Attachment A

Implementation of a Ballard-to-downtown Seattle Water Taxi Route Proviso Response

November 2020

King County

I. Contents

II. Proviso Text

Ordinance 18930[1], Section 75, Transit, P8

Of this appropriation, $200,000 shall not be expended or encumbered until the executive transmits a report on implementation of a Ballard-to-downtown Seattle water taxi route and a motion that should acknowledge receipt of the report and reference the subject matter, the proviso's ordinance, ordinance section and proviso number in both the title and body of the motion and a motion acknowledging receipt of the report on implementation of a Ballard-to-downtown Seattle water taxi route is passed by the council.

The report on implementation of a Ballard-to-downtown Seattle water taxi route shall include, but not be limited to:

A. An update on the assessment of facilities, ridership projections, and capital and operating cost estimates provided in the 2015 ferry expansion options report;
B. A discussion of planning efforts underway or needed to implement the route;
C. An environmental impact analysis;
D. A summary of coordination with local agencies, including potential lease arrangements for facilities;
E. A discussion of options for funding implementation of the route including identifying grant opportunities;
F. A summary of public outreach undertaken; and
G. A description of next steps for moving forward.

The executive should file the report on implementation of a Ballard-to-downtown Seattle water taxi route and a motion requested by the proviso by December 31, 2020, in the form of a paper original and an electronic copy with the clerk of the council, who shall retain the original and provide an electronic copy to all councilmembers, the council chief of staff and the lead staff for the mobility committee, or its successor.

III. Executive Summary

This report is a response to a proviso in Ordinance 18930, Section 75, Transit, P8 directing the Executive to transmit a report on implementation of a Ballard-to-downtown Seattle water taxi route. The proviso directed Transit to update the details associated with the 2015 ferry expansion options report specifically to implement a Ballard-to-downtown Seattle water taxi route including next steps for moving forward. This report fulfills the proviso requirements.

As required by the proviso, the report includes:

A. An update on the assessment of facilities, ridership projections, and capital and operating cost estimates provided in the 2015 ferry expansion options report;
B. A discussion of planning efforts underway or needed to implement the route;

[1] Link to Ordinance 18930

C. An environmental impact analysis;
D. A summary of coordination with local agencies, including potential lease arrangements for facilities;
E. A discussion of options for funding implementation of the route including identifying grant opportunities;
F. A summary of public outreach undertaken; and
G. A description of next steps for moving forward.

The Metro Transit Department Marine Division has operated the King County Water Taxi since 2010, providing passenger-only ferry service (POF) to Vashon Island and West Seattle from downtown Seattle. Over the years there has been interest in expanding this service to other parts of King County. In 2015, the King County Council directed the Marine Division to study and analyze incorporating potential new long-term, passenger-only route service expansion opportunities. The Final Report on Ferry Expansion Options for Marine Division, approved by Motion 14561[2] in 2015, is the starting point for this report.

This report summarizes the analysis and evaluation completed for the implementation of a Ballard to Seattle passenger-only ferry route. The facilities were identified and evaluated using accessibility, urban planning, regulatory framework, vessel navigational considerations and infrastructure needs. The key implementation considerations were summarized by location with opportunities and challenges of each location documented. The locations evaluated include Shilshole Bay Marina in Ballard, Pier 86 near the Expedia Campus and Interbay in Centennial Park, and Pier 50 at Colman Dock in Seattle.

The ridership demand was projected for the Ballard-to-downtown Seattle route with annual ridership estimated at 195,000 by 2025. Cost estimates for the capital infrastructure and vessels was estimated to be $23 M and the operating costs were estimated to be $4.0 M annually.

The planning efforts needed to implement the route include:

- Review of the existing transit service provided to Ballard
- Analysis of future population and travel trends
- Evaluation of how this route would fit in with long-term planning for transit service to meet the needs for Ballard and the region in the future
- Determination of how this route aligns with the Mobility Framework, in terms of impacts on equity and sustainability

A preliminary analysis of impacts to environmental elements was completed for the operation of POF service along the route between Ballard and Seattle. Preliminary analysis suggest the design of the vessel is an important part of ensuring both wake and emission standards are met. Further analysis would be required once more specific route and vessel details are determined to provide a complete environmental assessment.

[2] Motion 14561

The Marine Division communicated and coordinated with representatives from the Port of Seattle and Expedia through meetings, on-site walk-throughs, and email correspondence to discuss opportunities and challenges of potential passenger-only ferry service.

Implementing POF service requires one-time capital investments and a sustainable funding source to support operating costs. Capital investments can be funded through a combination of grants, local revenue sources and debt service. Operating costs could be funded through a 50 to 60 percent increase to the existing dedicated POF property tax levy, currently at $0.0125 per $1,000 of assessed property value, andsupplemented with passenger fare revenue.

Survey responses regarding the feasibility of POF from Ballard to Seattle were generally positive indicating over 50 percent of respondents would take a POF three or more times per week. Additionally, a majority of people that responded to the survey indicated they were traveling for work Monday through Friday. Most survey respondents (72 percent) indicated they would prefer to walk or bike to the landing site.

A preliminary Equity Impact Review completed by Metro Service Planning indicated the Ballard to Seattle POF route would be serving an area that already has transit options available. The POF service would provide benefit and added amenity, but in general these areas have low equity scores. Therefore, the Ballard-Downtown service would provide benefit in areas where the population is less diverse and wealthier than the county averages.

Implementing Ballard POF service between Shilshole Bay Marina and Pier 50 downtown Seattle requires coordination with local agencies, forming partnerships with property owners, securing necessary funding for capital improvements and operating costs, tribal consultation, continuing stakeholder outreach and community engagement as well as beginning the legislative and regulatory process for approval.

This report provides analysis of the feasibility of a Ballard to Seattle POF route. Implementation of a Ballard-to-downtown Seattle water taxi route could provide an additional transit option and supports increased mobility, a strategic goal of King County and Metro. However, adding a water taxi route is not viable for the foreseeable future given the impacts caused by the COVID-19 pandemic. Metro will continue to focus on providing and preserving existing service while advancing transit options where needs are greatest.

IV. Background

The Marine Division has operated year-round passenger-only ferry service from Seattle to West Seattle and Vashon Island since 2010. During that time, the governance over ferry services has changed from contracting with the King County Ferry District (KCFD), formed in 2007, to being governed by the King County Council, beginning 2015.

Historical Context: As part of the state approved business plan used to form the KCFD, provision of passenger-only ferry service was planned to grow over time. In mid-2009, the KCFD began to study demonstration routes on Puget Sound and Lake Washington, but by late 2009 the KCFD ended the study in response to the economic recession. The King County Council directed the Marine Division, through a

proviso in the 2015-2016 adopted budget, to revisit the 2009 study and expand the analysis to incorporate potential new long-term, passenger-only route service expansion opportunities. The Final Report on Ferry Expansion Options for Marine Division, approved by Motion 14561[3] in 2015, referenced in the proviso is the starting point from which this proviso report was developed.

Current Context: Much of the information in this report was gathered, researched, and drafted prior to the adoption of the Mobility Framework, Motion 15618[4] and the global pandemic and subsequent economic downturn in the economy. While the implementation of a Ballard water taxi route would advance the goals of providing access to public transportation and help reduce greenhouse gas emissions in the region, more work is needed to review how this route would be prioritized in terms of advancing equity given Metro's plans for changes to policies, programs, services, and investment strategies to better advance equity and environmental sustainability through Metro's operations. Additionally, the economic conditions will require further analysis of how the Ballard route would align with the department's priorities for both capital and operating programs in the context of future funding.

Report Methodology: The Marine Division developed a scope of work to meet the requirements of the proviso and retained the services of a passenger ferry consultant, KPFF Consulting Engineers – Marine Transit and their subconsultants to provide technical support, analysis and development of the updates, and a report for implementing passenger ferry service for Ballard. For this report, see Appendix A: Implementation of a Ballard-to-downtown Seattle Water Taxi Route. The division, including representatives from Metro service planning section and community engagement, worked together with the consultant to complete the work. This methodology allowed for an assessment of the many characteristics of POF service as well as the path toward implementation and clearly identifies opportunities and constraints of POF service.

First, potential POF landing sites were identified along the Ballard shoreline, as well as potential destination landing sites in downtown Seattle. This step included review of previous studies and assessment of current travel patterns to identify where people are travelling to and, therefore, where a potential POF landing site should be located.

During the second step, the Marine Division met with property owners and local agencies that own potential POF landing sites to discuss opportunities and challenges associated with each potential location. Included in this step was a detailed analysis of potential POF landing sites for land use consistency, connectivity and accessibility to adjacent communities, navigational considerations, and infrastructure improvements required to determine the rough order of magnitude (ROM) capital costs.

The final step, included evaluating route options and recommending a route for implementation. This included developing route profiles along with potential service levels to estimate ROM operating costs, potential ridership, and revenue. This step also involved conducting a preliminary environmental impact analysis, gauging community interest through a public survey, and completing an Equity Impact Review.

[3] Motion 14561
[4] Motion 15618

V. Report Requirements

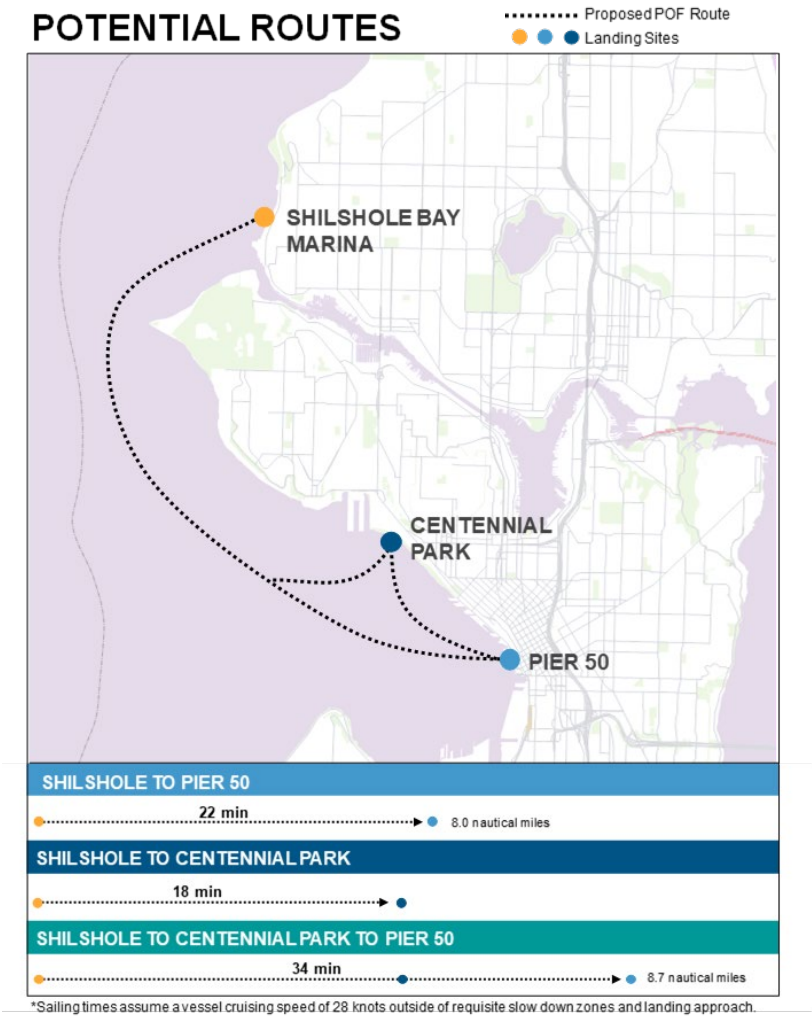
The Marine Division worked with the consultant and subconsultants to develop the following responses to requirements A-G in the proviso.

A. An update on the assessment of facilities, ridership projections, and capital and operating cost estimates provided in the 2015 ferry expansion options report

Assessment of facilities: Using the previous expansion studies completed in 2009 and 2015 as a basis, potential landing sites were identified that could support POF service to and from Ballard. A market area analysis was conducted to illustrate key employment locations for Ballard residents and commuters. Sites that offered potential connections to significant employment destinations were carried forward for a site assessment.

The locations evaluated include Shilshole Bay Marina in Ballard, Pier 86 near the Expedia Campus and Interbay in Centennial Park, and Pier 50 at Colman Dock in Seattle.

Figure 1: Potential Landing Sites in Ballard and Seattle



For each potential landing site, the following elements were evaluated:

- *Accessibility and connectivity* - how easy or difficult it is to access the site via a variety of mobility options and how much potential the site has for future mobility connections
- *Neighborhood context and long-range planning* - the nearby uses of properties adjacent to the site and planning efforts by local jurisdictions that impact the site and surrounding areas
- *Regulatory framework* - zoning requirements related to POF as a use and regulatory approvals that may be necessary to implement a POF landing
- *Navigational considerations* - exposure, water depth, and navigational challenges
- *Existing infrastructure* - what overwater and uplands infrastructures are present at the site
- *Proposed infrastructure* - what overwater and uplands infrastructures are proposed for developing the site into a POF landing

Table 1 summarizes the key implementation considerations for each site.

Table 1: Potential POF Landing Site Summary

	Infrastructure Needs	ROM Capital Cost	Challenges	Opportunities
Shilshole Bay Marina	» New float » Minor uplands improvements	$7.5 M	» Lack of existing transit connections » Recreational vessel traffic	» Parking could be made available » Recreational connections » Port is willing to discuss operating arrangements
Pier 50	» None	N/A	» Capacity constraints with existing POF routes	» Marine Division owns and operates the facility » Proximity to Marine Division's Pier 48 Maintenance Facility
Centennial Park	» New float/ramp » Minor uplands improvements	$7.5 M	» Exposure to inclement weather » Increases route travel time	» Existing pedestrian and bike connections » Public/private partnership

Ridership projections: For each proposed route BERK estimated unconstrained ridership demand potential for the years 2019, 2025, and 2040 (see Table 2). "Unconstrained" refers to the fact that the demand is not limited by the boat capacity, sailing schedule, or sailing frequency. To support comparison to the constrained ridership forecasts below, this summary of annual unconstrained ridership demand focuses only on days included in the proposed sailing schedules. Depending on the season, ferry services may run on weekdays, Saturdays only, full weekends, or holidays (which was assumed to run on a Saturday ferry schedule).

Table 2: Ballard Unconstrained Ridership Demand, Scheduled Days

Route	2019	2025	2040
Shilshole to Pier 50	186,559	292,365	482,445
Shilshole to Centennial Park to Pier 50	201,519	329,601	550,214

To forecast annual ridership, the unconstrained ridership demand was allocated to individual sailings by time of day. Periods of demand greater than 30 minutes away from a scheduled sailing time were not allocated to a sailing and do not impact annual POF ridership estimates. The results of this analysis are presented Table 3.

Table 3: Annual Ridership Forecast by Proposed Sailing Schedule: Ballard to Seattle

Route	2019	2025	2040
Shilshole to Pier 50	115,346	192,466	293,490
Shilshole to Centennial Park to Pier 50	96,853	176,537	273,313

Information on estimated travel times for various times of day for these routes is contained in Attachment A.5 in Appendix A.

Cost estimates: A Ballard to downtown Seattle route would require two vessels (one in service and one backup) and infrastructure improvements at Shilshole Bay Marina. Pier 50 is not anticipated to require capital improvements. Infrastructure improvements at Centennial Park would be completed by others. The total Terminal Capital Costs are the same for both route options.

Route	Terminal Capital Costs ($2019)	Vessel Capital Costs ($2019)	Annual Operating Costs in Year 1 ($2019)
Shilshole to Pier 50	$7.5 M	$15.4 M	$4.0 M
Shilshole to Centennial to Pier 50	$7.5 M	$15.4 M	$4.1 M

Based on the ridership and cost information presented above, anticipated farebox recovery for the Shilshole to Pier 50 route (the most cost effective route) is approximately 14% at startup, resulting in an overall POF system farebox recovery of approximately 31%.

Information on cost per rider for the Shilshole to Pier 50 route is contained in Appendix A, page 20.

B. A discussion of planning efforts underway or needed to implement the route

The planning efforts needed to implement the route include:

- Review of the existing transit service provided to Ballard
- Analysis of future population and travel trends

- Evaluation of how this route would fit in with long-term planning for transit service to meet the needs for Ballard and the region in the future
- Determination of how this route aligns with the Mobility Framework, in terms of impacts on equity and sustainability

Metro is facing the need to make significant changes as a result of the global pandemic and economic recession. All planning related to implementing a Ballard water taxi route would be subject to the reassessment and prioritization of transit services provided by Metro for King County.

C. An environmental impact analysis

The following section summarizes a preliminary analysis of environmental elements considered with the operation of POF service along the route between Ballard and downtown Seattle. To deliver POF service at the given service levels, the Marine Division would operate up to two 150-passenger vessels at an operating speed of up to 28 knots in unrestricted areas.

The route was evaluated using publicly available data and when possible visually representing this data using ArcGIS. The majority of data was created and compiled by local and state governments or research institutions; a few data sets were created through this project by digitizing information from aerial photographs.

The elements of earth, air, water and plants were reviewed in the context of operating POF service.

Earth: The potential POF route would operate on the waters of Puget Sound connecting Ballard and Seattle. Vessel-generated waves from a new POF operation could cause erosion of high banked and unstable sloped shorelines through mobilization and transport of sediments. Efficient hull design could be used to achieve ultra-low wake performance for POF vessels. Additionally, the Marine Division would develop operational protocols for where the POF vessel travels at a specified distance from the shoreline to prevent wake wash induced impacts on the shoreline areas.

Air: The diesel-powered propulsion systems would contribute to greenhouse gas (GHG) emissions, including carbon dioxide (CO_2) and nitrogen oxide (NO_x) emissions. The Environmental Protection Agency (EPA) requires new vessels to incorporate Tier 4 engines to significantly reduce GHG emissions. It is anticipated the new vessels would require Tier 4 engines, though hybrid-diesel propulsions systems would also be explored as an option for the route.

Water: To protect water quality and reduce the risk of any contaminants entering the water, best management practices would be used in any construction activities needed for landing sites to support POF service. Ferry vessels themselves, like most marine vessels, may use a raw water cooling process during operations. No sewer waste would be discharged into the waters of Puget Sound.

Plants: The majority of the shoreline consists of kelp and eelgrass. Vessel wake wash generated by the new operation while the vessel is in transit between docking locations would likely dissipate prior to reaching the shoreline and is not likely to impact native submerged aquatic vegetation, such as kelp and eelgrass.

The following additional tasks are recommended to adequately define impacts and develop measures to reduce potential impacts:

- Wind-wave and vessel wake energy assessment to quantify existing wave climate which can generate sediment transport along the shorelines and to determine the threshold for POF wake wash criterion.
- Review of fixed and floating structures that extend farther than average from the shoreline to determine tolerance for vessel wake wash.
- Review of recreation on Puget Sound along the vessel route and landing sites to define operation protocols to minimize impacts to recreation.
- Potential impacts to threatened and endangered fish species at landing sites and stream mouths.
- Other elements to be reviewed include animals, energy and natural resources, environmental health, noise, land and shoreline uses, critical areas, housing, aesthetics, recreation, historic and cultural resources, transportation and public services and utilities.

D. A summary of coordination with local agencies, including potential lease arrangements for facilities

As part of this proviso, the Marine Division reached out to the local agencies and owners of each potential landing to discuss opportunities and challenges of potential passenger-only ferry (POF) service. The following table provides a summary of these discussions.

Local Agency/ Owner	Outreach Information	Stakeholder Interest	Opportunities	Challenges	Outcomes
Port of Seattle	Meeting *See notes in Attachment D.1.*	» Owns Shilshole Marina. » Owns Centennial Park.	» Parking is available on the street adjacent to the marina. » Space is available at or adjacent to "Dock A."	» No available designated parking at the marina. » The walk to the pier is long and could be chllenging for some users. » Vessel traffic is high at the marina, as is car traffic.	» Port is willing to consider moving forward with POF landing.

Local Agency/ Owner	Outreach Information	Stakeholder Interest	Opportunities	Challenges	Outcomes
Expedia	Meeting	» Campus is adjacent to Centennial Park landing.	» Expedia, the Port of Seattle, and the State of Washington are partnering to fund the refurbishment of the Centennial Park Pier and landing. » This landing site is adjacent to the Elliott Bay Trail.	» There is a lack of nearby public parking (except for the Expedia pay parking garage) or public transit stops.	» Expedia is interested in a POF landing at Centennial Park.

In addition to coordination with local agencies and potential landing site owners, the Marine Division met with the United States Coast Guard (USCG), Sector Puget Sound. The USCG has regulatory authority over all vessel operations in Puget Sound waters as well as a whole host of other responsibilities. The goal of this meeting was to inform them of this study and discuss any concerns, issues, and focus areas.

E. A discussion of options for funding implementation of the route including identifying grant opportunities

This section provides a high-level overview of the potential ways for funding the implementation of the Ballard POF route. It is intended to be representative of what would be required to establish secure funding supporting the service over a twenty-year timeline.

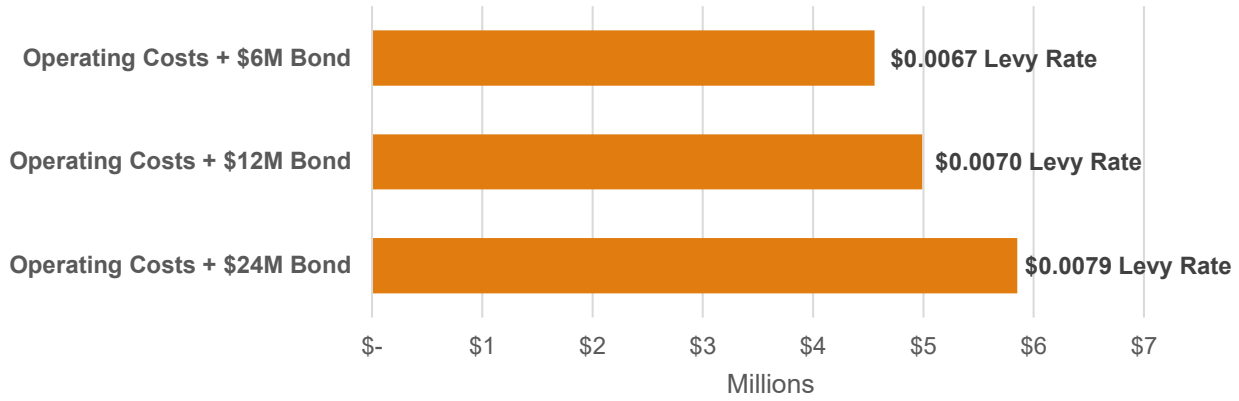
Ballard to Seattle POF service requires capital investment and a sustainable funding source to support operating costs. Capital costs total approximately $24 M in 2019 dollars and include improvements to Shilshole Marina and vessel purchases. Capital investments can be funded through a combination of grants, local sources, and debt service. Operating costs include operations and maintenance staff, maintenance parts, and fuel and are estimated at about $4M per year in 2019. Operating costs and debt service would be funded through an increase to the existing dedicated POF property tax levy supplemented with passenger fare revenue.

The capital investment and ongoing operating costs for a new Ballard POF route have been calculated using high level estimates based on the timing of implementation and include an annual inflation rate. The estimates are subject to change based on further detailed planning, partnership agreements, and the timing of funds being secured to support the service.

The Marine Division's current primary funding source is a dedicated property tax levy that is supported by passenger fares, federal grants, and bond issuance for capital investments. The property tax levy is currently set at a rate to sustain existing operations. Adding new service would require a complete analysis of all funding sources projected into the future.

The tax levy, along with the annual operating costs and debt service on three different bond options, is illustrated in Figure A. Figure A provides examples that show the property tax levy rate that would need to be levied in order to fund the ongoing operating costs as well as the debt service on three levels of bond funding. The highest bond issuance assumption is $24 M with no support from grants or partnerships for capital costs. The second assumption shows bonds at $12 M and grants and other support of $12 M. The third assumption shows bonds at $6 M and grants and other support of $18 M. In each of the examples, the levy rate would range between $0.0067 and $0.0079 per $1,000 of assessed property valuation, respectively. In comparison, the existing levy rate that funds the Vashon Island and West Seattle routes is $0.0125 per $1,000 of assessed property value. The maximum allowable levy rate for this dedicated property tax is $0.075 per $1,000 of assessed property value; therefore, all scenarios could be funded within the allowable limit.

Figure A: Annual Operating Cost, Debt Service and Tax Levy to Support POF Service



Current levy amount for existing routes is $0.0125 and the maximum allowable levy rate is $0.075.

The Marine Division has a successful history in seeking and receiving grants for many of their past capital projects and would seek out as much grant funding as possible for any new capital projects. The following grant opportunities are available for these capital investments:

- Federal Highway Administration (FHWA) - Ferry Boat Program
- Federal Transit Administration - Passenger Ferry Grant Program - Section 5307
- Department of Transportation - Better Utilizing Investments to Leverage Development (BUILD) Grant
- Other Federal Transit Administration competitive and earned share grants

F. A summary of public outreach undertaken

King Country Metro (Metro) conducted an online survey to gather input on the feasibility of passenger-only ferry (POF) service from Ballard to Seattle. The survey launched on December 6 and closed on December 23, 2019. During this approximately two-week surveying effort, rider bulletins were sent to seven Metro routes that serve the trip between Ballard and downtown Seattle, emails were sent to local community-based organizations and partners, and the survey was shared via partner social media channels and through paid social media ads and boosted posts.

Survey results provide information on the travel patterns as of late 2019 of prospective POF users along with feedback on their preferences for potential POF service from Ballard. The vast majority of individuals responding to the survey indicated a home zip code in the Ballard area, meaning that the majority of the opinions reflected in the survey are of Ballard residents and are most representative of their travel patterns.

The largest percentage (72 percent) of respondents traveled to downtown Seattle most days of the week, although many respondents (56 percent) also traveled within the Ballard area. Other less common travel destinations of survey respondents included the Fremont/Wallingford/Greenlake area and South Lake Union.

The vast majority (87 percent) of survey responses indicated they were traveling for work. Other travel included fun/social/recreational, shopping, school, and or other options. Chart 1 provides the survey results of why people typically traveled.

The majority of respondents (80 percent) traveled on weekdays, with weekend travel being far less common than weekday travel.

Based on survey responses, the morning and evening peak commute periods represented the highest travel periods throughout the day. The survey results indicated that travel rates during the afternoon peak of 3:00 and 7:00 pm were higher than during the morning peak period. While people typically traveled during the commute periods, about 40 percent of survey respondents also indicated they traveled in the midday period between 9:00 am and 3:00 pm.

Approximately the same percentage of survey respondents either drove (44 percent) or took the bus/transit (46 percent) to complete their trips.

To understand people's interest in POF service, the survey asked what landing sites people would prefer, how people would prefer to get to a POF landing, how often they would use POF service, why they would use POF service, and what amenities are important to them.

Of the available landing site options, the downtown Seattle waterfront site was by far the most preferred site (87 percent) for a POF landing. This preference seemed to correlate with the number of respondents who traveled to downtown being far larger than the number that traveled to Centennial Park (adjacent to Expedia).

Most survey respondents (72 percent) indicated they would prefer to walk or bike to the landing site. Many respondents (47 percent) also indicated a willingness to use transit to the ferry terminal, while others (32 percent) would be willing to drive themselves.

Survey respondents generally supported POF service; 49 percent of survey respondents would use the POF service at least three times per week. Moreover, 85 percent of respondents would use the service at least 3 days per month from the landing site they selected. The majority of the comments were in support of the proposed Ballard-Seattle POF route and/or expansion of POF service in general.

In order to change their travel mode to a POF, the majority of survey respondents (66 percent) said that their travel time with POF would need to be the same or faster than their travel mode at the time of the survey. Following a faster trip time, having a more consistent travel time, and having easy connections to the Ballard terminal were also reasons for taking a POF.

When asked to rank on-board amenities from highest to lowest, survey respondents ranked a guaranteed seat as the most important amenity. Following a guaranteed seat, on-board restrooms, and the ability to access Wi-Fi while traveling were also highly ranked by survey respondents.

G. A description of next steps for moving forward

Implementing POF service between Ballard and downtown Seattle requires forming partnerships with property owners, securing necessary funding for capital improvements and operating costs, consulting with tribes, continuing stakeholder outreach and community engagement as well as beginning the regulatory process for approval.

Although initial outreach has been conducted with potential partners such as the Port of Seattle, final agreements would need to be reached to ensure full support of POF route implementation moving forward. This requires continued meetings to identify and address stakeholder interests.

The Marine Division's current primary funding source is a dedicated property tax levy that is supported by passenger fares, federal grants, and bond issuance for capital investments. The property tax levy is currently set at a rate to sustain existing operations. Adding new service would require a complete analysis of all funding sources projected into the future.

Outreach is critical throughout the POF implementation phase. Engaging local agencies, property owners, tribes, and continuing public outreach throughout the development of landing sites will be key to a successful POF route implementation.

The Marine Division has met with the Port of Seattle to discuss potential POF service and to begin to understand their needs and concerns. The next steps for service implementation will include developing use and lease agreements for the specific site locations identified prior to POF landing site development.

As part of this proviso, the Marine Division reached out to the local agencies and owners to discuss opportunities and challenges of POF service. If implementation of a new route is pursued, , meetings and coordination with the appropriate agencies would continue throughout the route implementation process. Regular communications with key agencies will be essential throughout the permitting process that is required for terminal construction and POF service implementation.

The Marine Division would consult with the Muckleshoot Tribe and the Suquamish Tribe early in the environmental review process and through ongoing project development and future operations.

Prior to implementing a Ballard to downtown Seattle POF route and as part of the regulatory process, the Marine Division would continue community engagement. Outreach efforts would be to provide information and seek public input through community meetings, public comment periods, and publicizing key route information.

Compliance with the National Environmental Policy Act (NEPA) would be required for this project if federal funds are used for project implementation. This process requires coordinating with the lead agency as soon as possible to determine if the project is considered to be categorically excluded or have an impact. Depending on the determination, the project may need to proceed with an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). Based on the determination, the Marine Division would prepare environmental studies needed to support the review process.

VI. Conclusion

This report provides analysis of the feasibility of a Ballard to Seattle POF route, however, current events must be taken into account. Earlier this year, the COVID-19 pandemic emerged and greatly impacted the community. This public health crisis has impacted public transit significantly through a steep reduction in demand for transit due to work from home and social distancing orders and the corresponding impact of the economic slowdown, decline in sales tax collection, and Metro's decision to suspend fare collection on its services to minimize interaction with operators. A lot of uncertainty remains as recovery from this crisis will be difficult and will likely be long-lasting. Potential changes in travel habits are expected, with the adoption of more widespread teleworking. While Metro will continue to focus on providing as many transit options as possible, based on available service hours, to the communities with the greatest needs, implementation of a Ballard water taxi route is not recommended at this time.

Implementation of a Ballard-to-downtown Seattle water taxi route could provide an additional transit option and supports increased mobility, a strategic goal of King County and Metro. However, adding a water taxi route is unviable for the foreseeable future, given the impacts caused by the COVID-19 pandemic are far-reaching and adversely affect existing transit service. Metro will continue to focus on providing and preserving existing service while advancing transit options where needs are greatest. This route will remain in Metro's long-range plans for potential future expansion of passenger-only ferry service in King County.

VII. Appendices

Appendix A: Report on Implementation of a Ballard-to-downtown Seattle Water Taxi Route

Report on Implementation of a Ballard-to-downtown-Seattle Water Taxi Route

King County Metro Transit, Marine Division

Submitted in accordance with King County Council Ordinance 18930

July 2020

King County METRO

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PHOTO CREDITS

All photos in the Summary of Findings are courtesy of Ned Ahrens, Photographer for King County Metro.

All photos in Appendix A are from KPFF Consulting Engineers.

EXECUTIVE SUMMARY

SUMMARY REPORT

APPENDICES

EXECUTIVE SUMMARY

The highways and roadway networks in the Puget Sound area are becoming more congested as the region grows. People are interested in new and innovative transportation options. Passenger ferries are not a new mode of transportation in the Puget Sound. In fact, the Mosquito Fleet operating in Puget Sound experienced its peak in the 1930's and '40s with over 100 passenger vessels plying local waters. In its ten-year existence, the King County Water Taxi (Water Taxi) has exceeded ridership projections, providing a reliable and enjoyable travel option across uncongested waterways. As part of the ORCA program, the Water Taxi offers an affordable trip and seamless transfers to other transportation modes. When major roadway traffic disruptions occur–like the Alaskan Way Viaduct or West Seattle Bridge closures–the Water Taxi has proven that it can quickly respond with increased service, moving passengers around congested corridors.

While passenger-only ferry (POF) service provides reliable service and increases resiliency in the region, access to POF landings can be challenging. This requires investment in first/last mile connections to bring people to and from vessel landing sites.

This report outlines the steps necessary for implementing POF service from Ballard, in order to address the King County Council Proviso in the 2019-2020 Adopted Budget. With the onset of the COVID-19 pandemic, however, King County Metro has experienced a reduction in ridership across all services, including the Water Taxi. Reduced ridership is due to necessary public health orders to: stay home, only travel for essential business, and maintain six feet of space between you and others when making essential trips. This current slowdown in growth will require future analysis on the long-term effects current ridership reductions will have, as will the recovery efforts and what new commute habits will and should look like as people are able to return to work. Coupled with the current economic slowdown and expected economic recession, Metro's budget will be significantly impacted, and funding for Water Taxi expansion could require alternative sources than those outlined in this report. This report's projections for ridership of a new Water Taxi service is based on the assumption that commuters will return to work as normal once the COVID-19 pandemic is over.

Landing Locations

People living in Ballard typically commute to areas in and around downtown Seattle, along with other employment hubs like the University of Washington. Vessel operating speeds are not as constrained in Puget Sound as they are within Lake Union and the Ship Canal, which are subject to slow down zones and increased vessel and seaplane traffic. Therefore, the King County Metro's Marine Division (Marine Division) recommends a Shilshole Bay Marina in Ballard to Pier 50 in downtown Seattle route if Ballard POF service was to be implemented. The Shilshole Bay Marina requires improvements for POF service.

The newly redeveloped Pier 50 terminal in downtown Seattle is the hub for King Count Water Taxi and Kitsap Fast Ferry, serving four routes and at times five different vessels. Adding a route from Ballard to Pier 50 would necessitate the reworking of the vessel arrival/departure schedules in order to determine capacity for the new route.

Service Profile

With a sailing time of approximately 20 minutes, the Ballard POF service proposed by this report includes commuter-only service (6 round trips per day) in the non-peak season, and all-day and weekend service in the peak season. This service assumes two 150-passenger vessels that would serve 195,000 annual riders. This service profile is based on pre-COVID-19 pandemic conditions.

Community Interest

The Marine Division received over 4,400 survey responses regarding POF service from Ballard to downtown Seattle. Over 50 percent of survey respondents said they would take a Ballard to downtown Seattle POF three or more times per week.

Opportunities and Costs

Like all transportation investments, the Ballard to Seattle POF service has opportunities and costs that are oultined in the following table.

Opportunities of a Ballard to Seattle Route	Costs of a Ballard to Seattle Route
» Positive community interest. » Potential to serve approximately 115,000 riders in the first year of service. » Time competitive travel option for Ballard to downtown Seattle riders. » The Port of Seattle is a willing partner in developing an operating agreement to bring POF service to Shilshole Bay Marina. » Provides a transit option to an area that does not have bus service. » Farebox recovery with the addition of a Ballard route (estimated at 31%) aligns with Metro goals. » Enhancement of regional resiliency with increased marine infrastructure and vessel resources.	» Limited access to the marina from adjacent neighborhoods. » Added cost for transit or other mobility services to provide access to Shilshole Bay Marina. » Capital investment required to improve Shilshole Bay and invest in two vessels. » Annual operating subsidy required to support service.

Next Steps

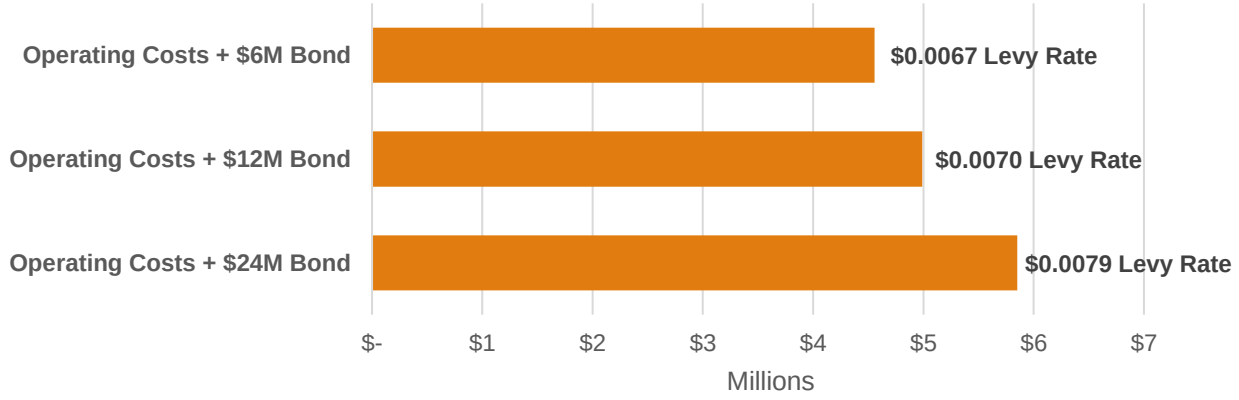
Upon Council approval for implementation, and before POF service from Ballard can begin, the Marine Division will develop a funding strategy, initiate the environmental and regulatory process, consult with tribes, develop agreements with the Port of Seattle, and engage the community and stakeholders. The following outlines the next steps required to begin implementing a new Ballard POF route.

Funding Options

Ballard to Seattle POF service requires capital investment and a sustainable funding source to support operating costs. Capital investments can be funded through a combination of grants, local sources, and debt service. The Marine Division has been successful in obtaining federal and state grants for their capital investments and will continue to seek all grant funding opportunities.

Operating costs would be funded through an increase to the existing property tax levy, supplemented with passenger fare revenue. All options are within the maximum allowable levy rate for ferry service in King County. The tax levy, along with the annual operating costs and debt service on three different bond options, is illustrated in Figure A.

Figure A: Annual Operating Cost, Debt Service and Tax Levy to Support POF Service



Current levy amount for existing routes is $0.0125 and the maximum allowable levy rate is $0.075.

Environmental and Regulatory Process

The Marine Division anticipates seeking federal funds for capital investments necessary to support service, including vessels and the landing facility at Shilshole Bay Marina. This will require compliance with the National Environmental Policy Act (NEPA). The Marine Division will work with the lead federal funding agency to determine the NEPA requirements.

To support environmental reviews and preliminary design, the Marine Division will conduct environmental studies. The Marine Division will consult with the two tribes that have treaty rights in these waterways (the Muckleshoot Indian Tribe and the Suquamish Tribe) during project development and future operations. This effort will also require continued community engagement.

Agreements with the Port of Seattle

The Marine Division met with the Port of Seattle, and they are supportive of POF service and willing to discuss operating agreements. The Marine Division will continue discussions and form agreements with the Port of Seattle throughout design of the Shilshole Bay Marina landing site.

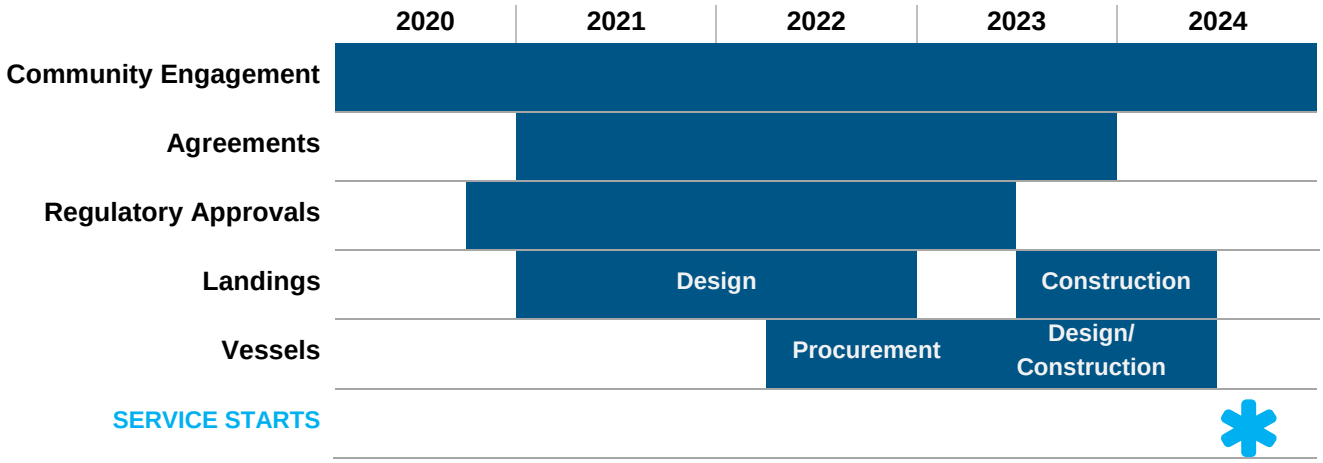
Community and Stakeholder Outreach

The Marine Division will continue community and stakeholder outreach to understand what the community's interests are when implementing POF service from Ballard. Feedback will be incorporated in the design and implementation of this new POF service.

Schedule for Implementation

Developing agreements, regulatory compliance, along with designing and constructing the landings and vessels, is anticipated to take an additional three plus years after funding is approved. Figure B illustrates an example of the estimated timeframe for implementation.

Figure B: Example Implementation Timeline for a Ballard to Seattle POF Route



INTRODUCTION AND LEGISLATIVE SUMMARY

As the Puget Sound region continues to grow, highway and roadway congestion correspondingly increase. This congestion equates to time lost for area residents, by way of lengthened commute travel times, and leaves many communities eager to explore additional transportation options. Operating on the waterways, passenger-only ferry (POF) vessels are not constrained by the frequently congested road network. This separation from vehicle traffic allows POFs to provide highly reliable and on time service along with the ability to support the resiliency and emergency response capabilities of the region.

King County operates two POF routes, including the West Seattle/downtown Seattle Water Taxi and the Vashon Island/downtown Seattle Water Taxi. These routes continue to exceed performance expectations, with increasing ridership, excellent reliability and on-time performance, farebox recovery above targets, as well as over 700,000 satisfied annual customers. Riders enjoy a scenic, often more direct trip with a guaranteed available seat, restrooms, and an over 98% assurance that the trip will be completed on time. However, POF service is not without its challenges. Located on waterfront properties, ferry terminals are often on the fringe of the existing transportation network "spine" that is served by fixed or high-capacity transit. This challenge can be overcome through thoughtful placement of POF landing sites and consideration and funding of improvements to infrastructure and services to help people reach terminals.

Ballard is located along the shores of Puget Sound, offering a geographic opportunity for POF service to provide another transit connection to downtown Seattle. Potential Ballard POF service has been studied a number of times in the past decade, but, thus far, has not been implemented. Even as conditions continue to shift and change, the public remains interested in new and innovative transportation options. This ever-changing transportation and demographic environment in King County led the King County Council to include a Proviso[1] in the 2019-2020 King County Adopted Budget for the Marine Division to develop a Ballard POF route implementation report. The report addresses where the route would land, how it fits within the current and planned transportation network, what the community is interested in, and next steps for implementation. This report is the response to that Proviso.

MV Doc Maynard

[1] Ordinance 18930, Section 75, Transit, P8

LEGISLATIVE SUMMARY

The Proviso specified key elements to include in the report. Table 1 provides a cross reference for each of those elements, the sections that address each proviso item and where it is found in this document.

Table 1: Proviso Element, Section, and Location

Proviso Element	Relevant Section	Page Number(s)
A. An update on the assessment of facilities, ridership projections, and capital and operating cost estimates provided in the 2015 ferry expansion options report.	» Approach and Findings » Appendix A: Capital and Operating Program Update	» Pages 15 - 20 » Appendix A
B. A discussion of planning efforts underway or needed to implement the route.	» Ballard Transit Options » Appendix B: Transportation Planning Update - Planning Efforts Related to a Potential Ballard POF Route	» Pages 10 - 12 » Appendix B
C. An environmental impact analysis.	» Approach and Findings » Appendix C: Preliminary Environmental Impact Analysis	» Page 23 » Appendix C
D. A summary of coordination with local agencies, including potential lease arrangements for facilities.	» Recommended Route and Next Steps » Appendix D: Local Agency/Owner Coordination: Ballard POF Route	» Pages 24 - 28 » Appendix D
E. A discussion of options for funding implementation of the route, including identifying grant opportunities.	» Next Steps » Appendix G: Ballard Implementation Plan	» Pages 28 - 30 » Appendix G
F. A summary of public outreach undertaken.	» Approach and Findings » Appendix E: Public Outreach Summary for a Potential Ballard to Seattle POF Route	» Pages 21 » Appendix E
G. A description of next steps for moving forward.	» Next Steps	» Pages 28 - 31

KING COUNTY GUIDING PRINCIPLES

King County has established a strategic plan and vision that define the government's guiding principles and that outline goals and objectives to guide its operations and plan for future growth.

Mobility is one of the County's goals that Metro Transit Department (Metro) provides and strives to continually improve. Equity and sustainability are the objectives of Metro's Mobility Framework, a guiding document recently adopted by the King County Council. The Mobility Framework was developed to provide a foundation for how Metro will analyze, change and grow its transportation services to better meet the needs of priority populations, and to become more sustainable. Before Metro invests in new transportation service, or initiates modifications to existing service, a review of how these service changes align with the guiding principles set forth in the Mobility Framework is conducted. This section illustrates how new POF service supports Metro's Mobility Framework.

METRO'S MOBILITY FRAMEWORK

The Metro-developed Mobility Framework provides guiding principles that serve as the foundation of the department's decision-making. Table 2 outlines the principles that apply to new POF service and how POF service achieves them.

Table 2: Mobility Framework Guiding Principles and Alignment with New POF Service

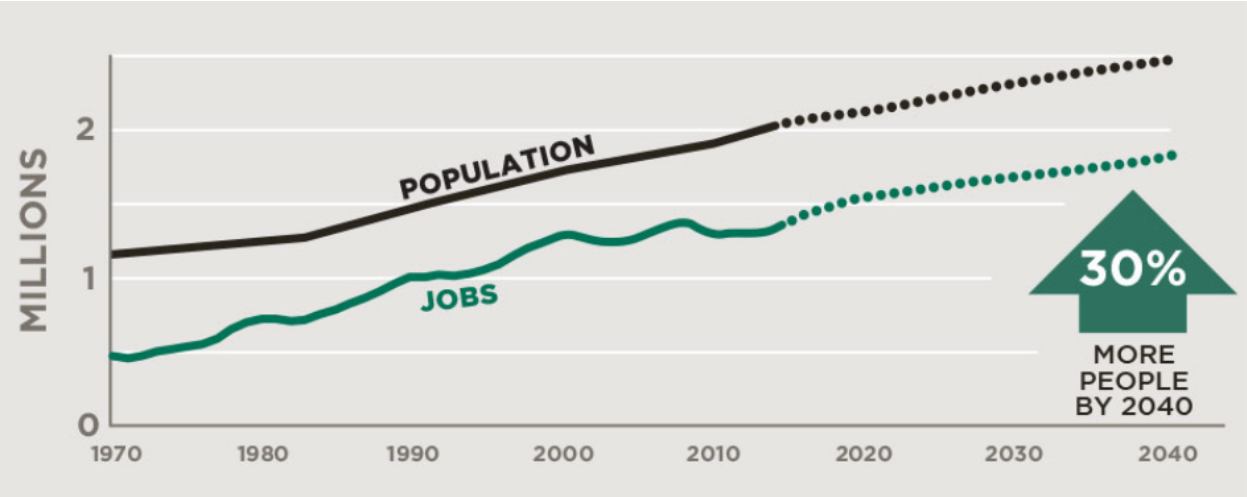
Guiding Principle	Alignment with POF Service
» Invest where needs are greatest.	» Providing connections to this POF service would enable priority populations to have additional modes of service, thereby investing in accessibility for those who need it most.
» Address the climate crisis and environmental justice.	» In alignment with all public transit modes, one goal of POF service is to reduce the number of single-occupant vehicle trips and reduce carbon emissions. » POF vessels would be powered using alternative fuel solutions where feasible. » POF vessels operate on regional waterways, avoiding impacts of traffic congestion (noise, emissions, etc.) on communities who already experience high volumes of traffic.

Guiding Principle	Alignment with POF Service
» Innovate equitably and sustainably.	» The Marine Division seeks innovative policies, connections, and fare structures that provide the opportunity for everyone to use POF services. » The Marine Division currently seeks innovative approaches in vessel technologies and green building standards for terminal facilities, and will continue to do so with new service. Current innovative practices include using biodiesel fuel technology and design-build practices for capital projects.
» Ensure safety.	» Current POF services provide an exceptional safety record for both passengers and its workforce, and the Marine Division will implement high safety standards with any new service.
» Encourage dense, affordable housing in urban areas near transit.	» With improved connections to landside transit, POF service could connect to dense, urban development in the center of Ballard.
» Improve access to mobility.	» The Marine Division, as part of Metro, continues to explore new, innovative ways to connect people to POF service. » POF service increases mobility alternatives for commuters.
» Provide fast, reliable, integrated mobility services.	» POF service uses waterways and is not encumbered by traffic congestion, resulting in high reliability. » Current King County POF services are highly reliable, completing 99% of scheduled trips and achieving 98% on-time performance. » A key evaluation criteria when exploring new POF service, is to focus on opportunities for access and connectivity to other regional transit modes.
» Support our workforce.	» New POF service would provide more routes and work hours for Marine Division staff that could result in improved crew schedules and opportunities for advancement.
» Align our investments with equity, sustainability and financial responsibility.	» Completing an analysis of potential landing sites and routes results in recommending the POF route that would be most equitable, sustainable, and financially responsible of the options reviewed.
» Engage deliberately and transparently.	» Beyond the public survey and stakeholder meetings conducted in response to this Proviso, the Marine Division will continue to engage with communities on existing and potential POF service.

BALLARD TRANSIT OPTIONS

King County has experienced significant population growth in the past decade—adding over 300,000 people between 2010 and 2018 (US Census Bureau)—and this growth is anticipated to continue over the long term. Prior to the COVID-19 pandemic, the Puget Sound Regional Council (PSRC) estimated that King County would add another 122,000 people by 2030. Figure 1 illustrates the historic and projected population and job growth trends in King County.

Figure 1: Population and Growth in King County



Source: King County Metro

This report was developed with a number of highly favorable growth assumptions to ridership and revenue; however, the emergence of the COVID-19 pandemic in early 2020 and the associated, and potentially prolonged, economic recovery has created an increased and potentially substantial financial shortfall for transit funding. In addition, transportation demand has changed very rapidly with steep drop-offs in transit ridership in response to public health recommendations to slow the spread of the virus. Ridership is expected to rise as recovery continues, but there is much uncertainty around future changes in travel, such as more widespread adoption of teleworking. If customers do not return to transit or if transit is not ready to meet customer demand, congestion and traffic could quickly meet or exceed congestion levels experienced pre-COVID-19. There are many immediate challenges and uncertainties that King County will face in responding to and recovering from the pandemic. However, long-term expectations for growth and population in this region remain, and Metro must stay ready to meet that growth.

A recovering economy and increase in regional population, combined with changes to travel patterns, will likely continue to put stress on the region's transportation network. The result will be more people traveling within the existing network—by car, bus, or train—many on the same road right-of-way. Not only does growth mean more people are spending their time in traffic congestion, it also increases greenhouse gas emissions that contribute to climate change. In response to this growth and regional climate change initiatives, regional planning organizations and local agencies have developed plans to expand and enhance mobility options. While the immediate funding crisis

will result in service and program reductions, the long-term goals of supporting sustainable communities and travel through a robust transit system remain.

People are looking for convenient, fast, and comfortable transit options that are a good value. This section explores the future transportation network in King County, upcoming transit options in Ballard, and how POF service from Ballard to downtown Seattle compliments these options. Appendix B provides a full analysis of existing transit plans and additional plans needed to implement Ballard POF service.

Transit Network in King County

Transit agencies around the King County region are investing in a transit network that will improve mobility options over the next 20 years, with projects including:

- Expanding Link light rail in the north, south, and east to serve other King County communities; and expanding to serve high-demand areas within the City of Seattle
- Adding RapidRide and Stride bus rapid transit (BRT)
- Adding POF service on Puget Sound to connect the Kitsap Peninsula with downtown Seattle.
- Extending commuter rail service.

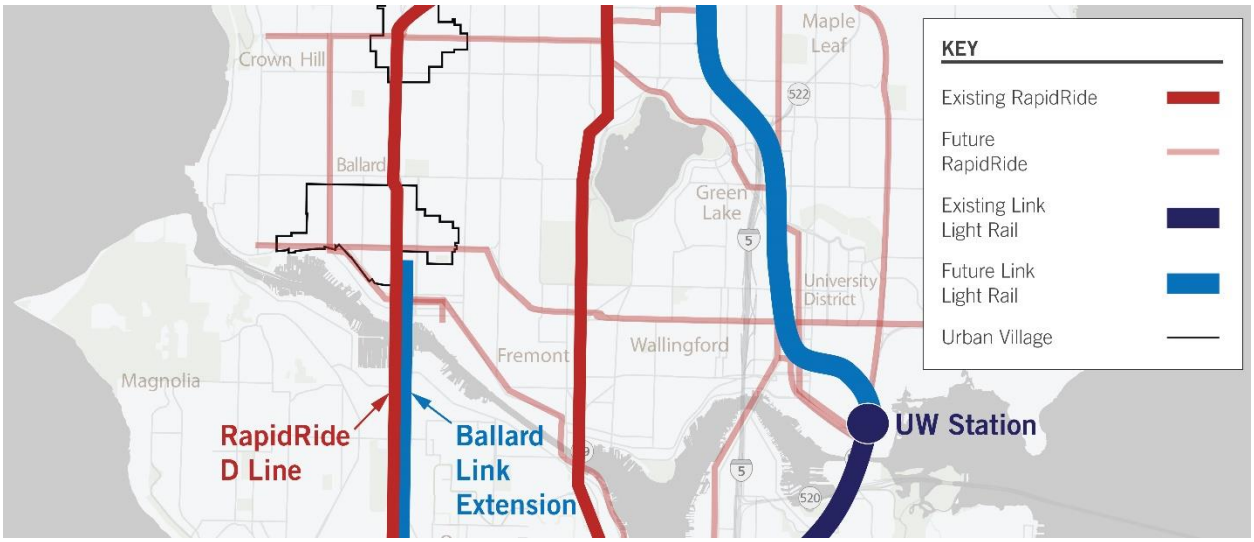
Ballard Transit Options

The Ballard area is currently served by the RapidRide D Line and a number of local and express buses that connect Ballard with downtown Seattle via two bridges; and with Fremont, the U District, Northgate, and other parts of north Seattle. The City of Seattle Comprehensive Plan designated urban villages within the Ballard area that encourage dense development and are served by transit (RapidRide D Line). Additionally, the City of Seattle's 2015 MOVE Seattle plan identifies enhancing the Ballard to downtown Seattle transit corridor as a priority for transit investment.

Sound Transit is planning for expanded Link light rail service to Ballard as part of the set of expansion projects funded by the Sound Transit 3 ballot measure. The Ballard light rail extension will expand Link between central Ballard and downtown Seattle, where people can connect to transit services across the region. The Ballard Link light rail alignment will be determined through the design process and could cross Salmon Bay via an elevated rail bridge or a tunnel crossing.

Figure 2 illustrates the urban villages in the Ballard area, current RapidRide lines, future RapidRide lines outlined in Metro Connects, as well as Link light rail in Ballard. As immediate funding challenges face both Metro and Sound Transit, the timing of future projects remains under discussion at the time of this report.

Figure 2: High-Capacity Transit Service in Ballard



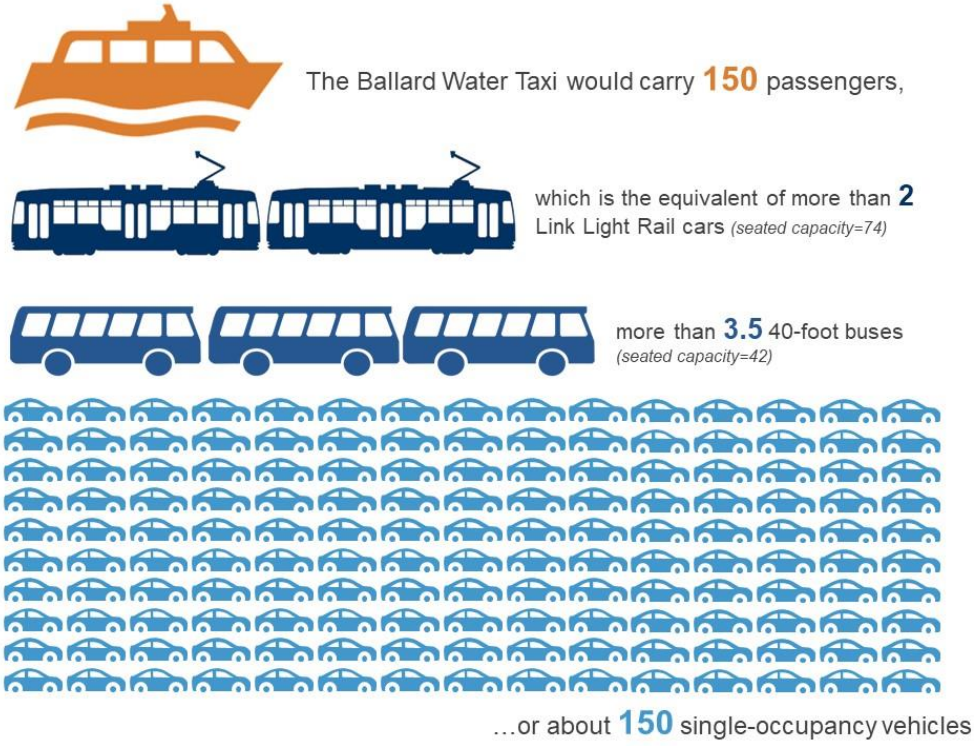
ROLE AND OPPORTUNITIES OF POF SERVICE

Neighborhoods to the north and west of the Ballard urban village have expressed interest in another transportation option. The addition of POF service in Ballard provides another transit option, adding transit capacity to the area, and increasing the resiliency of the transportation network.

Increasing Transit Capacity

POF service in the Ballard area provides another opportunity for people to choose transit for their travel needs, in lieu of their personal vehicles. The planned vessels would provide capacity and seats for up to 150 passengers. This capacity is the equivalent of more than three 40-foot buses (seated capacity). Figure 3 illustrates the number of seated passengers in a 150-passenger POF vessel compared to other transportation modes.

Figure 3: POF Passenger Capacity



To take advantage of the capacity of POF vessels, passengers need to be able to easily access the landing sites. Opportunities to improve access to and from POF landings include:

- Improving and increasing bike and pedestrian infrastructure.
- Dedicating adequate curb space for passenger pickup and drop off via rideshare or other on-demand transportation options.
- Providing connections to and easy transfers from existing transit options, or funding and providing new transit options where there is not existing service.
- Providing parking for single occupant vehicles and vanpools.

Resiliency

Implementing POF service in Ballard would increase regional resiliency by providing more POF capacity during emergency situations and significant traffic events. As an additional mode, POF provides overall system flexibility and adaptability along key transportation corridors.

Emergencies & Natural Disasters

The Marine Division is an integral part of the emergency preparedness network, partnering with regional response agencies and participating in numerous emergency and security training exercises. In 2015 alone, the Marine Division performed five water rescues in Puget Sound. In the

case of emergencies and natural disasters, POF vessels can bypass traffic or damaged roadways, travel at relatively high speeds, maneuver in close quarters, navigate in relatively shallow water, and moor at a variety of locations. In doing so, the vessels are able to transport first responders and key supplies to where they are most needed. Going where cars cannot, they can also play a key role in evacuating the public during emergencies.

Significant Traffic Events

More routine than emergencies, events such as roadway closures, construction, and automobile accidents are all events that can cause significant traffic delays that negatively impact the efficiency of the regional transportation system. An example of this was the recent Alaskan Way Viaduct closure, during which the Marine Division increased West Seattle Water Taxi service to continue to keep people connected during the closure. Similarly, the West Seattle Water Taxi can help mitigate the West Seattle Bridge closure by increasing service and providing another mobility option for people traveling to and from West Seattle. With its numerous construction and development projects, Seattle would benefit from the additional flexibility provided by expanded POF services.

The City of Seattle's 2016 MOVE Seattle plan identifies the need for resilient transportation and multiple modes in order to prevent the system from being constrained by bridges raising, traffic collisions, and construction activities.

Water Taxi with the West Seattle Bridge in the Background

APPROACH AND FINDINGS

The response to this Proviso used a stepped approach. This methodology allowed for an assessment of the many characteristics of POF service, as well as the path toward implementation, and clearly identifies opportunities and constraints of POF service. Step 1 included identifying potential landing sites in the Ballard area. This step included review of previous studies and assessment of current travel patterns to identify where people are travelling to and thereby where a potential landing site terminus should be located.

As part of step 2, the Marine Division met with local agencies that own potential POF landing sites to discuss the opportunities and challenges of each location. Included in this step was a detailed analysis of potential landing sites for land use consistency, connectivity and accessibility to adjacent communities, navigational considerations, and infrastructure improvements required to determine the rough order of magnitude (ROM) capital costs.

The final step, step 3, included developing a route profile along with potential service levels to estimate ROM operating costs, conducting a preliminary environmental impact analysis, gauging community interest through a public survey, and completing an Equity Impact Review.

The following sections summarize the findings from each step of the review process.

STEP 1. IDENTIFY POTENTIAL LANDING SITES

Metro's guiding principles laid the groundwork for landing site identification. Compatible land use that could connect to public transportation options was of high priority. This led to the review of land use on the shoreline of Puget Sound, focusing on publicly-owned land or privately-owned land zoned for commercial and/or mixed-use development that would be compatible to, and potentially serve as, a destination for future riders.

