

December 18, 2024

The Honorable Marko Liias  
Senate Transportation Committee Chair  
PO Box 40421  
Olympia, WA 98504

The Honorable Jake Fey  
House Transportation Committee Chair  
PO Box 40600  
Olympia, WA 98504

The Honorable Curtis King  
Senate Transportation Committee Ranking  
Minority Member  
PO Box 40414  
Olympia, WA 98504

The Honorable Andrew Barkis  
House Transportation Committee Ranking  
Minority Member  
PO Box 40600  
Olympia, WA 98504

Subject: Cost Savings Report for Portage Bay Bridge and Roanoke Lid Project

Dear House and Senate Transportation Committee Leadership,

This report summarizes the cost reduction opportunities analyzed by the Washington State Department of Transportation as directed by proviso ESHB 2134 Sec. 304. (21) (a) in the 2024 supplemental transportation budget. The proviso directs WSDOT to “seek consequential cost reduction opportunities through value engineering and prioritizing functionality and usability of the Portage Bay Bridge and Roanoke Lid.”

### **SR 520 Program overview**

The SR 520 Bridge Replacement and HOV Program represents one of the largest transportation infrastructure projects in the Puget Sound region. The 12.8-mile-long SR 520 corridor extends from SR 202 in Redmond to I-5 in Seattle. It provides a vital social and commercial transportation link between Seattle and the growing, economically vibrant cities on the east side of Lake Washington.

[The Portage Bay Bridge and Roanoke Lid Project](#) is the last major project in the SR 520 corridor, completing SR 520’s east-to-west reconstruction from I-405 to I-5. Like other 1960s-era bridges, the Portage Bay Bridge was built with hollow concrete columns that could collapse in a severe earthquake. This project will replace the old, structurally vulnerable Portage Bay Bridge with two parallel, seismically resilient bridges. The project will also build a landscaped lid over SR 520 between 10th Avenue East and Delmar Drive East, complete the highway’s transit/HOV system between the Eastside and Seattle, and extend the regional SR 520 Trail across Portage Bay to the lid and local trails.

### **Portage Bay Bridge and Roanoke Lid Project proposal price and cost drivers**

On September 13, 2023, WSDOT opened bids from the two teams that submitted proposals for the Portage Bay Bridge and Roanoke Lid Project. Skanska’s proposal had the Apparent Best Value at \$1.375 billion, which exceeded the engineer’s estimate by about 70%. This cost discrepancy reflected the challenging trends in the contractor bidding environment in the region and across the nation, primarily related to:

- The four-month King County concrete strike in early 2022, which delayed the SR 520's Montlake Project and I-5 Express Lanes Project and depleted our program's risk reserve;
- Rising inflation, which significantly exceeded forecasted costs;
- Highly saturated market conditions, supply chain issues, and workforce shortages, which sapped competition and increased expenses.

The Program needed an additional \$728 million authorized in the 2024 session to build and complete the Portage Bay Bridge and Roanoke Lid Project without causing further schedule delays.

### **Overview of cost-reduction analysis during the proposal phase**

The team analyzed five options for moving forward with the project. Key considerations beyond cost and schedule included safety, legal risks, mobility, constructability, compliance with regulations and negotiated agreements, community impacts and staffing.

- **Option 1:** Extend Skanska's proposal validity (set to expire on Nov. 12, 2023) until the end of 2024 legislative session. This gave decision-makers time to identify ways to address the funding gap. This option cost \$1.766 billion.
- **Option 2:** Deliver the project in two separate contracts. This option required rejecting the bids and restarting the procurement process. WSDOT would build the north and south bridges first followed by construction of the lid. This option extended the project completion by seven years and added approximately \$1 billion to the budget for a total cost of \$2.839 billion.
- **Option 3:** Deliver the project in two separate contracts. This option required rejecting the bids and restarting the procurement process. WSDOT would build the north bridge first followed by the south bridge and lid. This option extended the project completion by seven years and required adding approximately \$1.5 billion to the budget for a total cost of \$3.275 billion.
- **Option 4:** Deliver the project in two separate contracts. This option required rejecting the bids and restarting the procurement process. WSDOT would build only the north bridge. The remainder of the project would be paused and reconsidered by decision-makers at a later time. This option kept a seismically vulnerable bridge in place and posed undetermined environmental mitigation costs. The total cost to build the north bridge alone was \$1.5 billion, plus additional undetermined mitigation costs.
- **Option 5:** Reject the bids and cancel procurement. This option cost \$42 million to shut down the program. It kept the seismically vulnerable Portage Bay bridge in place (as well as other seismically vulnerable structures) and carried undetermined costs and legal risks.

