and year)?**
   12/2020

**Other Considerations**

1. **Describe any additional aspects of your project not requested in the evaluation criteria that could be relevant to the final project recommendation and decision-making process.**
   The wide range of support from local, regional, and state officials is evident in the letters of support for the WSF Hybrid Electric Ferry Conversion Project, provided in Appendix A. Statewide and regional organizations, including the Washington State Department of Ecology, Washington State Department of Commerce, Washington State Department of Enterprise Services, and the Puget Sound Clean Air Agency.

2. **Describe any innovative components included in your project: these could include design elements, cost saving measures, or other innovations.**
   WSDOT uses a Practical Solutions performance-based approach to transportation decision-making and a Cost Estimate Validation Process (CEVP) to validate base costs, schedule, and risks.

   WSDOT has been using the Practical Solutions performance-based approach to transportation decision-making since 2015, when the WSDOT Design Manual received significant updates, including guidance on examining and confirming the need for a project, considering the context and community input about a project, and an approach to translating these needs and concerns into performance metrics and targets. This practical design effort refines the basis of project design, starting with essential need identification, then understanding context, development of performance metrics and performance targets, alternatives development, and, finally, alternatives rating and screening. Practical design is effective at defining the scope to meet the essential needs as stakeholders are brought into the process early to understand budget challenges and the need for trade-offs to be identified and resolved. Cost estimates are the product of WSDOT’s Cost Risk Assessment (CRA) and Cost Estimate Validation Process (CEVP) cost benefit analysis, which are used to validate base costs, schedule, and risks. The process involves workshops that provide project teams the means to evaluate the quality and completeness of current cost estimates and risk register, increase confidence in the final results for the cost and schedule, and identify areas of uncertainty that need to be monitored. The CEVP includes base costs, risk assignment, and escalation to the year of expenditure for each phase. The CEVP results
provide the project team with actionable information on risk events and allows them to manage the risks on an ongoing basis to better control project cost and schedule. A CEVP for this project is scheduled to occur once preliminary engineering is completed.

3. Describe the process that your agency uses to determine the benefits of projects; this could include formal cost-benefit analysis, practical design, or some other process by which the benefits of projects are determined.

Appendix A: Letters of Support
Appendix B: Maps and Project Graphics
Appendix C: Emissions Calculations for Conversion of 2 JMII Vessels
Appendix D: Funding Documents

4. Final documents
   Appendix_C_-_WSF_Hybrid_Conversion_Emissions_Calculations.xlsx
PSRC Funding Application

Appendix B: Maps, Tables, Photos, Graphics

Project Title: WSF Hybrid Electric Ferry Conversion
Sponsoring Agency: WSDOT Marine Division (PSRC Region Only)
Figure 1. Photo of WSF vessels at Seattle Terminal

Source: WSF

Figure 2. Photo of WSF Vessel at Dusk

Source: WSF
Figure 3. Battery Bank on Board Electrical Ferry in Norway

Source: https://www.maritime-executive.com/article/first-electric-car-ferry-in-operation#gs._hslnQA

Figure 4. Norwegian Electric Ferry’s integrated genset, switchboard, propulsion and thruster control systems

Source: https://www.maritime-executive.com/article/first-electric-car-ferry-in-operation#gs._hslnQA
Ferry Routes / Terminals

- International: Anacortes
  Sidney, BC
- San Juan Islands:
  Anacortes, Friday Harbor,
  Lopez, Orcas, Shaw
- Port Townsend-Keystone
- Clinton-Mukilteo
- Kingston-Edmonds
- Bainbridge Island-Seattle
- Bremerton-Seattle
- Triangle: Southworth, Vashon, Fauntleroy
- Tahlequah-Point Defiance

Auto Passenger Routes

Source: WSF
Figure 6. WSF System Map

Source: WSF
Figure 7. WSF System Assets

<table>
<thead>
<tr>
<th>Vessel and Characteristics</th>
<th>Puyallup</th>
<th>Tacoma</th>
<th>Wenatchee</th>
<th>Jumbo Mark I Class</th>
<th>Spokane</th>
<th>Split Walla Walla</th>
<th>Super Class</th>
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<tbody>
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<td>Jumbo Mark II Class</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evergreen State Class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MV Tillikum</td>
<td>1200</td>
<td>87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kwa-a-il (Gab)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MV Chetlumok</td>
<td>750</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MV Kennewick</td>
<td>750</td>
<td>64</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>MV Salish</td>
<td>750</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: WSF

Figure 8. WSF Jumbo Mark II Vessel Information

M/V Puyallup

Features/ADA Information
- Car Deck ADA Shelter: No
- Car Deck ADA Restroom: No
- WiFi Access: No
- ADA Notes: The MV Puyallup has elevator access from both auto deck levels to all of the passenger cabin areas. Accessible restrooms are on the main passenger deck and on the sun deck. If you are traveling by car and want to park near the elevator be sure to let the ticket seller know. The main passenger deck also has vending and newspaper machines and a galley. This vessel is equipped with a visual paging system.

Vessel Information
- Class: Jumbo Mark II
- Length: 460’ 4”
- Beam: 90’
- Draft: 17’ 3”
- Max Passengers: 2599
- Max Vehicles: 202
- Engine: 4
- Horsepower: 16,000
- Speed in Knots: 18
- Propulsion: DIESEL ELECTRIC (AC)
- Displacement (weight in long tons): 184
- City Built: Seattle, WA
- Year Built/Re-built: 1999

Meaning of Puyallup: From the Puyallup language, “generous people.” The Puyallup tribe had a reputation for generosity in dealing with traders and travelers. Early settler Ezra Meeker renamed his town from Franklin in 1877 looking for something unique. Besides the tribe and town, Puyallup is also used on a river and a Mt. Rainier glacier.
WSF Hybrid Electric Ferry Conversion Project

M/V Tacoma

Features / ADA Information

| Car Deck ADA Shelter: No          | Main Cabin Restroom: Yes          |
| Car Deck ADA Restroom: No        | Elevator: Yes                     |
| WIFI Access: No                  |                                  |

ADA Notes: The MV Tacoma has elevator access from both auto deck levels to all of the passenger cabin areas. Accessible restrooms, vending and newspaper machines and a galley are on the main passenger deck. Accessible restrooms are also available on the sun deck. If you are traveling by car and want to park near the elevator, be sure to let the ticket seller know. This vessel is equipped with our visual paging system.

Vessel Information

- **Class:** Jumbo Mark II
- **Length:** 460' 2”
- **Beam:** 90’
- **Draft:** 17' 3”
- **Max Passengers:** 2499
- **Max Vehicles:** 202
- **Tail Deck Space:** 60
- **Auto Deck Clearance:** 15' 4”
- **Type:** Auto/Passenger Ferry
- **Engines:** 4
- **Horsepower:** 16,000
- **Speed in Knots:** 18
- **Propulsion:** DIESEL-ELECTRIC (AC)
- **Displacement (weight in long tons):** 6184
- **City Built:** Seattle, WA
- **Year Built / Re-built:** 1997

Meaning of Tacoma: From the native word Tah-ho-rah (now Mt. Rainier), meaning “snowy mountain.” Tacoma was first attributed to the mountain in an 1860s book, “The Canoe and the Saddle” by Theodore Winthrop, a popular volume on the early Pacific Northwest. The city picked the name from Commencement City when the railroad made its terminus there in the 1870s.

M/V Wenatchee

Features / ADA Information

| Car Deck ADA Shelter: No          | Main Cabin Restroom: Yes          |
| Car Deck ADA Restroom: No        | Elevator: Yes                     |
| WIFI Access: No                  |                                  |

ADA Notes: The MV Wenatchee has elevator access from both auto deck levels to all of the passenger cabin areas. Accessible restrooms, vending and newspaper machines and a galley are located on the main passenger deck. Accessible restrooms are also on the sun deck. If you are traveling by car and want to park near the elevator, be sure to let the ticket seller know. This vessel is equipped with our visual paging system.

Vessel Information

- **Class:** Jumbo Mark II
- **Length:** 460' 2”
- **Beam:** 90’
- **Draft:** 17' 3”
- **Max Passengers:** 2499
- **Max Vehicles:** 202
- **Tail Deck Space:** 60
- **Auto Deck Clearance:** 15' 4”
- **Type:** Auto/Passenger Ferry
- **Engines:** 4
- **Horsepower:** 16,000
- **Speed in Knots:** 18
- **Propulsion:** DIESEL-ELECTRIC (AC)
- **Displacement (weight in long tons):** 6184
- **City Built:** Seattle, WA
- **Year Built / Re-built:** 1998

Meaning of Wenatchee: From the Yakama language comes the word wenatchee for “river flowing from canyon.” When Lewis and Clark traveled through the Columbia River valley in 1803-1805, they mentioned the word Wenatchee in their journal, hearing of the river and the tribe living along its banks. A city, lake, river, and national forest are also named after the tribe.