What landing sites were previously studied?

Landing site identification built upon the 2009 and 2015 POF studies. In Ballard, the Shilshole Bay Marina remains the same as previously studied and is evaluated in this report. Landing sites east of the Ballard Locks are limited by wake restrictions and resulting long transit times, therefore these sites are not considered in this report.

Where are people in Ballard traveling to?

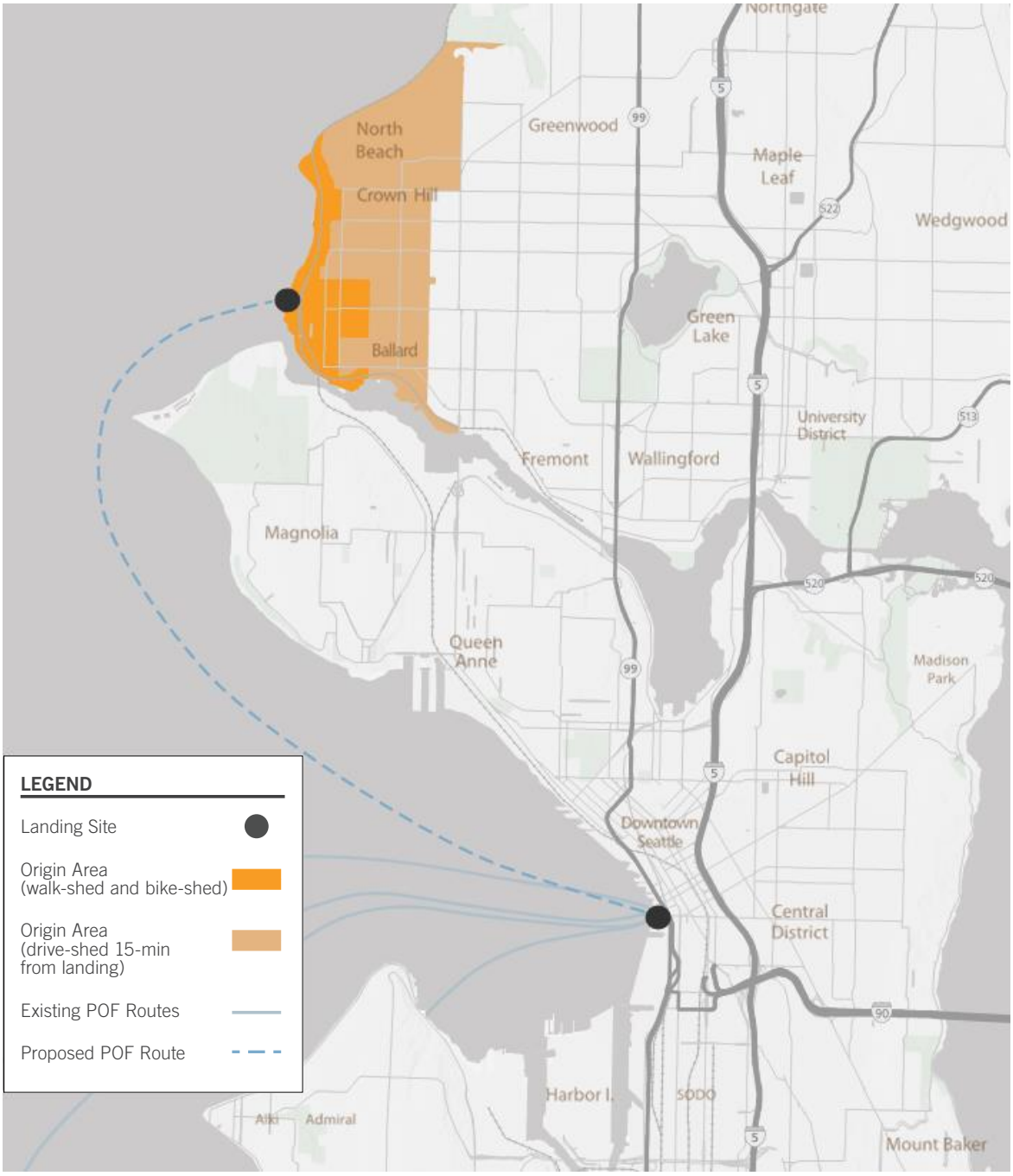
To determine destination landing sites from Ballard, a market area analysis was completed to illustrate where people in Ballard typically travel for work. This analysis indicated downtown Seattle, the First Hill and lower Queen Anne neighborhoods, and the University of Washington (UW) as main employment destinations for people commuting to work from Ballard. Based on its long transit time in the Ship Canal and Lake Union, a Ballard to UW route was not considered in this report.

In downtown Seattle, the existing Pier 50 POF terminal is owned by King County and operated by the Marine Division and is integral with the Seattle Multimodal Terminal at Colman Dock. This

landing site was previously reviewed and is carried forward in this report as the potential downtown Seattle landing site.

The Ballard and downtown Seattle landing sites have been assessed in past POF studies. Each landing site provides its own unique opportunities and challenges, as outlined in the following sections. Figure 4 illustrates the Shilshole Bay Marina landing site in Ballard, the 15-minute driveshed and walk- and bike-shed from the Shilshole Bay Marina landing, and Pier 50 landing site in Seattle that were reviewed in this report.

Figure 4: Potential Landing Sites in Ballard and Seattle



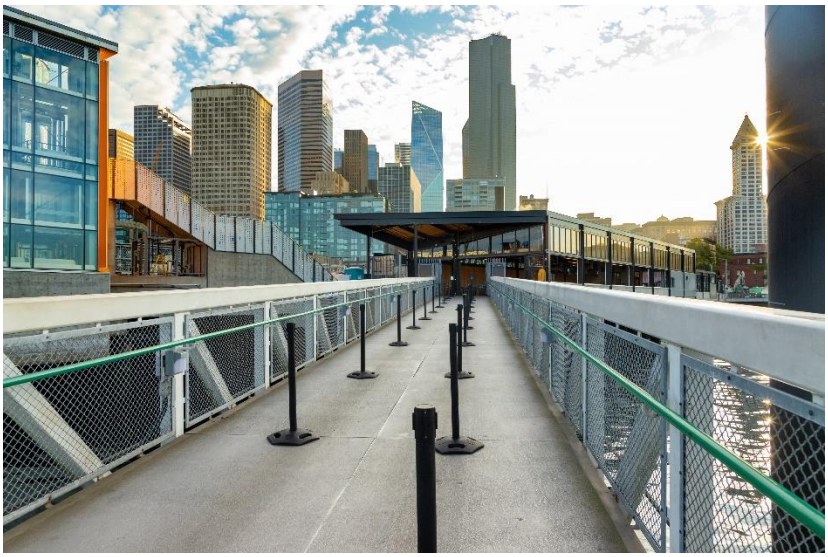
STEP 2. ASSESS LANDING SITES

There are a number of factors to consider when evaluating potential landing sites for implementation of a POF route. Similar to other transit modes, POF landings must be easily accessible and convienient for people to get to, in order to attract riders. Potential POF landings must also be consistent with the land use and environmental regulations. The waters connecting to landing sites must allow POF vessels to safely maneuver to the dock and allow passengers to easily load and unload the vessel. The following sections highlight key characteristics of the potential Shilshole Bay Marina and Pier 50 landing sites. Full analysis can be found in Appendix A Capital and Operating Cost Update, Attachment A.2 Site Profiles.

Shilshole Bay Marina, operated by the Port of Seattle, provides recreational, commercial and residential vessel moorage. While POF service fits well with the marina use, access and connections from the adjacent neighborhoods to the marina are limited. There is no bus service along Seaview Avenue NW, and access to the adjacent neighborhoods to the east is restricted by the railroad and a steep slope. With the narrow slips within the marina, POF service would require a new float to safely load and unload passengers. Near Golden Gardens Park, a Shilshole Bay Marina landing site could provide a transit connection to recreational opportunities during summer when service is increased.

Centennial Park, near the new Expedia Campus was evaluated as a potential landing site that would serve as an additional stop along a Ballard-Downtown Seattle route. A POF route that stops directly at the park could provide both commute and recreational opportunities. However, adding a stop at Centennial Park would increase travel times along a Ballard to Seattle route.

The POF terminal at **Pier 50** was improved in 2019 to include a passenger shelter, office, and float that accommodates two vessels at one time. As part of the Seattle Multimodal Terminal at Colman Dock, Pier 50 provides a direct connection to the future Seattle Waterfront. The Marine Division currently operates the West Seattle and Vashon Island POF routes from Pier 50, and Kitsap Fast Ferries land two additional POF routes at the facility. Regional interest in POF service to Seattle is growing, and the Pier 50 facility may need to be expanded to accommodate future POF service. Table 3 provides a summary of the site assessment including proposed infrastructure, ROM capital costs, challenges, and opportunities for the Shilshole Bay Marina and the Pier 50 landing sites.



Pier 50 POF Terminal

Table 3: Potential POF Landing Site Summary

	Infrastructure Needs	ROM Capital Cost	Challenges	Opportunities
Shilshole Bay Marina	» New float » Minor uplands improvements	$7.5 M	» Dedicated access and connections to/from Shilshole Bay Marina	» Ample space available for access improvements (car, transit, bike, & pedestrian) » Recreational connections to Golden Gardens Park » Port is willing to discuss operating arrangements.
Pier 50	» None	N/A	» Capacity constraints with existing POF routes	» Marine Division owns and operates the facility » Proximity to Marine Division's Pier 48 Maintenance Facility
Centennial Park	» Provided by others	N/A	» Exposure to inclement weather » Increases route travel time	» Existing pedestrian and bike connections » Public/private partnership

STEP 3. DEVELOP ROUTE PROFILE

The final step in analyzing the feasibility of a future POF route is developing route and operational profiles, given a set of underlying service level assumptions to define what POF service would look like. With these operating profiles, routes were evaluated based on the potential ridership, annual operating expenses, what the community expressed interest in, how POF service aligns with equity goals, and the potential environmental impacts.

What would POF service look like?

Based on the landing site assessment, an operating profile was developed for a Shilshole Bay Marina to Pier 50 route. Adding a potential Centennial Park stop to the route was found to increase travel times, leading to decreased ridership. As a result, the stop was not included at this time. This profile outlines the anticipated service levels that determine the number of vessels, the vessel operating speed required to deliver the service, crew requirements, and fuel needs. Service would be provided as follows.

- **Non-peak season (October - March):** Weekday commute service with three sailings in the morning and three sailings in the afternoon, along with nine hours of Saturday service.
- **Peak season (April - September):** Expanded service includes weekday commute service, plus mid-day, evening, and weekend service.

One-way trip time from Ballard to Pier 50 would be approximately 20 minutes, assuming the vessels travel at 28 knots in unrestricted areas. The one-way trip from Ballard to Pier 50 with a stop at Centennial Park would be approximately 35 minutes. Table 3 provides the estimated one-way and total round-trip travel times for each POF route.

Table 3: Approximate One-way and Round-Trip Times

	One-way Travel Time	Total Round-trip Time*
Shilshole Bay Marina to Pier 50	Approx. 20 minutes	Approx. 60 minutes
Shilshole Bay Marina to Centennial Park to Pier 50	Approx. 35 minutes	Approx. 70 minutes

**Includes up to 10 minutes on either end of transit route to load and unload passengers*

How many people would use POF service?

For people traveling between Ballard and downtown Seattle, comparing the potential POF route to existing transportation options indicates that a POF trip would be about 10 to 20 minutes longer than existing transit options. The ridership forecast assumed Shilshole Bay Marina has similar connections to the West Seattle POF terminal at Seacrest Park. Additionally, the ridership estimates are based on potential passengers that would not take the RapidRide D or future Link light rail. Refer to Appendix A Capital and Operating Cost Update, Attachment A.5 for assumptions made for travel time comparisons.

With a longer trip time, the Shilshole Bay Marina to Centennial Park to Pier 50 route is anticipated to have lower ridership than the direct Shilshole Bay Marina to Pier 50 Route. Therefore, the Centennial Park route option was not recommended for further analysis. Table 4 provides the estimated annual ridership for a Shilshole Bay Marina to Pier 50 route. The ridership forecast, again conducted prior to the COVID-19 pandemic, is provided in Appendix A Capital and Operating Cost Update, Attachment A.4 Ridership Memo.

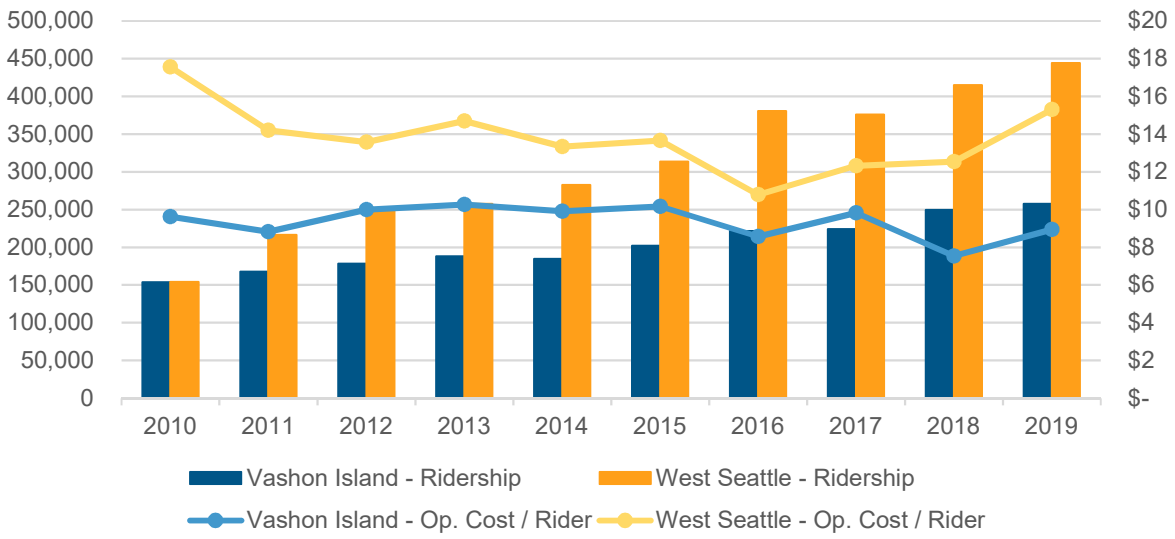
Table 4: Annual Ridership Forecasts for 2019, 2025 and 2040 (Rounded to nearest 5,000)

	2019	2025	2040
Shilshole Bay Marina to Pier 50	115,000	195,000	295,000
Shilshole Bay Marina to Centennial Park to Pier 50	100,000	180,000	275,000

How much would it cost to operate?

With ridership increasing over the past 10 years of service, the West Seattle and Vashon Island Water Taxi routes maintain an average operating cost per rider that is between $11 and $13. Figure 5 shows the operating cost per rider and ridership for the Vashon Island and West Seattle routes for the previous 10 years, demonstrating the growth in ridership as service reached maturity.

Figure 5: Historical Operating Cost per Rider vs. Ridership



Comparing the 2019 estimated performance of the Shilshole Bay Marina to Pier 50 route with the 2019 performance of the existing Water Taxi system, the Shilshole Bay Marina to Pier 50 route will cost more per rider, but will still achieve the Marine Division's system-wide farebox recovery goal of 25%. Table 5 shows the estimated 2019 system-wide totals for existing and new service.

Table 5: 2019 System-wide Estimated and Actual Performance Metrics

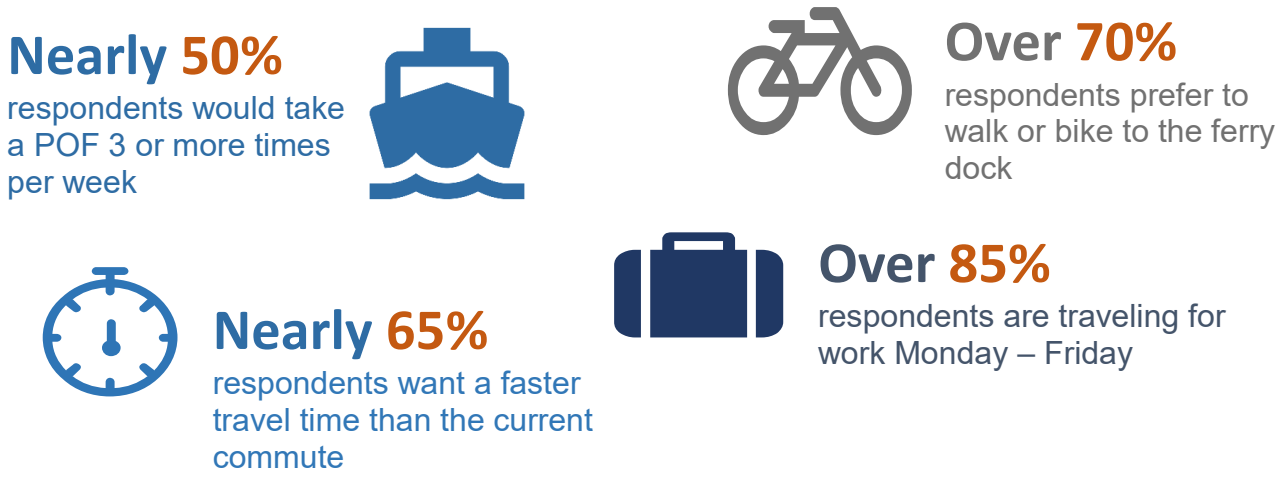
System Totals		Annual Operating Costs**	Annual Ridership	Farebox Recovery	Operating Cost per Rider
2019	Existing Water Taxi System (Vashon and West Seattle Routes)	$8.6 M	700,000	39%	$12.23
	Estimated Shilshole Bay Marina to Pier 50*	$4.0 M	115,000	14%	$34.82
	Existing System with Estimated Shilshole Bay Marina to Pier 50	$12.6 M	815,000	31%	$15.41

**Estimated costs for Ballard service start-up expressed in 2019 dollars.*
***Operating costs do not include debt service.*

What is the community interested in?

An online survey was conducted to gather input on the feasibility of POF service from Ballard to downtown Seattle, and to gain a better understanding of the public's preferences for POF service. During this approximately two-week surveying effort, rider bulletins were sent to seven Metro bus routes, emails were sent to local community-based organizations and partners, and the survey was shared via partner social media channels and through paid social media ads and boosted posts. This approach generated over 4,400 survey responses and over 1,600 comments to the open-ended questions.

The survey responses were generally positive indicating most people (nearly 50%) would take a POF three or more times per week. A majority of people that responded to the survey indicated they are traveling for work Monday through Friday, and that they are interested in a commute that is faster than their current mode. The majority of people (over 70%) expressed interest in walking or biking to get to the landing. For a more detailed summary of the survey results see Appendix E, Public Outreach Summary.

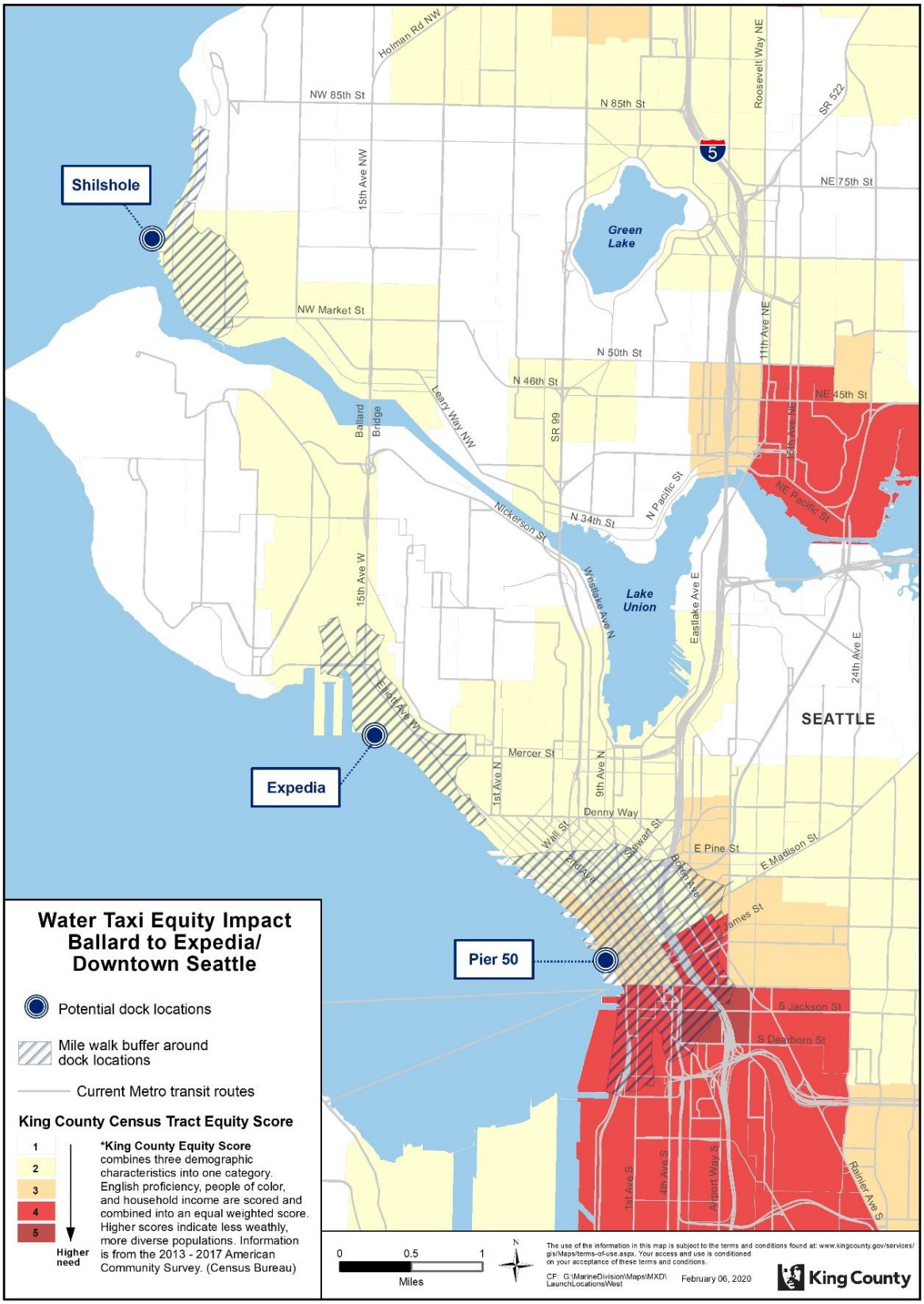


How do the POF routes align with equity goals?

To understand the equity impacts of the proposed POF route between Ballard and downtown Seattle, King County performed an Equity Impact Review (EIR) of the service. The EIR process merges quantitative and qualitative methods and is used to inform planning, decision-making, and implementation processes throughout King County. Based on this EIR (found in Appendix F) POF service would improve access for those living and working around Shilshole Bay Marina. Additionally, POF service would increase overall transit capacity and provide an added amenity in Ballard. However, the EIR found that the areas which would benefit from the Ballard to Downtown POF service have a population that is less diverse and also wealthier than King County averages. Figure 6 illustrates the equity scores associated with potential landings.

To improve access to POF service, it should be coupled with connections to time- and cost-competitive land-side service for all potential users, and offered with both peak commute and off-peak service. There are no existing transit connections at Shilshole, so improving walking, biking, and mobility access will need to be considered.

Figure 6: Equity Impact Review for Potential POF Service



What are the potential environmental impacts of POF service?

The Shilshole Bay Marina landing would require in-water and upland infrastructure, and would need to meet federal, state, and local environmental regulations prior to starting service. The following work would further define impacts and any necessary mitigating measures as a part of the environmental review in the design phase of project implementation:

- Preparing a biological evaluation.
- Evaluating potential impacts to threatened and endangered fish species at landing sites.

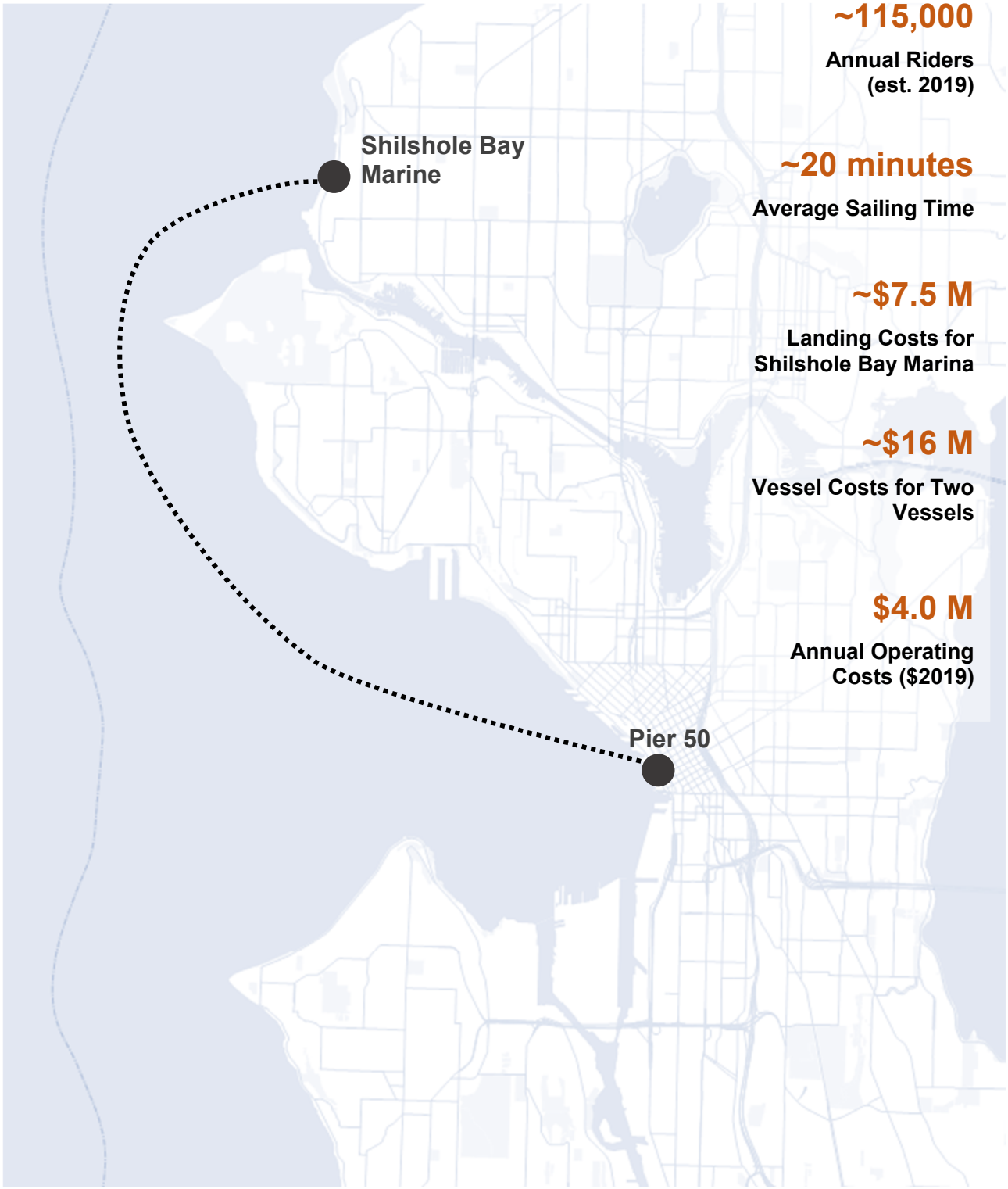
The Marine Division will consult with the Muckleshoot Indian Tribe and the Suquamish Tribe early in the environmental review process.

Carbon emissions produced would depend on the vessel propulsion system chosen. The Marine Division currently uses biodiesel to power vessels, which lessens environmental impacts as compared to conventional diesel. The Marine Division would explore the latest vessel propulsion technologies as well as alternative fuel/energy systems when procuring new vessels to serve this route. For more detail regarding potential environmental impacts of service see Appendix C.

King County Water Taxi Crossing Elliott Bay

RECOMMENDED ROUTE

Based on the ridership potential, community interest, and projected financial performance, the Marine Division recommends the Shilshole Bay Marina to Pier 50 route for implementation if a Ballard POF route was to be implemented.



Opportunities

Connecting people from the Ballard area to downtown Seattle would place riders within walking distance of the downtown Seattle business district, as well as Link light rail and bus options to connect them to their destination. POF service from Shilshole would complement future Link light rail by serving an adjacent geographic market. A POF landing at Shilshole Bay Marina could also provide a transit connection to recreational opportunities at Golden Gardens Park.

Though this service profile did not include a Centennial Park landing site, in the future, a stop at and/or new route from that location could be considered to provide more transit connections along the downtown Seattle waterfront.

Challenges

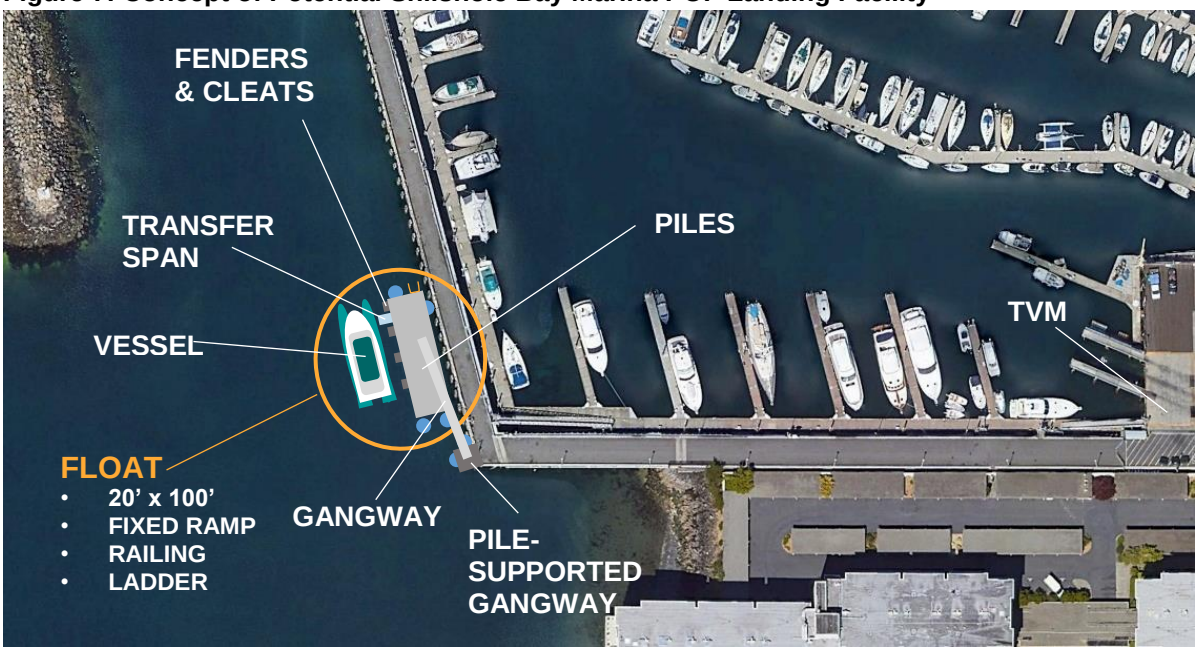
The Marine Division would need to improve accessibility and connections to adjoining neighborhoods to bring people to the Shilshole Bay Marina landing site. The Marine Division through partnership agreements with the Port of Seattle would encourage accessibility to the landing site at the marina.

Shilshole Bay Marina Landing

The Shilshole Bay Marina landing requires upgrades to the existing facilities to accommodate POF service. In-water improvements would install a new float to accommodate POF service. Adjacent to the POF facility, passenger walkways would need to be improved along with the addition of ticketing kiosks.

In order to move toward the implementation of the route, the Marine Division would continue working with the Port of Seattle to collaborate on a design. Figure 7 provides a concept for a Shilshole Bay Marina POF landing.

Figure 7: Concept of Potential Shilshole Bay Marina POF Landing Facility

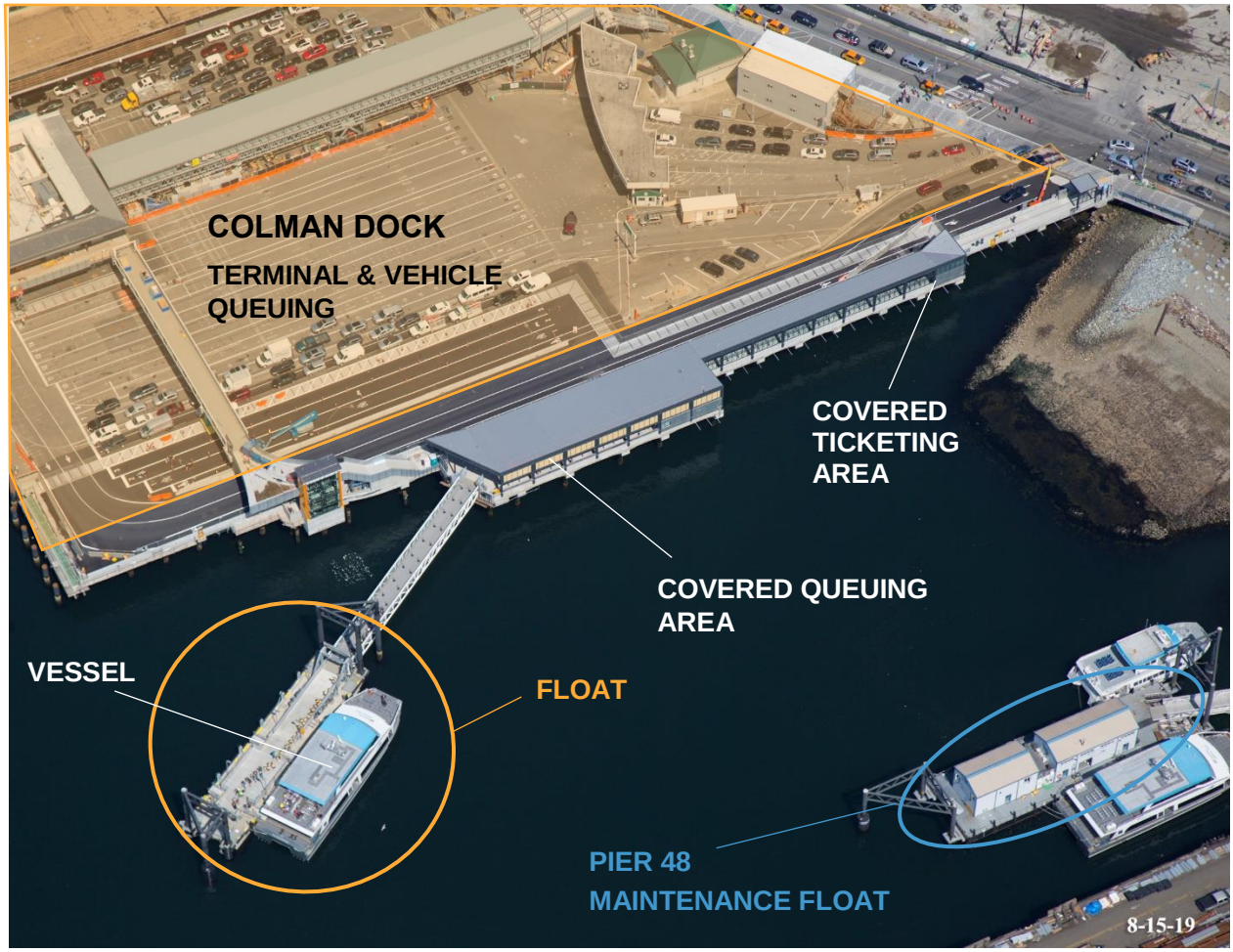


PIER 50 LANDING

In 2019, the Marine Division completed improvements to the Pier 50 POF facility that includes a covered shelter to accommodate up to 500 passengers, improved access to Alaskan Way, a crew office, and a new float accommodating two vessels at one time. As part of the Seattle Multimodal Terminal Facility at Colman Dock, Pier 50 is connected to the Washington State Ferries terminal via a pedestrian walkway. Pier 50 serves as the downtown POF hub, providing a landing site for the Marine Division's two existing routes and the Kitsap Fast Ferries two routes with a third Kitsap County route anticipated in 2020. This location is also close to the Marine Division's Maintenance Facility at Pier 48 allowing easy access to service vessels.

The interest in bringing people to downtown Seattle via POF service is growing. However, the new Pier 50 POF hub likely cannot accommodate additional routes while maintaining the desired service schedule for those routes. Partnerships with current and future operators will be essential to increasing capacity to bring future POF routes to downtown Seattle. Figure 8 illustrates the current Pier 50 POF facility, Colman Dock, and the Marine Division's Maintenance Facility.

Figure 8: Overview of the Existing Pier 50 POF Landing Facility



PERMITTING

Each landing would require review and approval from the following agencies:

Shilshole Bay Marina

- Federal: U.S. Army Corps of Engineers and National Marine Fisheries/U.S. Fish and Wildlife
- State: Washington Department of Fish and Wildlife, Washington State Department of Natural Resources, Washington Department of Archeology and Historic Preservation
- Local: City of Seattle

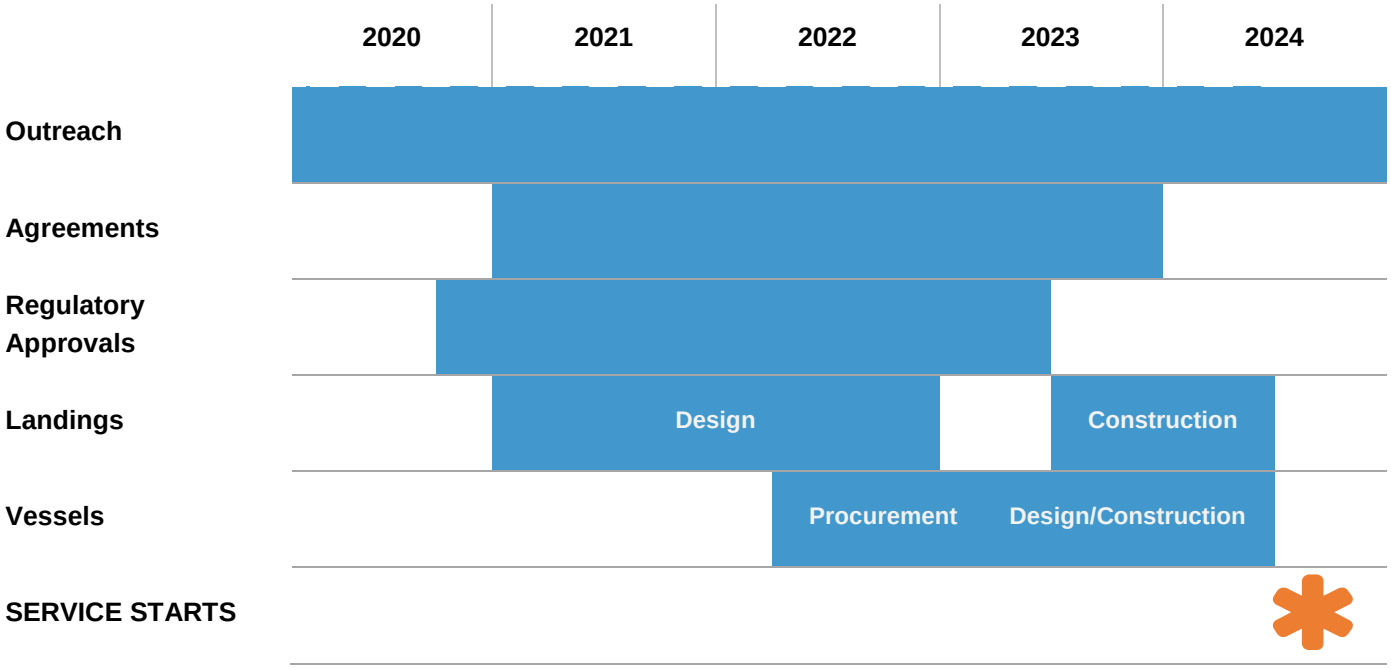
Pier 50

- None

IMPLEMENTATION TIMELINE

The implementation timeline includes several key milestones: reaching agreements with property owners, obtaining regulatory approvals, designing and constructing landings, and designing and constructing vessels. This timeline is based on securing the funding necessary to move forward with implementation. Assuming work beginning in 2021 on the regulatory process and initial landing design, the Shilshole Bay Marina to Pier 50 POF route would likely begin service in 2024. Figure 9 provides an example timeline for beginning service. The impacts of the COVID-19 pandemic on the economy and funding landscape could affect this timeline.

Figure 9: Example Timeline for POF Route Implementation



NEXT STEPS

Implementing POF service between Shilshole Bay Marina and Pier 50 requires forming partnerships with property owners, securing necessary funding for capital improvements and operating costs, tribal consultation, continuing stakeholder outreach and community engagement, as well as beginning the regulatory process for approval.

PARTNERSHIPS

Though initial outreach has been conducted with potential partners such as the Port of Seattle, final agreements would need to be reached to ensure full support of POF route implementation moving forward. This requires continued meetings to identify and address stakeholder interests.

FUNDING OVERVIEW

This section provides a high-level overview of the potential ways for funding the implementation of the Ballard POF route. It is intended to be representative of what would be required to establish secure funding supporting the service over a twenty-year timeline.

Implementing POF service requires capital investment and a sustainable funding source to support operating costs. Capital investments can be funded through a combination of grants, local sources, and debt service. Operating costs would be funded through an increase to the existing dedicated POF property tax levy supplemented with passenger fare revenue.

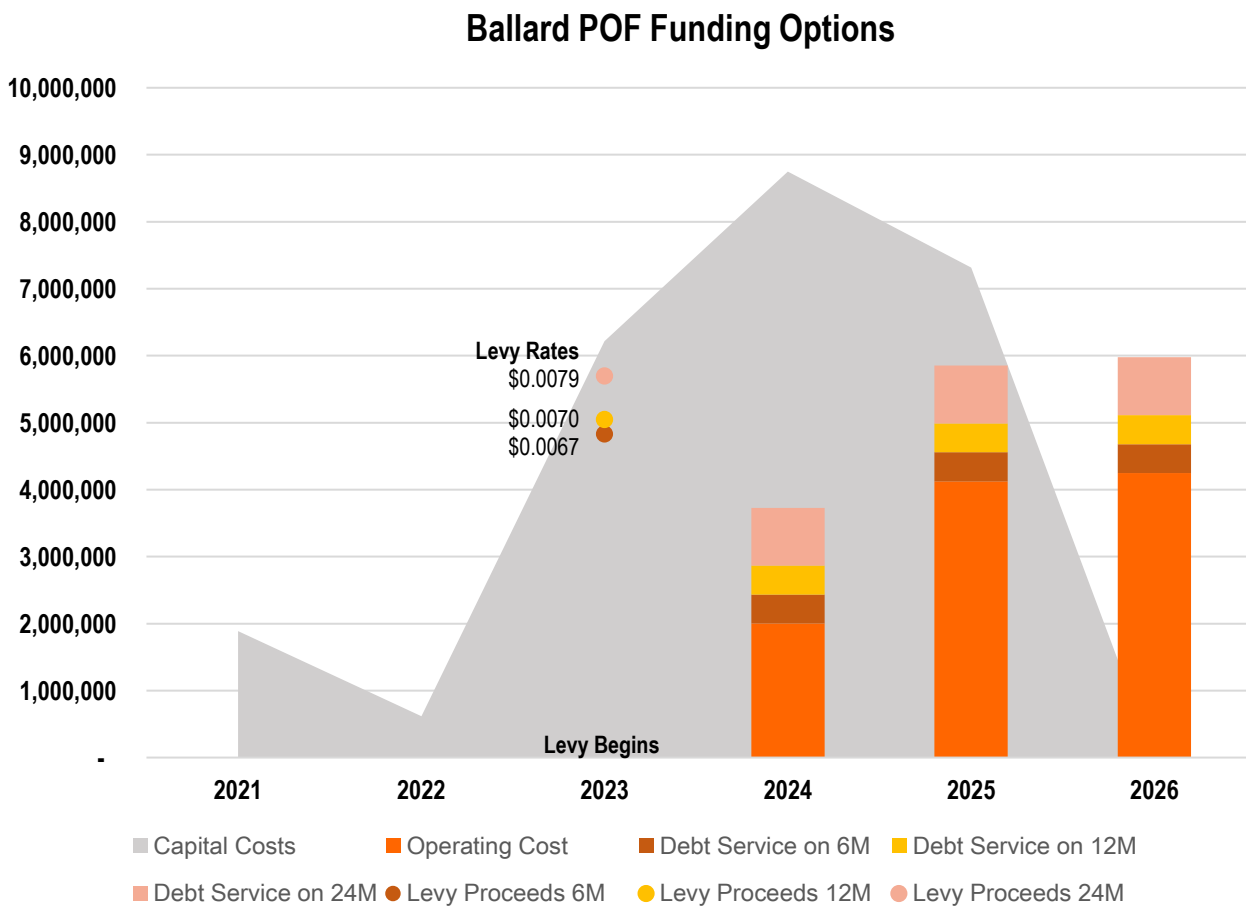
The capital investment and ongoing operating costs for a new Ballard POF route have been calculated using high level estimates based on the timing of implementation and include an annual inflation rate. The estimates are subject to change based on further detailed planning, partnership agreements, and the timing of funds being secured to support the service.

The Marine Division's current primary funding source is a dedicated property tax levy that is supported by passenger fares, federal grants, and bond issuance for capital investments. The property tax levy is currently set at a rate to sustain existing operations. Adding new service would require a complete analysis of all funding sources projected into the future.

Based on current funding assumptions and initial timing of investments, Figure10 illustrates the total investment outlay over time using three examples of funding combinations to support the implementation of Ballard POF service.

The examples in Figure 10 show the property tax levy rate (that would need to be levied in order to fund the ongoing operating costs) as well as the debt service on three levels of bond funding. The highest bond issuance assumption is $24M, with no support from grants or partnerships. The second assumption shows bonds at $12M and grants and other support of $12M. The third assumption shows bonds at $6M and grants and other support of $18M. In each of the examples, the levy rate would range between $0.0067 and $0.0079 per $1,000 of assessed property valuation, respectively. In comparison, the existing levy rate that funds the Vashon Island and West Seattle routes is $0.0125 per $1,000 of assessed property value.

Figure 10: Ballard POF Funding Options



*The graph assumes the balance of the capital costs to total $24M would come from grants or partnerships.

**The levy rate is calculated based on the valuation of property. Example: $400,000 home would be assessed $2.68 per year at levy rate $0.0067.

Potential Grant Funding Options

The Marine Division has a successful history in seeking and securing grants for many of their past capital projects, and would seek out as much grant funding as possible for any new capital projects. The following grant opportunities are available for these capital investments:

- Federal Highway Administration (FHWA) - Ferry Boat Program

- Federal Transit Administration - Passenger Ferry Grant Program Section 5307, and Section 5337
- Department of Transportation - Better Utilizing Investments to Leverage Development (BUILD) Grant
- Other Federal Transit Administration competitive and earned shared grants

OUTREACH

Outreach will continue and extend throughout the POF implementation phase. Engaging local agencies, tribes, property owners, and continuing public outreach throughout the development of landing sites will be key to a successful POF route implementation.

Agreements

The Marine Division has met with the Port of Seattle to discuss potential POF service and to begin to understand their needs and concerns. The next steps for service implementation will include developing use and lease agreements for the specific site locations identified prior to POF landing site development.

Ongoing Agency Coordination

As part of this Proviso, the Marine Division reached out to the local agencies and owners to discuss opportunities and challenges of POF service. With a route defined, meetings and coordination with the appropriate agencies will continue throughout the route implementation process. Regular communications with key agencies will be essential throughout the permitting process that is required for terminal construction and POF service implementation.

Continued Public Outreach

Prior to implementing the Shilshole Bay Marina to Pier 50 POF route, the Marine Division will continue community engagement. This engagement will be conducted to support next steps in the regulatory process. Outreach efforts will be conducted to provide information and seek public input through community meetings, public comment periods, and publicizing key route information.

Equity and Social Justice

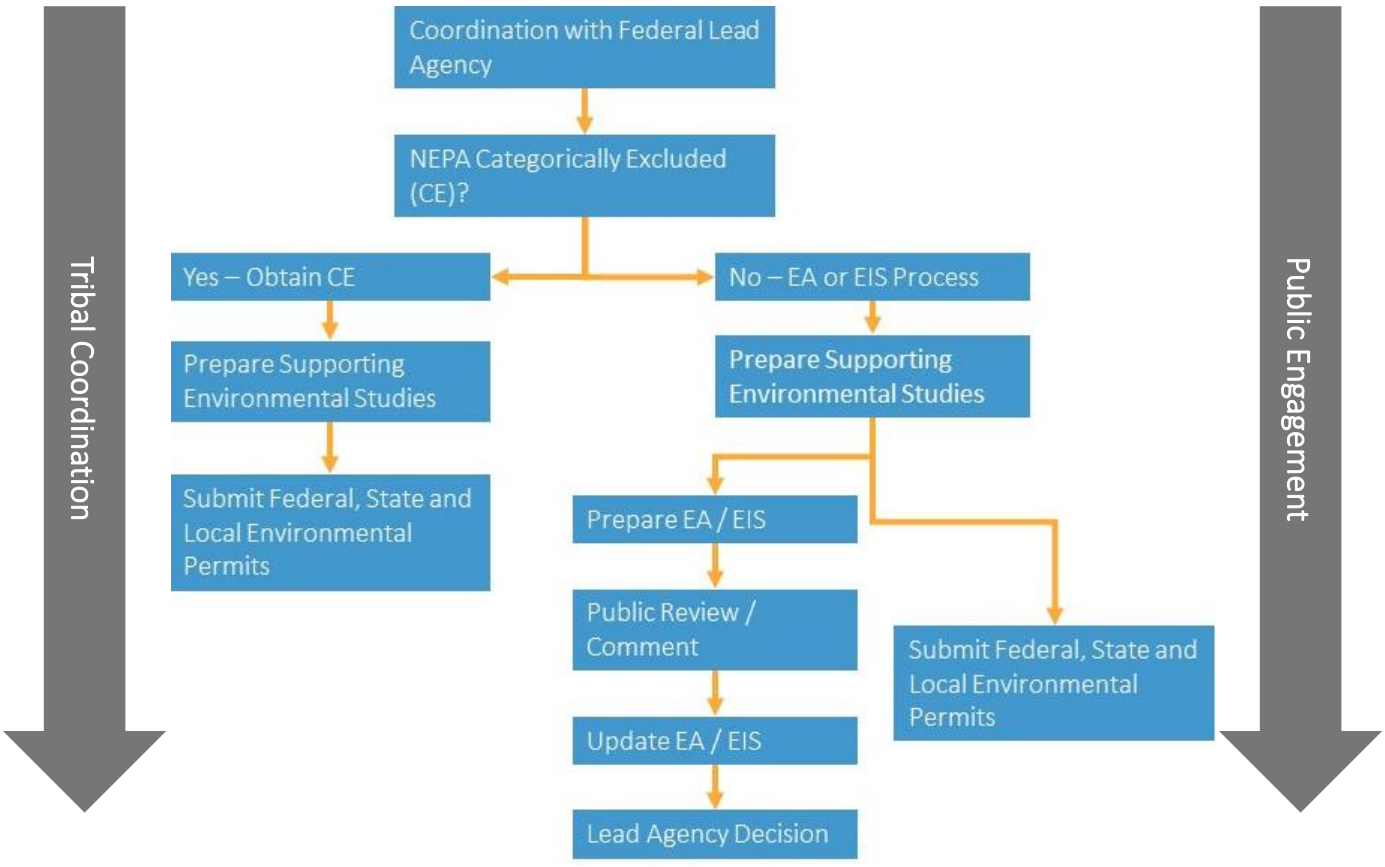
In addition to seeking public input on the route, community engagement will also focus on gathering feedback to understand how the new POF route can further Metro's equity and social justice goals. This includes seeking input on which types of modes would increase accessibility to the Shilshole Bay Marina and identifying barriers to people choosing POF service.

REGULATORY APPROVALS

Compliance with the National Environmental Policy Act (NEPA) would be required for this project if federal funds are used for project implementation. This process requires coordinating with the lead agency as soon as possible, to determine if the project is considered to be categorically excluded or an impact. Depending on the determination, the project may need to proceed with an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). Based on the determination, the Marine Division would prepare environmental studies needed to support the review process.

Landing site development will also require review and approval from other federal, state, and local agencies. Figure 11 illustrates the regulatory process anticipated for implementing a POF route.

Figure 11: Summary of Regulatory Processes Needed for POF Implementation



APPENDIX A:
CAPITAL AND OPERATING PROGRAM

CAPITAL AND OPERATING PROGRAM

The purpose of this appendix is to provide an update to the 2015 Ferry Expansion Options study evaluating the necessary facilities, capital costs and operating costs associated with implementing a passenger-only ferry (POF) route from Ballard to downtown Seattle.

APPROACH

Two potential POF routes from Ballard were identified: Shilshole Bay Marina in Ballard to Pier 50 in downtown Seattle, and Shilshole Bay Marina to Pier 50 with a mid-route stop at the Fishing Pier at Centennial Park near the new Expedia campus. The three potential landing sites were assessed for compatibility with POF service, and route options were developed.

SITE IDENTIFICATION Using the previous expansion studies completed in 2009 and 2015 as a basis, potential landing sites were identified that could support POF service to and from Ballard. A market area analysis was conducted to illustrate key employment locations for Ballard residents and commuters. Sites that offered potential connections to significant employment destinations were carried forward for a site assessment.

SITE ASSESSMENT Site visits and research were conducted to develop comprehensive site profiles that identify challenges and opportunities with each potential landing site. The site assessment included evaluating access to and from the landing site, the regulatory framework to consider when developing a landing site, navigational considerations, and existing infrastructure. Additionally, potential infrastructure improvement options were developed for each landing site along with rough order of magnitude (ROM) cost estimates. Stakeholder outreach helped to inform the site assessment; for more information please see Appendix D.

ROUTE DEVELOPMENT For each site assessed, potential route combinations were mapped and operating assumptions were developed to identify service levels, travel time and ROM operating costs. Travel time comparisons with existing transportation modes were analyzed and compared to estimated POF travel time, and the resulting ridership estimates based on these characteristics were quantified.

POTENTIAL LANDING SITES

SITE IDENTIFICATION

Sites Previously Reviewed

Building on the 2009 and 2015 studies and with the growth in Seattle, Ballard continues to be an option for expanding POF service in Puget Sound. In 2015, the street end at 24th Avenue NW along the Ship Canal was reviewed as a potential POF landing site for a route connecting to South Lake Union, but was not recommended due to the long travel time required through the Ballard Locks. Alternatively, Shilshole Bay Marina was studied as the potential landing site for Ballard. The 2015 study found that despite existing transit connections being limited at Shilshole Bay Marina, a potential POF route to Pier 50 was projected to develop into a well utilized route.

The existing POF landing at Pier 50 was identified as a preferred downtown Seattle landing site in previous POF expansion studies because of the existing infrastructure, as well as connections to job sites and transit.

Market Analysis

To understand where people are traveling and if other POF landing sites should be considered in this study, a market area analysis was conducted. This analysis identified prominent employment centers for Ballard residents such as downtown Seattle, the First Hill area, Pacific Tower on Beacon Hill, South Lake Union and the University of Washington. Other smaller employment areas including Fremont and Seattle Children's Hospital were also identified as key destinations for Ballard commuters. The detailed Market Area Analysis is included as Attachment A.1.

As downtown Seattle represented the greatest volume of jobs accessible via a potential POF service, this study focused on a route serving Ballard to downtown Seattle. The new King County owned Pier 50 POF terminal was identified as the downtown Seattle landing site.

Why not South Lake Union?

The Ship Canal and South Lake Union are no-wake zones with vessel speeds restricted to no more than 7 knots. The speed restrictions make a POF trip from Ballard to South Lake Union slower than other modes. As a result, a POF route from Ballard to South Lake Union was not evaluated in this study.

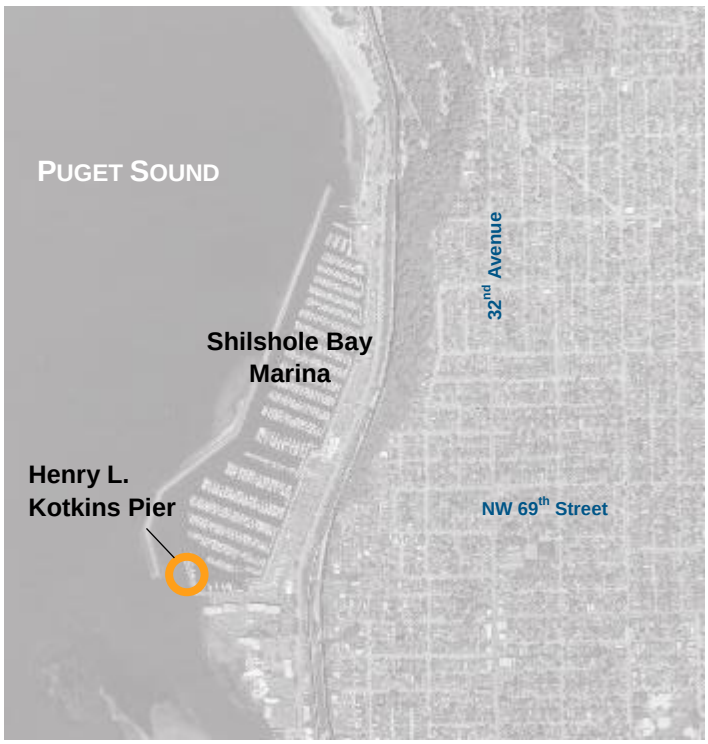
Since the 2015 study, the Expedia campus moved from Bellevue to the Interbay neighborhood bringing an additional 4,500 jobs to the neighborhood. The Centennial Park Fishing Pier is directly adjacent to the new Expedia Campus, which opened to employees in late 2019 and is scheduled for completion in 2020. Consequenttly, Centennial Park was added to the study as a Potential POF landing site, due to its proximity to this new major employment destination along the waterfront.

SITE ASSESSMENT

Three potential landing sites were identifed for this route: Shilshole Bay Marina in Ballard, Pier 50 in downtown Seattle, and Centennial Park. To assess the feasibility of each site for POF service, this study evaulated the neighborhood context and adjacent land use, the regulatory framework that governs the site, the vessel navigational considerations, as well as any existing infrastructure. Based on this information, site improvement recommendations were developed along with ROM capital costs. Site assessment findings are summarized in the following section, and detailed in the Site Profiles included in Attachment A.2.

Ballard - Shilshole Bay Marina

Figure 1. Potential Shilshole Bay Marina Landing Site



Shilshole Bay Marina is owned by the Port of Seattle, and offers over 1,400 moorage slips for various sized vessels. The marina has upland infrastructure that could support POF operations; however, a float and ramp would need to be installed and pedestrian access is limited by security gates. Additionally, there are currently no transit connections to the marina and few areas available for parking, though the location is near to well-travelled walking and biking trails. Public street parking is available near the marina and additional parking could be made available nearby. The marina is separated from downtown Ballard by a residential area and providing first/last mile connections to the marina would be necessary to connect the residential area to the marina. This study focuses on the preferred location of the Henry L. Kotkins pier, but additional slips could be considered as options for POF service.

Interbay - Centennial Park

Centennial Park is currently home to the Centennial Park Fishing Pier and is adjacent to the new Expedia Campus that is currently under construction. The campus is scheduled to be completed in 2020. A POF route that stops directly at the park could provide both commute and recreational opportunities. However, the Fishing Pier in Centennial Park is currently closed due to structural issues. The Port of Seattle, Washington Department of Natural Resources and Expedia are partnering to redevelop the pier including adding improvements that would support POF service.[1]

[1] https://thelens.news/2019/03/21/salvaging-elliott-bays-fishing-pier/ and discussions with the Port of Seattle on 11/13/19.

Downtown Seattle - Pier 50

King County Marine Division (the Marine Division) owns and operates the downtown Seattle POF facility at Pier 50. KCMD recently constructed this new ADA accessible POF facility that includes a heated, covered waiting area for up to 500 passengers along with a new float that accomodates two POF vessels simultaneously. Pier 50 currently serves as a POF terminal for KCMD routes to West Seattle and Vashon Island, as well as for Kitsap Transit (KT)'s Fast Ferry routes from Bremerton and Kingston. The redevelopment of the Seattle waterfront has improved pedestrian connections from the waterfront to downtown Seattle. While Pier 50 is the optimal location for a Ballard to downtown Seattle route, the Pier 50 float is reaching capacity during peak commute periods and additional routes, such as the Kitsap Transit Southworth – Seattle route, may necessitate construction of an additional float. The Southworth route is expected to begin operating in 2020.

SITE SUMMARIES

For each potential landing site, the following elements were evaluated:

- Accessibility and connectivity: how easy or difficult it is to access the site via a variety of mobility options and potential for future mobility connections
- Neighborhood context and long-range planning: the nearby uses of properties adjacent to the site and planning efforts by local jurisdictions that impact the site and surrounding areas
- Regulatory framework: zoning requirements related to POF use and regulatory approvals that may be necessary to construct a POF landing
- Navigational considerations: exposure, water depth, and navigational obstacles
- Infrastructure: overwater and uplands infrastructure currently at the sites, and overwater and uplands infrastructure required to support POF service

Attachment A.2 includes the comprehensive site profiles for each landing site reviewed. Table 1 provides a site summary for each site reviewed.