In December 2023, with the support of the Governor's Office and transportation leadership in the Legislature, WSDOT negotiated with Skanska to extend its proposal validity through the end of the 2024 legislative session (option 1). The extension provided more time to address the funding.

### **Overview of cost-reduction measures during proposal validity extension**

Extending the proposal validity added approximately \$40 million to account for inflation and risks associated with the Skanska team holding its price proposal beyond November 2023. WSDOT identified and implemented the following four cost-saving measures to offset the additional \$40 million and maintain the original proposal price.

- Expanded the in-water vibratory work window from eight months to year-round. WSDOT worked with state and federal regulatory agencies during the negotiations to get this allowance.
- Performed additional on-land and in-water exploratory borings to inform project design and construction planning in advance. These borings would have been otherwise drilled by the design-build contractor which would have delayed the project schedule and added cost.
- Shifted potential cost increases (with an upper-end cap) for certain elements – such as labor, materials, and storage – from the contractor to the state.
- Transferred potential cost-saving Alternative Technical Concepts identified in the Kiewit Stacy Witback JV proposal to Skanska for implementation.

The March 2024 final supplemental transportation budget proviso directed us to move forward with awarding the project’s contract and “seek consequential cost reduction opportunities through value engineering and prioritizing functionality and usability of the Portage Bay Bridge and Roanoke Lid.”

### **Overview of cost-reduction analysis following project award**

WSDOT awarded the project in March 2024 and began implementing the legislative proviso to identify potential cost-reduction opportunities.

#### Practical design workshop

WSDOT and our Portage Bay Bridge and Roanoke Lid Project contractor, Skanska, participated in a two-day practical design workshop in April 2024. The workshop involved reviewing and developing a list of potential opportunities to reduce the project’s design costs while maintaining function and use. We evaluated cost reduction opportunities based on the following factors:

#### *Categories of opportunities:*

- Bridge & structures
- Maintenance of traffic
- Mechanical
- Architecture, landscape and urban design
- Environmental
- Pavement

#### *Criteria for which opportunities were evaluated:*

- Functionality and usability
- Estimated cost savings
- Estimated schedule impacts
- Community impacts
- Coordination and commitment made to the Seattle Design Commission
- Coordination and approval with the Seattle Department of Transportation
- Coordination and approval from the Washington State Legislature
- Regulatory compliance and permitting modification
- Risk to the project or public

*Additional considerations:*

- **Legal obligations:** The SR 520 Program is legally obligated to fulfill the Portage Bay Bridge and Roanoke Lid Project's stated purpose and need: replacing a seismically vulnerable bridge with a seismically resilient structure with added HOV/transit capacity. Project elements included in the Final Environmental Impact Statement cannot be removed without undergoing a National Environmental Policy Act reevaluation and/or permitting modifications. These additional NEPA processes would delay the project schedule, ultimately adding more time and money.
- **Public commitments:** Many of the project features resulted from years of public involvement and engagement. While technically feasible, breaking commitments and removing scope elements would significantly differ from the expectations set and negotiated with the community and partner agencies.

Cost reduction opportunities

The below chart summarizes the cost reduction opportunities analyzed by the SR 520 team. Cost reduction opportunities are split into four categories:

- **Implement:** Measures we analyzed and decided to implement.
- **Under negotiation:** Measures under negotiation with our contractor.
- **Defer to design:** Measures we identified for potential cost savings that require additional analysis once the project design has advanced to a later stage.
- **Closed:** Measures we analyzed and decided not to pursue.