Source: WSF
Table 1. Consistency with Local Comprehensive Plans

<table>
<thead>
<tr>
<th>Plan Name</th>
<th>Relevant Section(s), Page #</th>
<th>Relevant Text/Language</th>
</tr>
</thead>
</table>
| **2017 Adopted King County Comprehensive Plan** | Chapter 8 (Transportation), Section I.A (Introduction), Page 8-2 | “The following summarizes county priorities for responding to policy direction established and articulated in the King County Strategic Plan, the King County Comprehensive Plan, County transportation agencies’ functional plans, and the associated state and regional laws and planning requirements:…  
- Maintain safe and secure county-owned infrastructure, including roads, bridges, trails, buses and passenger ferries, transit and ferry facilities, and airport facilities;” |
| **2017 Adopted King County Comprehensive Plan** | Chapter 8 (Transportation), Section III.A (Public Transportation Policies and Service Guidelines), Page 8-26 | “T-302 The King County Marine Division should work with the Washington State Department of Transportation, Kitsap County, and other entities offering passenger ferry services, to ensure that service and capital plans for ferries are consistent with the King County Ferry District 2014 Strategic Plan, or successor plans.” |
| **2017 Adopted King County Comprehensive Plan** | Chapter 5 (Environment), Section II (Climate Change), Page 5-15 | “E-201 King County should participate in and support appropriate local, regional and national efforts and organizations focused on reducing greenhouse gas emissions and preparing for climate change impacts.” |
| **2017 Adopted King County Comprehensive Plan** | Chapter 5 (Environment), Section II.B (Reducing GHG Emissions), Page 5-18 | “E-205 King County shall reduce greenhouse gas emissions from all facets of its operations and actions associated with construction and management of county-owned facilities, infrastructure development, transportation, and environmental protection programs….“ |
| **2017 Adopted King County Comprehensive Plan** | Chapter 5 (Environment), Section II.B (Reducing GHG Emissions), Page 5-18 | “E-206 King County shall reduce total greenhouse gas emissions from government operations, compared to a 2007 baseline by at least 25% by 2020 and 50% by 2030.” |
Public Services and Facilities. Public services and facilities – including, but not limited to, parks and recreation, law enforcement, fire protection, emergency preparedness, water/sewer, roads, transit, non-motorized facilities, ferries, stormwater management, education, library services, health and human services, energy, telecommunications, etc. – are provided in an efficient, high-quality and timely manner by the County and its partner agencies. Public services and facilities are monitored, maintained and enhanced to meet quality service standards.” |
| Kitsap County Comprehensive Plan 2016-2036 | Chapter 2 (Economic) | “Our economic future is also dependent upon the availability and maintenance of strong infrastructure in transportation (roads, bridges, ferries, rail, and air) energy, communications, water and waste water;
city of Bainbridge Island 2016 Comprehensive Plan

Transportation Element, Transportation Issues, Page TR-3 – TR-4

“B. Roadway Congestion – Traffic on Island roadways, particularly on SR 305 and within Winslow, can result in a variety of issues such as making it difficult to “get around” by automobile, traffic “spilling over” into adjacent neighborhoods, and making it more difficult for transit and non-motorized users to get to their destinations in a timely manner. Congestion related to ferry loading and unloading creates surges on Island roadways every 45 to 50 minutes. In the afternoon hours, impacts from ferry activities can snarl area traffic and cause traffic delays. In addition to ferry traffic, the SR 305 Corridor has experienced increasing congestion due to commuters traveling on and off island across the Agate Pass Bridge. Congestion and increased travel times are experienced during commute hours along the SR 305 Corridor.”

Kitsap County Comprehensive Plan 2016-2036

Chapter 5 (Transportation), Transportation Directives, Page 5-60

““The goals and policies recognize the County residents’ desire for an efficient, flexible, and coordinated multi-modal transportation system including roads, bridges and highways, ferries, transit and non-motorized travel, that provides interconnectivity and mobility and; preserves our urban and rural land use character through design standards.”

Kitsap County Comprehensive Plan 2016-2036

Chapter 5 (Transportation), Transportation Goals and Policies, Pages 5-63 - 5-64

“Transportation Goal 7. Avoid first, minimize second, and then mitigate negative environmental or use impacts due to additions to or improvements to the transportation system whether upland or on shoreline. Plan, locate and design transportation systems and essential utility facilities along shoreline areas where they will have the least possible adverse effect on shoreline ecological functions and/or processes and existing or planned water-dependent uses.

Transportation Policy 34. Explore and evaluate costs and benefits of foot ferries as a complement to existing public transportation system in partnership with Kitsap Transit and Washington State Ferries.”

Kitsap County Comprehensive Plan 2016-2036

Chapter 7 (Capital Facilities and Utilities), Page 7-76

“Public services and facilities – including, but not limited to, parks and recreation, law enforcement, fire protection, emergency preparedness, water/sewer, roads, transit, non-motorized facilities, ferries, stormwater management, education, library services, health and human services, energy, telecommunications, etc. – are provided in an efficient, high-quality and timely manner by the County and its partner agencies. Public services and facilities are monitored, maintained and enhanced to meet quality service standards ...

Capital Facilities and Utilities goals and policies in this Comprehensive Plan are an integral part of the other elements including: Land Use, Economic Development, Environment, Housing and Human Services, Parks and Recreation, and Transportation. Specifically impacted are public service and facilities – including but not limited to, parks and recreation, law enforcement, fire protection, emergency preparedness, water/sewer, roads, transit, non-motorized facilities, ferries, stormwater management, education, library services, health and human services, energy, and telecommunications.”

City of Bainbridge Island 2016 Comprehensive Plan

Transportation Element, Introduction, Page TR-1

“The ferry to Seattle and the Agate Pass Bridge are the only two public options for travel to or from the Island. Many Islanders commute to work off-island by ferry or bridge. Likewise, many on-Island workers commute from off-island. Lengthy commute times by ferry or being stuck in traffic on SR 305 mean spending hours away from family, friends, and activities. Speeding and cut-through traffic makes neighborhood streets feel unsafe. During commute hours, SR 305 creates a wall across the Island. Reliable and efficient transportation on and off island is important to balance jobs and housing and maintaining the quality of life for Island residents.”
C. SR 305 Traffic Congestion – Concern surrounds the future of the SR 305 Corridor. While the existing configuration of two lanes is adequate during off-peak hours, peak hour traffic coupled with surges from exiting ferry activities have resulted in high levels of congestion at multiple locations. This affects Island residents and off-Island commuters using the corridor and increases the difficulty of cross-Island travel, resulting in higher volumes of traffic on local streets when drivers try to avoid SR 305 congestion. Access to SR 305 is becoming increasingly difficult at the north end of the Island.

H. Transit Service – Ferry Service is vital to many residents who work in Seattle and to the local and regional economy. As automobile capacity and parking space at the ferry terminal are limited, non-motorized facilities with connectivity to the ferry and transit service are important to many Islanders for sustainably accommodating population growth. WSF forecasts significant growth of non-motorized trips in the coming decade. Kitsap Transit provides bus service connecting many areas of the Island to the ferry and Winslow. Kitsap Transit is working to expand service during non-peak hours and to inter-Island locations, and many in the community would like to see this service maintained and expanded. This service has provided valuable mobility to the community, especially for older people, those with disabilities and younger populations.

J. Climate Change – Transportation is both a cause of climate change and provides opportunities to mitigate the effects of climate change. Creating a transit plan that reduces emission of greenhouse gases and increases our communities resilience to the effects of climate change is a priority. These criteria should be used to evaluate all transportation solutions and proposed projects.”