Table 1: Site Summary

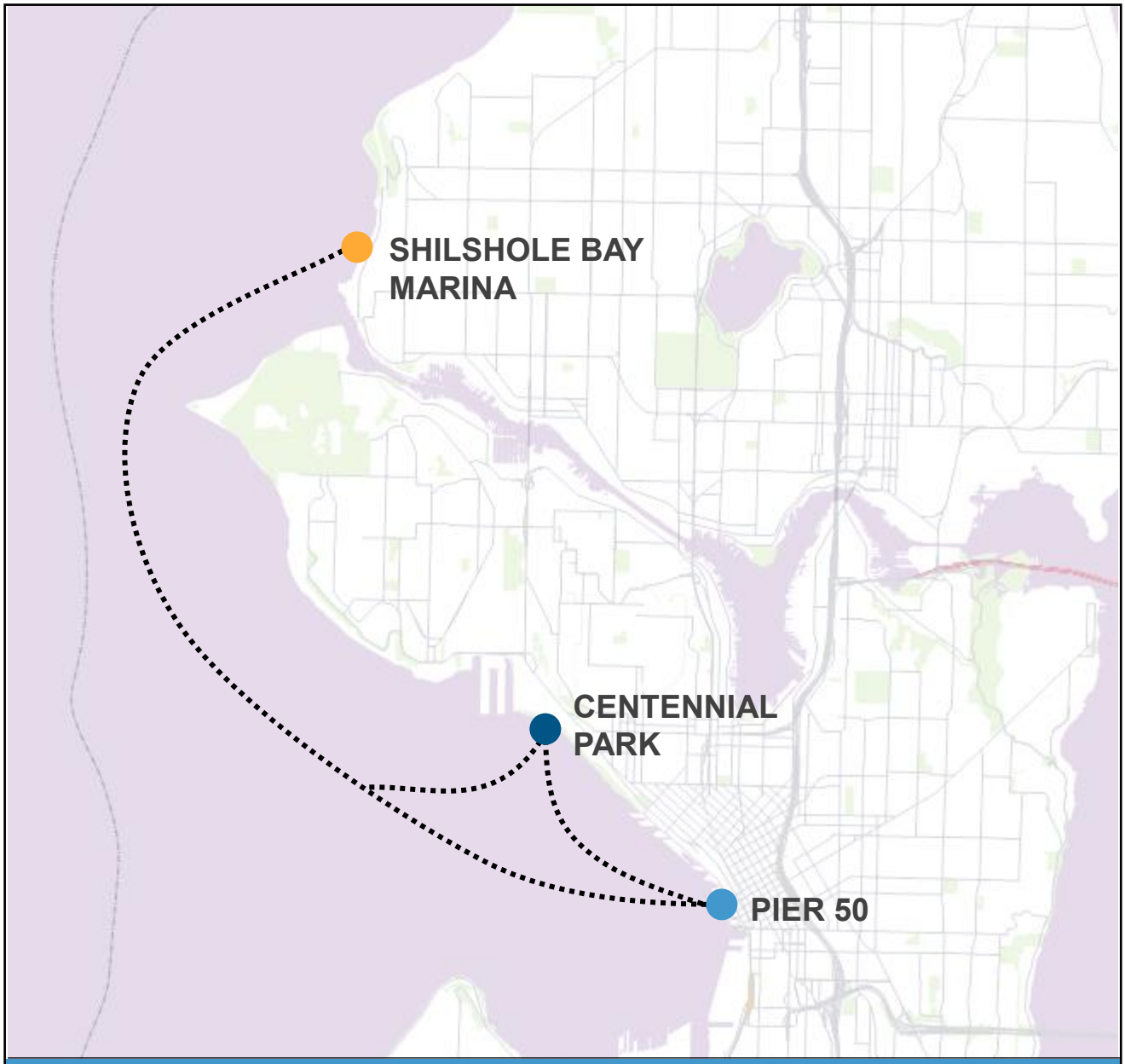
	Proposed Infrastructure	ROM Capital Cost	Challenges	Opportunities
Shilshole Bay Marina	» New float/ramp » Minor uplands improvements	» $7.5 M	» Dedicated access and connections to/from Shilshole Bay Marina »	» Ample space available for access improvements (car, transit, bike, & pedestrian) » Recreational connections to Golden Gardens Park » Port is willing to discuss operating arrangements.
Centennial Park	» Provided by others	» N/A	» Unknown timing for pier redevelopment » Exposure to inclement weather	» Existing pedestrian and bike connections » Alignment with pier replacement project » Public/private partnership
Pier 50	» None	» N/A	» Vessel docking capacity constraints with existing POF routes during peak commute periods	» Ready to support a new route » Proximity to Marine Division-owned Pier 48 Maintenance Barge

ROUTE DEVELOPMENT

Routes connecting the three sites were mapped to determine sailing times based on route distances and operating parameters (such as vessel transit speed, slowdown zones, and vessel maneuvering). These sailing times were used to identify the travel time comparisons of each route to other travel modes including car and transit. Along with sailing times, operating assumptions such as the time required for passenger loading and unloading, vessel fueling, and vessel moorage/maintenance were developed to prepare potential service schedules. Proposed service schedules and operating assumptions provided the basis for ROM operating cost estimates. Operating assumptions are detailed in Attachment A.3.

POTENTIAL ROUTES

Proposed POF Route
Landing Sites



SHILSHOLE TO PIER 50

22 min — 8.0 nautical miles

SHILSHOLE TO CENTENNIAL PARK

18 min — 6.3 nautical miles

SHILSHOLE TO CENTENNIAL PARK TO PIER 50

34 min — 8.7 nautical miles

*Sailing times assume a vessel cruising speed of 28 knots outside of requisite slow down zones and landing approach.

SERVICE PROFILE

Service levels and operating assumptions (schedule, fleet, maintenance, fueling) were generated based on the route profiles and characteristics of existing POF service in the region. ROM implementation costs were estimated based on the service levels and operating assumptions. Route, operating, schedule, and cost assumptions are detailed in Attachment A.3.

Service Levels

Service level considerations include the frequency and number of sailings that would be provided, the seasonality of schedules, and how many and what type of vessels would deliver service. For this study, proposed service levels were modeled on existing POF services in the region and the service needed to meet typical travel needs for commute and discretionary trips. The frequency of service based on one vessel delivering service:

- Shilshole to Pier 50: 1 hour round-trip
- Shilshole to Centennial Park to Pier 50: 1 hour 10 minutes round-trip

Schedule

Year-round service was assumed for this route, with a seasonal variation in the summer months. Commute service included six daily round-trips provided on weekdays, year-round. These trips were developed to meet commuter needs of typical morning arrival in Seattle and evening departure times. Expanded service would be provided six months of the year with mid-day, evening and weekend service. Service schedules can be summarized as follows:

Commute Service

6 months – October through March

- Weekdays: 6 daily round trips, morning and evening commute periods
- Saturdays: 8 daily round trips
- Sundays: No service

Expanded Service

6 months – April through September

- Monday-Thursday: 14 daily round trips, commute and mid-day
- Friday: 17 daily round trips, commute, mid-day and evening
- Saturdays: 13 daily round trips
- Sundays: 10 daily round trips

Fleet

One of the benefits of POF vessels is being flexible and adaptable to serve other routes if a vessel needs maintenance. Based on the current vessels operating in the Puget Sound region, the following fleet assumptions were used for this study:

- Size: 150 passengers (roughly 80-feet long).
- Propulsion: Diesel propulsion with four main engines was assumed for this analysis. Best available hybrid vessel technologies (diesel-electric, diesel-battery, etc.,) would be explored to meet King County sustainability goals..
- Crew: Crew of three (one captain and two deckhands).

- Fleet Size: This service schedule could be provided with a single vessel. A backup vessel is assumed to increase reliability of the service.

Maintenance

It is assumed that moorage and maintenance would occur at the Marine Division's Pier 48 Maintenance Facility. Typical light maintenance activities include vessel cleaning, fluid monitoring, equipment monitoring, propulsion and auxiliary systems maintenance, and minor repair and preservation activities. Costs of these activities are included in the operating costs estimates found in Attachment A.7 Operating Cost Profiles. Heavy maintenance activities, such as work requiring dry docking, are assumed to be conducted at local area shipyards.

Fueling

The proposed service schedule and estimated operating costs assume that all fueling would occur at Maxum Petroleum located on Harbor Island (approximately 10-minute sailing distance from Pier 48/50), where the King County Water Taxi vessels currently fuel.

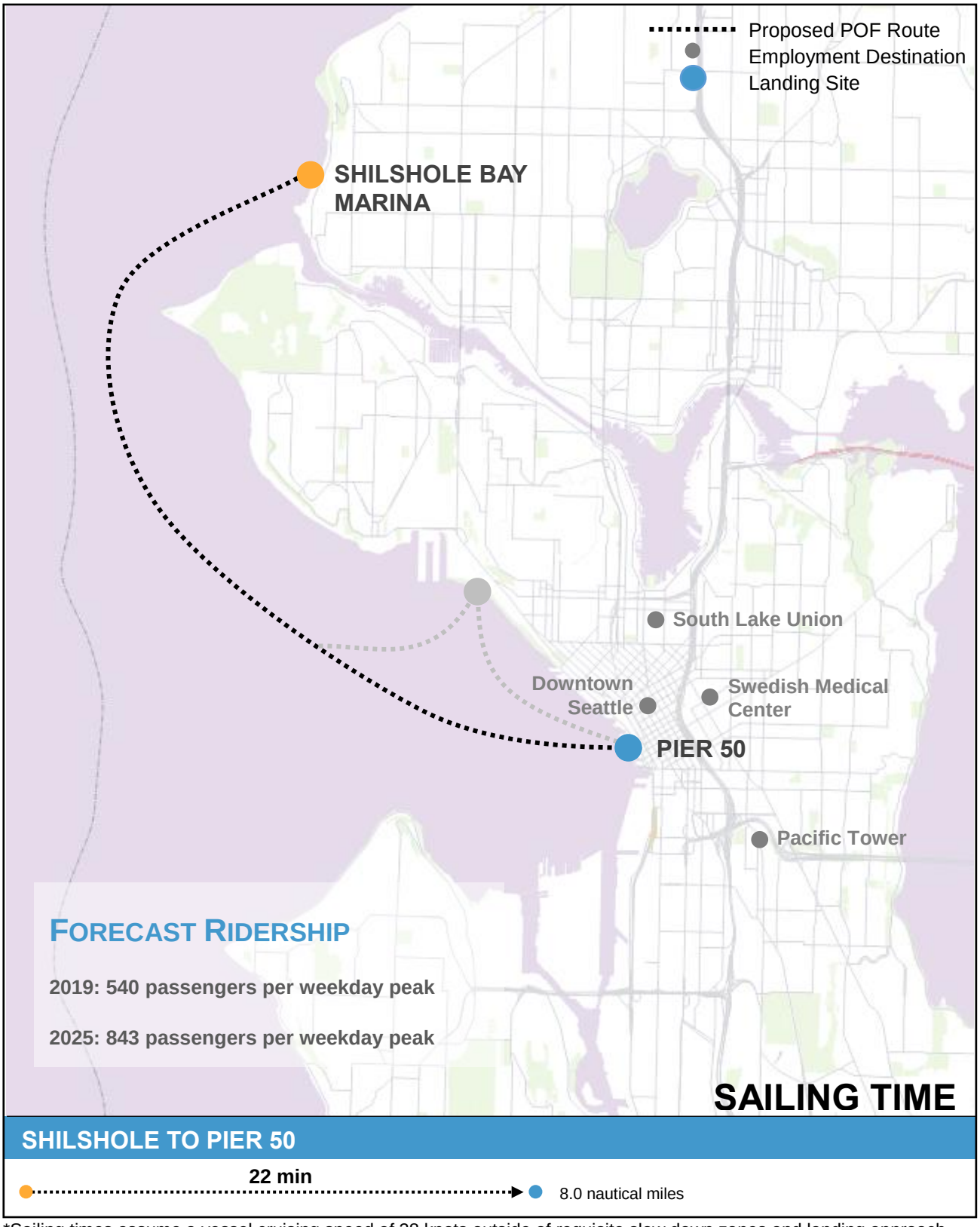
ROUTE PROFILES

Based on the operating assumptions, the Shilshole to Pier 50 and Shilshole to Centennial Park to Pier 50 route configurations were analyzed for the following components:

- Route distances and sailing times
- Ridership (See Attachment A.4 for the detailed ridership analysis)
- Travel time comparisons (See Attachment A.5 for the travel time calculations)
- ROM capital and operating costs for each route (See Attachments A.6 and A.7 for ROM cost worksheets)

With only two stops, the Shilshole to Pier 50 would provide a faster trip for people traveling to/from downtown Seattle from Ballard. Additionally, the operating costs would be slightly less with less fuel consumption. The following sections detail the route profiles for the Shilshole to Pier 50 and Shilshole to Centennial Park to Pier 50 route configurations.

SHILSHOLE TO PIER 50



*Sailing times assume a vessel cruising speed of 28 knots outside of requisite slow down zones and landing approach.

TRAVEL TIME COMPARISONS

The travel times below compare ferry trip times for a direct sailing from Shilshole Bay Marina to Pier 50 to trip times for car and existing transit to major employment destinations in Seattle. These Seattle destinations include the First Hill Medical Campus, downtown Seattle, South Lake Union and the Pacific Tower building on Beacon Hill. See Attachments A.3 and A.5 for a full list of assumptions and travel time comparisons. As illustrated in the table below, POF service would provide a faster trip for people making the evening commute to Ballard from the Pacific Tower or a comparable trip for people traveling to Ballard from the First Hill Medical Campus, compared to existing transit options.

Origin/Destination	Car	Bus Transit	Ferry	Direct Ferry vs. Existing Transit
First Hill Medical Campus / 24th Ave NW and NW 85th St	26-55 minutes	55 minutes	56 minutes	**1 minute slower**
Downtown Seattle / 24th Ave NW and NW 85th St	22-57 minutes	37 minutes	50 minutes	**13 minutes slower**
South Lake Union / 24th Ave NW and NW 85th St	22-42 minutes	33 minutes	54 minutes	**24 minutes slower**
Pacific Tower / 24th Ave NW and NW 85th St	28-55 minutes	64 minutes	54 minutes	**10 minutes faster**

*Evening (PM) commute period shown

COSTS

A Shilshole to downtown Seattle route would require two vessels (one in service and one backup) and infrastructure improvements at Shilshole Bay Marina. Pier 50 is not anticipated to require capital improvements.

Route	Terminal Capital Costs ($2019)	Vessel Capital Costs ($2019)	Annual Operating Costs in Year 1 ($2019)
Shilshole to Pier 50	$7.5 M	$15.4 M	$4.0 M

SHILSHOLE TO CENTENNIAL PARK TO PIER 50

*Sailing times assume a vessel cruising speed of 28 knots outside of requisite slow down zones and landing approach.

TRAVEL TIME COMPARISONS

The travel times below compare ferry trip times to trip times for a car and existing transit to major employment destinations in Seattle including the First Hill Medical Campus, downtown Seattle, South Lake Union and the Pacific Tower building. See Attachments A.3 and A.5 for a full list of assumptions and travel time comparisons. As illustrated in the table below, POF service would a comparable trip for people traveling from the Pacific Tower or Expedia in the evening commute compared to existing transit options. However, trips from other locations would be more than 10 minutes slower compared to the other transit options.

Origin/Destination	Car	Bus Transit	Ferry	Direct Ferry vs. Existing Transit
First Hill Med. Campus / 24th Ave NW and NW 85th St	26-55 minutes	55 minutes	69 minutes	**14 minutes slower**
Downtown Seattle / 24th Ave NW and NW 85th St	22-57 minutes	37 minutes	63 minutes	**26 minutes slower**
South Lake Union / 24th Ave NW and NW 85th St	22-42 minutes	33 minutes	70 minutes	**37 minutes slower**
Pacific Tower / 24th Ave NW and NW 85th St	28-55 minutes	64 minutes	67 minutes	**3 minutes slower**
Expedia Campus / 24th Ave NW and NW 85th St	16-35 minutes	31 minutes	34 minutes	**3 minutes slower**

*Evening (PM) commute period shown

COSTS

A Ballard to Centennial Park to downtown Seattle route would require two vessels (one in service and one backup), and infrastructure improvements at Shilshole Bay Marina and Centennial Park. Infrastructure improvements at Centennial Park would be complete by others. The downtown Seattle landing site, Pier 50, would not require capital improvements.

Route	Terminal Capital Costs ($2019)	Vessel Capital Costs ($2019)	Annual Operating Costs in Year 1 ($2019)
Shilshole to Centennial to Pier 50	$7.5 M	$15.4 M	$4.1 M

Attachment A.1

Market Area Analysis

PRELIMINARY EMPLOYMENT DESTINATION MAPPING

This attachment includes a preliminary analysis created by BERK with the goal of roughly mapping the places of employment for people who live in the Ballard home market area. This home market area is roughly drawn and is meant to include home locations for which a new passenger-only ferry (POF) could be a potentially reasonable option for commute travel. The purpose of this analysis is to help determine which potential routes and landing sites might include significant demand for commuter travel.

Following the memo is a map of BERK's findings related to the Ballard home market area employment destinations.

PRELIMINARY EMPLOYMENT DESTINATION MAPPING

This memo shows very preliminary work to map the places of employment (in 2015) for people who live in home market areas shown with a yellow/orange boundary in each map. These market areas are very roughly drawn and meant to include home locations for which a new passenger ferry could potentially be a reasonable option for commute travel. Additional analysis will be required to more carefully determine where passenger ferry travel could be reasonably time competitive, and what other trip purposes (e.g., school or recreation) may be served by passenger ferry service. The purpose of these maps is simply to help determine which proposed routes might include significant demand for work commute travel, and which do not.

The map on the following page is supplemented by Table 1 below showing the sum of employment within the 15-minute walksheds around potential ferry landing sites, for those employees who live in the given market area.

Ballard to Seattle Destinations

Note: The home market area in this map is drawn for commuters with destinations in downtown or via a transit connection from downtown.

This map shows that both Downtown Seattle and the waterfront area north of downtown (near the future Expedia HQ) have significant job density among residents living in the Ballard area.

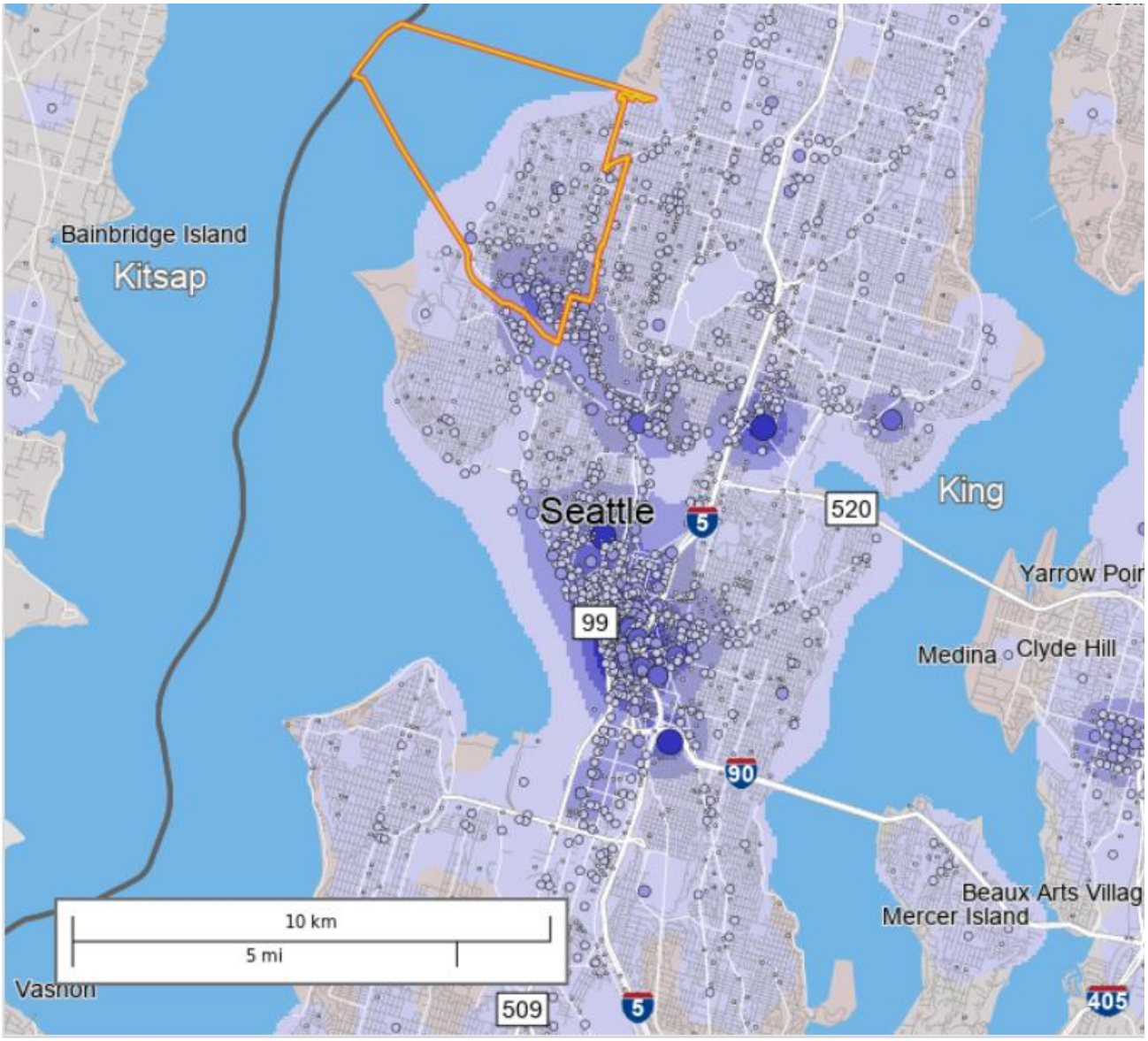
Table 1. Employment Comparisons in Destination Walksheds, Ballard to Downtown Seattle

POTENTIAL FERRY LANDING SITE	MARKET AREA	JOBS IN 15-MIN WALKSHED FROM FERRY LANDING
Interbay	Ballard	179
Downtown-Pier 50	Ballard	2,327

Note: The number of jobs does ***not*** reflect all jobs in the 15-minute walksheds from the destinations, rather it reflects the number of jobs held by employees who live in the given ferry origin market area.

Source: US Census OnTheMap LEHD, 2015; BERK, 2019

Figure 1: Ballard Market Area



Map Legend

Job Density [Jobs/Sq. Mile]

- 5 - 185
- 186 - 725
- 726 - 1,626
- 1,627 - 2,887
- 2,888 - 4,509

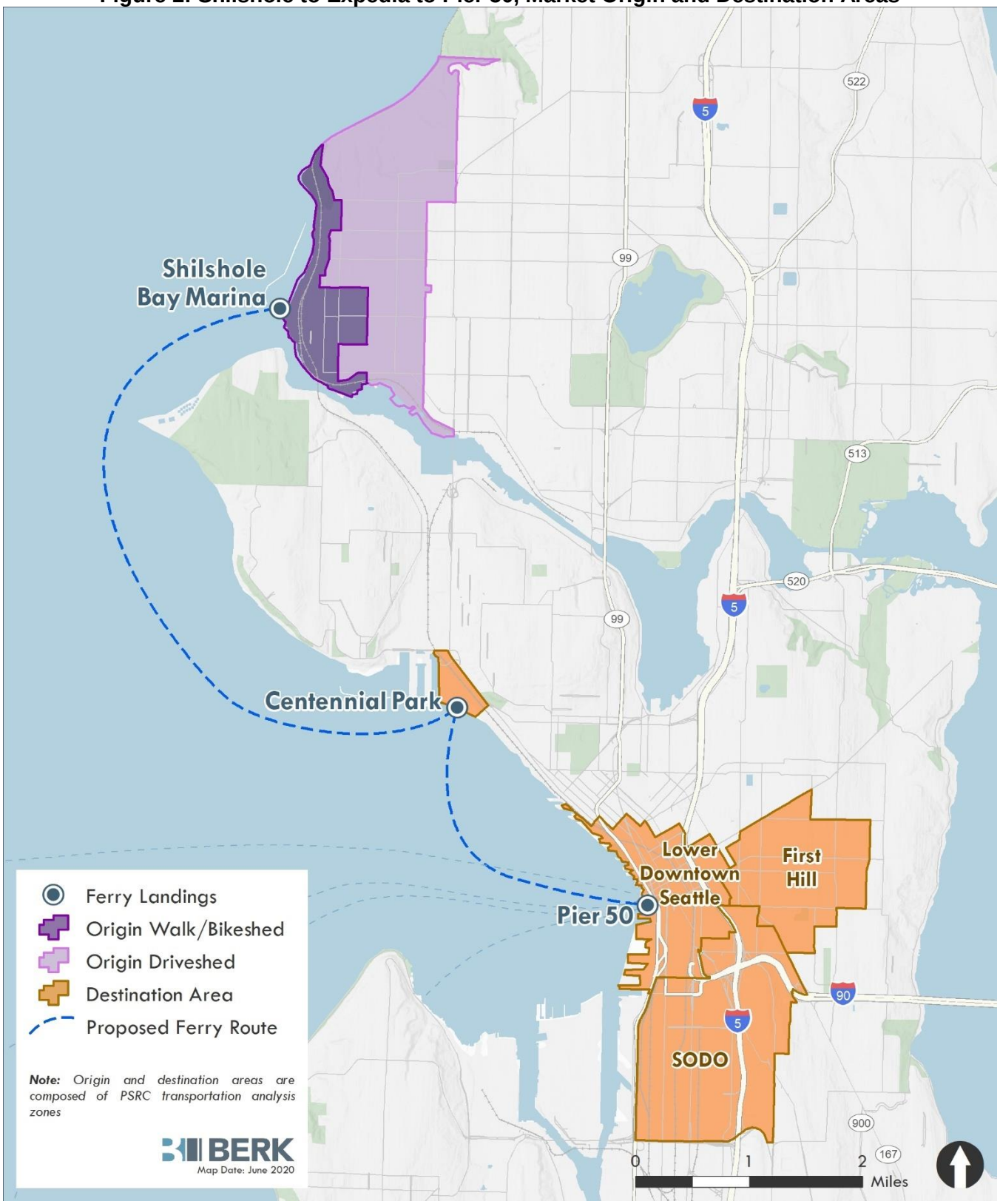
Job Count [Jobs/Census Block]

- 1 - 2
- 3 - 21
- 22 - 102
- 103 - 322
- 323 - 787

Selection Areas

- Analysis Selection

Figure 2: Shilshole to Expedia to Pier 50, Market Origin and Destination Areas



Attachment A.2

Site Profiles

SITE PROFILES

Comprehensive site profiles were developed for three sites including the Henry L. Kotkins Pier at Shilshole Bay Marina in Ballard, the Centennial Park Fishing Pier near the new Expedia campus, and Pier 50 in downtown Seattle.

METHODOLOGY

Each site profile contains a summary of key considerations for implementation, access and connectivity, site context, as well as physical and navigational considerations. The following sections provide context for what was reviewed for each element in the site profiles.

ACCESS & CONNECTIVITY: How well can one get to and from the site via different modes? Are there safe connections for pedestrians and bicyclists? Where are the current transit stops closest to the site? Does the site have the potential for future shuttles or transportation network companies (TNCs)? Is there adequate space for micromobility options to access the site?

SITE CONTEXT: What is the surrounding neighborhood of the site like? What is the current zoning and comprehensive plan designation for the site? Are there major planning efforts that affect the future of this site? What are the regulatory considerations when developing the site for POF service?

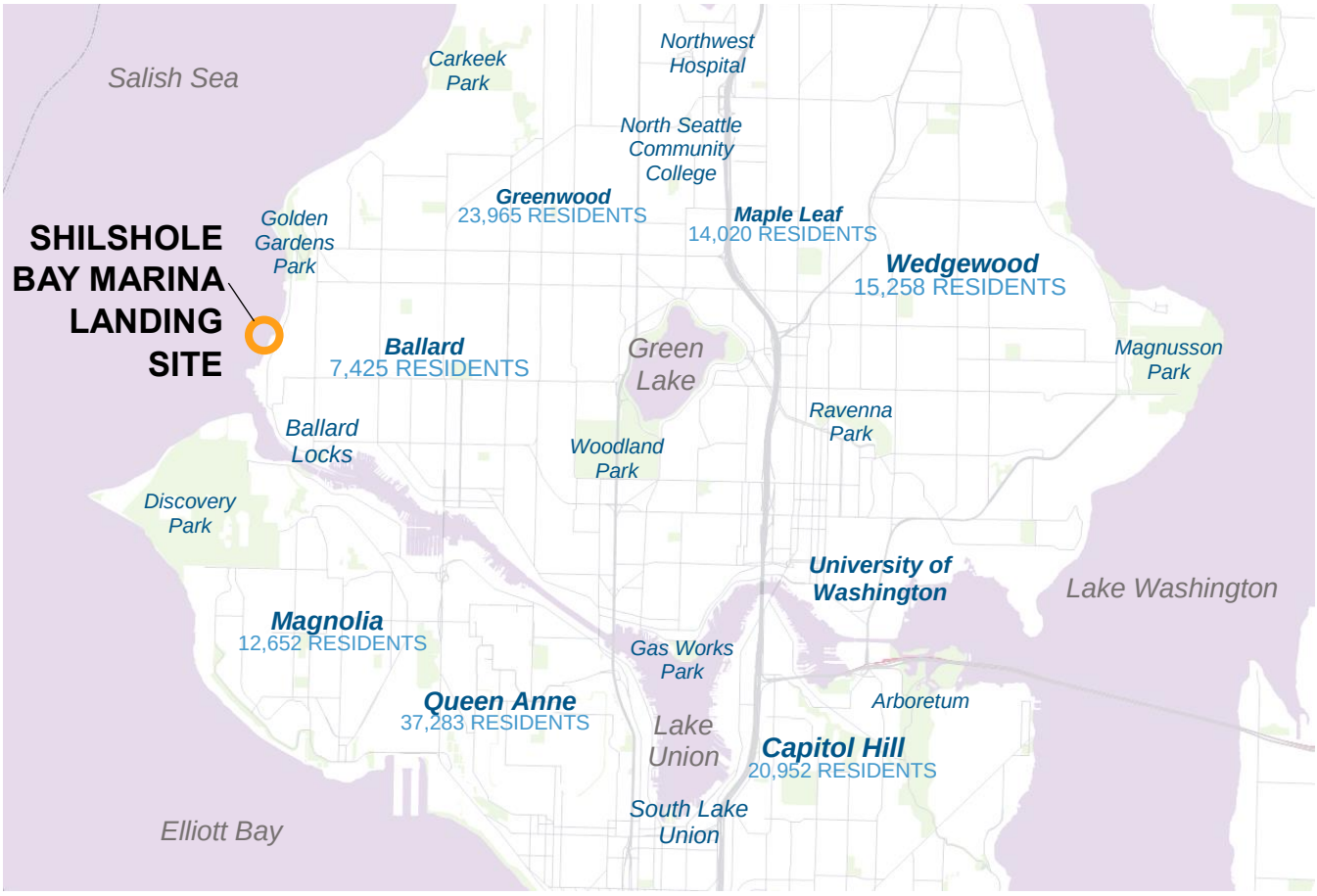
NAVIGATIONAL CONSIDERATIONS: Is the site exposed to wind and wave conditions that could be challenging for POF service? Is there adequate water depth for vessels to safely navigate around the landing? Are there obstacles or obstructions in the water that could make navigation difficult?

INFRASTRUCTURE: What infrastructure is currently present at the site, and what is its condition? What infrastructure improvements are needed at the site in order to support a Ballard passenger-only ferry (POF) route? What are the rough order of magnitude (ROM) costs of improvements?

REFERENCES

- Google Earth
- Google Maps
- King County Metro Schedules and Maps
- City of Seattle website
- City of Seattle GIS- Community Reporting Areas
- City of Seattle Municipal Code
- King County Marine Division website
- Shilshole Bay Marina website

SHILSHOLE BAY MARINA



SUMMARY

Located along Shilshole Bay, the Shilshole Bay Marina offers over 1,400 moorage slips, along with moorage amenities and retail and commercial space. The Henry L. Kotkins Pier is the preferred location for POF service.

OPPORTUNITIES

- **Accessibility:** There is space for shuttle pick-up and drop-off at this location. There are potential opportunities for parking, bike storage, and existing pedestrian paths.
- **Recreational Connections:** The landing is close to Golden Gardens Park and the Burke Gilman Trail.

CHALLENGES

- **Accessibility:** Access to transit is limited at this location. Additionally, there is a steep slope connecting the marina to the adjacent neighborhood which could make bike and pedestrian access difficult.

IMPLEMENTATION

Required Improvements:

New float, piles, gangway support, gangway, ramp, fendering. Minor upland terminal improvements.

Necessary Permits & Approvals:

Federal, state, and local

Cost Estimates:

$7.5 M

Timeline (once funding is secured):

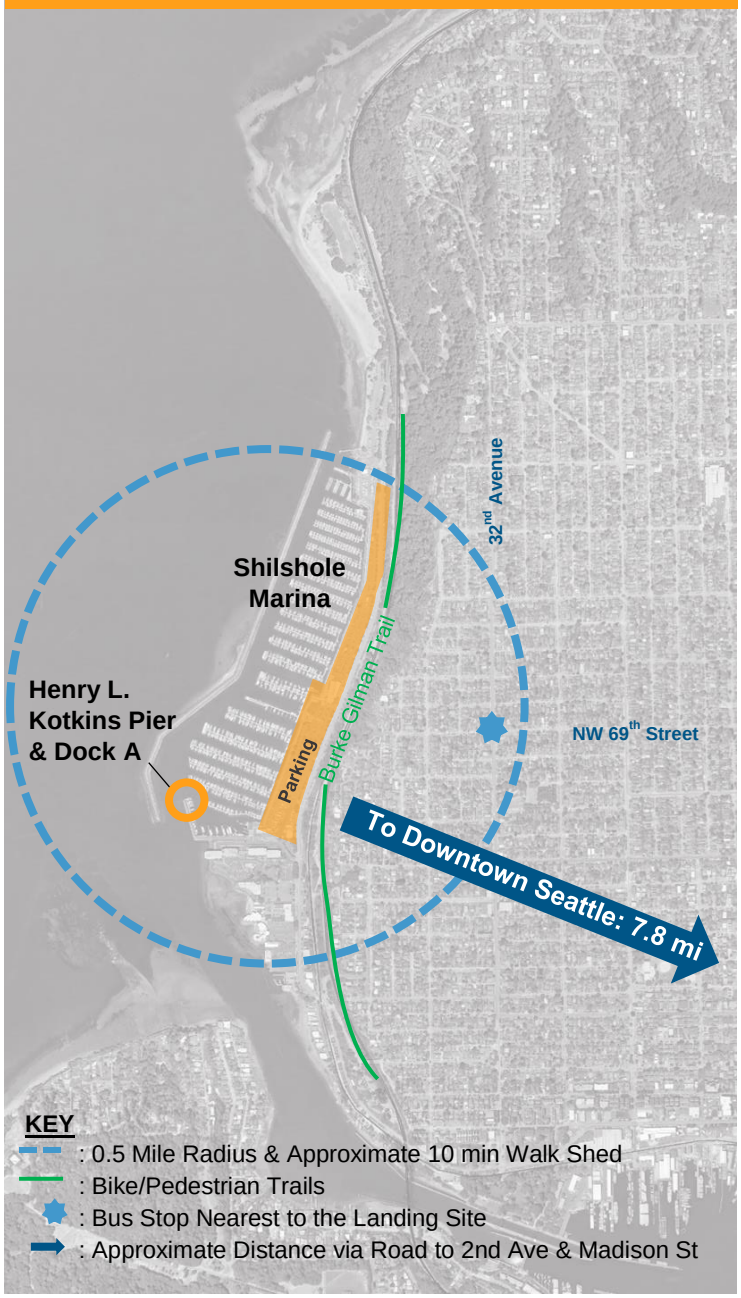
3-5 years

SHILSHOLE BAY MARINA

ACCESS & CONNECTIVITY

- **ADA Access:** There are sidewalks and ADA accessible infrastructure from the nearest roads connecting to walkways along the marina.
- **Parking:** Limited parking is available along Seaview Avenue NW. The marina parking lot is owned by the Port of Seattle and has approximately 120 parking stalls mostly used by residents at the Marina.
- **Bicycle:** There is a bike trail along Seaview Avenue that provides access to other local trails including the Burke Gilman Trail and Myrtle Edwards Trail.
- **Pedestrian:** There is a bike trail that could be used by pedestrians and sidewalks along Seaview Avenue, but there are no direct pedestrian connections from the residential neighborhood.
- **Transit:** The closest bus stop is located at 32nd Ave NE & NW 69th Street. This stop is an approximately 20-minute walk from the marina and crosses a railroad.
- **Shuttle/TNC:** There is an existing parking area where shuttles could queue. The Elks Lodge/event space parking lot to the south of the marina lot could be an option for a daytime park and ride.
- **Micromobility:** There is drop-off and pick-up space in the nearby parking lot adjacent to the marina.

BUS STOP DESTINATIONS
South to Ballard and downtown Seattle



QUICK FACTS

- **Ownership:** Port of Seattle
- **Zoning:** Commercial (C1-40)
- **Shoreline:** Urban Commercial (UC)
- **Surrounding Land Use:** Commercial and Residential
- **Nearby Attractions:** Golden Gardens Park, Ballard Bay Club, Ballard Locks, Nordic Heritage Museum
- **Nearby Employment Areas:** Downtown Ballard

SHILSHOLE BAY MARINA

SITE CONTEXT

NEIGHBORHOOD CHARACTERISTICS

The landing site is part of a Port-owned marina, which includes restaurants and commercial marine services. The residential area begins east of the site, separated from the marina by train tracks and a grade change. South of the marina are condominiums and a small commercial area catering to marine uses such as boating and surfing.

REGULATORY ENVIRONMENT

The shoreline designation for the Shilshole Bay Marina permits passenger terminals if they are water-dependent or water-related. A POF terminal would meet this requirement and is permitted outright.

The type of funding and design of the facility affect the regulatory approvals required. Compliance with the National Environmental Policy Act (NEPA) is required when federal funds are used for a project. Additionally, overwater and in-water work requires approval from federal, state and local agencies as well as coordination with tribes. To support agency review, a biological evaluation and other supporting environmental studies will be required.

Figure 1- View of the Shilshole Marina

NEARBY PLANNING UPDATES

- **Move Ballard (2016):** The Move Ballard transportation plan identified and prioritized key upcoming transportation projects to be implemented in Ballard. Most of the projects prioritize improved pedestrian safety and connectivity, but other modes such as bike and freight are also addressed.
- **Ballard Urban Design and Transportation Framework (2015):** This framework prioritizes balancing multimodal transportation needs and increased waterfront access, both of which would align with the implementation of a POF route from Shilshole Marina to downtown Seattle.
- **LINK Light Rail and ST3 (2015-2016):** Since 2015, the UW station has been built. An extension of the LINK to Ballard is planned to be implemented by 2035. The LINK station is anticipated to be located near Market Street and 15th Avenue NW and is outside the capture area for potential POF riders.
- **City of Seattle HALA and MHA (2019):** This site was not impacted by the recently passed Housing Affordability and Livability Agenda.

NAVIGATIONAL CONSIDERATIONS

Figure 2- The western edge of Henry L. Kotkins Pier

EXPOSURE

The site is located behind a breakwater and protected from inclement weather.

WATER DEPTH

The water depth is adequate to support POF service.

NAVIGATIONAL OBSTACLES

The site is located within a well-used marina and operating protocols would need to be developed in coordination with the Port of Seattle to ensure safe operations.

INFRASTRUCTURE

OVERWATER

Of the numerous docks and slips at Shilshole Bay Marina, the western edge of the Henry L. Kotkins Pier was studied for potential POF service. This location is preferred due the proximity to the marina entrance, as well as the accessibility of the pier for passengers. The berthing space along the pier is sufficient for a 150-pasenger vessel, although the height of the pier prohibits direct loading and unloading of a POF vessel without a gangway and float. Other docks at the marina could also serve as potential landing site options.

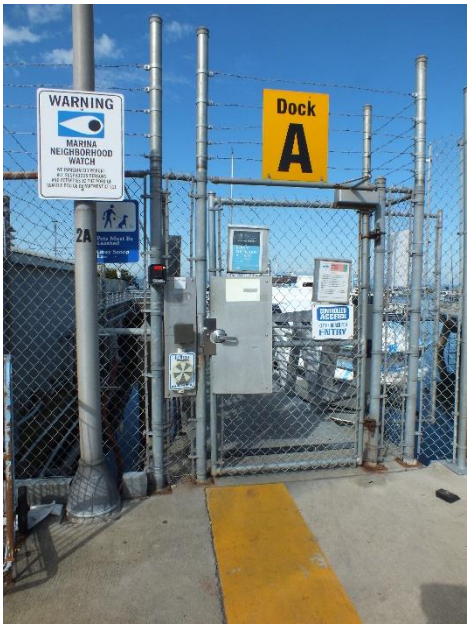


Figure 3- Existing security gating

Proposed Overwater Improvements

The following overwater improvements would be required to support ferry service:

- Pile-supported gangway platform
- Gangway
- Float
- Piles
- Transfer span
- Fixed ramp, railing, ladder
- Fendering and cleats

SHILSHOLE BAY MARINA

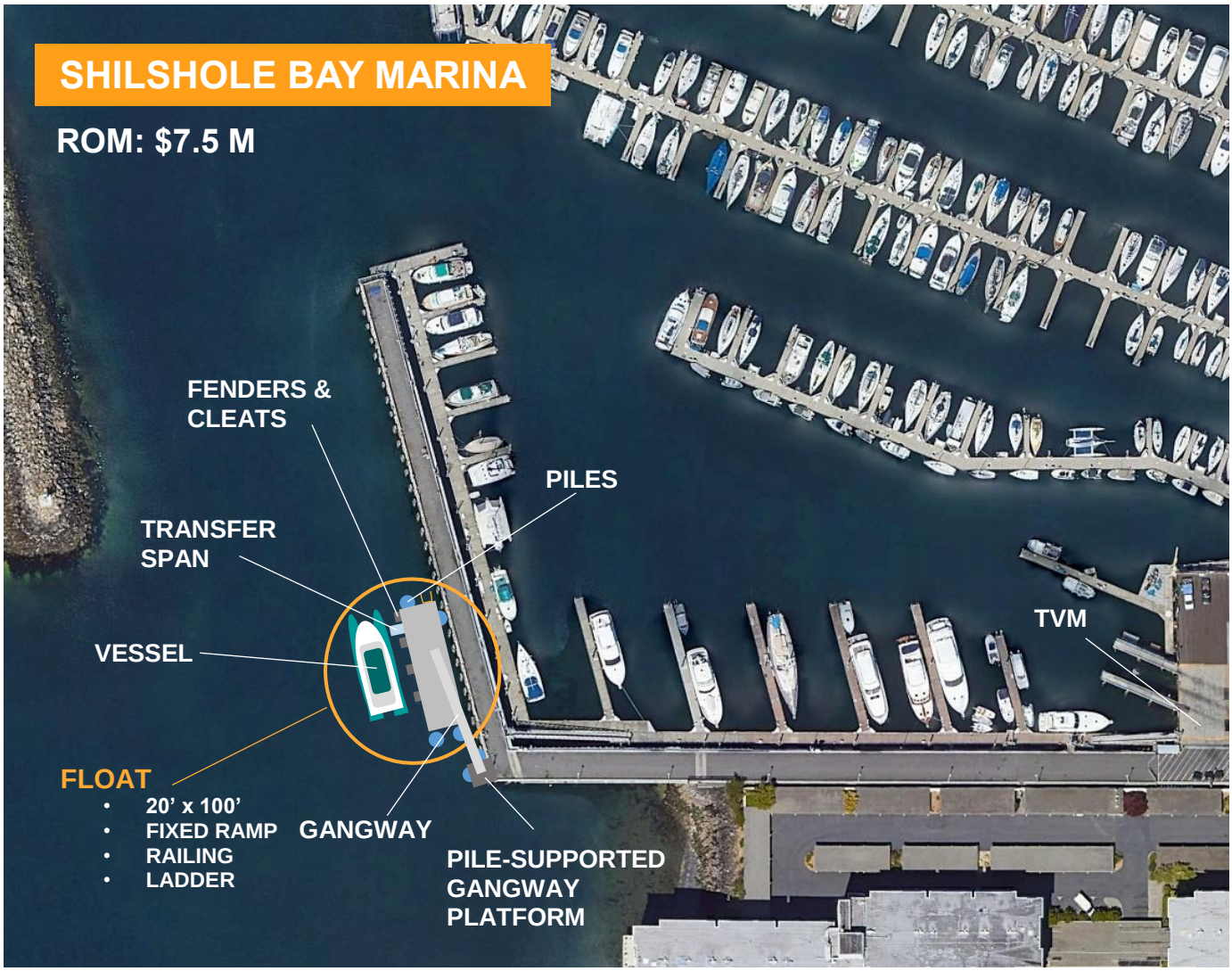
UPLANDS

The site is connected to existing pathways that have lighting, though access to a ramp and float would be restricted by security gates. Surrounding walkways are paved that connect to established sidewalks. There is a small concessions building adjacent to the pier that is not in service.

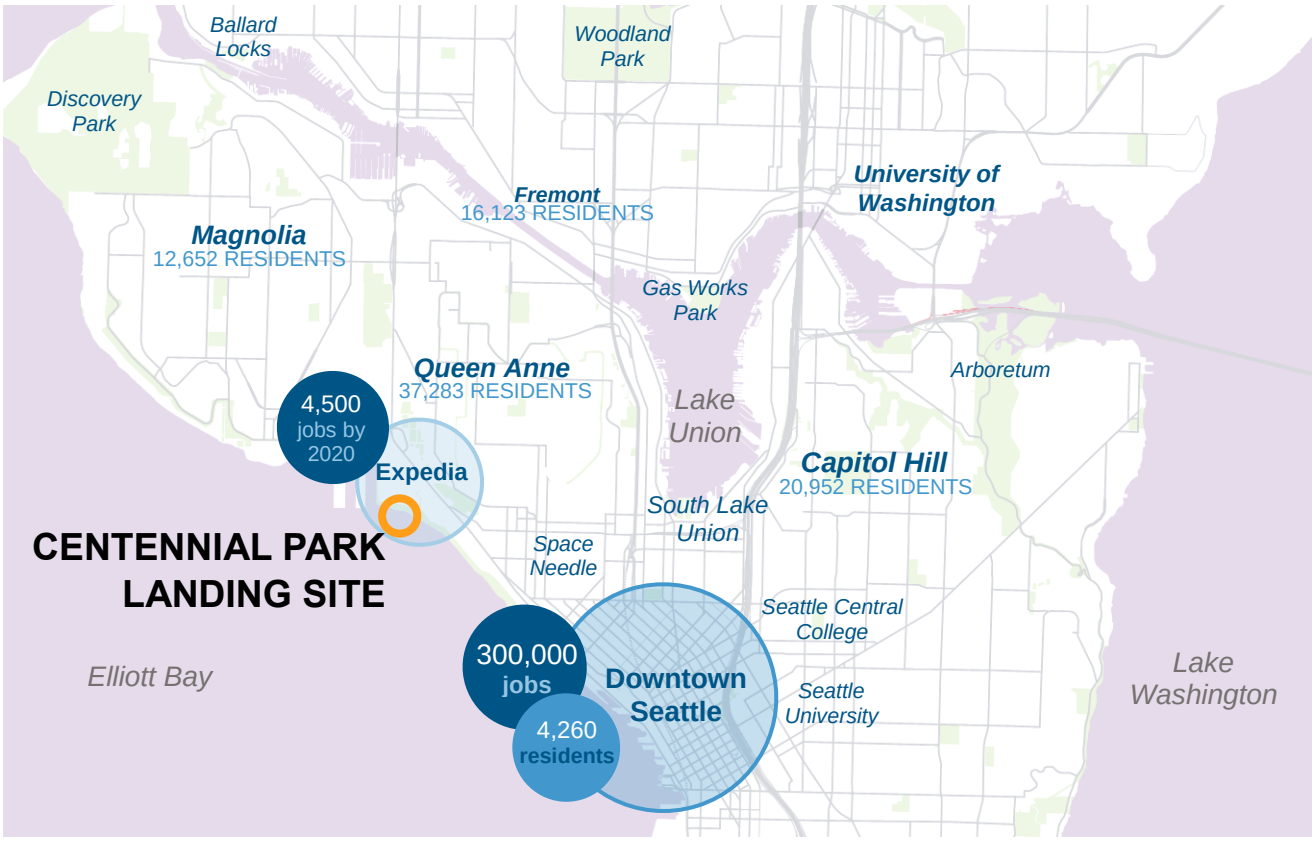
Proposed Upland Improvements

The following upland improvements would be needed to support POF service:

- Ticketing, signage
- Modification of the existing security gates to separate the POF terminal from the secured marina slips



CENTENNIAL PARK



SUMMARY

Centennial Park has an existing fishing pier that could support POF service with modifications. Nearby, the new Expedia campus is under construction and once completed, will bring approximately 4,500 jobs to the Interbay neighborhood.

Opportunities

- **Uplands Infrastructure:** Existing uplands infrastructure would support POF service, including restrooms, a small concession stand building, benches, bike racks, and connecting pedestrian and bike paths.
- **Alignment with Pier Replacement Project:** Could be efficiencies in coordination of pier replacement design.

Challenges

- **Re-development Plans:** The possible redevelopment of the pier has an unknown timeframe.
- **In-Water Work:** A new float will be required to support POF service.

IMPLEMENTATION

Required Improvements:

New float, gangway support, piles, ramp, transfer span, fendering. Minor upland terminal improvements

Necessary Permits & Approvals:

Federal, state, and local

Cost Estimates:

N/A

Timeline (once funding is secured):

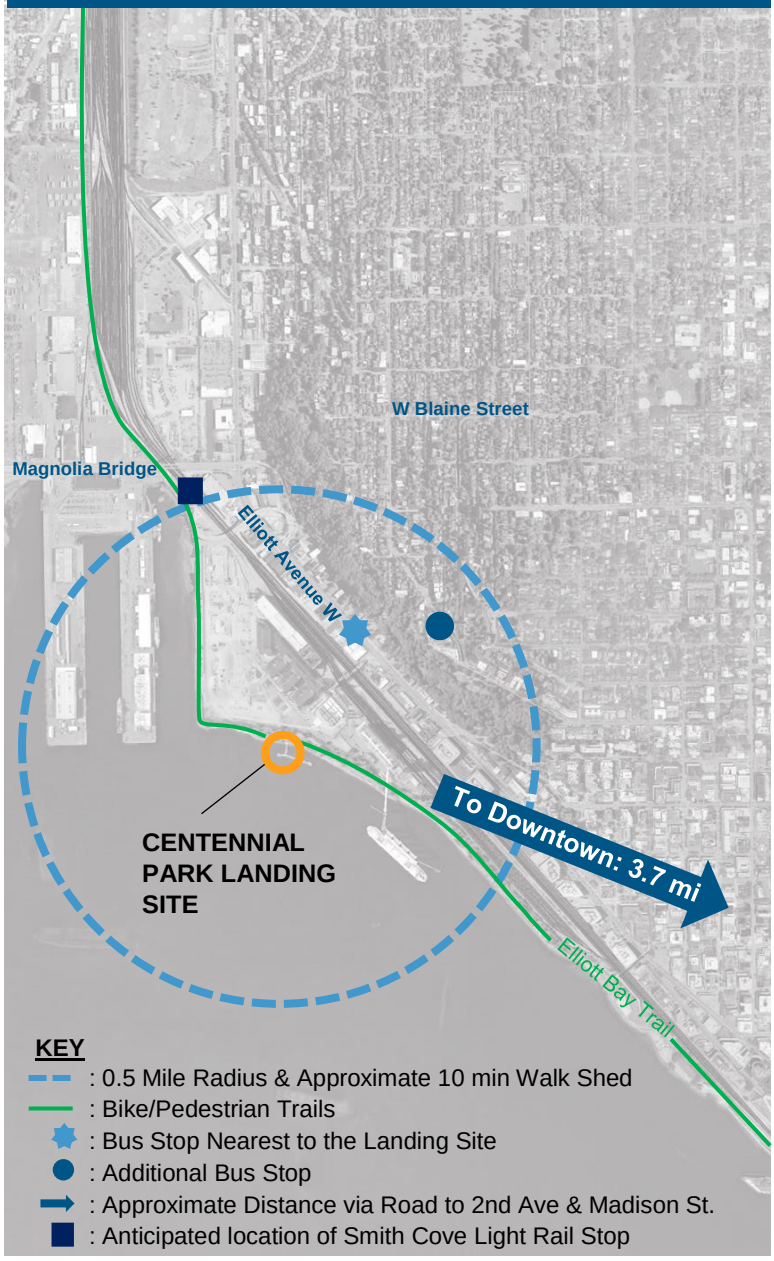
3-5 years

CENTENNIAL PARK

ACCESS & CONNECTIVITY

- **ADA Access:** There are sidewalks with curb ramps and paved walkways along Elliott Bay Trail.
- **Parking:** A small public parking for the park is available adjacent to the landing. Limited parking would be available for POF passengers.
- **Bicycle:** The site is also adjacent to the Elliott Bay Trail and bike racks are present near the existing fishing pier.
- **Pedestrian:** The site located is along Elliott Bay Trail, which has established paved trails for pedestrians and runners.
- **Transit:** The nearest bus stop is over half a mile away via pedestrian walkways and is located at Elliott Ave W & W Roy Street. It is about a 13-minute walk to the stop.
- **Shuttle/TNC:** There is a small parking area where shuttles could queue, though a smaller shuttle would likely be required due to the small size of the lot. TNCs could also use this area for pick-up and drop-off.
- **Micromobility:** There are paved pathways and sidewalks connecting to the site for micromobility options.

BUS STOP DESTINATIONS
North to Ballard, south to downtown Seattle, east to the University District



QUICK FACTS

- **Ownership:** City of Seattle Parks Department
- **Zoning:** Industrial Commercial (IC-65 (M))
- **Shoreline:** Conservancy Management (CM)
- **Surrounding Land Use:** Commercial
- **Nearby Attractions:** Myrtle Edwards Park, Kinnear Park
- **Nearby Employment Areas:** Downtown Seattle, Expedia

CENTENNIAL PARK

SITE CONTEXT

NEIGHBORHOOD CHARACTERISTICS

The landing site connects to Centennial Park with pedestrian and bicycle trails along the Elliott Bay waterfront and includes a small parking lot. Adjacent to the park is the Expedia campus, which is planned to house 4,500 jobs at full build out in 2020. Additional commercial and retail uses are located east of the railroad tracks from the pier, along Elliott Avenue West.

Adjacent waterway uses include the Smith Cove cruise terminal to the north and the Pier 86 Grain Terminal to the south.

REGULATORY ENVIRONMENT

This site is located in the Conservancy Management (CM) shoreline environment. In the CM shoreline zone, POF terminals are allowed as a special use with mitigation of any substantial adverse impacts.

The type of funding and design of the facility affect the regulatory approvals required. Compliance with NEPA is required when federal funds are used for a project. Additionally, overwater and in-water work require approval from federal, state and local agencies as well as coordination with tribes. To support agency review, a biological evaluation and other supporting environmental studies will be required.

Figure 4- View of the adjacent Centennial Park and the grain silos at Pier 86

NEARBY PLANNING UPDATES

- **LINK Light Rail and ST3 (2015-2016):** Since 2015, the UW station has been built. An extension of the LINK to Ballard is planned to be implemented by 2035. Though final alignment is still being determined, the line is expected to have a stop a approximately 0.5 miles from Centennial Park at nearby Smith Cove..

- **City of Seattle HALA and MHA (2019):** This site was not impacted by the recently passed Housing Affordability and Livability Agenda.

CENTENNIAL PARK

NAVIGATIONAL CONSIDERATIONS

EXPOSURE

The site is exposed to the Puget Sound and potential inclement weather.

WATER DEPTH

Water depth is adequate to support POF service at low and high tides.

NAVIGATIONAL OBSTACLES

Operating protocols would need to be developed to ensure safety of adjacent recreational vessel traffic and fishing.

Figure 5- View of the existing fishing pier

INFRASTRUCTURE

OVERWATER

There is an existing 342-ft. by 14-ft. pier (see Figure 5) at the site that is currently in poor condition. Due to its poor condition, the pier has been labeled a safety hazard and is closed to the public (see Figure 6). Discussions regarding a capital project to replace and/or upgrade the pier are ongoing between the Port of Seattle, the Washington State Department of Natural Resources, and Expedia.

Overwater Improvements

The following overwater improvements would be required to support ferry service but would be provided by others:

Figure 6- Sign on the existing pier

- Gangway support
- Gangway
- Float
- Piles
- Transfer span
- Fixed ramp, railing, ladder
- Fendering and cleats

CENTENNIAL PARK

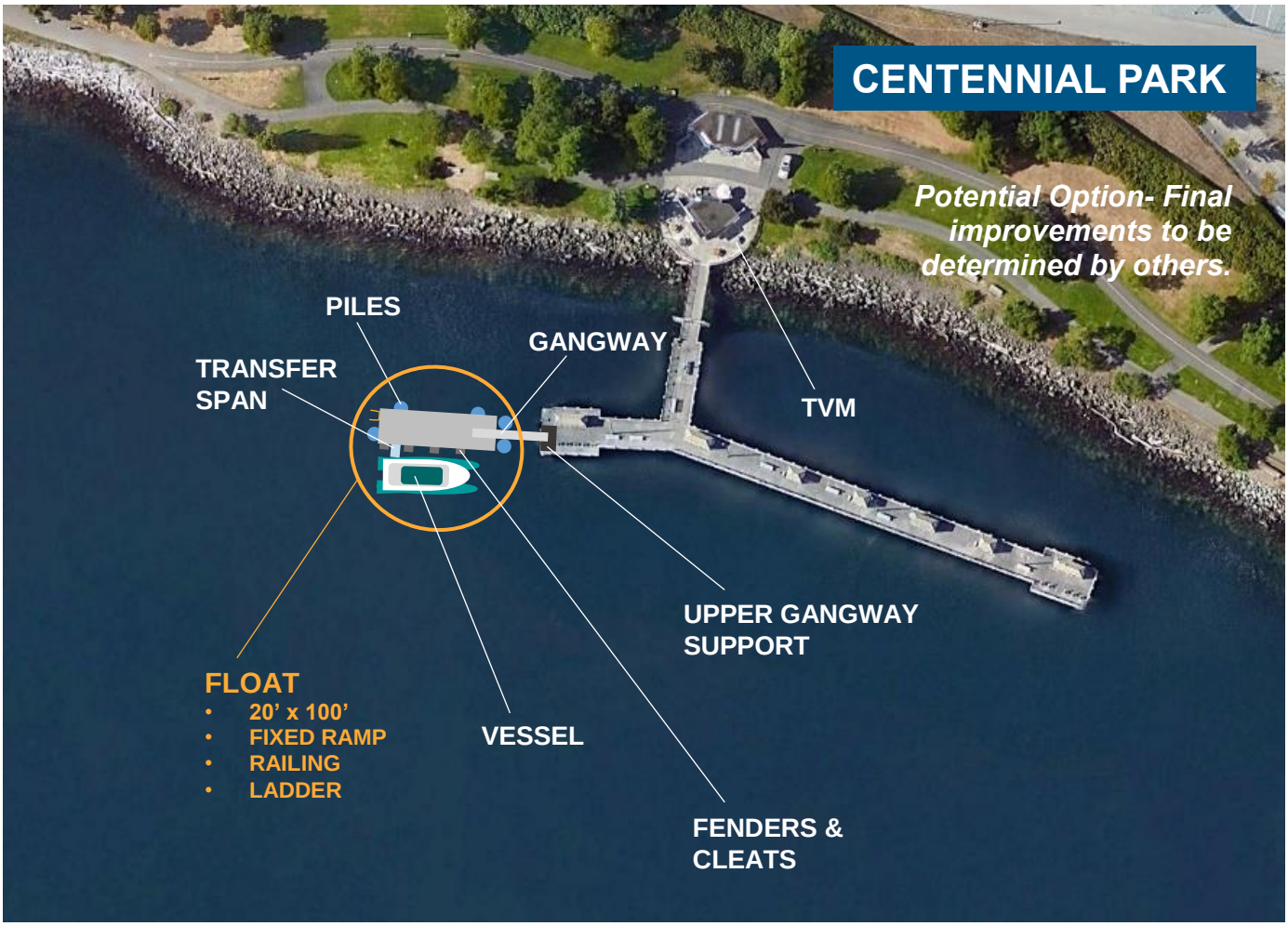
UPLANDS

Centennial Park has existing park facilities including restrooms, picnic tables, bike racks, and an ADA accessible walkway to access the pier. There is also a small concessions building, not currently in service, adjacent to the pier. The upland walkways and paved areas are in good condition. Lighting is also present, and there is adequate area near the pier to add signage, information, and ticketing.

A small public parking lot is about a 3-minute walk from the pier, where a shuttle holding area could be designated.

