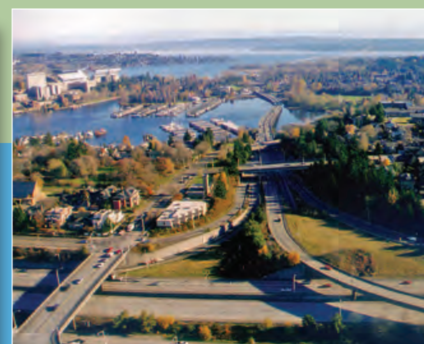
FINAL ENVIRONMENTAL IMPACT STATEMENT
and SECTION 4(f) and 6(f) EVALUATIONS
SR 520 BRIDGE REPLACEMENT AND HOV PROGRAM

JUNE 2011

SR 520, I-5 to Medina: Bridge Replacement and HOV Project



U.S. Department of Transportation
Federal Highway Administration

Washington State
Department of Transportation

Executive Summary

Note: This signature page is from the Final EIS, which can be viewed on the attached DVD.

FHWA-WA-EIS-06-02-F

SR 520 Bridge Replacement and HOV Program

SR 520, I-5 to Medina: Bridge Replacement and HOV Project Final Environmental Impact Statement and Final Section 4(f) and 6(f) Evaluations

ABSTRACT

The existing Portage Bay and Evergreen Point bridges on SR 520 are at the end of their useful life and must be replaced. The Federal Highway Administration (FHWA) and Washington State Department of Transportation (WSDOT) plan to replace the existing facilities in order to provide structures capable of withstanding windstorms and earthquakes and to improve mobility and access for people and goods along the corridor.

The August 2006 Draft Environmental Impact Statement (EIS) for the SR 520 Bridge Replacement and HOV Program evaluated the No Build Alternative and two build alternatives, the 4-Lane Alternative and the 6-Lane Alternative. The January 2010 Supplemental Draft EIS and Section 4(f)/6(f) Evaluation evaluated the effects of a No Build Alternative and three design options for the 6-Lane Alternative for the SR 520, I-5 to Medina project. These design options were developed through a mediation process established as part of Engrossed Substitute Senate Bill 6099, enacted during the 2008 session of the Washington State Legislature.

Based on findings of the SDEIS and comments submitted, a Preferred Alternative was identified in 2010. This Final EIS analyzes the direct, indirect, and cumulative effects of the Preferred Alternative compared to the No Build Alternative and the three SDEIS design options. No decision will be made on the proposed action prior to July 18, 2011. For information about the project, contact Margaret Kucharski, WSDOT Environmental Lead, 600 Stewart Street, Suite 520, Seattle, Washington 98101, (206) 770-3500.

SUBMITTED PURSUANT TO:
National Environmental Policy Act, 42 USC 4332(2)(C)
State Environmental Policy Act, Chapter 43.21C,
Revised Code of Washington & Chapter 197-11, Washington Administrative Code 468-12
Section 4(f) (49 USC § 303 and USC § 138)

Daniel M. Mathis

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Introduction and Project Overview

The State Route (SR) 520, Interstate 5 (I-5) to Medina: Bridge Replacement and High-Occupancy Vehicle (HOV) Project (also referred to as the SR 520, I-5 to Medina project) is located at the western end of the SR 520 corridor (Exhibit ES-1). It begins at SR 520's interchange with I-5, the main north-south artery through Seattle, and ends at Evergreen Point Road in Medina, east of Lake Washington. In addition to the I-5 interchange, the 5.2-mile-long corridor currently includes an interchange at Montlake Boulevard and ramps connecting to Lake Washington Boulevard, both in Seattle.

SR 520 is a critical link connecting the major population and employment centers of the Puget Sound region on either side of Lake Washington. The floating span of the Evergreen Point Bridge, opened in 1963, now carries approximately 115,000 vehicles per day across the lake, providing east-west access for commuters, freight, transit, and general-purpose traffic. The aging floating bridge is vulnerable to failure in a severe windstorm, and the fixed bridges along the corridor do not meet current seismic standards and could collapse in an earthquake. In addition, the corridor currently carries nearly twice as many vehicles as it was originally designed for, resulting in extended congestion and impaired mobility.

The uninterrupted movement of people and goods across SR 520 and the floating bridge is essential to the region's economic vitality and quality of life. The proposed project would improve safety and mobility in the SR 520 corridor by replacing the vulnerable bridges and adding eastbound and westbound HOV lanes to move people more efficiently in transit and carpools. It would ensure the continued availability of SR 520 as a key corridor for transportation and commerce.

What is the purpose of this document?

This document is an executive summary of the Final Environmental Impact Statement (Final EIS) for the SR 520, I-5 to Medina project. The Final EIS was issued on June 17, 2011, by the Washington State Department of Transportation (WSDOT) and the Federal Highway Administration (FHWA). This Executive Summary of the Final EIS provides an overview of the project background, design features, impacts, and mitigation measures. Additional detail can be found in the complete Final EIS, which is on the DVD attached to this document.

Why is the Final EIS being prepared?

Environmental review for this project began in July 2000, when the FHWA and WSDOT filed a Notice of Intent to issue an environmental impact statement under the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA). Both NEPA and SEPA require that an EIS be prepared when an undertaking is likely to result in significant adverse impacts on the natural and/or built environment.

In August 2006, FHWA and WSDOT issued a Draft EIS evaluating the effects of the No Build, 4-Lane, and 6-Lane Alternatives, as well as several design options for the 6-Lane Alternative. The Draft EIS covered improvements in the SR 520 corridor from I-5 in Seattle to just west of I-405 in Bellevue. WSDOT received over 1,700 comment letters, emails, and oral testimonies during the public comment period on the Draft EIS.

Exhibit ES-1. **Project Vicinity Map**

Following the issuance of the Draft EIS, FHWA and WSDOT determined that the portion of the corridor east of Evergreen Point Road had independent utility and should be evaluated as a separate project. In addition, a legislatively mandated mediation group was formed to develop new design options for the 6-Lane Alternative in Seattle. As a result, in January 2010, FHWA and WSDOT issued a Supplemental Draft EIS (SDEIS) for the SR 520 corridor from I-5 to Medina that evaluated three new 6-Lane Alternative design options generated by the mediation group. The SDEIS generated over 400 comment letters, emails, and oral testimonies, comprising thousands of individual comments from the public, regulatory agencies, and Native American tribes, totaling more than 8,000 individual comments.

After publishing the SDEIS and evaluating the comments received, FHWA and WSDOT identified a Preferred Alternative in April 2010. The Preferred Alternative is most similar to SDEIS Option A, but includes a number of features to reduce neighborhood and park effects, improve regional and local transit connections, and enhance compatibility with potential future light rail transit in the corridor. A description of the Preferred Alternative can be found in the Alternatives section of this Executive Summary, and a more detailed description is provided in Chapter 2 of the Final EIS.

NEPA requires that FHWA and WSDOT prepare a Final EIS to respond to comments received on the Draft EIS and SDEIS and to identify a preferred alternative. NEPA also requires FHWA and WSDOT to discuss at appropriate points in the Final EIS "any responsible opposing view which was not adequately discussed in the draft statement" and indicate their responses to the issues raised. Preparing the Final EIS provides FHWA and WSDOT the opportunity to respond to comments from agencies, tribes, and the public; to further evaluate the Preferred Alternative identified in April 2010; to supplement, improve, and modify previous analyses as appropriate; and to make corrections to previous environmental documentation. The Final EIS and attachments, including the Draft EIS and SDEIS, are provided on the DVD included with this document.

What is the project purpose?

In 2000, the Trans-Lake Washington Study Committee developed the project's statement of purpose, which has guided the environmental review process since that time:

The purpose of the project is to improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.

The statement of purpose—part of a longer purpose and need statement also adopted in 2000—has helped the project team develop and evaluate alternatives for the EIS analysis by defining the objectives that the alternatives must meet. Although the project limits have changed since the original statement was adopted, the project still has the purpose of improving mobility within the SR 520 corridor, and its transportation performance is evaluated on a corridor-wide basis. The I-5 to Medina project also serves another important purpose: to replace the aging and vulnerable Evergreen Point, Portage Bay, and west approach bridges. The following section describes the need for the project in terms of both mobility and safety.

Why is the project needed now?

The Evergreen Point Bridge is a critical component of the Puget Sound region's transportation infrastructure. It is one of only two connections across Lake Washington that link urban centers in Seattle and the Eastside. The SR 520, I-5 to Medina project addresses two key issues facing the SR 520 corridor: 1) bridge structures that are vulnerable to catastrophic failure and 2) worsening traffic levels and congestion due to growth in jobs and housing over the last two decades.

SR 520's bridges are vulnerable to catastrophic failure.

The Evergreen Point Bridge and its approaches are in danger of structural failure. Recent WSDOT studies have demonstrated that the floating span of the Evergreen Point Bridge is highly vulnerable to windstorms, while the Portage Bay Bridge and the east and west approaches to the Evergreen Point Bridge are vulnerable to earthquakes. In 1999, WSDOT estimated the remaining service life of the floating portion of the Evergreen Point Bridge to be 20 to 25 years, based on its structural condition and the likelihood of severe windstorms. Its life expectancy now is only 10 to 15 years.

The floating span was originally designed for a sustained wind speed of 57.5 miles per hour (mph). In 1999, WSDOT rehabilitated the bridge to allow it to withstand sustained winds up to 77 mph. This still falls well short of the current design standard of 92 mph. Moreover, some bridge mechanisms have been damaged in recent storms. The floating pontoons currently float about 1 foot lower than originally designed, increasing the likelihood of waves breaking onto the bridge deck. Cracks in the structure leak water that WSDOT must pump out on a regular basis. The probability that the bridge will sustain serious structural damage (i.e., sink or become impassable to traffic) over the next 15 years is extremely high. To bring the Evergreen Point Bridge up to current design standards and eliminate the risk of its catastrophic failure, the existing span must be completely replaced. Exhibit ES-2 shows the vulnerable sections of SR 520.

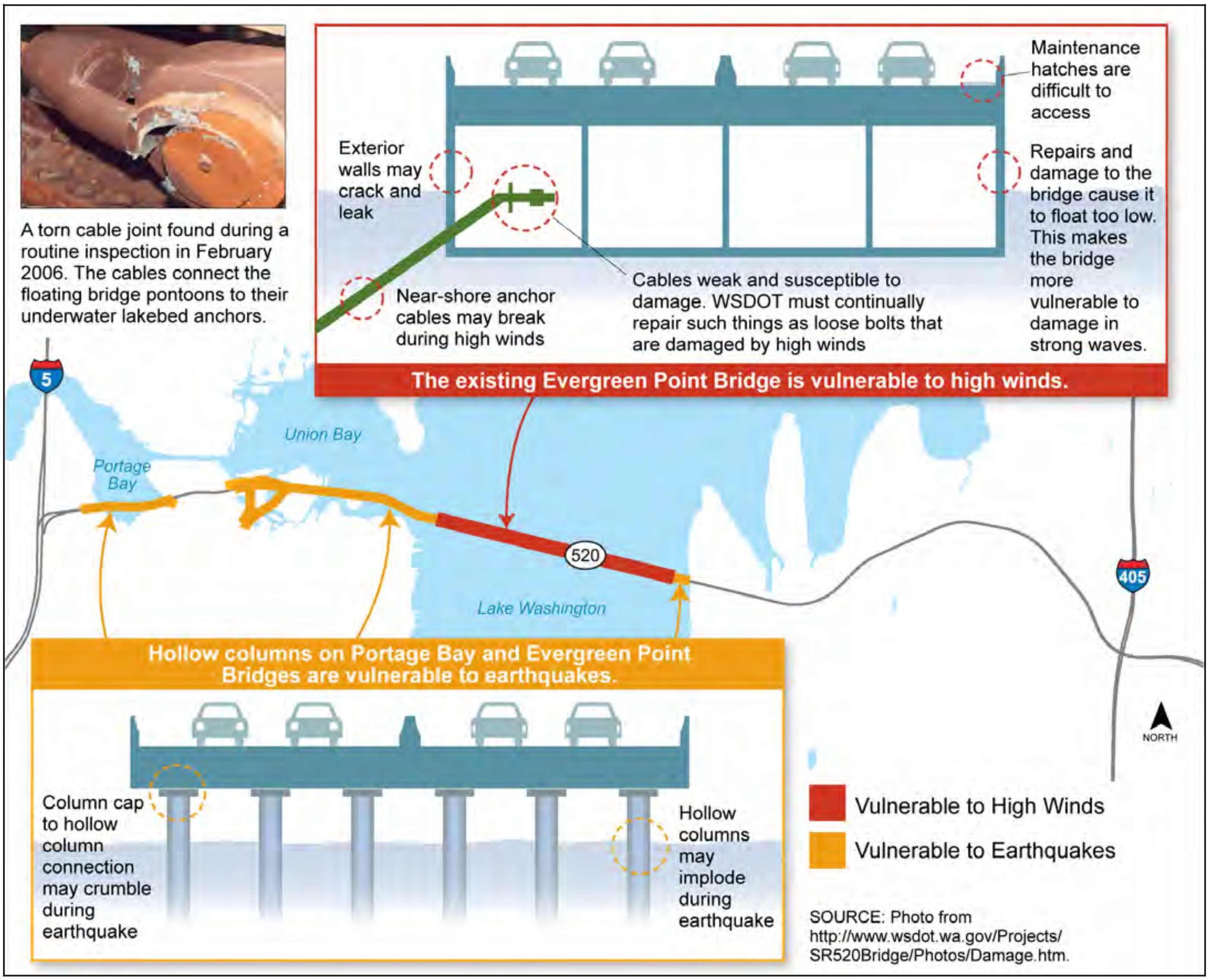
The ever-present possibility of an earthquake in the Seattle area poses additional risks to other bridges in the SR 520 corridor. The columns of the Portage Bay Bridge and both the west and east approaches to the Evergreen Point Bridge are hollow and do not meet current seismic design standards. Hollow-core columns are difficult and costly to retrofit to today's accepted seismic protection levels; WSDOT studies indicate that such retrofitting would cost nearly as much as building new structures, and would have similar environmental effects. WSDOT estimates that over the next 50 years, there is a 20 percent chance of serious damage to these structures in an earthquake.

SR 520 is congested and unreliable, and does not encourage maximum transit and carpool use.

A second key reason for implementing this project now is the severe traffic congestion in the SR 520 corridor, which was the reason for initiating the original Trans-Lake Washington Study in 1997. The traffic demand in both directions exceeds the highway's capacity, creating several hours of congestion every weekday. The corridor was not built to handle as many vehicles as currently want to use it. Today, seven times more vehicles cross SR 520 each day than when the bridge first opened in 1963; traffic during peak hours is nearly equal in each direction. All of these vehicles result in frequent breakdown of the traffic flow and long backups of vehicles traveling at very slow speeds.

Beyond the number of people and cars, another important factor causing today's congestion is the design of the Evergreen Point Bridge. By today's engineering standards, the bridge is too narrow. The narrow shoulders provide no room for vehicles to pull over after an accident or breakdown. Instead, disabled vehicles must stay in the

Exhibit ES-2. **Points Along SR 520 Vulnerable to Earthquake and Windstorms**



SOURCE: Photo from http://www.wsdot.wa.gov/Projects/SR520Bridge/Photos/Damage.htm.

through lane and block other traffic, immediately rendering a full lane of traffic unusable. This slows down traffic and impedes emergency vehicle response. In addition, the westbound HOV lane on the Eastside ends at the bridge, creating congestion as westbound HOV traffic is forced to merge with general-purpose traffic.

Together, growth and physical limitations will make the future traffic situation on SR 520 worse if the corridor is not improved. Under average evening peak-hour conditions today, a single-occupant vehicle traveling westbound takes approximately 39 minutes to travel SR 520 from SR 202 in Redmond to I-5 in Seattle—a distance of about 13 miles. By 2030, if the project is not built, this same trip will take over an hour. This makes it imperative that commuters be provided with travel choices that allow them to avoid driving alone, and that the proposed project be built to support increased use of transit and HOVs.

What would happen if the project were not built?

If the project were not built, the section of SR 520 between I-5 and Evergreen Point Road would not be improved, and these critical needs would not be met:

- The risk of bridge failure in a storm or earthquake would increase as the structures continued to age, with consequences ranging from severe traffic congestion to loss of life. As the floating bridge becomes more fragile, it would require more frequent closures to protect its components from damage.
- Planned growth in the project area over time would cause continued growth in traffic volumes on SR 520, increasing congestion and raising the potential economic and social cost of traffic closures and/or bridge failures.
- Transit vehicles and carpools would remain in congested general purpose lanes, increasing travel time, reducing reliability, and discouraging commuters from choosing transit.
- The facility's narrow shoulders would continue to result in blocked lanes and long delays when accidents occur.
- Without lids, SR 520 would continue to serve as a barrier between neighborhoods.
- Pedestrians and bicyclists would remain limited to I-90 as a choice for crossing Lake Washington.
- Stormwater discharging from SR 520 into Portage Bay and Lake Washington would remain untreated.

Who has been involved in the environmental process?

Who are the lead agencies?

For environmental review of this project, FHWA is the federal lead agency under NEPA, and WSDOT is the project proponent and the state lead agency under SEPA. FHWA is providing highway design guidance and environmental oversight. WSDOT is leading the highway design efforts and development of the EIS. The lead agencies also give close consideration to public, agency, and tribal comments on the project.

Who are FHWA and WSDOT's cooperating agencies for this project?

Staff from the affected jurisdictions, representatives of state and federal natural resource agencies, and tribes have provided advice and recommendations to the lead agencies about the scope and content of environmental analysis. These "cooperating agencies" are defined under NEPA as those that have an interest in a proposed project for which environmental documents are being prepared. Most cooperating agencies issue or contribute to permit decisions for a project, and will adopt the SR 520, I-5 to Medina project Final EIS under NEPA or SEPA in support of these decisions.

WSDOT worked with the cooperating agencies through a forum known as the Regulatory Agency Coordination process (RACp). All agencies with jurisdiction over the project were invited to attend, as were all tribes with fishing rights and/or cultural resource interests in the project area. While the RACp itself was primarily focused on sharing of information, smaller technical working groups (TWGs) met more often to focus on topics of specialized interest, including natural resource effects, in-water construction, mitigation, stormwater, parks, Endangered Species Act compliance, and the design of the bridge maintenance facility. In the TWGs, agency and tribal staff worked closely with WSDOT to collaborate on methods for impact assessment and mitigation planning. WSDOT also met regularly with resource agency directors to keep them apprised of the project status.

How have FHWA and WSDOT consulted with Native American tribes?

FHWA and WSDOT have engaged with affected tribes through government-to-government consultation and conducted outreach through correspondence, individual meetings, and resource agency meetings. The Muckleshoot Indian Tribe and the Snoqualmie Indian Tribe are cooperating agencies under NEPA for the SR 520, I-5 to Medina project. In this role, they had the opportunity to review discipline reports for the SDEIS and other environmental documents prior to public release.

The Muckleshoot Indian Tribe is the only tribe with usual and accustomed treaty fishing rights in Lake Washington and its tributaries. FHWA and WSDOT have coordinated and are continuing to coordinate with the tribe on effects on fishing access and fish habitat. Formal government-to-government consultation is ongoing between FHWA, WSDOT, and the Muckleshoot Tribe to determine appropriate mitigation for the project's effects on resources protected by treaty fishing rights. A draft agreement identifying formal commitments is expected to be completed in summer 2011, with a final agreement in late 2011.

Section 106 of the National Historic Preservation Act and its implementing regulations require federal agencies to consult with tribes when proposed projects could affect properties with historic, religious, or cultural significance to those tribes. Tribes may have input on these cultural resources regardless of whether they have court-affirmed treaty rights or are federally recognized. FHWA and WSDOT have consulted with tribes whose cultural resources might be affected by the project, including the federally recognized Muckleshoot Indian Tribe, Snoqualmie Tribe, Suquamish Tribe, Tulalip Tribes, and Yakama Indian Nation, as well as the non-federally-recognized Duwamish Tribe. The results of tribal consultation under Section 106, including mitigation measures to which WSDOT has agreed, are memorialized in the Section 106 Programmatic Agreement (PA) between FHWA, WSDOT, the tribes, the consulting parties, and the Washington State Department of Archaeology and Historic Preservation (DAHP). Through the PA, WSDOT has committed to develop a Foster Island Treatment Plan to mitigate for adverse effects to this traditional cultural property. FHWA and WSDOT will continue to coordinate with tribal nations throughout project design to implement the mitigation measures committed to in the PA and

Cooperating Agencies

- Federal Transit Administration
- National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries)
- National Park Service
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- Muckleshoot Indian Tribe
- Snoqualmie Indian Tribe
- Washington State Department of Archaeology and Historic Preservation
- Washington State Department of Ecology
- Washington State Department of Fish and Wildlife
- Washington State Department of Natural Resources
- Washington State Recreation and Conservation Office
- Sound Transit
- Puget Sound Clean Air Agency
- Puget Sound Regional Council
- King County
- City of Medina
- City of Seattle

A list of cooperating agencies for the SR 520, I-5 to Medina project is shown in the box above.

to ensure that construction activities are monitored as necessary to ensure that any unanticipated discoveries of cultural resources are addressed appropriately.

More information on how FHWA and WSDOT have coordinated with Native American tribes can be found in Section 1.6 of the Final EIS.

How is the SR 520, I-5 to Medina project related to other projects and processes in the SR 520 Program?

The Draft EIS for the SR 520 HOV and Bridge Replacement Project, published in August 2006, evaluated the SR 520 corridor from I-5 in Seattle to 108th Avenue NE in Bellevue as a single project. Since that time, in response to changing conditions, WSDOT has worked with FHWA to develop new projects within the context of an overall SR 520 corridor program. Each project has a separate purpose and need; each provides independent benefit to the region. The four projects in the SR 520 program, and their review status under NEPA, are:

- SR 520, I-5 to Medina: Bridge Replacement and HOV Project (Final EIS published June 2011)
- SR 520, Medina to SR 202: Eastside Transit and HOV Project (Medina to SR 202 project) (Finding of No Significant Impact issued in May 2010)
- SR 520 Pontoon Construction Project (Record of Decision issued in January 2011)
- SR 520 Variable Tolling Project (Finding of No Significant Impact issued in June 2009)

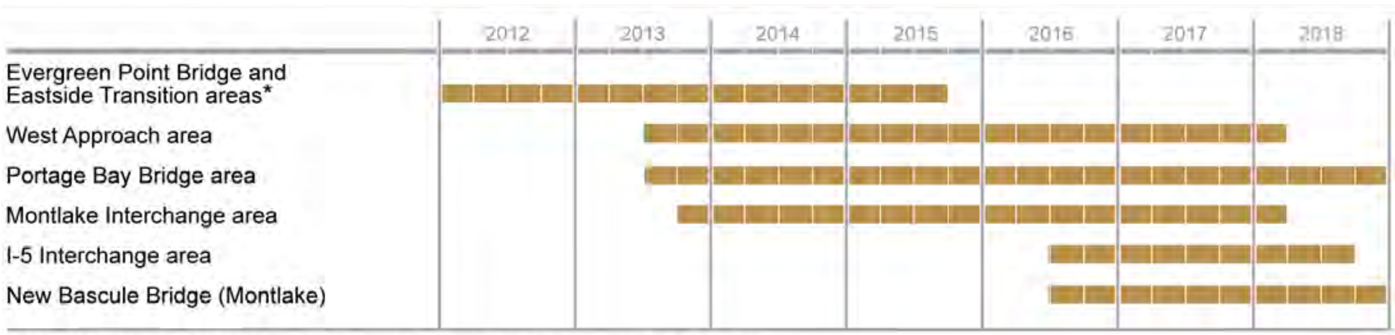
Section 1.7 of the Final EIS briefly describes each of the other projects in the SR 520 Bridge Replacement and HOV Program and how they meet FHWA's criteria for independent utility and logical termini under NEPA.

When would the project be built?

Construction is planned to begin in 2012, after project permits are received. The floating bridge would open to traffic as early as 2014. If full funding is identified by 2012, the rest of the project is currently planned for completion in 2018. As described in Section 2.8 of the Final EIS, construction may be phased if full funding is not available.

The most vulnerable structures (the Evergreen Point Bridge and east approach) would be built in the first stage of construction. The remaining components of the project would be built in subsequent stages. Exhibit ES-3 provides an overview of the anticipated construction stages and durations identified for the SR 520, I-5 to Medina project. For more information on construction sequencing, please see Chapter 3 of the Final EIS.

Exhibit ES-3. **Preferred Alternative Construction Stages and Durations**



Note: Completion dates shown for construction stages assume full finding.

* Bridge opening as early as 2014; construction finalized in 2015.

Table ES-1. **Cost Estimates for SR 520 Corridor Projects (millions of dollars)**

	SR 520, I-5 to Medina Project[a]	Most Likely Total SR 520 Corridor Cost[b]
Preferred Alternative[c]	$3,419	$4,615
6-Lane Alternative with Option A	$3,392 to 3,668	$4,526 to 4,802
6-Lane Alternative with Option K	$5,440 to 5,538	$6,574 to 6,672
6-Lane Alternative with Option L	$3,932 to 4,012	$5,066 to 5,146

Note: Estimates are adjusted to account for risk and inflation using the Cost Estimate Validation Process® method. All estimates include anticipated mitigation costs.

[a] The ranges shown for Options A, K, and L reflect the cost of potential suboptions for each option. No suboptions are evaluated for the preferred alternative, therefore a cost range is not provided.