<table>
<thead>
<tr>
<th>City of Bainbridge Island 2016 Comprehensive Plan</th>
<th>Transportation Element, Transportation Issues, Page TR-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Transportation issues are among the top concerns for Bainbridge Island residents since Island roadways serve two equally important purposes. Not only do the roadways provide mobility, they also enhance the character of the Island. Much of the concern over transportation is related to the future of State Route 305, which serves not only Bainbridge Island, but also functions as a regional facility connecting Seattle and the Island ferry terminal with the Kitsap and Olympic Peninsulas.”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City of Bainbridge Island 2016 Comprehensive Plan</th>
<th>Transportation Element, Goals &amp; Policies, Page TR-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Goal TR-2 Provide a non-motorized transportation system that is a planned and coordinated network of shoulders, sidewalks, trails, footpaths, bikeways and multi-purpose trails that connect neighborhoods with parks, schools, the shoreline, the ferry terminal and commercial areas. Policy TR 2.1 … Provide safe and appropriately scaled non-motorized access that connects designated centers, the ferry terminal, services such as a doctors’ offices, schools, parks, recreation areas, shorelines (including road-ends), and transit connections including to ferry and bus services.”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City of Bainbridge Island 2016 Comprehensive Plan</th>
<th>Transportation Element, Goals &amp; Policies, Page TR-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>“FERRY SERVICE GOAL TR-3 Coordinate with Washington State Ferries (WSF) and other ferry service providers to ensure that ferries meet local service and commuter needs, are integrated with all travel modes and provide equitable regional service. Policy TR 3.1 Advocate for ferry services to and from Bainbridge Island in order to optimize the use of each ferry service, balance peak hour travel times and provide ferry capacity in proximity to users’ origin and destination.”</td>
<td></td>
</tr>
</tbody>
</table>
| City of Bainbridge Island 2016 Comprehensive Plan | Transportation Element, Goals & Policies, Page TR-11 | “Policy TR 4.2 Support actions from Metro, Sound Transit, Kitsap Transit or other appropriate agencies that:  
• Improve public transit from the Seattle ferry terminal directly to popular destinations in Seattle metropolitan area as well as Sea-Tac Airport.  
• Promote the availability of public transit service to ferry commuters and for special events.  
• Maintain bus schedules to meet ferry arrival and departure times and improve service throughout the day and during evening hours.  
• Provide information on the ferries and at the ferry terminals regarding transit options.  
• Increase bus service on the Island to seven days a week.  
...  
Policy TR 4.4 Support the expansion of Island transit services that target:  
• Ferry commuters  
• Transit dependent access, including addressing the access needs of all ages and abilities.” |
| --- | --- | --- |
| Seattle’s Comprehensive Plan, Toward a Sustainable Seattle | Transportation Element, Increasing Transportation Choices: Making Transit a Real Choice, Policies, Pages 3.6 - 3.7 | “T28 Support efficient use of ferries to move passengers and goods to, from, and within Seattle. Explore route, funding and governance options for waterborne transit service, especially those that serve pedestrians. In order to limit the expansion of automobile traffic by ferry, encourage the Washington State Ferry System to expand its practice of giving loading and/or fare priority to certain vehicles, such as transit, carpools, vanpools, bicycles, and/or commercial vehicles, on particular routes, on certain days of the week, and/or at certain times of day. Encourage the Washington State Ferry System to integrate transit loading and unloading areas into ferry terminals, and to provide adequate bicycle capacity on ferries and adequate and secure bicycle parking at terminals.  
T29 For water-borne travel across Puget Sound, encourage the expansion of passenger-only ferry service and land-side facilities and terminals that encourage walk-on (by foot, bicycle and transit) trips rather than ferry travel with automobiles.” |
<p>| Seattle’s Comprehensive Plan, Toward a Sustainable Seattle | Transportation Element | “T31 Integrate pedestrian and bicycle facilities, services, and programs into City and regional transportation and transit systems. Encourage transit providers, the Washington State Ferry System, and others to provide safe and convenient pedestrian and bicycle access to and onto transit systems, covered and secure bicycle storage at stations, especially for persons with disabilities and special needs.” |</p>
<table>
<thead>
<tr>
<th></th>
<th>Walking, Policies, Page 3.7</th>
<th>T61 Support a strong regional ferry system that maximizes the movement of people, freight, and goods.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Seattle’s Comprehensive Plan, Toward a Sustainable Seattle</strong></td>
<td>Transportation Element, Connecting the Region, Policies, Page 3.11</td>
<td>DT-TP2 Improve and expand the street level elements of the regional transit system to provide the primary mode of vehicular travel among downtown activities. Integrate the system with the transit tunnel, the pedestrian circulation network, peripheral parking facilities and other modes of travel to downtown including the ferry system, intercity bus and intercity rail.</td>
</tr>
<tr>
<td><strong>Seattle’s Comprehensive Plan, Toward a Sustainable Seattle</strong></td>
<td>Downtown Neighborhood Plan, Downtown Urban Center, Transportation Policies, Page 8.66</td>
<td>“With the City’s long-standing commitment to environmental stewardship and as home to the nation’s first carbon neutral electric utility, Seattle is well-positioned to be a leader in emissions reduction. Building on this history of stewardship and leadership, in 2011 the City Council adopted carbon neutrality by 2050 as the City’s climate goal. … Goal EG7 Reduce emissions of carbon dioxide and other climate-changing greenhouse gases in Seattle by 30 percent from 1990 levels by 2020, and become carbon neutral by 2050. … Policy E15 Work with private and public sector partners to achieve the goal of reducing climate-changing greenhouse gas emissions.”</td>
</tr>
<tr>
<td><strong>Seattle’s Comprehensive Plan, Toward a Sustainable Seattle</strong></td>
<td>Environmental Element, Climate Change, Page 11.6</td>
<td></td>
</tr>
</tbody>
</table>
Figure 9. Regional Growth Centers (RGC) and Manufacturing/Industrial Centers (MIC)

Source: https://www.psrc.org/sites/default/files/centers_small_1.pdf
Table 2. Characteristics of the three RGCs and two MICs that the JMII vessels serve (Source: https://www.psrc.org/rdp-economy)

<table>
<thead>
<tr>
<th></th>
<th>Population</th>
<th>Housing Units</th>
<th>Employment</th>
<th>Access to Transit (Employee or Resident)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duwamish MIC</td>
<td>1,376</td>
<td>523</td>
<td>58,771</td>
<td>68%</td>
</tr>
<tr>
<td>Ballard-Interbay MIC</td>
<td>1,846</td>
<td>780</td>
<td>14,237</td>
<td>68%</td>
</tr>
<tr>
<td>Seattle Downtown, RGC</td>
<td>25,920</td>
<td>19,185</td>
<td>135,285</td>
<td>100%</td>
</tr>
<tr>
<td>Seattle Uptown, RGC</td>
<td>7,641</td>
<td>6,110</td>
<td>13,910</td>
<td>100%</td>
</tr>
<tr>
<td>Seattle First Hill / Capitol Hill, RGC</td>
<td>36,502</td>
<td>25,972</td>
<td>41,645</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 3. Regional Demographic Profile of Populations Served by the Project

<table>
<thead>
<tr>
<th>Terminals Served</th>
<th>Minority Population</th>
<th>Poverty</th>
<th>Elderly Population (Age 65+)</th>
<th>Disabled Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bainbridge Island</td>
<td>17%</td>
<td>7%</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>Seattle</td>
<td>58%</td>
<td>33%</td>
<td>20% and Above</td>
<td>34%</td>
</tr>
</tbody>
</table>

NOTE: All percentages are based on the upper range provided on the PSRC Project Selection Resource Map
**Figure 10. Seattle Streetcar System Map**

We’re building a modern streetcar system that will provide new mobility options, support economic growth, and strengthen connections in Seattle’s densest neighborhoods.

**By the numbers**
- 5 total miles of streetcar line connecting Seattle’s densest neighborhoods
- 4 new streetcar stations
- 7 new streetcars, meaning more frequent service
- 12 neighborhoods along the line
- 23 total streetcar stops
- 100k+ of destinations
- 20,000+ anticipated system-wide ridership per day in operating year

Table 4. Annual Fuel and Emissions Reductions Calculations

<table>
<thead>
<tr>
<th></th>
<th>Current Conditions</th>
<th>Proposed Project</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Diesel Consumption</td>
<td>3,752,000</td>
<td>2,962,000</td>
<td>790,000</td>
</tr>
<tr>
<td>(gallons)¹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO₂ emission factor</td>
<td>22.4</td>
<td>22.4</td>
<td>--</td>
</tr>
<tr>
<td>(pounds/gallon of diesel)²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual CO₂ emissions</td>
<td>84,044,800</td>
<td>66,348,800</td>
<td>17,696,000</td>
</tr>
<tr>
<td>(pounds/year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual CO₂ emissions</td>
<td>38,123</td>
<td>30,096</td>
<td>8,027</td>
</tr>
<tr>
<td>(metric tons/year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM emission factor (g/kWh)³</td>
<td>0.5</td>
<td>0.5</td>
<td>--</td>
</tr>
<tr>
<td>Btu content of 1 gallon of</td>
<td>137,452</td>
<td>137,452</td>
<td>--</td>
</tr>
<tr>
<td>diesel⁴</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Btu per kWh⁴</td>
<td>3,412</td>
<td>3,412</td>
<td>--</td>
</tr>
<tr>
<td>Annual PM emissions (g/year)</td>
<td>75,574,429</td>
<td>59,661,903</td>
<td>15,912,526</td>
</tr>
<tr>
<td>Annual PM emissions (pound/year)</td>
<td>166,610</td>
<td>131,530</td>
<td>35,081</td>
</tr>
</tbody>
</table>

¹ Hybrid Conversion Feasibility Study, Table 1, Baseline and Increment 2
² EIA Carbon Dioxide Emissions Coefficients by Fuel [https://www.eia.gov/environment/emissions/co2_vol_mass.php](https://www.eia.gov/environment/emissions/co2_vol_mass.php)
³ Federal Marine Compression-Ignition (CI) Engines: Exhaust Emission Standards [https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA0B.pdf](https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA0B.pdf)
⁴ [https://www.eia.gov/energyexplained/print.cfm?page=about_energy_units](https://www.eia.gov/energyexplained/print.cfm?page=about_energy_units)

Figure 11. WSDOT 7-Step Annual Investment Process

Source: WSF
Figure 12. State of Washington Proposed Volkswagen Beneficiary Mitigation Plan funding allocation table

Table 2. Eligible Mitigation Action Categories with Preliminary Funding Allocation and Anticipated Percentage of Funds