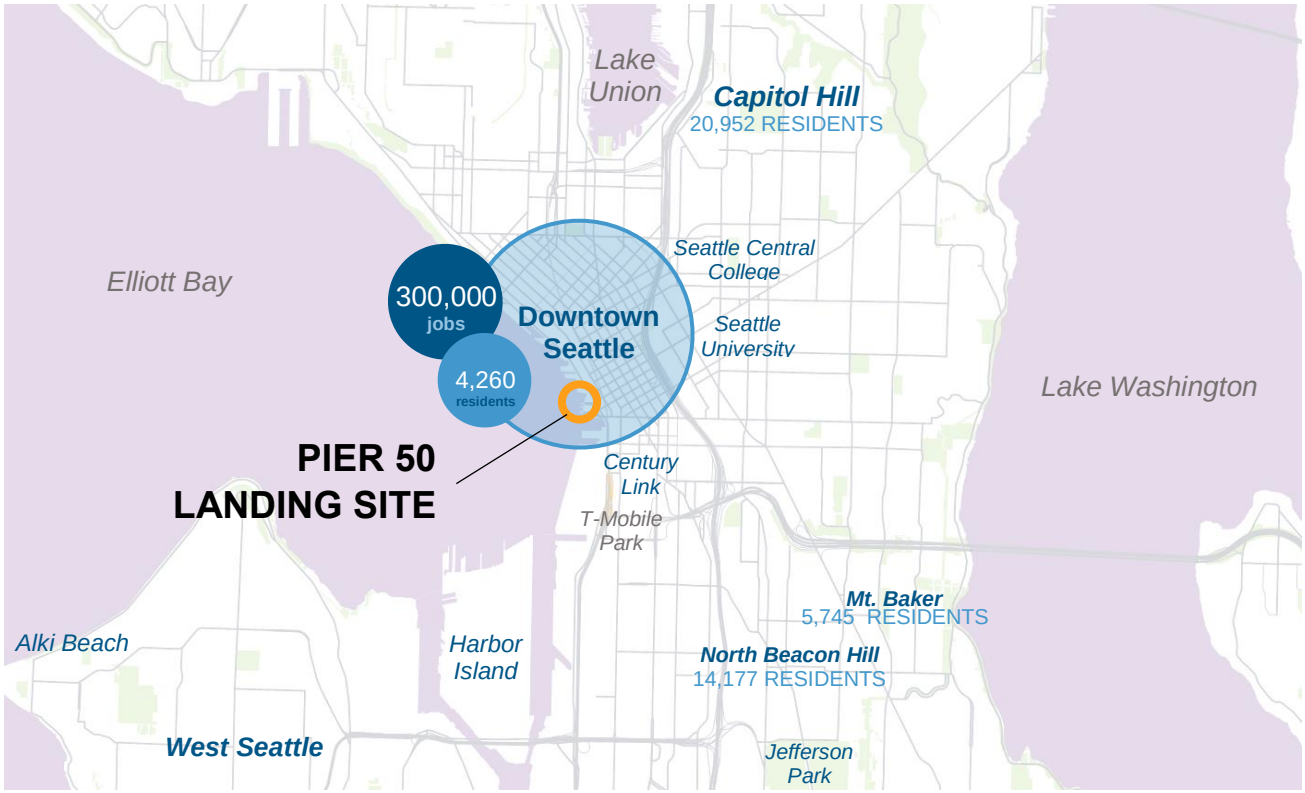
Potential Upland Improvements

Minor improvements would be required to support POF service, including ticketing and signage.




PIER 50

PIER 50



SUMMARY

Located on the Central Seattle Waterfront in downtown Seattle adjacent to Washington State Ferries (WSF)'s Colman Dock, the Pier 50 terminal recently re-opened after extensive improvements made to the facility to support POF service.

Opportunities

- **Minimal Cost:** Infrastructure improvements would not be necessary to begin service at this site.
- **Maintenance Barge:** The site is adjacent to the King County Marine Division's Pier 48 moorage and maintenance barge.

Challenges

- **Capacity Constraints:** The two operating slips and Pier 50 currently support two King County Water Taxi routes and two Kitsap Fast Ferry routes, with one more Kitsap route planned to begin service in 2020. Scheduling another route would be challenging.

IMPLEMENTATION

Required Improvements:

None required.

Necessary Permits & Approvals:

None required.

Cost Estimates:

N/A

Timeline (once funding is secured):

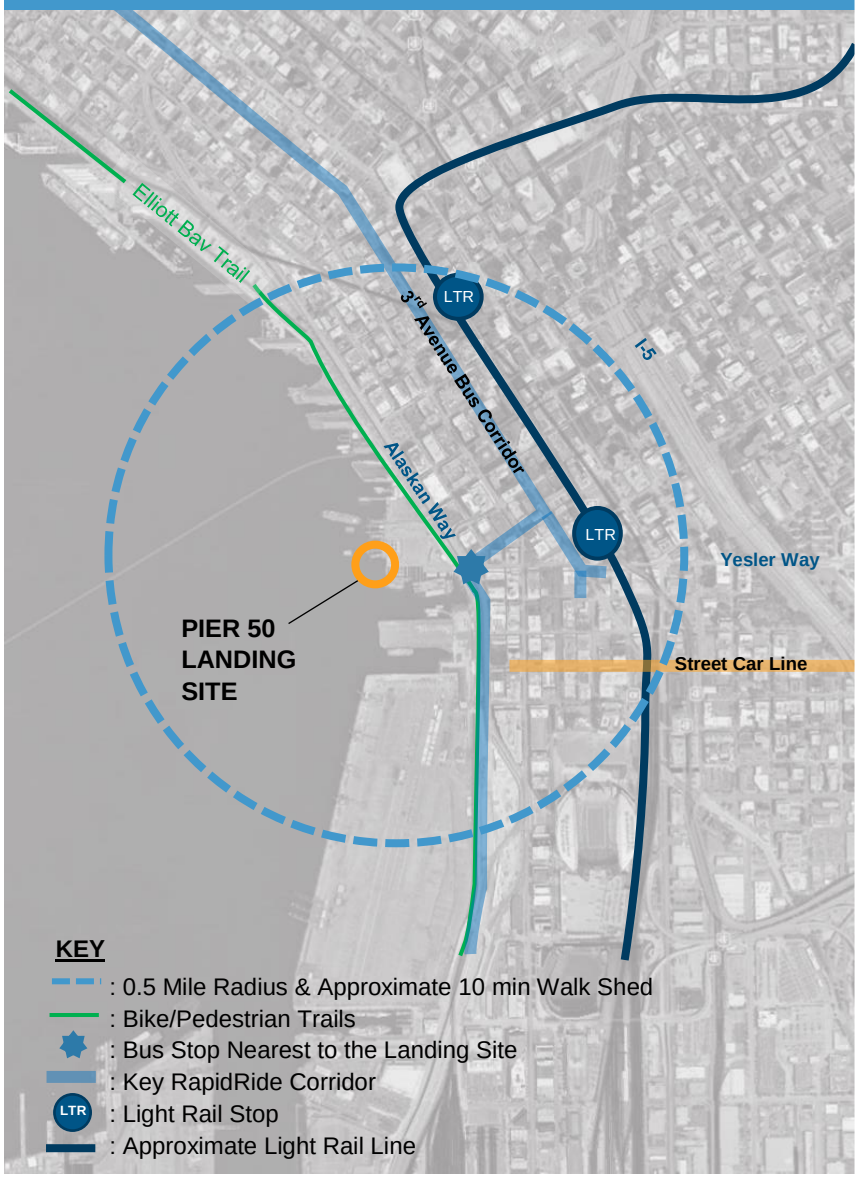
N/A

PIER 50

ACCESS & CONNECTIVITY

- **ADA Access:** The new POF facility improved ADA access with tactile strips, walkway improvements and ADA access to the WSF terminal.
- **Parking:** Some paid lots and street parking is available nearby. Most passengers are anticipated to be connecting to downtown Seattle destinations.
- **Bicycle:** Bicycles can access the POF facility via a pedestrian walkway. The site is also adjacent to the Elliott Bay Trail, which connects north and south along the waterfront.
- **Pedestrian:** The site is well connected to sidewalks to connect to downtown Seattle and Elliott Bay Trail along the waterfront.
- **Transit:** Numerous transit stops are located two blocks away on 1st Ave, as well as in the 3rd Ave bus corridor and Link light rail transit tunnel.
- **Shuttle/TNC:** A free seasonal waterfront shuttle has been provided along the waterfront. Drop-off and pick-up space is limited along Alaskan Way.
- **Micromobility:** There are paved walkways connecting to Pier 50.

BUS STOPS
North to Sand Point, Ballard, and Northgate, South to Alki and Burien



QUICK FACTS

- **Ownership:** City of Seattle
- **Zoning:** DH1/45
- **Shoreline:** Urban Harborfront (UH)
- **Surrounding Land Use:** Commercial & Residential
- **Nearby Attractions:** Pioneer Square, Elliott Bay Trail,
- **Nearby Employment Areas:** Downtown Seattle

PIER 50

SITE CONTEXT

NEIGHBORHOOD CHARACTERISTICS

Located in the heart of downtown Seattle, the Pier 50 POF facility is located along the waterfront in a primarily commercial area of downtown. Near the Pioneer Square neighborhood, the facility is close to job sites, hotels, and restaurants, as well as the SODO stadium district.

The Colman Dock vehicle ferry terminal lies directly to the north of the Pier 50 facility, and the nearby Puget Sound waterway is used by freight and recreational vessels.

REGULATORY ENVIRONMENT

The Pier 50 facility is currently permitted to operate as a POF terminal. A POF terminal use is permitted outright in this zone, and any expansion of the Pier 50 facility would thus be permitted.

NEARBY PLANNING UPDATES

- **Seattle Waterfront (Ongoing):** Many waterfront restoration projects are in progress to encourage walkability, connectivity, and increased use of the waterfront. This project includes removal of the Alaskan Way Viaduct and street improvements to Alaskan Way.

- **City of Seattle HALA and MHA (2019):** This site was not impacted by the recently passed Housing Affordability and Livability Agenda.

Figure 7- Passengers disembarking at the new Pier 50 facility

PIER 50

NAVIGATIONAL CONSIDERATIONS

EXPOSURE

The site is exposed to the Puget Sound and potential inclement weather.

WATER DEPTH

Water depth is adequate to support POF service.

NAVIGATIONAL OBSTACLES

As the facility is currently used by both the King County Water Taxi and the Kitsap Fast Ferry, schedule coordination would be required.

Figure 8- View of the new Pier 50 facility

INFRASTRUCTURE

OVERWATER

Pier 50 includes a new 128-ft. by 29-ft. float that allows for side loading of two vessels simultaneously. The float is connected to a covered passenger shelter by transfer span. The covered passenger area is located on a new pier structure and includes queuing for up to 500 passengers. Additionally, the facility has an office for managing operations, variable message signage and ticket vending machines for passengers to purchase tickets.

Proposed Overwater Improvements

The addition of a new route at Pier 50 would require vessel schedule coordination. The limited slip capacity could present challenges for all operators to meet sailing schedules. With the increase in potential POF service in the Puget Sound region, a second float may be necessary to accommodate demand for POF service into downtown Seattle.

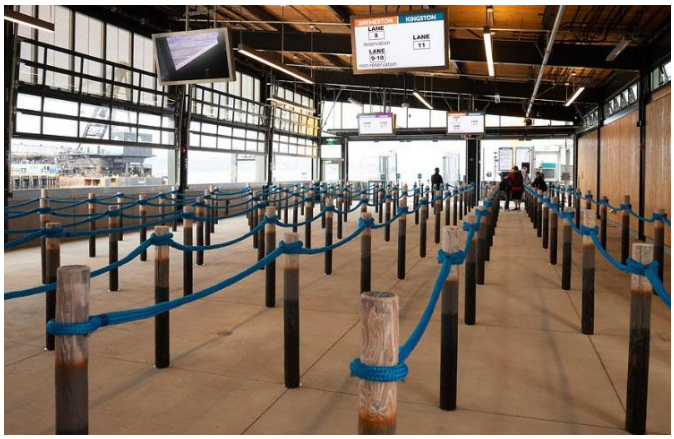


Figure 9- Queuing lanes at the Pier 50 facility

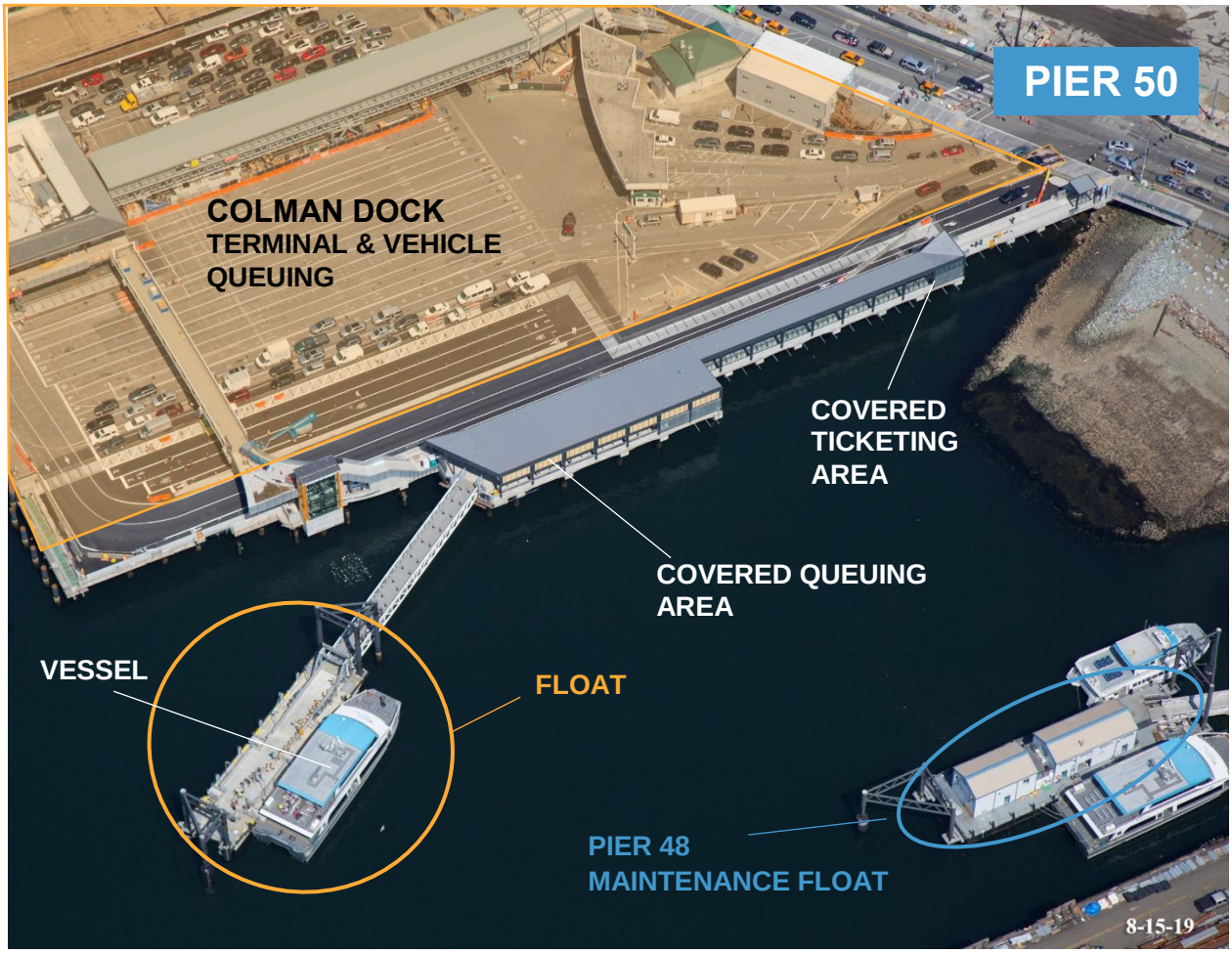
PIER 50

UPLANDS

Since the Pier 50 facility is located overwater, the uplands consist of the walkway connecting to Alaskan Way.

Proposed Upland Improvements

No uplands improvements would be required to support additional POF service.



Attachment A.3

Capital and Operating Assumptions

BALLARD ROUTE IMPLEMENTATION – ASSUMPTIONS

ROUTE ASSUMPTIONS

- Maximum speed: 28 knots
- Slowdown speed: 7 knots
- Maneuvering speed: 5 knots
- Min. water depths required: 8-10 feet (propeller), 6-8 feet (jets)

VESSEL ASSUMPTIONS

- Vessel size: 150 passengers
- Vessel propulsion: Diesel or diesel/hybrid propulsion, four main engines[1]
- Crew size: Three, one Captain and two deckhands
- Fuel consumption:
  - Data from All American Marine for 150-passenger vessel designed for SECO Development. Assumed a fuel tank capacity of 750 gallons per tank (one each hull for total vessel capacity of 1,500 gallons).
  - With a full tank of ~95% representing a maximum of 710 gallons each tank and retaining a minimum of ~15% in the tank, or 110 gallons/tank, this means a maximum of 600 gallons/tank (vessel total of 1,200 gallons) of usable fuel between fueling stops.
  - A fuel consumption rate during maneuvering of 40% of cruising rates was assumed (or 20% of cruising rates with assumption that two engines will be used).
  - In-dock "dwell" time fuel consumption at 20% of cruising rates was assumed (10% assuming two-engine use).

OPERATING ASSUMPTIONS

- Number of vessels: 2 vessels: one vessel for operations, one as backup
- Moorage/maintenance location: Pier 48 Moorage/Maintenance Float
- Fueling: Maxum Petroleum at Harbor Island

Schedule Assumptions

- Peak seasonal service April through September
- Commute service: October through March

[1] Diesel propulsion with four main engines was assumed for vessel capital and operating costs. Best available hybrid vessel technologies (diesel-electric, diesel-battery, etc.,) would be explored to meet King County sustainability goals. Hybrid vessel options are anticipated to be approximately 15-20% more to construct than a standard diesel propulsion.

- Special event service: None
- Dwell time: Minimum required dwell time was assumed to be 5 minutes for loading and 3 minutes for unloading at Pier 50 and Shilshole. Where needed, additional dwell time was incorporated into the schedule to bring departures to the nearest 5 minutes.

Cost Assumptions

- Terminal security needs: Fence/gate, cameras
- Crew: Assume operating hours + 45 minutes of startup and tie-up time before and after service for crew costs
- Labor costs: Assumes Marine Division 2019 salary rates
- Fuel price: Assumes $3.00 per gallon of diesel fuel
- Vessel maintenance:
  - Labor – Estimated as two full-time dedicated maintenance personnel/employees – one engineer and one oiler for Marine Division. Direct (estimated base salary) + overhead.
  - Routine (or preventative) maintenance – Taken as a function of vessel operating hours and includes routine/preventative machinery maintenance, including materials and ancillary costs, assuming a cost of $5 per hour per engine ($20 per hour per vessel).
  - Annual maintenance – Includes the annual cost for vessel drydocks and hull/out-of-water maintenance, including labor, materials, and ancillary costs, estimated as $0.30 per foot of vessel length per vessel operating hours.
  - Unplanned maintenance – Cost of unplanned or unexpected machinery failures, taken as an additional 10% of the estimated combined maintenance costs.
- Terminal operations:
  - Routine terminal maintenance – Estimated as $1 per number of service hours.
  - Terminal lease – Estimated cost of leasing pier space, taken as $3,000 per month, based on previous lease between Kitsap Transit and Washington State Ferries for use of Pier 50, plus an increase.
  - Fare collection – Estimated cost of fare collection processing, including cash processing, transit cards, and maintenance contracts, estimated at $1,000 per month or $12,000 annually.
- Management, administration, and support:
  - Labor – Marine Division management and administration staff assumes one manager-level staff member.
  - Administration, insurance, and overhead – Expenses assumed to include ancillary operating costs such as liability insurance, administrative costs, and overhead (supplies, etc.). Assumed at 15% of the direct costs per route for the Marine Division.

Travel Time Comparison Assumptions

- Ferry trip time:
  - Connection from origin to terminal uses drive time from Google Maps (assuming a shuttle service to Shilshole) plus 3 minutes of walk time from parking lot to pier plus 5 minutes dwell time.
  - Sailing time assumes a service speed of 28 knots.
- Transit time:
  - Commute transit times from Google Maps for weekday departure between 5:00 and 6:00 PM, using the shortest option. Comments indicate number of transfers required and the associated travel time. Bus travel time does not account for roadway traffic impacts.
  - Wait time is calculated using Google Maps total travel time and subtracting the walk and travel time. This is the assumed wait time when connecting to another segment of the trip.
- Driving trip time:
  - Commute drive times from Google Maps for weekday departure at 5:00 PM, showing the typical travel time range due to traffic.
  - Drive time includes walk time from the nearest public parking garage to the destination, if parking is not located on site.
  - Mileage cost is calculated using the US General Services Administration (GSA) rate of $0.58 per mile.
  - Parking cost is the daily (at least 9 hours) rate of the nearest public parking garage.

Attachment A.4

Ridership Memo

King County Waterborne Transit

Potential Ridership Demand for Proposed Ballard to Downtown Seattle Passenger-Only Service

BERK Consulting

Overview and Approach

BERK Consulting (BERK) analyzed potential ridership demand for five different proposed passenger-only ferry (POF) routes within King County. Two routes connect Ballard with destinations along the Downtown Seattle Waterfront which are included in this memo. This work includes an analysis of baseline potential ridership demand in 2019 as well as forecasts for the years 2025 and 2040.

One primary source of data for this analysis is the Puget Sound Regional Council's (PSRC) SoundCast activity-based travel model. This model estimates expected travel patterns and volumes from origins to destinations across the four-county Central Puget Sound region. In addition to a baseline of 2014, SoundCast includes forecast outputs for 2025 and 2040 which reflect anticipated future changes to the transportation network as well as a land use forecast with assumptions about population and employment growth. This report documents BERK's analysis of the travel model data and development of capture rate assumptions to estimate potential POF ridership demand during weekday commute, midday, and evening periods.

One limitation of PSRC's SoundCast data is that it does not consider the potential for induced discretionary travel demand. Analysis of historic ridership on the West Seattle to Pier 50 Water Taxi indicates that demand for non-commute travel is higher than would be predicted using the SoundCast model alone. Therefore, our methodology considers the potential for additional induced discretionary travel demand based on historic analysis of existing POF service in the Puget Sound region.

Ridership Forecasting Methodology

TRAVEL TIME COMPARISON

Among the benefits of POF service for daily commuters is a predicable schedule and reliable travel time that is not affected by roadway traffic congestion. However, if travel times from home to destination are significantly longer than alternatives modes of travel, POF service will not be as competitive. To evaluate travel time competitiveness, we selected representative origin points in communities served by the proposed POF and then estimated travel times to various commute destinations in Seattle. A more detailed description of the travel time comparison methodology is in the main report.

MARKET CAPTURE AREAS FOR SEATTLE-BOUND PASSENGERS

For each proposed passenger ferry route, we identified a geographic area where residents could potentially choose ferry service as part of their daily commute to destinations in Seattle. Our methodology for determining the boundaries of these areas included three steps.

1. **Define destination areas.** We identified employment centers that could potentially be destinations

for commuters who use the new ferry service. Each proposed ferry route includes one or more potential destination area. Some destinations assume a transit leg following disembarking.

2. **Compare travel time competitiveness.** We compared the estimated travel times from representative starting and destination points for commuters choosing POF versus alternative modes of transportation. Our analysis also considered differences in reliability[1] between modes, in addition to total duration of travel. See the main report for the methodology used to estimate travel time duration.
3. **Define origin areas.** The travel time competitiveness analysis enabled us to identify the approximate boundaries for areas in which some residents may reasonably select the ferry as a commute option. For each route we defined two origin areas, a walk- and bike- shed closer to the ferry landing, and larger driveshed. For drivesheds, we selected transportation analysis zones that fall within a 15-minute drive but trimmed back to exclude areas where alternative modes of travel are far more competitive.

A series of maps showing the assumed market capture areas for each proposed ferry routes is included at the end of this appendix. As will be discussed in the following section, BERK's forecast model includes different market capture rate assumptions for each origin-destination pair.

POTENTIAL TRAVEL DEMAND ANALYSIS

Projected Capture of Current and Future Travel Demand

As noted above, BERK obtained and analyzed outputs from PSRC's SoundCast travel model for the years 2014, 2025, and 2040. This model estimates demand for travel by mode between over 3,700 transportation analysis zones (TAZ). We identified TAZ associated with the potential origin and destination market capture areas. We then summarized total travel demand in each direction for each origin-destination pair. To estimate travel demand in 2019, BERK interpolated between the SoundCast data for 2014 and 2025 forecast, accounting for the percentage of PSRC's forecasted household growth in the origin area that had already occurred by 2019.[2]

The next step was to determine the assumed percentage of travelers from each origin-destination area pair who would select ferry service compared to other modes. The competitiveness of POF service for commute travel is expected to vary by origin-destination pair. Therefore, we developed separate market capture rate assumptions for each pair. To determine a baseline assumption, we analyzed historic ridership data for the West Seattle Water Taxi. This service shares many characteristics in common with the proposed Ballard POF. Both serve neighborhoods that feature strong demand for bus transit to Downtown Seattle. Both have terminals that are a mile or more from neighborhoods centers. Finally, while

[1] Reliably was estimated in two ways. First, Google Maps provides a range for "typical" car travel times. These ranges can be large during commute periods and are an indicator of reliability. Secondly, King County Metro publishes an annual System Evaluation report that includes the percentage of scheduled buses that are beyond a lateness threshold by time of day. This information was used as an indicator of reliability for non-ferry transit travel.

[2] One input for SoundCast is a land use forecast model called Land Use Vision (LUV). BERK compared our own estimates of actual households counts in each TAZ for 2019 to LUV data available for the years 2014, 2025, and 2040. In a few cases, 2019 households exceeds the 2025 forecast assumption. For these TAZ we interpolated travel demand based on the percentage of growth expected between 2025 and 2040. While there are some limitations to this approach, since SoundCast has slightly different assumptions about the transportation network in each forecast year than what existing in 2019. However, we believe it is reasonable for the purpose of estimating potential POF ridership demand from areas that have experienced more growth than is assumed in the SoundCast model.

both lack a parking lot for commuter use, each has free street parking that is typically available on weekdays for daily commuters willing to make a short walk to the ferry dock. Based on these similarities, the West Seattle Water Taxi provides a good starting point for developing capture rate assumptions for the Ballard POF.

To calculate the capture rate of the West Seattle Water Taxi, we compared historic ridership to the modeled travel demand from SoundCast for the years 2014 and BERK's interpolated demand for 2019. This work required defining origin and destination market capture areas as we did for the proposed routes. We selected origins and destination areas that provide reasonable travel time competitiveness compared to transit options. We then calculated capture rates for morning commute period travel in 2014 and 2019. The capture rate for this route has increased over time from 3.6% in 2014 to 4.6% in 2019. This indicates a steady shifting of commuter mode-choice to POF and/or the arrival of new households who selected their home location based on the POF availability.

These rates served as the starting point for our assumed potential capture rates for proposed POF routes, with the lower rate assumed for the baseline potential ridership demand and higher rate assumed when the proposed service reaches maturity in 2025. We project modest growth in this capture rate for the 2040 forecast, consistent with historic trends observed in West Seattle.[3] We then varied these starting assumptions upward or downward based on how time-competitive POF service is compared to bus transit for commute travel.

Adjustments to PSRC/SoundCast Commute-Period Travel Demand

The land use inputs for the SoundCast travel demand model are based on policy-based forecasts derived in 2017 and building off a baseline in 2014.[4] Additional information is now available about actual and planned growth within areas served by the proposed ferry routes. BERK's work to account for growth that has already occurred between 2014 and 2019 was discussed above. In addition, we compared information about planned future growth to PSRC's 2025 land use forecast to make targeted adjustments to the travel model. Each instance is described here.

Census Longitudinal Employer-Household Dynamics

The Census releases data about the approximate home and work location of most workers in the Seattle region.[5] The most recent data available reflects conditions in 2017. For each origin and destination market area pair we summarized workers whose home is in the origin area and primary job is in the destination area. We then compared this count to the total peak AM commute period travel demand between the same areas estimated with SoundCast. If the 2017 LEHD primary job count exceeds the total travel demand, then we assumed the travel demand would be equal to the 2017 primary job count. This change had a minor effect on a few origin-destination pairs.

While not all primary jobs in the LEHD database have typical 9-5 weekday work schedules, it is also true

[3] This assumption is consistent with PSRC's SoundCast model, which indicates that the percentage of trips taken by transit among these market area pairs in our study will collectively increase during the study period, from an estimated 23% in 2014 to 28% in 2025 and 29% in 2040. BERK's forecast for potential ridership demand in 2025 and 2040 also reflects this assumed increase in percentage of travelers that choose to select transit.
[4] The technical documentation for Land Use Vision, PSRC's land use input for the SoundCast travel model can be found here: https://www.psrc.org/sites/default/files/luv-documentation.pdf
[5] For more information see, https://lehd.ces.census.gov/

that not all travel during the AM commute period is done by commuters. And our ridership demand model only assumes a small percentage of the total travel demand would select to use the POF for their trip. So, we used the LEHD data as a reasonable proxy for how total AM commute-period travel demand between the two areas may have changed in recent years.

Expedia Campus

Expedia purchased and expanded office buildings near Centennial Park and announced plans to locate around 4,500 employees at the site by 2020.[6] This is well over double the number of employees at the site assumed in PSRC's land use forecast for the year 2025. We used this information to scale the total expected travel demand to and from the campus to be consistent with Expedia's plans. Our analysis makes no special assumptions about the home locations of Expedia workers. Instead, commute period travel demand to the transportation analysis zone containing the facility is based on the SoundCast travel model which is built using household travel survey data collected before Expedia's decision to relocate to the facility on Elliot Bay.

Consideration for Future Link Light Rail Service to Ballard

Sound Transit is currently planning Link Light Rail service to Ballard with a projected opening date of 2035. This new transit service has potential to significantly shape future travel patterns and habits among Ballard residents traveling to Downtown Seattle. However, this change is not expected to significantly impact future demand for proposed POF service. The assumed market capture area for riders of the proposed POF (shown below in Exhibit 8) excludes much of central Ballard as well as the proposed light rail station location. Additionally, the light rail corridor is already served by RapidRide, and the travel time competitiveness analysis indicates that for residents living near RapidRide, bus transit is already a more attractive choice. Finally, with the introduction of new light rail service Metro commonly reroutes some existing bus routes to encourage transfer to light rail. There is a possibility some residents in Ballard will prefer a "one seat" ride on the POF rather than transferring to light rail.

Estimated Weekday Non-Commute Travel Demand

POF service is a unique transit mode with potential to attract both locals and visitors to make trips they would not have otherwise taken, just for the experience of boat travel. In these cases, POF service is not simply a replacement for travel demand which is currently being served by other modes. Rather, the mode's uniqueness induces additional travel demand which would not be considered in a typical travel demand model like SoundCast. In this section we present analysis that identifies likely induced discretionary travel demand based on historical ridership on the West Seattle Water Taxi. We also discuss how this analysis is used as a basis for estimating potential discretionary ridership demand for the proposed routes, taking into consideration differences in amenities.

Exhibit 1 shows peak season ridership statistics in each direction of travel. A significant portion of the riders are using the service for trip purposes that fall outside of the typical commute period. In 2019, an average of 354 riders took the Water Taxi from Seacrest to Pier 50 before 9am. This accounts for less than half of the daily weekday ridership heading towards Downtown. Looking at the reverse evening

[6] See https://www.seattletimes.com/seattle-news/transportation/elliott-bay-trail-in-interbay-to-reopen-saturday-along-expedias-new-campus/

commute, 456 riders took the water taxi from Pier 50 to Seacrest, or almost 30% more than the presumed commuters riding into downtown in the morning.

Exhibit 1. Peak Season Average Daily Ridership on the West Seattle Water Taxi*

Seacrest to Pier 50										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AM peak (before 9am)	63	135	188	179	194	248	311	316	318	354
Midday (9am-3:30pm)	117	121	131	147	157	170	194	204	222	234
PM Peak (3:30-6:30pm)	62	64	65	70	79	83	98	98	126	125
Evening (after 6:30pm)	43	38	36	46	53	55	63	62	70	75
Weekend	468	542	580	598	647	656	707	773	798	817

Pier 50 to Seacrest										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AM peak (before 9am)	3	3	7	6	8	6	7	6	11	15
Midday (9am-3:30pm)	102	106	97	119	134	154	177	176	194	204
PM Peak (3:30-6:30pm)	137	224	278	272	289	345	410	414	403	456
Evening (after 6:30pm)	80	86	107	109	119	128	155	168	185	206
Weekend	461	533	553	564	618	635	692	798	816	833

*These statistics exclude holidays and closures of SR 99.
Source: King County Marine Division West Seattle Water Taxi Ridership Statistics, 2010-2019. BERK

Comparison to SoundCast travel model output indicates that West Seattle Water Taxi ridership accounts for a much larger share of total PM peak travel demand from Downtown to West Seattle than it does for AM peak travel demand from West Seattle to Downtown. One likely explanation is that SoundCast does not fully account for induced travel demand from visitors or locals who choose to make a discretionary trip using the Water Taxi because of the uniqueness of POF service. Based on these findings, using the SoundCast travel demand output alone with a single market capture rate assumption would likely result in understating ridership potential for proposed POF routes.

One way to forecast the potential for induced discretionary travel demand for proposed POF routes is to estimate this ridership population for the West Seattle Water Taxi. Of course, not all routes have the same discretionary trip potential. The West Seattle Water Taxi benefits from being the most convenience and affordable option for tourists and locals who wish to take a quick boat tour across Elliott Bay. And West Seattle offers access to the recreational attractions of Alki Trail, Alki Beach, and the commercial strip along Alki Ave. Each of the proposed routes also have potential for discretionary travel demand.

To very roughly estimate total non-commute trips on the West Seattle Water Taxi by direction and time of day, we compared the ridership statistics by direction in Exhibit 1. This work assumes that 100% of the trips before 9:00 AM in either direction on weekdays are commuters heading to jobs. Most of these riders are heading from Seacrest to Pier 50, but a few head in the opposite direction. It also assumes 100% of those commuters take the ferry back in the opposite direction between 3:30 PM and 6:30 PM. The remainder of trips are assumed to be non-commute focused. The results of this analysis are shown in Exhibit 2.

Exhibit 2. Peak Season Estimated Non-Commuter Weekday Ridership on the West Seattle Water Taxi

Seacrest to Pier 50										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Midday (9am-3:30pm)	117	121	131	147	157	170	194	204	222	234
PM Peak (3:30-6:30pm)	59	61	58	64	71	77	91	92	115	110
Evening (after 6:30pm)	43	38	36	46	53	55	63	62	70	75

Pier 50 to Seacrest										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Midday (9am-3:30pm)	102	106	97	119	134	154	177	176	194	204
PM Peak (3:30-6:30pm)	75	89	90	93	96	97	100	98	85	102
Evening (after 6:30pm)	80	86	107	109	119	128	155	168	185	206

Source: BERK, 2019. Based on analysis of West Seattle Water Taxi Ridership Statistics, 2010-2019.

While these assumptions oversimplify commute patterns between the two areas, they suffice for the purpose of estimating the total potential magnitude of induced discretionary travel demand on this route. Below we compare the discretionary ridership potential of the proposed POF routes to the West Seattle Water Taxi. We also explain how we apply the findings of our analysis of West Seattle Water Taxi ridership to estimate potential non-commute travel for the proposed routes.

Shilshole to Pier 50: Non-Commute Ridership Potential

This proposed route has recreational characteristics that are somewhat like the current West Seattle Water Taxi. Both routes serve Pier 50, which is near significant recreational opportunities along and near the Downtown Seattle waterfront. On the other end, Shilshole is a 1.1 mile walk or easy bike ride to Golden Gardens, compared to a 1.7 mile walk or ride from Seacrest to Alki Beach. Both destinations have a few restaurant or food options near the landing. From the perspective of recreation, the main difference between the routes is the ferry trip duration (21 minutes for Shilshole vs. 10 minutes for Seacrest) and the types of views that may be enjoyed along the way.

Our analysis assumes that non-commute ridership on this route will be equal to *at least half* of the non-commute ridership currently estimated for the West Seattle Water Taxi. In other words, for the non-commute periods and directions identified in Exhibit 2, assume that non-commute ridership on this route will be equal to half of that which is estimated for West Seattle Water Taxi, unless travel demand estimated using SoundCast output and market capture assumptions alone shows higher ridership potential.

This assumption is meant to be conservative. It is based on the idea that due to similarities between the recreational amenities offered, some induced trips to Shilshole may be replacements for trips that would otherwise have gone to Seacrest. It also acknowledges that the sailing time to Shilshole is somewhat longer and therefore potentially less attractive for a spontaneous trip.

Shilshole to Centennial Park to Pier 50: Non-Commute Ridership Potential

This proposed route adds an additional destination with significant discretionary ridership potential. Centennial Park is a waterfront destination with a 1.8-mile recreational trail running north from the Olympic Sculpture Park and continuing on a popular bike route through Interbay north into Ballard. The sailing between Pier 50 and Centennial Park would be about 10 minutes, equivalent to the current West

Seattle Water Taxi.

Due to the offering of this additional destination, our analysis assumes that this route has greater total discretionary ridership potential than the Shilshole to Pier 50 route. We assume that the combined non-commuter ridership is three fourths of what we estimate for the West Seattle Water Taxi. This total discretional ridership is assumed to be split between afternoon routes, so that there is a modest reduction in the number of discretionary trips from Pier 50 to Shilshole compared to the Shilshole to Pier 50 route alternative that excludes Centennial Park.

Weekend and Holiday Travel Demand

SoundCast travel demand model output for weekends and holidays was not available from PSRC. Therefore, to derive assumptions for potential travel demand we looked at actual weekend ridership patterns on the West Seattle Water Taxi and Bremerton Fast Ferry. Specifically, we calculated the ratio of average daily weekend ridership to average weekday ridership for each route during peak season.[7] These ratios are shown in Exhibit 3. We used them as a basis for determining average daily weekend ridership for the proposed services. For Ballard and Downtown Seattle routes, we selected the higher West Seattle Water Taxi ratio, due to the common Downtown Seattle landing and similarity in amenities.

Exhibit 3. Peak Season Average Daily Ridership, 2019

	Weekdays	Weekends	Weekend Ridership as a % of Weekday
West Seattle Water Taxi	1,670	1,649	99%
Bremerton Fast Ferry	1,165	865	74%

Source: King County, 2019; Kitsap Transit, 2019; BERK 2019.

To distribute total ridership demand by direction and time of day, we analyzed historical ridership by sailing time and direction on the West Seattle and Bremerton routes and smoothed out this demand by hourly increment. This resulted in assumptions for percentage of total daily demand allocated by hour and direction of travel.

Total Unconstrained Ridership Demand Potential

For each proposed route BERK estimated unconstrained ridership demand potential for the years 2019, 2025, and 2040. "Unconstrained" refers to the fact that the demand is not limited by the boat capacity, sailing schedule, or sailing frequency. To support comparison to the constrained ridership forecasts below, this summary of annual unconstrained ridership demand focuses only on days included in the proposed sailing schedules. Depending on the season, ferry services may run on weekdays, Saturdays only, full weekends, or holidays (which was assumed to run a Saturday ferry schedule).

[7] For the West Seattle Water Taxi, "peak season" is defined as the Spring/Summer schedule period of roughly April through October. For Bremerton Fast Ferry, we analyzed data from the May-September period available on their website.

Exhibit 4. Ballard Unconstrained Ridership Demand, Scheduled Days

Route	2019	2025	2040
Shilshole to Pier 50	186,559	292,365	482,445
Shilshole to Centennial Park to Pier 50	201,519	329,601	550,214

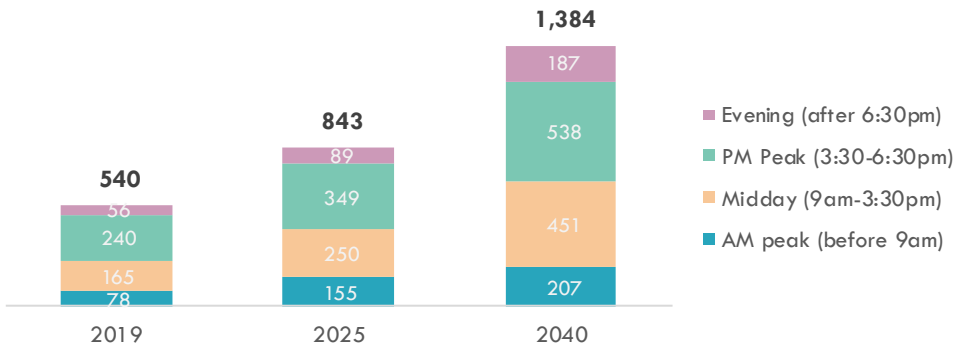
Constrained Ridership: Forecasted Annual Ridership for Proposed Sailing Schedules

To forecast annual ridership, the unconstrained ridership demand was allocated to individual sailings by time of day. Periods of demand greater than 30 minutes away from a scheduled sailing time were not allocated to a sailing and do not impact annual POF ridership estimates. The results of this analysis are presented Exhibit 5 and Exhibit 6.

Exhibit 5. Annual Ridership Forecast by Proposed Sailing Schedule: Ballard to Seattle

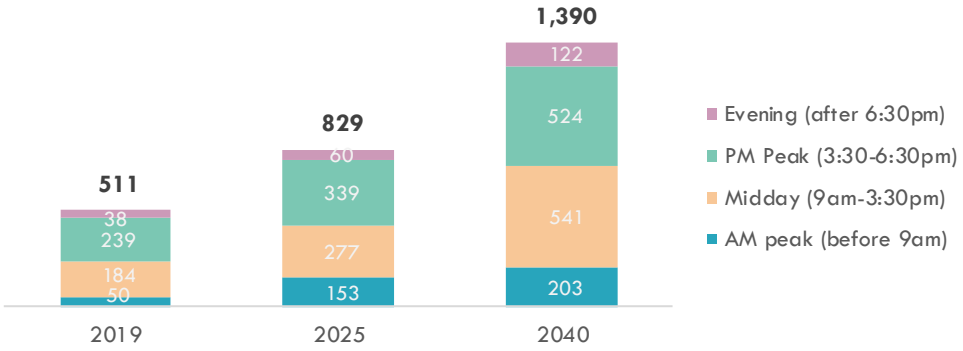
Route	2019	2025	2040
Shilshole to Pier 50	115,346	192,466	293,490
Shilshole to Centennial Park to Pier 50	96,853	176,537	273,313

Exhibit 6. Daily Ridership Forecast: Shilshole to Pier 50, Extended Service M-Th



Shilshole to Pier 50	2019	2025	2040
AM peak (before 9am)	78	155	207
Midday (9am-3:30pm)	165	250	451
PM Peak (3:30-6:30pm)	240	349	538
Evening (after 6:30pm)	56	89	187
Daily total	**540**	**843**	**1,384**

Exhibit 7. Daily Ridership Forecast: Shilshole to Centennial Park to Pier 50, Extended Service M-Th



Shilshole to Centennial Park to Pier 50	2019	2025	2040
AM peak (before 9am)	50	153	203
Midday (9am-3:30pm)	184	277	541
PM Peak (3:30-6:30pm)	239	339	524
Evening (after 6:30pm)	38	60	122
Daily total	**511**	**829**	**1,390**

ASSUMED MARKET AREAS FOR RIDERSHIP DEMAND CAPTURE

Exhibit 8. Shilshole to Pier 50, Market Origin and Destination Areas

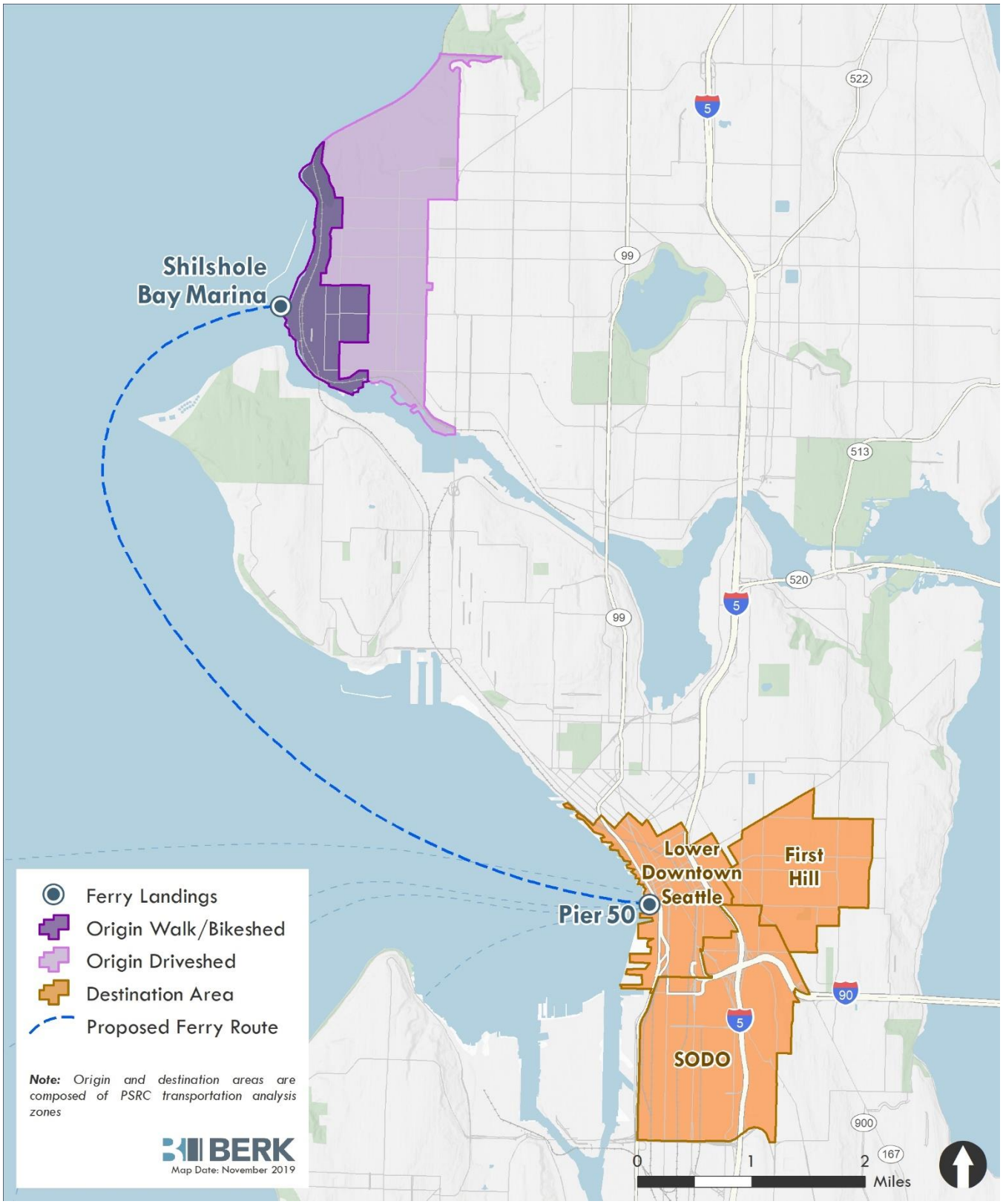
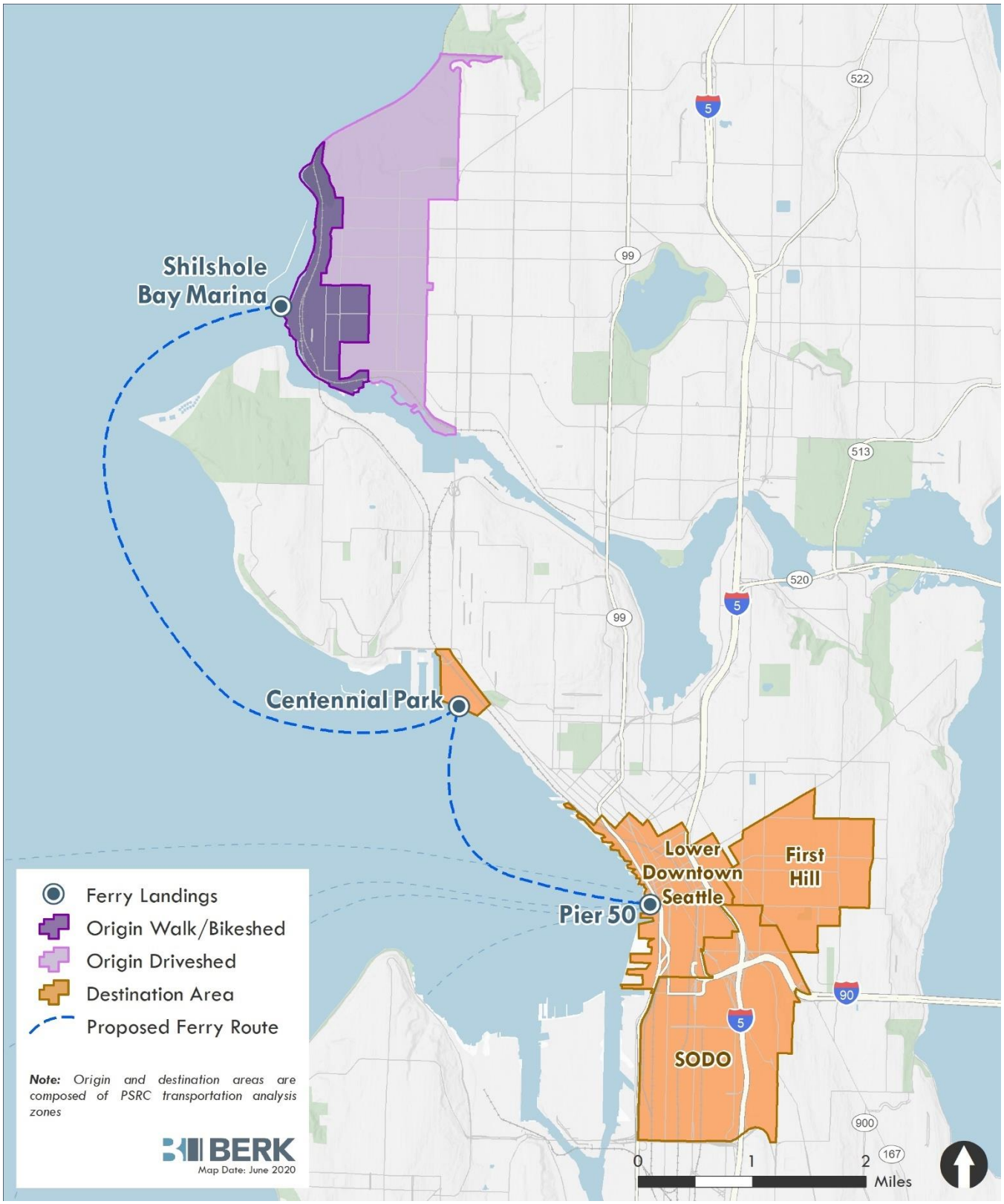


Exhibit 9. Shilshole to Centennial Park to Pier 50, Market Origin and Destination Areas



Attachment A.5

Ballard Travel Time Comparisons

Ballard POF Route
Travel Time Comparison - AM/ Morning Commute

Route	Origin	Destination	Ferry Sailing Time (min)	Ferry Trip Time (min)	Transit Trip Time (min)	# of Transit Legs	Trip Time Difference	Driving - low estimate	Driving - high estimate
Ballard - Pier 50	24th Ave NW and NW 85th St	First Hill Swedish Medical Campus	21	56	51	2	5	24	50
Ballard - Pier 50	24th Ave NW and NW 85th St	Downtown Seattle	21	50	31	1	19	24	47
Ballard - Pier 50	24th Ave NW and NW 85th St	South Lake Union	21	57	28	1	29	20	37
Ballard - Pier 50	24th Ave NW and NW 85th St	Pacific Medical Center	21	54	57	2	-3	24	50
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	First Hill Swedish Medical Campus	34	69	51	2	18	24	50
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	Downtown Seattle	34	63	31	1	32	24	47
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	South Lake Union	34	70	28	1	42	20	37
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	Pacific Medical Center	34	67	57	2	10	24	50
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	Centennial Park	17	34	27	1	7	14	28
Ballard - Pier 50	24th Ave NW and NW Market St	First Hill Swedish Medical Campus	21	54	38	2	16	20	45
Ballard - Pier 50	24th Ave NW and NW Market St	Downtown Seattle	21	48	19	1	29	18	37
Ballard - Pier 50	24th Ave NW and NW Market St	South Lake Union	21	55	19	1	36	14	28
Ballard - Pier 50	24th Ave NW and NW Market St	Pacific Medical Center	21	52	47	2	5	20	40
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	First Hill Swedish Medical Campus	34	67	38	2	29	20	45
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	Downtown Seattle	34	61	19	1	42	18	37
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	South Lake Union	34	68	19	1	49	14	28
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	Pacific Medical Center	34	65	47	2	18	20	40
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	Centennial Park	17	32	18	1	14	9	16

Green indicates ferry is less than transit/driving
Red indicates ferry is 10 minutes or longer than transit/driving
White indicates ferry is between 0-10 minutes longer than transit/driving

Ballard POF Route
Travel Time Comparison - Mid-day Travel

Route	Origin	Destination	Ferry Sailing Time (min)	Ferry Trip Time (min)	Transit Trip Time (min)	# of Transit Legs	Trip Time Difference	Driving - low estimate	Driving - high estimate
Ballard - Pier 50	24th Ave NW and NW 85th St	First Hill Swedish Medical Campus	21	56	68	2	-12	22	45
Ballard - Pier 50	24th Ave NW and NW 85th St	Downtown Seattle	21	50	40	1	10	20	42
Ballard - Pier 50	24th Ave NW and NW 85th St	South Lake Union	21	57	31	1	26	18	26
Ballard - Pier 50	24th Ave NW and NW 85th St	Pacific Medical Center	21	54	61	2	-7	20	45
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	First Hill Swedish Medical Campus	34	69	68	2	1	22	45
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	Downtown Seattle	34	63	40	1	23	20	42
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	South Lake Union	34	70	31	1	39	18	26
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	Pacific Medical Center	34	67	61	2	6	20	45
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	Centennial Park	17	34	41	2	-7	12	24
Ballard - Pier 50	24th Ave NW and NW Market St	First Hill Swedish Medical Campus	21	54	59	2	-5	20	40
Ballard - Pier 50	24th Ave NW and NW Market St	Downtown Seattle	21	48	31	1	17	16	37
Ballard - Pier 50	24th Ave NW and NW Market St	South Lake Union	21	55	22	1	33	14	24
Ballard - Pier 50	24th Ave NW and NW Market St	Pacific Medical Center	21	52	52	2	0	20	40
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	First Hill Swedish Medical Campus	34	67	59	2	8	20	40
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	Downtown Seattle	34	61	31	1	30	16	37
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	South Lake Union	34	68	22	1	46	14	24
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	Pacific Medical Center	34	65	52	2	13	20	40
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	Centennial Park	17	32	21	1	11	9	14

Green indicates ferry is less than transit/driving
Red indicates ferry is 10 minutes or longer than transit/driving
White indicates ferry is between 0-10 minutes longer than transit/driving

Ballard POF Route
Travel Time Comparison - PM/Evening Commute

Route	Origin	Destination	Ferry Sailing Time (min)	Ferry Trip Time (min)	Transit Trip Time (min)	# of Transit Legs	Trip Time Difference	Driving - low estimate	Driving - high estimate
Ballard - Pier 50	24th Ave NW and NW 85th St	First Hill Swedish Medical Campus	21	56	55	2	1	26	55
Ballard - Pier 50	24th Ave NW and NW 85th St	Downtown Seattle	21	50	37	1	13	22	57
Ballard - Pier 50	24th Ave NW and NW 85th St	South Lake Union	21	57	33	1	24	22	42
Ballard - Pier 50	24th Ave NW and NW 85th St	Pacific Medical Center	21	54	64	2	-10	28	55
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	First Hill Swedish Medical Campus	34	69	55	2	14	26	55
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	Downtown Seattle	34	63	37	1	26	22	57
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	South Lake Union	34	70	33	1	37	22	42
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	Pacific Medical Center	34	67	64	2	3	28	55
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	Centennial Park	17	34	31	1	3	16	35
Ballard - Pier 50	24th Ave NW and NW Market St	First Hill Swedish Medical Campus	21	54	53	2	1	24	55
Ballard - Pier 50	24th Ave NW and NW Market St	Downtown Seattle	21	48	30	1	18	18	47
Ballard - Pier 50	24th Ave NW and NW Market St	South Lake Union	21	55	25	1	30	18	42
Ballard - Pier 50	24th Ave NW and NW Market St	Pacific Medical Center	21	52	52	2	0	24	50
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	First Hill Swedish Medical Campus	34	67	53	2	14	24	55
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	Downtown Seattle	34	61	30	1	31	18	47
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	South Lake Union	34	68	25	1	43	18	42
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	Pacific Medical Center	34	65	52	2	13	24	50
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	Centennial Park	17	32	23	1	9	12	24

Green indicates ferry is less than transit/driving
Red indicates ferry is 10 minutes or longer than transit/driving
White indicates ferry is between 0-10 minutes longer than transit/driving

Ballard POF Route
Ferry Trip Times

			Connection from origin to terminal		*Ferry Sailing Times (landing to landing)*	*Transit/walk time from ferry landing to destination*		*Total transit time via ferry*
Route	**Origin Address**	**Destination**	**Time (min)**	**Notes**	**Time (min)**	**Time (min)**	**Notes**	**Time (min)**
Ballard - Pier 50	24th Ave NW and NW 85th St	First Hill Swedish Medical Campus	15	Assumes shuttle	21	20	Rt. 12 + 13 min walk	**56**
Ballard - Pier 50	24th Ave NW and NW 85th St	Downtown Seattle	15	Assumes shuttle	21	14	Rt. 5 + 10 min walk	**50**
Ballard - Pier 50	24th Ave NW and NW 85th St	South Lake Union	15	Assumes shuttle	21	21	C Line + 8 min walk	**57**
Ballard - Pier 50	24th Ave NW and NW 85th St	Pacific Medical Center	15	Assumes shuttle	21	18	Rt. 26 + 10 min walk	**54**
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	First Hill Swedish Medical Campus	15	Assumes shuttle	34	20	Rt. 12 + 13 min walk	**69**
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	Downtown Seattle	15	Assumes shuttle	34	14	Rt. 5 + 10 min walk	**63**
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	South Lake Union	15	Assumes shuttle	34	21	C Line + 8 min walk	**70**
Ballard - Centennial Park - Pier 50	24th Ave NW and NW 85th St	Pacific Medical Center	15	Assumes shuttle	34	18	Rt. 26 + 10 min walk	**67**
Ballard - Centennial Park	24th Ave NW and NW 85th St	Centennial Park	15	Assumes shuttle	17	2	walk	**34**
Ballard - Pier 50	24th Ave NW and NW Market St	First Hill Swedish Medical Campus	13	Assumes shuttle	21	20	Rt. 12 + 13 min walk	**54**
Ballard - Pier 50	24th Ave NW and NW Market St	Downtown Seattle	13	Assumes shuttle	21	14	Rt. 5 + 10 min walk	**48**
Ballard - Pier 50	24th Ave NW and NW Market St	South Lake Union	13	Assumes shuttle	21	21	C Line + 8 min walk	**55**
Ballard - Pier 50	24th Ave NW and NW Market St	Pacific Medical Center	13	Assumes shuttle	21	18	Rt. 26 + 10 min walk	**52**
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	First Hill Swedish Medical Campus	13	Assumes shuttle	34	20	Rt. 12 + 13 min walk	**67**
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	Downtown Seattle	13	Assumes shuttle	34	14	Rt. 5 + 10 min walk	**61**
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	South Lake Union	13	Assumes shuttle	34	21	C Line + 8 min walk	**68**
Ballard - Centennial Park - Pier 50	24th Ave NW and NW Market St	Pacific Medical Center	13	Assumes shuttle	34	18	Rt. 26 + 10 min walk	**65**
Ballard - Centennial Park	24th Ave NW and NW Market St	Centennial Park	13	Assumes shuttle	17	2	walk	**32**

Assumptions:

Connection form origin to terminal uses drive time from google maps (assuming a shuttle service) plus 3 minutes walk time from parking lot to pier (.15 miles) and 5 minutes dwell time

Ferry trip time assumes 28 knot cruising speed

Ballard POF Route
Ferry Sailing Time Calculations

		Shilshole	Centennial Park				Pier 50	
	Speed (kts):	**5**	**5**	**0**	**28**	**12**	**5**	
Route	Total Distance (nm)	Maneuvering (nm)	Maneuvering (nm)	Unload/load (min)	Cruising (nm)	Slowdown (nm)	Maneuvering (nm)	**Total Sailing Time**
Ballard - Pier 50	8.00	0.25			7.60		0.15	21.1
Ballard - Centennial Park	6.30	0.25	0.15		5.90			17.4
Ballard - Centennial Park - Pier 50	8.70	0.25	0.30	8.00	8.00		0.15	33.5

	Speed (kts):	**5**	**5**	**0**	**32**	**12**	**5**	
Route	Total Distance (nm)	Maneuvering (nm)	Maneuvering (nm)	Unload/load (min)	Cruising (nm)	Slowdown (nm)	Maneuvering (nm)	**Total Sailing Time**
Ballard - Pier 50	8.00	0.25			7.60		0.15	19.1
Ballard - Centennial Park	6.30	0.25	0.15		5.90			15.9
Ballard - Centennial Park - Pier 50	8.61	0.25	0.30	8.00	7.91		0.15	31.2

	Speed (kts):	**5**	**5**	**0**	**38**	**12**	**5**	
Route	Total Distance (nm)	Maneuvering (nm)	Maneuvering (nm)	Unload/load (min)	Cruising (nm)	Slowdown (nm)	Maneuvering (nm)	**Total Sailing Time**
Ballard - Pier 50	8.00	0.25			7.60		0.15	16.8
Ballard - Centennial Park	6.30	0.25	0.15		5.90			14.1
Ballard - Centennial Park - Pier 50	8.61	0.25	0.30	8.00	7.91		0.15	28.9

Ballard POF Route
Transit Trip Time Calculations

		AM Commute (best travel time for arrival between 7-8 AM)								Mid-day (arrival by 1 PM)								PM Commute (best travel time for departure between 5-6 PM)							
Origin	**Destination**	Walk between trips	Walk from transit to dest.	Transit Time only	Wait time for Transfer	**Trip Total (min)**	Transit legs	Cost	Notes	Walk between trips	Walk from transit to dest.	Transit Time only	Wait time for Transfer	**Trip Total (min)**	Transit legs	Cost	Notes	Walk to transit from origin	Walk between trips	Transit Time only	Wait time for Transfer	**Trip Total (min)**	Transit legs	Cost	Notes
24th Ave NW and NW 85th St	First Hill Swedish Medical Campus	0	7	38	6	**51**	2	$ 2.75	18+2	2	4	52	10	**68**	2	$ 2.75	40+12	7	1	40	7	**55**	2	$ 2.75	303+40
24th Ave NW and NW 85th St	Downtown Seattle		2	29		**31**	1	$ 2.75	18		1	39		**40**	1	$ 2.75	40	0		37		**37**	1	$ 2.75	18
24th Ave NW and NW 85th St	South Lake Union		1	27		**28**	1	$ 2.75	40		1	30		**31**	1	$ 2.75	40	0		33		**33**	1	$ 2.75	40
24th Ave NW and NW 85th St	Pacific Medical Center	0	2	47	8	**57**	2	$ 2.75	40+36		2	54	5	**61**	2	$ 2.75	40+36	2		54	8	**64**	2	$ 2.75	36+18
24th Ave NW and NW 85th St	Centennial Park		10	17		**27**	1	$ 2.75	18	1	10	21	9	**41**	2	$ 2.75	45+D	11		20		**31**	1	$ 2.75	18
24th Ave NW and NW Market St	First Hill Swedish Medical Campus	0	7	27	4	**38**	2	$ 2.75	17+12	2	4	43	10	**59**	2	$ 2.75	40+12	4	3	40	6	**53**	2	$ 2.75	309+40
24th Ave NW and NW Market St	Downtown Seattle		1	18		**19**	1	$ 2.75	17		1	30		**31**	1	$ 2.75	40	0		30		**30**	1	$ 2.75	18
24th Ave NW and NW Market St	South Lake Union		1	18		**19**	1	$ 2.75	40		1	21		**22**	1	$ 2.75	40	0		25		**25**	1	$ 2.75	40
24th Ave NW and NW Market St	Pacific Medical Center	0	2	31	14	**47**	2	$ 2.75	17+36		2	45	5	**52**	2	$ 2.75	40+36	2	1	44	5	**52**	2	$ 2.75	36+17
24th Ave NW and NW Market St	Centennial Park		10	8		**18**	1	$ 2.75	18		10	11		**21**	1	$ 2.75	D	10		13		**23**	1	$ 2.75	17

Assumptions:

Commute transit times from Google Maps for Wednesday arrival between 7:00 and 8:00 AM. Shortest travel time is shown.