[b] Total corridor cost includes the Pontoon Construction Project and the SR 520, Medina to SR 202 Project.

[c] Costs were estimated for the Preferred Alternative during a 2010 Cost Estimate Validation Process® workshop.

How much would the project cost, and how much has been funded?

The total cost to construct the SR 520, I-5 to Medina project includes the costs of the Seattle portion, the Eastside (Medina) portion, the floating bridge (including the east approach and transition section), and 44 additional pontoons that are needed for a 6-lane bridge and are not included in the SR 520 Pontoon Construction Project. As shown in Table ES-1, these costs are estimated to total approximately $3.42 billion for the Preferred Alternative and between $3.39 and $5.54 billion for the SDEIS options, depending upon the suboptions chosen. Table ES-1 also compares the overall costs estimated in 2008 for the SR 520 Bridge Replacement and HOV Program—including the I-5 to Medina, Pontoon Construction, and Medina to SR 202 projects—to program costs estimated in 2010 after identifying the Preferred Alternative. WSDOT continues to pursue cost savings in the form of contract delivery, cost estimate refinement, and design refinements wherever feasible.

The budget established by the state legislature in 2009 for the overall SR 520 program (including the I-5 to Medina, Medina to SR 202, and Pontoon Construction projects) is $4.65 billion. As shown in Table ES-2, WSDOT has secured a variety of state and federal funding sources to help pay for the SR 520 program. However, the funding for the full corridor program falls approximately $2.03 billion short of the $4.65 billion total. WSDOT and the legislature are working to identify additional funding sources to fill the gap. The legislature has allocated toll revenues from the Lake Washington Variable Tolling Project to allow WSDOT to move forward with the following components of the Bridge Replacement and HOV Program, pending completion of environmental review and permitting:

- Building a new pontoon construction facility in Grays Harbor and producing pontoons at that facility
- Beginning construction of the Medina to SR 202 project
- Constructing a new floating bridge and approaches
- Advancing design on the Seattle side of the corridor

As shown in Exhibit ES-3, WSDOT has proposed project construction for completion in 2018, based on the assumption that full funding will be provided by 2014. Should full funding not be available, the project would be phased, with the floating bridge and landings comprising the initial construction phase. For more information on the potential for phased construction, please see Section 2.8 of the Final EIS.

Table ES-2. **Committed Funding Sources for SR 520 Bridge Replacement and HOV Program**

Funding Source	Amount
State gas tax	$550 million
Federal funds	$70 million
SR 520 Account (tolling and future federal funding)	$1,850 million
Sales tax deferral	$150 million
Total funding identified to date	**$2,620 million**
Total program cost[a]	**$4,650 million**
Unfunded portion of program cost	**$2,030 million**

[a]Total program cost is based on Engrossed Substitute House Bill (ESHB) 2211 legislation

Source: Washington State Legislature 2011 Legislative Budget.

How will tolling be used on SR 520?

Tolling is currently slated to begin on the existing Evergreen Point Bridge in summer 2011 as part of the implementation of the Lake Washington Congestion Management Program. Tolling is also planned on the new 6-lane Evergreen Point Bridge once it is completed. The assumptions made for tolling the new bridge are somewhat different from the toll program for the existing bridge. Details on the near-term tolling are provided below. The assumptions used for tolling the new bridge are discussed in the Alternatives section below and in Section 1.11 of the Final EIS.

Under the Lake Washington Congestion Management Program, users of the existing bridge will be charged a toll whose amount will vary based on time of day. The toll is designed to maintain travel time, speed, and reliability while generating revenue to fund improvements in the SR 520 corridor. Tolls will be completely automated, with no toll booths. All vehicles will be charged a toll to cross the Evergreen Point Bridge except transit, registered vanpools, maintenance vehicles, and tow trucks responding to blocking incidents. Users who are required to pay the toll will have transponders (Good To Go! passes; www.goodtogo.org) that are read by an electronic reader. Cars without transponders will have their license plates photographed and be billed by mail, at a higher fee to defray the cost of processing and mailing.

The Lake Washington Congestion Management Program includes tolling as a key component of the SR 520 program's financing plan, which is consistent with previous assumptions in the Draft EIS and the SDEIS. Tolling has been authorized by the legislature, with variable toll rates established by the State Transportation Commission. Any future changes to the toll rate structure will be determined by the Transportation Commission.

What has happened since publication of the SDEIS?

Since the SDEIS was published, WSDOT has coordinated with agencies, tribes, and the public to develop and refine the Preferred Alternative and to meet requirements for consultation and mitigation. Some key activities (described further in Section 1.12 of the Final EIS) include:

- Collaboration with the City of Seattle, the University of Washington, and transit agencies on design refinements, transit connections, and transit planning and financing under Engrossed Substitute Senate Bill (ESSB) 6392, passed by the Washington State Legislature in March 2010. A full report was prepared and submitted to the legislature on Oct. 1, 2010.
- Coordination with natural resource agencies and the Muckleshoot Indian Tribe Fisheries Division in the Natural Resources Technical Working Group to identify impacts, mitigation sequencing strategies, avoidance and minimization measures, and appropriate compensatory mitigation for the Preferred Alternative.
- Coordination with the Arboretum and Botanical Garden Committee to develop a mitigation plan for the Washington Park Arboretum, as directed by ESSB 6392. The plan, which includes a list of mitigation measures agreed upon by all parties, was submitted to the legislature in December 2010; a MOU to define roles and responsibilities for implementation was executed in April 2011.
- Extensive work under Section 106 of the National Historic Preservation Act, including outreach to and

engagement with nearly two dozen consulting parties, coordination with DAHP, and development of a Programmatic Agreement that identifies the avoidance, minimization, and mitigation activities WSDOT will undertake. Tribal issues have been addressed in a separate memorandum of understanding that is included in the Programmatic Agreement by reference.

- Consultation with NOAA Fisheries and the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act, with a Biological Assessment submitted in November 2010 and a Biological Opinion issued by each agency in April/May 2011.
- Issuance in late 2010 of a solicitation for design-build proposals for construction of the floating portion of the Evergreen Point Bridge and landings. Three teams submitted qualifications and were invited to submit proposals; WSDOT plans to select a contractor in mid-2011. Final design under the contract will take place following the issuance of the Record of Decision.

How did WSDOT respond to public comments received on the SDEIS?

WSDOT read and assessed all of the comments received from the public, agencies, and tribes. Each comment is responded to in Attachment 11 to the Final EIS. As needed, some factual corrections, additional analysis, and language clarifications have been included in the Final EIS and/or the discipline report discussions to address topics raised in the comments. Where changes in the documents have been made as a result of comments submitted, this is noted in the response.

WSDOT continues to inform and engage the public through venues such as community council briefings, fairs and festivals, the project and program websites, press releases, emails, and the project dialogue center. WSDOT has also committed to involving public stakeholders in processes to refine project design and construction methods, as appropriate. In addition to involving the public, WSDOT has worked with a large number of local, state, and federal jurisdictions and agencies that are involved in transportation, parks and natural resource issues around the SR 520 corridor. WSDOT's work with these groups and agencies is outlined below and described in Chapters 1 and 2 of the Final EIS.

Topics most frequently noted in public and agency comments on the SDEIS are summarized in Chapter 11 of the Final EIS, and can be found in the Supplemental Draft EIS Summary of Comments – April 28, 2010 (WSDOT 2010b).

How has the public been involved during the preparation of the Final EIS?

A regional transportation facility like SR 520 affects a large number of people—those who travel on it, those who live and work near it, and, in a broader sense, any person or business that depends upon the region's ability to move people and goods across Lake Washington. WSDOT developed appropriate outreach methods to reach these different public audiences, which include the Cities of Seattle and Medina; specific neighborhoods in Seattle, including Montlake, Portage Bay/Roanoke, North Capitol Hill, Madison Park, University District, Laurelhurst, and Eastlake; and major institutions such as the University of Washington and NOAA Northwest Fisheries Science Center.

The outreach also extended to a broader set of public audiences, which included:

- Commuters who use the corridor to travel via bus or car to and from Seattle and the Eastside
- Businesses that rely on the corridor for movement of employees, goods, and customers
- Chambers of commerce that are interested in transportation issues
- Minority, low-income, and limited-English-proficiency users of the corridor
- Social service and advocacy organizations that work with minority and low-income communities
- Other interested groups such as bicycle, environmental, and neighborhood organizations

WSDOT's ongoing program to engage the public and to provide information about the project has remained active throughout the NEPA process. Some of the activities and resources to encourage public engagement are as follows:

- Community and agency briefings, including nearly 40 open houses and public meetings, more than 140 meetings and workshops related to legislation, and more than 140 community group meetings and briefings
- Project website
- Newsletters and monthly email updates
- Outreach to minority and low-income populations, including translated project materials and interviews with social service providers
- Outreach to the business community

Additional information on how the public has participated in the SR 520, I-5 to Medina project is found in Section 1.13 of the Final EIS.

Alternatives

How were the alternatives and design options for the project developed and evaluated?

Planning for the SR 520 corridor began in 1998 with the work of the Trans-Lake Washington Study, initiated by the state legislature to explore ways of improving mobility across and around Lake Washington. Many potential solutions for the corridor have been developed and evaluated since that time. Table ES-3 summarizes how WSDOT, FHWA, and numerous stakeholders have worked through the years to identify and screen potential alternatives and design options. A more in-depth overview of the project's NEPA process and the alternatives and design options that have been evaluated can be found in Chapter 2 of the Final EIS. The Range of Alternatives and Options Evaluated report (Attachment 7 to the Final EIS) provides additional detail on alternatives analysis.

Table ES-3. **History of SR 520, I-5 to Medina Project NEPA Process and Alternatives**

Trans-Lake Washington Study (1998 –1999)		
NEPA/Project Element	Goal	Address traffic congestion across and around Lake Washington.
	Screening	47-member study committee identified and evaluated potential solutions.
	Alternatives	Seven "solution sets" were developed representing different mixes of roadway, transit, transportation demand management, and transportation systems management solutions.
Process	Activities	Identified and evaluated potential solutions: new corridors, new modes (ferry, high-capacity transit), increased capacity on existing corridors, crossing methods (tubes, tunnels), demand management.
	Recommendations and Outcomes	Move forward with improvements to SR 520. Prepare EIS to evaluate the following alternatives: No Build, 4-Lane, 6-Lane (with and without high-capacity transit [HCT]), 8-Lane (with and without HCT).
EIS Initiation and Alternatives Screening (2000 – 2002)		
NEPA/Project Element	Project Purpose and Need	Improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.
	Screening	Two levels of screening criteria developed from Purpose and Need and applied to Trans-Lake alternatives.
	Alternatives	Project corridor alternatives evaluated: No Build, 4-Lane, 6-Lane, 8-Lane.
Process	Activities	Developed Purpose and Need statement based on Trans-Lake findings. Established and applied screening criteria.
	Recommendations and Outcomes	Evaluate No Build, 4-Lane, and 6-Lane Alternatives in Draft EIS. Do not further evaluate 8-Lane Alternative. Do not further evaluate new corridors and crossing methods due to risk, impacts, and cost. Affirm regional planning assumption of I-90 as initial HCT corridor. Defer HCT on SR 520 in near term, but provide long-term compatibility.

Table ES-3. **History of SR 520, I-5 to Medina Project NEPA Process and Alternatives** (continued)

Draft EIS (Released August 2006)		
NEPA/Project Element	Goal/Purpose and Need	Improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.
	Screening	New design options proposed by community members were screened using original criteria, resulting in the 6-Lane design options (see below).
	Alternatives	Project corridor alternatives evaluated: No Build, 4-Lane, 6-Lane, 8-Lane (described rationale for dropping).
Process	6-Lane Design Options	Evaluated in Draft EIS: Pacific Street Interchange, Second Montlake Bridge, No Montlake Freeway Transit Stop.
	Activities	Conducted coordination and outreach with local jurisdictions, resource agencies, and the public. Prepared and published Draft EIS incorporating evaluation of No Build, 4-Lane, and 6-Lane Alternatives and 6-Lane design options.
	Recommendations and Outcomes	Traffic modeling identified 6-Lane Alternative as better meeting Purpose and Need. 4-Lane would provide safety, but would not improve mobility, while 6-Lane Alternative would improve both safety and mobility. The Pacific Street Interchange option would provide best local mobility in Seattle, but with greater impacts to wetlands, aquatic habitat, and parks compared to 6-Lane base. Gov. Gregoire's findings on Draft EIS identified 6-Lane Alternative as "best serving needs of regional transportation system," but identified the need for additional design refinement in Seattle portion of project area.
Supplemental Draft EIS (Released January 2010)		
NEPA/Project Element	Goal/Purpose and Need	Improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.
	Screening	Mediation group identified shortlist of options (A, K, L); FHWA and WSDOT agreed to evaluate.
	Alternatives	Draft EIS "base" 6-Lane Alternative and design options dropped from further analysis. SDEIS evaluated: No Build, 4-Lane (traffic analysis only), 6-Lane with design options noted below.
Process	6-Lane Design Options	Evaluated: Option A (improvements to Montlake interchange plus second Montlake bascule bridge); Option K (tunnel under the Montlake Cut and lowered interchange east of Montlake); Option L (diagonal bridge over the Montlake Cut and elevated interchange east of Montlake).
	Activities	Legislation (ESSB 6099) directed development of a 6-lane corridor interchange design for the Montlake area through a mediated community involvement process. Mediation explored 12 design options but did not reach a consensus solution, electing further study of Options A, K, and L. WSDOT prepared discipline reports and Supplemental Draft EIS to evaluate the impacts of these options, and conducted coordination and outreach with agencies and the public. A legislative workgroup created by ESHB 2211 recommended Option A with suboptions as the preferred alternative.
	Recommendations and Outcomes	4-Lane Alternative not further considered after updated traffic analysis confirmed it failed to meet Purpose and Need. Mediation participants agreed on three options to carry forward: A, K, and L. WSDOT evaluated A, K, and L in the SDEIS; legislative workgroup recommended Option A with suboptions.

Table ES-3. **History of SR 520, I-5 to Medina Project NEPA Process and Alternatives** (continued)

Final EIS (Released July 2011)		
NEPA/Project Element	Goal/Purpose and Need	Improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.
	Alternatives	No Build, Preferred Alternative, and Options A, K, and L.
Process	6-Lane Design Options	Options A, K, and L compared to Preferred Alternative.
	Activities	In April 2010, following evaluation of comments on SDEIS, Gov. Gregoire announced selection of a Preferred Alternative (similar to Option A, but with design refinements) by FHWA and WSDOT. WSDOT prepared final evaluation of Preferred Alternative with comparisons to SDEIS design options. FHWA and WSDOT consulted with tribal governments, Section 106 consulting parties, resource agencies, and other project stakeholders to identify effects of the Preferred Alternative and determine appropriate mitigation.
	Recommendations and Outcomes	Proceed with preparation of Record of Decision.

Were any additional alternatives considered after publication of the SDEIS?

NEPA requires that if new reasonable alternatives are proposed via comments on a draft (or supplemental draft) environmental document, they must be fully analyzed. Commenters on the SDEIS suggested two alternatives that they believed should have been evaluated further:

- A "transit-optimized" 4-Lane Alternative
- An alternative that would include light rail transit on SR 520 when it opened, rather than accommodating it as part of a future project

Although both the 4-Lane Alternative and a multimodal alternative including light rail transit were evaluated and eliminated earlier in the NEPA process, WSDOT re-evaluated both to determine whether changed conditions might result in their being considered "reasonable alternatives" as defined by NEPA (40 Code of Federal Regulations [CFR] Section 1502.14(c)). The evaluation confirmed that these alternatives were not reasonable. The analysis used to reach this conclusion is discussed in Section 2.4 of the Final EIS.

Although there was not a formal request for its analysis in the SDEIS comments, several comments suggested that Option M, which was proposed by the former supporters of Option K during the legislative workgroup process, had been dropped without sufficient consideration. Option M had a similar alignment to Option K, but substituted a dredged tunnel across the Montlake Cut for the excavated tunnel included in Option K. WSDOT's evaluation of Option M at that time indicated that it was not a reasonable alternative. A brief discussion of the factors considered in this conclusion is also provided in Section 2.4 of the Final EIS.

What is evaluated in the Final EIS?

The Final EIS evaluates a Preferred Alternative and three design options (Options A, K, and L) for the SR 520, I-5 to Medina project. The Preferred Alternative and all the design options include a number of common features. All would widen the SR 520 corridor to six lanes (Exhibit ES-4) from I-5 in Seattle to Evergreen Point Road in Medina and would restripe and reconfigure the lanes in the corridor from Evergreen Point Road to 92nd Avenue Northeast in Yarrow Point. The vulnerable Evergreen Point Bridge, Portage Bay Bridge, and west approach bridge would be replaced with new structures designed to withstand windstorms and earthquakes. The project would complete the regional HOV lane system across SR 520, as called for in regional and local transportation plans.

Across the floating bridge, SR 520 would include six lanes (two 11-foot-wide outer general-purpose lanes and one 12-foot-wide inside HOV lane in each direction), with 4-foot-wide inside shoulders and 10-foot-wide outside shoulders and a 14-foot-wide regional bicycle/pedestrian path (Exhibit ES-4). The typical roadway cross-section would be approximately 116 feet wide, compared to the existing width of 60 feet. The additional width is needed for the new HOV lanes and bicycle/pedestrian path and to accommodate wider, safer travel lanes and shoulders. It has, however, been reduced by 18 feet from what was shown in the Draft EIS to respond to community concerns. Exhibit ES-5 illustrates the major features of the Preferred Alternative and Options A, K, and L in Seattle. In areas where there are ramps and/or gaps between lanes, the overall width of the roadway would be greater; Exhibits ES-6 through ES-9 and Chapter 2 of the Final EIS provide cross sections at various locations in the corridor. Key features common to the Preferred Alternative and the SDEIS design options are described below.

Lids and Landscape Features

The Preferred Alternative includes lids at the following locations:

- 10th Avenue East and Delmar Drive East
- Montlake Boulevard

The following lids were included in Options A, K, and/or L, but are not part of the Preferred Alternative (see Exhibit ES-5):

- I-5/East Roanoke Street (Options A, K, and L)
- Montlake Boulevard NE and NE Pacific Street (Options K and L only)
- Foster Island "land bridge" (Option K only)

The lids would reconnect neighborhoods, enhance movement of pedestrians and cyclists, restore and create views, and provide access to existing and new transit stops.

Regional Bicycle/Pedestrian Path

The project includes a 14-foot-wide bicycle/pedestrian path along the north side of SR 520 through the Montlake area and across the Evergreen Point Bridge to the Eastside. In the Montlake area, the path would connect to the existing Bill Dawson Trail that crosses underneath SR 520 near the eastern shore of Portage Bay. It would also connect to the Montlake lid and East Montlake Park. On the Eastside, the path would connect to the bicycle/pedestrian path proposed as part of the SR 520, Medina to SR 202: Eastside Transit and HOV Project.

A new path beginning in East Montlake Park would pass under the west approach bridge at Montlake to connect to a proposed new trail in the Arboretum. The portion of the existing Arboretum Waterfront Trail that crosses SR 520 at Foster Island would also be restored or replaced after construction of the SR 520 west approach structure. There would be no new bicycle/pedestrian path along SR 520 west of Portage Bay.

Exhibit ES-4. **6-Lane Alternative Floating Bridge Roadway Cross Section**

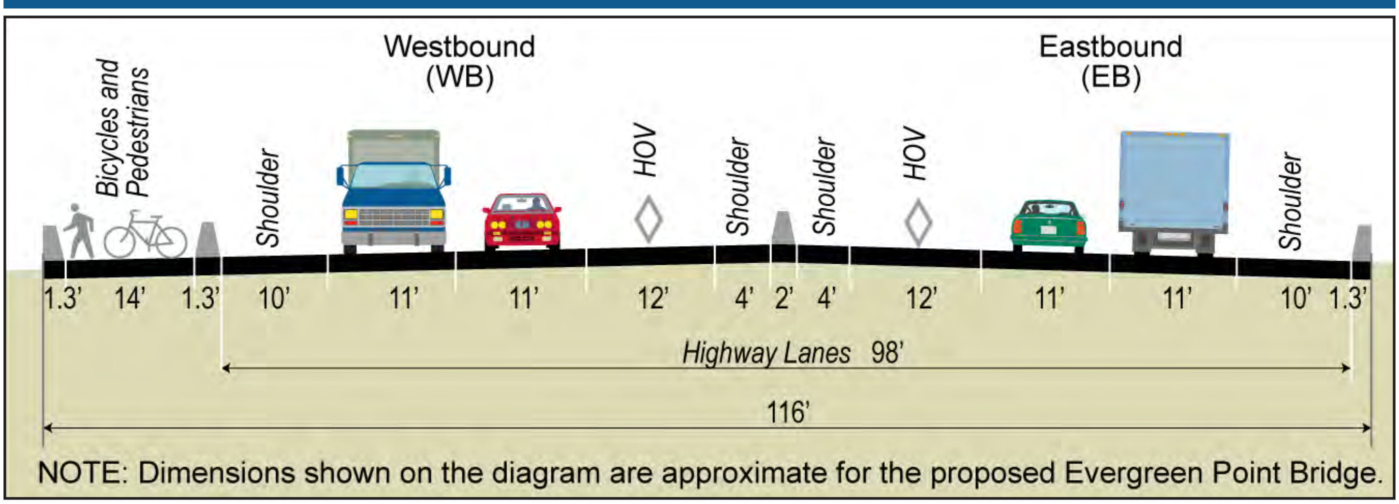
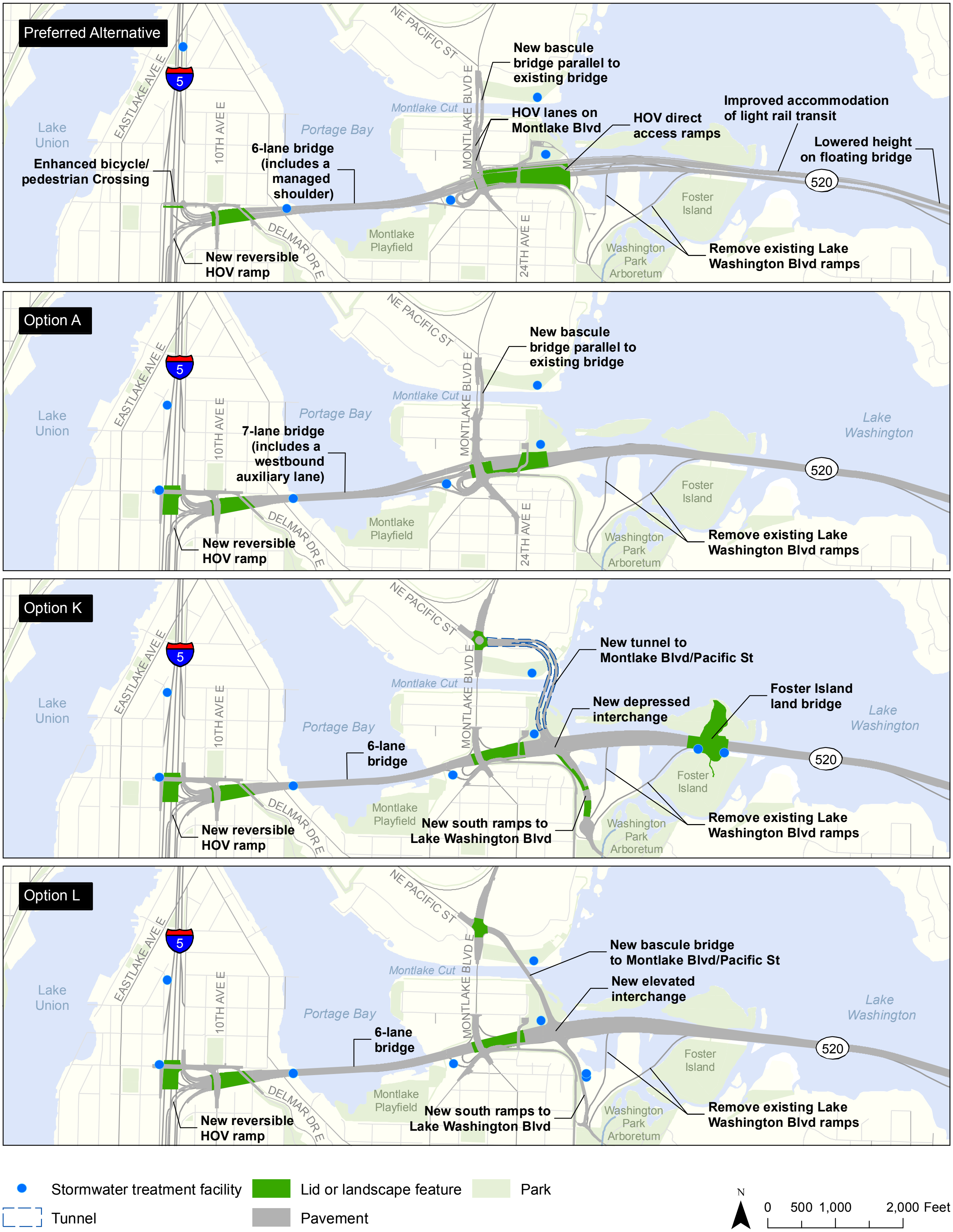


Exhibit ES-5. **Preferred Alternative and Options A, K, and L**



Noise Reduction

Under FHWA regulations (23 CFR Part 772), noise abatement measures must be considered when highway noise levels approach or exceed the thresholds set in FHWA's noise abatement criteria, as they currently do along much of the SR 520 corridor and would continue to do under the No Build Alternative. (See Section 4.7 of the Final EIS for information on existing noise levels and the FHWA criteria.) Such measures must meet FHWA and WSDOT guidelines for feasibility and reasonableness. The SDEIS evaluated traffic noise reduction measures for each design option. Option A was defined as including noise walls and/or quieter rubberized asphalt pavement; Option K was defined as including only quieter rubberized asphalt pavement for noise reduction; and Option L included noise walls along most of the corridor. However, because the effectiveness these types of pavements has not been demonstrated in this region, it is not considered a mitigation measure, and no noise reduction benefits were assumed from their use in the project noise analysis. The Preferred Alternative includes several design elements and general corridor improvements that were added as a result of recommendations from the SR 520 Noise Expert Review Panel and in response to community input. The design includes 4-foot concrete traffic barriers and noise-absorptive material on the traffic barriers and around the lid portals and expansion joints. Additionally, posted speeds on the Portage Bay Bridge between I-5 and the Montlake lid would be reduced to 45 mph. These measures, coupled with project design features such as a higher profile in the west approach area, would collectively reduce noise levels throughout the SR 520, I-5 to Medina corridor. Quieter concrete pavement would also be used throughout the corridor in response to public input. As noted above, quieter concrete pavement is not an approved mitigation measure and was not accounted for in the noise model.