<table>
<thead>
<tr>
<th>Eligible Mitigation Action Categories*</th>
<th>Fund Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>On-Road Heavy Duty Vehicles</strong></td>
<td>≤ 45%</td>
</tr>
<tr>
<td>Priority: Electrification of public fleets, especially transit buses</td>
<td></td>
</tr>
<tr>
<td>- Class 4-8 School Bus, Shuttle Bus, or Transit Bus (Eligible Buses)</td>
<td></td>
</tr>
<tr>
<td>- Class 4-7 Local Freight Trucks (Medium Trucks)</td>
<td></td>
</tr>
<tr>
<td>- Class 8 Local Freight Trucks and Port Drayage Trucks (Eligible Large Trucks)</td>
<td></td>
</tr>
<tr>
<td><strong>Non-Road Equipment</strong></td>
<td>≤ 5%</td>
</tr>
<tr>
<td>Priority: Electrification</td>
<td></td>
</tr>
<tr>
<td>- Airport Ground Support Equipment</td>
<td></td>
</tr>
<tr>
<td>- Forklifts and Port Cargo Handling Equipment</td>
<td></td>
</tr>
<tr>
<td><strong>Locomotives</strong></td>
<td>≤ 5%</td>
</tr>
<tr>
<td>Priority: Publicly owned locomotives</td>
<td></td>
</tr>
<tr>
<td>- Freight Switchers</td>
<td></td>
</tr>
<tr>
<td><strong>Marine Vessels</strong></td>
<td>≤ 45%</td>
</tr>
<tr>
<td>Priority: Electrification of public vessels, especially ferry vessels</td>
<td></td>
</tr>
<tr>
<td>- Ferries/Tugs</td>
<td></td>
</tr>
<tr>
<td>- Ocean Going Vessels (OGV) Shore Power</td>
<td></td>
</tr>
<tr>
<td><strong>Light Duty Zero Emission Vehicle Supply Equipment</strong></td>
<td>15%</td>
</tr>
<tr>
<td><strong>Diesel Emission Reduction Act (DERA) Option</strong></td>
<td>≤ 5%</td>
</tr>
<tr>
<td></td>
<td>&lt; 120 %</td>
</tr>
</tbody>
</table>

### APPENDIX C

Emissions Calculations for Conversion of 2 JMII Vessels

<table>
<thead>
<tr>
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<th>Current</th>
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<td>NOX (MT/year)</td>
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#### Notes:

1. Hybrid Conversion Feasibility Study, Table 1, Baseline and Increment 2
2. EIA Carbon Dioxide Emissions Coefficients by Fuel [https://www.eia.gov/environment/emissions/co2_vol_mass.php](https://www.eia.gov/environment/emissions/co2_vol_mass.php)
3. Federal Marine Compression-Ignition (CI) Engines: Exhaust Emission Standards [https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA08.pdf](https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA08.pdf)
4. [https://www.eia.gov/energyexplained/print.cfm?page=about_energy_units](https://www.eia.gov/energyexplained/print.cfm?page=about_energy_units)
PSRC Funding Application

Appendix D: Funding Documentation

**Project Title:** WSF Hybrid Electric Ferry Conversion

**Sponsoring Agency:** WSDOT Marine Division (PSRC Region Only)
Figure 1. Documentation of Secured $250,000 for WSF Hybrid Electric Ferry Conversion Studies

Executive T.E.I.S. - Capital Projects System
Project Notes Report

PIN: 981031G
Book Description: MV Tacoma Improvement (17-19)
Targeted improvements for the MV Tacoma are investments that address existing deficiencies, enhance efficiency, and meet other needs to maintain and support existing service levels. An existing deficiency is a situation where there is a clear equipment limitation that would pose a serious safety or operational challenge if left unmitigated. A targeted improvement may be made to replace vital components that have become obsolete, not supported by the manufacturer, or to take advantage of new technology available.
Increase $90,000 CN State-PSCC per Change Management for IRA's
Increase $359,792 PE State-PSCC per Change Management for Electrification Studies

Project increase $259,792 PE State-PSCC for Electrification Studies
The project change requested by the vessels program will increase the MV Tacoma Improvement (17-19) PIN 981031G preliminary engineering phase by $259,792 State-PSCC funds. The request will transfer $259,792 State-PSCC funds from vessel donor MV Tacoma Commercial Dockside PIN 981030F preliminary engineering phase.
The increase on PIN 981031G is needed for two consultant agreements for the Jumbo Mark II Class Electrification Studies.
The WSF Budget office considers the Electrification studies as an improvement to the Jumbo Mark II Class vessels. The MV Tacoma Improvement (17-19) PIN 981031G preliminary engineering phase does not have sufficient State-PSCC spending authority in 2017-19 biennium. The State-PSCC funds increase is needed in order to complete the studies.
After this funds transfer, there is no significant impact on the preliminary engineering work on the MV Tacoma in the 2017-19 biennium. The Jumbo Mark II Class Electrification Studies and RFP Development project is included in the 2018 Supplemental Budget Request. Once the 2018 Supplemental Budget is approved, the funding will be replenished back to the PIN 981030F.
This change management will provide sufficient funding to complete the Jumbo Mark II Class Electrification Studies and show the effective use of limited resources.

Created By: Brian, David
Created Date: 2/12/2018 12:34:35 PM
Modified By: Brian, David
Modified Date: 3/1/2018 12:46:05 PM
Associated Version: 17WSFCEBK
Last Modified Version: 17WSFCEBK
Figure 2. Documentation of Secured $600,000 for WSF Hybrid Electric Ferry Conversion Project: Governor’s Proposed 2018 Supplemental Budget – Agency Recommendation Summary – Department of Transportation – Washington State Ferries-Capital

(https://www.ofm.wa.gov/sites/default/files/public/budget/statebudget/18supp/recsum/405W0C.pdf)

**TRANSPORTATION**

**Agency 405**

**Department of Transportation (cont.)**

**Pgm W - WA State Ferries-Cap**

**Recommendation Summary**

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**POLICY CHANGES**

1. **Capital Projects Reappropriation**
   
   Expenditure authority is adjusted for unspent funds relating to unfinished work in the previous biennium. (Puget Sound Capital Construction Account-State; Puget Sound Capital Construction Account-Federal; Puget Sound Capital Construction Account-Local; other accounts)

2. **Capital Projects**
   
   Appropriations provide for capital projects that preserve and improve existing ferry terminals and vessels. Additional appropriation authority is needed for the Seattle Terminal project. (Puget Sound Capital Construction Account-State; Puget Sound Capital Construction Account-Federal; Puget Sound Capital Construction Account-Local; other accounts)

3. **Electric Vessel RFP**
   
   Funding is provided for the request for proposal (RFP) process to convert three Jumbo Mark II class ferry vessels from diesel to hybrid electric along with the necessary modifications to the terminals to support and charge electric ferries. (Puget Sound Capital Construction Account-State)
Figure 3. Documentation of Secured $600,000 for WSF Hybrid Electric Ferry Conversion Project: ESSB 610, 2018 Transportation Supplemental Budget, as enacted 3/27/2018 ([http://lawfilesext.leg.wa.gov/biennium/2017-18/Pdf/Bills/Senate%20Passed%20Legislature/6106-S.PL.pdf](http://lawfilesext.leg.wa.gov/biennium/2017-18/Pdf/Bills/Senate%20Passed%20Legislature/6106-S.PL.pdf))

(ix) Identify operational changes that may reduce costs, such as nighttime tie-up locations.

(c) The department shall submit a status report on the long-range plan update to the governor and the transportation committees of the legislature by June 30, 2018, and a final report by January 1, 2019.

(7) $600,000 of the Puget Sound capital construction account—state appropriation is provided solely for development of a request for proposal to convert the three ferry vessels in the Jumbo Mark II class to hybrid electric propulsion and make associated necessary modifications to the Seattle, Bainbridge, Edmonds, and Kingston terminals. The department is directed to explore capital project financing options to include, but not be limited to, federal funding opportunities, private or local contributions, application for Volkswagen settlement funds, and energy-savings performance contracting to be repaid in whole or in part by fuel-cost savings. The department will report total capital cost estimates, optimal construction schedule, annual capital and operating savings or costs, and a recommended funding option to the governor and to the transportation committees of the legislature by June 30, 2019.

Sec. 310. 2017 c 313 s 310 (uncodified) is amended to read as follows:

FOR THE DEPARTMENT OF TRANSPORTATION—RAIL—PROGRAM Y—CAPITAL

Essential Rail Assistance Account—State Appropriation . ((424,000)) $845,000

Transportation Infrastructure Account—State Appropriation . ((5,367,000)) $7,575,000

Multimodal Transportation Account—State Appropriation . ((51,665,000)) $79,357,000

Multimodal Transportation Account—Federal Appropriation . ((1,487,000)) $59,814,000

TOTAL APPROPRIATION. . . . . . . . ((53,943,000)) $147,591,000

The appropriations in this section are subject to the following conditions and limitations:
Figure 4. Draft State of Washington Proposed Volkswagen Beneficiary Mitigation Plan
October 2017

Publication Contact Information

This document is available on the Department of Ecology’s website at ecology.wa.gov.