Mid-day transit times from Google Maps for Wednesday arrival by 1:00 PM. Shortest travel time is shown.

Commute transit times from Google Maps for Wednesday departure between 5:00 and 6:00 PM. Shortest travel time is shown.

Wait time is calculated using Google maps total travel time and subtracting the walk and travel time. This is the assumed wait time when connecting to another segment of the trip.

Cost assumes use of ORCA card for free transfers. Cash fare would be $5.50 in multi-leg trips where riders transfer between agencies

Ballard POF Route
Driving Trip Times

		AM Commute		Mid-day		PM Commute					
Origin	Destination	Low	High	Low	High	Low	High	Distance	Mileage Cost	Parking Cost	Total Cost
24th Ave NW and NW 85th St	First Hill Swedish Medical Campus	24	50	22	45	26	55	9.4	5.45	$ 17.00	$ 22.45
24th Ave NW and NW 85th St	Downtown Seattle	24	47	20	42	22	57	8.7	5.05	$ 20.00	$ 25.05
24th Ave NW and NW 85th St	South Lake Union	20	37	18	26	22	42	7.1	4.12	$ 21.00	$ 25.12
24th Ave NW and NW 85th St	Pacific Medical Center	24	50	20	45	28	55	10.2	5.92	$ -	$ 5.92
24th Ave NW and NW 85th St	Centennial Park	14	28	12	24	16	35	5.3	3.07	$ -	$ 3.07
24th Ave NW and NW Market St	First Hill Swedish Medical Campus	20	45	20	40	24	55	6.4	3.71	$ 17.00	$ 20.71
24th Ave NW and NW Market St	Downtown Seattle	18	37	16	37	18	47	5.7	3.31	$ 20.00	$ 23.31
24th Ave NW and NW Market St	South Lake Union	14	28	14	24	18	42	4.9	2.84	$ 21.00	$ 23.84
24th Ave NW and NW Market St	Pacific Medical Center	20	40	20	40	24	50	8.6	4.99	$ -	$ 4.99
24th Ave NW and NW Market St	Centennial Park	9	16	9	14	12	24	3.6	2.09	$ -	$ 2.09

Assumptions

Commute drive times from Google Maps for weekday arrival by 8:00 AM and departure at 5:00 PM

Mid-day drive times from Google Maps for weekday arrival by 1:00 PM.

Walk time from nearest public parking garage is added to drive time if parking is not at destination.

Mileage cost is calculated using the GSA rate of $0.58 per mile

Parking Cost is the daily (at least 9 hours) rate of the nearest public parking garage. Expedia location assumes free employee parking will be provided.

Destination	Destination Address Used
First Hill Swedish Medical Campus	747 Broadway
Downtown Seattle	3rd Ave and Union
South Lake Union	Westlake and Harrison
Pacific Medical Center	1200 12th Ave S
Centennial Park	1111 Expedia Group Way W

Attachment A.6

Ballard Capital Cost Worksheets

Ballard Implementation Study - Landing Site Capital Improvements
Engineer's Rough Order of Magnitude Estimate
February 27, 2020

#	Item		
	Landing Site	Shilshole South	
	Option	Passenger Service Only	
	Mobilization/Demobilization	$	271,000
	Overwater Improvements	$	2,384,000
	Uplands Improvements	$	327,000
	Site Work	$	-
	Subtotal Construction	**$**	**2,990,000**
	Environmental and Permitting Costs	$	750,000
	Const. Mangmt. & Admin (6% of const'n + enviro costs)	$	230,000
	KCMD Labor Costs	$	1,200,000
	Contingency (40% of construction + environmental costs)	$	1,500,000
	Design Engineering (15% of construction costs)	$	450,000
	Tax (10.1% of construction only)	$	310,000
	Total ROM Estimate	**$**	**7,500,000**
	Total Construction + Escalation (5% per year)		
	Year 1 - 2021	$	7,900,000
	Year 2 -2022	$	8,300,000
	Year 3 -2023	$	8,800,000

 # Notes:

All amounts rounded
All Amounts in 2020 dollars
Mobilization for heavy derrick barges for pile driving and
Sites with new floats require dry fire lines
If in-lieu fee program is used cost would be at 1:1 ratio at 104$/SF (2020)
Market forces in trade labor in the Seattle area has created a surge in trade labor costs. This estimate should be revised yearly to adjust for the current market.
Other mitigation to cover possible Marine Mammal monitoring, water quality issues with pile pulling and public outreach

Ballard Implementation Study - Landing Site Capital Improvements
Engineer's Rough Order of Magnitude Estimate

	Ballard - Shilshole Marina South, Henry L. Kotkins Pier				
	POF service only, add float, moorage at KCMD Maintenance Center				
#	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Cost** (2020 $)
	Mobilization/Demobilization	1	LS	$ 271,100	$ 271,100
	Mobilization/Demobilization Subtotal				**$ 271,000**
	Overwater Improvements				
	Concrete Foam Filled Float (20' x 100' x 6' freeboard) Procurement	2000	SF	$ 500	$ 1,000,000
	Steel Pile Hoops	4	EA	$ 10,000	$ 40,000
	Float Installation and Final Ballasting	1	LS	$ 40,000	$ 40,000
	Electrical for Lighting and Transfer Spans on Service Floats	1	LS	$ 40,000	$ 40,000
	Gangway (tidal locations - 8' x 80')	480	SF	$ 360	$ 172,800
	Upper Gangway Support	1	LS	$ 250,000	$ 250,000
	Moorage Transfer Span	2	EA	$ 8,000	$ 16,000
	Fixed Ramp	1	EA	$ 30,000	$ 30,000
	Fendering (fixed vertical, D-Rubber on Wide Flange bolted to float, installed)	4	EA	$ 8,000	$ 32,000
	20Ton Cleats (hardware + installation)	4	EA	$ 2,500	$ 10,000
	Fiberglass Ladder	1	EA	$ 3,000	$ 3,000
	Steel Handrail	240	LF	$ 150	$ 36,000
	Furnish (7) 24"x0.75" Steel Piles (75' ea)	49	TONS	$ 2,500	$ 122,500
	Steel Pile Coating (3/4 Pile Length)	2800	SF	$ 8	$ 22,400
	Pile Driving	7	EA	$ 10,000	$ 70,000
	Bubble Curtain/Enviro Observation	1	LS	$ 60,000	$ 60,000
	Environmental Mitigation for Over Water Coverage	2736	SF	$ 104	$ 284,544
	Electrical for Lighting and Transfer Spans on Service Floats	1	LS	$ 40,000	$ 40,000
	Float Fire System	1	LS	$ 115,000	$ 115,000
	Overwater Improvements Subtotal				**$ 2,384,000**
	Uplands Improvements				
	Signage and Way Finding	30	EA	$ 500	$ 15,000
	Ticketing	1	EA	$ 22,000	$ 22,000
	Shelter	1200	SF	$ 200	$ 240,000
	Security System (gates, fencing and monitoring system)	1	LS	$ 50,000	$ 50,000
	Uplands Improvements Subtotal				**$ 327,000**
	Site Work				
					$ -
	Site Work Subtotal				**$ -**
	Subtotal Construction				***$ 2,990,000***
	Other Cost Items				
	Environmental and Permitting Costs			$ 750,000	$ 750,000
	Construction Management and Administration (on const'n + enviro costs)			6.0%	$ 230,000
	KCMD Labor for Capital Project Management and Implementation				$ 1,200,000
	Contingency (on construction + environmental costs)			40.0%	$ 1,500,000
	Design Engineering (on construction costs)			15.0%	$ 450,000
	Tax (on construction only)			10.1%	$ 310,000
	Other Cost Items Subtotal				**$ 4,440,000**
	Total ROM Estimate				**$ 7,500,000**
	Total Construction + Escalation (5% per year)				
	Year 1				$ 7,900,000
	Year 2				$ 8,300,000
	Year 3				$ 8,800,000

 # Notes:

Attachment A.7

Operating Cost Worksheets

One-way Route Plan - Ballard (Shilshole) to Seattle (Pier 50)										
Route Segment	Distance (Statute Miles)	Distance (Nautical Miles)	Average Speed (Kts)	Average Speed (MPH)	Time Required (Minutes)	Full Load Fuel Rate (GPH)	Full Load Fuel Usage (Gals/Segment)	Light Load Fuel Rate (GPH)	Light Load Fuel Usage (Gals/Segment)	Round Trip Fuel Usage
Shilshole - Maneuver	0.29	0.25	5.0	5.8	3.0	26.6	1.3	19.4	1.0	
Shilshole to Pier 50	8.74	7.60	28.0	32.2	16.3	132.9	36.1	97.2	26.4	
Pier 50 Maneuver	0.17	0.15	5.0	5.8	1.8	26.6	0.8	19.4	0.6	
Total (or average) One-Way Transit	**9.20**	**8.00**	**22.8**	**26.2**	**21.1**	**108.7**	**38.2**	**92.9**	**27.9**	**66.1**
Rounded Average (H:MM)					0:21				**54.9**	
Off/On Load PAX	0.00	0.00	0.0	0.0	9.0	13.3	2.0	9.7	1.5	
Rounded Average (H:MM)					0:09					
Trip Total (or average) One-Way	**9.20**	**8.00**	**16.0**	**18.3**	**30.1**	**80.1**	**40.2**	**88.8**	**29.4**	**69.6**
Rounded Average (H:MM)					0:30		**2.0**	Round Trips per Fueling Stop		**17.2**
Moorage/maintenance float to Pier 50	0.12	0.10	7.0	8.1	0.9	26.6	0.4	19.4	0.3	**0.7**
					0:00					

Route Assumptions
* Assumed cruising speed at 28 knots, resulting in a one-way transit time of ~24 minutes
* Using AAM data, estimated cruising speed fuel consumption at 80% engine rating at ~133GPH
* Estimated maneuvering speeds at 5 knots, with fuel consumptions rates during maneuvering at 40% of cruising rates (20% on 2 engines)
* Estimated dwell times of at least 8 mins in both Ballard and Seattle in peak direction, at least 5 minutes in off-peak direction. Dwell time including loading and unloading, except for in the first or last sailings of the travel period where only loading or unloading is included.
* Assumes a one-way trip time of 23 minutes, or a round trip time of 46 minutes
* Estimated dwell time fuel consumption (while in dock) at 10% of cruising rates
* Assumed fuel tank capacity=750 Gals/hull; with full tank ~95%=710 Gals each tank; retain minimum of ~15% in tank=110 Gals => max of 600 Gals/tank (total 1,200) usable between fueling stops
* With one-way transit fuel consumption ranging from 30 to 40 Gals/transit => an average of ~77 Gals/round trip => maximum of ~17 round-trips before fueling
* Assumes all ferry service begins and ends in Seattle at Pier 50 (.1 nm distance)
* Fueling to occur at Harbor Island (assumes capability @ a rate of 50 GPM => will take ~24 minutes to fuel)
* Distance from Pier 50 to Harbor Island (assumes 7 knots) will take ~9 minutes)
* Distance from Moorage/Maintenance Float to Pier 50 = ~.1 nm, which will take ~3 minutes at 7 knots one-way

All American Marine Fuel Consumption Data				
Vessel Condition	Engine Rating	Gals/NM	Speed NM/HR	GPH
Full Fuel & Passengers	100%	4.88	34.20	166.90
Full Fuel & Passengers	95%	4.81	32.90	158.25
Full Fuel & Passengers	90%	4.73	31.60	149.47
Full Fuel & Passengers	85%	4.66	30.30	141.20
Full Fuel & Passengers	80%	4.63	28.70	132.88
Full Fuel & Passengers	75%	4.59	27.20	124.85
Full Fuel & Passengers	70%	4.51	25.70	115.91
Half Fuel & No Passengers	100%	4.08	40.90	166.87
Half Fuel & No Passengers	95%	4.00	39.50	158.00
Half Fuel & No Passengers	90%	3.93	38.00	149.34
69.4 Half Fuel & No Passengers	85%	3.85	36.60	140.91
69.4 Half Fuel & No Passengers	80%	3.78	35.20	133.06
Half Fuel & No Passengers	75%	3.72	33.60	124.99
Half Fuel & No Passengers	70%	3.64	31.90	116.12
Half Fuel & No Passengers	65%	3.52	30.10	105.95
Half Fuel & No Passengers	60%	3.46	28.10	97.23
Half Fuel & No Passengers	55%	3.40	26.20	89.08

Description	Speed knots	Crossing minutes	Dwell minutes
100% Rated at full load	34.2	54.1	5.9
95% Rated at full load	32.9	54.7	5.3
90% Rated at full load	31.6	55.4	4.6
85% Rated at full load	30.3	56.1	3.9
80% Rated at full load	28.7	57.1	2.9
75% Rated at full load	27.2	58.1	1.9
90% Rated at light load	38	52.5	7.5
70% Rated at light load	31.9	55.2	4.8

All American Marine Data	
Spec	AAM
Hybrid Add	$300k-$600k
Passenger	149
Engine	Quad-Engine
Propulsion	Water Jet
Speed	30 knots
Top Speed	35 knots
Length	81'
Beam	30'
# of decks	2
Vessel Height	26'
Freeboard	5'
Hull	Aluminum
Bicycles	30
Noise Level	75 – 78 db's (TBD)
Fuel Consumption	(See to Left)
Load Locations	Vessel sides (front & rear)

Service Assumptions	
Landing Sites	* Shilshole Marina in Ballard * Pier 50 in Seattle
Service Levels & Seasonality	* Commute service schedule: - AM & PM commute periods Monday through Friday only - October through March (Total of 26 weeks - holidays; equivalent of 25 full weeks) - Saturday service - single vessel service for total of 5 round trips per day for 26 weeks - Assumes 5 holiday days with no service (Thanksgiving, Christmas, New Year, MLK, President's Day) * Peak service schedule: - Expanded weekdays, extended evenings, and weekend service -April through September (Total of 25 weeks - full service, with 3 weekday holidays at Sunday schedule) - Assumes Memorial Day, Independence Day & Labor Day operated on Sunday schedule * Special Event service: - None assumed
Vessel	* All American Marine Design - 81' x 30' * Two vessels (one in service, one spare/backup) * Configuration - side loading * Size: 150 passengers * Cruising speed: 28 knots (will not require compliance with high speed craft standards) * Engine: 4-engine waterjet or two-engine hybrid * Bicycle Capacity: 25-35 bicycles * Vessel/terminal interface: Two entrances on both sides, gangways stored at terminals.
Vessel Crews	* Crew of three (1 Captain & 2 Deckhands) * No mate or senior deckhand was assumed
KCMD Operator - Plus up Management, Administration, Support Staff	* Management Staff of 1
Fueling location & schedule	* Fueling assumed to occur at Maxum Petroleum at Harbor Island
Vessel Moorage	* Vessel moorage at Pier 48 moorage/maintenance float * Assume all service begins and ends at Pier 50
Vessel Maintenance Plans	* Routine maintenance to be performed at Pier 48 maintenance facility * Engineering crew assumed to be 1 engineer and 1 oiler * Major maintenance to be performed at area shipyard

Ballard (Shilshole) to Seattle (Pier 50) - Operating Input Data		
Description	**Values**	**Units**
Service Profile		
Commute-only	26.00	Weeks per year
	25.00	Weeks of weekday service excluding holidays/year
	5.00	Service days per week
	5.00	Holidays
Peak	25.00	Weeks per year
	7.00	Service days per week
	4.00	Days of weekday service per week
	3.00	Holidays
Special Events	0.00	Events per year
Service Hours		
Commute-only	4.97	service hours per weekday (Monday - Friday)
	620.83	weekday service hours for 6 months of year (excludes 5 holidays/year)
	7.45	service hours per weekend (Saturday)
	186.25	Saturday service hours for 6 months of year
	807.08	total commute-only service hours
	151.00	days of service (25 weeks of commute-only @ 5 days/week - 5 holidays)
Peak	14.18	service hours per day for 6 months (Monday - Thursday)
	1375.78	service hours for 6 months of year (excludes service on 3 holidays)
	16.45	service hours per day for 6 months (Friday)
	411.25	service hours for 6 months of year
	11.72	service hours per day for 6 months (Saturday)
	292.92	service hours for 6 months of year
	9.45	service hours per day for 6 months (Sunday)
	274.05	service hours for 6 months of year (includes 3 holidays on Sunday schedule)
	175.00	days of service (26 weeks of peak @ 7 days/week)
Special	0.00	service hours per event
	0.00	service hours for 10 special events per year
Annual Totals	9.69	average service hours per day per year (excluding special events)
	3161.08	total service hours per year, including special events (excludes 5 holidays/year)
	326.00	days of service per year (excluding special events)
Transits (Round Trips)		
Commute-only	6.00	round trips per day (Monday - Friday)
	8.00	round trips per day (Saturday)
	958.00	round trips for 6 months of year (excludes 5 holidays/year)
Peak	14.00	daily round trips per day for 6 months (Monday - Thursday)
	1358.00	round trips for 6 months of year (excludes service on 3 holidays)
	17.00	round trips per day for 6 months (Friday)
	425.00	round trips for 6 months of year
	13.00	round trips per day for 6 months (Saturday)
	325.00	round trips for 6 months of year
	10.00	round trips per day for 6 months (Sunday)
	280.00	round trips for 6 months of year (includes 3 holidays on Sunday schedule)
Special	0.00	round trips per event
	0.00	round trips for 10 special events per year
Annual Totals	10.47	average round trips per day per year (excludes special events)
	3346.00	total round trips per year including special events (excludes 5 holidays/year)
Vessel Operating Hours		
Commute-only	6.68	vessel hours per day per vessel (Monday - Friday)
	835.42	weekday vessel hours per vessel for 6 months of commute-only
	9.08	vessel hours per day (Saturday)
	236.17	Saturday vessel hours for 6 months of commute-only
	1,071.58	total vessel hours per year (excludes 5 holidays/year)
Peak	15.08	hours per day per vessel (Monday - Thursday)
	1,463.08	hours per year per vessel (excludes 3 holidays/year)
	18.08	hours per day per vessel (Friday)
	452.08	hours per year per vessel
	14.08	hours per day per vessel (Saturday)
	352.08	hours per year per vessel
	11.08	average hours per day per vessel (Sunday)
	310.33	average hours per year per vessel (w/ Sunday service on 3 holidays)
	2,577.58	vessel hours per year per vessel
Special	0.00	vessel hours per day per event per vessel
	0.00	total vessel hours per year
Annual Totals	11.30	average hours per day per year per vessel (excluding special service)
	3,649.17	total vessel hours per year (excludes 5 holidays/year)

Crew Hours		
Commute-only	59.00	total crew hours per week
	1,485.58	total crew hours for 6 months (excludes 5 holidays/year)
Peak	114.08	total crew hours per week (typical)
	2,840.08	total crew hours for 6 months (includes Sunday service on 3 holidays)
Special	0.00	total crew hours per event per vessel
	0.00	total crew hours for special service
Annual Totals	4,325.67	total crew hours per year
	12,977.00	total labor hours for year (assuming number of crew specified below)
Fuel Usage		
Average Fuel Use	69.59	average gallons per round trip
Commute-only	6.00	number of round trips per weekday
	8.00	number of round trips per Saturday
	38.00	number of round trips per week
	2,644.46	typical gallons per week
	955.00	round trips for 6 months of year (excludes 5 holidays/year)
	66,459.34	total gallons for 6 months of year (excludes 5 holidays/year)
Peak	96.00	typical number of round trips per week
	6,680.73	typical gallons per week
	2,388.00	round trips for 6 months of year (includes Sunday service on 3 holidays)
	166,183.14	total gallons for 6 months of year (includes Sunday service on 3 holidays)
Special	0.00	number of round trips per special event
	0.00	number of round trips per year
	-	total gallons for special events per year
Annual Totals	3,343.00	total round trips per year
	232,642.48	total gallons per year
	244,274.61	total gallons per year, with extra 5% to cover miscellaneous fuel use
Vessel Particulars		
Vessel Length	81.00	feet (length overall)
Vessel Breadth	30.00	feet
Vessel Crew		
Captains	1	per vessel
Senior Deckhands	1	per vessel
Purser Deckhands	1	per vessel
Vessel Maintenance Staff		
Engineer	1	per system
	2,080	hours per year
Oiler	1	per system
	2,080	hours per year

Ballard (Shilshole) to Seattle (Pier 50) - Cost Input Data			
Description	**Cost**	**Unit**	**Source/Justification for Values**
Capital Costs			
Vessels			
150-pax	$ 7,700,000.00	per vessel	Based on estimate from AAM for SECO
Mid-life Vessel Overhaul	30%	of acquisition costs	Estimate; occurring at mid-point in life of vessel, includes interior refurbishment along with engine overhaul
Terminals			
Estimated Capital Improvements	$ 7,500,000.00	total	From KPFF rough order of magnitude costs estimates for improvements at Shilshole Bay Marina
Management and Support			
Admin/Insurance/Materials	5%	of direct costs	Includes project administration and materials
Operating Costs			
Vessel Operations			
Labor			
KCMD			
Captain/Master	$ 55.15	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 37.22	per hour	Based on KCMD 2019 costs
Senior Deckhand	$ 37.74	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 28.39	per hour	Based on KCMD 2019 costs
Purser Deckhand	$ 36.85	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 27.95	per hour	Based on KCMD 2019 costs
Fuel			
Fuel Price	$ 3.00	dollars/gallon	Estimated price of Maxum Petro
Maintenance			
Labor			
KCMD			
Engineers	$ 51.36	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 35.29	per hour	Based on KCMD 2019 costs
Oilers	$ 36.85	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 31.07	per hour	Based on KCMD 2019 costs
Routine Maintenance	$ 5.00	per engine per hour	Estimated factor for routine maintenance costs based on number of vessel hours
	$ 20.00	per hour	Estimated maintenance cost per hour assuming 4 engines per vessel
	$ 72,983.33	per year	Estimate of routine maintenance cost based on total number of vessel hours each year
Annual Maintenance	$ 0.33	per foot per vessel per hour	Estimate factor for periodic hull/out-of-water maintenance costs based on vessel length and hours of operation
	$ 26.73	per vessel per hour	Estimate based on proposed AAM vessel characteristics
	$ 32,514.08	per vessel	Assumes three vessels delivering similar levels of service
	$ 97,542.23	per year	Assumes three vessels delivering similar levels of service for full year
Unplanned Maintenance	10%	of total maintenance cost	Estimate to account for unplanned maintenance and repair work
Vessel Insurance	$ 133,333.33	per vessel	Annual vessel insurance for two vessels assumed
Shuttle			
Shuttle Operations - hourly	$ 162.05	per hour	Based on 2019 KC Metro fully loaded costs for 40' bus
Shuttle Operations - annual	$ 674,128.00	per year	Weekdays, 8 hours/day during commute times, 2 shuttles
Terminal Operations			
Labor			
KCMD			
Information Agent(s)	$ 29.07	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 24.01	per hour	Based on KCMD 2019 costs
Info Agent Annual Cost	$ -	per year, fully weighted	None assumed
Routine Terminal Maintenance	$ 1.00	per service hour	Estimate of terminal maintenance cost based on hours of operation
	$ 3,161.08	per year	Estimate of routine maintenance cost based on annual service hours
Terminal Lease	$ 3,000.00	per landing site	Estimate for landing site lease (based on existing KT lease agreement between KT and WSF in Seattle plus escalation)
	$ 3,000.00	per month	Lease costs at Shilshole
	$ 36,000.00	per year	Annual estimate based on 12 months of operations
Fare Collection Costs	$ 12,000.00	per year	Estimated cost of fare collection processing, including cash processing, transit cards, and maintenance contracts
Management, Administration & Support			
KCMD			
Management/Admin/Support Lab	$ 143,000.00	per year	Assumed the cost of 1 extra FTEs to support service expansion (see assumptions tab for details)
Overhead/Benefits	$ 51,000.00	per year	Estimate of overhead costs such as sick leave, vacation, benefits based on KCMD 2019 costs
Admin/insurance/overhead/misc	18%	of direct costs	Estimate includes liability insurance, miscellaneous administrative/management costs and overhead (supplies, etc.), plus other potential miscellaneous costs
Inflation Rate			
KCMD	3.00%	per year	Assumed higher inflation rate for KCMD due to higher increases in central rates, benefit costs and labor expenses
Operating Costs per rider			
Systemwide Operating Costs	$ 9,096,050.00	per year	Based on KCMD 2019 costs
Systemwide Ridership	701,678	per year	Based on KCMD 2019 costs
Existing Systemwide Ops costs Year 7	$ 10,069,586.00	per year	Based on model from Ridership & ops costs from 2008 to 2019
Existing Systemwide Ops costs Year 21	$ 16,307,456.00	per year	Based on model from Ridership & ops costs from 2008 to 2019
Existing Systemwide Ridership in Year 7	899,807	per year	Based on model from Ridership & ops costs from 2008 to 2019
Existing Systemwide Ridership in Year 21	1,510,307	per year	Based on model from Ridership & ops costs from 2008 to 2019

Ballard (Shilshole) to Seattle (Pier 50)
KCMD Operator Costs

Funding Type	Component		Years																					
	Description	Sub-tasks	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Capital	Vessels	Vessel Acquisition (2 Vessels)	$ 15,400,000																					
		Mid-life Overhaul											$ 4,620,000											
	Terminals	Terminal Improvements	$ 7,500,000																					
	Management	Management & Support	$ 1,145,000										$ 231,000											
		Capital Cost Subtotal	*$ 24,045,000*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 4,851,000*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*
Operating	Vessel Ops	Labor																						
		- Direct Labor		$ 561,212	$ 578,048	$ 595,390	$ 613,251	$ 631,649	$ 650,599	$ 670,116	$ 690,220	$ 710,927	$ 732,254	$ 754,222	$ 776,849	$ 800,154	$ 824,159	$ 848,883	$ 874,350	$ 900,580	$ 927,598	$ 955,426	$ 984,089	$ 1,013,611
		- Overhead		$ 404,709	$ 416,851	$ 429,356	$ 442,237	$ 455,504	$ 469,169	$ 483,244	$ 497,741	$ 512,674	$ 528,054	$ 543,896	$ 560,212	$ 577,019	$ 594,329	$ 612,159	$ 630,524	$ 649,440	$ 668,923	$ 688,991	$ 709,660	$ 730,950
		Fuel		$ 732,824	$ 754,809	$ 777,453	$ 800,776	$ 824,800	$ 849,544	$ 875,030	$ 901,281	$ 928,319	$ 956,169	$ 984,854	$ 1,014,400	$ 1,044,832	$ 1,076,176	$ 1,108,462	$ 1,141,716	$ 1,175,967	$ 1,211,246	$ 1,247,584	$ 1,285,011	$ 1,323,561
		Maintenance																						
		- Labor		$ 183,477	$ 188,981	$ 194,651	$ 200,490	$ 206,505	$ 212,700	$ 219,081	$ 225,653	$ 232,423	$ 239,396	$ 246,577	$ 253,975	$ 261,594	$ 269,442	$ 277,525	$ 285,851	$ 294,426	$ 303,259	$ 312,357	$ 321,728	$ 331,380
		- Overhead		$ 138,029	$ 142,170	$ 146,435	$ 150,828	$ 155,353	$ 160,013	$ 164,814	$ 169,758	$ 174,851	$ 180,096	$ 185,499	$ 191,064	$ 196,796	$ 202,700	$ 208,781	$ 215,044	$ 221,496	$ 228,141	$ 234,985	$ 242,034	$ 249,295
		- Routine		$ 72,983	$ 75,173	$ 77,428	$ 79,751	$ 82,143	$ 84,608	$ 87,146	$ 89,760	$ 92,453	$ 95,227	$ 98,083	$ 101,026	$ 104,057	$ 107,178	$ 110,394	$ 113,706	$ 117,117	$ 120,630	$ 124,249	$ 127,977	$ 131,816
		- Annual		$ 97,542	$ 100,468	$ 103,483	$ 106,587	$ 109,785	$ 113,078	$ 116,471	$ 119,965	$ 123,564	$ 127,270	$ 131,089	$ 135,021	$ 139,072	$ 143,244	$ 147,541	$ 151,968	$ 156,527	$ 161,222	$ 166,059	$ 171,041	$ 176,172
		- Unplanned		$ 17,053	$ 17,564	$ 18,091	$ 18,634	$ 19,193	$ 19,769	$ 20,362	$ 20,972	$ 21,602	$ 22,250	$ 22,917	$ 23,605	$ 24,313	$ 25,042	$ 25,794	$ 26,567	$ 27,364	$ 28,185	$ 29,031	$ 29,902	$ 30,799
		Vessel Insurance		$ 266,667	$ 274,667	$ 282,907	$ 291,394	$ 300,136	$ 309,140	$ 318,414	$ 327,966	$ 337,805	$ 347,940	$ 358,378	$ 369,129	$ 380,203	$ 391,609	$ 403,357	$ 415,458	$ 427,922	$ 440,759	$ 453,982	$ 467,602	$ 481,630
		Shuttle		$ 674,128	$ 694,352	$ 715,182	$ 736,638	$ 758,737	$ 781,499	$ 804,944	$ 829,092	$ 853,965	$ 879,584	$ 905,972	$ 933,151	$ 961,145	$ 989,980	$ 1,019,679	$ 1,050,269	$ 1,081,778	$ 1,114,231	$ 1,147,658	$ 1,182,088	$ 1,217,550
	Terminal Ops	Labor		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Routine Terminal Maintenance		$ 3,161	$ 3,256	$ 3,354	$ 3,454	$ 3,558	$ 3,665	$ 3,774	$ 3,888	$ 4,004	$ 4,124	$ 4,248	$ 4,376	$ 4,507	$ 4,642	$ 4,781	$ 4,925	$ 5,073	$ 5,225	$ 5,382	$ 5,543	$ 5,709
		Terminal Lease		$ 36,000	$ 37,080	$ 38,192	$ 39,338	$ 40,518	$ 41,734	$ 42,986	$ 44,275	$ 45,604	$ 46,972	$ 48,381	$ 49,832	$ 51,327	$ 52,867	$ 54,453	$ 56,087	$ 57,769	$ 59,503	$ 61,288	$ 63,126	$ 65,020
		Fare Collection		$ 12,000	$ 12,360	$ 12,731	$ 13,113	$ 13,506	$ 13,911	$ 14,329	$ 14,758	$ 15,201	$ 15,657	$ 16,127	$ 16,611	$ 17,109	$ 17,622	$ 18,151	$ 18,696	$ 19,256	$ 19,834	$ 20,429	$ 21,042	$ 21,673
	Administration / Support	Management/Admin/ Support Labor		$ 194,000	$ 199,820	$ 205,815	$ 211,989	$ 218,349	$ 224,899	$ 231,646	$ 238,596	$ 245,753	$ 253,126	$ 260,720	$ 268,541	$ 276,598	$ 284,896	$ 293,442	$ 302,246	$ 311,313	$ 320,652	$ 330,272	$ 340,180	$ 350,386
		Admin/Insurance/ Overhead		$ 610,881	$ 629,208	$ 648,084	$ 667,526	$ 687,552	$ 708,179	$ 729,424	$ 751,307	$ 773,846	$ 797,061	$ 820,973	$ 845,602	$ 870,971	$ 897,100	$ 924,013	$ 951,733	$ 980,285	$ 1,009,694	$ 1,039,984	$ 1,071,184	$ 1,103,319
		Operating Cost Subtotal	*$ -*	*$ 4,004,666*	*$ 4,124,806*	*$ 4,248,550*	*$ 4,376,007*	*$ 4,507,287*	*$ 4,642,505*	*$ 4,781,780*	*$ 4,925,234*	*$ 5,072,991*	*$ 5,225,181*	*$ 5,381,936*	*$ 5,543,394*	*$ 5,709,696*	*$ 5,880,987*	*$ 6,057,416*	*$ 6,239,139*	*$ 6,426,313*	*$ 6,619,103*	*$ 6,817,676*	*$ 7,022,206*	*$ 7,232,872*
Total Annual Cost			***$ 24,045,000***	***$ 4,004,666***	***$ 4,124,806***	***$ 4,248,550***	***$ 4,376,007***	***$ 4,507,287***	***$ 4,642,505***	***$ 4,781,780***	***$ 4,925,234***	***$ 5,072,991***	***$ 10,076,181***	***$ 5,381,936***	***$ 5,543,394***	***$ 5,709,696***	***$ 5,880,987***	***$ 6,057,416***	***$ 6,239,139***	***$ 6,426,313***	***$ 6,619,103***	***$ 6,817,676***	***$ 7,022,206***	***$ 7,232,872***

Ballard to Pier 50

Ballard (Shilshole) to Seattle (Pier 50)				
Contract Operator	Year 0	Year 1	Year 7	Year 20
KC Marine Division	$ 24,045,000	$ 4,005,000	$ 4,781,780	$ 7,233,000
Service Summary Metrics		Year 1	Year 7	Year 20
Est. Annual Ridership		115,346	192,466	293,490
Est. Fare Revenue		$ 519,057.00	$ 1,034,165.11	$ 2,385,340.14
Est. Farebox Recovery Rate		**13%**	**22%**	**33%**
Est. Operating Cost per rider		$34.72	$24.84	$24.64
Est. Systemwide Ops Cost per rider		$16.03	$13.60	$13.05

Category		KCMD
Vessel Labor		$ 966,000
Fuel		$ 733,000
Maintenance		$ 509,000
Vessel Insurance		$ 267,000
Shuttle		$ 674,000
Terminal Ops		$ 51,000
Management/Support		$ 194,000
Admin/Overhead		$ 611,000
Subtotal:		$ 4,005,000

Sub-tasks	KCMD		
	Cost Estimate	Subtotals	Rounded
Labor			
- Direct Labor	$ 561,212	$ 965,921	$ 966,000
- Overhead	$ 404,709		
Fuel	$ 732,824	$ 732,824	$ 733,000
Maintenance			
- Labor	$ 183,477		
- Overhead	$ 138,029	$ 509,084	$ 509,000
- Routine	$ 72,983		
- Annual	$ 97,542		
- Unplanned	$ 17,053		
Vessel Insurance	$ 266,667	$ 266,667	$ 267,000
Shuttle	$ 674,128	$ 674,128	$ 674,000
Terminal Labor	$ -		
Routine Terminal Maintenance	$ 3,161	$ 51,161	$ 51,000
Terminal Lease	$ 36,000		
Fare Collection	$ 12,000		
Management/Admin/Support Labor	$ 194,000	$ 194,000	$ 194,000
Admin/Insurance/Overhead	$ 610,881	$ 610,881	$ 611,000
Subtotal	$ 4,004,666	$ 4,004,666	$ 4,005,000
Total:	**$ 4,004,666**		

Fully weighted Operating Cost per vessel operating hour $ 1,097

One-way Route Plan - Ballard (Shilshole) to Centennial Park to Seattle (Pier 50)										
Route Segment	Distance (Statute Miles)	Distance (Nautical Miles)	Average Speed (Kts)	Average Speed (MPH)	Time Required (Minutes)	Full Load Fuel Rate (GPH)	Full Load Fuel Usage (Gals/Segment)	Light Load Fuel Rate (GPH)	Light Load Fuel Usage (Gals/Segment)	Round Trip Fuel Usage
Shilshole - Maneuver	0.29	0.25	5.0	5.8	3.0	26.6	1.3	19.4	1.0	
Shilshole to Centennial Park	6.79	5.90	28.0	32.2	12.6	132.9	28.0	97.2	20.5	
Centennial Park Maneuver (arrive and depar	0.35	0.30	5.0	5.8	3.6	26.6	1.6	19.4	1.2	
Centennial Park Dwell (load and unload)					8.0					
Centennial Park to Pier 50	2.42	2.10	28.0	32.2	4.5	132.9	10.0	97.2	7.3	
Pier 50 Maneuver	0.17	0.15	5.0	5.8	1.8	26.6	0.8	19.4	0.6	
Total (or average) One-Way Transit	**10.01**	**8.70**	**15.6**	**17.9**	**33.5**	**74.6**	**41.7**	**90.3**	**30.5**	**72.2**
Rounded Average (H:MM)					0:34				**60.0**	
Off/On Load PAX	0.00	0.00	0.0	0.0	8.0	13.3	2.8	9.7	2.4	
Rounded Average (H:MM)					0:08					
Trip Total (or average) One-Way	**10.01**	**8.70**	**12.6**	**14.5**	**41.5**	**46.1**	**44.5**	**62.7**	**32.9**	**77.4**
Rounded Average (H:MM)					0:42		**2.8**	Round Trips per Fueling Stop		**15.5**
Moorage/maintenance float to Pier 50	0.12	0.10	7.0	8.1	0.9	26.6	0.4	19.4	0.3	**0.7**
					0:00					

Route Assumptions
* Assumed cruising speed at 28 knots, resulting in a one-way transit time of ~24 minutes
* Using AAM data, estimated cruising speed fuel consumption at 80% engine rating at ~133GPH
* Estimated maneuvering speeds at 5 knots, with fuel consumptions rates during maneuvering at 40% of cruising rates (20% on 2 engines)
* Estimated dwell times of at least 8 mins in both Ballard and Seattle in peak direction, at least 6 minutes in off-peak direction
* Assumes a one-way trip time of 23 minutes, or a round trip time of 46 minutes
* Estimated dwell time fuel consumption (while in dock) at 10% of cruising rates
* Assumed fuel tank capacity=750 Gals/hull; with full tank ~95%=710 Gals each tank; retain minimum of ~15% in tank=110 Gals => max of 600 Gals/tank (total 1,200) usable between fueling stops
* With one-way transit fuel consumption ranging from 30 to 40 Gals/transit => an average of ~77.5 Gals/round trip => maximum of ~15 round-trips before fueling
* Assumes all ferry service begins and ends in Seattle at Pier 50 (.1 nm distance)
* Fueling to occur at Harbor Island (assumes capability @ a rate of 50 GPM => will take ~24 minutes to fuel)
* Distance from Pier 50 to Harbor Island (assumes 7 knots) will take ~9 minutes)
* Distance from Moorage/Maintenance Float to Pier 50 = ~.1 nm, which will take ~3 minutes at 7 knots one-way

All American Marine Fuel Consumption Data				
Vessel Condition	Engine Rating	Gals/NM	Speed NM/HR	GPH
Full Fuel & Passengers	100%	4.88	34.20	166.90
Full Fuel & Passengers	95%	4.81	32.90	158.25
Full Fuel & Passengers	90%	4.73	31.60	149.47
Full Fuel & Passengers	85%	4.66	30.30	141.20
Full Fuel & Passengers	80%	4.63	28.70	132.88
Full Fuel & Passengers	75%	4.59	27.20	124.85
Full Fuel & Passengers	70%	4.51	25.70	115.91
Half Fuel & No Passengers	100%	4.08	40.90	166.87
Half Fuel & No Passengers	95%	4.00	39.50	158.00
Half Fuel & No Passengers	90%	3.93	38.00	149.34
Half Fuel & No Passengers	85%	3.85	36.60	140.91
Half Fuel & No Passengers	80%	3.78	35.20	133.06
55.9 Half Fuel & No Passengers	75%	3.72	33.60	124.99
55.9 Half Fuel & No Passengers	70%	3.64	31.90	116.12
Half Fuel & No Passengers	65%	3.52	30.10	105.95
Half Fuel & No Passengers	60%	3.46	28.10	97.23
Half Fuel & No Passengers	55%	3.40	26.20	89.08

Description	Speed knots	Crossing minutes	Dwell minutes
100% Rated at full load	34.2	54.1	5.9
95% Rated at full load	32.9	54.7	5.3
90% Rated at full load	31.6	55.4	4.6
85% Rated at full load	30.3	56.1	3.9
80% Rated at full load	28.7	57.1	2.9
75% Rated at full load	27.2	58.1	1.9
90% Rated at light load	38	52.5	7.5
70% Rated at light load	31.9	55.2	4.8

All American Marine Data	
Spec	AAM
Hybrid Add	$300k-$600k
Passenger	149
Engine	Quad-Engine
Propulsion	Water Jet
Speed	30 knots
Top Speed	35 knots
Length	81'
Beam	30'
# of decks	2
Vessel Height	26'
Freeboard	5'
Hull	Aluminum
Bicycles	30
Noise Level	75 – 78 db's (TBD)
Fuel Consumption	(See to Left)
Load Locations	Vessel sides (front & rear)

Service Assumptions	
Landing Sites	* Shilshole Marina in Ballard * Centennial Park in Seattle * Pier 50 in Seattle
Service Levels & Seasonality	* Commute service schedule: - AM & PM commute periods Monday through Friday only - October through March (Total of 26 weeks - holidays; equivalent of 25 full weeks) - Saturday service - single vessel service for total of 5 round trips per day for 26 weeks - Assumes 5 holiday days with no service (Thanksgiving, Christmas, New Year, MLK, President's Day) * Peak service schedule: - Expanded weekdays, extended evenings, and weekend service - April through September (Total of 25 weeks - full service, with 3 weekday holidays at Sunday schedule) - Assumes Memorial Day, Independence Day & Labor Day operated on Sunday schedule * Special Event service: - None
Vessel	* All American Marine Design - 81' x 30' * Two vessels (one in service, one spare/backup) * Configuration - side loading * Size: 150 passengers * Cruising speed: 28 knots (will not require compliance with high speed craft standards) * Engine: 4-engine waterjet or two-engine hybrid * Low wake * Bicycle Capacity: 25-35 bicycles * Vessel/terminal interface: Two entrances on both sides, gangways stored at terminals.
Vessel Crews	* Crew of three (1 Captain & 2 Deckhands) * No mate or senior deckhand was assumed
KCMD Operator - Plus up Management, Administration, Support Staff	* Management Staff of 1
Fueling location & schedule	* Fueling assumed to occur at Maxum Petroleum at Harbor Island
Vessel Moorage	* Vessel moorage at Pier 48 moorage/maintenance float * Assume all service begins and ends at Pier 50
Vessel Maintenance Plans	* Routine maintenance to be performed at Pier 48 maintenance facility * Engineering crew assumed to be 1 engineer and 1 oilers * Major maintenance to be performed at area shipyard

Ballard (Shilshole) to Centennial Park to Seattle (Pier 50) - Operating Input Data		
Description	**Values**	**Units**
Service Profile		
Commute-only	26.00	Weeks per year
	25.00	Weeks of weekday service excluding holidays/year
	5.00	Service days per week
	5.00	Holidays
Peak	25.00	Weeks per year
	7.00	Service days per week
	4.00	Days of weekday service per week
	3.00	Holidays
Special Events	0.00	Events per year
Service Hours		
Commute-only	6.03	service hours per weekday (Monday - Friday)
	754.17	weekday service hours for 6 months of year (excludes 5 holidays/year)
	8.57	service hours per weekend (Saturday)
	214.17	Saturday service hours for 6 months of year
	968.33	total commute-only service hours
	151.00	days of service (25 weeks of commute-only @ 5 days/week - 5 holidays)
Peak	15.13	service hours per day for 6 months (Monday - Thursday)
	1467.93	service hours for 6 months of year (excludes service on 3 holidays)
	17.44	service hours per day for 6 months (Friday)
	435.90	service hours for 6 months of year
	12.07	service hours per day for 6 months (Saturday)
	301.67	service hours for 6 months of year
	10.47	service hours per day for 6 months (Sunday)
	293.07	service hours for 6 months of year (includes 3 holidays on Sunday schedule)
	175.00	days of service (26 weeks of peak @ 7 days/week)
Special	0.00	service hours per event
	0.00	service hours for 10 special events per year
Annual Totals	10.66	average service hours per day per year (excluding special events)
	3466.90	total service hours per year, including special events (excludes 5 holidays/year)
	326.00	days of service per year (excluding special events)
Transits (Round Trips)		
Commute-only	6.00	round trips per day (Monday - Friday)
	8.00	round trips per day (Saturday)
	958.00	round trips for 6 months of year (excludes 5 holidays/year)
Peak	13.00	daily round trips per day for 6 months (Monday - Thursday)
	1261.00	round trips for 6 months of year (excludes service on 3 holidays)
	15.00	round trips per day for 6 months (Friday)
	375.00	round trips for 6 months of year
	11.00	round trips per day for 6 months (Saturday)
	275.00	round trips for 6 months of year
	9.00	round trips per day for 6 months (Sunday)
	252.00	round trips for 6 months of year (includes 3 holidays on Sunday schedule)
Special	0.00	round trips per event
	0.00	round trips for 10 special events per year
Annual Totals	9.71	average round trips per day per year (excludes special events)
	3121.00	total round trips per year including special events (excludes 5 holidays/year)
Vessel Operating Hours		
Commute-only	7.75	vessel hours per day per vessel (Monday - Friday)
	968.75	weekday vessel hours per vessel for 6 months of commute-only
	10.20	vessel hours per day (Saturday)
	265.20	Saturday vessel hours for 6 months of commute-only
	1,233.95	total vessel hours per year (excludes 5 holidays/year)
Peak	16.03	hours per day per vessel (Monday - Thursday)
	1,555.23	hours per year per vessel (excludes 3 holidays/year)
	18.37	hours per day per vessel (Friday)

	459.17	hours per year per vessel
	13.70	hours per day per vessel (Saturday)
	342.50	hours per year per vessel
	11.37	average hours per day per vessel (Sunday)
	318.27	average hours per year per vessel (w/ Sunday service on 3 holidays)
	2,675.17	vessel hours per year per vessel
Special	0.00	vessel hours per day per event per vessel
	0.00	total vessel hours per year
Annual Totals	12.15	average hours per day per year per vessel (excluding special service)
	3,909.12	total vessel hours per year (excludes 5 holidays/year)
Crew Hours		
Commute-only	65.45	total crew hours per week
	1,647.95	total crew hours for 6 months (excludes 5 holidays/year)
Peak	118.07	total crew hours per week (typical)
	2,937.67	total crew hours for 6 months (includes Sunday service on 3 holidays)
Special	0.00	total crew hours per event per vessel
	0.00	total crew hours for special service
Annual Totals	4,585.62	total crew hours per year
	13,756.85	total labor hours for year (assuming number of crew specified below)
Fuel Usage		
Average Fuel Use	77.39	average gallons per round trip
Commute-only	6.00	number of round trips per weekday
	8.00	number of round trips per Saturday
	38.00	number of round trips per week
	2,940.79	typical gallons per week
	955.00	round trips for 6 months of year (excludes 5 holidays/year)
	73,906.76	total gallons for 6 months of year (excludes 5 holidays/year)
Peak	87.00	typical number of round trips per week
	6,732.87	typical gallons per week
	2,046.00	round trips for 6 months of year (includes Sunday service on 3 holidays)
	158,338.47	total gallons for 6 months of year (includes Sunday service on 3 holidays)
Special		number of round trips per special event
		number of round trips per year
	-	total gallons for special events per year
Annual Totals	3,001.00	total round trips per year
	232,245.23	total gallons per year
	243,857.49	total gallons per year, with extra 5% to cover miscellaneous fuel use
Vessel Particulars		
Vessel Length	81.00	feet (length overall)
Vessel Breadth	30.00	feet
Vessel Crew		
Captains	1	per vessel
Senior Deckhands	1	per vessel
Purser Deckhands	1	per vessel
Vessel Maintenance Staff		
Engineer	1	per system
	2,080	hours per year
Oiler	1	per system
	2,080	hours per year

Ballard (Shilshole) to Centennial Park to Seattle (Pier 50) - Cost Input Data			
Description	**Cost**	**Unit**	**Source/Justification for Values**
Capital Costs			
Vessels			
150-pax	$ 7,700,000.00	per vessel	Based on estimate from AAM for SECO
Mid-life Vessel Overhaul	30%	of acquisition costs	Estimate; occurring at mid-point in life of vessel, includes interior refurbishment along with engine overhaul
Terminals			
Estimated Capital Improvements	$ 15,000,000.00	total	From KPFF rough order of magnitude costs estimates for improvements at Shilshole Bay Marina and Centennial Park
Management and Support			
Admin/Insurance/Materials	5%	of direct costs	Includes project administration and materials
Operating Costs			
Vessel Operations			
Labor			
KCMD			
Captain/Master	$ 55.15	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 37.22	per hour	Based on KCMD 2019 costs
Senior Deckhand	$ 37.74	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 28.39	per hour	Based on KCMD 2019 costs
Purser Deckhand	$ 36.85	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 27.95	per hour	Based on KCMD 2019 costs
Fuel			
Fuel Price	$ 3.00	dollars/gallon	Estimated price of Maxum Petro
Maintenance			
Labor			
KCMD			
Engineers	$ 51.36	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 35.29	per hour	Based on KCMD 2019 costs
Oilers	$ 36.85	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 31.07	per hour	Based on KCMD 2019 costs
Routine Maintenance	$ 5.00	per engine per hour	Estimated factor for routine maintenance costs based on number of vessel hours
	$ 20.00	per hour	Estimated maintenance cost per hour assuming 4 engines per vessel
	$ 78,182.33	per year	Estimate of routine maintenance cost based on total number of vessel hours each year
Annual Maintenance	$ 0.33	per foot per vessel per hour	Estimate factor for periodic hull/out-of-water maintenance costs based on vessel length and hours of operation
	$ 26.73	per vessel per hour	Estimate based on proposed AAM vessel characteristics
	$ 34,830.23	per vessel	Assumes three vessels delivering similar levels of service
	$ 104,490.69	per year	Assumes three vessels delivering similar levels of service for full year
Unplanned Maintenance	10%	of total maintenance cost	Estimate to account for unplanned maintenance and repair work
Vessel Insurance	$ 133,333.33	per vessel	Annual vessel insurance for two vessels assumed
Shuttle			
Shuttle Operations - hourly	$ 162.05	per hour	Based on 2019 KC Metro fully loaded costs for 40' bus
Shuttle Operations - annual	$ 674,128.00	per year	Weekdays, 8 hours/day during commute times

Terminal Operations			
Labor			
KCMD			
Information Agent(s)	$ 29.07	per hour	Based on KCMD 2019 costs
Overhead/Benefits	$ 24.01	per hour	Based on KCMD 2019 costs
Info Agent Annual Cost	$ -	per year, fully weighted	None assumed
Routine Terminal Maintenance	$ 1.00	per service hour	Estimate of terminal maintenance cost based on hours of operation
	$ 3,466.90	per year	Estimate of routine maintenance cost based on annual service hours
Terminal Lease	$ 3,000.00	per landing site	Estimate for landing site lease (based on existing KT lease agreement between KT and WSF in Seattle plus escalation)
	$ 6,000.00	per month	Lease costs at Shilshole and Centennial
	$ 36,000.00	per year	Annual estimate based on 12 months of operations
Fare Collection Costs	$ 12,000.00	per year	Estimated cost of fare collection processing, including cash processing, transit cards, and maintenance contracts
Management, Administration & Support			
KCMD			
Management/Admin/Support Labor	$ 143,000.00	per year	Estimate includes liability insurance, miscellaneous administrative/management costs and overhead (supplies, etc.), plus other potential miscellaneous costs
Overhead/Benefits	$ 51,000.00	per year	Estimate of overhead costs such as sick leave, vacation, benefits based on KCMD 2019 costs
Admin/insurance/overhead/misc	18%	of direct costs	Estimate includes liability insurance, miscellaneous administrative/management costs and overhead (supplies, etc.), plus other potential miscellaneous costs
Inflation Rate			
KCMD	3.00%	per year	Assumed higher inflation rate for KCMD due to higher increases in central rates, benefit costs and labor expenses
Operating Costs per rider			
Systemwide Operating Costs	$ 9,096,050.00	per year	Based on KCMD 2019 costs
Systemwide Ridership	701,678	per year	Based on KCMD 2019 costs
Existing Systemwide Ops costs Year 7	$ 10,069,586.00	per year	Based on model from Ridership & ops costs from 2008 to 2019
Existing Systemwide Ops costs Year 21	$ 16,307,456.00	per year	Based on model from Ridership & ops costs from 2008 to 2019
Existing Systemwide Ridership in Year 7	899807	per year	Based on model from Ridership & ops costs from 2008 to 2019
Existing Systemwide Ridership in Year 21	1510307	per year	Based on model from Ridership & ops costs from 2008 to 2019

Ballard (Shilshole) to Centennial Park to Seattle (Pier 50)
KCMD Operator Costs

Funding Type	Component		Years																				
	Description	Sub-tasks	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Capital	Vessels	Vessel Acquisition (2 Vessels)	$ 15,400,000																					
		Mid-life Overhaul											$ 4,620,000											
	Terminals	Terminal Improvements	$ 15,000,000																					
	Management	Labor	$ 1,520,000										$ 231,000											
		Capital Cost Subtotal	*$ 31,920,000*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 4,851,000*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*
Operating	Vessel Ops	Labor																						
		- Direct Labor		$ 594,938	$ 612,786	$ 631,170	$ 650,105	$ 669,608	$ 689,696	$ 710,387	$ 731,699	$ 753,650	$ 776,259	$ 799,547	$ 823,533	$ 848,239	$ 873,686	$ 899,897	$ 926,894	$ 954,701	$ 983,342	$ 1,012,842	$ 1,043,227	$ 1,074,524
		- Overhead		$ 429,030	$ 441,901	$ 455,158	$ 468,813	$ 482,877	$ 497,364	$ 512,285	$ 527,653	$ 543,483	$ 559,787	$ 576,581	$ 593,878	$ 611,695	$ 630,045	$ 648,947	$ 668,415	$ 688,468	$ 709,122	$ 730,395	$ 752,307	$ 774,876
		Fuel		$ 731,572	$ 753,520	$ 776,125	$ 799,409	$ 823,391	$ 848,093	$ 873,536	$ 899,742	$ 926,734	$ 954,536	$ 983,172	$ 1,012,667	$ 1,043,047	$ 1,074,339	$ 1,106,569	$ 1,139,766	$ 1,173,959	$ 1,209,178	$ 1,245,453	$ 1,282,817	$ 1,321,301
		Maintenance																						
		- Labor		$ 183,477	$ 188,981	$ 194,651	$ 200,490	$ 206,505	$ 212,700	$ 219,081	$ 225,653	$ 232,423	$ 239,396	$ 246,577	$ 253,975	$ 261,594	$ 269,442	$ 277,525	$ 285,851	$ 294,426	$ 303,259	$ 312,357	$ 321,728	$ 331,380
		- Overhead		$ 138,029	$ 142,170	$ 146,435	$ 150,828	$ 155,353	$ 160,013	$ 164,814	$ 169,758	$ 174,851	$ 180,096	$ 185,499	$ 191,064	$ 196,796	$ 202,700	$ 208,781	$ 215,044	$ 221,496	$ 228,141	$ 234,985	$ 242,034	$ 249,295
		- Routine		$ 78,182	$ 80,528	$ 82,944	$ 85,432	$ 87,995	$ 90,635	$ 93,354	$ 96,154	$ 99,039	$ 102,010	$ 105,071	$ 108,223	$ 111,469	$ 114,813	$ 118,258	$ 121,806	$ 125,460	$ 129,223	$ 133,100	$ 137,093	$ 141,206
		- Annual		$ 104,491	$ 107,625	$ 110,854	$ 114,180	$ 117,605	$ 121,133	$ 124,767	$ 128,510	$ 132,366	$ 136,337	$ 140,427	$ 144,640	$ 148,979	$ 153,448	$ 158,052	$ 162,793	$ 167,677	$ 172,707	$ 177,888	$ 183,225	$ 188,722
		- Unplanned		$ 18,267	$ 18,815	$ 19,380	$ 19,961	$ 20,560	$ 21,177	$ 21,812	$ 22,466	$ 23,140	$ 23,835	$ 24,550	$ 25,286	$ 26,045	$ 26,826	$ 27,631	$ 28,460	$ 29,314	$ 30,193	$ 31,099	$ 32,032	$ 32,993
		Admin/Insurance		$ 266,667	$ 274,667	$ 282,907	$ 291,394	$ 300,136	$ 309,140	$ 318,414	$ 327,966	$ 337,805	$ 347,940	$ 358,378	$ 369,129	$ 380,203	$ 391,609	$ 403,357	$ 415,458	$ 427,922	$ 440,759	$ 453,982	$ 467,602	$ 481,630
		Shuttle		$ 674,128	$ 694,352	$ 715,182	$ 736,638	$ 758,737	$ 781,499	$ 804,944	$ 829,092	$ 853,965	$ 879,584	$ 905,972	$ 933,151	$ 961,145	$ 989,980	$ 1,019,679	$ 1,050,269	$ 1,081,778	$ 1,114,231	$ 1,147,658	$ 1,182,088	$ 1,217,550
	Terminal Ops	Labor		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Routine Terminal Maintenance		$ 3,467	$ 3,571	$ 3,678	$ 3,788	$ 3,902	$ 4,019	$ 4,140	$ 4,264	$ 4,392	$ 4,524	$ 4,659	$ 4,799	$ 4,943	$ 5,091	$ 5,244	$ 5,401	$ 5,563	$ 5,730	$ 5,902	$ 6,079	$ 6,262
		Terminal Lease		$ 36,000	$ 37,080	$ 38,192	$ 39,338	$ 40,518	$ 41,734	$ 42,986	$ 44,275	$ 45,604	$ 46,972	$ 48,381	$ 49,832	$ 51,327	$ 52,867	$ 54,453	$ 56,087	$ 57,769	$ 59,503	$ 61,288	$ 63,126	$ 65,020
		Fare Collection		$ 12,000	$ 12,360	$ 12,731	$ 13,113	$ 13,506	$ 13,911	$ 14,329	$ 14,758	$ 15,201	$ 15,657	$ 16,127	$ 16,611	$ 17,109	$ 17,622	$ 18,151	$ 18,696	$ 19,256	$ 19,834	$ 20,429	$ 21,042	$ 21,673
	Administration / Support	Management/Admin/ Support Labor		$ 194,000	$ 199,820	$ 205,815	$ 211,989	$ 218,349	$ 224,899	$ 231,646	$ 238,596	$ 245,753	$ 253,126	$ 260,720	$ 268,541	$ 276,598	$ 284,896	$ 293,442	$ 302,246	$ 311,313	$ 320,652	$ 330,272	$ 340,180	$ 350,386
		Admin/Insurance/ Overhead		$ 623,565	$ 642,272	$ 661,540	$ 681,386	$ 701,828	$ 722,882	$ 744,569	$ 766,906	$ 789,913	$ 813,610	$ 838,019	$ 863,159	$ 889,054	$ 915,726	$ 943,198	$ 971,493	$ 1,000,638	$ 1,030,657	$ 1,061,577	$ 1,093,424	$ 1,126,227
		Operating Cost Subtotal	*$ -*	*$ 4,087,813*	*$ 4,210,447*	*$ 4,336,761*	*$ 4,466,863*	*$ 4,600,869*	*$ 4,738,895*	*$ 4,881,062*	*$ 5,027,494*	*$ 5,178,319*	*$ 5,333,669*	*$ 5,493,679*	*$ 5,658,489*	*$ 5,828,244*	*$ 6,003,091*	*$ 6,183,184*	*$ 6,368,679*	*$ 6,559,740*	*$ 6,756,532*	*$ 6,959,228*	*$ 7,168,005*	*$ 7,383,045*
Total Annual Cost			***$ 31,920,000***	***$ 4,087,813***	***$ 4,210,447***	***$ 4,336,761***	***$ 4,466,863***	***$ 4,600,869***	***$ 4,738,895***	***$ 4,881,062***	***$ 5,027,494***	***$ 5,178,319***	***$ 10,184,669***	***$ 5,493,679***	***$ 5,658,489***	***$ 5,828,244***	***$ 6,003,091***	***$ 6,183,184***	***$ 6,368,679***	***$ 6,559,740***	***$ 6,756,532***	***$ 6,959,228***	***$ 7,168,005***	***$ 7,383,045***

Ballard to Centennial Park to Pier 50

Ballard (Shilshole) to Centennial Park to Seattle (Pier 50)				
Contract Operator	Year 0	Year 1	Year 7	Year 20
KC Marine Division	$ 31,920,000	$ 4,088,000	$ 4,881,062	$ 7,383,000
Est. Annual Ridership		96,853	176,537	273,313
Est. Fare Revenue		435,839	948,575	2,221,352
Est. Farebox Recover Rate		**11%**	**19%**	**30%**
Est. Operating Cost per rider		$ 42.21	$ 27.65	$ 27.01
Est. Systemwide Ops Cost per rider		$ 16.51	$ 13.89	$ 13.28

Category		KCMD
Vessel Labor		$ 1,024,000
Fuel		$ 732,000
Maintenance		$ 522,000
Terminal Ops		$ 51,000
Management/Support		$ 194,000
Admin/Overhead		$ 624,000
Subtotal:		$ 3,147,000

Sub-tasks	KCMD		
	Cost Estimate	Subtotals	Rounded
Labor			
- Direct Labor	$ 594,938	$ 1,023,968	$ 1,024,000
- Overhead	$ 429,030		
Fuel	$ 731,572	$ 731,572	$ 732,000
Maintenance			
- Labor	$ 183,477		
- Overhead	$ 138,029	$ 522,446	$ 522,000
- Routine	$ 78,182		
- Annual	$ 104,491		
- Unplanned	$ 18,267		
Terminal Labor	$ -		
Routine Terminal Maintenance	$ 3,467	$ 51,467	$ 51,000
Terminal Lease	$ 36,000		
Fare Collection	$ 12,000		
Management/Admin/Support Labor	$ 194,000	$ 194,000	$ 194,000
Admin/Insurance/Overhead	$ 623,565	$ 623,565	$ 624,000
Subtotal	$ 4,087,813	$ 3,147,018	$ 3,147,000
Total:	**$ 4,087,813**		

Fully weighted Operating Cost per vessel operating hour	$ 1,046

APPENDIX B: TRANSPORTATION PLANNING UPDATE PLANNING EFFORTS RELATED TO A POTENTIAL BALLARD PASSENGER-ONLY FERRY ROUTE

TRANSPORTATION PLANNING UPDATE

PLANNING EFFORTS UNDERWAY

The growth of the Puget Sound region has put increasing strain on the regional transportation network. A number of recent and ongoing planning efforts propose to expand or improve the region's transportation systems. These efforts define where transportation improvements will occur within given time frames. Evaluating the current and planned transit network is an important step in understanding how a passenger-only ferry (POF) could improve mobility options in a community.