The noise reduction measures outlined above were incorporated into the Preferred Alternative in response to strong opposition to noise walls expressed in SDEIS comments and in community forums. However, as required, noise walls were evaluated for the Preferred Alternative, as they were for Options A, K, and L, to determine if they would meet the feasibility and reasonableness criteria. By reducing noise levels, the design refinements of the Preferred Alternative would reduce the number of recommended noise walls compared to those recommended for Options A, K, and L.

Stormwater Treatment

The project includes the installation of stormwater treatment facilities to collect and treat stormwater runoff. Three facility types incorporating stormwater best management practices approved by the Department of Ecology have been identified for the project: biofiltration swales, constructed stormwater treatment wetlands, and media filter vaults (Option K only). Table ES-4 identifies which facility types are proposed for each project area drainage basin.

Biofiltration swales are vegetation-lined channels designed to remove suspended solids from stormwater. They offer basic water quality treatment to remove pollutants such as metals, suspended solids, and nutrients from contaminated stormwater.

Table ES-4. **Proposed Stormwater Treatment Facilities – Preferred Alternative and SDEIS Options**

Drainage Basin	Type of Proposed Facility
Lake Union	Biofiltration swale
Portage Bay	Constructed stormwater treatment wetland and biofiltration swale
Union Bay	Constructed stormwater treatment wetlands and biofiltration swale Media filter vaults (Option K only)
Lake Washington	Biofiltration swale; high-efficiency sweeping in conjunction with modified catch basins and stormwater lagoons on the new floating bridge and approach structures

Stormwater treatment wetlands offer enhanced treatment, achieving greater removal of dissolved metals from stormwater than basic treatment. These wetlands provide enhanced treatment by using multiple cells and wetland vegetation to reduce the amount of these pollutants in runoff.

Media filter vaults, a basic treatment method, are enclosed treatment facilities (usually underground) that provide stormwater filtration. The vault channels the collected stormwater through filtering cartridges that trap particulates and dissolved pollutants. For the SR 520, I-5 to Medina project, media filter vaults are only included as part of Option K to address stormwater needs at Foster Island.

Enclosed spill containment lagoons are also part of the proposed floating bridge design. Surface pollutants would be removed on a periodic basis under normal monitoring and maintenance activities. The lagoons would also allow dilution of remaining pollutants prior to mixing with lake waters beneath the bridge.

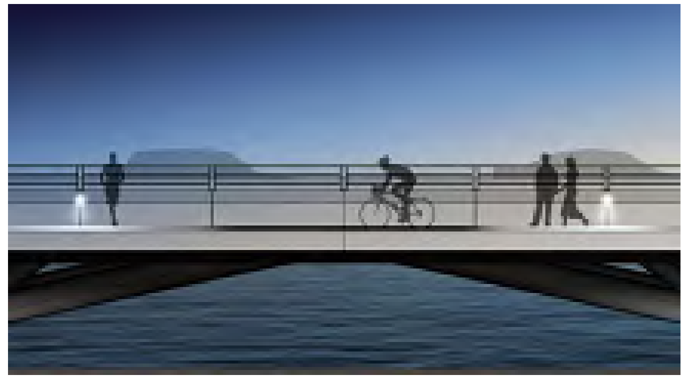
Lighting

Similar to today's roadway lighting configuration, continuous lighting would be provided along the SR 520 corridor from I-5 to Foster Island and on bridge structures crossing the Montlake Cut. Recessed lighting as shown in the adjacent sidebar would illuminate the proposed bicycle and pedestrian path along the west approach structure and the Evergreen Point Bridge. Lighting would be designed to minimize effects on aquatic habitat, likely through the use of downlights similar to those on the I-90 floating bridges.

Tolls

The Final EIS traffic analysis made the following assumptions for how the new 6-lane SR 520 would be tolled:

- Single-point tolling at one location for vehicles crossing the Evergreen Point Bridge
- Variable toll rates depending on the time of day and whether trips are taken on a weekday or a weekend
- A peak toll rate of $3.81 (year 2007 dollars) for all vehicle types for the bridge crossing, with exemptions for transit and HOVs with three or more riders



Example of recessed downlighting which is proposed for use in the bicycle and pedestrian path along the west approach structure and the Evergreen Point Bridge

These assumptions are used as a basis for comparison among the design options. Actual toll rates will be determined by the Transportation Commission, based upon legislative direction, and the application of the tolls will be determined by the legislature. Since the traffic modeling assumptions were applied consistently across the alternatives, they show the relative performance of each in comparison to No Build. See Chapter 1 of the Final EIS for a discussion about what legislation has been passed to authorize tolling.

Tolling Assumptions

Tolling assumptions included in the transportation model for the Final EIS are:

- Single-point tolling implemented on SR 520 between I-5 and I-405
- Variable toll rates depending on the time of day and whether trips are taken during a weekday or during the weekend
- A maximum toll rate of $3.81, with exemptions for transit and HOVs with three or more riders

Like the SDEIS, the Final EIS assumes that the 2030 No Build Alternative would not include tolls. For more information on how tolling was evaluated, please see Chapter 5.1 and the Final Transportation Discipline Report (Attachment 7).

The Final EIS assumes that all vehicles with one or two occupants would be charged a toll to cross the Evergreen Point Bridge. Users who are required to pay the toll would have transponders that would be read by an electronic reader. Transponders allow drivers to pay tolls without stopping at a toll booth. Drivers who do not purchase a transponder would have their license plates photographed as they crossed the tolling point, and bills would be sent by mail to the address at which the vehicle is registered.

How was the Preferred Alternative developed?

The Preferred Alternative is similar to SDEIS Option A, but includes a number of refinements that respond directly to stakeholder comments and concerns. During and after the SDEIS comment period, FHWA and WSDOT carefully reviewed all public, tribal, and agency comments. Comments on the SDEIS (summarized in Section 2.3 of the Final EIS) were a key consideration in developing the Preferred Alternative. Table ES-5 identifies how design elements of the Preferred Alternative respond to specific themes in the SDEIS comments.

How does the Preferred Alternative compare with SDEIS Options A, K, and L?

The greatest physical differences between the Preferred Alternative and the SDEIS design options are in the location and lid configuration of the interchange in the Montlake area and in the profile of the west approach. The differences between the Preferred Alternative and the SDEIS options can be summarized as follows:

Preferred Alternative

The Preferred Alternative is similar to today's configuration in terms of its geometry, although wider, and the west approach profile is taller. It maintains the existing location of the Montlake interchange, but changes the westbound off-ramp so that it connects to 24th Avenue East first, followed by a connection to Montlake Boulevard (Exhibit ES-6). It adds a new bascule bridge over the Montlake Cut, parallel to the existing Montlake Bridge. It includes a 1,400-foot lid over Montlake Boulevard with landscaping, ramps, transit facilities, and pathways, and provides near-term transit enhancements along with the ability to accommodate potential future light rail on SR 520. It does not include a lid in the I-5 / Roanoke area.

Option A

Option A was also similar to a widened version of today's configuration. It maintained the existing location of the Montlake interchange and added a new bascule bridge over the Montlake Cut, parallel to the existing Montlake Bridge. It included a partial landscaped lid over Montlake Boulevard (Exhibit ES-7).

Option K

Option K included a new single-point urban interchange about a half mile east of the existing Montlake interchange. The new interchange ramps would pass below the SR 520 roadway, with the northern leg of the interchange crossing beneath the Montlake Cut in a tunnel (Exhibit ES-8).

Option L

Option L also included a single-point urban interchange with a similar alignment to that in Option K. However, instead of being beneath the SR 520 main line, the interchange ramps would rise above it. The northern leg of the interchange would cross the Montlake Cut on a new bascule bridge (Exhibit ES-9).

The Preferred Alternative, like the SDEIS options, places an emphasis on multimodal transportation by decreasing reliance on single-occupant vehicle travel, facilitating transit connections, and improving the overall flow of SR 520 traffic compared to No Build. Like the SDEIS options, the Preferred Alternative includes lids and landscaped features, stormwater treatment, and a regional bicycle/pedestrian path, although the specific details of those features differ. The key differences between the Preferred Alternative and the SDEIS options are in the larger size of the Montlake lid, the increased emphasis on transit access and reliability in the Montlake interchange vicinity, the proposed noise reduction measures, and the fact that access to and from Lake Washington Boulevard would be via 24th Avenue East instead of separate Lake Washington Boulevard ramps. Table ES-6 compares the Preferred Alternative to the SDEIS options by geographic area.

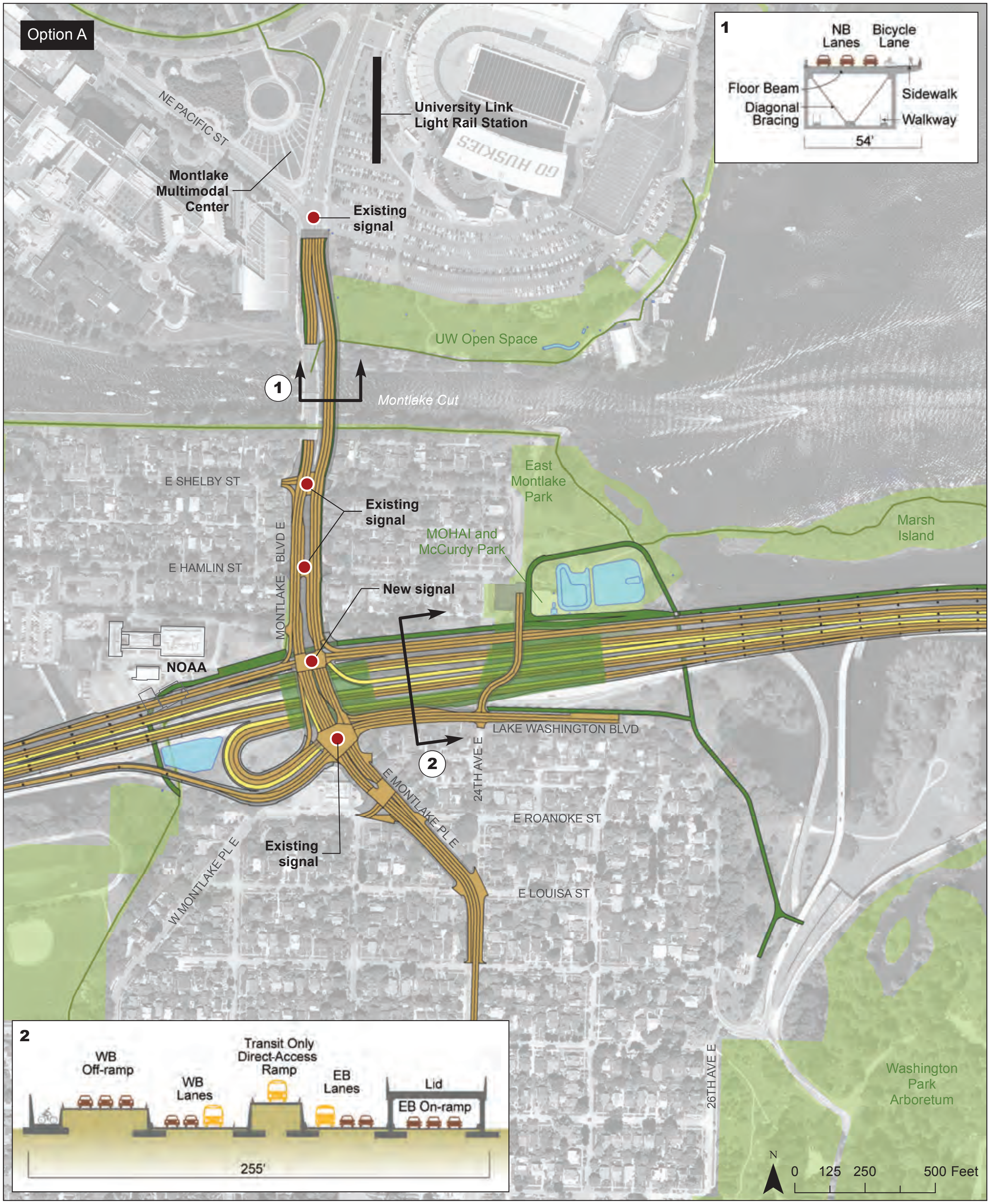
Table ES-5. **Design Elements in Preferred Alternative that Respond to Public, Agency and Tribal Comments**

SDEIS Comment	Source of Comment	How Preferred Alternative Responds to Comment
Project design is not compatible with addition of light rail.	Seattle Mayor's Office, community groups, individuals	Although project has always been designed to accommodate future light rail, modifications have been made to better facilitate potential future light rail connections to University Link station, either within HOV lanes or on separate structure.
New floating bridge would be too high compared to existing conditions and would block views.	Community groups, individuals	Height of bridge has been lowered from approximately 30 feet (in Draft EIS and SDEIS) to approximately 20 feet above lake surface.
Footprint across Arboretum and Foster Island is too wide.	Tribes, Seattle Parks, Arboretum Foundation, individuals	Footprint in Arboretum has been further refined, with right-of-way acquisition reduced from SDEIS options.
West approach bridge should be as high as possible to minimize shading.	Resource agencies, tribes	Preferred Alternative includes a constant slope profile slightly higher than that of SDEIS Option L.
Noise in the corridor should be reduced using methods other than walls, e.g., innovative methods identified by a noise Expert Review Panel (ERP).	Community groups, individuals	As recommended by the ERP, the Preferred Alternative includes 4-foot concrete traffic barriers, noise-absorptive coatings on barriers and lid portals, and lower speed limit west of Montlake lid; as a result, fewer noise walls are warranted. Quieter concrete pavement is also included, although its effectiveness is still being evaluated and it is not an approved noise mitigation measure.
Portage Bay Bridge should be as narrow as possible (6 lanes maximum).	City of Seattle, community groups, individuals	Portage Bay Bridge includes 6 lanes plus a managed shoulder to improve traffic operations during peak hours; overall width is 7 feet less than SDEIS Option A.
The Option A Montlake lid is discontinuous and would not effectively reconnect communities.	Community groups, individuals	Montlake lid has been lengthened to approximately 1,400 feet and extended across SR 520.
Option A with Lake Washington Boulevard ramps would increase wetland impacts and create more traffic in the Arboretum.	Community groups, individuals	Lake Washington Boulevard ramps have been removed, and access to Lake Washington Boulevard has been consolidated with Montlake interchange; traffic through Arboretum is projected to decrease compared to No Build.
Construction of Option K tunnel would have severe impacts on aquatic habitat and species.	Resource agencies, tribes	Preferred Alternative does not include a tunnel.
Mitigation measures are not adequately defined.	Resource agencies, tribes, City of Seattle, community groups, individuals	Detailed mitigation measures and implementation steps have been developed and are included in this Final EIS and its attachments.

Exhibit ES-6. **Montlake Area (Preferred Alternative)**

- Columns
- Signalized intersection
- Existing regional bicycle/pedestrian path
- General-purpose lane
- HOV, direct-access, and/or transit-only lanes
- Proposed bicycle/pedestrian path
- Lid or landscape feature
- Stormwater treatment facility
- Pavement

Exhibit ES-7. **Montlake Area (Option A)**



- Columns
- Signalized intersection
- Existing regional bicycle/pedestrian path
- General-purpose lane
- HOV, direct-access and/or transit-only lane
- Proposed bicycle/pedestrian path
- Lid or landscape feature
- Stormwater treatment facility
- Pavement

Exhibit ES-8. **Montlake Area (Option K)**

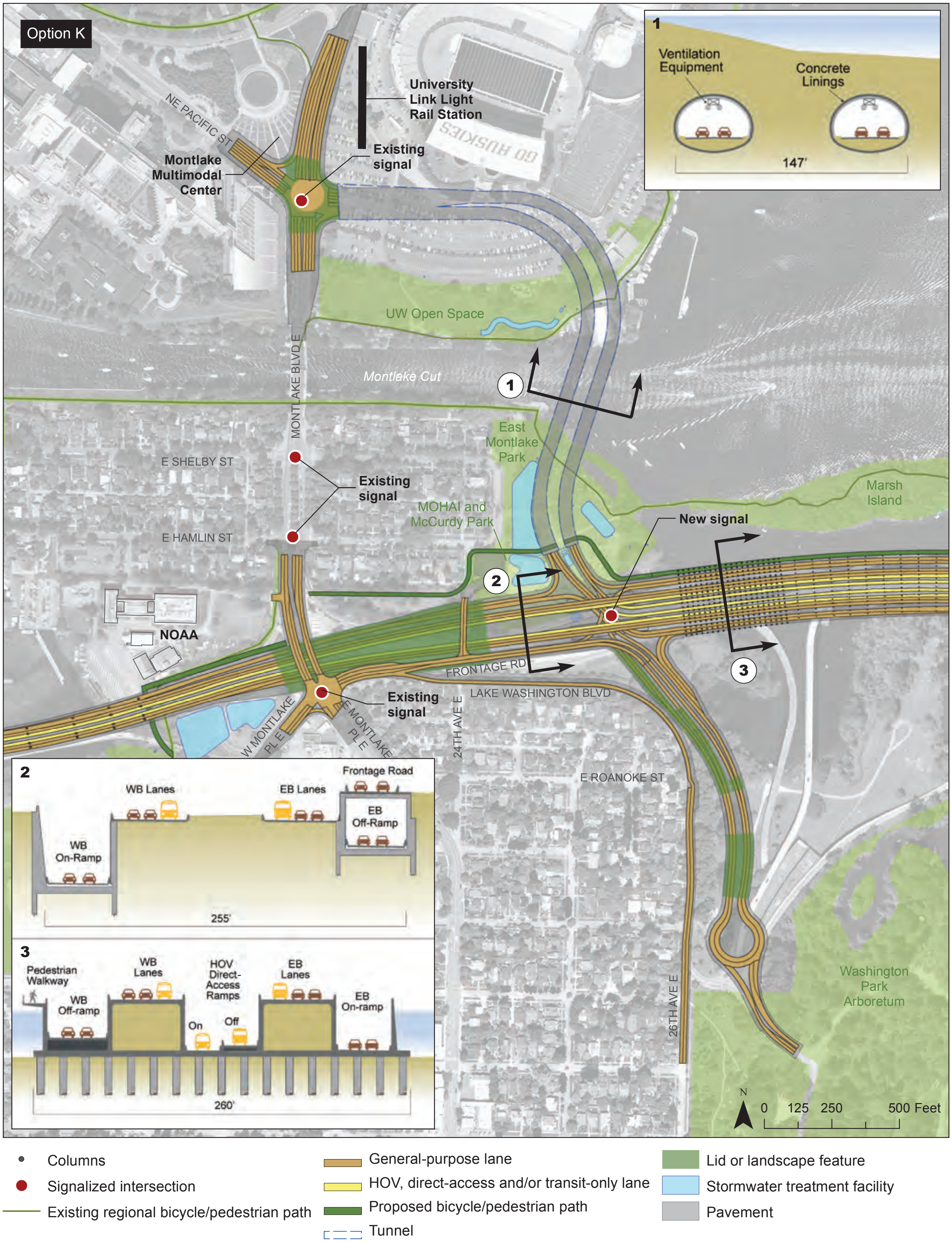
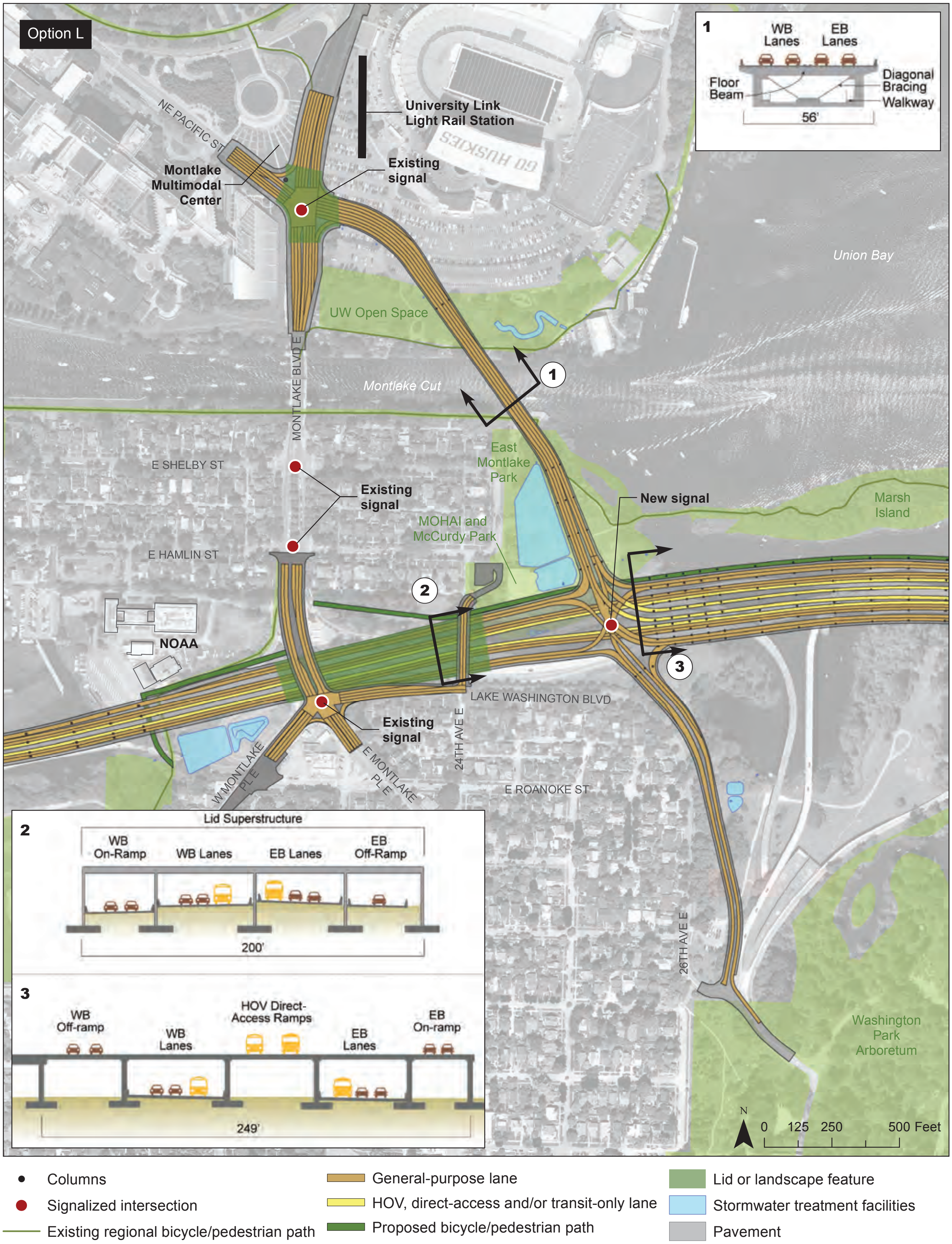


Exhibit ES-9. **Montlake Area (Option L)**



How was the Preferred Alternative refined based on ESSB 6392?

As described in Chapter 1 of the Final EIS, during the 2010 legislative session, the Washington State Legislature passed ESSB 6392. Signed into law by Governor Gregoire, the bill outlined specific areas and elements of the Preferred Alternative to be refined through a multi-agency process. In response to this direction from the legislature, WSDOT led a workgroup process in collaboration with the City of Seattle, King County, the University of Washington, and Sound Transit. The ESSB 6392 workgroup was informed by two technical coordination teams established by WSDOT and the Seattle Department of Transportation, one on design refinements and transit connections and the other on transit planning and finance. These teams reported technical findings to the ESSB 6392 workgroup. In addition, the bill directed WSDOT to work with the Arboretum governing board to develop a mitigation plan, and established various reporting timelines for the different work efforts.

The legislature directed that design refinements to the Preferred Alternative be "consistent with the current environmental documents prepared by the department for the supplemental draft environmental impact statement," so as to accommodate a "timely progression" of the SR 520, I-5 to Medina project. Accordingly, the ESSB 6392 workgroup recommendations included only design refinements that were within the range of impacts studied in the SDEIS and would not require additional supplemental analysis.