For more information contact:

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For special accommodations or documents in alternate format, call (360) 407-6800, 711 (relay service), or 877-833-6341 (TTY).
State of Washington
Beneficiary Mitigation Plan

Air Quality Program
Washington State Department of Ecology
Olympia, Washington
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Overview

Volkswagen’s Violation and Settlement

From 2008 to 2015, the global automaker Volkswagen sold diesel vehicles equipped with illegal software designed to cheat and falsify U.S. emissions tests, a violation of the federal Clean Air Act. About 24,000 of these diesel vehicles are registered in Washington, each emitting up to 40 times the permitted levels of nitrogen oxides – a harmful air pollutant. Volkswagen’s fraudulent actions damaged public trust and put people’s health at risk.

In 2017, the U.S. Department of Justice entered into a settlement with Volkswagen that requires the automaker to pay $2.7 billion into an Environmental Mitigation Trust. The trust will fund projects that reduce emissions to offset damage from the vehicles equipped with the cheating software. Washington State is eligible for $112.7 million from the settlement.

The Mitigation Plan

The justice department requires beneficiaries of settlement funds to name a lead agency and develop a plan for use of the funds. Washington Governor Jay Inslee appointed the Washington State Department of Ecology (Ecology) as the lead agency for Washington.

The plan provides an overview of how the funds can be used, eligible project categories, projected reductions in emissions, health impacts, and the approach to involve the public. It also includes principles to maximize public health and environmental benefits, focus air quality improvement towards communities that have historically borne a disproportionate share of air pollution and substantially reduce harmful air pollutants beyond nitrogen oxides. Plan priorities guide selection of projects that emphasize transformational change in advanced emission reduction technologies.

A Transformational Opportunity

Transportation is the largest source of air pollution, including carbon pollution, in Washington. Diesel emissions pose a particular concern because toxic chemicals and small particle pollution in diesel exhaust are especially harmful to human health. Over four million people – more than half the state’s population – live or work close to transportation corridors where they breathe high levels of toxic diesel exhaust.\(^1\) Some of the highest exposures come from public transportation.

The settlement represents an unprecedented opportunity to make transformative improvements across Washington’s transportation sector. By investing in advanced zero emission technologies and prioritizing publicly owned transportation fleets, we can substantially reduce public exposure.

---

\(^1\) Diesel Particulate Emission Reduction Strategy for Washington State, Washington State Department of Ecology Air Quality Program, December 2006; Publication No. 06.02.022
to harmful pollutants and help address climate change while saving millions of dollars in government fuel and maintenance costs.

Next Steps

Once Ecology has received and considered public comments on the draft plan, it will update the plan, share the comments and the revised final plan that will be submitted to the trustee.

Development of Washington’s Mitigation Plan

Ecology developed this Plan in consultation with the Washington State legislature, Washington State Departments of Transportation, Commerce, Enterprise Services and Health and the Governor’s office. Development of the plan included substantial stakeholder and public education, outreach and input, further described in Appendix B.

Ecology may modify the goals and investment levels in Washington’s Plan at Washington’s discretion, consistent with the Environmental Mitigation Trust Agreement, and as needed to achieve the stated goals. The Plan provides an overview of the vehicles in Washington covered by the Environmental Mitigation Trust Agreement, diesel emissions in Washington and their human health impacts. It also includes principles and project priorities that Ecology will use to prioritize the selection of eligible mitigation projects.

In accordance with the Trust agreement, it describes:

- Washington’s overall goal for the use of Trust funds.
- Eligible mitigation actions to achieve the stated goals and the percentages of funds anticipated to be used for each type of eligible mitigation action.
- How Washington will consider the potential beneficial impact of the selected eligible mitigation actions on air quality in areas that bear a disproportionate share of the air pollution burden.
- Expected ranges of emissions benefits Washington estimates would be realized by implementation of the eligible mitigation actions identified in the Plan.
- The process Washington will use to seek and consider public input on its Plan.

Washington’s Plan was developed to reduce emissions from diesel engines in Washington where the Volkswagen vehicles were, are, or will be operated and to fully mitigate the total lifetime excess nitrogen oxide emissions of the subject vehicles. It provides a high-level summary of how Washington intends to use the funds under the Environmental Mitigation Trust Agreement.
Volkswagen Diesel Vehicles in Washington

Ecology estimates there are more than 24,000 affected diesel vehicles registered in Washington. About 87 percent of these subject vehicles are registered in 13 counties, with King County predominating with 38 percent (See Figure 1 and Table 1).

Figure 1. Top Washington counties with registered subject 2.0 and 3.0 Volkswagen diesel vehicles. Other counties have less than 1.5 percent of the registered vehicles.
Table 1. Top Washington Counties with Registered Subject 2.0 and 3.0 Volkswagen Diesel Vehicles

<table>
<thead>
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<th>County</th>
<th>Percent of Registered Subject Vehicles</th>
<th>Number of Registered Subject Vehicles</th>
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<td>Snohomish</td>
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<td>Pierce</td>
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<td>Clark</td>
<td>6.5%</td>
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<td>Whatcom</td>
<td>4.2%</td>
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<tr>
<td>Thurston</td>
<td>3.9%</td>
<td>937</td>
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<tr>
<td>Kitsap</td>
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Diesel Pollution in Washington

Pollution from diesel engines is particularly harmful to public health and the environment. The Department of Ecology has identified diesel exhaust as the toxic air pollutant most harmful to Washington’s citizens. It causes or contributes to asthma, heart and lung diseases, and cancer. More than four million people live or work close to transportation corridors where they are exposed to high levels of diesel exhaust.

Diesel engines primarily emit nitrogen oxides, fine particulate matter, and greenhouse gases including black carbon, all of which cause or contribute to significant public health and environmental impacts.

---

Nitrogen Oxides (NOx) and ground-level ozone

Nitrogen oxides (NOx) are a family of poisonous, highly reactive gases that irritate the lungs. These gases form when fuel is burned, especially at high temperatures. NOx pollution is primarily emitted by automobiles, trucks and various non-road vehicles (e.g., construction equipment, boats, etc.) and reacts with other chemicals in the air to form ground-level ozone (smog) and particulate matter.

Ground-level ozone is formed when NOx and volatile organic compounds react with each other in sunlight and hot temperatures. Ozone aggressively attacks lung tissue and has harmful effects on peoples' health. Excessive levels of ozone can make it difficult to breathe, cause lung damage, worsen asthma symptoms, and cause coughing with throat or chest irritation.

In 2014, Washington sources emitted 363,312 tons of NOx. The transportation sector accounts for nearly 70 percent of the NOx emissions in Washington. On-road motor vehicles alone account for about half of these NOx emissions (see Figure 2).

![Pie chart showing 2014 NOx Tons per Year]

**Figure 2.** Washington State NOx emissions for 2014 total 363,312 tons.²

Motor vehicles generate significant amounts of NOx along our major traffic corridors, especially in the central Puget Sound region, where the largest number of people reside and commute to work (see Figure 3).

Figure 3. Diesel NOx emissions in tons/kilometer squared (2014 emissions inventory)\(^4\)

Washington has historically reported its highest values of ozone downwind of our major urban areas. This typically occurs on hot, sunny days with stagnant air conditions (see Figure 4).

The state currently meets federal air quality standards. In the past, we violated federal air quality standards for ozone in the central Puget Sound and Vancouver regions. Recent monitoring of the Tri-cities area has detected periods of high ozone concentrations. Reducing NOx emissions will lower the risk ozone presents to public health and lower the risk of these areas violating the federal ozone standards.

Figure 4. Maximum 8-hour average ozone concentrations on Aug. 1, 2015.

5 AIRPACT-4 model simulations of maximum 8-hour average ozone concentrations for Washington on August 1, 2015.
Diesel particulate matter

Diesel particulate matter is composed of fine and ultra-fine particles, which easily penetrate deep in the lungs, where they cause or contribute to a range of health problems. Diesel particulate matter makes healthy people more at risk for respiratory disease and worsens the symptoms of people with health problems such as asthma, heart disease, and lung disease. Seventy percent of the cancer risk from airborne pollutants in Washington comes from diesel exhaust. More than four million people in Washington live or work close to highways and other major roads where they are most likely exposed to diesel particulate matter. People living or working near ports or areas with high rail or truck traffic are also at a greater risk of exposure. Strategies to mitigate the excess diesel pollution will achieve co-benefits that reduce toxic diesel fine particles and their negative human health effects.

In 2014, Washington sources emitted 4,578 tons of diesel particulate matter (PM). The transportation sector accounts for about 96 percent of the diesel particulate matter emissions in Washington. Similar to NOx emissions, on-road motor vehicles alone account for nearly half of the diesel particulate matter emissions (see Figure 3).

---

Figure 5. Washington State 2014 diesel PM emissions total 4,578 tons.\(^7\)

\(^7\) Washington Department of Ecology, 2014 Comprehensive Emissions Inventory, preliminary estimates.
Greenhouse Gases and Black Carbon

In 2013, Washington sources emitted 94,400,000 tons of greenhouse gases. Transportation is the largest source of greenhouse gas emissions in Washington, accounting for 43 percent of total greenhouse gas emissions in 2013. On-road diesel vehicles account for 18 percent of the transportation sector's greenhouse gas emissions (see Figures 6 and 7).