It is important to note that additional potential cost savings could be identified and implemented as the project design advances. We are continuing to explore cost-saving opportunities at every step of the design process as well as across other SR 520 projects. This includes some cost savings gained on the SR 520/I-5 HOV Express Lanes Project by eliminating temporary construction elements that would interface with the Portage Bay Project. Moreover, savings could be gained during construction by coordinating closures used by other transportation projects in the area, such as the I-5 Yesler Project. This would reduce both cost and schedule risks.

**Portage Bay Bridge and Roanoke Lid Project cost-savings analysis chart**

Cost reduction opportunity	Category	Background	Est. cost savings	Rationale
<b>Cost reduction measure: Implement</b>				
Change the bridge stormwater pipe material from steel to fiber-reinforced pipe.	Mechanical	Fiber-reinforced pipe is cheaper than steel. It is also lighter and easier to install. The fiber-reinforced pipe was recently authorized for use by the bridge maintenance office in 2024.	\$2.1M	Savings are generated from the reduced costs in materials and labor.
<b>Total savings: \$2.1M</b>				
<b>Cost reduction measure: Under negotiation</b>				
Reduce the size of retaining wall along northbound I-5 to eastbound SR 520 off-ramp.	Bridge and structures	Designers would slightly move the off-ramp's alignment to allow the wall to be reduced in size and length.	\$1-2M	Savings would be generated by simplifying construction and decreasing labor and materials costs.
<b>Total potential savings: \$1-2M</b>				
<b>Cost reduction measure: Defer to design</b>				
Extend the allowable long-term closure limit for the eastbound off-ramp to Montlake.	Maintenance of traffic	Extending the closure limit would allow for efficiencies in construction staging and maintenance of traffic.	Cost savings to be determined as the design process advances	Savings would be generated from reduced construction staging, nighttime closures and traffic changes.
<b>Total potential savings: To be determined as the design process advances</b>				
<b>Cost reduction measure: Closed</b>				
Remove the proposed Harvard Avenue shared-use path.	Bridge & structures	The Harvard shared-use path is a 670-foot-long path, with a 5% grade, that would extend from the future Roanoke lid to Harvard Avenue East.	~ \$10 -\$15M	Following discussions and feedback from legislators, Skanska, project partners and community advocates, we decided to forgo this cost-reduction measure.  <i>*More information included in Appendix I</i>

Cost reduction opportunity	Category	Background	Est. cost savings	Rationale
Implement a longer-term closure of the eastbound off-ramp to Montlake to eliminate the need to build a temporary off-ramp.	Maintenance of traffic	Instead of closing the existing off-ramp and building a new temporary off-ramp, we would close this off-ramp to traffic for approximately one year.	Undetermined	We removed this option from consideration because the negative effects on traffic from closing an off-ramp for a year outweighed the potential savings of not building a temporary off-ramp.
Replace the existing, vulnerable retaining wall along Boyer Ave East by grading back the slope instead of replacing with a new wall.	Bridge & structures	The current retaining wall is old. Removing the wall and grading back the slope would be cheaper than replacing it with a new one.	~ \$400K	We removed this option from consideration because we need a wall in that location to stabilize the hillside from potential landslides. Eliminating the wall and replacing it with a graded slope would not provide enough stability for the hillside. The current wall is old and vulnerable and must be replaced with a new wall.
Substitute mirrors on Bill Dawson Trail wall with an alternative, cheaper solution to maintain function.	Architecture, landscape and urban design	Mirrors under the bridge on the Bill Dawson Trail will increase natural light and visibility. However these are not typically installed on trails and enhance the function of the trail.	~ \$300K	We removed this option from consideration because it would require significant coordination with the Seattle Design Commission and other stakeholders. There was no cost benefit when we accounted for the time needed for coordination and approval.
Substitute finish type for new landscape retaining walls.	Architecture, landscape and urban design	Form liner is a high-quality finish and is more expensive and difficult to install. Changing the material to a standard finish would potentially save costs.	~ \$150K	We removed this option from consideration because it would require significant coordination with the Seattle Design Commission and other stakeholders. There was no cost benefit when we accounted for the time needed for coordination and approval.