Some specific recommendations from the workgroup included in the Preferred Alternative are:

- Enhance bicycle and pedestrian connections
- Design the Portage Bay Bridge to include a planted strip and managed shoulder
- Modify bus stops in the Montlake Triangle area to accommodate more users and minimize pedestrian and transit travel times
- Implement transit/HOV lanes on Montlake Boulevard
- Identify proposed traffic calming and traffic management strategies in the Arboretum
- Implement noise reduction strategies throughout the corridor
- Accommodate future light rail transit on the floating bridge and approach structures

The full reports from each workgroup contain additional recommendations and detailed descriptions of their processes. The Arboretum Mitigation Plan can be found in Attachment 9 and the ESSB 6392: Design Refinements and Transit Connections Workgroup Recommendations Report can be found in Attachment 16. The High Capacity Transit Planning and Financing Findings and Recommendations Report is located on the WSDOT website at www.wsdot.wa.gov/Projects/SR520Bridge/6392workgroup.htm.

Table ES-6. **Preferred Alternative compared to SDEIS**

Geographic Area	Preferred Alternative	Comparison to SDEIS Options A, K, and L
I-5/Roanoke Area	The SR 520 and I-5 interchange ramps would be reconstructed with generally the same ramp configuration as the ramps for the existing interchange. A new reversible transit/ HOV ramp would connect with the I-5 express lanes.	Similar to all options presented in the SDEIS. Instead of a lid over I-5 at Roanoke Street, the Preferred Alternative would include an enhanced bicycle/ pedestrian path adjacent to the existing Roanoke Street Bridge.
Portage Bay Area	The Portage Bay Bridge would be replaced with a wider and, in some locations, higher structure with six travel lanes and a 14-foot-wide westbound managed shoulder.	Similar in width to Options K and L, similar in operation to Option A. Shoulders are narrower than described in SDEIS (2-foot-wide inside shoulders, 8-foot-wide outside shoulder on eastbound lanes), posted speed would be reduced to 45 mph, and median plantings would be provided to create a boulevard-like design.
Montlake Area	The Montlake interchange would remain in a similar location as today. A new bascule bridge would be constructed over the Montlake Cut. A 1,400-foot-long lid would be constructed between Montlake Boulevard and the Lake Washington shoreline, and would include direct-access ramps to and from the Eastside. The Lake Washington Boulevard ramps would be removed, and access would be provided to Lake Washington Boulevard via a new intersection at 24th Avenue East.	Interchange location similar to Option A. Lid would be approximately 75 feet longer than previously described for Option A, and would be a complete lid over top of the SR 520 main line, which would require ventilation and other fire, life, and safety systems. Transit connections would be provided on the lid to facilitate access between neighborhoods and the Eastside. Montlake Boulevard would be restriped for two general-purpose lanes and one HOV lane in each direction between SR 520 and the Montlake Cut.
West Approach Area	The west approach bridge would be replaced with wider and higher structures, maintaining a constant profile rising from the shoreline at Montlake out to the west transition span. Bridge structures would be compatible with potential future light rail through the corridor.	Bridge profile similar to and higher than Option L; structure types similar to Options A and L. The gap between the eastbound and westbound structures would be wider than previously described to accommodate light rail in the future.
Floating Bridge Area	A new floating span would be located approximately 190 feet north of the existing bridge at the west end and 160 feet north of the existing bridge at the east end. The floating bridge would be approximately 20 feet above the water surface (about 10 to 12 feet higher than the existing bridge deck).	Similar to design described in the SDEIS. The profile of the bridge would be approximately 10 feet lower than described in the SDEIS, and most of the roadway deck support could be constructed of steel trusses instead of concrete columns.
Eastside Transition Area	A new east approach to the floating bridge, and a new SR 520 roadway would be constructed between the floating bridge and Evergreen Point Road.	Same as described in the SDEIS.

Project Effects and Mitigation

This section of the Executive Summary provides an overview of how the SR 520, I-5 to Medina project would affect the built and natural environment. There is a separate summary of project effects and mitigation for each environmental discipline evaluated during the NEPA process. The summaries compare the Preferred Alternative and Options A, K, and L with the No Build Alternative. Tables and graphics are used wherever possible to provide these comparisons in an easy-to-understand format. Generally, each discipline discusses effects common to all options first, followed by effects unique to the Preferred Alternative or Options A, K, or L. For each environmental discipline evaluated in the following sections, mitigation measures are outlined for construction and operational effects. In some cases, no mitigation measures are indicated if they are not warranted under NEPA or other applicable regulations.

As its name suggests, this Executive Summary provides a high-level overview of key study results that differentiate the alternatives and options. Readers who are interested in more detailed analysis should refer to the full text of the Final EIS, where project operational effects and mitigation are described in Chapter 5 and construction effects and mitigation in Chapter 6. Those who want to delve even more deeply into specific aspects of the analysis can consult the discipline reports and addenda in Attachment 7 to the Final EIS, which can be found on the project website (www.wsdot.wa.gov/projects/SR520bridge) and on a DVD included with this document. These reports, which are more complex and lengthy than the EIS discussion, provide the technical basis for findings presented in this document and the Final EIS.

Transportation

The Preferred Alternative and the SDEIS options are designed to improve safety and mobility in the SR 520 corridor by facilitating traffic flow and operations on SR 520, as well as access between the freeway and the local road system. The project would improve transit connections and reliability, and would provide new facilities and connections for nonmotorized transportation (bicycles and pedestrians). This section provides a summary of findings from the updated Final EIS No Build Alternative and Preferred Alternative analyses and compares them with the findings from the SDEIS, which included an analysis of the No Build Alternative and Options A, K, and L.

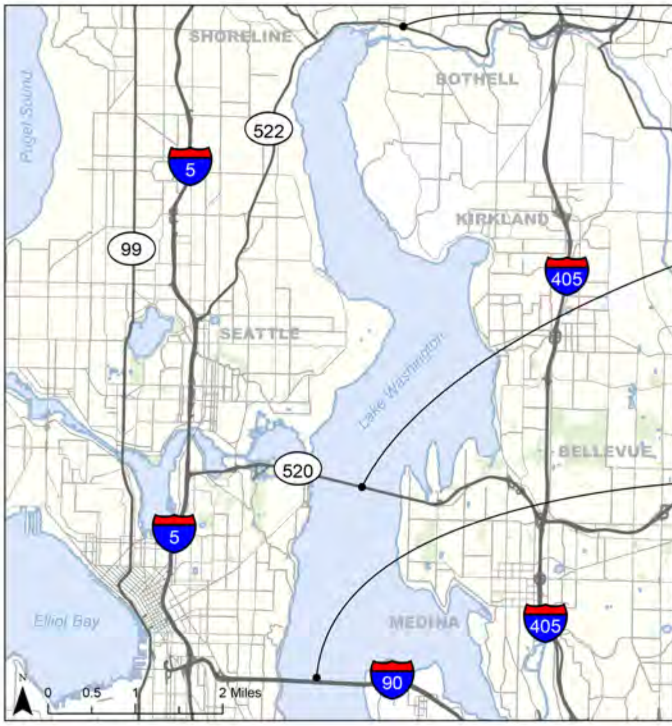
Transportation benefits of the Preferred Alternative include:

- Completes the SR 520 transit and HOV lane system from I-5 to SR 202.
- Moves nearly 4,000 more people across SR 520 daily in 5 percent fewer vehicles than the No Build Alternative.
- Reduces traffic volumes on Lake Washington Boulevard by up to 32 percent through the Washington Park Arboretum.
- General-purpose and transit travel times on SR 520 would be up to 24 minutes faster from Seattle to Bellevue during the morning commute.
- Travel times on I-5 would improve by up to 24 minutes as a result of the SR 520 project improvements.

Table ES-7. **Commute Peak Period Travel Times (minutes), I-5 to SR 202 (2030)**

		AM Peak Period			PM Peak Period		
Direction	**Lane**	**Existing**	**No Build Alternative**	**Preferred Alternative**	**Existing**	**No Build Alternative**	**Preferred Alternative**
Westbound	General Purpose	19	27	15	33	39	17
	HOV	16	16	14	23	18	15
Eastbound	General Purpose	22	23	16	18	20	20
	HOV	22	22	14	18	16	14

Exhibit ES-10. **Daily Vehicle Demand Volumes on SR 522, SR 520, and I-90**



SR 522 West of 61st Ave NE

ALTERNATIVE	VEHICLES	% CHANGE
Existing Conditions	49,000	
Year 2030 No Build Alternative	53,200	9%[1]
Year 2030 Preferred Alternative	54,400	2%[2]

SR 520 at Mid-span

ALTERNATIVE	VEHICLES	% CHANGE
Existing Conditions	115,000	
Year 2030 No Build Alternative	127,400	11%[1]
Year 2030 Preferred Alternative	120,900	-5%[2]

I-90 at West Bridge

ALTERNATIVE	VEHICLES	% CHANGE
Existing Conditions	149,000	
Year 2030 No Build Alternative	149,400	0%[1]
Year 2030 Preferred Alternative	151,500	1%[2]

[1] Compared to existing conditions
[2] Compared to year 2030 No Build Alternative

Source: King County (2008) GIS Data (Streams, Streets, Water Bodies), CH2M HILL (2008) GIS Data (Park). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.

Operational Effects

Traffic Volumes and Travel Times

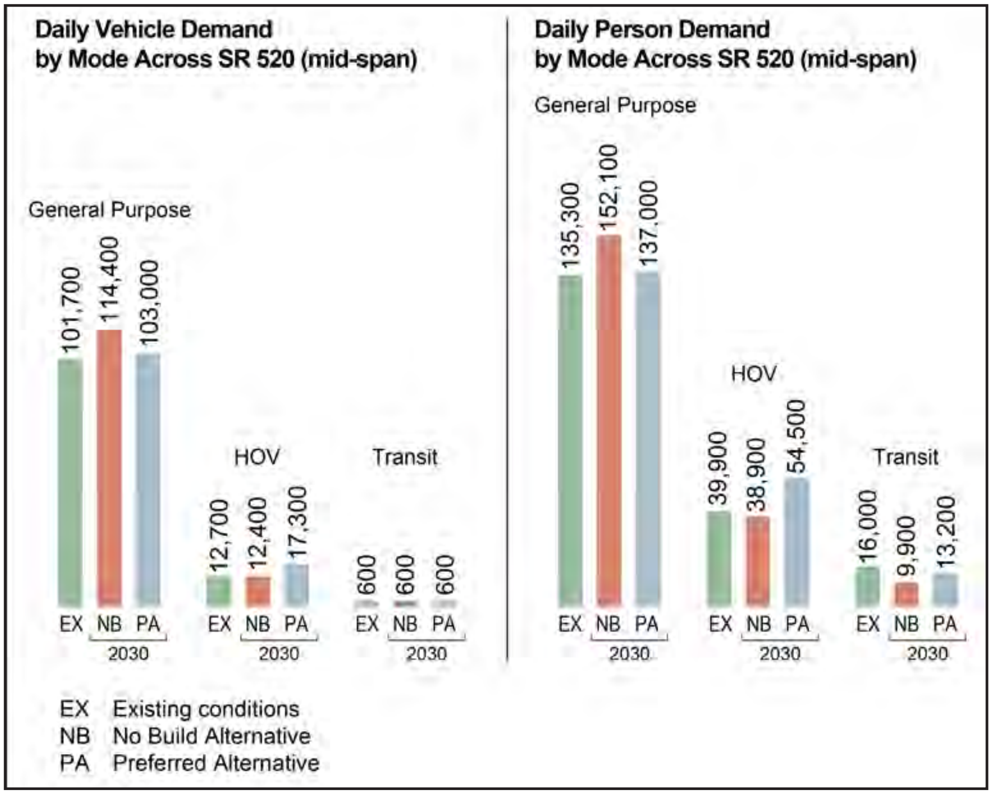
The Preferred Alternative and all SDEIS options include HOV lanes in both directions, an HOV direct-access ramp to the I-5 express lanes, and HOV bypass lanes on all on-ramps. These improvements would allow more people to move through the corridor in fewer vehicles than the No Build Alternative (Exhibit ES-10), reducing congestion and improving travel times for general-purpose vehicles, transit, and HOVs. As shown in Exhibit ES-11, general-purpose trips for both vehicles and people would be reduced compared to No Build, while carpooling and transit use would increase substantially. Travel times would improve during the morning commute peak period for both the eastbound and westbound directions. During the evening commute, westbound travel times under the Preferred Alternative would improve for both general-purpose and HOV traffic; eastbound HOV travel times would improve slightly, while eastbound general-purpose traffic would see no change in travel times (Table ES-7). Similar results would occur with SDEIS Options A, K, and L.

Local Street Operations

The Preferred Alternative and all the SDEIS options would improve local street operations compared to No Build by providing additional capacity across the Montlake Cut and reducing congestion that currently spills back from westbound SR 520 onto southbound Montlake Boulevard. Exhibit ES-10 compares local street operations and traffic volumes under the Final EIS No Build Alternative and the Preferred Alternative, while Exhibit ES-11 shows the results for the SDEIS No Build Alternative and design options A, K, and L.

Under the Preferred Alternative, travel patterns on local streets in the area would change due to the direct-access HOV ramp from SR 520, the removal of the Lake Washington Boulevard ramps, and the addition of a new bascule bridge adjacent to the existing bridge on Montlake Boulevard. The new bascule bridge and the addition of a second general-purpose lane to the SR 520 eastbound on-ramp would reduce congestion and delay for both transit and general-purpose traffic in both directions on Montlake Boulevard between East Roanoke Street and NE Pacific Street. Removal of the Lake Washington Boulevard ramps would result in lower traffic volumes through

Exhibit ES-11. **SDEIS Analysis – Traffic Volume Changes During the PM Peak Period**



the Arboretum compared to the No Build Alternative, improving conditions for park users.

As shown in Exhibit ES-11, SDEIS Option A would remove the Lake Washington Boulevard ramps that exist today, provide direct transit access from the westbound SR 520 HOV lane, and add a new Montlake bridge. These changes would also improve traffic flow on Montlake Boulevard compared to No Build. Traffic in the Arboretum would be less than with No Build unless the suboption to include the Lake Washington Boulevard ramps were implemented.

Option K would include a new lowered single-point urban interchange that would combine the functions of the existing SR 520/Montlake Boulevard and Lake Washington Boulevard ramps. Traffic volumes in the Montlake Boulevard interchange area are forecasted to increase under Option K compared to the No Build Alternative because drivers would take advantage of the capacity associated with the new interchange and crossing of the Montlake Cut. Traffic volumes through the Arboretum would increase compared to No Build.

Traffic forecasts, travel patterns, and operations would be the same under Options K and L, except that vehicles would not be able to access the new interchange from Lake Washington Boulevard southbound. Instead, drivers would go north on Montlake Boulevard to the Montlake Boulevard/ NE Pacific Street intersection and would turn right to access the new bridge connection to the new interchange. As a result, Montlake Boulevard traffic volumes under Option L would not decrease as much as under Option K compared to the No Build. However, they would still be substantially less than under the No Build Alternative between Lake Washington Boulevard and NE Pacific Street in the morning and afternoon peak hours.

Bus Facilities and Service

The Preferred Alternative and the SDEIS options would all provide improved access for HOV and transit in the Montlake interchange area, but design details would vary. As shown in Exhibit ES-12, the Preferred Alternative and the SDEIS options would all result in the following changes to bus operations:

- Add HOV lanes in both directions across SR 520 from Evergreen Point Road to I-5.

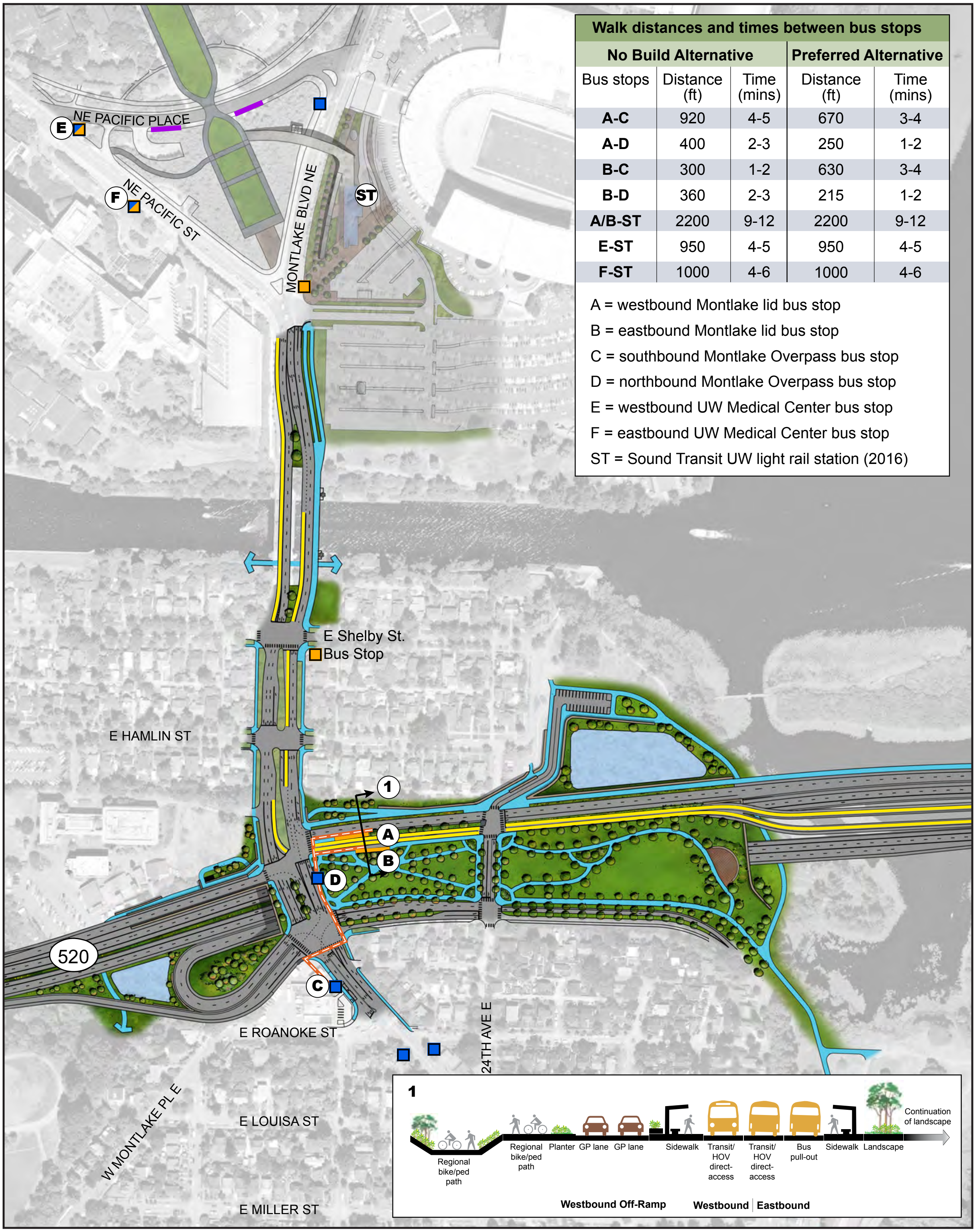
- Add an HOV direct connection to the I-5 express lanes that would operate westbound-to-southbound in the morning and northbound-to-eastbound in the afternoon.
- Add HOV direct-access ramps to the Montlake interchange area, connecting with SR 520 to and from the east. Option A is the only exception because it did not provide direct access from Montlake to the east.
- Remove the Montlake Freeway Transit Station, with connections provided at a new multimodal facility at Montlake Boulevard and NE Pacific Street.
- As shown in Exhibit ES-13, the Preferred Alternative would also include:
  - Bus stops on the new Montlake lid to help replace the function of the Montlake Freeway Transit Station.
  - HOV lanes to Montlake Boulevard NE from SR 520 (southbound between NE Pacific Street and East Shelby Street and northbound between SR 520 to the Montlake Cut).
  - Signal priority at the interchange area.

Transit benefits of the Preferred Alternative include:

- The direct-access ramp on the Montlake lid, a second Montlake bridge, and transit/HOV lanes on Montlake Boulevard all contribute to improving off-peak travel time for local buses between 7 and 12 minutes.
- In the peak periods, transit traveling between the Montlake Triangle area and the Montlake interchange area would save approximately 5 minutes.
- A new bus-only lane and northbound bus stop on Montlake Boulevard improve reliability for local transit routes.
- New Montlake lid bus stops would remain open for all buses in the off-peak period, allowing the flyer stop functions to remain as they are today.
- Most transit riders would have a 1- to 2-minute shorter transfer time due to short walking distances and no stairs between local and SR 520 bus stops. Transit stops will be located on a landscaped lid instead of adjacent to the freeway lanes.
- Transit signal priority is accommodated at key intersections.

Exhibit ES-12. **HOV and Transit Improvements Along SR 520 with the Preferred Alternative**

Exhibit ES-13. **Preferred Alternative Transit and HOV Facilities Within Montlake Area**



Walk distances and times between bus stops

	No Build Alternative		Preferred Alternative	
Bus stops	Distance (ft)	Time (mins)	Distance (ft)	Time (mins)
A-C	920	4-5	670	3-4
A-D	400	2-3	250	1-2
B-C	300	1-2	630	3-4
B-D	360	2-3	215	1-2
A/B-ST	2200	9-12	2200	9-12
E-ST	950	4-5	950	4-5
F-ST	1000	4-6	1000	4-6

A = westbound Montlake lid bus stop
B = eastbound Montlake lid bus stop
C = southbound Montlake Overpass bus stop
D = northbound Montlake Overpass bus stop
E = westbound UW Medical Center bus stop
F = eastbound UW Medical Center bus stop
ST = Sound Transit UW light rail station (2016)

- Bus Stop (Local Route)
- Bus Stop (SR 520 Route)
- Bus Stop (Local and SR 520 Route)
- Layover Area
- HOV Lanes
- Bicycle/Pedestrian Path

N

Parking

The Preferred Alternative would have fewer parking effects than SDEIS options A, K, and L. Option L would have the greatest overall effect on parking due to construction of the northern interchange ramps across the Montlake Cut, which would pass through the Husky Stadium's south parking lot.

All options would require removal of most or all of the parking provided at the Museum of History and Industry (MOHAI) facility, and the existing lot at Bagley Viewpoint Park due to construction of the 10th and Delmar lid. At NOAA Northwest Fisheries Science Center (NWFSC), only the portion of the facility parking lot located on WSDOT right-of-way under the Portage Bay structure would be removed under the Preferred Alternative. Under Option A, roughly 12 spaces could be removed from the portion of the parking lot that is not under the existing structure due to column placement. Options K and L would not affect parking at this location. WSDOT continues to work with NOAA to minimize or mitigate parking effects. Total parking effects of each option are as follows:

Preferred Alternative

The Preferred Alternative would remove approximately 172 parking spaces in the project area (this number includes 124 spaces from the MOHAI location).

Option A

Option A would remove approximately 196 parking spaces in the project area (this number includes 150 spaces from the MOHAI location).

Option K

Option K would remove approximately 211 parking spaces in the project area (this number includes 150 spaces from the MOHAI location).

Option L

Option L would remove approximately 337 parking spaces in the project area (this number includes 150 spaces from MOHAI and 171 spaces from the University of Washington (UW) Husky Stadium lot).

Pedestrian and Bicycle Traffic

The Preferred Alternative and the SDEIS options would meet the project goals of providing mobility benefits in the SR 520 corridor and to the region as a whole. The Preferred Alternative and Options A, K, and L include a new regional bicycle/pedestrian path across the bridge, improvements to intersection connections on the 10th Avenue East and Delmar Drive East lid, and pedestrian and bicycle improvements and connections to trails in the Montlake area.

The Preferred Alternative would add a path on the Roanoke Street bridge over I-5 and new crosswalks at the Harvard Avenue East/Roanoke Street intersection. Under Options A, K, and L, a lid over I-5 would be provided at the existing East Roanoke Street crossing over I-5, extending to the north and south.

The Preferred Alternative and Option A would improve connectivity for bicyclists and pedestrians with other modes of transportation via the Montlake Multimodal Center and University Link light rail station by expanding the pedestrian facilities across the Montlake Cut. Under Options K and L, there would be a lid over the NE Pacific Street/Montlake Boulevard intersection that would provide nonmotorized connections between local bus services and regional bus services.

The Preferred Alternative and SDEIS Options A, K, and L would result in the loss of 54 bicycle locker spaces and 53 bicycle rack spaces near the existing Montlake Freeway Transit Station due to construction of the SR 520 westbound off-ramp. WSDOT, King County Metro, and Sound Transit are working together to determine the best way to replace these bicycle parking facilities.

Mitigation

The project would improve mobility on SR 520 and would meet local traffic concurrency standards. WSDOT has identified several potential intersection improvements that may benefit local traffic operations and will work with the Seattle Department of Transportation to determine their potential effectiveness (see Section 5.1 of the Final EIS for more details).

Construction Effects

The Preferred Alternative and SDEIS options would have similar construction effects on transportation through most of the project area, with differences in the vicinity of the Montlake Boulevard interchange. Most intersections would operate similarly to existing conditions, with localized areas of reduced or increased congestion during certain parts of the construction period. Options K and L would result in more effects than the Preferred Alternative and Option A because of the amount of truck traffic required for construction of the new single point urban interchange (SPUI) and the traffic effects during the closure of NE Pacific Street.