Burning diesel releases carbon dioxide, a greenhouse gas, into the atmosphere. It also produces black carbon, a solid particle that absorbs radiation from the sun and contributes to warming of the atmosphere. Black carbon is called a "short-lived climate forcer" because it has a short lifespan and remains in the air for only a few weeks. In comparison, carbon dioxide can build up in the atmosphere for hundreds of years. Reducing black carbon has a more immediate effect on the climate, and can slow the rate of climate change in the near term. Strategies to mitigate the excess diesel pollution will also help Washington achieve co-benefits and reduce transportation greenhouse gas emissions.

2013 Washington State Greenhouse Gas Emissions

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>6%</td>
</tr>
<tr>
<td>Electricity, Net Consumption-Based</td>
<td>19%</td>
</tr>
<tr>
<td>Residential/Commercial/Industrial</td>
<td>22%</td>
</tr>
<tr>
<td>Transportation</td>
<td>43%</td>
</tr>
<tr>
<td>Fossil Fuel Industry</td>
<td>1%</td>
</tr>
<tr>
<td>Industrial Processes</td>
<td>5%</td>
</tr>
<tr>
<td>Waste Management</td>
<td>4%</td>
</tr>
</tbody>
</table>

Figure 6. Washington State 2013 greenhouse gas emissions totaling 94,400,000 tons\(^8\)

Figure 7. Washington State 2013 transportation sector greenhouse gas emissions totaling 40,400,000 tons. \(^9\)

Mitigation Plan Requirements

To protect air quality in the interest of public health and welfare, the Environmental Mitigation Trust Agreement requires environmental remediation to address excess NOx emissions caused by the subject vehicles.

In accordance with the Trust agreement, this section describes:

- Washington’s overall goal for the use of Trust funds.
- The categories of eligible mitigation actions to achieve the stated goals and the percentages of funds anticipated to be used for each type of eligible mitigation action.
- How Washington will consider the potential air quality benefits the selected mitigation actions may have in areas that bear a disproportionate share of the air pollution burden.
- A general description of the expected ranges of emissions benefits Washington estimates would be realized by implementation of the eligible mitigation actions identified in the Plan.
- The process by which Washington has already and will continue to seek and consider public input on its Plan.

Ecology, along with input from stakeholders and Washington citizens also established a set of principles, and a list of project priorities to help guide project selection.

Mitigation plan goals

Washington’s goals for the use of Trust funds are to:

- Reduce emissions from diesel engines in the state where the 2.0 and 3.0 liter Volkswagen vehicles were, are, or will be operated.
- Fully mitigate the total, lifetime excess NOx emissions of the subject vehicles.

Washington will use the following principles and priorities to guide project selection to achieve the goals of the mitigation plan.

Principles

Washington will use the following principles to guide the selection of eligible mitigation projects.

- Improve air quality for communities that have historically borne a disproportionate share of the air pollution burden in Washington.
- Maximize air quality co-benefits beyond nitrogen oxide reductions.
- Maximize public health benefits.
Priorities

Washington will prioritize projects that:

- Accelerate adoption of electric vehicles, equipment, and vessels.
- Promote electrification technologies in public transportation fleets.
- Accelerate fleet turnover to the cleanest engines.
- Achieve substantial additional emission reductions—beyond what would already occur, absent trust funding.
- Ensure cost-effectiveness.
- Leverage additional matching funds.

Mitigation fund opportunities and investments

By investing in projects that dramatically transform Washington’s transportation sector we can advance much-needed changes that will lower public exposure to harmful pollutants from diesel exhaust.

Key opportunities include:

Electric Buses
About half of urban transit bus routes occur in in low income and minority neighborhoods. Strategic deployment of electric transit buses could improve air quality and public health in communities that have historically borne an undue share of the air pollution burden. Converting diesel buses to all-electric buses would reduce fuel and maintenance costs by about 10%.10,11

Electric Ferries
In the Puget Sound, Washington State Ferries account for more than half of the air pollution generated by harbor vessels. Converting diesel to all-battery electric ferries will significantly reduce diesel and carbon emissions, improve fleet reliability, virtually eliminate engine noise that can harm marine animals, and reduce ferry operating costs by up to 20%.12

Electric Charging Stations
Passenger vehicles generate nearly half of our state’s air pollution and greenhouse gas emissions. Major auto manufacturers recently announced the intent to significantly increase the number of all-electric vehicles produced. To support the expected increase in electric vehicles, we need to significantly increase the number of electric charging stations in Washington.

Each of the eligible vehicle and equipment categories in the VW settlement generate significant amounts of NOx emissions in Washington. In each eligible category, replacing the diesel vehicles and equipment, or repowering their diesel engines, will cost effectively reduce NOx emissions.

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10 Feasibility of Achieving a Carbon-Neutral or Zero-Emission Fleet, March 2017, King County Metro Transit, Sam Schwartz Consulting, and WSP | Parsons Brinkerhoff Engineering Services
11 Electric Bus Analysis for New York City Transit, May 2016, Judah Aber, Columbia University
emissions and provide public health benefits. On-road vehicles, non-road equipment, marine vessels, and locomotives combine to generate 73% of the NOx emissions in Washington.

- Regionally, these engines generate significant emissions that chemically react with other pollutants to form ozone.
- In densely populated areas, they regularly expose large numbers of people to toxic emissions.
- At ports, heavy-duty trucks, non-road equipment, marine vessels, and locomotives combine to form the largest concentration of diesel emission sources in Washington.
- Buses, vessels, and locomotives often operate in or near communities that have historically borne a disproportionate share of the air pollution burden.

Appendix A contains the full suite of categories and types of eligible mitigation actions excerpted from Appendix D-2 of the settlement agreement. Table 2 lists the eligible high-level mitigation categories and an initial proposed percentage of investment in each category that Washington anticipates will be appropriate to achieve its stated goals. EPA has determined that the included eligible categories have a proven track record, are relatively straightforward to implement, and are cost-effective.
Table 2. Eligible Mitigation Action Categories with Preliminary Funding Allocation and Anticipated Percentage of Funds

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<thead>
<tr>
<th>Eligible Mitigation Action Categories</th>
<th>Fund Percentages</th>
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<tr>
<td>On-Road Heavy Duty Vehicles</td>
<td>≤ 45%</td>
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<td><em>Priority: Electrification of public fleets, especially transit buses</em></td>
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</tr>
<tr>
<td>• Class 4-8 School Bus, Shuttle Bus, or Transit Bus (Eligible Buses)</td>
<td></td>
</tr>
<tr>
<td>• Class 4-7 Local Freight Trucks (Medium Trucks)</td>
<td></td>
</tr>
<tr>
<td>• Class 8 Local Freight Trucks and Port Drayage Trucks (Eligible Large Trucks)</td>
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<tr>
<td>Non-Road Equipment</td>
<td>≤ 5%</td>
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<tr>
<td><em>Priority: Electrification</em></td>
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<tr>
<td>• Airport Ground Support Equipment</td>
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</tr>
<tr>
<td>• Forklifts and Port Cargo Handling Equipment</td>
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<tr>
<td>Locomotives</td>
<td>≤ 5%</td>
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<td><em>Priority: Publicly owned locomotives</em></td>
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<tr>
<td>• Freight Switchers</td>
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<tr>
<td>Marine Vessels</td>
<td>≤ 45%</td>
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<tr>
<td><em>Priority: Electrification of public vessels, especially ferry vessels</em></td>
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</tr>
<tr>
<td>• Ferries/Tugs</td>
<td></td>
</tr>
<tr>
<td>• Ocean Going Vessels (OGV) Shore Power</td>
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<tr>
<td>Light Duty Zero Emission Vehicle Supply Equipment</td>
<td>15%</td>
</tr>
<tr>
<td>Diesel Emission Reduction Act (DERA) Option</td>
<td>≤ 5%</td>
</tr>
<tr>
<td></td>
<td>≤ 120%</td>
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</tbody>
</table>

The relative allocation of funds may change over time depending on project proposals, technology advancement, and analysis of emission benefits and costs for each proposed project.
On-road, Heavy-duty Vehicles
On-road, heavy-duty vehicles generate 49% of the NOx emissions in Washington. Buses generate toxic emissions that expose both the public and bus riders. School buses transport our most sensitive and vulnerable population (children).

- **Transit, School, and Shuttle Buses**: Replacing diesel transit buses and school buses can annually reduce up to 0.5 tons of NOx emissions per bus.\(^{13}\)
- **Heavy-duty Trucks**: Replacing local freight delivery, heavy-duty trucks can annually reduce up to 0.3 tons of NOx emissions per truck.\(^{14}\)

Non-Road Equipment
Non-road equipment generates 12% of the NOx emissions in Washington.

- **Airport Ground Support Equipment**: Electrifying airport ground support equipment can annually reduce up to 0.4 tons of NOx emissions per equipment.\(^{15}\)
- **Forklifts and Port Cargo Handling Equipment**: Replacing forklifts and port cargo handling equipment can annually reduce up to 0.4 tons of NOx emissions per equipment.\(^{16}\)

Marine Vessels and Switch Locomotives
Marine vessels and locomotives combine to generate 12% of the NOx emissions in Washington. Marine vessels and locomotives have huge diesel engines, typically generating ten to sixty times the amount of NOx emissions as other diesel vehicles and equipment.