Cost reduction opportunity	Category	Background	Est. cost savings	Rationale
Change the method to install a concrete median barrier on the bridge deck for two-way traffic when westbound and eastbound traffic are temporarily shifted to the new north bridge.	Maintenance of traffic	The contractor proposed a different fastening system than asphalt embedment to anchor and install a temporary median concrete barrier on the Portage Bay Bridge North, however, there are no cost savings.	\$0	We removed this option from consideration because the asphalt embedment method did not meet the contract's technical requirements and posed a safety risk.
Evaluate a potential 30-day lane closure of a northbound I-5 lane and Express lanes to construct the I-5 Trail Crossing.	Maintenance of traffic	A longer-term closure would potentially eliminate the need for costly nighttime closures.	~\$1M	We removed this option from consideration because Skanska can build the crossing within the allowable contract closure limits. The effects on traffic are not worth the nominal savings.
Eliminate the I-5 trail crossing's enhanced landscaping and narrow the crossing's path.	Bridge & structures	The current design includes an enhanced landscaped crossing along the new I-5 trail crossing to provide a visual and physical buffer from I-5.	~ \$3M	We removed this option from consideration because eliminating the planters would change the aesthetic of this bicycle and pedestrian improvement, which was a commitment made to SDOT and the community during the design process. The design team was unable to develop a design that provided the same level of function as the landscaping.
Switch to prestressed girders instead of a cast-in-place bridge on the east end of Portage Bay and the eastbound part of SR 520 and the eastbound SR 520 off-ramp to Montlake.	Using prestressed girders would eliminate the need to build a portion of the bridge onsite, which would save time and money.		Undetermined	We removed this option from consideration because it would increase the number of piers in the water, which would change the bridge design. The savings in schedule would be offset by additional design changes and the need to update our environmental permits. The visual changes would also break commitments to the community and the Seattle Design Commission.

Cost reduction opportunity	Category	Background	Est. cost savings	Rationale
Reduce the size of the Roanoke Lid.	Architecture, landscape and urban design	Reducing the size of the lid would also reduce the number and cost of needed retaining walls.	Undetermined	We removed this option from consideration because it would require significant coordination with the city of Seattle as well as an extensive community outreach process. The time to complete the coordination and approval process would delay the project and result in minimal or no cost savings.
Install a portable dam in Portage Bay to eliminate the need to build temporary work bridges and allow equipment/material access to the work areas.	Environmental	After placing the temporary dam, lake water would need to be pumped out of Portage Bay, triggering additional environmental permits.	\$20M	We removed this option from consideration because it would require additional environmental permits, which would likely delay the project schedule. Skanska would lose its ability to work within the first in-water fish window. There is no guarantee that Skanska would receive the necessary environmental permits due to the increased environmental impacts. Moreover, it's unlikely the geotechnical conditions of the lake bottom would support this temporary dam structure.
Replace multiple road areas with asphalt concrete pavement instead of concrete pavement required in the contract.	Pavement	Asphalt is cheaper than concrete and easier to install. However, it has a shorter lifespan.	~ \$550K	We removed this option from consideration because it ultimately increased costs. While the adjustment from concrete to asphalt would have immediate cost savings, the longer-term maintenance needs and potential schedule delays from reopening agreements would increase costs overall. Moreover, this change would likely be rejected by the Seattle Department of Transportation.
Close Delmar Avenue East for two years.	Maintenance of traffic	Building the planned detour requires clearing trees, putting in temporary fill and building temporary retaining walls. Closing Delmar and not building the detour saves material and labor costs. It also reduces the lid construction schedule by six months.	~ \$1 million +	We removed this option from consideration because the negative effects on neighborhood traffic, as well as the reduced SR 520 bridge traffic capacity, would outweigh the potential savings. Closing Delmar for two years would require significant coordination with the city of Seattle as well as City Council approval. Seattle Department of Transportation indicated they would not approve a closure of this duration. Initial cost estimates were also reduced following additional analysis.
<b>Total potential closed savings: ~\$36.4 million - \$41.4 million + undetermined savings</b>				



## **Conclusion**

In summary, the SR 520 Program has a total of \$2.1 million in cost savings ready for implementation and \$1-2 million of savings under negotiation. We have identified additional opportunities for future savings as the design advances. We will continue to keep the Legislature informed about cost-saving opportunities as they are considered and implemented.