Temporary Road Cosures and Detours

During weekday peak periods, WSDOT would maintain two through lanes on SR 520 in each direction. The on- and off-ramps at Montlake Boulevard would remain open, or temporary ramp connections would be constructed. The Preferred Alternative and SDEIS options would close the Lake Washington Boulevard ramps for some period of time during construction (Exhibit ES-14). Traffic that currently uses the Lake Washington Boulevard ramps would be detoured to use the ramps at Montlake Boulevard. The ramp closures would mostly affect local street operations and are not expected to have a substantial effect on SR 520 operations. A number of improvements would be made to the ramps at Montlake Boulevard in order to accommodate the detour traffic. Refinements to construction sequencing since the SDEIS have eliminated the need for the closure of Delmar Drive East.

Preferred Alternative and SDEIS Options

The Preferred Alternative and all SDEIS options would require the closure of the 24th Avenue East bridge across SR 520 north of Lake Washington Boulevard for approximately one year while the bridge is demolished and reconstructed.

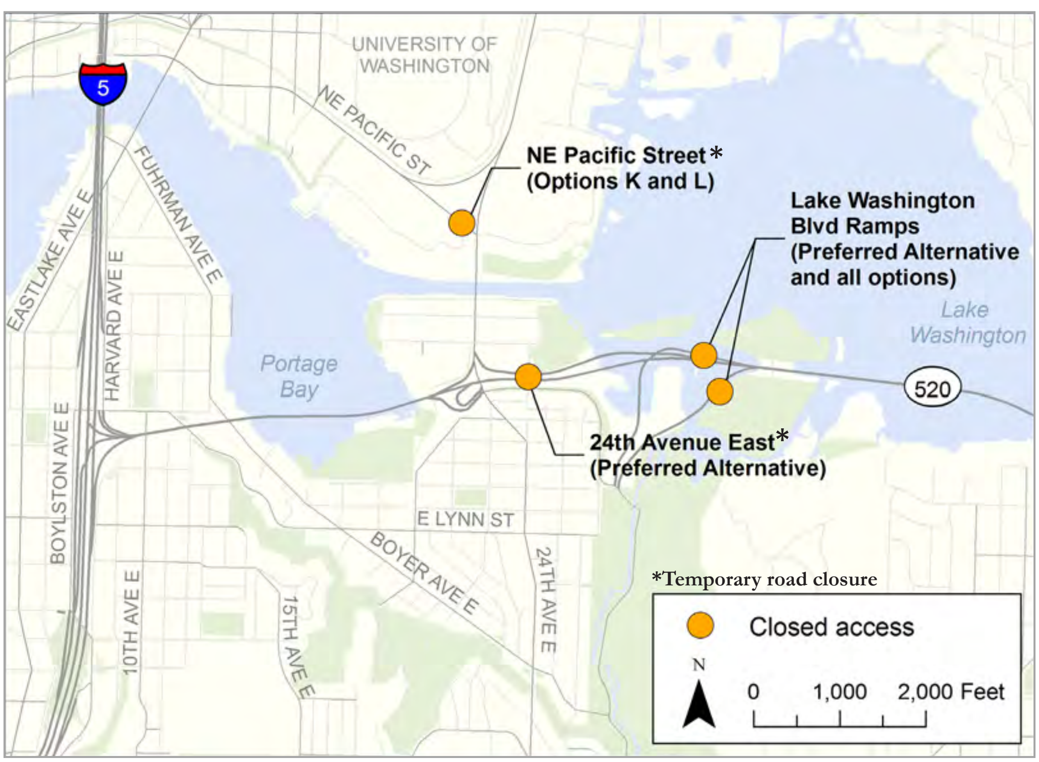
Options K and L

Options K and L would close NE Pacific Street for 9 to 12 months. During this closure, detour traffic would turn at the Montlake Boulevard NE/NE Pacific Place intersection. Even with improvements to accommodate the additional detour traffic, the intersection would be severely congested.

Haul Routes

Exhibit ES-15 shows the potential primary and secondary truck haul routes evaluated for the Preferred Alternative and SDEIS design options. The majority of haul route

Exhibit ES-14. **Road Closures for Preferred Alternative and Options A, K, and L**



traffic would be on I-5 and SR 520, these main routes would be more efficient for contractors to access work sites. Whenever possible, crews will work from the WSDOT right of way or build temporary direct-access connections to work sites and staging areas from SR 520. Most of the construction truck trips would use Montlake Boulevard to access SR 520. A few other arterials would be affected, but the estimated number of construction truck trips along these arterials would be relatively low compared to existing overall traffic volumes.

Transit

The Montlake Freeway Transit Station would remain open during construction, with closures for short periods of time to accommodate construction activities. During closures, riders would make their transfers along Montlake Boulevard or on the Eastside, depending on where their trips started and ended. The two bus stops along Montlake Boulevard nearest the SR 520 interchange would be temporarily relocated during construction. Midday transit travel times during construction on routes that use Montlake Boulevard would be between 3 minutes faster and 4 minutes slower than existing travel times, depending upon the stage of construction and the specific bus route used.

Parking

The Preferred Alternative and Options A, K, and L would temporarily affect parking at the Bagley Viewpoint (10 spaces), along 24th Avenue East (5 spaces), and along Lake Washington Boulevard (35 spaces).

The Preferred Alternative and SDEIS options would also affect parking in the UW E-11 and E-12 lots, the NOAA NWFSC, MOHAI, the WSDOT public lot on East Lake Washington Boulevard though the effects would differ with each option. MOHAI operations would not be affected because operations would be moved prior to the start of construction.

Pedestrian and Bicycle Traffic

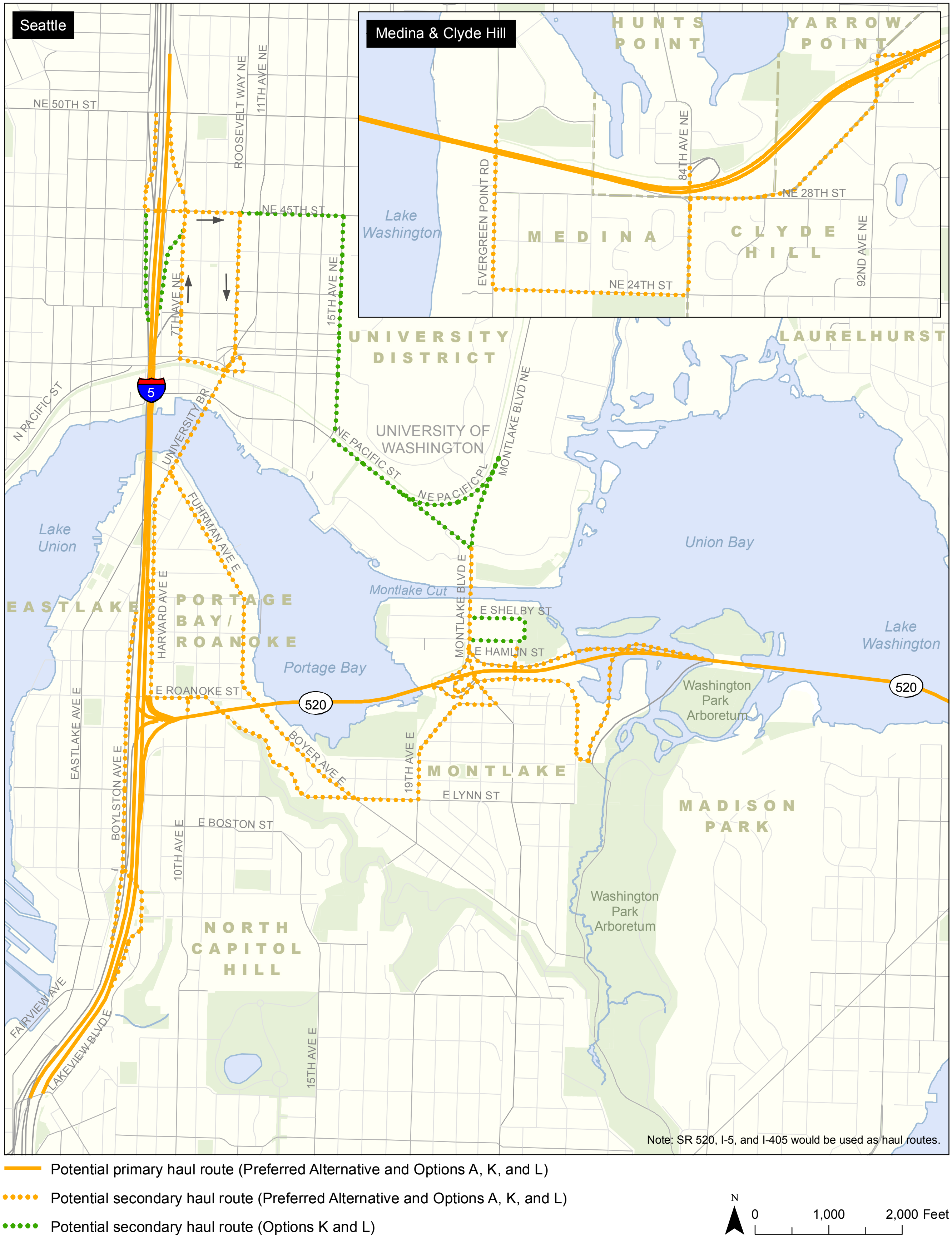
The Preferred Alternative and SDEIS options would close the 24th Avenue East bridge and the Bill Dawson Trail for most of the construction duration, leaving only Montlake Boulevard open to pedestrian and bicycle traffic. Bicycle and pedestrian access may be restricted to one side of Montlake Boulevard.

The NE Pacific Street intersection would be affected by Options K and L due to reconstruction of the intersection at NE Pacific Place and Montlake Boulevard NE. The Preferred Alternative is similar to Option A, and would not substantially affect this intersection.

Mitigation

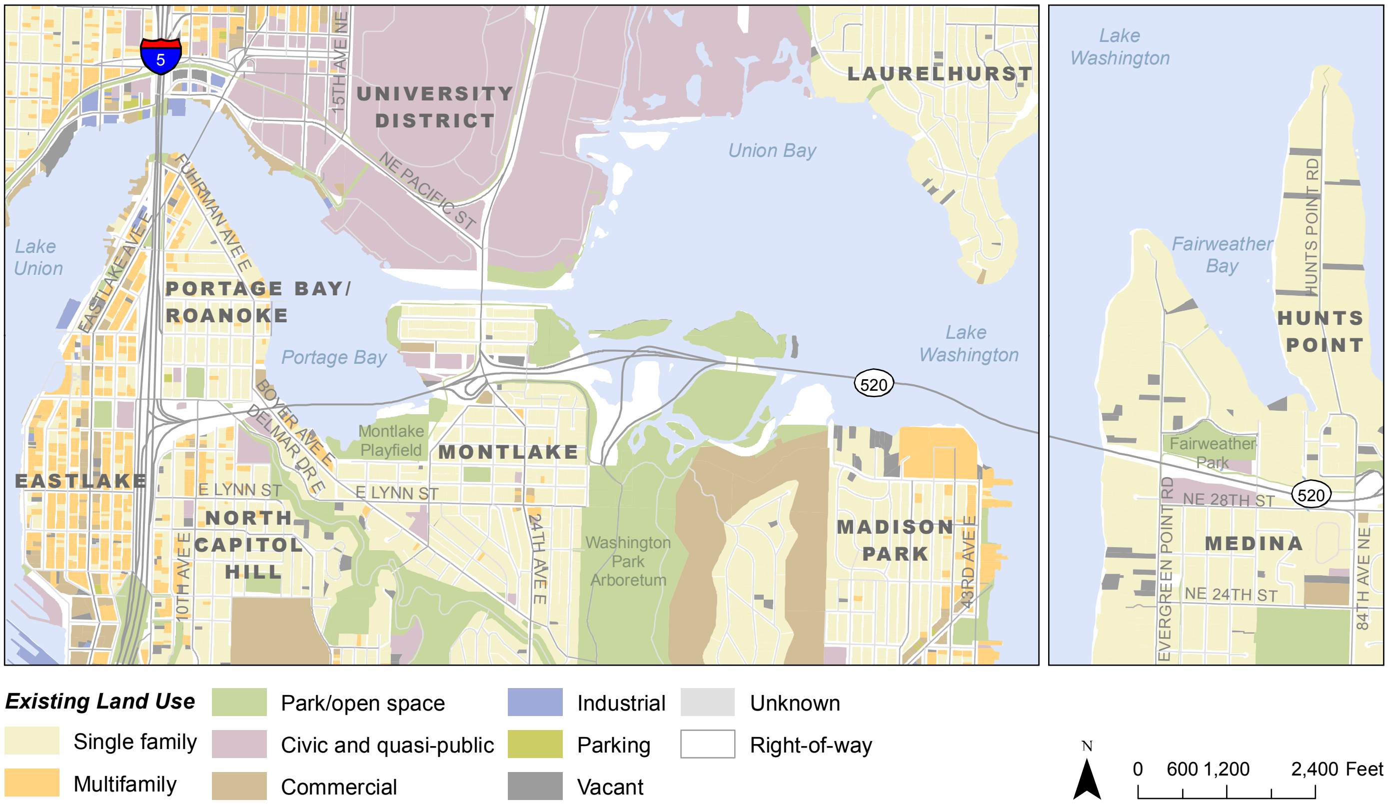
WSDOT will develop a construction traffic management plan to ensure that construction effects on local streets, property owners and businesses are minimized. This plan will involve coordination with the Seattle Department of Transportation and transit agencies. WSDOT may also implement travel demand management measures to provide additional travel options during construction. Please see Section 6.1 of the Final EIS for more information.

Exhibit ES-15. **Potential Haul Routes for Preferred Alternative and Options A, K, and L**



Land Use, Economics, and Relocations

Exhibit ES-16. **Existing Land Use**



Operational Effects

WSDOT would acquire some of the land adjacent to the existing corridor for new permanent right-of-way in order to accommodate alignment and interchange improvements. The number of acres that would be converted to right-of-way and the number of structures affected would differ slightly with the Preferred Alternative and Options A, K, and L. The estimated property tax effects from these land acquisitions would be similar between the Preferred Alternative and SDEIS options, and would result in a less than 0.01 percent decrease in overall tax revenue. Property acquisition and relocations will be completed in accordance with Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

Preferred Alternative

The Preferred Alternative would require the least amount of new right-of-way (10.6 acres). This alternative would result in 9 full parcel acquisitions, and would remove 6 residential structures and the MOHAI building.

Option A

Option A would require 11.1 acres of new right-of-way. This option would result in 7 full parcel acquisitions, and would remove 6 residential structures, the MOHAI building, the Montlake 76 gas station, and 9 of the 11 buildings on the south campus of the NOAA NWFSC.

Option K

Option K would require the most new right-of-way (15.7 acres). This option would result in 6 full parcel acquisitions, and would remove 4 residential structures and the MOHAI building.

Option L

Option L would require 11.9 acres of new right-of-way. This option would result in 5 full parcel acquisitions and would remove 4 residential structures and the MOHAI building.

The Preferred Alternative and all design options would be consistent with local and regional land use plans and policies.

Construction Effects

For the Preferred Alternative and SDEIS options, construction would occur within existing WSDOT right-of-way, adjacent to SR 520, to the greatest extent possible. However, in some places within the project area, land now used for other purposes would be used for construction. Construction easements would affect a portion of the Seattle Fire Station 22 property on East Roanoke Street. During construction, the station would be fully operational, access would be maintained, and emergency response would not be affected.

Preferred Alternative

The Preferred Alternative would require construction easements on land in the UW Open Space (immediately north of the Montlake Cut); within East Montlake Park; east of the new Montlake Boulevard bascule bridge; along East Lake Washington Boulevard and East Montlake Boulevard; and at the existing SR 520/East Montlake Boulevard interchange.

Option A

Construction effects with Option A would be similar to the Preferred Alternative; however, Option A would permanently remove the Montlake 76 gas service station on Montlake Boulevard East at the SR 520 ramps. Although some of the parcel would be converted to WSDOT right-of-way, most of the parcel would be used for construction staging, vacated by WSDOT after construction, and available for development after construction.

Options K and L

Options K and L would relocate the UW's Waterfront Activities Center throughout the construction duration.

The loss of parking near Husky Stadium could inconvenience UW Medical Center employees, event attendees, and campus visitors.

In Portage Bay, the boat slips on the south side of the southernmost dock at the Queen City Yacht Club and all slips at the Bayshore Condominiums would be removed to accommodate construction of the Portage Bay Bridge. These moorages would be replaced after construction was completed.

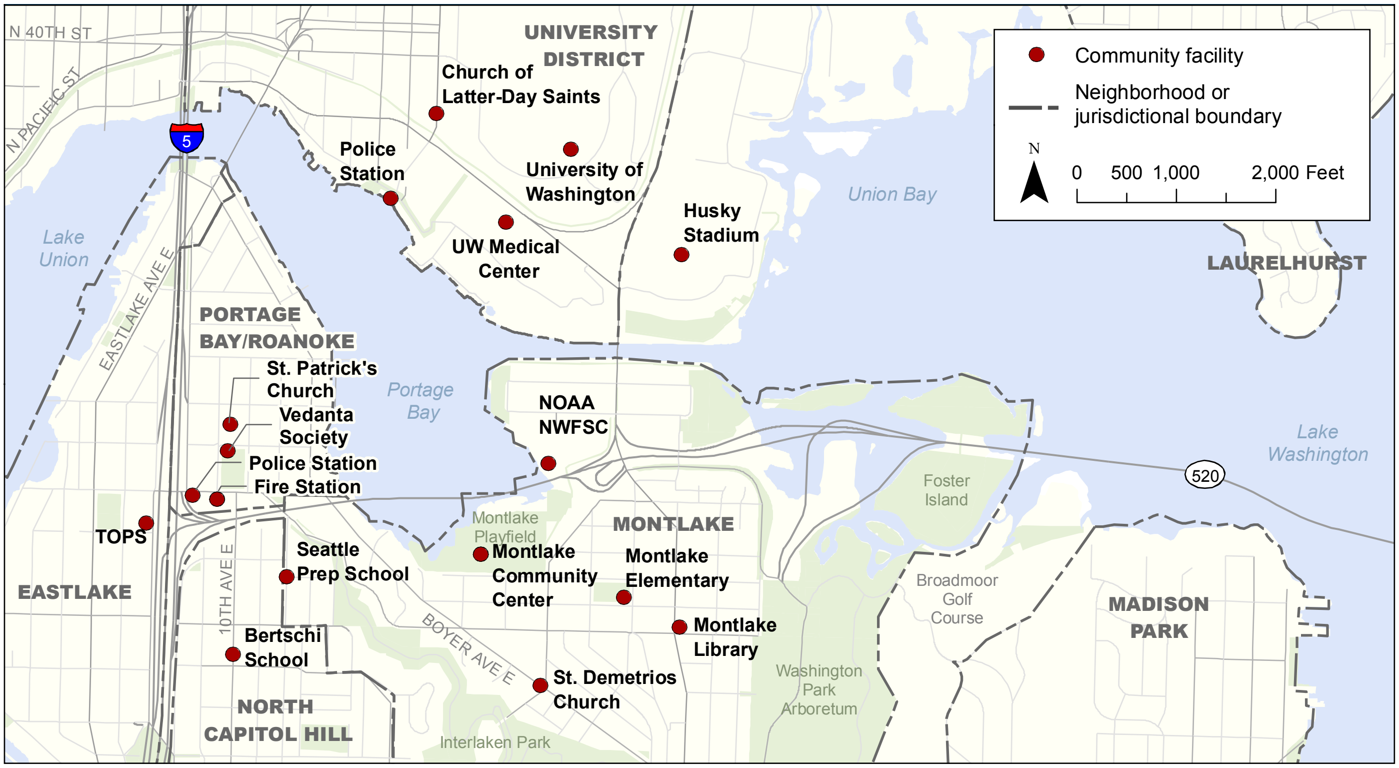
The positive effects of construction-related jobs, spending (e.g., project spending and spending by construction workers), and resulting sales tax revenues would be widely dispersed through the local and regional economies.

Mitigation

WSDOT will coordinate with business owners to provide alternative access and appropriate detour signage. The temporary loss of boat moorage at Queen City Yacht Club and the Bayshore Condominiums would be mitigated through relocation of boats to temporary moorages. If Option K or L were selected, WSDOT would coordinate with the UW to temporarily relocate the functions of the UW Waterfront Activities Center and to address reduced parking availability and associated revenues at Husky Stadium lots. Specific mitigation measures have not been determined at this time.

Social Elements

Exhibit ES-17. **Neighborhoods and Community Facilities**



Operational Effects

The Preferred Alternative and the SDEIS options include lids that would benefit community cohesion by reconnecting neighborhoods originally bisected by SR 520 and/or I-5, providing linkages between adjacent and nearby parks, improving views toward the highway from nearby residences, and providing safe passage across I-5 and SR 520. In addition, the project would reduce noise at many locations near SR 520, improve local traffic circulation, reduce air pollutant emissions, add new park land, and enhance the Washington Park Arboretum. The overall effect of project operation on social elements is therefore expected to be positive.

However, the environmental justice analysis concluded that, after mitigation, the project would not have a disproportionately high and adverse effect on minority or low-income populations. Tolling for the project would adversely affect low-income populations; in addition, construction of the new Evergreen Point and west approach bridges would have adverse effects on tribal treaty fishing and on the Foster Island traditional cultural property. See Section 5.3 of the Final EIS for a discussion of the environmental justice analysis.

Mitigation

Environmental justice effects are being addressed through a variety of measures described in Section 5.3 of the Final EIS, including:

- Outreach to low-income and minority populations regarding tolling on SR 520, along with increases in transit service that will provide benefit to low-income users of SR 520.
- Consultation with the Muckleshoot Indian Tribe, Suquamish Tribe, Snoqualmie Tribe, and Tulalip Tribes to mitigate for effects on the Foster Island traditional cultural property through a Foster Island Treatment Plan.

- Government-to-government consultation between FHWA, the Muckleshoot Indian Tribe, and WSDOT that describes commitments made to address the project's effects on treaty fishing and natural resources.

Construction Effects

The Preferred Alternative and SDEIS options would affect adjacent neighborhoods during construction, resulting in negative effects from detours, haul truck traffic, relocated bus stops, and utility service disruptions. Construction would also increase noise, dust, and visual clutter in residential, business, and park areas adjacent to construction zones. These effects could reduce residents' quality of life and limit connections to community resources, patronage at neighborhood businesses, or use of recreational amenities. Partial closures of sidewalks, bicycle routes, trails, and park areas could discourage neighborhood activity and use of community resources.

The Preferred Alternative and SDEIS options would have similar effects in all areas except Montlake and the UW south campus, where the scale and intensity of construction would differ. The scale and intensity of construction-related effects within these areas would be greatest with Option K.

Construction of the project would affect access to tribal fishing areas within the usual and accustomed fishing areas of the Muckleshoot Indian Tribe, although with mitigation these effects would not be disproportionately high and adverse. Transporting pontoons from Grays Harbor to the Port of Seattle would only have a minimal effect on access to tribal fishing grounds, as the travel route already experiences a large amount of vessel traffic.

Effects on the University District and Montlake neighborhoods under Options K and L would include longer and more intense noise, dust, vibration, construction traffic, and visual changes due to construction of the tunnel (Option K) or new bascule bridge and SPUI ramps (Option L).

Closure of NE Pacific Street associated with Options K and L could affect response times and emergency access to UW Medical Center.

Mitigation

WSDOT will continue to work with the project area neighborhoods to keep residents informed of project changes, and to develop neighborhood-specific measures to address anticipated construction effects. WSDOT is developing a community construction management plan (CCMP) to keep residents informed and to help minimize the effects of construction activities on affected communities. A traffic management plan will be prepared that will identify measures and practices to minimize construction effects on local streets, transit and transit users, property owners, and businesses (see Section 6.1, Transportation in the Final EIS). WSDOT will work with utility service providers to prepare a consolidated utility engineering plan that will include sequenced and coordinated schedules for utility work and descriptions of potential service disruptions. WSDOT will work with affected communities to provide advance notice of any service disruptions.

Recreation

Exhibit ES-18. **Parks and Recreational Facilities**

Operational Effects

Under the Preferred Alternative and all SDEIS options, WSDOT would acquire all or part of up to six recreational properties (depending on the alternative) for new permanent right-of-way in order to accommodate alignment and interchange improvements. The Preferred Alternative would result in the least acquisition of park land. The largest acquisitions would occur at McCurdy and East Montlake Parks. The Preferred Alternative and all SDEIS options would also acquire Bagley Viewpoint in its entirety. In addition to land acquisition, the greater width and higher profile of the west approach bridge across Foster Island would change park users' experience in this area.

Removal of the Lake Washington Boulevard ramps under the Preferred Alternative and Option A would benefit the Arboretum by reducing traffic and improving views. The landscaped lids at 10th Avenue East and Delmar Drive East and in the Montlake area would provide new areas for passive recreation. Trails across these lids would further improve connectivity for bicyclists and pedestrians. In addition, the proposed regional bicycle/pedestrian path across SR 520 would provide a new connection between the City of Seattle's bicycle and pedestrian system and the Points Loop Trail in Medina.

Preferred Alternative
The Preferred Alternative would acquire a total of 6.7 acres of park land from Bagley Viewpoint, Montlake Playfield, the UW Open Space, East Montlake Park, McCurdy Park, and the Washington Park Arboretum.