- **Locomotives**: Repowering switch locomotives can annually reduce two to twelve tons of NOx emissions per engine.\(^{17}\)
- **Tug Boats**: Repowering tugs can annually reduce twenty to forty tons of NOx emissions per engine.\(^{18}\)
- **Ferries**: Repowering ferries can annually reduce twenty to thirty tons of NOx emissions per engine.\(^{19}\)
- **Shorepower for ocean-going vessels**: Providing electric shore power can annually reduce five to one hundred tons of NOx emissions per shorepower station.\(^{20}\)

**Diesel Emission Reduction Act (DERA)**
Under DERA, state may match federal funds to receive 50% incentive funds. Annually, Washington typically receives $200,000 to $300,000 of DERA. If Washington uses VW funds

\(^{13}\) EPA Diesel Emissions Quantifier: replace pre-2007 bus
\(^{14}\) EPA Diesel Emissions Quantifier: replace pre-2007 truck
\(^{15}\) EPA Diesel Emissions Quantifier: replace Tier 1 or older engine
\(^{16}\) EPA Diesel Emissions Quantifier: replace Tier 1 or older engine
\(^{17}\) VW Settlement Recommendations prepared by Environmental Defense Fund for Texas. Methodology developed by Texas Emission Reduction Program
\(^{18}\) Benefits reported on Crowley Marine tugboat repower project at Port of Los Angeles
\(^{19}\) VW Settlement Recommendations prepared by Environmental Defense Fund for Texas. Methodology developed by Texas Emission Reduction Program
\(^{20}\) EPA 2016 National Port Strategy Assessment
to match DERA funds, then Washington would additionally annually receive $100,000 to $150,000 to help reduce diesel emissions. Over a 10-year period, Washington would expect to use $2,000,000 to $3,000,000 of VW funds for the DERA option category.

**Light-duty Zero Emission Vehicle Supply Equipment**
On-road motor vehicles account for nearly half of Washington’s NOx and diesel particulate matter emissions. The transportation sector is, by far, the largest source of greenhouse gas emissions.

Washington’s electricity comes predominantly from hydro-power, one of the cleanest sources of electricity. Clean cars not only reduce emissions to the air, but electric-drive systems use fewer lubricants and fluids that can drip onto roadways and end up polluting water bodies, such as our rivers and Puget Sound. Investments in light-duty zero emission vehicle supply equipment will expedite the deployment of zero emission vehicles (ZEVs) and help offset emissions from the largest source of vehicle emissions in Washington.

**Expected ranges of emission benefits**

The Environmental Mitigation Trust Agreement requires the beneficiary’s mitigation plan include, “...a general description of the expected ranges of emission benefits the Beneficiary estimates would be realized by implementation of the Eligible Mitigation Actions identified in the Beneficiary Mitigation Plan.”

Ecology estimated the excess lifetime NOx emissions for the 24,000 violating vehicles registered in Washington. The VW settlement requires VW replace or repair 85% of the violating vehicles. This calculation of lifetime excess emissions from the subject vehicles includes a range of values:

1) $\approx 3,000$ tons, based on VW replacing or repair 85% of the vehicles\(^{21}\)
2) $\approx 8,000$ tons, based on VW not replacing or repairing any vehicles\(^{22}\)

Ecology expects to fund projects that reduce lifetime NOx emissions by at least 3,000 tons.

**Disproportionately impacted communities**

A principle of Washington’s Plan is to improve air quality for communities that have historically borne a disproportionate share of the air pollution burden in Washington.

Low income households, communities of color, and minority populations located near industrial facilities, ports, and high-traffic or freight corridors often bear a disproportionate share of the air pollution burden. Ecology, in coordination with Washington Department of Health, local clean air agencies, and environmental justice community organizations, will use a variety of tools (Washington Tracking Network, Puget Sound Clean Air Agency’s Highly Impacted Communities analysis, Ecology Comprehensive Emissions Inventory, etc.) to identify and consider beneficial impacts of projects in disproportionately impacted communities.

\(^{21}\) Washington Department of Ecology 2017 calculation
\(^{22}\) Washington Department of Ecology 2017 calculation
For example, Ecology has determined that projects along the I-5 corridor, located near and between the Ports of Seattle and Tacoma, including SeaTac Airport, represent the type of area that deserves priority consideration. Through its stakeholder process, Washington will engage these communities to help identify appropriate projects that mitigate the impact of NOx emissions and improve air quality in their communities.

To the extent practical, Washington will use mitigation funds for mitigation actions that provide air quality benefits in disproportionately impacted communities.

Public Engagement

Prior to drafting the Mitigation Plan, Ecology regularly engaged stakeholders and the general public. Principle tools included a dedicated website and listserv, where Ecology provided information and solicited public input. A portion of Ecology’s public engagement included outreach to:

- Stakeholders to help refine Washington’s Mitigation Plan’s goal, principles and geographic scope, and general priorities.
- The public by offering surveys that allowed individuals and groups to comment on the draft mitigation plan goal, principles, priorities, and eligible project categories.

Appendix B further details the process by which Washington sought and considered public input for the state Mitigation Plan.
Appendices
Appendix A. Eligible Project Categories

See Appendix D-2 in the Environmental Mitigation Trust Agreement.  

1. Class 8 Local Freight Trucks and Port Drayage Trucks (Eligible Large Trucks)
   
   a) Eligible large trucks include 1992-2009 engine model year class 8 local freight or drayage.
   
   b) Eligible large trucks must be scrapped.
   
   c) Eligible large trucks may be repowered with any new diesel or alternate fueled engine or all-electric engine, or may be replaced with any new diesel or alternate fueled or all-electric vehicle, with the engine model year in which the eligible large trucks mitigation action occurs or one engine model year prior.

2. Class 4-8 School Bus, Shuttle Bus, or Transit Bus (Eligible Buses)
   
   a) Eligible buses include 2009 engine model year or older class 4-8 school buses, shuttle buses, or transit buses. For beneficiaries that have state regulations that already require upgrades to 1992-2009 engine model year buses at the time of the proposed eligible mitigation action, eligible buses shall also include 2010-2012 engine model year class 4-8 school buses, shuttle buses, or transit buses.
   
   b) Eligible buses must be scrapped.
   
   c) Eligible buses may be repowered with any new diesel or alternate fueled or all-electric engine, or may be replaced with any new diesel or alternate fueled or all-electric vehicle, with the engine model year in which the eligible bus mitigation action occurs or one engine model year prior.

3. Freight Switchers
   
   a) Eligible freight switchers include pre-Tier 4 switcher locomotives that operate 1000 or more hours per year.
   
   b) Eligible freight switchers must be scrapped.
   
   c) Eligible freight switchers may be repowered with any new diesel or alternate fueled or all-electric engine(s) (including generator sets), or may be replaced with any new diesel or alternate fueled or all-electric (including generator sets) freight switcher, that is certified to meet the applicable EPA emissions standards (or other more stringent equivalent state standard) as published in the federal Code of Federal Register for the engine model year in which the eligible freight switcher mitigation action occurs.

4. Ferries/Tugs
   
   a) Eligible ferries and/or tugs include unregulated, Tier 1, or Tier 2 marine engines.

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23 Case No. 16-cv-00293-CRB (N.D. Cal.), MDL No. 2672 CRB (JSC); United States Notice of Filing of Trust Agreements, Filed 10/02/2017
b) Eligible ferry and/or tug engines that are replaced must be scrapped.

c) Eligible ferries and/or tugs may be repowered with any new Tier 3 or Tier 4 diesel or alternate fueled engines, or with all-electric engines, or may be upgraded with an EPA certified remanufacture system or an EPA verified engine upgrade.

5. Ocean Going Vessels (OGV) Shore Power  Eligible marine shore power includes systems that enable a compatible vessel’s main and auxiliary engines to remain off while the vessel is at berth. Components of such systems eligible for reimbursement are limited to cables, cable management systems, shore power coupler systems, distribution control systems, and power distribution.

6. Class 4-7 Local Freight Trucks (Medium Trucks)
   a) Eligible medium trucks include 1992-2009 engine model year class 4-7 local freight trucks, and for beneficiaries that have state regulations that already require upgrades to 1992-2009 engine model year trucks at the time of the proposed eligible mitigation action, eligible trucks shall also include 2010-2012 engine model year class 4-7 local freight trucks.
   b) Eligible medium trucks must be scrapped.
   c) Eligible medium trucks may be repowered with any new diesel or alternate fueled or all-electric engine, or may be replaced with any new diesel or alternate fueled or all-electric vehicle, with the engine model year in which the eligible medium trucks mitigation action occurs or one engine model year prior.

7. Airport Ground Support Equipment
   a) Eligible airport ground support equipment includes:
      1. Tier 0, Tier 1, or Tier 2 diesel powered airport ground support equipment, and
      2. Uncertified, or certified to 3 g/bhp-hr or higher emissions, spark ignition engine powered airport ground support equipment.
   b) Eligible airport ground support equipment must be scrapped.
   c) Eligible airport ground support equipment may be repowered with an all-electric engine, or may be replaced with the same airport ground support equipment in an all-electric form.