We worked diligently to find opportunities to reduce costs before and after awarding the contract. This report represents our commitment to build the project in the most timely and cost-efficient way without compromising the project purpose or program commitments.

Sincerely,

A handwritten signature in black ink, reading "Julie Meredith". The signature is written in a cursive, flowing style.

**Julie Meredith, PE**

Assistant Secretary – Urban Mobility, Access and Megaprograms  
Washington State Department of Transportation

## *Appendix I: Cost-reduction opportunity for Harvard shared-use path*

### **Background**

The Harvard shared-use path (Harvard Connection) is a 670-foot-long path, with a 5% grade, that would extend from the future Roanoke lid, located between 10th Avenue East and Delmar Drive East, to Harvard Avenue East. The path would include a bicycle/pedestrian tunnel underneath 10th Avenue East. We officially added the Harvard Connection to the scope of the Portage Bay Bridge and Roanoke Lid Project in 2019 based on public feedback and at the request of the city of Seattle.

### **Rationale for removal**

WSDOT identified removing the Harvard Connection as a cost-reduction opportunity because we knew there were alternative walking/biking routes in the area that provided a similar function. We also knew the city of Seattle had plans for bicycle and pedestrian improvements in the area, including a designated bike lane on Eastlake Avenue East. We saw this as an opportunity to better align resources with the city of Seattle and work together to improve the alternative connections. Initial cost estimates to remove this connection were approximately \$10 million to \$15 million.

Additionally, the proposed Harvard Connection has both environmental costs and benefits. The path increases accessibility and connectivity for people biking, walking and rolling. However, it is located on a steep and unstable hillside. To stabilize the slope, we need to build concrete retaining walls that require cutting down approximately 50 mature trees.

The path and tunnel under 10th Avenue East also cut through an area with low visibility and foot traffic, raising concerns about safety and maintenance. Keeping the path safe requires regular maintenance and costs related to illumination, pavement, vegetation and graffiti removal.

### **Public outreach**

Our external engagement process was short and targeted because it affected the design of the Roanoke lid. Our main goals in gathering feedback were to learn how much people used Harvard Avenue East compared to other routes and to understand how much bicyclists and pedestrians would be affected by removing the Harvard Connection.

Over the course of a month, we had discussions with the following agency partners:

- Seattle Department of Transportation
- Seattle City Light
- Seattle Public Utilities
- Seattle Parks and Recreation

- Seattle Design Commission
- Federal Highway Administration

Feedback from agency partners was either neutral or supportive. We also met with members from Cascade Bicycle Club and Disabilities Rights Washington. Advocates shared this was a loss for the bicycle and pedestrian community and not the preferred outcome. They encouraged us to reach out to other constituents and coordinate with the city of Seattle on bike safety/access improvements in the area. Members also emphasized the importance of Eastlake Avenue as a downtown link and 10th Avenue East to get to Capitol Hill, and they supported aligning WSDOT and SDOT investments along the Eastlake corridor.

Altogether, given the legislative directive to reduce costs, the availability of alternative routes, the environmental and maintenance considerations, and the external feedback, we decided to move forward with removing the Harvard Connection.

### **Community response**

WSDOT shared the initial decision to remove the Harvard shared-use path from the project on May 1. In June, community members and bicycle and pedestrian advocates launched an online campaign via an email petition. The petition received almost 8,000 signatures and the SR 520 program received approximately 400 emails.

### **Conclusion**

Following conversations with legislators, our contractor, project partners and community advocates, we decided to forgo pursuing this cost-reduction measure. Building the Harvard Connection was a clear priority for the community and the cost savings were relatively nominal based on the overall budget.