Option A
Option A would acquire 7.5 acres of park land from Bagley Viewpoint, the UW Open Space, East Montlake Park, McCurdy Park, and the Washington Park Arboretum.

Option K
Option K would acquire 9.1 acres of park land from the same parks as for Option A. The land bridge located on the north portion of Foster Island would change the island from a wetland viewing area to a more landscaped upland setting.

Option L
Option L would acquire 7.6 acres of park land from the parks listed for Option A.

Mitigation

Mitigation for park effects is required by Section 4(f) of the Department of Transportation Act and Section 6(f) of the Land and Water Conservation Fund Act. WSDOT worked extensively with the City of Seattle, the UW, FHWA, the National Park Service, and the Washington State Recreation and Conservation Office to ensure that all regulatory requirements were met. Mitigation measures that WSDOT has committed to include:

- Funding for a 3.9 acre new public park at the Bryant Building property on the Lake Washington Ship Canal.
- Funding for projects at the Washington Park Arboretum as part of an Arboretum Mitigation Plan.
- Restoration of all park properties affected by construction.
- Replacement of the Bagley Viewpoint on the new lid at 10th Avenue East and Delmar Drive East.

Section 5.4 and Chapters 9 and 10 of the Final EIS provide more detail on WSDOT's park mitigation commitments.

Construction Effects

The Preferred Alternative and SDEIS options would affect adjacent parks during construction, with negative effects including temporary easements, construction-related truck traffic, construction noise, dust, and visual clutter. The scale and intensity of construction near these parks would vary among the options. Construction staging would take place in the portion of East Montlake and McCurdy Parks acquired for right-of-way, and also in the WSDOT-owned peninsula adjacent to the Arboretum.

The Preferred Alternative and SDEIS options would require periodic closure and detours of the Ship Canal Waterside Trail and the Arboretum Waterfront Trail, and would affect trail access from Montlake Boulevard and in East Montlake Park. The kayak and canoe launch point at East Montlake Park would also be periodically inaccessible.

Preferred Alternative
The Preferred Alternative would require 7.4 acres of parks for construction easements.

Option A
Option A would require 5.9 acres of parks for construction easements.

Option K
Option K would require 9.0 acres of parks for construction easements.

Option L
Option L would require 6.9 acres of parks for construction easements.

Mitigation

Best management practices will be implemented to protect recreational resources from construction-related effects such as dust, vibration, glare, and accidental damage from construction equipment. Detour routes and traffic control measures will allow continued access to parks and to UW recreational activities. Construction closures will be timed to minimize effects during major events. WSDOT, the City of Seattle, the UW, and appropriate regulatory agencies will evaluate how best to protect specimen trees and important vegetation in the Arboretum.

Visual Quality

Operational Effects

The Preferred Alternative and SDEIS options would affect visual quality as a result of the new lids and wider bridges and roadways that would be shifted in some areas and raised or lowered in other areas. The new lids and wider column spacing on bridges would improve views from many locations in the project area, although the increased width and height of new structures would be very noticeable in the west approach area, including the Arboretum.

Preferred Alternative

A larger lid over Montlake Boulevard would improve views for residences north and south of SR 520. Removal of the Lake Washington Boulevard ramps would reduce visual clutter in the west approach area. Although the crossing of Foster Island would be higher and wider than it is today, the path beneath SR 520 would offer a more open and pleasant experience. The planted median along Portage Bay Bridge would be designed to create a "boulevard" effect.

Exhibit ES-19. **View of Portage Bay Bridge Columns**

Existing View

- 4-lane bridge
- Column spacing at 100 feet on center

Preferred Alternative

- 6-lane bridge with eastbound off-ramp to Montlake
- Bridge re-aligned 40 feet north
- Bridge design and aesthetic treatments to be determined

Option A

- 6-lane bridge with westbound auxiliary lane
- No noise walls
- Bridge design and aesthetic treatments to be determined

Option K

- 6-lane bridge
- No noise walls
- False arches

Option L

- 6-lane bridge
- Noise walls
- False arches

Exhibit ES-20. **Looking Northeast from Lake Washington Boulevard toward MOHAI and McCurdy Park Trees**

Existing View
- 4-lane roadway with transit-only on ramp
- Unused R.H. Thomson Expressway ramps in distance
- 20-foot-high retaining wall on north side of corridor

Preferred Alternative
- Montlake Boulevard lid with westbound off-ramps (white barrier in middle distance)
- Transit stop on lid (green and yellow bus at far left)

Option A
- Partial lid from Montlake Boulevard East to 24th Avenue East
- Landscaping not shown

Option K
- Full lid from Montlake Boulevard to beyond 24th Avenue East
- Vent tower for twin tunnels under Montlake Cut
- Depressed SPUI east of 24th Avenue East
- Landscaping not shown

Option L
- Full lid from Montlake Boulevard to 24th Avenue East
- Bridge over East Montlake Park
- Elevated SPUI east of 24th Avenue East
- HOV direct-access ramps

Option A
Effects of Option A would be similar to those of the Preferred Alternative, except that the lid would not be as large and the crossing of Foster Island would be somewhat lower.

Option K
Tall retaining walls at the tunnel entrance and columns to support the main line over the interchange would affect views dramatically. The land bridge at Foster Island would remove naturalized woodlands on both sides of SR 520. Additional structures required in the McCurdy Park and East Montlake Park areas would be visible to motorists and park users.

Option L
The new diagonal bridge across the Montlake Cut would cross East Montlake Park at an angle, significantly affecting

Exhibit ES-21. **Looking Northwest from Edgewater Apartments toward SR 520 West Approach and Husky Stadium**

Existing View
- 4-lane bridge
- View of south Union Bay
- Column spacing at 100 feet on center
- Husky Stadium in distance (left of center)
- Boat traffic

Preferred Alternative
- Wider and higher 6-lane bridge
- More open view into north Union Bay
- Column spacing at 250 feet on center
- Gantry (visible in front of Husky Stadium roof line
- Transit bus on bridge (center)

Option A
- 6-lane bridge
- Column spacing at 250 feet on center

Option K
- 6-lane bridge
- Column spacing at 250 feet on center

Option L
- 6-lane bridge
- Column spacing at 250 feet on center
- Noise walls

views for park users and some residents in the Shelby-Hamlin neighborhood as well as users of Husky Stadium and the UW Open Space. The Foster Island crossing would be similar to Option A.

Mitigation
Many of the features already incorporated into the project will enhance visual quality, and WSDOT has already undertaken several initiatives to work with community members in developing context-sensitive designs for features that are in or near their neighborhoods.

Development of specific aesthetic treatments and landscaping plans will occur in conjunction with final design for the project. WSDOT has initiated discussions with the Seattle Design Commission to develop urban design guidelines for the project in collaboration with community members, and will continue to update and expand these guidelines as design progresses.

Construction Effects
Vegetation removal, large construction equipment, earthwork and grading, and work bridges would all

Exhibit ES-22. **Looking Northeast across Lake Washington at Evergreen Point Bridge**

Existing View

- Shoreline park in Madison Park
- Evergreen Point Bridge and East Approach
- Medina shoreline in distance
- Cascade Mountains far in distance

Preferred Alternative

- Evergreen Point Bridge and East Approach
- Bridge height at mid-span approximately 20 feet above water

Options A, K, and L

- Evergreen Point Bridge and East Approach
- Bridge height at mid-span approximately 30 feet above water

contribute to changes in visual quality during construction. Views from some homes that are currently screened by trees would overlook ongoing construction. Construction equipment and activities would be visible from homes along adjacent roadways. All in-water and upland activities associated with replacing the Portage Bay Bridge would result in substantial degradation of visual character and quality in the south part of Portage Bay. The viewers most affected would be motorists crossing the bridge, residents on houseboats near the bridge's west end, park users at Montlake Playfield, and patrons of the Queen City and Seattle yacht clubs.

A considerable amount of earthwork is required for widening SR 520 and grading for the stormwater ponds. Construction work bridges would clutter views, especially for SR 520 motorists and boaters in Portage and Union bays, and they would be highly visible at breaks in the tree line in the Arboretum and from various locations along the Arboretum Waterfront Trail. Staging areas in East Montlake Park and on the WSDOT-owned peninsula adjacent to the Arboretum would also be visible to park users.

Preferred Alternative and Option A

Construction would require the removal of a band of mature, dense trees along the Montlake Cut as well as the removal of two single-family residences; which would eliminate a buffer for nearby homes from construction activities on Montlake Boulevard.

Option K

The greatest effect on views would be from the extensive excavation and construction activity in the MOHAI area for the interchange and tunnels. A temporary detour bridge south of the existing west approach would add to the clutter.

Option L

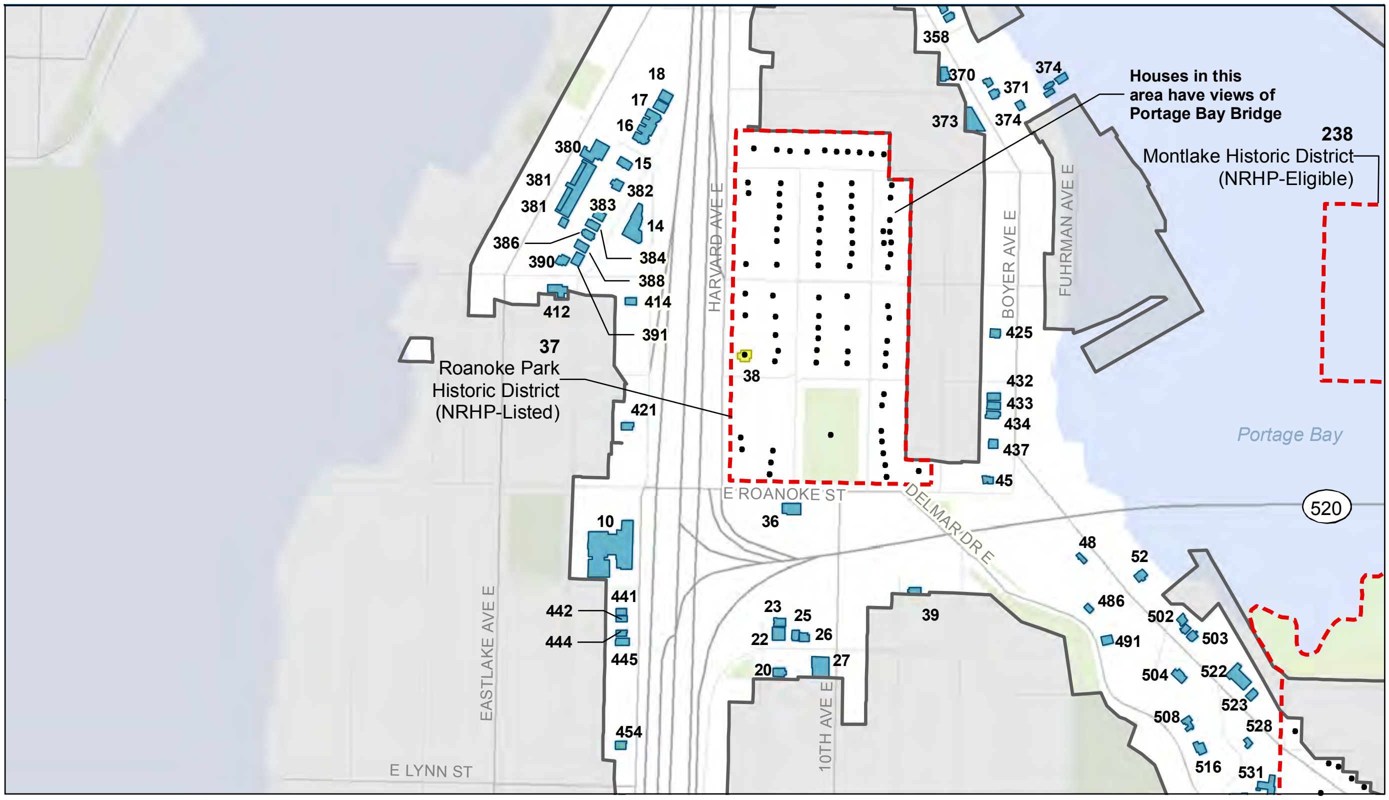
Views would be greatly affected at the east end of the Montlake Cut, the east Shelby-Hamlin neighborhood, and East Montlake Park area due to construction of the new interchange and bascule bridge.

Mitigation

Best management practices (BMPs) such as construction screening, standardized work hours, and low-impact construction methods, materials, and tools will be used to reduce construction effects on surrounding neighborhoods. All disturbed areas will be restored and revegetated as soon as possible after construction. Section 5.5 in the Final EIS provides more information on the revegetation and landscaping activities that will occur for the project.

Cultural Resources

Exhibit ES-23 **Historic Properties Within the I-5 and Portage Bay Area**



NRHP Eligibility of Surveyed Resources

- • Contributing
- Listed
- Eligible
- Area of potential effects
- Historic district boundary

Note: All resources are mapped and described in detail in the Final Cultural Resources Assessment and Discipline Report. See Table 4.6-1 for a list of properties that correspond to the ID numbers shown above.

N

0 250 500 1,000 Feet

The project area includes a number of historic and cultural resources, including two historic districts (Roanoke Park and Montlake), that are listed on, eligible for, or contributing to a district's eligibility for the National Register of Historic Places (NRHP). In addition, although there are no known archaeological resources in the project area, Foster Island is a traditional cultural property that retains ongoing significance to members of Native American tribes. Exhibits ES-23 and ES-24 show the locations of these resources within the project's Area of Potential Effect (APE).

Operational Effects

WSDOT and FHWA evaluated the project's potential effects on these properties using the Criteria of Adverse Effect (36 CFR 800.5) outlined in Section 106 of the National Historic Preservation Act. This legislation states that a project would have an adverse effect on a historic property if it results in changes to the property's characteristics that qualify it for inclusion on the NRHP. Examples of potential adverse effects include the physical destruction of an entire historic property; damaging, altering, or removing a portion of a historic property; and introducing environmental factors that are out of character with the historic property and diminish its setting and integrity (for example, visual intrusions). In consultation with the Washington State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation, FHWA and WSDOT have determined that operation of the SR 520, I-5 to Medina project would have an overall adverse effect on historic properties.

Mitigation

FHWA and WSDOT have consulted with the SHPO and other "consulting parties" (tribes, organizations and individuals with stewardship interests in historic properties) to seek resolution of the adverse effect from the project. This work culminated in a Programmatic Agreement, completed in May 2011, that memorializes the stipulations agreed upon to avoid, minimize, and mitigate adverse effects on historic properties located within the APE. See Attachment 9 of the Final EIS for a copy of the Programmatic Agreement. Potential effects on historic properties from operation of the Preferred Alternative and Options A, K, and L are described in more detail in Final EIS Section 5.6.

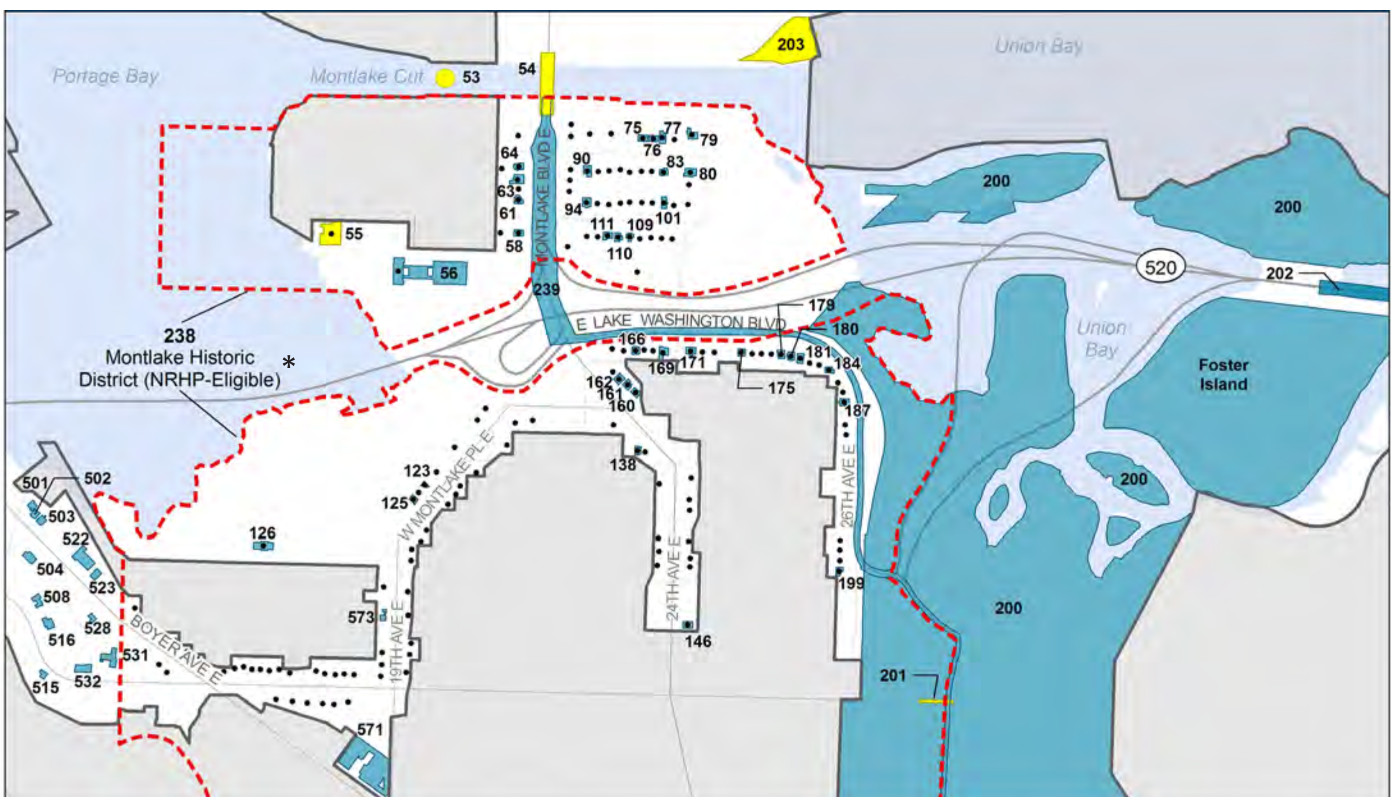
Construction Effects

Construction of the Preferred Alternative and all SDEIS options would affect a number of historic properties in the APE, and would result in an adverse effect. Although some effects would be avoided and minimized throughout the construction period through implementation of a CCMP (described below) and use of construction best management practices, not all effects from construction could be avoided. These effects include noise, dust, and visual intrusion from the presence of construction activities and haul routes within or adjacent to historic districts and individual properties.

Mitigation

Even with WSDOT and FHWA's ongoing efforts to avoid effects to the greatest extent feasible, it will not be possible to avoid all effects on historic properties from construction of the SR 520, I-5 to Medina project. As described above under Operational Effects, the adverse effect will be mitigated, and the mitigation measures are stipulated in the Section 106 Programmatic Agreement. As

Exhibit ES-24. **Historic Properties Within the Montlake Area**



*The Montlake Historic District extends further to the south.

NRHP Eligibility of Surveyed Resources

- • Contributing
- Listed
- Eligible
- Area of potential effects
- Historic district boundary

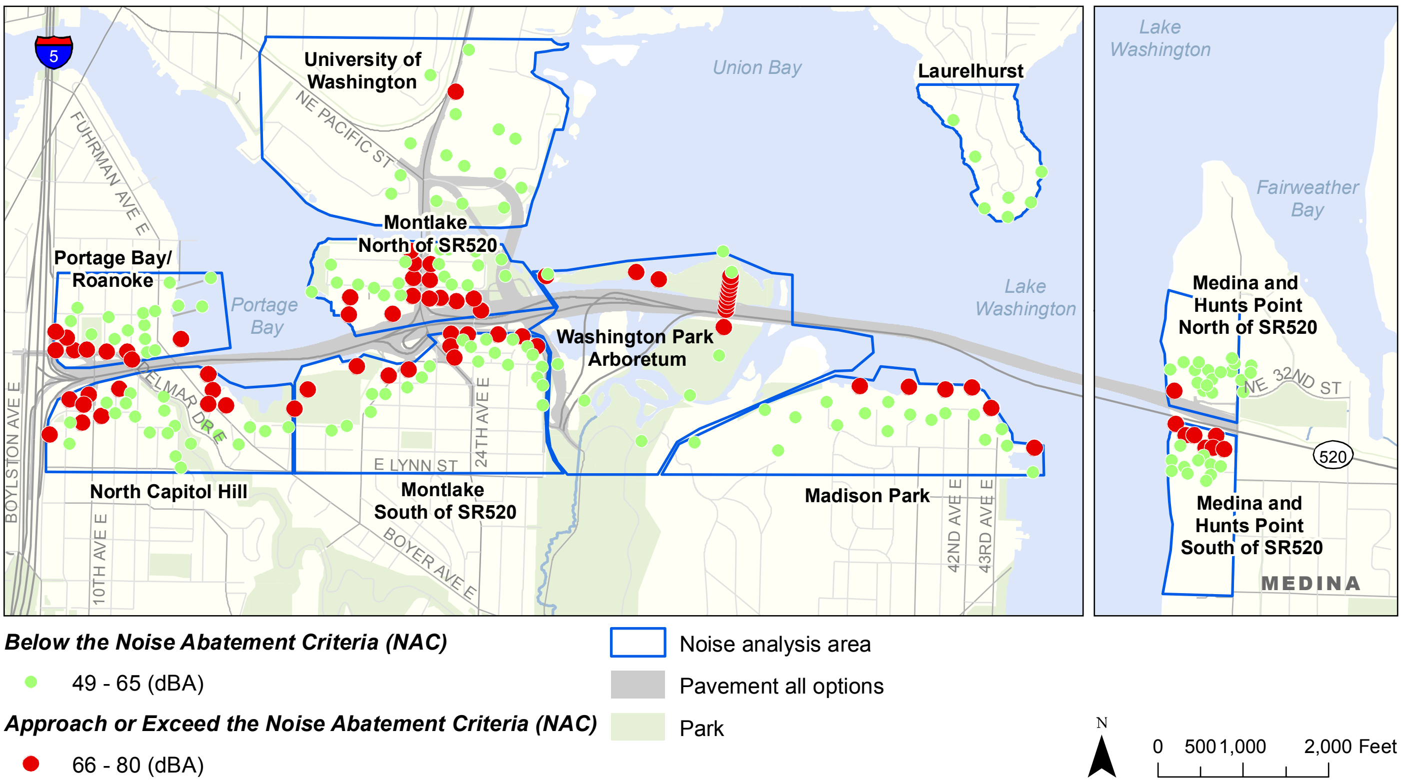
Note: All resources are mapped and described in detail in the Final Cultural Resources Assessment and Discipline Report. See Table 4.6-1 for a list of properties that correspond to the ID numbers shown above.

N 0 250 500 1,000 Feet

part of the Programmatic Agreement, in consultation with the Section 106 consulting parties, affected community groups, and the City of Seattle, WSDOT will develop a CCMP. The CCMP will contain specific measures designed to protect historic properties in the APE and to address quality of life issues. The CCMP will be designed as an adaptable plan so that it can handle unanticipated issues that may arise during construction.

Noise

Exhibit ES-25. **Existing Noise Levels in the Project Area**



FHWA and WSDOT evaluate the effects of highway noise using FHWA's Noise Abatement Criteria (NAC). These criteria set acceptable noise levels based on the type of property receiving the noise. As shown in Exhibit ES-25, existing noise levels in the Seattle study area approach or exceed the NAC in many locations, including the neighborhoods of Portage Bay/Roanoke, North Capitol Hill, Montlake, and Madison Park as well as in the Washington Park Arboretum.

Operational Effects and Mitigation

Because many members of the public have expressed concerns about the aesthetic effects of noise walls, noise modeling for the project was done both without noise walls and with noise walls where they are warranted by WSDOT and FHWA guidance. Even without noise walls, the Preferred Alternative and all the SDEIS options would decrease overall noise levels in the SR 520 corridor and reduce the number of residences that exceed the NAC. This reduction results from features that are part of the project design, such as lids, depressed or elevated roadway sections, and different alignments.

The Preferred Alternative achieves greater overall noise reduction than the SDEIS design options without noise mitigation (Table ES-8). This is due to design features such as the larger Montlake lid, the raised profile through the west approach, and lower speed limits west of the Montlake interchange. The largest number of residences with reduced noise would be in North Capitol Hill and in the portion of Montlake south of SR 520.

Mitigation for noise under the SDEIS design options included only noise walls in areas where they were determined to be feasible and effective under FHWA

Table ES-8. **Number of Residences where Noise Levels would Exceed NAC**

	NAC Exceedences Without Noise Mitigation	NAC Exceedences With Noise Mitigation
Preferred Alternative	207 Residences	143 Residences
Option A	249 Residences	94 Residences
Option K	256 Residences	123 Residences
Option L	235 Residences	119 Residences
No Build	287 Residences	N/A

and WSDOT guidelines. The Preferred Alternative differs from the SDEIS options in that it was designed to incorporate measures recommended by a Noise Expert Review Panel to reduce noise without the use of walls. (These measures are shown in the text box on this page.) Some measures (such as 4-foot traffic barriers) provide predictable noise reductions, and can therefore be modeled. Others (such as quieter concrete pavement) can't be modeled quantitatively because there is not yet enough data available on their effectiveness. Noise walls are recommended throughout most of the corridor for the SDEIS design options. Because of the Preferred Alternative's innovative noise reduction measures, walls are considered reasonable and feasible only in Medina, where they would adjoin the walls being built as part of the SR 520, Medina to SR 202 project.