8. Forklifts and Port Cargo Handling Equipment
   a) Eligible forklifts includes forklifts with greater than 8000 pounds lift capacity.
   b) Eligible forklifts and port cargo handling equipment must be scrapped.
   c) Eligible forklifts and port cargo handling equipment may be repowered with an all-electric engine, or may be replaced with the same equipment in an all-electric form.

9. Light Duty Zero Emission Vehicle Supply Equipment  Each beneficiary may use up to fifteen percent (15%) of its allocation of trust funds on the costs necessary for, and directly
connected to, the acquisition, installation, operation and maintenance of new light duty zero emission vehicle supply equipment.

10. **Diesel Emission Reduction Act (DERA) Option.** Beneficiaries may use trust funds for their non-federal voluntary match, allowing use for actions not identified not specifically included above.
Appendix B. Public Engagement

As required by the Environmental Mitigation Trust Agreement, Washington’s Beneficiary Mitigation Plan shall explain the process by which Washington shall seek and consider public input.

7. (ii) for the Beneficiary Mitigation Plan required under Paragraph 4.1 of the Trust Agreement, the procedures by which public input will be solicited and considered.

PUBLIC INPUT STRATEGY

Ecology is working with interested stakeholders and the public to seek and consider public input on the Beneficiary Mitigation Plan. Our goal is to promote a transparent process to keep people informed and provide multiple opportunities for engagement at key decision points.

Ecology will provide an opportunity for the public to comment on the proposed Beneficiary Mitigation Plan. Ecology will consider these public comments in development of the final plan. Ecology will use public input from a variety of stakeholders to help determine the types of projects that best serve communities’ needs. In addition to the general public, organizational representatives with potential interests include:

- Business and trucking companies
- Utilities
- Environmental organizations
- Environmental justice groups
- State and local governments
- Local air agencies
- Tribes
- Port authorities
- Transit and transportation agencies

Ecology will seek input from the public through three levels of public involvement: we will inform the public, consult with the public, and involve the public. Below we describe these strategies for seeking input, as well as criteria we will consider in evaluating input.

INFORM THE PUBLIC

- Use the Ecology website as an information hub.
- Provide educational opportunities through online webinars, videos, blogs, and speaking engagements.
- Provide information in multiple languages in addition to English.
- Use an email listserv to inform and notify.
- Provide legislative briefings to keep state leaders informed.
- Share information through social media channels, e.g., Twitter and Facebook.
- Broadcast public service announcements to encourage public participation to comment on the state’s draft Beneficiary Mitigation Plan.
CONSULT WITH THE PUBLIC

We have already begun developing opportunities for the public to provide input on key decisions. We will continue to ask the public for their opinions and fully consider the input we receive:

- Encourage early, active and ongoing participation.
- Engage cross-agency coordination to expand reach.
- Deploy multiple surveys to gather input on decisions around:
  - Plan goal, principles, and priorities (completed March 2017).
  - Eligible projects Washington should invest in (completed June 2017).
- Solicit formal public comments on the state’s draft Beneficiary Mitigation Plan mitigation plan.

INVOLVE THE PUBLIC

Ecology has already involved the public and invited stakeholder groups to engage in the development of Washington’s Beneficiary Mitigation Plan. Ecology will continue to provide opportunities for public input as decision-making progresses through:

- Surveys.
- Round table discussions.
- State and local cross-agency coordination.
- Sounding board sessions to gain feedback as the draft Beneficiary Mitigation Plan is developed.

CONSIDERING INPUT

In considering the input we receive, Washington will first determine whether comments are consistent with the Environmental Mitigation Trust Agreement, including but not limited to the following key elements:

- Intent of the Environmental Mitigation Trust, "...to fully mitigate the total, lifetime excess NOx emissions..." from the subject vehicles.
- Eligible mitigation actions and mitigation action expenditures.
- Beneficiary Mitigation Plan requirements.
- Required certifications in Appendix.

For input consistent with the Environmental Mitigation Trust Agreement, Washington will consider, qualitatively, the degree to which the input aligns with and supports Washington’s Beneficiary Mitigation Plan.

Washington will also consider the degree to which the input supports and furthers progress toward the goals of the Washington State Legislature, Gov. Jay Inslee’s Results Washington performance management system and Washington Department of Ecology’s strategic plan.
- The Washington State Legislature’s limits for greenhouse gas emissions (Chapter 70.235 RCW). The limits require Washington to reduce greenhouse gas emissions to 1990 levels by 2020, 25 percent below 1990 levels by 2035, and 50 percent below 1990 levels by 2050.

- Governor Jay Inslee’s Results Washington Goal(s) regarding Clean Transportation and Healthy Air. The Clean Transportation goal is to reduce transportation greenhouse gas emissions by getting 50,000 electric vehicles on the road by 2020, accelerating fleet turnover to cleaner engines, and increasing the overall efficiency of the transportation system. The Healthy Air goal is for all of the state to continue to have healthful air that meets federal air quality standards.

- Washington Department of Ecology, Air Quality Program Strategic Plan (esp. re. transportation). The plan includes strategies to prevent unhealthful air and violations of air quality standards, reduce health and environmental threats from motor vehicle emissions, and advance the public’s understanding of their role in reducing motor vehicle emissions.
Appendix E
Capital Vessel Replacement Account Financial Plan

WSF Vessel Hybrid Electric Conversion Project (Two Jumbo Mark II Ferries)
Financing Plan Through the Capital Vessel Replacement Account
Based on the February 2018 Revenue Forecast and Spending Plan Approved by the 2018 Legislature (TEIS File 18SupBud)
Adjusted to Fund the Vessel Hybrid Electric Conversion Project
2017-31 Biennia, In Thousands of Dollars

Version: 18SupBud - 2018 Supplemental Budget As Passed Legislature with Updates (Forecast: 18FebSup)

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<td></td>
<td></td>
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<td>Total Expenditures</td>
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<td>(72,490)</td>
<td>0</td>
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</table>

<table>
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<th>Ending Fund Balance</th>
<th>17 - 19 Total</th>
<th>19 - 21</th>
<th>21 - 23</th>
<th>23 - 25</th>
<th>25 - 27</th>
<th>27 - 29</th>
<th>29-31</th>
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<tr>
<td>1,776</td>
<td>6,750</td>
<td>5,230</td>
<td>3,467</td>
<td>1,932</td>
<td>1,078</td>
<td>1,020</td>
<td>1,759</td>
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This is the financial plan for the Capital Vessel Replacement Account. In addition, WSF has already committed $850K to this project in the 2017-19 biennium from the Puget Sound Capital Construction Account.
April 23, 2018

Mr. Josh Brown
Executive Director
Puget Sound Regional Council
1011 Western Avenue, Suite 500
Seattle, WA 98104-1035

Re: 2018 FHWA PSRC Regional Competition
Project: Washington State Ferries (WSF) Vessels - Hybrid Electric Ferry Conversion

Dear Mr. Brown:

The Department of Enterprise Services supports the Puget Sound Regional Council (PSRC) Congestion Mitigation and Air Quality (CMAQ) funding application for $7,000,000 for the Washington State Ferries (WSF) Hybrid Electric Ferry Conversion Project. This vessel conversion project will provide immediate air quality improvements. Follow-on projects involving shore-side improvements offer the potential for even greater reductions in diesel fuel consumption and improvements in air quality.

WSF will focus CMAQ funds from this grant application on the vessels that serve the Seattle-Bainbridge Island ferry route. The Seattle-Bainbridge Island ferry route supports regional growth and manufacturing / industrial centers in Downtown Seattle, Uptown, First Hill / Capitol Hill, Duwamish, and Ballard-Interbay, while reducing adverse environmental impacts.

The project will convert two Jumbo Mark II vessels from diesel to hybrid electric propulsion. In 2017, 6.4 million people rode the two Jumbo Mark II ferries assigned to the Seattle-Bainbridge Island ferry route. These are the largest vessels in WSF’s fleet and together account for over 17% of the fleet’s consumption of diesel fuel. Due to the reduction in diesel fuel consumption from the project, the region will experience significant annual environmental and operational benefits, including:

- CO₂e emissions reductions of 8,027 metric tons;
- PM emissions reductions of 35,081 lbs.;
- Diesel fuel savings of 790,000 gallons; and
- Cost Savings of $1.975 million.

This is the first step of WSF’s transition to a zero-carbon emissions ferry fleet. The next step of the Hybrid Electric Conversion Program will focus on full electrification of the vessels. This will be
accomplished by installation of utility infrastructure and rapid-charging equipment at the Seattle and Bainbridge Island terminals, which will further decrease diesel fuel consumption and improve air quality.

The Washington State Department of Ecology has identified diesel particulate emissions as the toxic air pollutant most harmful to public health in Washington State. The WSF vessel project addresses this concern, while allowing WSF to continue service on the Seattle-Bainbridge Island route in a sustainable manner in compliance with Governor’s Executive Order 18-01, State Efficiency and Environmental Performance, and State law (RCW 70.235.020).

In conclusion, Department of Enterprise Services fully supports WSF as it seeks CMAQ grant funding for this important project. Thank you for your consideration of the application. Should you have any questions regarding this letter of support, please do not hesitate to contact me at (360) 407-9201 or chris.liu@des.wa.gov.

Sincerely,

[Signature]

Chris Liu
Director