This study includes a summary of regional planning efforts that most directly impact King County, an overview of the existing and planned high-capacity transit network, and a description relating the planning efforts and transit projects to potential landing sites associated with a POF route from Ballard. Based on this analysis, the appendix provides recommendations of planning efforts needed to implement a POF route from Ballard.

With the onset of the COVID-19 pandemic, however, King County Metro has experienced a reduction in ridership across all services, including the Water Taxi. Reduced ridership is due to necessary public health orders to: stay home, only travel for essential business, and maintain six feet of space between you and others when making essential trips. This current slowdown in growth will require future analysis on the long-term effects current ridership reductions will have, as will the recovery efforts and what new commute habits will and should look like as people are able to return to work. Coupled with the current economic slowdown and expected economic recession, Metro's budget will be significantly impacted, and funding for Water Taxi expansion could require alternative sources than those outlined in this report. This report's projections for ridership of a new water taxi service is based on the assumption that commuters will return to work as normal once the COVID-19 pandemic is over.

REGIONAL PLANNING EFFORTS

The Puget Sound region, including King County, has experienced significant growth in the past decade, and growth is anticipated to continue even after the current slowdown due to the COVID-19 pandemic and potentially prolonged recovery effort. The Puget Sound Regional Council (PSRC) had forecasted that by 2050 the Puget Sound region would add 1.8 million people and 1.2 million jobs. The PSRC's Vision 2050 regional planning document identified the Ballard/Interbay area as a manufacturing/industrial center that is intended to continue to sustain a significant amount of regional employment.[1] The following sections provide an overview of regional transit plans and POF studies that influence potential POF service between Ballard and downtown Seattle.

Sound Transit – ST3 System Plan

As a regional transit authority, Sound Transit provides multiple high-capacity transit (HCT) services in Puget Sound, including the Link light rail system, high-capacity bus rapid transit (BRT), and commuter rail. Sound Transit services operate in Pierce, King, and Snohomish Counties.

[1] PSRC Draft VISION 2050, July 2019.

The ST3 System Plan (ST3) is a Sound Transit initiative passed by ballot measure in November 2016 that plans for numerous transit expansion projects. ST3 builds on previous Sound Transit initiatives (ST2 and Sound Move) that funded Link light rail and express bus services. ST3 seeks to expand Link light rail, establish Sound Transit BRT, and provide other transit-oriented improvements.

Under ST3, Link light rail service is planned to extend from downtown Seattle to Ballard by 2035. The Ballard light rail terminal is anticipated to be located near NW Market Street and 14th Avenue NW and 15th Avenue NW. The final alignment will be determined through the planning phase that is anticipated to be completed by 2022. Link light rail service will allow the Ballard community to connect to other light rail lines to the north, south and east via downtown Seattle.

King County Metro – METRO CONNECTS

King County Metro (Metro) operates regular fixed-route bus service, Bus Rapid Transit (RapidRide), a variety of vanpool and rideshare services, paratransit services, and many park and rides around the region. Additionally, Metro operates the Sound Transit Regional Express bus service, Link light rail, and the City of Seattle's South Lake Union Streetcar.[2] Metro Connects is Metro's long-range plan that was adopted in January 2017 and includes service expansion over a 20-year planning horizon. Metro Connects will be updated in 2021 to integrate Metro's Mobility Framework guiding principles.

Metro recently developed the Mobility Framework which focuses on creating more equitable and sustainable transportation services that will be used to inform the implementation of new services. Due to these updated guiding principles, Metro is updating their service guidelines and strategic plans in addition to Metro Connects. As part of the Ballard POF Route Implementation Study, King County Metro's Marine Division (Marine Division) will align its planning efforts with the Mobility Framework.

Seattle Department of Transportation (SDOT)- MOVE Seattle

Seattle Department of Transportation published the MOVE Seattle Plan that outlines a 10-year strategic vision for transportation in Seattle. MOVE Seattle focuses on advancing five key values in transportation including safety, multimodality/interconnectedness, vibrancy, affordability, and innovation. The plan identifies Ballard to downtown Seattle as a major corridor for transit improvements. These improvements include supporting future Link light rail extension to Ballard, enhancing bus route infrastructure, and improving safety for pedestrians and bicyclists.

King County Passenger-Only Ferry Studies

A potential POF route from Ballard to downtown Seattle has been studied in previous planning efforts by the former King County Ferry District as well as the Marine Division:

- 2009 King County Ferry District Demonstration Project
- 2015 Final Report on Ferry Expansion Options for the Marine Division

[2] King County 2013-2014 Transportation Budget, King County F-136.

In 2009, assessment of potential demonstration routes concluded that a Ballard route from Shilshole Bay Marina to downtown Seattle was considered one of three candidates for implementation.[3]

In the 2015 study, a route between Ballard and downtown Seattle was one of three routes that met the study's evaluation criteria, including time competitiveness and farebox recovery projections, and was recommended for further analysis. In Ballard, Shilshole Bay Marina was studied as the potential POF landing site. Pier 50 was studied as the potential POF landing for downtown Seattle.[4]

Previous planning efforts for potential POF routes have placed increasing focus on exploration of first and last mile connections to the terminal—how users connect to and from the POF terminal. This reflects the importance of understanding how passengers will use POF service as part of their whole trip, rather than just focusing on the route between terminals. Typical first and last mile connections include various modes such as walking, biking, and riding transit. Existing and emerging mobility options can be leveraged to support POF service, including dedicated shuttle service, transportation network companies, autonomous vehicles (AV), and bike share programs.

PSRC – Puget Sound Regional Council Passenger-Only Ferry Study

The PSRC is conducting a regional study to identify and analyze existing and potential new POF routes throughout the Puget Sound region. The study will examine potential ridership levels, terminal locations, ridership demands/costs, use of alternative fuels, and the environmental impacts of potential passenger ferry routes. The study is set to be delivered to the Washington State Legislature on January 31, 2021. Findings of the Ballard POF Implementation Report are anticipated to inform discussion of POF routes in the PSRC POF Study.

KING COUNTY TRANSIT NETWORK

This study identifies planned changes to the transit network across King County, evaluates how a POF route connecting Ballard and downtown Seattle aligns with these changes, and outlines any additional planning efforts needed to implement POF service.

Planned changes to the following transit services were examined in this study:

- Light Rail (Link light rail)
- Rail (Sounder)
- BRT (Metro RapidRide and Sound Transit BRT)[5]
- Streetcar (Seattle Streetcar)
- POF (King County Water Taxi and Kitsap Fast Ferries)

[3] King County Ferry District, 2009 King County Ferry District Demonstration Project Technical Studies and Implementation.
[4] King County Marine Division, 2015 Final Report on Ferry Expansion Options for Marine Division.
[5] Other forms of bus-based transportation are available throughout the Puget Sound Region, including local, frequent, and express bus services. These services are acknowledged but, for the sake of brevity, have not been extensively analyzed in this study.

EXISTING KING COUNTY TRANSIT NETWORK

The King County region has invested in a transit network that includes two Link light rail lines, one commuter rail line, two streetcar lines, six RapidRide BRT lines, and four POF routes. Along with these services, express, frequent, and local bus service connect people to main transit corridors and provide additional transit options. The existing regional transit network identified in Metro Connects is depicted in Figure 1.

The Ballard area is currently served by the RapidRide D line, frequent all-day routes 40, 44, 45 and several express and local bus routes. Table 1 summarizes the current transit modes that serve King County.

Table 1: Existing Transit Modes in the Puget Sound Region

Mode	*Service Name*	*Managing Agency*	*Separated Right of Way*	*Commute Only or Expanded Service*	*Scheduled Service Frequency*	*Connectivity*
LIGHT RAIL	Link Light Rail	Sound Transit	Most of the line	Expanded service	Every 6, 10 or 15 min.	• University of Washington (UW) to Angle Lake • Tacoma
HEAVY RAIL	Sounder	Sound Transit	Yes	Commute only	Every 30 min.	• Everett to Lakewood
STREETCAR	Seattle Streetcar	Seattle Department of Transportation (SDOT)	No	Expanded service	Between every 10-25 min.	• Downtown Seattle to South Lake Union • Pioneer Square to First Hill
BRT	RapidRide	King County	Partial; bus-only or BAT lanes for part of some lines	Expanded service	Every 10-15 min. or better	• Sea-Tac to Federal Way • Bellevue to Redmond • West Seattle to downtown Seattle • Ballard to downtown Seattle • Shoreline to downtown Seattle • Renton to Burien
POF	King County Water Taxi	Marine Division	Yes	*Fall/Winter:* commute only *Spring/ Summer:* expanded service	• Every 35 min. • Every 65 min.	• West Seattle to downtown Seattle • Vashon Island to downtown Seattle
	Fast Ferry	Kitsap Transit	Yes	*Fall/Winter:* commute only *Spring/ Summer:* expanded service	• Every 80 min. • Every 70-100 min	• Bremerton to downtown Seattle • Kingston to downtown Seattle

Figure 1: Metro Existing Service Map

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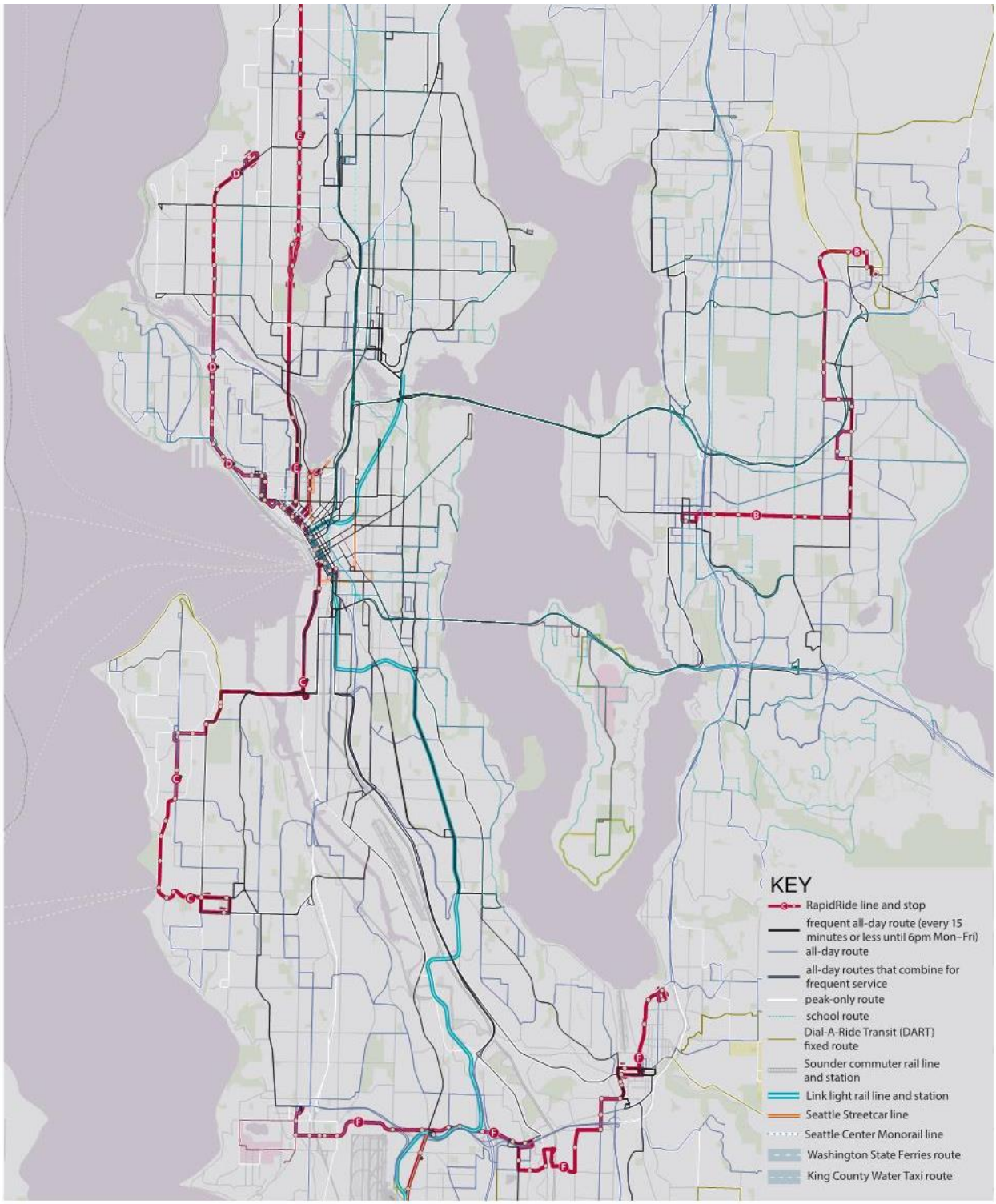

KING COUNTY TRANSIT NETWORK EXPANSION

Over the next few years, the King County transit network will change significantly. Link light rail will expand to provide improved connections to the Eastside, north to Lynnwood, and south to Federal Way. Metro will also add new RapidRide lines serving Seattle, Burien, Auburn, Kent, and Renton. By 2040, additional Link and RapidRide expansion combined with expansion of other modes will dramatically expand the reach of frequent, high-capacity transit across King County. The following table summarizes the changes, in planning and development, to the regional transit network. Ballard will be served by Link and continue to be served by RapidRide as transit expands region-wide.

Table 2: Transit Projects Proposed by 2040 serving King County

Mode	*Service Name*	*Managing Agency*	*Connectivity Changes*
LIGHT RAIL	Link Light Rail	Sound Transit	• Extends north to Lynnwood and south to Federal Way by 2024/5 • Expands east to connect downtown Seattle to the eastside (Bellevue & Redmond)Expansion to Ballard, West Seattle, Everett, Issaquah, and Tacoma
HEAVY RAIL	Sounder	Sound Transit	• Extends further south to Tillicum and Du Pont
STREETCAR	Seattle Streetcar	SDOT	• Connects the two existing streetcar lines in downtown Seattle from Westlake to Pioneer Square via 1st Avenue
BRT	RapidRide	King County	• Increase in number of lines serving critical high-ridership connections not served by Link light rail
	BRT	Sound Transit	• Stride lines serving I-405 and SR 522 corridors
POF	King County Water Taxi	King County	• Potential Lake Washington routes including Kenmore to Seattle and/or Renton to Seattle • Potential Ballard to downtown Seattle route
	Fast Ferry	Kitsap Transit	• Southworth to downtown Seattle
	Tacoma Fast Ferry	Pierce Transit/ City of Tacoma/ Port of Tacoma	• Tacoma to downtown Seattle

Figure 2: Metro Connects Long Range Plan: 2040 Transit Network

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TRANSIT PLANS AND IMPROVEMENTS BY LANDING

The Marine Division is assessing what would be needed to implement a POF route from Ballard to downtown Seattle. This includes review of three potential landing sites, one in Ballard, one in downtown Seattle, and a potential additional stop at Centennial Park near the new Expedia Campus. Figure 4 provides a map of the three potential landing sites. The following sections evaluate the transit options by landing site and how a POF would align with existing and future transit options.

Figure 3: Potential Landing Sites for a Ballard POF Route

SHILSHOLE BAY MARINA LANDING SITE

The potential Shilshole Bay Marina landing site is approximately two miles northwest of the Ballard commercial district and POF service could provide another transit option for the Ballard area.

Alignment with POF Service

As planned, Link light rail service is not expected to reach the majority of the Ballard area, and the service that will be provided is anticipated to start in 2035. POF service could provide an additional transit option for the Ballard community with earlier implementation. No bus service currently reaches Shilshole Bay Marina, and additional options are not planned in the future. The lack of direct transit connections would make it difficult for people to connect to the POF. To support a POF service from Shilshole Bay Marina, first/last mile connections to the marina would be necessary.

OVERALL CONNECTIVITY:

- No planned transit connections within ½-mile radius
- Very limited connectivity

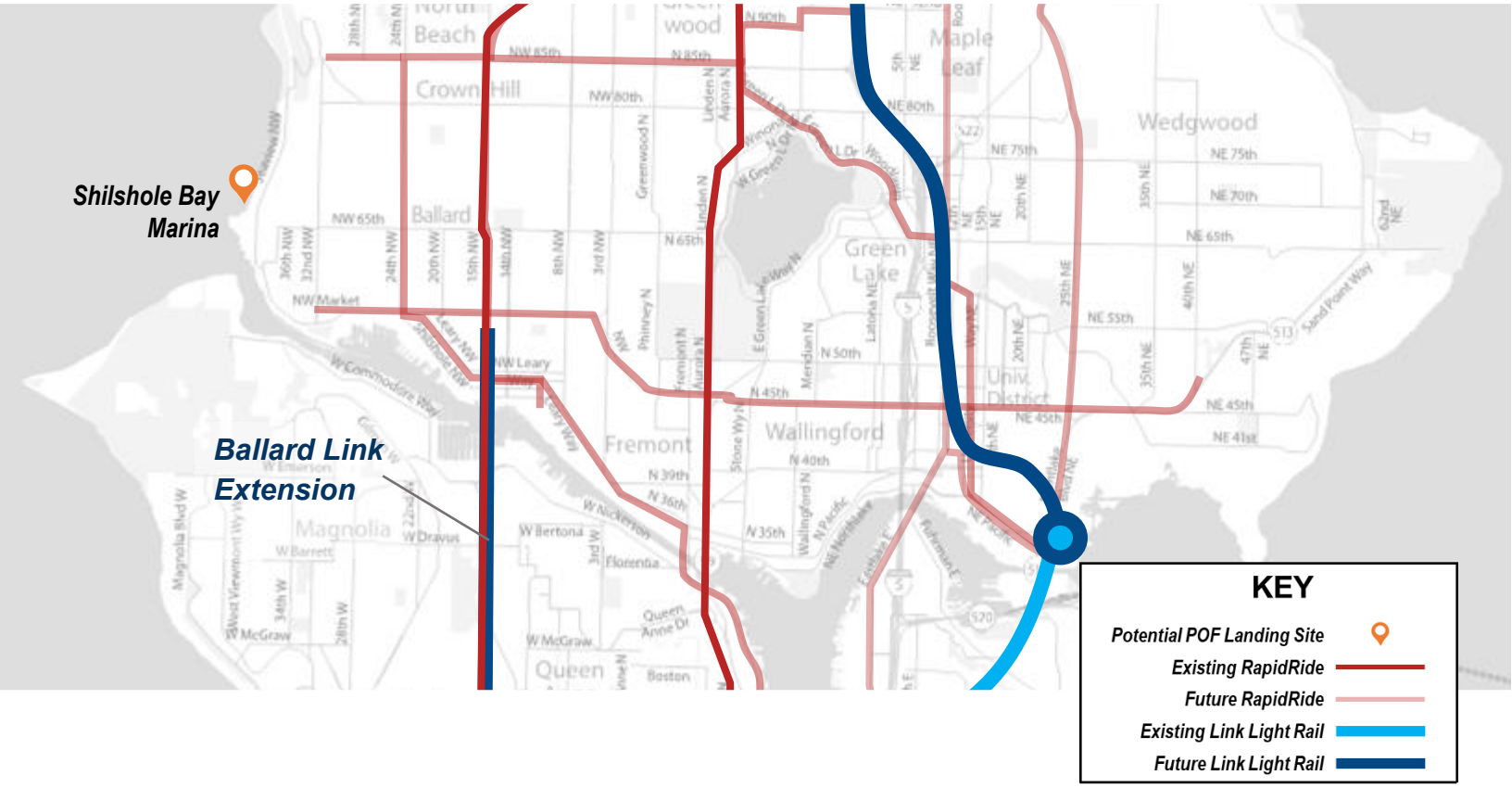
FIRST/LAST MILE CONNECTIONS:

- Limited first/last mile connections are currently available for walking and biking
- There is no transit service available

ADDITIONAL PLANNING EFFORTS NEEDED FOR IMPLEMENTATION:

- Accessibility study
- Public outreach

Figure 4: Key Transit Expansions by the Prospective Shilshole Bay Marina Landing Site



CENTENNIAL PARK LANDING SITE

The potential Centennial Park landing site is located next to the new Expedia Campus, adjacent to Myrtle Edwards Park in Seattle's Interbay neighborhood.

Alignment with POF Service

The Centennial Park landing site would provide a direct connection to the Expedia Campus (a large employer outside the downtown Seattle core) and would be within a half mile of the existing RapidRide D line for passengers to make connections to their destination. Additionally, a light rail station near Centennial Park is planned as part of the Ballard light rail expansion. Passengers could also connect to the Elliott Bay Trail that serves bicycles and pedestrians.

OVERALL CONNECTIVITY:

- Direct connection to the Expedia employment hub

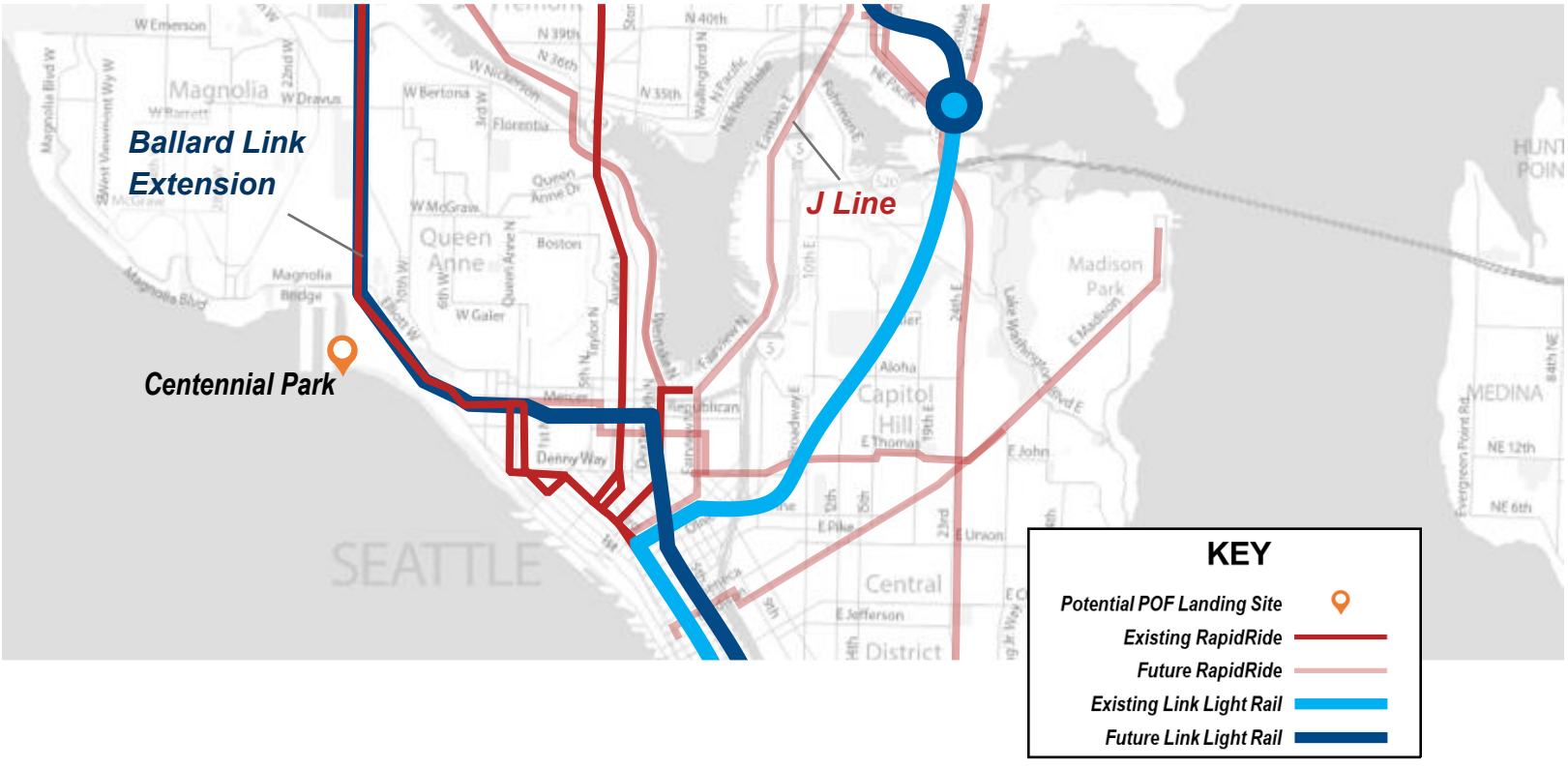
FIRST/LAST MILE CONNECTIONS:

- First/last mile connections are available

ADDITIONAL PLANNING EFFORTS NEEDED FOR IMPLEMENTATION:

- Public outreach

Figure 5: Key Transit Expansions by the Prospective Centennial Park Landing Site



PIER 50 LANDING SITE

The Pier 50 landing site serves the existing King County Water Taxi and Kitsap Fast Ferry routes. This site is adjacent to Washington State Ferries' Colman Dock ferry terminal that is a transportation hub connecting ferries to other modes of transportation.

Alignment with POF Service

As an existing POF facility, Pier 50 is well served by other modes of transit allowing passengers to quickly connect to their final destination. Pier 50 was recently improved as part of the Colman Dock Preservation Project and integrates with the Seattle Waterfront Redevelopment Project. However, the Pier 50 landing site is constrained by the two-vessel slip that is reaching capacity with the number of POF routes that can operate from this location.

OVERALL CONNECTIVITY:

- Close to downtown Seattle central business district and transit hub

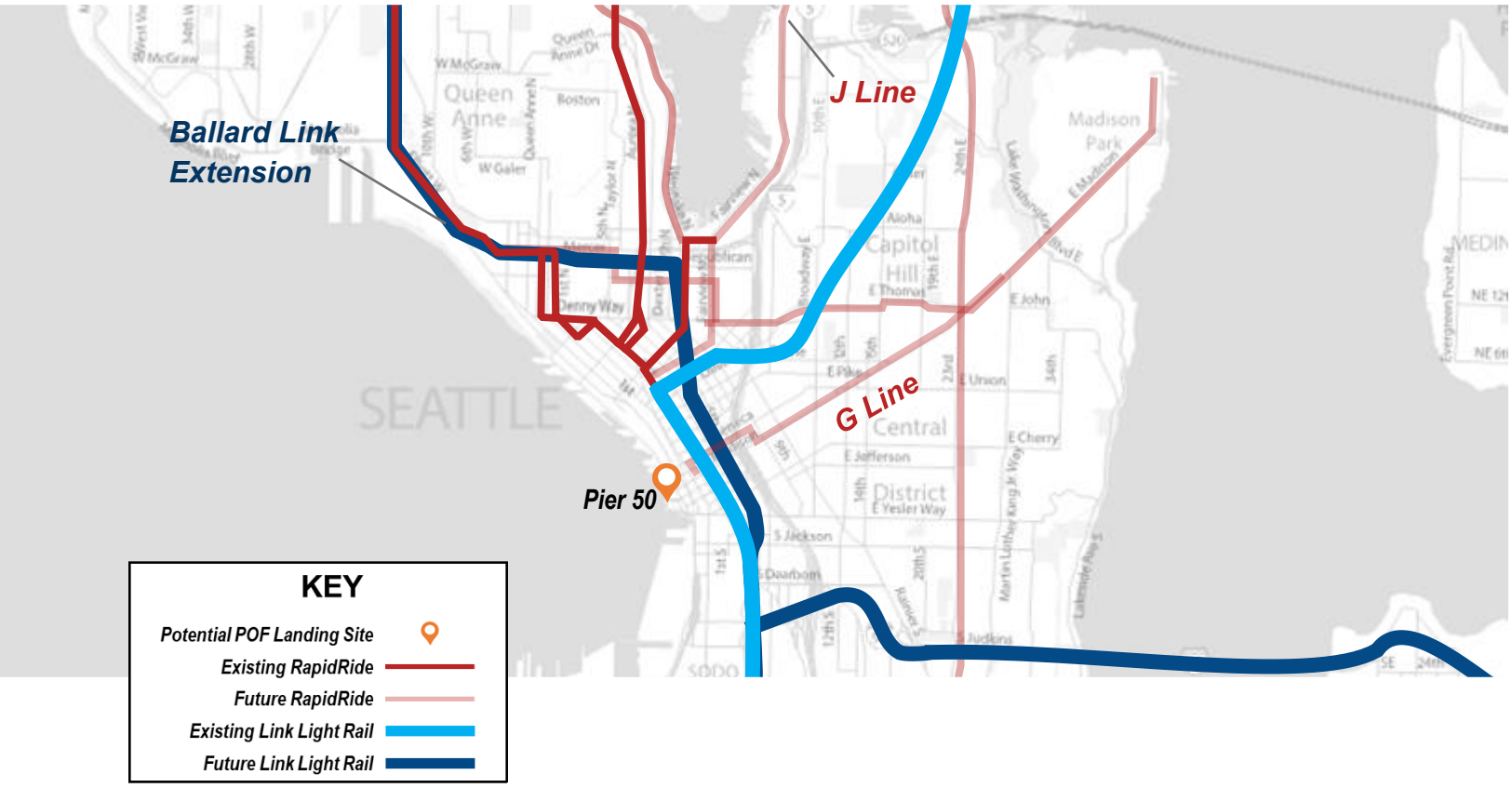
FIRST/LAST MILE CONNECTIONS:

- Various bike/pedestrian/transit options avaiable to passengers

ADDITIONAL PLANNING EFFORTS NEEDED FOR IMPLEMENTATION:

- Pier 50/ Seattle Waterfront POF Expansion Study

Figure 6: Key Transit Expansions by the Pier 50 Landing Site



APPENDIX C: PRELIMINARY ENVIRONMENTAL IMPACT ANALYSIS

PRELIMINARY ENVIRONMENTAL IMPACT ANALYSIS

The purpose of this memo is to assess potential environmental impacts resulting from passenger-only ferry (POF) service to and from Ballard and downtown Seattle. The potential environmental impacts are intended to provide a guide for future environmental work required for the implementation of POF service. The methodology for this assessment was based closely on the environmental review framework as outlined in the State Environmental Policy Act (SEPA).

INTRODUCTION

King County Marine Division (the Marine Division) is proposing to expand POF service to provide another transportation option for the Puget Sound region. The proposed POF route expands upon the two existing POF routes currently operated by the Marine Division, including the West Seattle route and the Vashon Island route. The West Seattle route provides year round commute and all-day seasonal service between the landing at West Seattle at Seacrest Park and the POF terminal in downtown Seattle at Pier 50. The Vashon Island route provides year round commute-only service between Vashon Island and Pier 50.

The expanded POF service would provide year round commute and all-day seasonal service between a landing in Ballard and the existing Pier 50 landing in downtown Seattle with a potential stop at Centennial Park, near the new Expedia Campus.

The proposed route expansion would likely require the following processes and approvals prior to implementation:

- King County Council budget approval
- Grant funding for capital improvements
- Environmental review process

This technical memorandum documents a preliminary analysis of potential environmental impacts from POF service along the expansion routes from Ballard to downtown Seattle. To deliver POF service at the given service levels, the Marine Division would operate one 150-passenger vessel at an operating speed of up to 28 knots in unrestricted areas. For the purpose of this evaluation, it has been assumed that this vessel would be a foil-assisted catamaran built by All American Marine and owned and operated by Kitsap Transit. This vessel is 24 meters in length and hereafter will be referred to as 150-passenger vessel.

The route options were evaluated using publicly available data and when possible visually representing this data using ArcGIS. The majority of data were created and compiled by local and state governments or research institutions; a few data sets were created through this project by digitizing information gathered from other sources. There are gaps in this data, and further site-specific analysis is recommended.

The following sections provide a more detailed project description and preliminary analysis of environmental elements when considering POF service.

PROJECT DESCRIPTION

The proposed project would provide POF service along a new route on Puget Sound. The route would be from the Shilshole Bay Marina in Ballard to the Pier 50 ferry in downtown Seattle with a potential additional stop at Centennial Park. The potential route options and ferry landing sites considered are depicted in Figure 1 Potential Ballard Route Map and Landing Sites.

Figure 1. Potential Ballard Route Map and Landing Sites

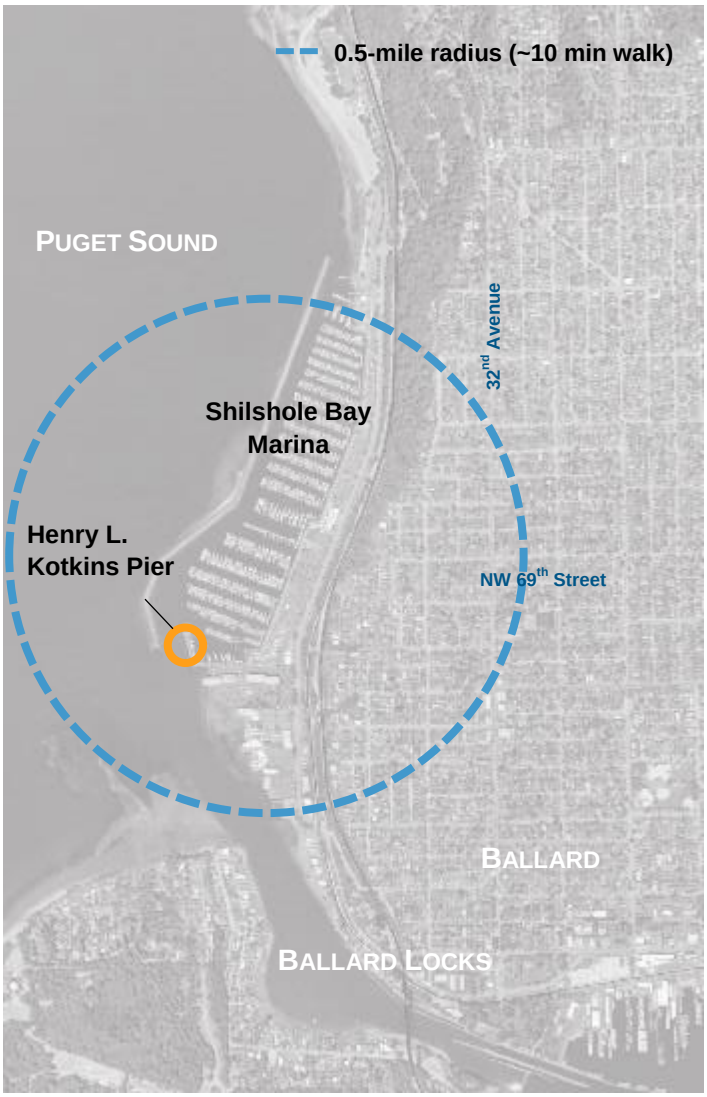
Potential Ferry Landing Sites

Three landing sites are being considered for potential POF service between Ballard and downtown Seattle. The following sections provide a brief overview of the potential landing sites.

Shilshole Bay Marina—Ballard

The Shilshole Bay Marina is approximately 1 mile north of the Ballard Locks and offers over 1,400 moorage slips, along with moorage amenities and retail and commercial space. The Henry L. Kotkins Pier at the southern end of the marina is the preferred location for POF service, though other docks have also been discussed as a moorage location. The site would require a new float, gangway, and upland improvements for POF service. Figure 2 provides a vicinity map of the Shilshole Bay Marina landing site.

Figure 2. Potential Shilshole Bay Marina Landing Site



Centennial Park—Interbay

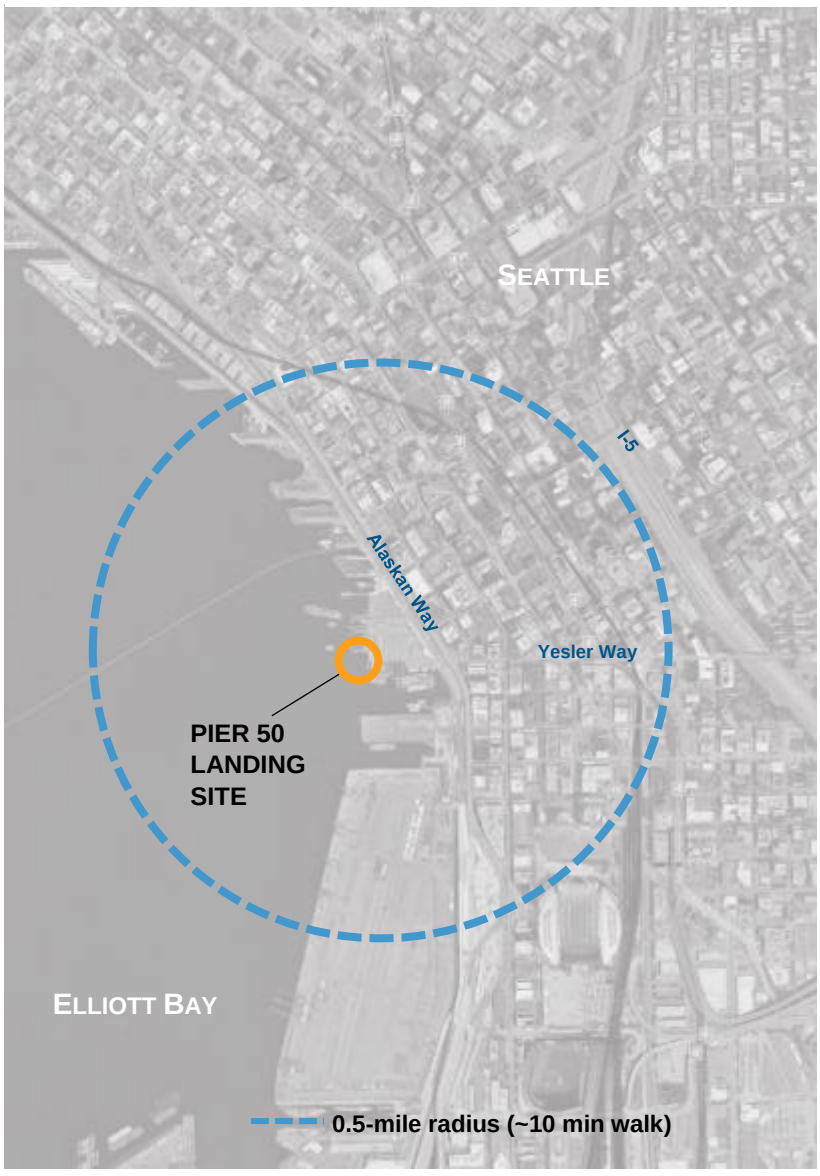
The Centennial Park landing site would be located near the new Expedia Campus in the Interbay neighborhood. The site has an existing pier that was originally used for fishing and other recreational activities but has been closed for safety reasons. The site would require a new float, gangway, and upland improvements for POF service. Figure 3 provides a vicinity map of the Centennial Park landing site.

Figure 3. Potential Centennial Park Landing Site

Pier 50—Downtown Seattle

The Pier 50 landing site is currently used as the landing site for the West Seattle and Vashon Island King County Water Taxi routes, and for the Kitsap Transit Fast Ferry with routes from Bremerton and Kingston. Located in the heart of downtown Seattle, adjacent to Washington State Ferries (WSF)'s Colman Dock, the Pier 50 terminal recently re-opened after extensive improvements were made to the facility to support POF service. No additional improvements would be required to support the additional POF service to Ballard. Figure 4 provides a vicinity map of the Pier 50 landing site.

Figure 4. Potential Pier 50 Landing Site



Initial Service Levels

The Ballard POF route would provide year-round commute service in the winter and peak all-day service in the summer months. The total number of round-trip sailings per week would be up to:

- Peak service (May–September): up to 90 sailings per week
- Commute service (October–April): up to 40 sailings per week

Operating Parameters

Vessels

To deliver POF service at the given service levels, a 150-passenger vessel would be required. The vessels would be equipped with diesel or diesel/hybrid propulsion engines and would operate with a three-person crew.

Speed

Vessels would travel up to 28 knots in unrestricted areas.

Moorage, Maintenance, and Fueling

The existing King County Moorage/Maintenance Barge at Pier 48 would serve as the site for overnight moorage and maintenance. Vessels would be fueled at a local fuel dock on Elliott Bay.

Implementation Schedule

To implement a POF route between Ballard and downtown Seattle, funding would need to be secured, and the capital investments would need to be designed and reviewed by regulatory agencies and stakeholders. These reviews, including relevant shoreline and environmental reviews, are anticipated to take up to two to three years. Consequently, it is anticipated that the implementation of POF service would take approximately three to five years once funding is secured.

ENVIRONMENTAL ELEMENTS

The following sections provide preliminary analysis of environmental elements considered with operating POF service. Additional data will be required to fully assess the environmental impacts of selected landing sites, which will be evaluated in later phases of the project.

Earth

The potential POF route would operate on the waters of Puget Sound connecting Ballard and downtown Seattle. Vessel-generated waves from a new POF operation could cause erosion of shorelines through mobilization and transport of sediments.

Steep Slopes and Unstable Soils

Shorelines backed by steep slopes or unstable soils are particularly vulnerable to erosion and destabilization by the transport of sediment by vessel-generated waves. In this section, shorelines which will be more sensitive to erosion have been identified so operations can be planned to minimize the potential changes in these areas. Figure 5 shows the slope stability mapped along the proposed POF route. The shoreline along the Ballard to downtown Seattle route is composed predominantly of steep slopes and is primarily categorized as unstable. There is at least one documented recent slide and one documented older slide along this route.

Figure 5. Slope Stability Mapped Along Proposed Ballard to Seattle Route

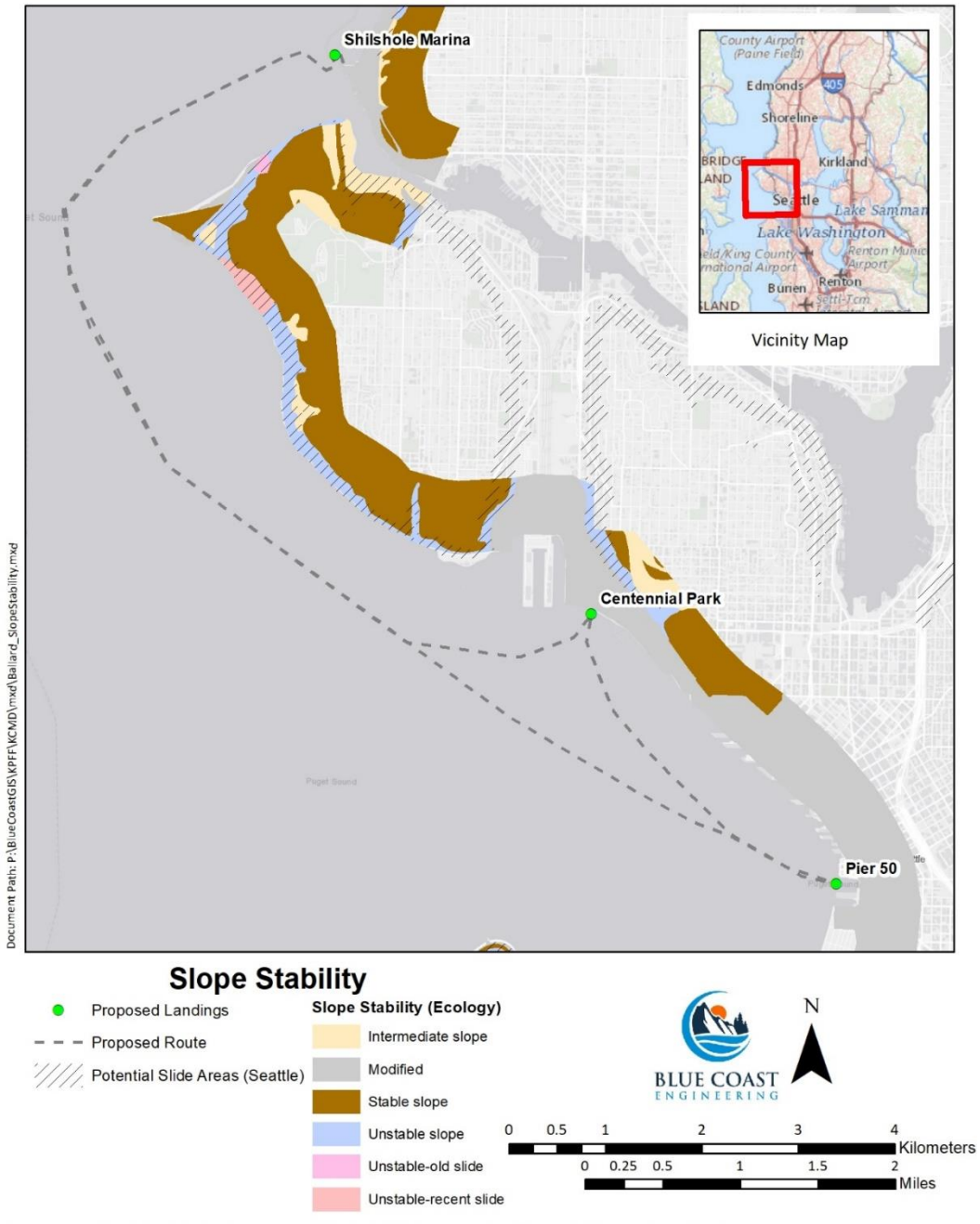


Figure 6 depicts high banks and unstable slopes along the route. These shorelines are categorized as feeder bluffs and feeder bluff exceptional as they provide an important source of sediment to the littoral drift cells along this reach. This figure also shows West Point as an accretion zone where sediment accumulates. The navigation chart produced by National Oceanic and Atmospheric Administration (NOAA) show there is a wide low tide terrace off shore of the Feeder Bluff Exceptional between West Point and Magnolia, which further emphasizes the volume of sediment being discharged by the bluffs into the nearshore zone, which can be easily transported by vessel wake wash.

Figure 6. Shoretype Mapped Along Proposed Ballard to Seattle Route

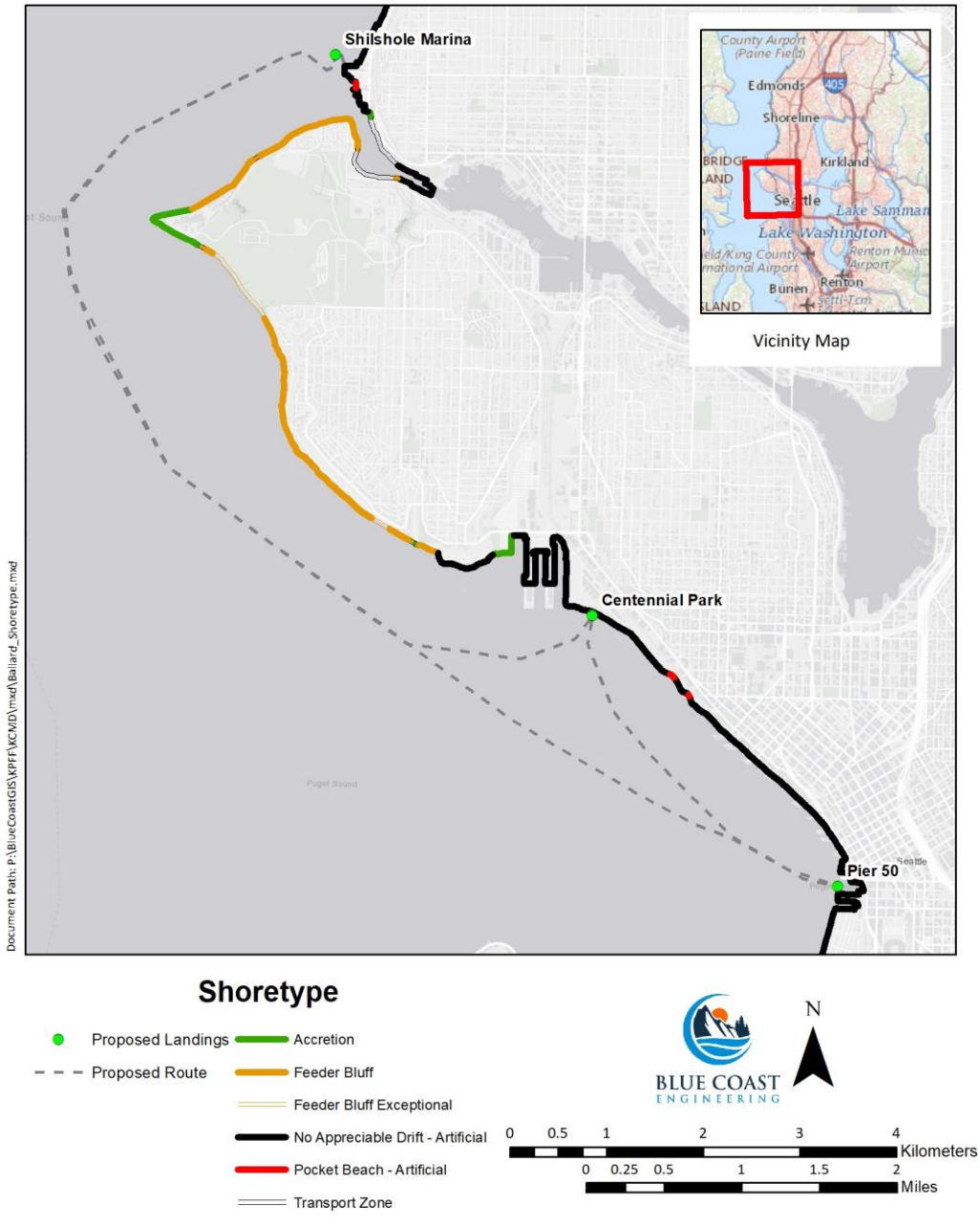
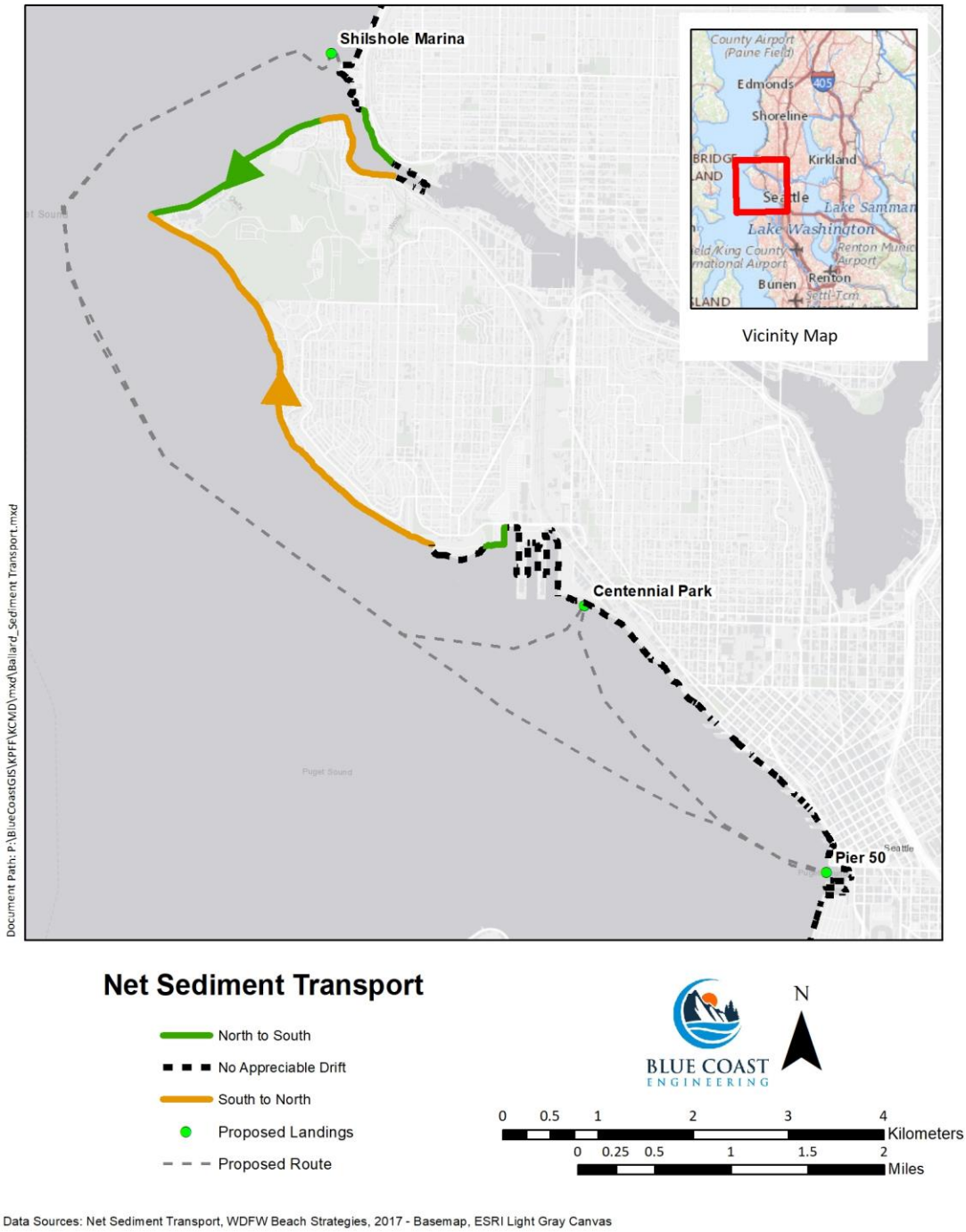


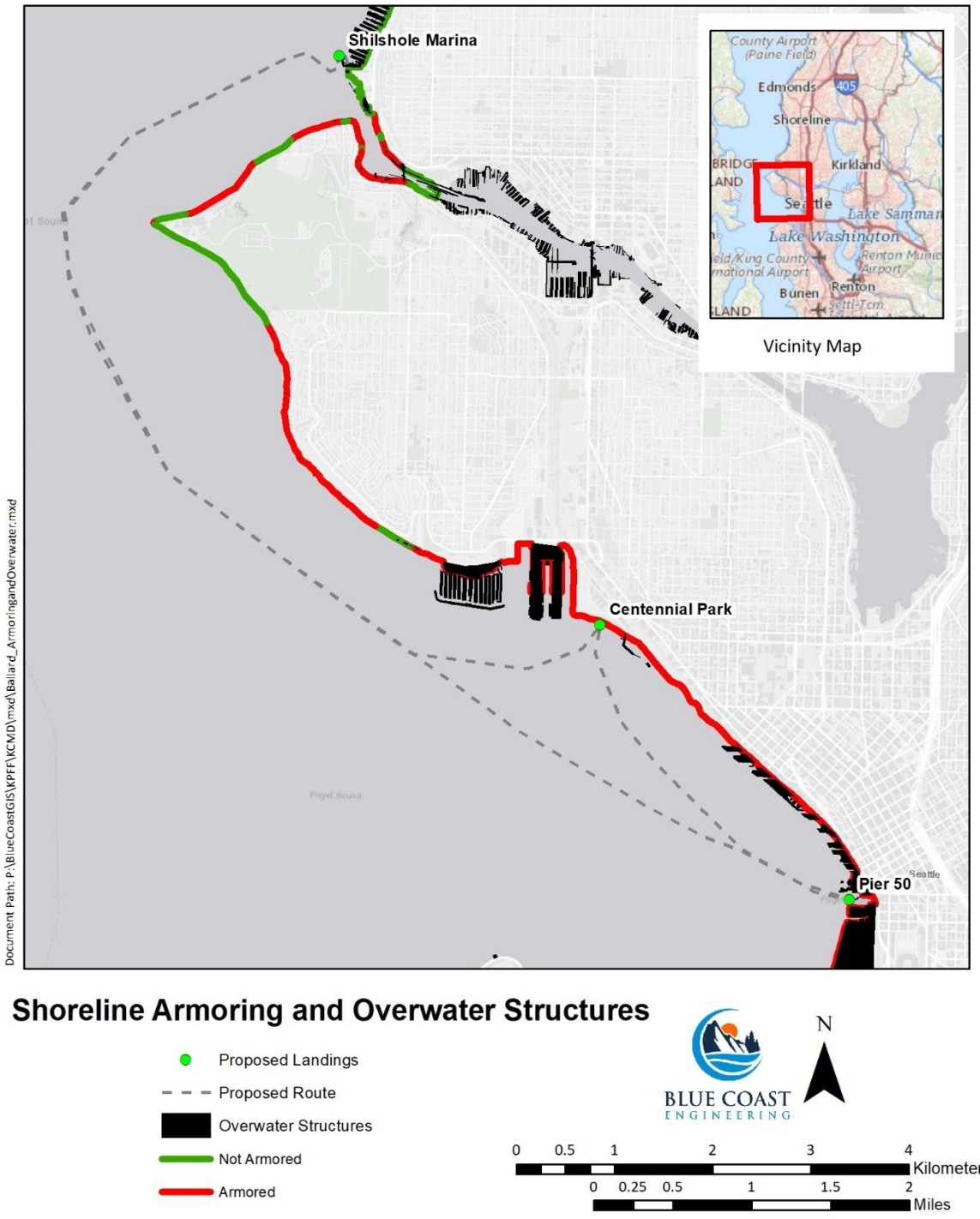
Figure 7 shows the three primary drift cells along the route, which are separated by areas which have no appreciable drift. These are: (1) Ship Canal to West Point, (2) West Point to Elliott Bay Marina, and (3) Elliott Bay Marina to Pier 50. Sediment is transported from the entrance to the Ship Canal toward West Point and from the area near Elliott Bay Marina towards West Point. The shoreline areas at the end of these drift cells near the Ship Canal and Elliott Bay Marina tend to be more erosional.

Figure 7. Sediment Transport Direction Mapped Along Proposed Ballard to Seattle Route



Feeder bluffs with shoreline structures tend to impound sediment behind the structure and can be erosional as a result of a lack of sediment supply. Vessel wake wash interacting with bulkheads can increase erosion rates. Figure 8 shows large stretches of the shoreline to the north of the Elliott Bay Marina are also armored.

Figure 8. Shoreline Armoring and Overwater Structures Mapped Along Proposed Ballard to Seattle Route



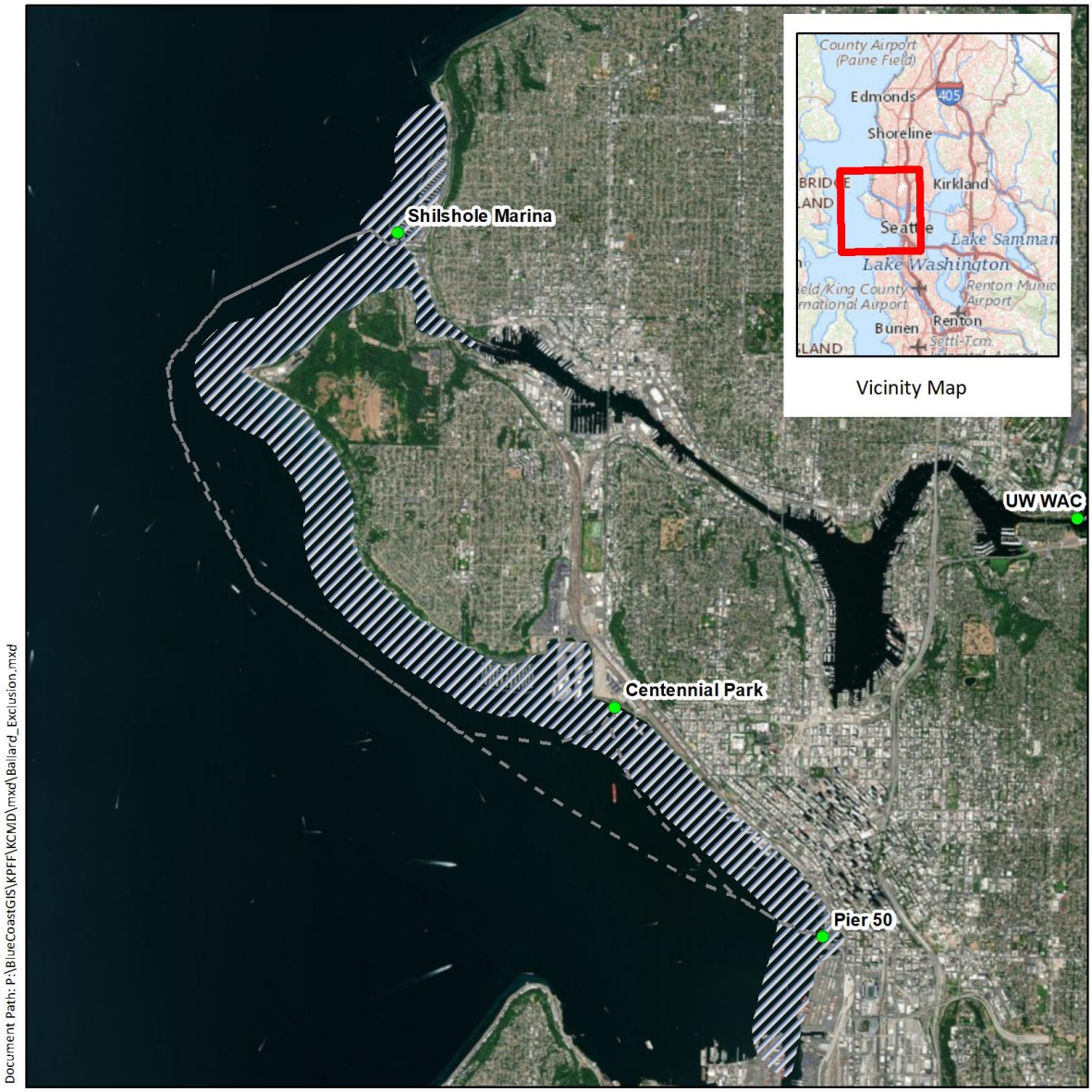
Measures to Reduce Potential for Impacts to Earth

The Marine Division would develop operational protocols for the POF on the Ballard route to minimize the potential for wake wash-induced impacts on the critical shoreline areas.