With mitigation included in the model, the Preferred Alternative and the SDEIS options all achieve substantial additional reductions in noise compared to No Build. Because the Preferred Alternative does not include noise walls in Seattle, it would reduce noise at somewhat fewer residences along the corridor than Options A, K, or L with noise walls. However, it would still provide significant reductions in noise while avoiding the aesthetic effects of the walls. Noise reduction effects not included in the model, such as noise-absorptive coatings and quieter concrete pavement, may provide greater benefits than are shown in the model results.

Construction Effects

Activities such as new bridge construction, roadway paving, and structure demolition would result in noise levels ranging from 83 to 94 A-weighted decibels (dBA) at 50 feet from the construction site. Pile-driving for the Portage Bay and west approach bridges would be the loudest single source of noise during construction, producing short-term noise levels of 99 to 105 dBA at 50 feet. Noise levels can vary depending on the distance, topographic conditions between the pile-driving location and receiver, frequency of pile-driving, and the number of pile-drivers operating at one time. While the duration of pile-driving activities would be relatively short, noise levels could be as high as 75 to 80 dB in areas within 1,000 feet of construction, affecting residents of the Portage Bay/Roanoke and Montlake neighborhoods as well as recreational boaters and Arboretum users.

Vibration from construction—particularly pile-driving—can affect receivers that use vibration-sensitive medical or scientific equipment. The only such known receiver located close to construction activities is the NOAA Northwest Fisheries Science Center, which uses equipment sensitive to vibration in its research. Major vibration-producing activities would occur primarily during demolition and preparation for the new bridges. While pile-driving or vibratory sheet installation may occur within 50 to 100 feet of sensitive receivers, it is unlikely that vibration levels would exceed 0.5 inch per second at distances greater than 100 feet from the construction sites.

Mitigation

State regulations restrict noise from construction activities by imposing noise limits based on the type of activity, time of day, and property type, with less noise allowed for residential than for commercial and industrial receivers and lower allowable noise levels at night. WSDOT will

Noise Expert Review Panel recommendations included in the Preferred Alternative:

- 4-foot traffic barriers with noise-absorptive coating
- Noise-absorptive materials at lid portals
- Quieter concrete pavement
- Encapsulated bridge expansion joints

follow state noise control regulations and will employ other methods of mitigating noise, such as limiting construction hours within 500 feet of any occupied dwelling to minimize effects on receivers. Vibration monitoring may also be required during pile-driving near the NOAA facility.

Several construction noise and vibration abatement methods—including operational methods, equipment choice, or acoustical treatments—could be implemented to limit the noise effects of construction. The use and effectiveness of these methods depends on a number of factors such as topography, the amount of space available for construction staging, and the distance of the noise-producing activity from sensitive receivers. WSDOT will work with its contractors and with community members during the ongoing refinement of the CCMP (discussed above under Cultural Resources) to identify appropriate measures for mitigating construction noise.

Air Quality

Operational Effects

Under the Preferred Alternative and all SDEIS options, reduced congestion and improved traffic speeds would result in a slight improvement in air pollutant emissions compared to No Build. The project would not result in any violations of the National Ambient Air Quality Standards (NAAQS); modeled concentrations of air pollutants are well below the 1-hour and 8-hour NAAQS for the Preferred Alternative and all SDEIS options. The project would meet air quality conformity requirements and is consistent with the State Implementation Plan for carbon monoxide emissions.

Mitigation

No mitigation measures for operational effects are warranted because the project would improve air quality compared to No Build.

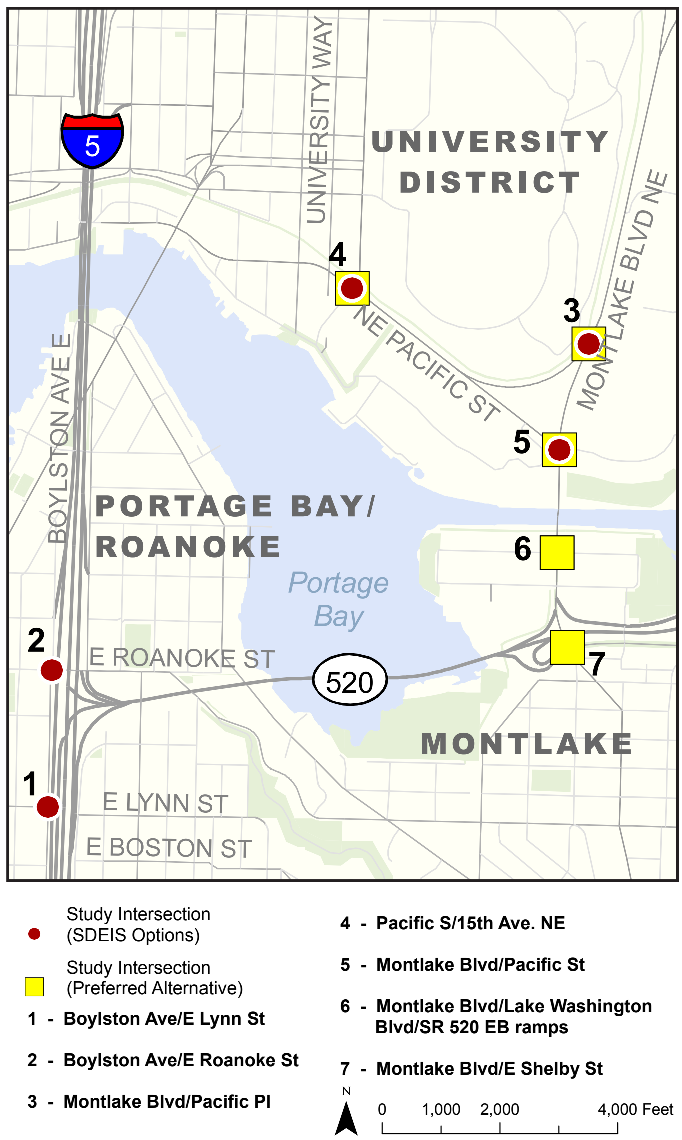
Construction Effects

Soil-disturbing activities, exhaust from diesel equipment, traffic congestion, and paving with asphalt would generate emissions that may temporarily affect air quality in the vicinity of the construction activity. Engine and motor vehicle exhaust would result in emissions of volatile organic compounds, oxides of nitrogen, particulate matter, and air toxics. Air quality would be most affected in localized areas close to the active construction sites.

Mitigation

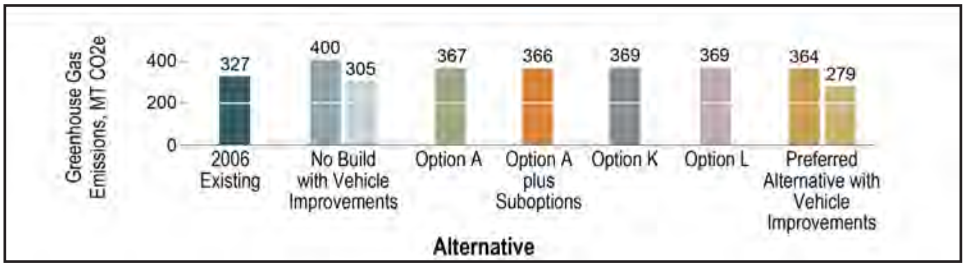
Best management practices will be used to control emissions related to construction. These can include measures such as dust suppression, requiring contractors to turn off idling vehicles and equipment, use of emission controls, and encouraging carpooling by construction workers. WSDOT would comply with procedures outlined in the Memorandum of Agreement between WSDOT and the Puget Sound Clean Air Agency for controlling fugitive dust.

Exhibit ES-26. **Intersections Evaluated for CO**



Energy and Greenhouse Gases

Exhibit ES-27. **Weekday Peak Period Greenhouse Gas Emissions**



Operational Effects

As a result of tolling and improvements in traffic flow, the Preferred Alternative and all SDEIS options would reduce annual vehicle-miles traveled (VMT) and energy consumption in the SR 520 corridor by 4 to 8 percent (depending on the option) compared to the No Build Alternative. For the same reason, greenhouse gas (GHG) emissions in the SR 520 corridor would decrease by nearly 10 percent over No Build as a result of the project. At a regional level, there would be little difference between the build and No Build alternatives in VMT and GHG emissions.

Mitigation

No mitigation measures for operational effects are warranted because the project would reduce energy use and GHG emissions in the SR 520 corridor compared to No Build.

Construction Effects

During construction, the primary source of GHG emissions would be fuel combustion, with the GHG emissions being proportional to the amount of energy used. To be conservative, the analysis assumed that construction vehicles and equipment would use only diesel fuel. The results are intended to show relative differences between the options.

Mitigation

WSDOT will work with the project contractor(s) to implement measures to conserve energy during project construction. Such measures could include limiting idling equipment, requiring emission controls on construction vehicles, encouraging carpooling of construction workers, and locating staging and material transfer areas near work sites.

Preferred Alternative

Energy use would be approximately 15,006,000 million British thermal units (MBtu) for onsite construction and approximately 108,000 MBtu for pontoon transport. Construction of the Preferred Alternative would emit approximately 1.2 million metric tonnes carbon dioxide equivalent of GHG.

Option A

Option A would have approximately the same level of energy use and construction GHG emissions as the Preferred Alternative.

Option K

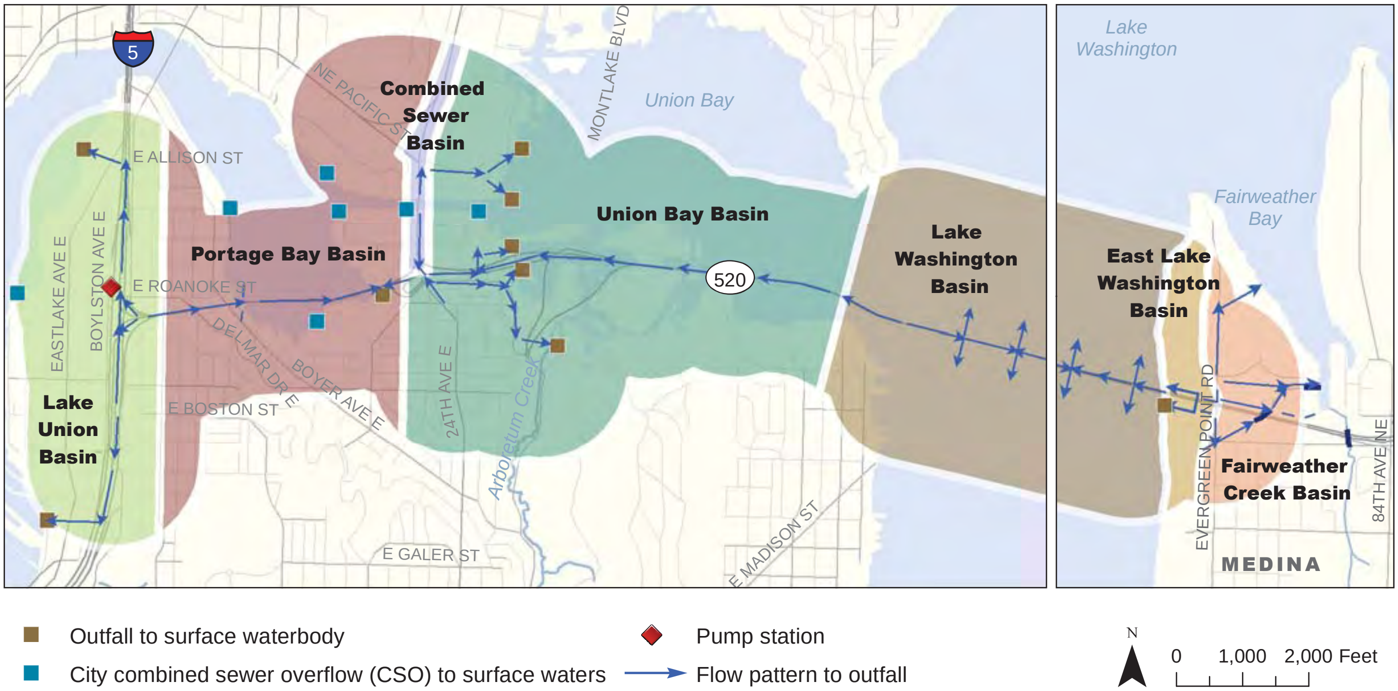
Option K is estimated to consume approximately 34,299,000 MBtu during onsite construction. GHG emissions would be about twice those of the Preferred Alternative and Option A at approximately 2.5 million metric tonnes carbon dioxide equivalent. Energy required for pontoon transport would be the same as for the Preferred Alternative.

Option L

Onsite energy consumption is estimated at approximately 18,780,000 MBtu; energy required for pontoon transport would be the same as Option A. Option L would produce approximately 20 percent more GHG emissions than Option A, but substantially less than Option K.

Water Resources

Exhibit ES-28. **Drainage Basins and Stormwater Flow**



Currently, stormwater runoff from SR 520 is untreated and flows directly into Lake Washington, Portage Bay, and Lake Union. Exhibit ES-28 illustrates the existing drainage basins and stormwater discharge locations in the project area.

Operational Effects

The Preferred Alternative and all SDEIS options would increase the amount of land covered by pollutant-generating impervious surfaces within these areas by 35 to 45 percent. However, the inclusion of stormwater treatment in the project design would improve the quality of runoff from SR 520. As a result, the Preferred Alternative and Options A, K, and L would meet or exceed state and federal water quality requirements, with enhanced treatment provided at some locations to remove additional metals from the runoff.

Mitigation

Since the project would comply with all applicable standards, no mitigation for operational effects is required.

Construction Effects

The primary concern for water quality during construction is increased turbidity (i.e., suspended soil and sediment) in water bodies. For land-based construction activities, the most likely source of turbidity would be exposed soils eroding during rainstorms and flowing into nearby water bodies. For water-based activities, the most likely source would be from direct disturbance of sediments through activities such as pile-driving, column construction, and temporary barge anchor placement. Other potential risks are spills of pollutants such as fuel and lubricants, and localized changes in water quality from concrete construction and demolition.

Construction of the roadway near Montlake and the bridge maintenance facility may temporarily require dewatering of groundwater, but these effects would be localized and temporary except under Option K, which would require a large excavation below the level of Union Bay to construct the new interchange and tunnels.

Mitigation

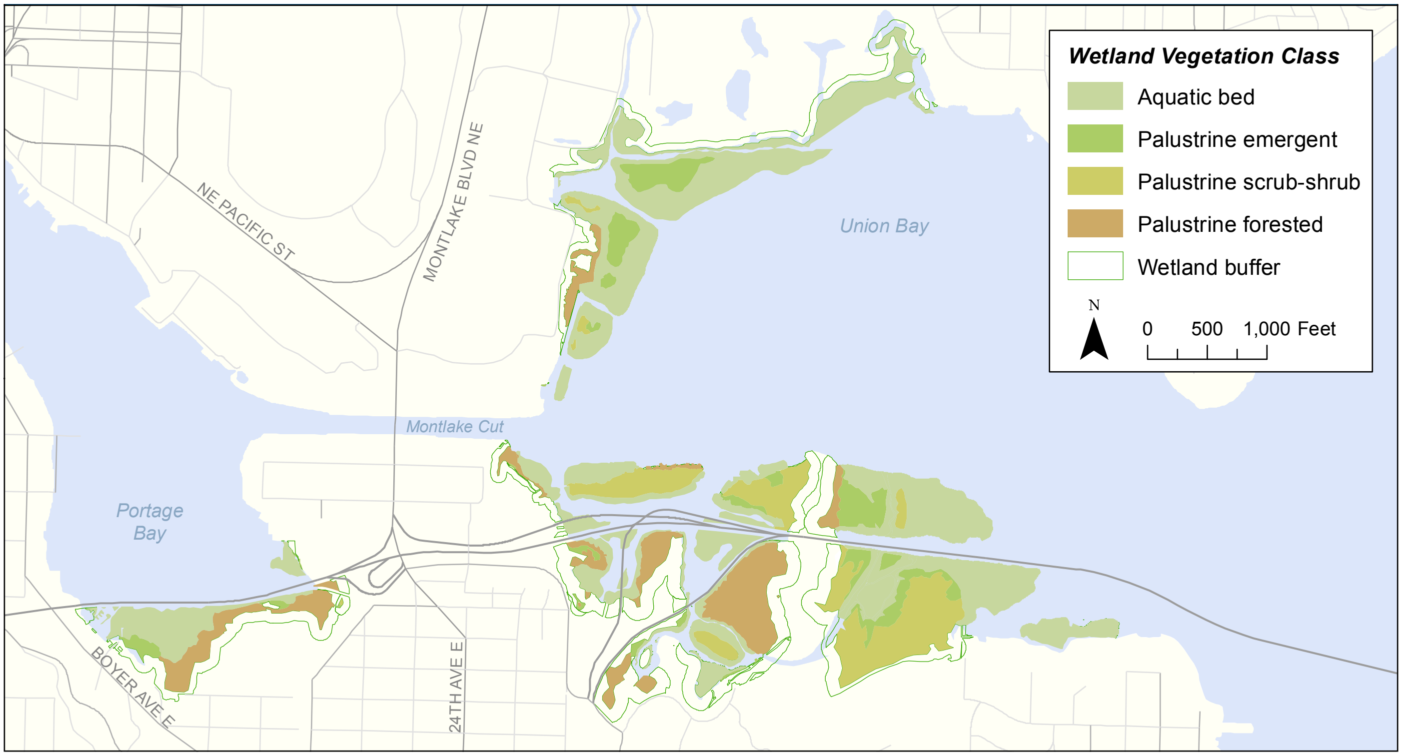
WSDOT will minimize turbidity by employing BMPs wherever feasible so that work on bridge foundations will be isolated from the water column. During demolition, material from bridge decks will be contained to prevent it from entering surface waters.

For on-land construction, WSDOT will minimize adverse effects on surface water bodies by implementing water pollution control BMPs. These measures will be outlined in various plans required under state and federal permits, including a temporary erosion and sedimentation control plan; a spill prevention, control, and countermeasures plan; and a concrete containment and disposal plan. These plans will specify the use of appropriate construction BMPs, which could include mulching, matting, and netting; filter fabric fencing; quarry-rock entrance mats; sediment traps and ponds; surface water interceptor swales and ditches; and placing construction material stockpiles away from streams. Erosion and sediment control BMPs are monitored and maintained during construction to make sure they are continuing to perform as designed.

Groundwater generated from dewatering activities during construction would be stored either in temporary treatment ponds, at the location of the permanent stormwater treatment wetlands, or in portable steel tanks. Water would be stored for a sufficient amount of time to allow particles to settle out or could be treated by chemical or mechanical filtration before the water is discharged to an approved location.

Ecosystems

Exhibit ES-29. **Wetlands in the Seattle Project Area**



Operational Effects

The Preferred Alternative and all of the SDEIS options would reduce the availability and quality of wetland and wetland buffer habitat due to filling and shading. The Preferred Alternative would have the least wetland and buffer fill, while Option K would fill the most wetland and wetland buffer area.

The Preferred Alternative and all of the SDEIS options would reduce fish habitat functions, primarily due to increased shading by the larger overwater structures and the addition of new in-water structures. Compared to the existing structures, the proposed overwater structures are about twice as wide for all designs. The Preferred Alternative would result in the most wetland shading in the west approach area, while Option L would result in the most overwater shading. However, the Preferred Alternative's higher profile would reduce the intensity of shading, allowing more light to support wetland vegetation. Consequently, resource agencies for the project require less mitigation for shading than for wetland fill. Option K would result in the overall greatest loss of fish habitat due to the filling for the new depressed interchange on the Montlake shoreline.

The Preferred Alternative and all of the SDEIS options would affect wildlife by permanently removing vegetation and wildlife habitat, and by increasing shading. The greatest habitat removal would be of the urban matrix cover type. Option K would result in the greatest loss of wildlife habitat and the Preferred Alternative the least.

Mitigation

Mitigation as described below is pending approval by regulatory agencies.

Wetlands

The SR 520, I-5 to Medina project will provide approximately 9.5 acres of compensatory wetland mitigation in five locations for the project's wetland effects. Four of these locations are onsite or close to the project, and one is located several miles from the project but in the same watershed. See the Conceptual Wetland Mitigation Plan in Attachment 9 to the Final EIS for more information.

Table ES-9. **Project Operational Effects on Ecosystems Resources**

	Wetland		Wetland Buffer		Fish Resources		Wildlife Habitat Removal
	Fill	Shading[a]	Fill	Shading	In-Water Structures	Shading[a]	
Preferred Alternative	0.1 acre	4.8 acres	0.7 acre	1.1 acres	0.9 acre	49.9 acres	8.1 acres
Option A	0.1 acre	3.2 acres	0.7 acre	0.9 acre	0.7 acre	49.0 acres	11.4 acres
Option K	1.8 acres	2.8 acres	5.4 acres	0.1 acre	2.8 acres	48.6 acres	19.5 acres
Option L	0.3 acre	4.3 acres	1.5 acres	1.3 acres	0.8 acre	52.1 acres	10.8 acres

[a] The effects of shading on wetland and aquatic habitat vary with structure height; higher structures (such as the west approach under the Preferred Alternative) create less intense shade than lower structures. For this analysis WSDOT conservatively estimated shade impacts by assuming that all areas beneath the project footprint were equally shaded, regardless of structure height or gaps between structures.

Fish Resources

WSDOT has developed a comprehensive conceptual mitigation plan for aquatic restoration and habitat improvements at seven locations within Water Resource Inventory Area 8 including restoration projects in Lake Washington, the Cedar River, and Bear Creek. The primary mitigation goal is to compensate for the SR 520, I-5 to Medina project's physical and biological effects while enhancing the production and survival of fish species to the maximum extent practicable. See the Conceptual Aquatic Mitigation Plan (Attachment 9) to the Final EIS for further detail.

Wildlife and Habitat

The wetland and aquatic habitat mitigation measures discussed above will also benefit wildlife by creating new habitat and enhancing existing habitat. WSDOT will continue to work with the City of Seattle and the UW to develop mitigation planting strategies to offset operational effects on shoreline habitat in Portage Bay and Union Bay.

Construction Effects

The Preferred Alternative and SDEIS options include construction work bridges, work platforms, staging areas, and construction access roads that would have temporary effects on wetlands due to vegetation clearing or shading during construction. Option K would have the greatest effect on wetlands during construction.

Construction would also result in areas with reduced fish habitat functions, primarily due to increased shading by work bridges and barges. This shading could reduce the distribution, density, and/or growth rate of aquatic vegetation in the shadow of these structures. The Preferred Alternative and SDEIS options would result in the same area of temporary overwater structure in the Portage Bay area (approximately 3 acres). Option A would result in the most temporary overwater shading in the west approach area. In addition to shading, the work bridge piers would result in the loss of lake bottom substrate that supports aquatic vegetation.

The Preferred Alternative and SDEIS options would require substantial in-water pile-driving to build construction work bridges in shallow-water areas that cannot be accessed by barge. If not mitigated, the underwater sound levels generated during pile-driving activities can disturb or alter the natural behavior and habitat of fish and other aquatic species and in some instances cause injury or mortality. Option K would require considerably more in-water and over-water construction in the Montlake and west approach areas compared to Options A and L. The depressed interchange would be constructed below the high-water elevation of the lake, and would involve substantial excavation and disturbance within the water column.

All of the options would result in noise from construction activities that could affect wildlife species by causing stress and altering behavioral patterns. Construction would also affect wildlife by removing vegetation and wildlife habitat and increasing shading through the use of work bridges. Although habitat quality is generally low for the Urban Matrix cover type, some urban-adapted species such as black-capped chickadees, American robins, and eastern gray squirrels would be affected. Option K would result in the greatest loss of wildlife habitat during construction.

Mitigation

Wetlands

Mitigation specific to construction effects on wetlands will occur at one or more of the five mitigation sites discussed above. Section 5.11 of the Final EIS and the Conceptual Wetland Mitigation Plan (Attachment 9 to the Final EIS) present wetland mitigation in more detail.

Fish Resources

The Preferred Alternative and SDEIS options will implement standard overwater and in-water construction and demolition BMPs in accordance with environmental regulatory permit requirements. Specific in-water construction time periods will also be established through the project permitting process to minimize potential effects of pile-driving and other in-water construction activities on aquatic species.

During column and bridge construction, contractors will use BMPs (e.g., cofferdams and silt curtains) to avoid unintentional effects on habitat and water quality. Cofferdams or other appropriate measures will be used to isolate work areas from open-water areas, particularly for concrete pouring activities, and work bridges will minimize the use of barges in shallow water areas. Bibs will be used to contain falling debris during construction of the new bridge decking and demolition of the existing decking. As noted in the Water Resources discussion, temporary erosion and sediment control measures, a stormwater pollution prevention plan, and a spill prevention, control, and countermeasures plan will be developed and implemented.

Appropriate BMPs and sound attenuation methods will be developed in coordination with the regulatory agencies to minimize potential effects of pile-driving activities. A test pile program undertaken by WSDOT in 2009 - 2010 determined that the use of bubble curtains resulted in substantial reductions in underwater sound levels, and this technique will be used where feasible during project construction.

Temporary project effects that would likely require compensatory mitigation include partial shading and fill from the construction work bridges and falsework, which would reduce habitat value and may provide cover for salmonid predators. Mitigation for these effects will occur at one or more of the seven mitigation sites identified in Section 5.11. The Conceptual Aquatic Mitigation Plan (Attachment 9 to this Final EIS) describes mitigation for aquatic resources effects.