- Vessel should not operate within 600 meters of the shoreline except near the landing sites.
- Vessel speed should be decreased to below 12 knots prior to entering the 600-meter buffer zone on the approach to the landing site.
- Making turns with a radius of less than 30 degrees should be avoided because wake wash from the inside of a sharper turn can be focused on points of land. This can result in a single point of land-receiving wakes from more than one direction. The radius of the turn along West Point should be increased if possible. Alternatively, a buffer of 1,000 meters would also minimize the interaction of wake wash with West Point.

Figure 9 shows the 600-meter shoreline buffer zone that vessels would not operate near except at landing sites.

Figure 9. Exclusion Zones Mapped Along the Proposed Ballard to Seattle Route



Data Sources: 600m Buffer, Blue Coast Engineering, 2019 - Imagery, DigitalGlobe, July 2017

AIR

The diesel-powered propulsion systems would contribute to greenhouse gas (GHG) emissions, including carbon dioxide (CO_2) and nitrogen oxide (NOx) emissions. The Environmental Protection Agency (EPA) requires new vessels to incorporate Tier 4 engines to significantly reduce GHG emissions. It is anticipated that the new vessels would require Tier 4 engines, though hybrid-diesel propulsion systems would be explored for the route.

Based on the estimated POF service levels using approximately 250,000 gallons of diesel annually, POF service would generate approximately 2.2 million kg of CO_2 annually. However, it is anticipated that POF service would reduce the number of passenger vehicle miles traveled, therefore offsetting the greenhouse gases generated from the vessels.

WATER

The project occurs in marine waters of Central Puget Sound. To protect water quality and reduce the risk of any contaminants entering the Sound, best management practices would be used in any construction activities needed for landing sites to support POF service.

Ferry vessels themselves, like most marine vessels, may use a raw water cooling process during operation. Raw water cooling involves extracting water through the hull and using it to cool engines. Shortly after use, the water is returned to the source waterbody. Withdrawal water is screened to prevent the intake of any marine life.

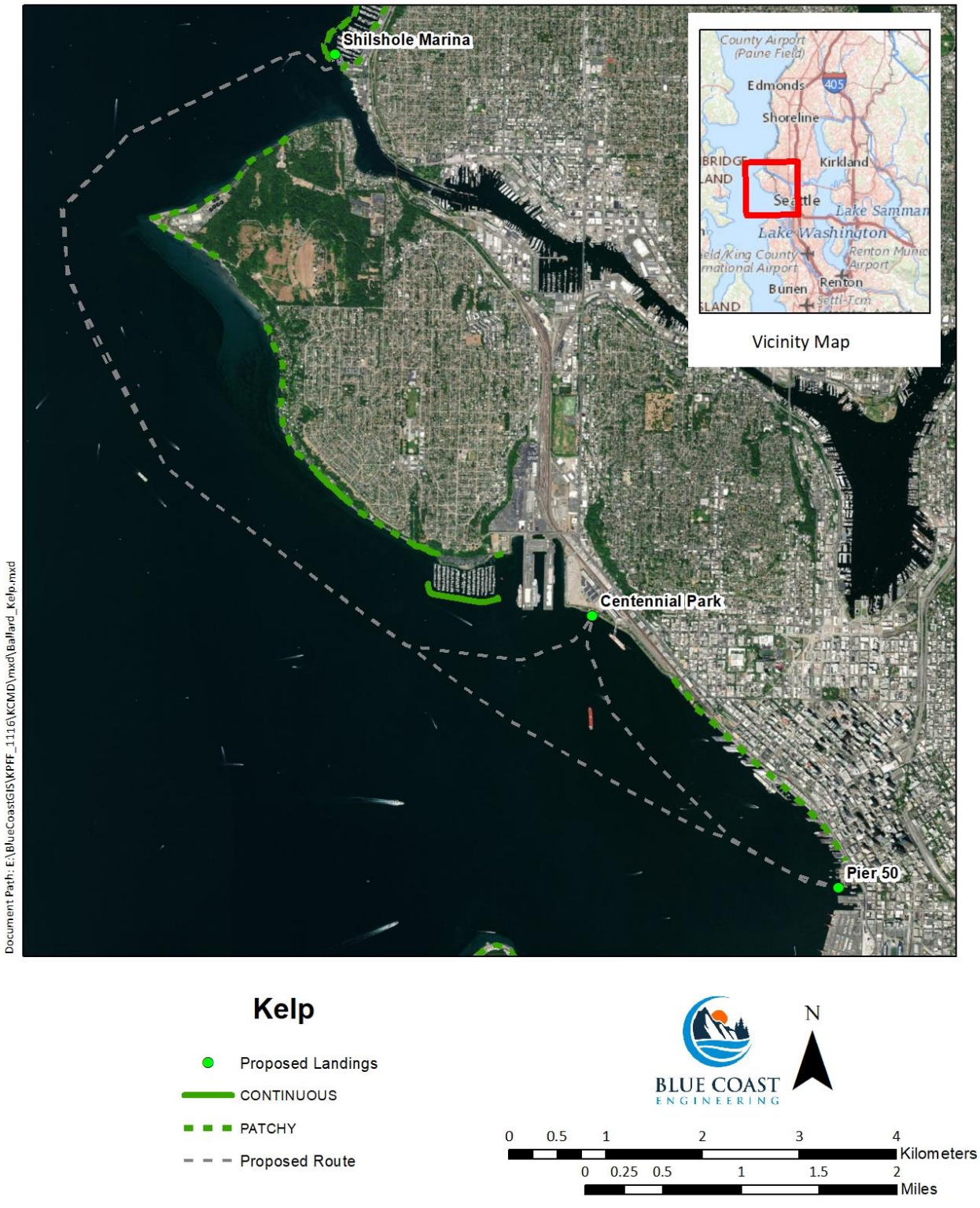
No sewer waste would be discharged into the waters of Puget Sound. Ferry vessels would store any sanitary sewer waste generated during trips using marine holding tanks and will discharge tanks to upland sanitary sewer treatment systems.

PLANTS

Kelp and eelgrass are considered two important submerged aquatic vegetation (SAV) species that may be impacted by proposed POF service (WAC 365-190-130). Based on the importance of SAV to fish and other species, a site-specific survey in the vicinity of the landing sites where improvements are being proposed would be required for the project (WAC 220-660-350).

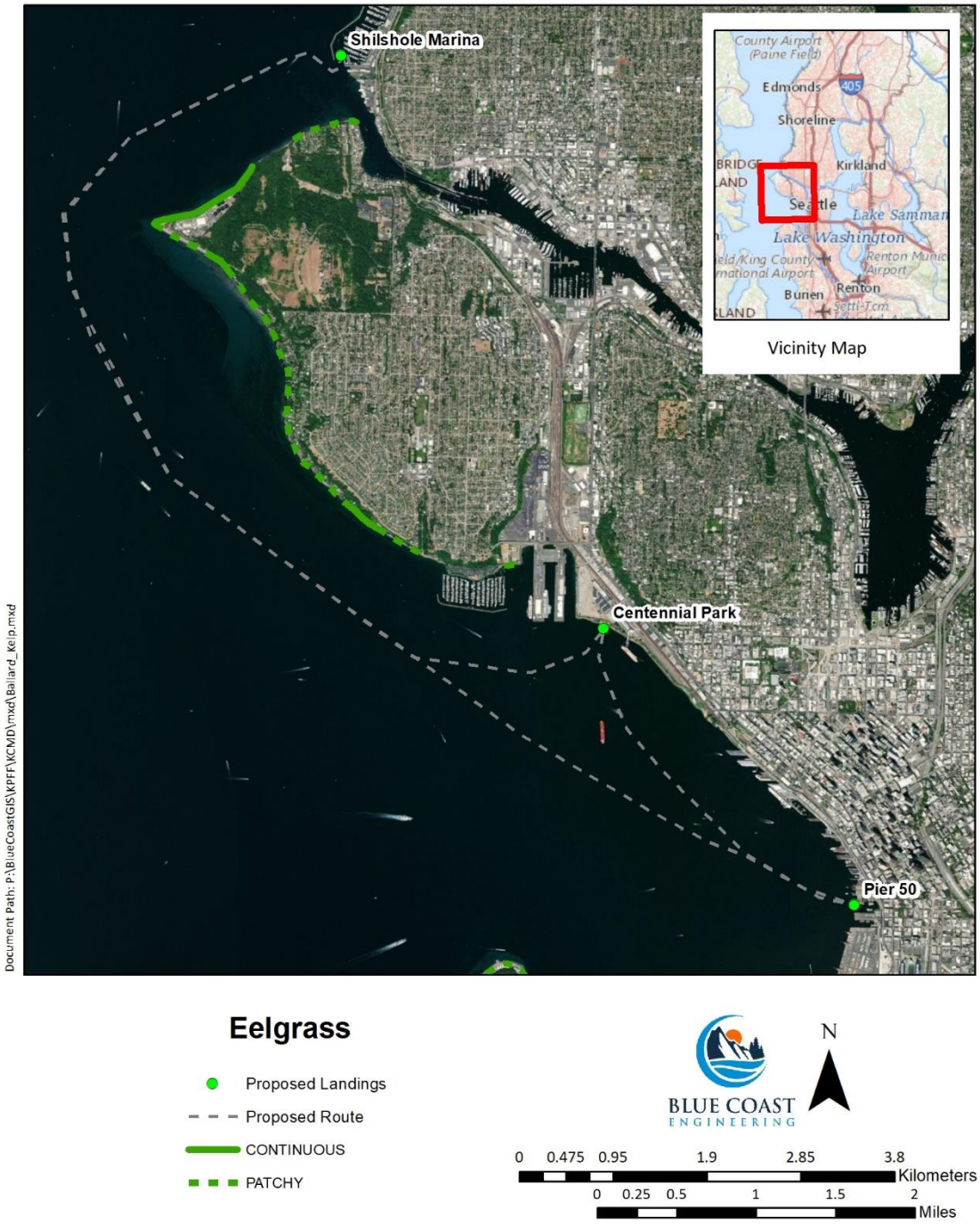
Kelp was monitored by the Washington State Department of Natural Resources (DNR) as part of the ShoreZone Inventory between 1994 and 2000. During this work, which used aerial imagery, kelp is documented along the majority of the shoreline route as patchy, including at Shilshole Marina and Pier 50. The kelp distribution is shown in Figure 10.

Figure 10. Kelp Mapped Along Proposed Ballard to Downtown Seattle Route



Eelgrass was also monitored as part of the ShoreZone Inventory by WDFW and is mapped along the shoreline between Elliot Bay Marina and Lake Washington Ship Canal. There are also two long-term monitoring sites along the shoreline that have shown eelgrass present, but have not detected a trend in increasing or decreasing vegetative cover over time (DNR 2019). Eelgrass concentrations are provided in Figure 11.

Figure 11. Eelgrass Mapped Along Proposed Ballard to Downtown Seattle Route



Data Sources: Eelgrass, WADNR ShoreZone Inventory, 1994-2000 - Imagery, DigitalGlobe, July 2017

Vessel wake wash generated by the new operation while the vessel is in transit between docking locations would likely be dissipated prior to reaching the shoreline and is not likely to impact SAV.

Measures to Reduce Potential for Impacts to Plants

The distance between the proposed vessel sailing line and the shoreline between West Point and Magnolia should be at least 1,000 meters to avoid impacts to eelgrass and kelp.

ANIMALS

Data were acquired from the Priority Habitat and Species (PHS) program through Washington Department of Fish and Wildlife for any habitats and species that are not listed on the public-facing website for the program (WDFW 2019).

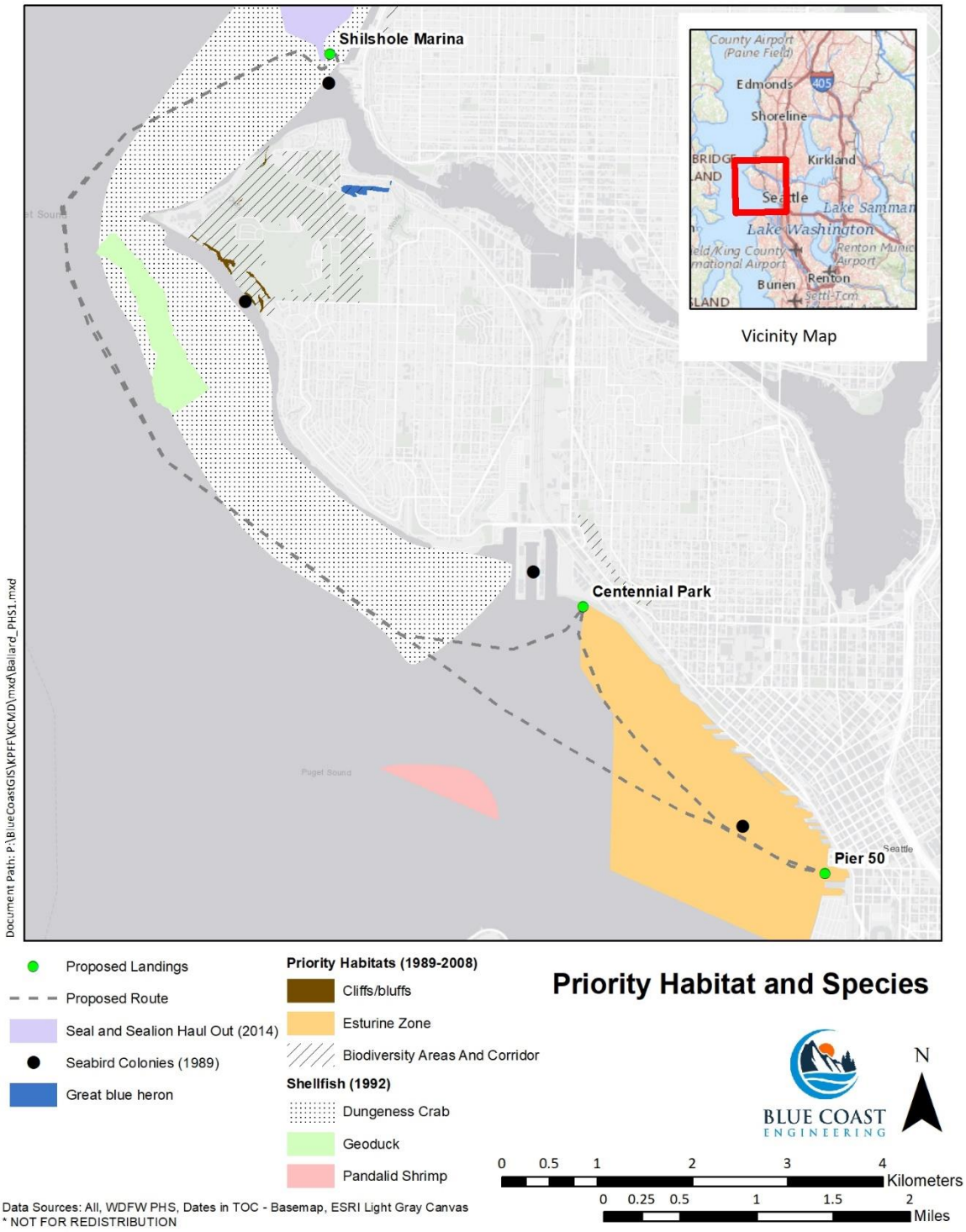
A priority habitat is unique or significant to many species, and any site-specific work in these areas would be regulated by local jurisdictions. Priority species may be state-listed as Endangered, Threatened, or Sensitive (WAC 232-12). Species and habitats may also be listed as a priority if the species aggregates; for example, heron group in large rookeries and seals haul-out in large groups, which may make them more susceptible to impacts. Species of recreational, commercial, or tribal importance may also be listed as a priority species, such as geoduck. Regulations around priority habitat and species are generally defined by local jurisdictional codes.

Along the proposed Ballard route are PHS-identified areas of shellfish (Dungeness crab, geoduck, and shrimp), but no harvest of benthic shellfish is allowed recreationally due to poor water quality in the area.

Marine mammals are protected under the National Marine Mammal Protection Act, and any in-water work for the project would require monitoring and a protection plan. Near the Shilshole Marina is an identified haul-out area for seals and sea lions. Other marine mammals such as Southern Resident Orca and other whales could be encountered along the route, and operation protocols to slow down and report sightings will be required to minimize the potential impacts to these protected species.

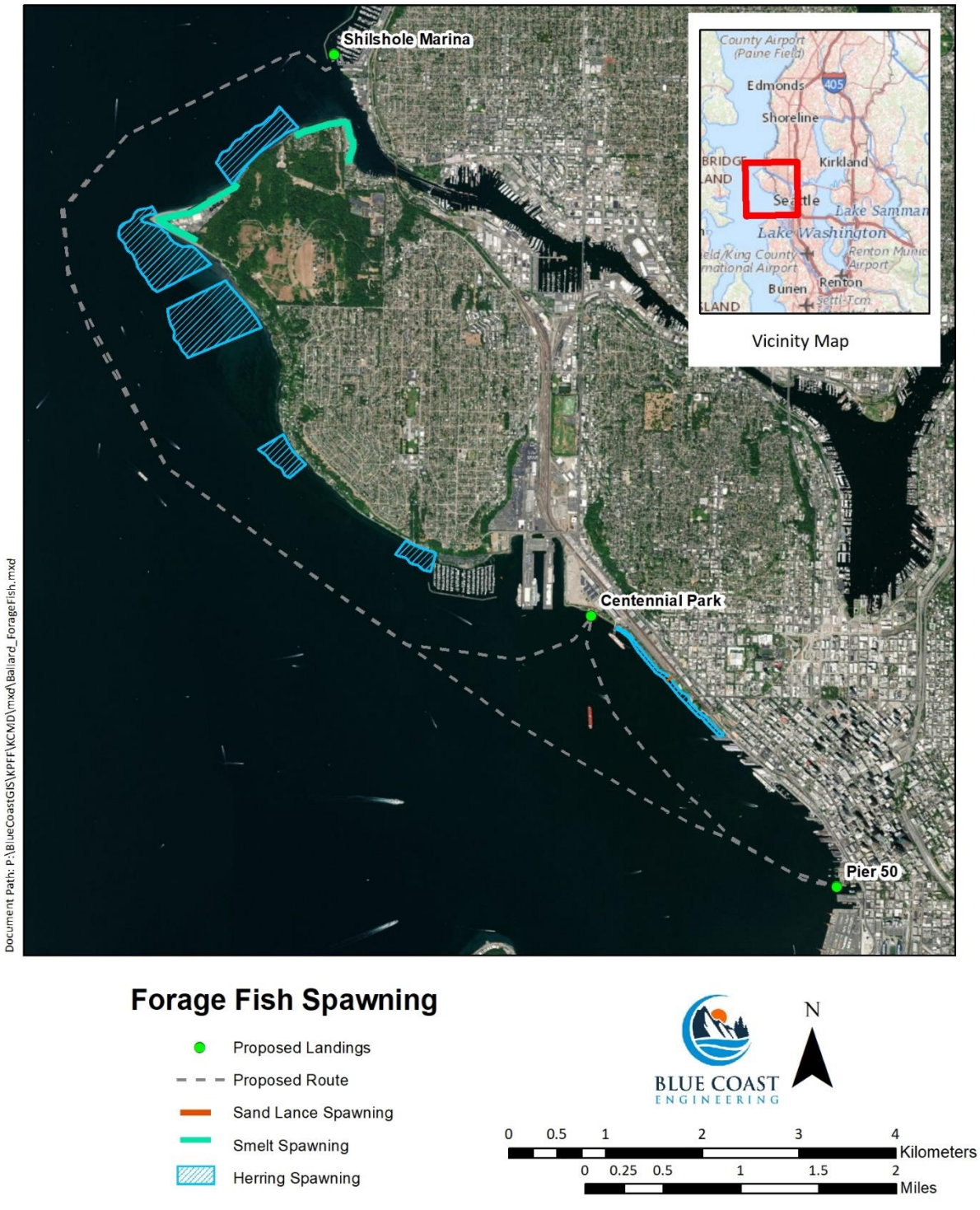
A great blue heron rookery is located in Discovery Park, and four seabird colonies are located along the route. Noise could be a possible impact to birds, and further evaluation of the presence of birds in the area and noise effects may be required. Figure 12 provides the priority habitat species within the vicinity of a potential Ballard route.

Figure 22. Priority Habitat and Species Mapped Along Proposed Ballard to Seattle Route



Forage fish are an important species in Puget Sound, and surveys are required for intertidal in-water work to determine the presence/absence of forage fish spawn (WAC 220-660-340). Forage fish concentrations are identified in Figure 13.

Figure 13. Forage Fish Spawning Beaches Mapped Along Proposed Ballard to Seattle Route



Data Sources: Forage Fish, WDFW, https://www.arcgis.com/home/webmap/viewer.html?webmap=19b8f74e2d41470cbd80b1af8dedd6b3 - Imagery, DigitalGlobe, July 2017

Smelt and herring are documented spawning along the proposed route, herring spawn on vertical structures (man-made and natural), and smelt and sand lance spawn in the mixed sand and gravel of the upper intertidal zone. Spawning habitat for surf smelt or sand lance at the landing areas has likely been altered by existing land uses and anthropogenic affects. Therefore, it is not likely that this project would have an impact on forage fish spawning at the landing sites. Impacts to forage spawning on the beach would be minimized by the same mitigation measures to reduce the potential impacts to earth (shoreline buffers for operation).

There are no mapped streams along the route that provide habitat for salmon or other monitored fish species (WDFW 2019). Salmon, including Sockeye, Chinkook, and Coho species, will be using the shoreline along the route as a migration corridor, in particular at the entrance to the Ship Canal where fish enter to move to Lake Washington and connected rivers and streams. The table below provides the status of threatened and endangered fish, which could be affected by the project.

Fish Listing Status, https://wdfw.wa.gov/species-habitats/at-risk/listed

Common Name	Scientific Name	State Status	Federal Status
Bull Trout	*Salvelinus confluentus*	Candidate	Threatened
Chinook Salmon	*Oncorhynchus tshawytscha*	Candidate	Threatened
Coho Salmon	*Oncorhynchus kisutch*	None	Species of Concern
Steelhead Trout	*Oncorhynchus mykiss*	None	Threatened

Measures to Reduce Potential for Impacts to Animals

KCMD would develop operational protocols for the POF on the Ballard route to prevent wake wash induced impacts on the critical shoreline plants.

- Additional operating protocols to avoid impacts to sea lions and seal haul-outs near Shilshole Marina may be necessary.
- Operational protocols to slow down when encountering orcas and other marine mammals and to report sightings of these species.
- At least a 1,000-meter distance between the proposed vessel sailing line and the shoreline between West Point and Centennial Park should be maintained to avoid impacts to forage fish spawning areas.

ENERGY & NATURAL RESOURCES

Fuel-based vessel engines would be used for vessel propulsion and to power vessel generators. Annual diesel use would be approximately 250,000 per year based on current

estimated service levels. Vessel engines would be capable of using both conventional diesel and biodiesel fuels. Where appropriate, the less emissions-generating option of biodiesel would be used.

ENVIRONMENTAL HEALTH

It is anticipated vessels would be fueled at a local fuel dock on Elliot Bay.

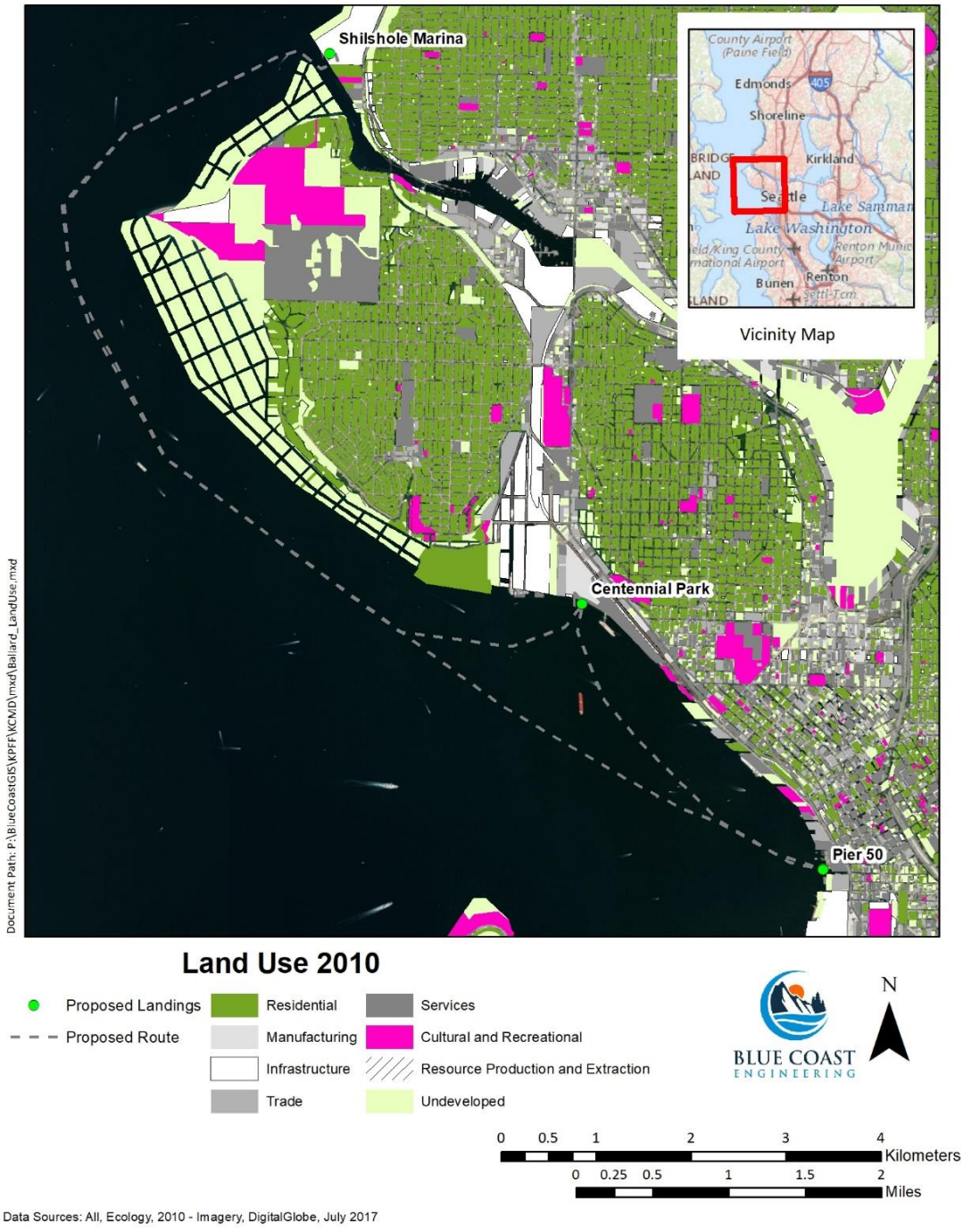
NOISE

Vessels operating along this route would produce noise when traveling across the water, which could temporarily increase noise along the shoreline. Additionally, POF vessels temporarily generate noise when they sound their horn upon departure from landing sites. Sounding the horn is required in accordance with United States Coast Guard protocols. However, the noise levels are not anticipated to exceed the allowable thresholds.

LAND AND SHORELINE USES

Land uses in the vicinity of the proposed Ballard routes are illustrated in Figure 14. Vessels would transit between ferry docks in areas with existing commercial, recreational, and ferry vessel use. Ferry operations would use existing navigable waters and existing vessel traffic routes. This proposal would be consistent with existing land uses on nearby or adjacent properties, and therefore not modify or affect current land use.

Figure 3. Land Use Mapped Along the Proposed Ballard to Seattle Route



Critical Areas

Shorelines are classified as “environmentally sensitive” areas; categorized as Fish and Wildlife Habitat Conservation Areas, including Saltwater Shorelines (King CountyTitle 21A.25); and designated as Environmentally Critical Areas (ECAs) by City of Seattle under the categories Floodprone, Liquifaction Zone, and Wildlife Preservation Area (Seattle Municipal Code (SMC) chapter 25.09). The potential POF route will meet all relevant ECA regulations, as laid out in the City of Seattle ECA code.

HOUSING

This proposed project would not add or eliminate housing. Therefore, it is not anticipated there would be any impacts to housing as a result of the proposed project.

AESTHETICS

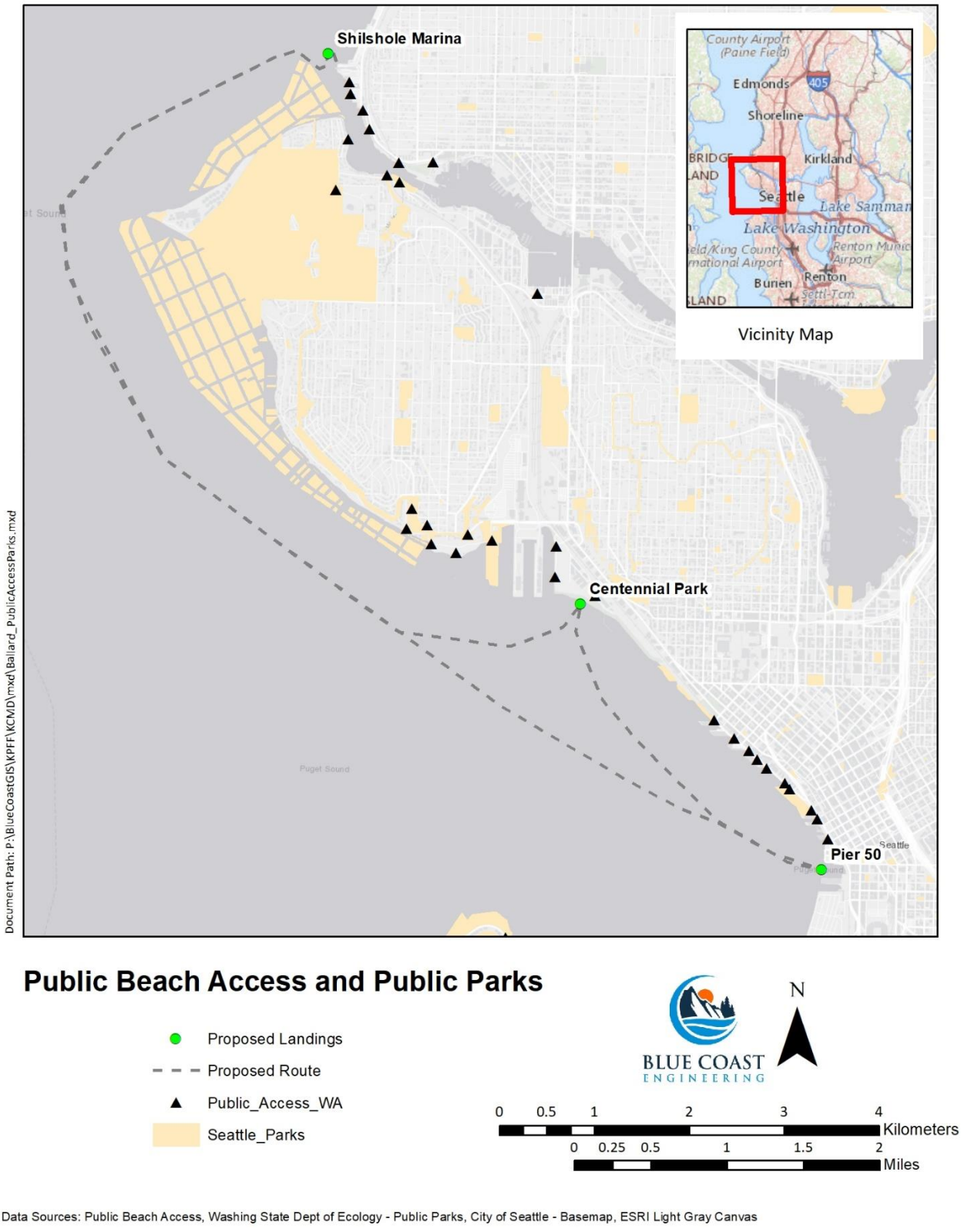
POF service would increase the number of scheduled vessel passages on Puget Sound. Existing and proposed vessels have a height above the waterline of approximately 25 to 30 feet. Views of the maritime waterfront would include additional vessel passages.

RECREATION

Informal recreational opportunities within the area include boating, kayaking, fishing, clamming, and wildlife viewing. Many of these activities occur or originate from the Seattle Parks and points of public beach access along the proposed vessel route. Figure 15 shows publicly accessible beaches along the proposed vessel route.

Vessel transits may temporarily affect the timing of recreational activities within the vessel route or dock vicinities. These areas have existing boat traffic, so the change is limited to the increase in frequency of vessel transits. The project would have a minor and temporary effect on recreational uses.

Figure 15. Land Use Mapped Along the Proposed Ballard to Seattle Route



HISTORIC & CULTURAL RESOURCES

Each site was reviewed through a desktop search of the Washington Information System for Architectural and Archeological Records Database (WISAARD). No landing sites had structures older than 45 years old, and there were no landmarks, features, or other evidence of historic use or occupation.

Areas along the shoreline are listed as high risk for being culturally significant. As a result, if ground-disturbing activities are required in the future for POF facility development, an archeological survey would be recommended.

TRANSPORTATION

The project occurs in marine waters of Central Puget Sound. The project includes acquisition, operation and maintenance of ferry vessels in the water. POF service would provide another transit option for people traveling between Ballard and downtown Seattle.

PUBLIC SERVICES AND UTILITIES

To get passengers to and from ferry landings, investments would need to be made in first- and last-mile connections. These connections could include other land-based public transit services or other public transit programs.

The Ballard and Centennial Park landings would require electricity for new lighting, while the Pier 50 landing already has lighting.

REFERENCES

Toft JD. 2001. Shoreline and Dock Modifications in Lake Washington. Report prepared for King County Department of Natural Resources.

Washington State Department of Natural Resources (DNR). 2019. Puget Sound Seagrass Monitoring, Submerged Vegetation Monitoring Program Data Viewer. Accessed December 4, 2019 https://wadnr.maps.arcgis.com/apps/webappviewer/index.html?id=83b8389234454abc8725827b49272a31

Washington State Department of Transportation (WSDOT). 2019. Navigable Waterways Discipline Report for SR 520: I-5 to Medina Bridge Replacement and HOV Project Supplemental EIS.

WDFW 2019 https://apps.wdfw.wa.gov/salmonscape/map.html

WRIA 8 https://www.govlink.org/watersheds/8/action/lakeside-living/aquatic-weeds.aspx

APPENDIX D:
LOCAL AGENCY/OWNER COORDINATION
BALLARD POF ROUTE

LOCAL AGENCY/OWNER COORDINATION

As part of this Proviso, King County Marine Division (Marine Division) reached out to the local agencies and owners of each potential landing to discuss opportunities and challenges of potential passenger-only ferry (POF) service. The following table provides a summary of these discussions.

Local Agency/ Owner	*Outreach Information*	*Stakeholder Interest*	*Opportunities*	*Challenges*	*Outcomes*
Port of Seattle	Meeting *See notes in Attachment D.1.*	» Owns Shilshole Marina. » Owns Centennial Park.	» Parking is available on the street adjacent to the marina. » Space is available at or adjacent to “Dock A.”	» No available designated parking at the marina. » The walk to the pier is long and could be chllenging for some users. » Car traffic is high at the marina which could limit parking opportunities.	» Port is willing to consider moving forward with POF landing.
Expedia	Meeting	» Campus is adjacent to Centennial Park landing.	» Expedia, the Port of Seattle, and the State of Washington are partnering to fund the refurbishment of the Centennial Park Pier and landing. » This landing site is adjacent to the Elliott Bay Trail.	» There is a lack of nearby public parking (except for the Expedia pay parking garage) or public transit stops.	» Expedia is interested in a POF landing at Centennial Park.

In addition to coordination with local agencies and potential landing site owners, the Marine Division met with the United States Coast Guard (USCG), Sector Puget Sound. The USCG has regulatory authority over all vessel operations in Puget Sound waters as well as a whole host of other responsibilities. The goal of this meeting was to inform them of this study and discuss any concerns, issues, and focus areas. Please see a summary of the meeting in Attachment D.2.

Attachment D.1

Summary of November 13, 2019 Meeting with the Port of Seattle

MEETING SUMMARY

Date: November 13, 2019

Time: 3 p.m. - 4 p.m.

Location: Port of Seattle

Subject: Potential Passenger-only Ferry Service from Ballard

Attendees:

Stephanie Jones Stebbins	*Managing Director, Maritime, Port of Seattle*
Melinda Miller	*Director, Portfolio & Asset Management, Port of Seattle*
Joseph Gellings	*Senior Planner, Port of Seattle*
Kenneth Lyles	*G.M. Fishermen's Terminal/Maritime Industrial Center at Port of Seattle*
Paul Brodeur	*Director, Marine Division, Metro Transit Department, King County*
Kristen Kissinger	*Associate/ Project Manager, KPFF Marine Transit Consulting Group*
Martha Hart	*Project Assistant, KPFF Marine Transit Consulting Group*

Project Overview

King County Marine Division (KCMD) is working on a King County Council budget proviso response studying implementation of passenger-only ferry service from Ballard to downtown Seattle. This includes refreshing the 2015 Service Expansion Options Report for Ballard, as well as, stakeholder and community outreach, environmental analysis and financial evaluation.

The goal of this meeting was to discuss what has changed at the Port properties (Shilshole Marina and the Centennial Park Fishing Pier) since 2015, potential landing sites at these properties, recent and planned transportation improvements, and any opportunities or challenges to consider in this study.

Discussion Topics

What's changed in Ballard & Expedia since 2015?

- The Port is constructing new customer service facilities that are anticipated to be complete by the end of the second quarter of 2020 at "H" dock. These include:
  - Laundry facilities
  - Restrooms
  - Showers
- Duke's flagship restaurant is going to be constructed at the marina adjacent to "H" dock where a temporary garden is currently located.
  - 133 of the current parking spaces will be designated for restaurant use

Potential Landing Sites

- Shilshole Bay Marina
    - Landside infrastructure will likely be a constraint for dock choice
    - 1/3 of slip owners live at the marina (~ 300 families at the facility)
    - Weekend regattas are held year round
    - A preferred location can be provided after Port's internal discussion with marina's ops staff
    - Port is conservative with new overwater coverage but does not have a policy for no new coverage at the marina
    - Fueling at "H" dock may be possible, depending on flow rate & quantities needed
    - *Shilshole Bay Marina: South Slip*
        - The Elk's Lodge has parking nearby
        - As most events at Elk's occur in the evenings and on weekends, parking could be available to POF commuter service
        - Farther for summer seasonal riders heading to Golden Gardens Park
        - Outside of the dock is not currently set up for embarking and disembarking
        - Small cruise vessels land on the outside of the pier approximately 3 times a year
        - Float and ramp would be needed on the outside of the dock
        - New facilities could be open access when POF service is not running
    - *Shilshole Bay Marina: Fuel Dock ("H" dock)*
        - Designated loading zone, potential challenge for landing a ferry on a schedule unless designation changes
        - Limited parking in the area
        - Adjacent to restaurant use and centrally located
        - Street use permit for parking, potential opportunity for shuttle loading
        - Closer to Golden Gardens
- Fishing Pier at Centennial Park
    - Potential capital project funded by the Port, State, and private business in negotiation. The State owns the pier and the Port owns the uplands parkland
    - Moorage at the reconstructed facility is a possibility with the addition of a float and gangway
    - Site is located adjacent to new Expedia campus, providing opportunities for commuters with opportunities for connecting to downtown Seattle and Kitsap County

Future Mobility Improvements

- Shilshole Bay Marina
    - Currently there is parking along Seaview Ave through a street use permit
    - Seaview Ave curb space could be used for a shuttle
    - Parking is a large challenge, and no new spaces are being built, however there may be a shared use opportunities at the Elk's Lodge that could be evaluated
    - First/last mile connections are a prime concern - limited transit that serves the marina

- Fishing Pier at Centennial Park
    - Expedia is building a parking garage

Action Items / Next Steps

- Port of Seattle
    - Send parking survey to KCMD
    - Contact Expedia for input in potential service
    - Let King County know if there are community engagement opportunities like workshops or events to attend
- KCMD
    - Send mock operating and vessel profile to the Port
    - Coordinate with Kenneth Lyles to schedule site visits
    - Contact Expedia for input in potential service

Follow-up with progress of stakeholder outreach

Attachment D.2

Summary of January 8, 2020 Meeting with USCG, Sector Puget Sound

MEETING SUMMARY

Date: January 8, 2020

Time: 1 p.m. - 2 p.m.

Location: US Coast Guard, Sector Puget Sound, Pier 15

Subject: Potential Passenger-only Ferry Service in Puget Sound and Lake Washington

Attendees:

John Dwyer	*Chief of Domestic Vessels*
Lee Bacon	*Chief, Domestic Vessel Branch*
LCDR Ryan Mowbray	*Marine Inspector*
LT Alex Kwolek	*Facilities and Containers Branch*
Jeff Zappen	*Waterways Management Specialist/Tribal Liaison*
Paul Brodeur	*Director, Marine Division, Metro Transit Department, King County*
Ron Panzero	*Marine Operations and Maintenance Manager, Marine Division, MTD, KC*
Scott Davis	*Project Manager, KPFF Marine Transit Consulting Group*

Project Overview

King County Marine Division (KCMD) is working on a King County Council budget proviso response studying implementation of passenger-only ferry services both in Puget Sound and Lake Washington. This includes refreshing the 2015 Service Expansion Options Report for Kenmore as well as stakeholder and community outreach, environmental analysis and financial evaluation.

The waters of Puget Sound and Lake Washington are federally navigable waters of the US and as such, the United States Coast Guard has regulatory authority over all vessel operations in those waters as well as a whole host of other responsibilities. The goal of this meeting was to inform our regulators of this study, to have a robust dialogue about any concerns, issues, areas of focus, and to learn from them of other potential stakeholders.

Discussion Topics

Route overview for Puget Sound route; Ballard

Route overview for Lake Washington route; Kenmore

- Ballard Discussion
  - Potential landing sites
  - Stakeholder engagements conducted or planned
  - Designation of facility as per Facility Security Plan

- Kenmore Discussion
    - Potential landing sites
    - Stakeholder engagements conducted or planned
    - Designation of facility as per Facility Security Plan

Potential Landing Sites – Ballard Route

- Shilshole Bay Marina
    - A preferred location can be provided after Port's internal discussion with marina's ops staff
    - The most southerly dock would provide the easiest access in/out of the marina for ferry operation
    - Float and ramp would be needed on the outside of the dock
- Fishing Pier at Centennial Park
    - Potential capital project funded by the Port, State, and private business in negotiation. The State owns the pier and the Port owns the uplands parkland
    - Moorage at the reconstructed facility is a possibility with the addition of a float and gangway
    - Site is located adjacent to new Expedia campus, providing opportunities for commuters with opportunities for connecting to downtown Seattle and Kitsap County
    - Should check with Army Corp. to see if that area has been swept for unexploded ordinances
- Pier 50 Downtown Seattle
    - New King County owner facility
    - King County Marine Division controls vessels docking schedules
    - Currently serving four routes
    - Kitsap Fast Ferries will be adding a second Bremerton vessel in spring 2020 and a new Southworth run beginning in late 2020
    - Pier 50 will be maxing out on waterside vessel landing capacity

Potential Landing Sites – Kenmore Route

- Kenmore – Log Boom Park
    - City owned park with existing in water piers suitable for ferry operations
    - Improvements needed – Float, fendering, ramp, passenger amenities
    - Shallow water, piling stub obstructions
- Lakepointe
    - Privately held
    - Side of 520 pontoon construction
    - Bulkhead improvements completed at that time
    - Upland improvement opportunities
    - Dredging the channel is being planned
    - Kenmore Air landing / takeoff patters, stakeholder
    - Private plane use of the Kenmore Air – stakeholder

- Madison Park
  - Dock in under DNR control, discussion underway
  - Location would require new facilities for a water taxi
  - Transit connections are limited with BRT extending to 23rd Avenue
- Leschi Park
  - City Park. Capital improvements are underway with no accommodation for ferry landing
  - Would still require improvements to accommodate a water taxi
  - Transit access is challenging to get passengers from the park into downtown Seattle
  -
- University of Washington
  - Quick connection (~6 min walk) to the UW light rail station
  - Requires new float and ADA improvements that could also be a benefit to UW as this is next to the historic shell building being planned for renovation.
  - KCMD met with UW in the stakeholder outreach process of this study

Regional Passenger Only Ferry discussions

- Puget Sound Regional Council – Regional Passenger Only Ferry Study
- POF service from Tacoma
- SECO Developments plans for Renton to South Lake Union route
- Pier 48 as a future home for a Central Puget Sound POF hub
- Pier 46 cruise ship terminal project with POF on north face possibility

Action Items / Next Steps

None identified at this point. Keep USCG updated as this project progresses.

APPENDIX E:
PUBLIC OUTREACH SUMMARY

PUBLIC OUTREACH APPROACH

King Country Metro conducted an online survey to gather input on the feasibility of passenger-only ferry service from Ballard to Centennial Park and/or Downtown Seattle. The survey was launched December 6 and closed December 23, 2019. During this approximately two-week surveying effort, rider bulletins were sent to seven Metro routes that serve the trip between Ballard and Downtown Seattle, emails were sent to local community-based organizations and partners, and the survey was shared via social media channels and through paid social media ads and boosted posts. These efforts also resulted in additional media coverage of the survey, which helped to amplify awareness and increase participation. The following is a summary of outreach goals, how the survey was developed, and our survey promotions approach.

PUBLIC OUTREACH GOALS

The passenger-only ferry survey was conducted to achieve the following goals:

- To determine whether general public and key stakeholders would find the service valuable, how they would get there, and what landing site locations would be best
- General public understanding of the next steps from their feedback and how this would inform future water taxi expansion efforts

The key tool used to achieve these goals was a public survey conducted online via PublicInput.com. All promotions of the survey, however, were branded King County (kingcounty.gov/metro/watertaxi/survey) and redirected to the PublicInput.com proprietary tool. An online survey was decided upon as the best method to reach the largest number of people, primarily because the survey could be taken on one's own time and at their own pace.

SURVEY DEVELOPMENT

The survey (See attachment A for the survey) underwent an extensive process to help refine which questions were asked of the Ballard community (see Attachment E.1 for the survey). The Metro project team approached development of questions using two key lenses, meaningful feedback and equity. The lenses are reflected through self-checks using the following questions and adjusting to achieve an affirmative answer to, at minimum, one of the questions.

- Does this question allow community to provide feedback that will affect our decision-making process?
- Does this question help Metro center equity in our decision-making process?

The survey development process was guided by clearly stated goals and required the survey team to collaboratively discern which questions needed to be asked and why. The resulting survey then became an effective tool to gauge feasibility of a passenger-only ferry (POF) as a commute option, allowed for the ability to take a deeper look at priority populations to evaluate any potential differences in needs, and better helped the project team clarify determining factors that need to be achieved to make POF service viable.

PROMOTIONAL APPROACH

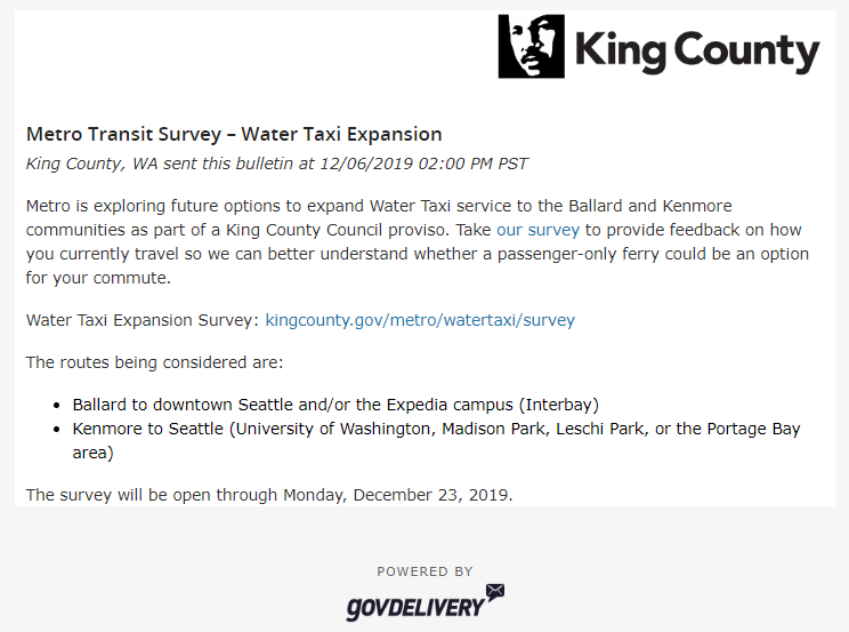
The survey was promoted through multiple channels. The project team did focus on commuters who currently travel between Ballard and Downtown Seattle via Metro Transit buses and

stakeholder groups around the docking sites. In total, 19,833 rider bulletins were sent to subscribers of Metro routes 40, 29, 17 Express, 15 Express, 18 Express, 28 Express, and RapidRide D Line. A detailed chart of number of subscribers for each route can be found below.

Bus Routes Receiving Water Taxi Survey Alerts

Route Number	Number of Subscribers
RapidRide D Line	2,437
40	2,867
29	1,741
17X	2,843
15X	3,014
18X	3,607
28X	3,324

Rider Bulletin



King County

Metro Transit Survey – Water Taxi Expansion

King County, WA sent this bulletin at 12/06/2019 02:00 PM PST

Metro is exploring future options to expand Water Taxi service to the Ballard and Kenmore communities as part of a King County Council proviso. Take our survey to provide feedback on how you currently travel so we can better understand whether a passenger-only ferry could be an option for your commute.

Water Taxi Expansion Survey: kingcounty.gov/metro/watertaxi/survey

The routes being considered are:

- Ballard to downtown Seattle and/or the Expedia campus (Interbay)
- Kenmore to Seattle (University of Washington, Madison Park, Leschi Park, or the Portage Bay area)

The survey will be open through Monday, December 23, 2019.

POWERED BY GOVDELIVERY

The project team also contacted five community-based organizations, mobility boards, and partners to help promote the survey. Each organization was sent an email asking to share the survey link to their lists and on social media. The email to stakeholders is below:

Dear Stakeholder,

The King County Council has asked King County Metro Marine Division to prepare a plan for potential future water taxi service to the Ballard and Kenmore communities and we need your help! As part of the plan, we're looking at collecting feedback on how people currently travel so we can better understand whether a passenger-only ferry could be a commute option. **Would you be able to share our survey?**

Water Taxi Expansion Survey

kingcounty.gov/metro/watertaxi/survey

Metro currently provides passenger-only water taxi service from downtown Seattle to West Seattle and Vashon Island. The survey is exploring whether to expand to one, or both, of these potential route options:

- Ballard to downtown Seattle and/or the Expedia campus (Interbay)
- Kenmore to Seattle (University of Washington, Madison Park, Leschi Park, or the Portage Bay area)

Water taxis are a comfortable way to travel, usually providing a seat for all passengers and allowing them the ability to use travel time to work or relax and enjoy the views. These passenger-only boats are also ADA accessible and have options to store your bike during your trip. Because ferries are not impacted by roadway traffic, they offer a consistent and reliable travel time.

We look forward to hearing from you and your partners on whether water taxi service could be a future commute option for you. The survey will be open through Monday, December 23, 2019.

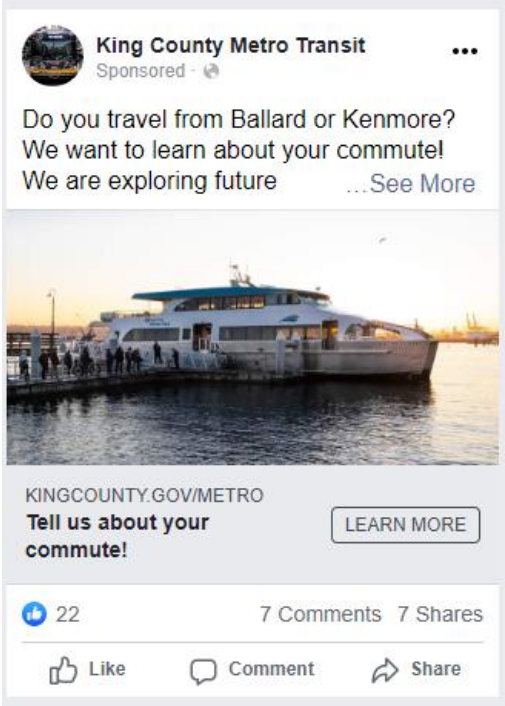
Metro engaged with the following community-based organizations and mobility boards:

- Transportation Choices Coalition
- Commute Seattle
- King County Mobility Coalition

And, with the following partners:

- Port of Seattle
- Seattle Parks and Recreation

In addition, Metro ran Facebook ads targeting users who lived within the Ballard ZIP code of 98107 and Downtown Seattle ZIP codes 98121, 98101, and 98104. Metro also posted organically on Facebook and Twitter, alerting all followers to take the survey if they commute from Ballard. A sample Facebook ad can be found below:



The paid Facebook ads resulted in 25,079 impressions and 159 clicks. The Metro Twitter post resulted in 18,065 impressions and 167 clicks. The Metro Twitter post was also shared by County Executive Dow Constantine

This promotional push was then amplified by local news outlets:

- King 5
- MyBallard.com
- Nextdoor
- The Urbanist
- The Evergrey

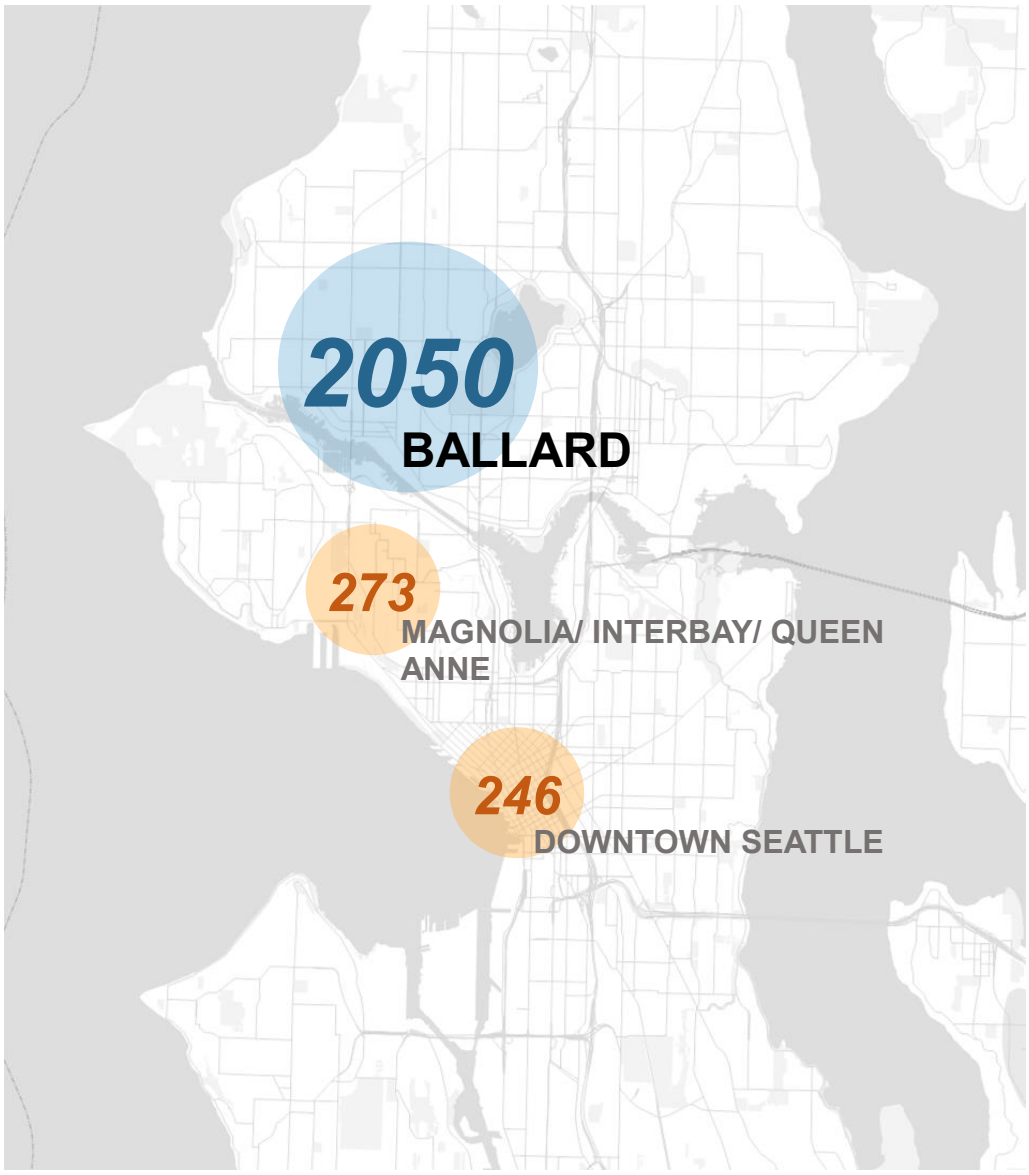
The MyBallard.com write up referred the most traffic to the survey totaling 3,550 clicks.

In all, the promotional approach led to over 12,000 page views, 4,448 completed surveys, and 1,614 open-ended comments.

SURVEY RESULTS & FINDINGS

Survey results provide information on the current travel patterns of prospective POF users along with feedback on their preferences for potential POF service from Ballard. The vast majority of individuals that responding to the survey indicated a home zip code in the Ballard area, meaning that the majority of the opinions reflected in the survey are of Ballard residents and are most representative of their travel patterns. Figure 1 below provides a map of the key clusters of the home zip codes identified by survey respondents and the number of survey responses received from those areas. The following sections of this summary document provide the results and findings from the survey.

Figure 1: Common Home Zip Codes of Survey Respondents



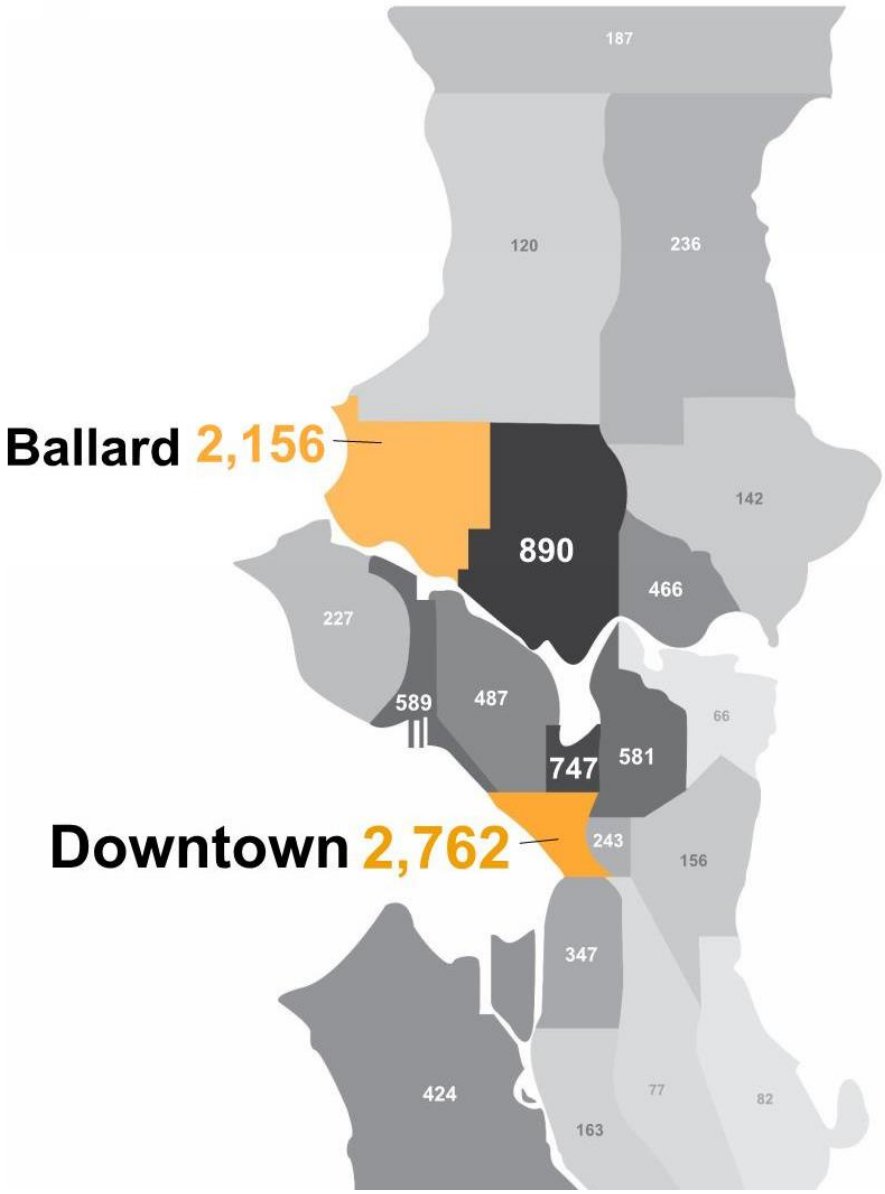
CURRENT TRAVEL PATTERNS

To understand if respondents consider POF service to be another viable transportation option when traveling to and from Ballard, this survey asked people where they are going, why they are traveling, when they travel and how they typically travel. The following sections summarize these findings.

Where are most people travelling to and from?

The largest percentage (72%) of respondents travel to downtown Seattle most days of the week though many respondents (56%) also travel within the Ballard area. Other less common travel destinations of survey respondents include the Fremont/Wallingford/Greenlake area and South Lake Union. Figure 2 illustrates where survey respondents are traveling.

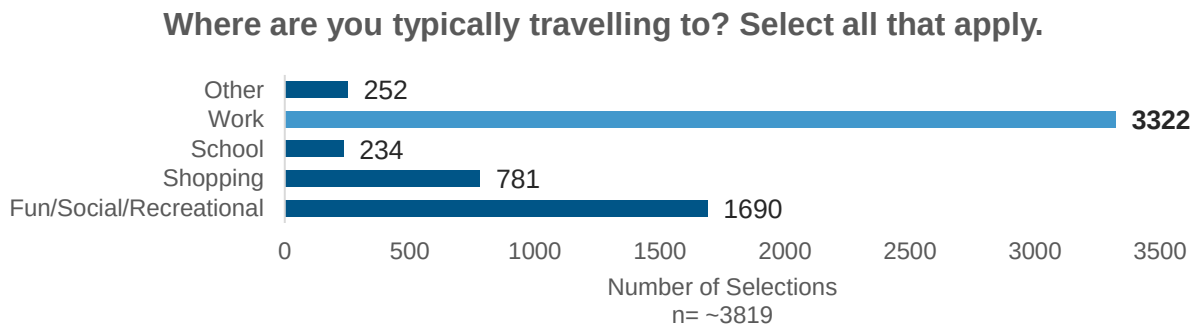
Figure 2: Travel Destinations by Number of Respondents



Why are people travelling?

The vast majority (87%) of survey responses indicate people are traveling for work. Other travel includes fun/social/recreational, shopping, school and or other options. Chart 1 provides the survey results of why people typically travel.

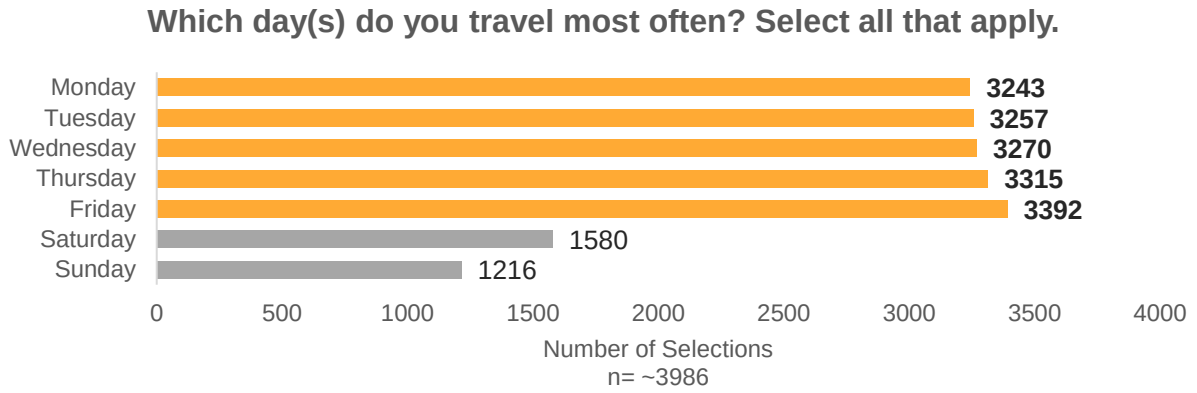
Chart 1: Reasons for Travel



When are people travelling?

The majority of respondents (80%) travel on weekdays, with weekend travel being far less common than weekday travel. Chart 2 illustrates when people suggested they typically travel.

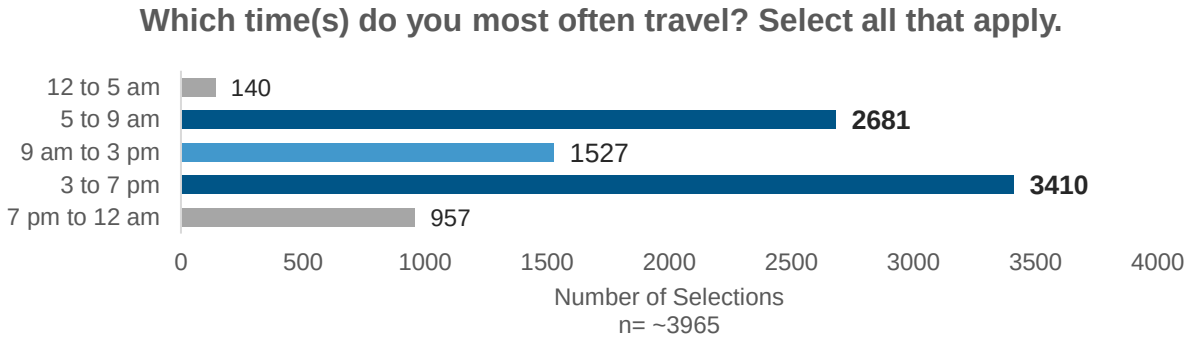
Chart 2: Common Travel Days



What times are people travelling?

Based on survey responses, the morning and evening peak commute periods represented the highest travel periods throughout the day. The survey results indicate that travel rates during the afternoon peak of 3:00 and 7:00 pm are higher than during the morning peak period. While people typically travel during the commute periods, about 40% of survey respondents also indicated they travel in the midday period between 9:00 am and 3:00 pm. Chart 3 provides the times of day survey respondents selected.

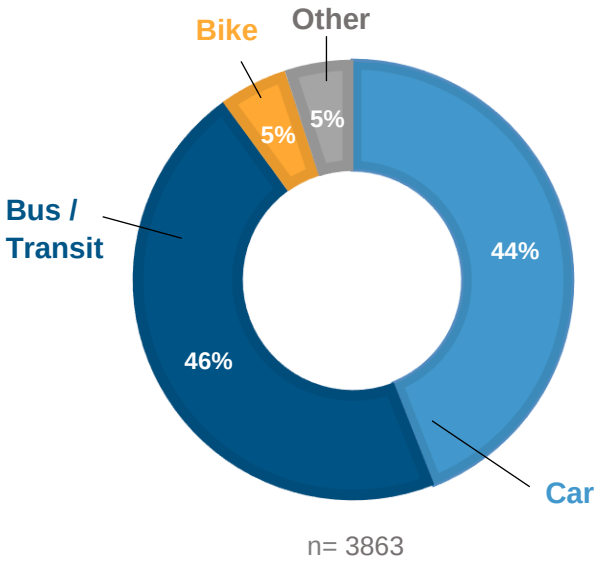
Chart 3: Times of Day for Travel



What mode of transportation do people currently use to travel?

Approximately the same percentage of survey respondents either currently drive (44%) or take the bus/transit (46%) to complete their trips. Chart 4 provides the distribution of the mode of transportation they currently use.

Chart 4: Current Travel Modes



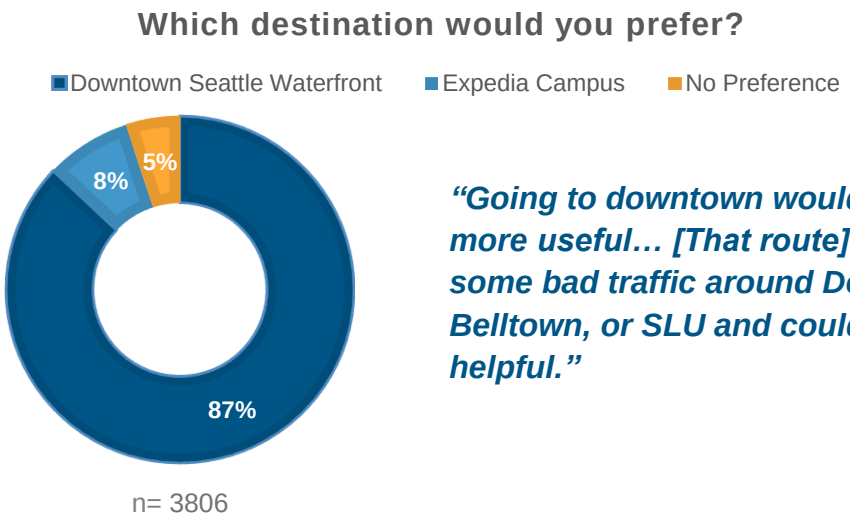
POF USE / PREFERENCES

To understand people's interest in POF service, the survey asked what landing sites people would prefer, how people would prefer to get to a POF landing, how often they would use POF service, why they would use POF service and what amenities are important to them.

Which landing site do respondents prefer?

Of the available landing site options, the downtown Seattle waterfront site was by far the most preferred site (87%) for a POF landing. This preference seems to correlate with the number of respondents who travel to downtown being far larger than the number that currently travel to Centennial Park (adjacent to Expedia). Chart 5 provides the preferred locations of a POF landing.

Chart 5: Preferred POF Landing Site

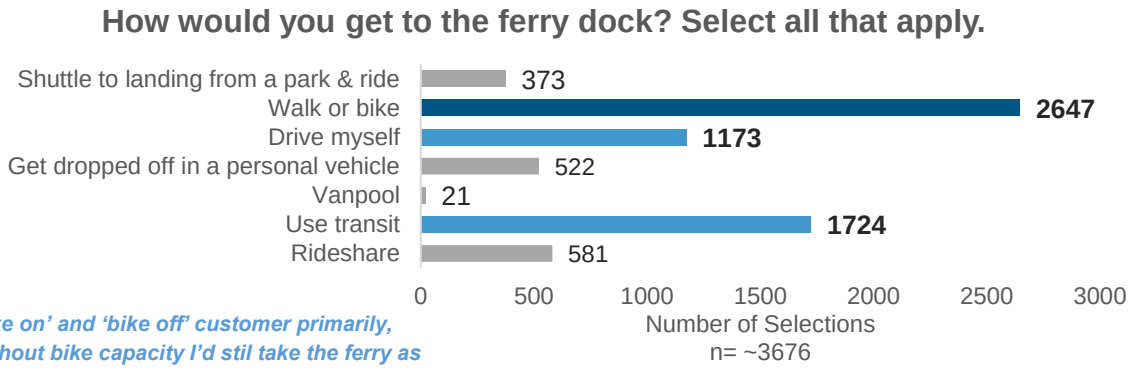


"Going to downtown would be far more useful… [That route] bypasses some bad traffic around Denny, Belltown, or SLU and could be very helpful."

How would respondents prefer to get to that landing site?

Most survey respondents (72%) indicated they would prefer to walk or bike to the landing site. Many respondents (47%) also indicated a willingness to use transit to the ferry terminal while others (32%) would be willing to drive themselves. Chart 6 provides results for how people would get to the ferry dock.

Chart 6: Travel to the Ferry Dock

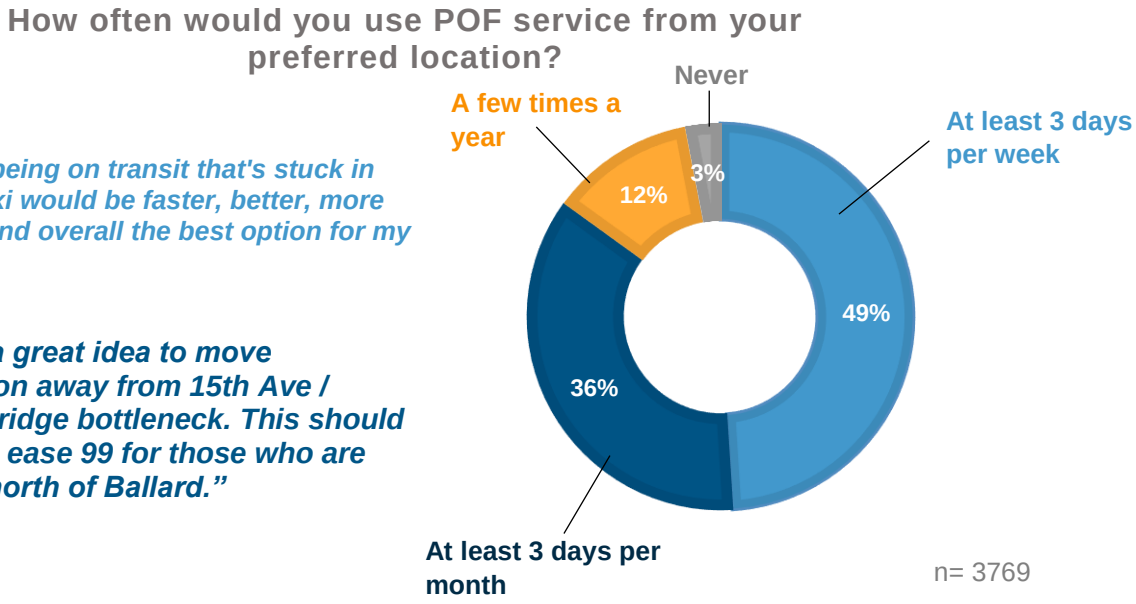


"I'd be a 'bike on' and 'bike off' customer primarily, but even without bike capacity I'd stil take the ferry as a walk on/walk off customer."

How often would respondents take POF? Do they support the service?

Survey respondents generally support POF service; 49% of survey respondents would use the POF service at least three times per week. Moreover, 85% of respondents would use the service at least 3 days per month from the landing site they selected. The majority of the comments were in support of the proposed Ballard-Seattle POF route and/or expansion of POF service in general. Chart 7 illustrates how often survey respondents would use POF service at their preferred location.

Chart 7: Frequency of POF Ferry Use



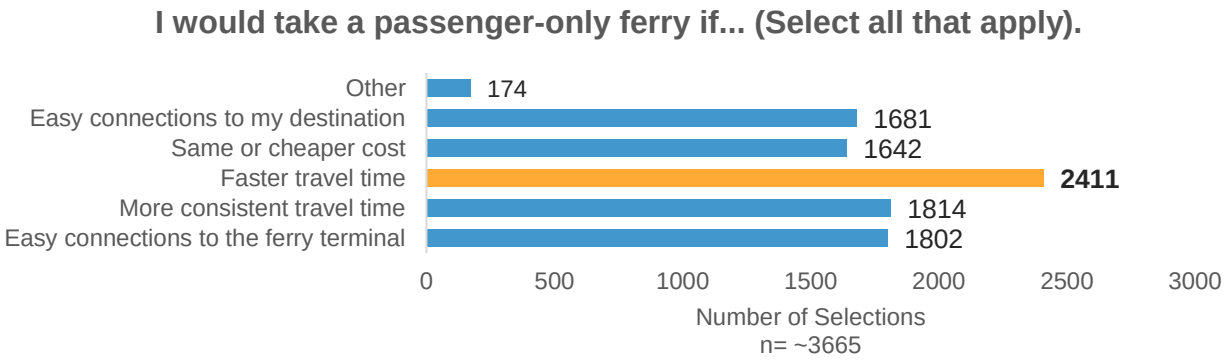
"I'm so tired of being on transit that's stuck in traffic! Water taxi would be faster, better, more relaxing, nicer and overall the best option for my travelling"

"This is a great idea to move congestion away from 15th Ave / Ballard bridge bottleneck. This should also help ease 99 for those who are coming north of Ballard."

What features influence people's decision in taking a POF?

In order to change their travel mode to a POF, the majority of survey respondents (66%) said that their travel time with POF would need to be the same or faster than their current travel mode. Following a faster trip time, having a more consistent travel time and having easy connections to the Ballard terminal were also reasons for taking a POF. Chart 8 indicates why people would take POF service.

Chart 8: Reasons for Taking POF

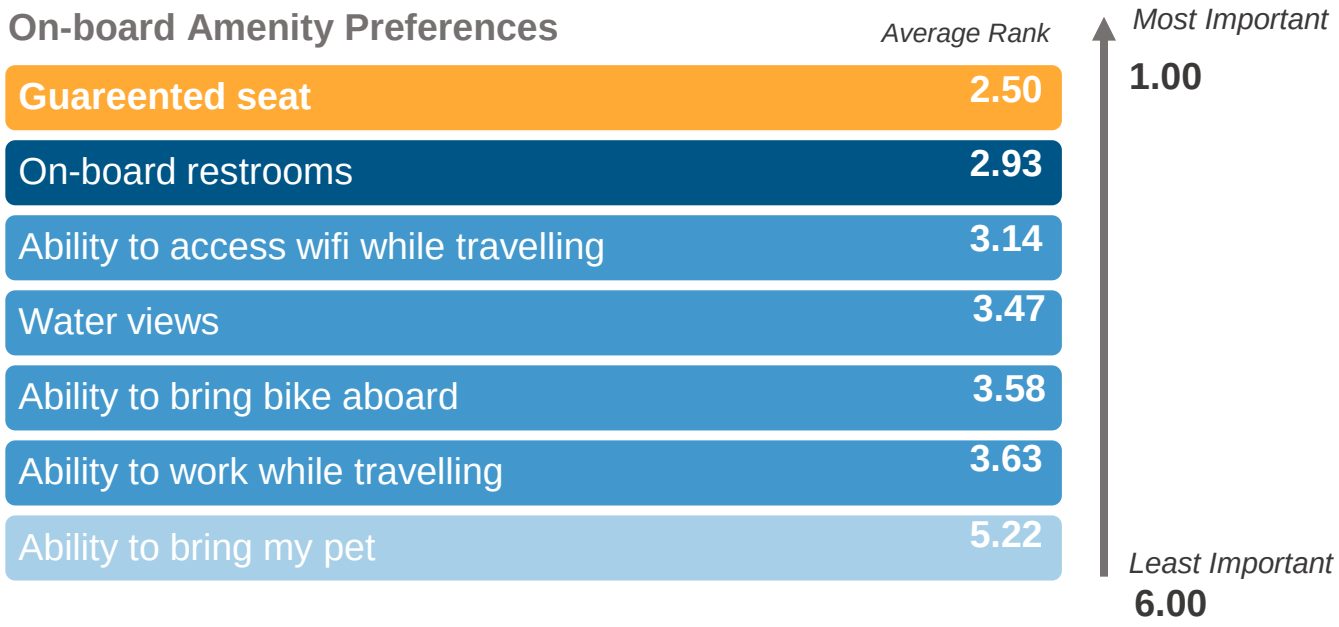


"Getting into downtown on a D [bus] can take an hour or more some days, especially getting to a sporting event or a random Thursday. An alternate route that doesn't get stuck in traffic would be fantastic."

What on-board amenities do respondents care about?

When asked to rank on-board amenities from highest to lowest as their preference, survey respondents ranked a guaranteed seat as the most important amenity. Following a guaranteed seat, on-board restrooms and the ability to access wifi while traveling were also highly ranked by survey respondents. Chart 9 illustrates how on-board amenities were prioritized.

Chart 9: On-Board Amenity Preferences



WHAT ELSE DID WE HEAR FROM SURVEY RESPONDENTS?

Survey respondents were also given the opportunity to provide additional comments or suggestions that were not addressed in the survey. Common themes arose in the comment responses around support for POF service, concerns about connections to Shilshole, additional public funding, potential environmental impacts as well as other desired landings.

General Support of POF & Ballard Service

"I would love to have a reason to head down to the waterfront more often. This would help us enjoy the natural beauty of our city and avoid awful traffic."

"Instead of setting up several one-stop routes, is there an opportunity to connect more of Seattle's neighborhoods using our waterways? It would go a long way towards addressing traffic issues and would be a delightful way for out of towners to see more of our city.

"Get this expansion. We are years behind."

"Public transportation between NW Ballard and downtown is limited. As Ballard continues to change and grow more travel options are needed, especially since we won't get light-rail for many years to come. A walk-on ferry would be an easy and welcomed solution."

Concerns About Connections To Shilshole

“…there is a missing transit link between downtown Ballard and Shilshole that would need to be solved before ferry service was extended to Ballard. “

“This would be cool, but not sure about the marina as the Ballard terminal unless there is frequent and reliable transit from there to "downtown" Ballard.”

Public Funding

“I’d rather you spend this money on bringing light rail about faster or implementing more bus improvements… What about removing RapidRide D from all the traffic by providing 24/7 bus only lanes?”

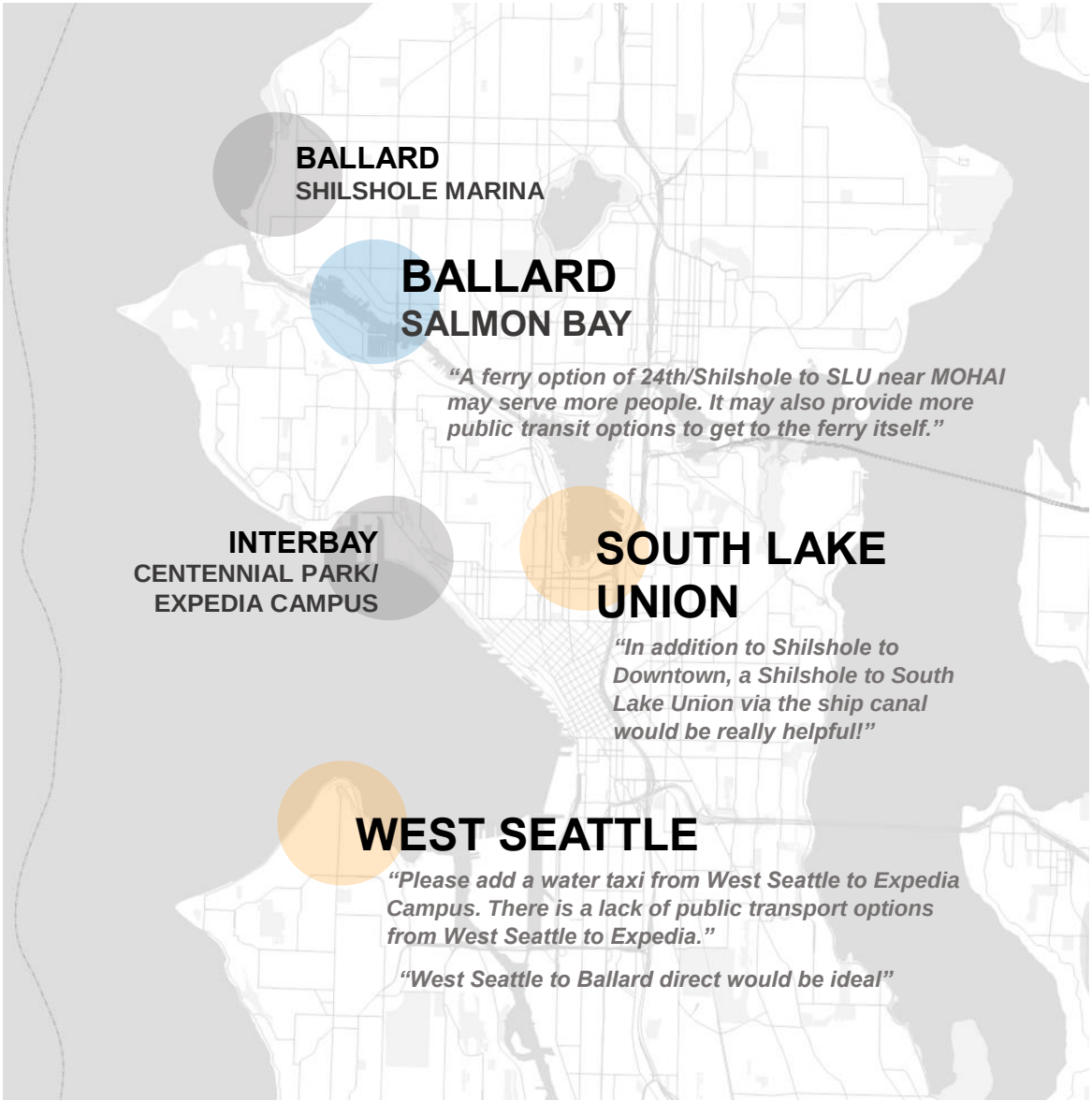
Environmental Impact

“I'm worried about the environmental impact the water taxies can have on our lakes. If it is an electric ferry I'd be happy to use it. “

Other Suggested Landing Sites and POF Services

Numerous additional landing locations and POF routes were suggested. Two popular destinations were South Lake Union and West Seattle. Others suggested a different origin-landing site in Ballard that was closer to Salmon Bay. The summary report addresses potential POF service from the suggested locations. Figure 3 shows some of the many other POF landing sites suggested by survey respondents.

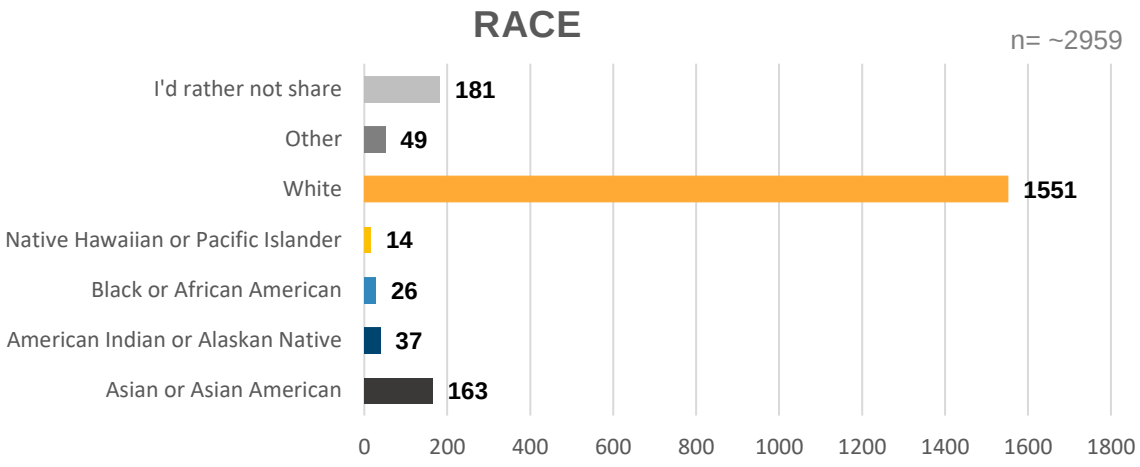
Figure 3: Some Other Suggested POF Landing Sites

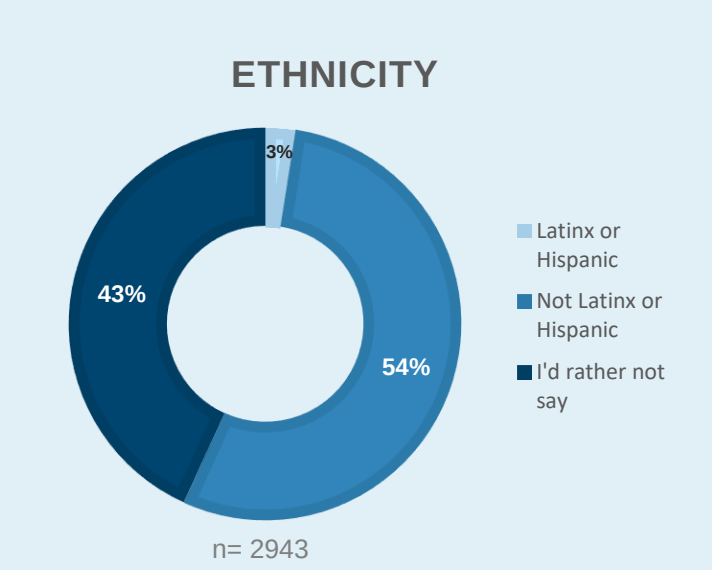


WHO RESPONDED?

Eighty-one percent of survey respondents identified as white, and 85% of respondents identified as not Latinx. Chart 10 illustrates the race and ethnicity survey respondents selected.

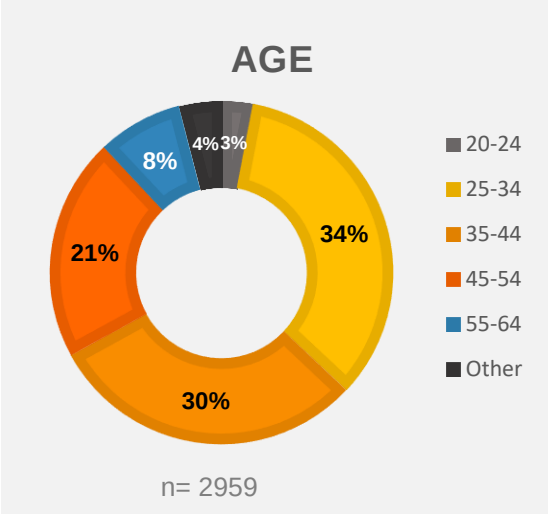
Chart 10: Demographics

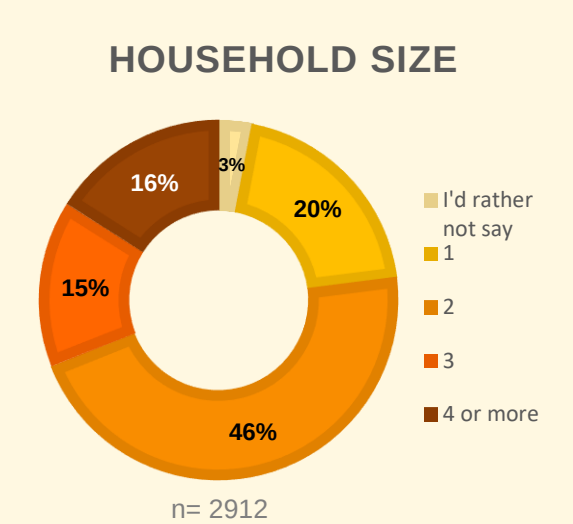




The majority (64%) of survey respondents were between the ages of 25 and 44, which skews young than most Metro surveys. Two thirds of respondents (66%) lived in households with two or fewer people. The average household income for respondents was higher than average Metro surveys with 21% of respondents indicating a household income of $100,000 to $149,000 and an additional 15% in the $150,000 to $199,999 range.

Chart 11: Age & Household Size





Attachment E.1
Survey Questionnaire

Water Taxi Expansion Survey

King County Metro currently operates the King County Water Taxi which provides passenger-only ferry service from downtown Seattle to West Seattle and Vashon Island. Passenger-only ferries are a comfortable way to travel, usually providing a seat for all passengers and allowing them the ability to use travel time to work or relax and enjoy the views. Because ferries are not impacted by roadway traffic, they offer a consistent and reliable travel time.

The King County Council, through a budget proviso, has asked Metro to prepare and transmit a report that outlines a plan for potential future service to the Ballard and Kenmore communities. As part of that report, Metro is looking for feedback on how you currently travel to better understand whether a passenger-only ferry could be an option.

Potential routes being considered:

- Ballard to downtown Seattle and/or the Expedia campus (Interbay)
- Kenmore to Seattle (University of Washington, Madison Park, Leschi Park, or the Portage Bay area)

We are also interested to know if you have any comments or suggestions about potential passenger-only ferry service.

What is your ZIP code?

Which route would you like to provide input on?

- ○ Ballard
- ○ Kenmore

Which day(s) do you travel most often? Select all that apply.

- ☐ Monday
- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday
- ☐ Friday
- ☐ Saturday
- ☐ Sunday

What time(s) do you most often travel? Select all that apply.

- ☐ 5 - 9 a.m.
- ☐ 9 a.m. - 3 p.m.
- ☐ 3 - 7 p.m.
- ☐ 7 p.m. - 12 a.m.
- ☐ 12 - 5 a.m.

Where do you travel to most often (3-5 days per week)?

- ☐ Shoreline/Lynnwood
- ☐ Bitter Lake/Broadview
- ☐ Northgate/Lake City
- ☐ Ballard
- ☐ Fremont/Wallingford/Greenlake
- ☐ U District
- ☐ NE Seattle
- ☐ Magnolia
- ☐ Interbay
- ☐ Queen Anne
- ☐ South Lake Union (SLU)
- ☐ Capitol Hill
- ☐ Montlake/Madison Park
- ☐ Downtown
- ☐ First Hill
- ☐ Central District
- ☐ SODO
- ☐ Beacon Hill
- ☐ Mount Baker/Columbia City/Rainier Valley
- ☐ West Seattle/Harbor Island
- ☐ Georgetown

I get to that destination by (if you use more than one, select the one type used for the longest distance):

- ○ Bus/transit
- ○ Car
- ○ Rideshare (Uber/Lyft)
- ○ Bike
- ○ Walk
- ○ Other

Where are you typically traveling to? Select all that apply.

- ☐ Work
- ☐ School
- ☐ Fun/social/recreation
- ☐ Shopping
- ☐ Other

If there was a passenger-only ferry that provided regular sailings from Ballard's Shilshole Bay Marina to one of the locations below, which destination would you prefer?

- ○ Downtown Seattle Waterfront (an approximately 25-min ferry trip)
- ○ Expedia Campus (an approximately 20-min ferry trip)
- ○ No preference

If a passenger-only ferry that traveled between Ballard's Shilshole Bay Marina and the destination you chose above was available for use, how often would you use it? Select one.

- ○ Regularly (at least 3 days per week)
- ○ Occasionally (at least 3 days per month)
- ○ Once in a while (a few times per year)
- ○ Never

If a passenger-only ferry that traveled between Ballard's Shilshole Bay Marina to the destination you chose above was available for use, how would you get to the ferry dock? Select all that apply.

- ☐ Walk or bike
- ☐ Use transit
- ☐ Rideshare (Uber/Lyft)
- ☐ Get dropped off in a personal car
- ☐ Vanpool
- ☐ Drive myself (if parking is available at the landing site)
- ☐ Drive to a nearby park and ride and take a shuttle to the landing site (if parking is not available at ...

I would take a passenger-only ferry if (select all that apply):

- ☐ My travel time was as fast or faster than my current options
- ☐ My travel time was more consistent than my current options
- ☐ My trip cost the same as or less than my current options
- ☐ I had easy connections to the Ballard ferry terminal
- ☐ I had easy connections to get to my destination
- ☐ Other

Which day(s) do you travel most often? Select all that apply.

- ☐ Monday
- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday
- ☐ Friday
- ☐ Saturday
- ☐ Sunday

What time(s) do you most often travel? Select all that apply.

- ☐ 5 - 9 a.m.
- ☐ 9 a.m. - 3 p.m.
- ☐ 3 - 7 p.m.
- ☐ 7 p.m. - 12 a.m.
- ☐ 12 - 5 a.m.

Where do you travel to most often (3-5 days per week)?

- ☐ Shoreline/Lynnwood/Everett
- ☐ Bothell/Woodinville
- ☐ Kenmore
- ☐ NW Seattle (Ballard/Greenwood)
- ☐ NE Seattle (University District/Northgate)
- ☐ Kirkland Area
- ☐ Redmond
- ☐ Queen Anne/Magnolia
- ☐ South Lake Union
- ☐ Capitol Hill/First Hill
- ☐ Bellevue
- ☐ Downtown Seattle
- ☐ South Seattle
- ☐ Mercer Island
- ☐ Renton/Newcastle

I get to that destination by: (If you use more than one, select the one type used for the longest distance)

- ○ Bus/transit
- ○ Car
- ○ Rideshare (Uber/Lyft)
- ○ Bike
- ○ Walk
- ○ Other

Where are you typically traveling to? Select all that apply.

- ☐ Work
- ☐ School
- ☐ Fun/social/recreation
- ☐ Shopping
- ☐ Other

If there was a passenger-only ferry that provided regular sailings from the Kenmore waterfront to one of the locations below, which destination would you prefer? Select one.

- ○ University of Washington (an approximately 30-min ferry trip)
- ○ Madison Park (an approximately 25-minute ferry trip)
- ○ Leschi Park (an approximately 30-minute ferry trip)
- ○ Portage Bay (an approximately 40-minute ferry trip)
- ○ No preference

If a passenger-only ferry that traveled between the Kenmore waterfront to the destination you chose above was available for use, how would you get to the ferry dock? Select all that apply.

- ☐ Walk or bike
- ☐ Use transit
- ☐ Rideshare (Uber/Lyft)
- ☐ Get dropped off in a personal car
- ☐ Vanpool
- ☐ Drive myself (if parking is available at the landing site)
- ☐ Drive to a nearby park and ride and take a shuttle to the landing site (if parking is not available at ...

If a passenger-only ferry that traveled between the Kenmore waterfront to the destination you chose above was available for use, how often would you use it? Select one.

- ○ Regularly (at least 3 days per week)
- ○ Occasionally (at least 3 days per month)
- ○ Once in a while (a few times per year)
- ○ Never

I would take a passenger-only ferry if (select all that apply):

- ☐ My travel time was as fast or faster than my current options
- ☐ My travel time was more consistent than my current options
- ☐ My trip cost the same as or less than my current options
- ☐ I had easy connections to the Kenmore ferry terminal
- ☐ I had easy connections to get to my destination
- ☐ Other

Please rank the following factors from most to least important when considering on-board amenities:

- ○ A guaranteed seat
- ○ Water views
- ○ On-board restrooms
- ○ Ability to work while travelling
- ○ Ability to access wifi while travelling
- ○ Ability to bring bike aboard
- ○ Ability to bring my pet

Do you have any comments or suggestions related to passenger-only ferry service that were not addressed in this survey?

_____

_____

_____

Demographics

These questions are optional. Information from these questions will be used for analytical purposes. Results will be reported together, and no individual information will be reported.

What is your age?

- ○ 15 or younger
- ○ 16-17
- ○ 18-19
- ○ 20-24
- ○ 25-34
- ○ 35-44
- ○ 45-54
- ○ 55-64
- ○ 65-74
- ○ 75 or older
- ○ I'd rather not share

Do you identify as Latinx or of Hispanic or Latino origin?

- ○ Yes
- ○ No
- ○ I'd rather not say

How do you identify? Select all that apply.

- ☐ American Indian or Alaska Native
- ☐ Asian or Asian American
- ☐ Black or African American
- ☐ Native Hawaiian or Pacific Islander
- ☐ White
- ☐ Another not listed here (please specify):
- ☐ I'd rather not share

What is your annual household income?

- ○ Less than $7,500
- ○ $7,500 to $34,999
- ○ $35,000 to $49,999
- ○ $50,000 to $74,999
- ○ $75,000 to $99,999
- ○ $100,000 to $149,999
- ○ $150,000 to $199,999
- ○ $200,000 to $250,000
- ○ More than $250,000
- ○ I don't know
- ○ I'd rather not share

What is the primary language you speak at home?

- ○ English
- ○ American Sign Language
- ○ Amharic
- ○ Arabic
- ○ Korean
- ○ Russian
- ○ Somali
- ○ Spanish
- ○ Chinese (Mandarin, Cantonese, etc.)
- ○ Oromo
- ○ Tagalog
- ○ Tigrinya
- ○ Ukrainian
- ○ Vietnamese
- ○ French
- ○ Punjabi
- ○ Other language or language(s) not listed here.
- ○ I'd rather not say

If you have a disability, please indicate what kind (check all that apply):

- ☐ A condition that substantially limits one or more basic physical activities such as walking, climbing ...
- ☐ Blindness or have serious difficulty seeing when wearing glasses
- ☐ Deafness or have a serious hearing difficulty
- ☐ Limited ability to care for yourself
- ☐ Physical, mental, or emotional condition that limits learning, remembering, or concentrating
- ☐ None of these
- ☐ I'd rather not say

How many people, including yourself, live in your household?

- ○ 1
- ○ 2
- ○ 3
- ○ 4 or more
- ○ I'd rather not say

Thank you for participating in this public outreach survey. The results will be compiled and summarized into the report that is expected to be transmitted to the King County Council mid-2020.

Learn more about King County Water Taxi (https://www.kingcounty.gov/depts/transportation/water-taxi.aspx).

Name

_____

Email

_____

Address

_____

APPENDIX F: EQUITY IMPACT REVIEW FOR BALLARD PASSENGER-ONLY FERRY ROUTE

BALLARD PROVISO EQUITY IMPACT REVIEW

King County adopted a Strategic Plan for Equity and Social Justice to advance equity and social justice in our community. As new programs or projects are planned, it is expected that an Equity Impact Review (EIR) is conducted as part of the planning, development and implementation processes. This EIR process merges quantitative data and community engagement qualitative findings to inform planning, decision-making and implementation of actions which affect equity in King County.

The EIR process has five phases. Phase 1 is defining the scope or identifying who will be affected by the program. Phase 2 is assessing equity and community context. Phase 3 is analyzing and decision process development. Phase 4 is implementation with a focus on staying connected with communities and employees. Phase 5 is ongoing learning, with listening, adjusting and co-learning with communities and employees.

This section of the Ballard Proviso report will focus on the first three phases of the EIR as it relates to the Ballard to Seattle passenger-only ferry (POF) route.

PHASE 1

WHO IS IMPACTED?

King County is striving to invest in areas of greatest need. Areas of need have been identified through the King County Equity score (1-5) assigned to each Census Tract that measures populations of color and low-income populations, and populations with limited English proficiency. Higher scores represent a more diverse, less wealthy population. These are considered priority populations for King County and are consistent with work done as part of Metro's Mobility Framework.

The proposed Ballard to Downtown route options include landing sites at the Pier 50 Terminal (currently serving the West Seattle and Vashon Island routes as well as Kitsap Fast Ferries) in downtown; as well as the Expedia campus in the Interbay community and Shilshole Marina in Ballard. Metro conducted analysis to consider factors such as Community Assets, Family Wage Jobs, Housing Units, total equity scores, as well as percentages of low-income, people of color, and people with limited English proficiency within a one-mile walk shed of the proposed landing sites.

This is a snapshot of the existing conditions for the area surrounding the proposed landing sites and should is used to capture information about jobs, assets, and people that have potential to be served by new service. For comparison, King County is 21.7% low-income, 39% minority, and 10.6% limited English proficiency residents. The community asset database shows the spatial locations of critical community resources including medical facilities, libraries, churches, schools and community centers.

Table 1: Landing Site Assets and Opportunities

Name	Community Assets	Family Wage Jobs	Housing Units
Pier 50	80	116,222	25,911
Shilshole	1	297	1,417
Expedia	4	2,408	1,749

Community Assets: number of community assets within a 1-mile walk buffer of each dock location (SPKC)

Family Wage Jobs: number of family wage jobs within a 1-mile walk buffer of each dock location (LEHD)

Housing Units: number of housing units within a 1-mile walk buffer of each dock location (KC Assessor)

Table 2: Landing Site Demographics and Equity Scores

Name	KC Equity Score	Total Population	Percent Low-Income	Percent POC	Percent LEP	Number of Tracts	Number of LI Tracts	Number of Minority Tracts	Number of LEP Tracts
Pier 50	3.2	68,761	31.00%	43.00%	11.00%	14	10	8	4
Shilshole	1.66	14,961	13.00%	15.00%	1.00%	2	0	0	0
Expedia	1.8	29,032	15.00%	28.00%	3.00%	5	0	1	0

KC Equity Score: average of scores for all census tracts that intersect the one-mile walk buffer around each option. (KC)

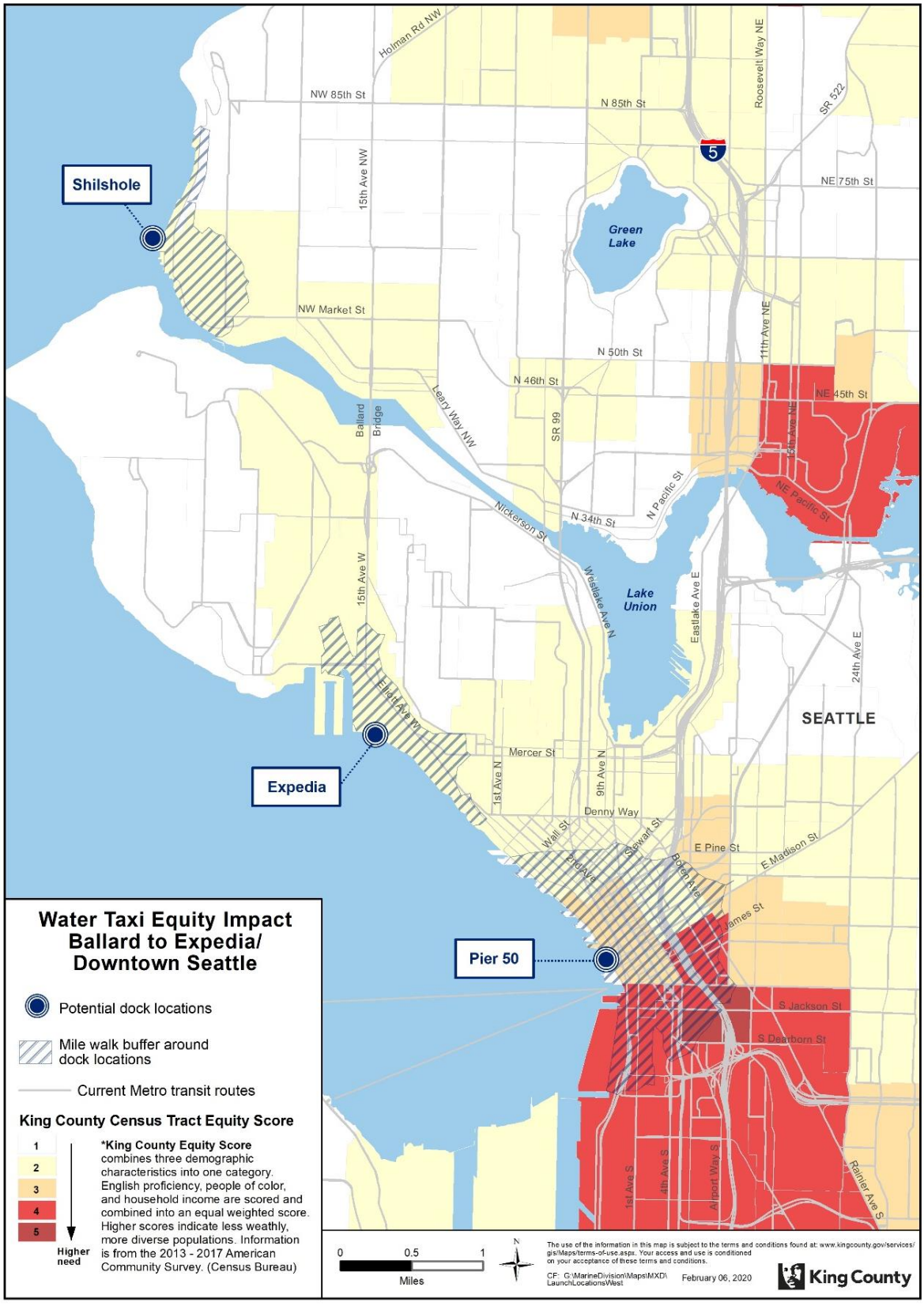
Total Population: total population of all census tracts that intersect the one-mile walk buffer around each option. (KC)

Percent Low-Income: combined percent of low-income populations for all census tracts that intersect the one-mile walk buffer around each option. (KC)

Percent POC) combined percent of persons of color for all census tracts that intersect the one-mile walk buffer around each option. (KC)

Percent LEP: combined percent of limited English proficiency speakers (5 and older) for all census tracts that intersect the one-mile walk buffer around each option. (KC)

Figure 1: Equity Impact Review for Potential Ballard Passenger-Only Ferry Route



WHAT WOULD THE IMPACT BE (INCLUDING EFFECTS, IMPACTS, OUTCOMES ON PEOPLE AND PLACES)?

This section summarizes the social equity impacts of new passenger-only ferry service between Ballard Shilshole Bay Marina and downtown Seattle for the people and places affected. For this evaluation, social equity impacts are considered changes from the proposed project that make disadvantaged populations better or worse off relative to current conditions. The main impacts considered in this section include:

- Impacts to ferry riders, such as trip travel time and reliability, trip cost, and amenity value.
- Impacts on communities near the landing sites through changes in access and/or capacity to a location or the desirability of a location.

The impacts for Ballard are partly dependent on whether an additional stop at the Expedia Campus is added to the route, which provides access to more jobs but increases travel time. The proposed downtown Seattle landing site is Pier 50 where the West Seattle route already docks. Thus, the impacts for the downtown Seattle landing site is likely minimal. The impacts summarized below are based on KPFF's Task 1.1. Capital and Operating Program memorandum and BERK Consulting's January 2020 memorandum on Potential Ridership Demand for Proposed Ballard to Downtown Seattle Passenger-only Service.

Impacts to Riders

Based on the proposed service profile, additional POF service between Ballard and downtown Seattle would be used for both commute trips year-round as well as leisure/recreational trips in the warmer months. There is no special event service planned. The ridership demand study projected average weekday ridership (Monday through Thursday) of about 825-850 by 2025.[1]

Impacts would generally be positive for commuters and recreational riders that choose to use POF service over other options. Travel time and costs are higher compared to other transit options. However, it is assumed riders that choose POF service do so because the specific benefit to them is greater than other options available. Riders would still have the same existing transit option and would not be any worse off as a result of adding a new POF service. Thus, the impact on riders from disadvantaged populations would most likely positive to neutral as well. A summary of the four types of impacts that may affect riders includes:

- **Trip Travel-time.** Travel times from downtown Seattle to Ballard directly via Shilshole Bay Marina would be longer than other transit options during the PM commute period (5:00 pm). Travel times from First Hill to Ballard would be similar to other transit options. Travel time would be 12 minutes longer if an additional stop was added at the Expedia Campus. Compared to driving, travel times directly from downtown Seattle to Ballard would typically be over 20 minutes more except for periods of heavy traffic congestion when travel time would be similar.

[1] For both the Shilshole to Pier 50 and Shilshole to Expedia Campus to Pier 50 route options. Annual ridership would be approximately 176,000-192,000. For comparison, in 2019, the West Seattle route had 443,993 boardings and the Vashon Island route had 257,615 boardings.

- **Trip Reliability.** POF service would provide reliable travel times because it is not affected by local traffic conditions. Reliability would be particularly valuable during times of high traffic congestion where POF travel times would be similar to driving and other transit options.
- **Trip Cost.** Fares for a POF trip ($5.50) would be higher than for a comparable bus trip ($2.75). Trip costs would likely be substantially lower than driving based on parking costs in downtown Seattle alone. The additional costs for gasoline and mileage would make car trips even more costly.
- **Trip Amenity Value.** POF service offers more amenities, such as restrooms, a seat for every passenger, and space to get up and take in the views, than other modes traveling between Ballard and downtown Seattle. Similar to the West Seattle route, the amenity value alone may induce new ridership, particularly for discretionary and recreational trips, on weekends.

Impacts on Community

Impacts (positive or negative) to the broader community near Shilshole Bay Marina and Pier 50 in downtown Seattle would likely be minimal. The Shilshole and Expedia Campus landing sites would have some uplands work to accommodate POF service, but there would be no direct impacts on housing or businesses at any of the potential landing sites. As a result, the impacts on disadvantaged populations in those areas would also be minimal. Impacts on the nearby community include:

- **Access.** The addition of POF service between Shilshole and downtown Seattle would improve access for those living, working or visiting near Shilshole Marina. The nearest bus route (route 17, which travels along 32nd Avenue NW and travels to downtown Seattle) is over 0.5 miles away. The addition of a stop at the Expedia Campus would not improve access for the site. The site is currently serviced by several bus routes that run along 15th Avenue W, including the RapidRide D line.
- **Capacity.** The addition of POF trips between Shilshole and downtown Seattle would increase overall transit capacity. Projected average weekday ridership between Shilshole and Pier 50 could be over 850 passengers. The maximum capacity on weekdays with one boat in service providing 12 daily roundtrips would be 900 passengers.[2] Route 17 does have minor crowding issues (instances of over 20-minutes standing load in the AM peak in spring 2019). Thus, additional transit capacity during this period may help relieve crowding.
- **Desirability.** For the Shilshole landing site, proximity to POF service to downtown Seattle may increase the desirability of some nearby properties, even as an amenity. For the Shilshole landing site, Golden Gardens Park is a mile away and there are a couple of restaurants near the landing site, similar to West Seattle. However, given the limited span of service and longer travel times, the service is unlikely to incentivize land use changes.

[2] This range assumes one boat operating on the route with three sailings about every hour in the commute period.

PHASE 2

EQUITY & COMMUNITY CONTEXT

This engagement effort included an online survey taken by approximately 4,500 respondents. The survey included questions regarding existing travel patterns, dock location preferences, as well as factors that might increase their willingness to shift modes. The demographic patterns of the respondents are below:

- 34% percent of respondents were between the ages of 25 and 34 and an additional 305 responded that they were between the ages of 35 and 44 (this skews younger than most of Metro surveys)
- 81% responded that they identified as white. The second highest selection was “I’d rather not share” at 9%
- 21% selected $100,000 to $149,000 and an additional 15% selected $150,000 to $199,999 (Annual household income was higher than average surveys.)
- Almost all households spoke English as their primary language (95%)
- 90% indicated they did not have a disability
- 46% of respondents lived in a 2-person household and an additional 20% were single occupancy households

Survey results found that that most people who responded were in favor of Water Taxi service in their community.

For fare payment, Water Taxi accepts ORCA card use and as such can help facilitate mobility for ORCA LIFT users as well as seniors, students, and holders of Regional Reduced Fare Permits (RRFP). ORCA users can also transfer between different transit providers including the Water Taxi, buses, and Link light rail.

As part of King County’s focus on equity and social justice and the Mobility Framework, Metro is focused on expanding service where needs are greatest while continuing to meet mobility needs throughout the County. The POF service would provide benefit and added amenity, but in general these areas have low equity scores. Therefore, the Ballard-Downtown service would provide benefit in areas where the population is less diverse and wealthier than county averages.

PHASE 3

DECISION PROCESS

Determining resource allocation and actual impacts are subject to funding constraints and budget decisions made by King County Council. King County Metro has identified Equity as a top priority in current and future budget developments. Future Water Taxi routes will need to find an opportunity to serve populations above and beyond those who traditionally have easy access to waterfront amenities. One way to do this is to ensure that Water Taxi service coupled with, land-side service connection is time and cost competitive for all potential users and by offering both traditional peak commuting service as well as off-peak service.

This proviso response is intended to provide updated planning and implementation information to King County Council. The EIR is an integral part of the proviso response. Water Taxi service growth will need to be reviewed and planned as part of Metro's overall long-term transportation planning. A further Equity Impact Review would need to be completed in the event funding for new Water Taxi Service is identified. As part of the Mobility Framework adoption, King County Metro has identified a need to invest in service that will positively impact priority populations in order to address deep and persistent inequities–especially by race and place–that in many cases are getting worse and threaten our collective prosperity.

APPENDIX G:
BALLARD POF IMPLEMENTATION PLAN

Shilshole to Pier 50 Route Implementation Plan

ROM Estimates

	2020												2021				2022				2023				2024				2025				Total $
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
PARTNERHIPS																																	
Key Stakeholders																																	
US Coast Guard Meetings																																	
Elk's Lodge Meetings																																	
Lease Agreements																																	
Port of Seattle Outreach Meetings																																	
Formal Negotiations w/ Port of Seattle																																	
Public Outreach Process																																	
Develop Public Outreach Strategy																																	
Develop Outreach Information																																	
Community Outreach including workshops																																	
FUNDING																																	
King County Budget Process																																	
2021/2022 Budget					KCMD Budget Due						Approval																							
2023/2024 Budget																				Approval													
2025/2026 Budget																											Approval					Approval	
Earned Share Grant Allocation Due																																	
Discretionary Grant Funding Process																																	
Federal Ferry Boat Funds (Yearly)																																	
Surface Transportation Block Grants																																	
PSRC Grants - FHWA & FTA																																	
CAPITAL PROJECT DEVELOPMENT																																	
REGULATORY PROCESS AND APPROVALS																																	
Tribal Coordination																																	
Supporting Environmental Studies														$ 150,000																			**$ 150,000**
NEPA/SEPA Compliance													$ 525,000																				**$ 525,000**
Federal/State/Local																$ 75,000																	**$ 75,000**
US Army Corps of Engineers (NMFS/USFW)																																	$ -
DNR																																	$ -
WDFW																																	**$ -**
Shoreline Permits																																	$ -
Construction Permits																																	$ -
Subtotal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 525,000	$ 150,000	$ -	$ 75,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 750,000**
DESIGN AND CONSTRUCTION																																	
KCMD Staff Time													$ 300,000				$ 300,000				$ 300,000				$ 300,000								**$ 1,200,000**
Terminals																																	**$ 5,550,000**
Preliminary Design													$ 90,000																				$ 90,000
Design																	$ 315,000																$ 315,000
Procurement																							$ 45,000										$ 45,000
Terminal Construction																								$ 5,100,000									$ 5,100,000
Vessels																																	**$ 15,400,000**
Vessel Procurement																							$ 770,000										$ 770,000
Vessel Construction																										$ 7,315,000							$ 7,315,000
Vessel Delivery																														$ 7,315,000			$ 7,315,000
Subtotal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 390,000	$ -	$ -	$ -	$ 615,000	$ -	$ -	$ -	$ 300,000	$ -	$ 815,000	$ 5,100,000	$ 300,000	$ 7,315,000	$ -	$ -	$ -	$ 7,315,000	$ -	$ -	**$ 22,150,000**
OPERATIONS																																	
SERVICE STARTS																																	$ -
Vessel Leasing																										$ 1,133,600							$ 1,133,600
Subtotal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 390,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,133,600	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Expenditures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 915,000	$ 150,000	$ -	$ 75,000	$ 615,000	$ -	$ -	$ -	$ 300,000	$ -	$ 815,000	$ 5,100,000	$ 300,000	$ 7,315,000	$ 1,133,600	$ -	$ -	$ 7,315,000	$ -	$ -	**$ 24,033,600**
															2021 Total $ 1,140,000																		
																			2022 Total $ 615,000															
																							2023 Total $ 6,215,000										
																											2024 Total $ 8,748,600						
																																	2024 Total $ 7,315,000	
In-Water Work Allowed (Fish Window)															7/15 to 2/15																		
																			7/15 to 2/15														
																							7/15 to 2/15										
																											7/15 to 2/15						

**All costs in 2019 dollars

Shilshole to Pier 50 Route Implementation Plan

ROM Estimates

	2024				2025				2026				2027				Total $
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
PARTNERHIPS																	
Key Stakeholder Check-ins																	
Port of Seattle Meetings																	
Expedia Meetings																	
Elk's Lodge Meetings																	
Passenger Feedback Process																	
Surveys																	
Public Outreach Process																	
Community Outreach Check-ins																	
Subtotal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
FUNDING																	
King County Budget Process																	
2025/2026 Budget				Approval													
2027/2028 Budget												Approval					
Earned Share Grant Allocation Due																	
Bond Issuance																	
Discretionary Grant Funding Process																	
Federal Ferry Boat Funds (Yearly)																	
Surface Transportation Block Grants																	
PSRC Grants - FHWA & FTA																	
Funding Received	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
OPERATOR COSTS																	
SERVICE BEGINS			✦														$ -
VESSEL OPS																	
Labor			**$ 483,000**		**$ 994,899**				**$ 1,024,746**				**$ 1,055,488**				**$ 3,558,094**
Direct Labor			$ 280,606		$ 578,048				$ 595,390				$ 613,251				$ 2,067,296
Overhead			$ 202,355		$ 416,851				$ 429,356				$ 442,237				$ 1,490,798
Fuel			**$ 366,412**		**$ 754,809**				**$ 777,453**				**$ 800,776**				**$ 2,699,450**
Maintenance			**$ 254,542**		**$ 524,356**				**$ 540,087**				**$ 556,290**				**$ 1,875,275**
Labor			$ 91,738		$ 188,981				$ 194,651				$ 200,490				$ 675,860
Overhead			$ 69,014		$ 142,170				$ 146,435				$ 150,828				$ 508,447
Routine			$ 36,492		$ 75,173				$ 77,428				$ 79,751				$ 268,843
Annual			$ 48,771		$ 100,468				$ 103,483				$ 106,587				$ 359,309
Unplanned			$ 8,526		$ 17,564				$ 18,091				$ 18,634				$ 62,815
Admin/Insurance			$ 133,333		$ 274,667				$ 282,907				$ 291,394				$ 982,301
SHUTTLE																	
Shuttle Operations			$ 337,064		$ 694,352				$ 715,182				$ 736,638				$ 2,483,236
TERMINAL OPS																	
Labor			$ -		$ -				$ -				$ -				$ -
Routine Terminal Maintenance			$ 1,581		$ 3,256				$ 3,354				$ 3,454				$ 11,644
Terminal Lease			$ 18,000		$ 37,080				$ 38,192				$ 39,338				$ 132,611
Fare Collection			$ 6,000		$ 12,360				$ 12,731				$ 13,113				$ 44,204
ADMINISTRATION / SUPPORT																	
Management/Admin/Support Labor/Misc			$ 97,000		$ 199,820				$ 205,815				$ 211,989				$ 714,624
Admin/Insurance/Overhead			$ 305,441		$ 629,208				$ 648,084				$ 667,526				$ 2,250,259
Subtotal	$ -	$ -	$ 2,002,333	$ -	$ 4,124,806	$ -	$ -	$ -	$ 4,248,550	$ -	$ -	$ -	$ 4,376,007	$ -	$ -	$ -	**$ 14,751,695**
Debt Service	$ 863,545				$ 863,545				$ 863,545				$ 863,545				$ 3,454,181
			2024 Total	***$ 2,865,878***			***2025 Total***	***$ 4,988,351***			***2026 Total***	***$ 5,112,095***			***2027 Total***	***$ 5,239,552***	