Wildlife and Habitat

WSDOT will continue to work with the City of Seattle and the UW to develop mitigation planting strategies to offset construction effects on shoreline habitat in Portage Bay and Union Bay.

Table ES-10. **Project Construction Effects on Ecosystems Resources**

	Wetland		Wetland Buffer		Fish Resources	Wildlife Habitat Removal
	Fill	Shading	Fill	Shading	Shading	
Preferred Alternative	0.2 acre	6.8 acres	3.0 acres	1.1 acres	10.9 acres	14.4 acres
Option A	0.6 acre	6.4 acres	2.8 acres	0.2 acre	11 acres	12.4 acres
Option K	1.1 acres	8.1 acres	3.2 acres	0.6 acre	11.9 acres	14.9 acres
Option L	0.5 acre	6.4 acres	2.8 acres	0.2 acre	10.4 acres	14.0 acres

Geology and Soils

Exhibit ES-30. **Geologic Hazards in the Project Area**

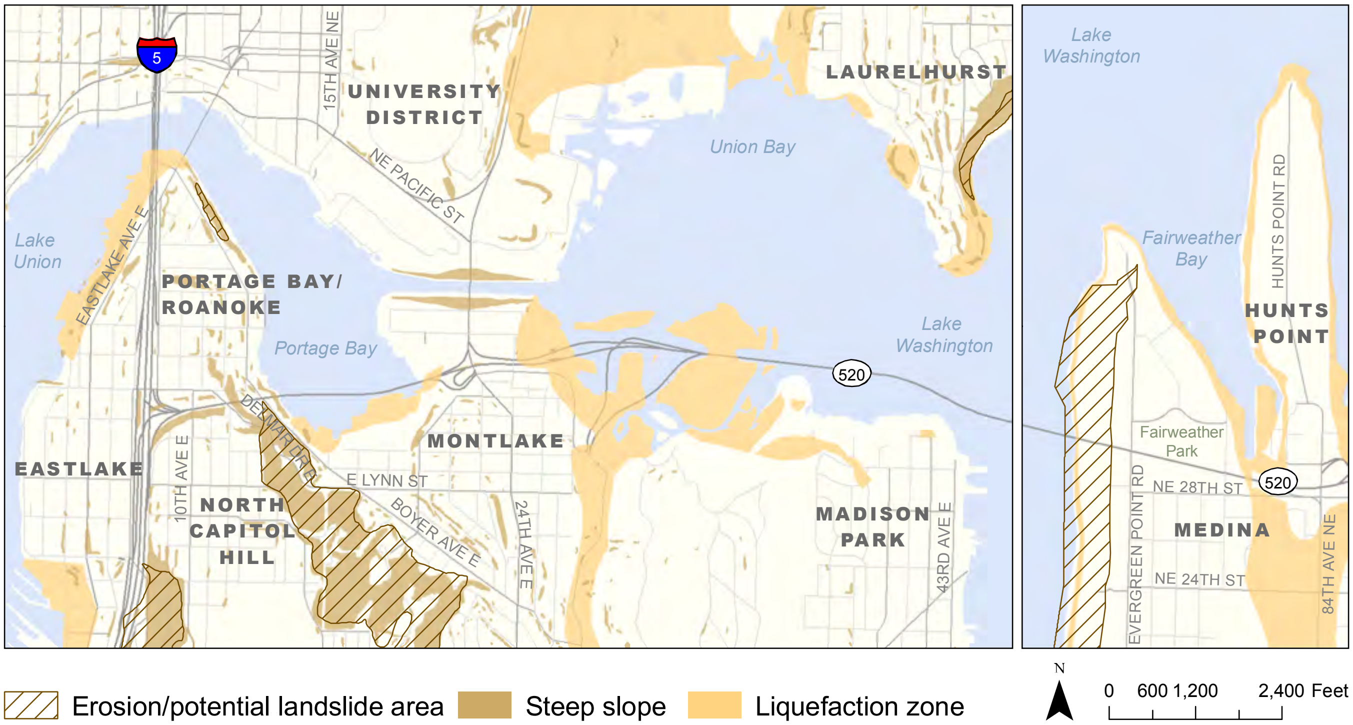


Exhibit ES-30 illustrates the existing geologic hazards in the project area. The primary hazard is areas of liquefiable soils, which can become unstable during an earthquake.

Operational Effects

Under the Preferred Alternative and all SDEIS options, WSDOT would design bridge columns to withstand seismic motion, and/or excavate areas of vulnerable soils and replace them with stronger material. The Preferred Alternative and Option A would have a lower risk of damage from liquefaction and long-term settling than Options K or L. This is because Options K and L would both have a large structure-supported interchange located in liquefiable soils near the Montlake shoreline. In addition, Option K would have greater risk of damage during liquefaction because a portion of the interchange would be below the water level.

Preferred Alternative

The Preferred Alternative would result in an estimated 340,000 cubic yards (cy) of excavation and 86,000 cy of fill material. The overall constructability risk based on geologic criteria is considered low to moderate.

Option A

Option A would have effects during construction similar to the Preferred Alternative.

Option K

Option K would result in an estimated 1,300,000 cy of excavation and 320,000 cy of fill material. Deep pile walls would be required for the depressed interchange, and risks from leaks and contamination or settlement of adjacent soils would be greater than for the other options. The overall constructability risk for this option is moderate to high.

Option L

Option L would result in an estimated 450,000 cy of excavation and 52,000 cy of fill material. The overall constructability risk for this option is moderate.

Mitigation

Because the proposed project would be designed to current standards for seismic loading and other geotechnical factors, no impacts are anticipated and no mitigation would be necessary.

Construction Effects

Construction would require excavation and grading for cuts and fills, and/or installation of bridge and retaining wall structures. Other than the depressed interchange and tunnel for Option K, topographic changes within the corridor would be minor.

Some construction would take place in areas identified in Exhibit ES-30 as having a high potential for landslides. WSDOT is developing construction methods specific to these areas to ensure that slope stability is maintained in areas where cut slopes are required. Erosion control measures will also reduce the risk of potential landslides.

Dewatering may be required in excavations, requiring disposal of excess groundwater and potentially resulting in settlement of nearby structures. The amount of dewatering is not expected to be high except under Option K, where the new interchange would extend below the water table.

Mitigation

WSDOT will implement BMPs to prevent erosion. These would include minimizing loss of vegetation, using erosion-control blankets and mulching, street sweeping, using construction exits that minimize mud tracking, constructing temporary sedimentation ponds, and limiting the area exposed to runoff at any given time.

Hazardous Materials

Exhibit ES-31. **Known or Potential Hazardous Material Sites in the Seattle Project Area**

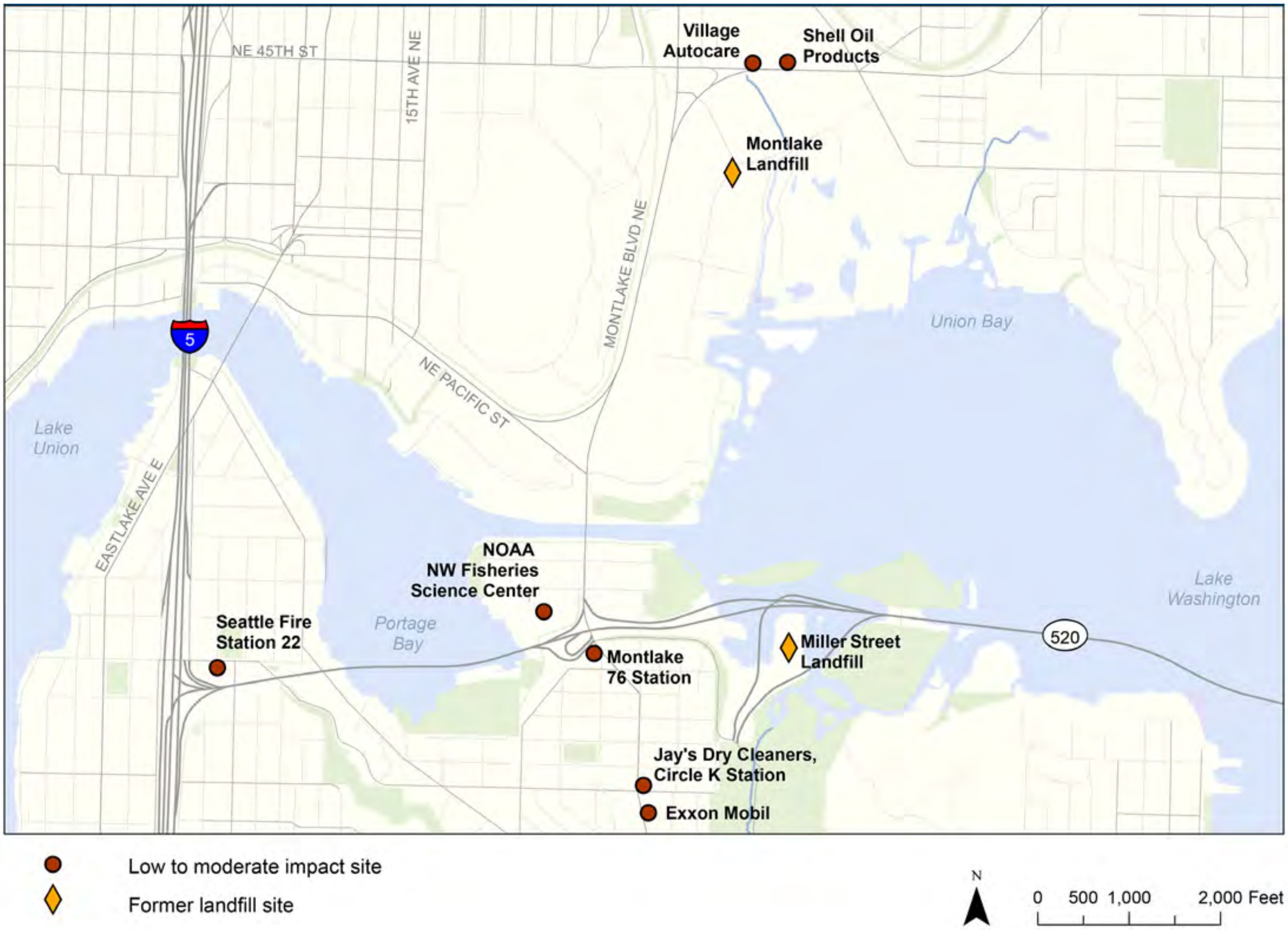


Exhibit ES-31 shows the known or potential hazardous materials sites in the project area.

Operational Effects

Project operation would result in primarily beneficial effects tied to the identification and remediation of any contamination that might be encountered during construction. In addition, the new stormwater facilities would operate to collect the currently untreated stormwater runoff.

All transportation facilities pose the risk of vehicular fluid spills by the travelling public. The risk of spills would not vary substantially between the Preferred Alternative and Options A, K, and L.

Mitigation

Since no adverse effects are anticipated, no mitigation for operational effects is required.

Construction Effects

The potential exists for construction activities to encounter contaminated soil, sediment, and groundwater; create accidental spills and release hazardous materials; demolish structures that contain hazardous materials; and/or encounter underground storage tanks. Construction would take place at or near several sites with a history of contamination and/or hazardous substance use, including Seattle Fire Station 22, the Montlake 76 station, the NOAA Northwest Fisheries Science Center, the Miller Street Landfill, and sediments in Lake Washington, Union Bay, and Portage Bay.

Preferred Alternative
Construction of the Preferred alternative could affect potential hazardous materials at Seattle Fire Station 22, the Montlake 76 station, the NOAA Northwest Fisheries Science Center, the Miller Street Landfill, and sediments in Lake Washington, Union Bay, and Portage Bay.

Option A
Option A would also affect the Exxon Mobil and Circle K stations.

Option K
No additional effects identified for Option K.

Option L
Option L would also affect the Shell Oil Products station and Village Autocare. Option L may also affect the Montlake Landfill through construction activities occurring within 1,000 feet of this site.

Mitigation

WSDOT will conduct an assessment of sites where contamination may be present to identify the nature and extent of any contaminants and, if necessary, develop appropriate cleanup and disposal methods. Structures to be demolished will be surveyed to determine whether they contain hazardous building materials like asbestos, lead-based paint, and polychlorinated biphenyls, and any required remediation would be carried out in accordance with applicable laws.

WSDOT will also prepare (or require the contractor to prepare) a comprehensive contingency and hazardous substance management plan and a worker health and safety plan to reduce potential risks to human health. A spill prevention, control, and countermeasures plan and a stormwater pollution prevention plan will be prepared to prevent the release of pollution and hazardous substances to the environment.

Navigation

Exhibit ES-32. **Existing Bridges and Navigational Clearances Between Chittenden Locks and Lake Washington**

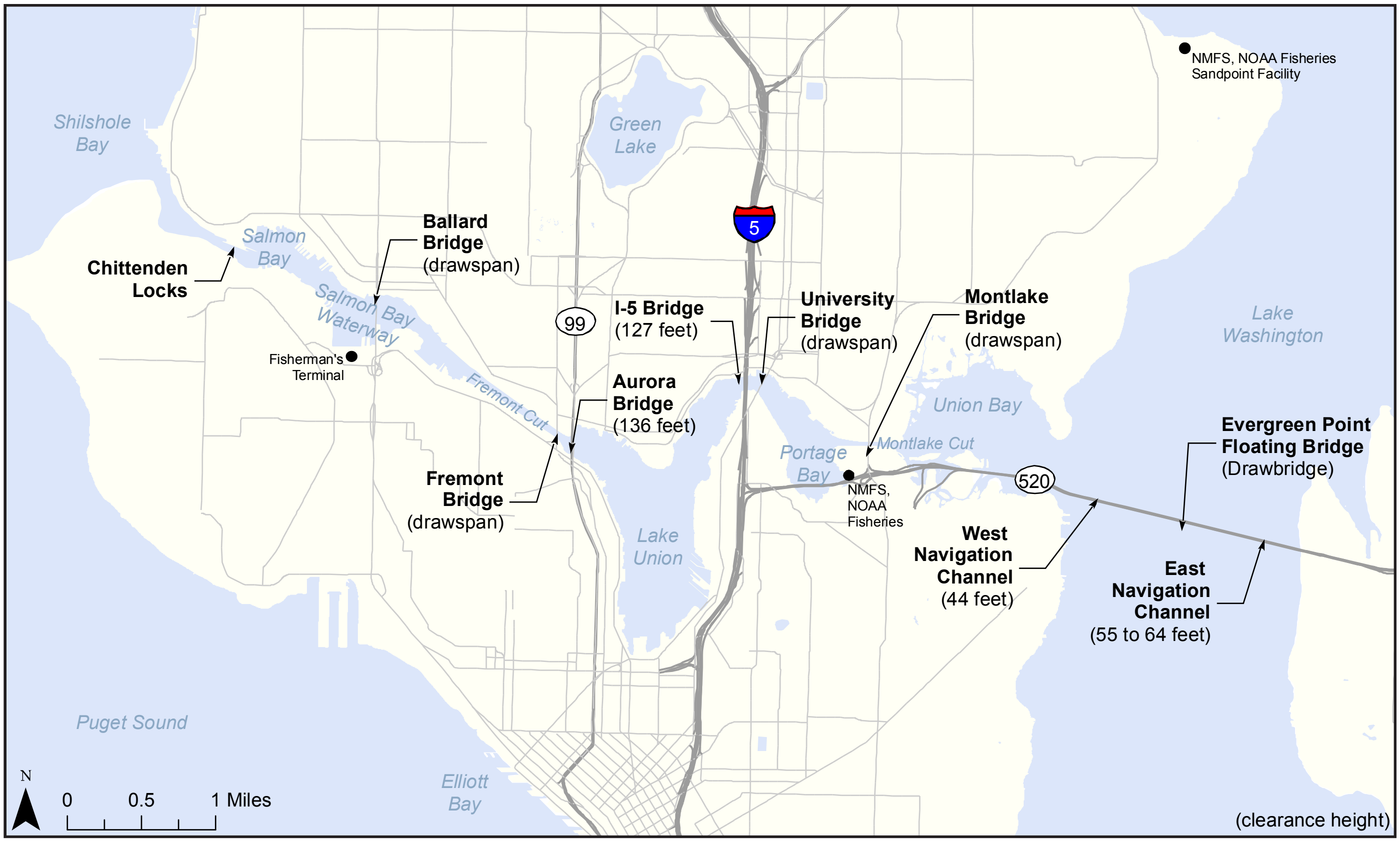


Exhibit ES-32 illustrates the existing bridges and navigation channel clearances in the Lake Washington Ship Canal between the Chittenden Locks and Lake Washington.

Operational Effects

Clearance beneath the west navigation channel of the Evergreen Point Bridge would be lowered from 44 to 41 feet under Options A, K, and L, and would remain at its existing height under the Preferred Alternative. Under the Preferred Alternative and all SDEIS options, the east navigation channel would be raised to 70 feet and the drawspan on the floating bridge would be removed. Removal of the drawspan is not expected to impair navigation in Lake Washington. Under the Preferred Alternative and Options A, K, and L, the proposed new bascule bridges would coordinate openings with the existing Montlake Bridge, and would not affect navigation through the Montlake Cut.

Mitigation

Since no adverse effects on navigation are expected, no mitigation is required.

Construction Effects

During construction, work bridges on both sides of the Portage Bay Bridge and the west approach bridge would limit the use of recreational vessels such as canoes or kayaks in these areas. For the Preferred Alternative and Options A and L, installation of the new bascule bridge would require complete closure of the Montlake Cut for two 24-hour periods and two full weekends (a total of 6 days).

Mitigation

Construction of the new floating bridge will be staged so that the west and east navigation channels will not be closed on the same days. A "Local Notice to Mariners" will be distributed electronically by the Coast Guard to alert local commercial and recreational boating communities of all construction-related closures in Lake Washington and the Montlake Cut. The notice will allow all potentially affected vessels time to relocate temporarily to prevent being blocked during the bridge construction period. Construction activities will be timed to avoid disruption of Opening Day activities occurring in Portage Bay, Lake Washington, and the Ship Canal.

Other Considerations and Next Steps

Summary of Final EIS Findings on the Preferred Alternative

The ROD for the SR 520, I-5 to Medina project will identify an "environmentally preferable alternative." This is defined as the alternative that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historic, cultural, and natural resources. Designation of the environmentally preferable alternative typically involves judgment and the balancing of some environmental values against others. The Council on Environmental Quality notes that comments on draft environmental documents (such as the Draft EIS and SDEIS for this project) can assist the lead agency in developing and determining environmentally preferable alternatives.

For this project, it is anticipated that the Preferred Alternative will be designated in the ROD as the environmentally preferable alternative. The Preferred Alternative was refined from the SDEIS design options based in large part on comments received on the SDEIS. Although it is does not have the least impact in every environmental discipline, WSDOT believes that this alternative best balances environmental effects and benefits. Below is a summary of the Final EIS's findings regarding the Preferred Alternative.

Ability to meet project purpose and need:

- Improves safety by replacing the existing vulnerable structures with facilities designed to modern standards that will better resist windstorms and earthquakes. Wider shoulders will also make travel safer and more reliable.
- Improves mobility by completing the HOV lane system so that more people can travel through the corridor in fewer vehicles.
- Saves general-purpose and transit riders up to 24 minutes in crossing the SR 520 corridor in 2030 compared to the No Build Alternative.
- Reduces transit travel times by up to 12 minutes on Montlake Boulevard compared to No Build.
- Adds new commuting options by connecting the Eastside and floating bridge bike/pedestrian path to local and regional trails in Seattle.
- Provides safe, efficient connections for bicyclists, pedestrians, and bus riders to the Montlake Triangle and the University Link light rail station.
- Accommodates near-term bus rapid transit service planned by King County Metro and Sound Transit; can accommodate future light rail if voted on and funded by the region.

Environmental benefits:

- Reduces height of the floating bridge compared to the SDEIS options to minimize visual effects.
- Has the lowest acreage of park impacts of any of the options evaluated and results in the least overall harm to Section 4(f) properties.
- Removes the existing Lake Washington Boulevard ramps and restores wetlands and open space in this area.
- Minimizes impacts in the Arboretum by limiting the bridge footprint on Foster Island and reducing traffic volumes on Lake Washington Boulevard.
- Provides a new 3.9-acre public park on the Lake Washington Ship Canal and adds eight acres of new public open space on the lids.
- Reduces wetland fill to less than one-tenth of an acre, making it the least environmentally damaging practicable alternative under Section 404 of the Clean Water Act.
- Incorporates a higher west approach profile than the SDEIS options to reduce the intensity of shading over open water and wetlands and improve the efficiency of stormwater treatment.
- Affects less wildlife habitat than any of the options evaluated.
- Reduces annual vehicle miles traveled on SR 520 by 5 to 10 percent and greenhouse gas emissions by almost 10 percent.
- Shorter construction duration and fewer haul trucks on local streets than SDEIS Options K and L.

Environmental tradeoffs:

- Creates more wetland shade than the SDEIS options, but reduces the intensity of this shade by raising the west approach bridge profile.
- Results in a somewhat lesser extent of noise reduction than the SDEIS options with recommended mitigation, but still achieves a substantial reduction from existing and No Build noise levels without the aesthetic impact of noise walls.
- Results in removal of two more residences than SDEIS Options K and L to allow for construction of the parallel Montlake Bridge.

- Has more traffic in the Arboretum than Option A without the Lake Washington Boulevard ramps, but less than any other SDEIS option.

What are the next steps?

After publication of the Final EIS, if FHWA determines the analysis to be adequate and to comply with necessary standards, the agency will prepare and sign a Record of Decision (ROD) that describes the decision, explains why it has taken a particular action, and presents the mitigation measures and commitments to be incorporated into project construction and operation. The ROD will identify the selected alternative, explain the alternatives considered, and specify an "environmentally preferable alternative." The ROD will also identify any outstanding issues yet to be resolved.

Although the ROD is the conclusion of the NEPA process, it signals the beginning of project implementation. WSDOT will further develop the engineering design for the project, including additional detail on project phasing, construction staging, and construction techniques. Having a preferred alternative identified also will allow WSDOT to develop more specific designs for mitigation measures, which will be documented in project permit applications. These designs will be prepared by WSDOT and FHWA, in cooperation with the affected jurisdictions, tribes, and resource agencies.

How can I learn more?

Join the project mailing list. WSDOT will continue to keep the public informed about opportunities for input as the project moves forward with design and construction. If you provide your name, we will add you to the project mailing list, which allows you to receive regular email updates. You may join the mailing list by logging onto our Web site at www.wsdot.wa.gov/projects/SR520Bridge or by calling the project hotline at 1-888-520-NEWS.

What permits and regulatory approvals are required?

Anticipated permits and approvals that would be required for the project, as well as regulatory processes that must be followed, include:

Federal

- NEPA ROD
- Department of Archaeology and Historic Preservation: National Historic Preservation Act Consultation (Section 106)
- Environmental Protection Agency
  - Review of Corps Clean Water Act Section 404 Permit
  - Review and Rating of NEPA Document(s)
- National Park Service: Confirm Recreation and Conservation Office Section 6(f) Approval
- Tribal Nations
  - Section 106 Impacts
  - Resolution of Impacts to Usual and Accustomed Areas Government-to-Government consultation
- U.S. Army Corps of Engineers
  - Clean Water Act Section 404, Individual Permits
  - Rivers and Harbors Act of 1899 Section 10 Permit
- U.S. Coast Guard
  - General Bridge Permit
  - Private Aids to Navigation Permit
- U.S. Fish and Wildlife Service and NOAA Fisheries
  - Section 7, Endangered Species Act Consultation
  - Magnuson-Stevens Essential Fish Habitat Consultation
  - Marine Mammal Protection Act Compliance
  - Bald and Golden Eagle Protection Act Compliance
  - Migratory Bird Treaty Act Compliance

State and Regional

- WSDOT: State Environmental Policy Act FEIS
- Puget Sound Clean Air Agency: Clean Air Conformity Certification
- Recreation and Conservation Office: Section 6(f) Replacement Package Approval
- Washington Department of Fish and Wildlife: Hydraulic Project Approval
- Washington Department of Natural Resources: Aquatic Lands Use Authorization
- Washington State Department of Ecology
  - Clean Water Act Section 401 Water Quality Certification
  - Clean Water Act Section 402 National Pollutant Discharge Elimination System
  - Coastal Zone Management Act Consistency Determination
  - Shoreline Substantial Development Permit with Conditional Use and Variance Approval

Local

- WSDOT will obtain the applicable local permits from the cities of Seattle and Medina, where the project will be located.
- King County: Waste Discharge Permit/Authorization

List of Acronyms

Acronym	Definition
BMP	best management practice
CCMP	Community construction management plan
CFR	Code of Federal Regulations
cy	cubic yards
DAHP	Department of Archaeology and Historic Preservation
dB	decibel
EIS	Environmental Impact Statement
ERP	Expert Review Panel
ESHB	Engrossed Substitute House Bill
ESSB	Engrossed Substitute Senate Bill
FHWA	Federal Highway Administration
GHG	Greenhouse gas
HCT	High capacity transit
HOV	high-occupancy vehicle
I-5	Interstate 5
I-90	Interstate 90
I-405	Interstate 405
LRT	Light rail transit
MBtu	million British thermal units
MOHAI	Museum of History and Industry
MOU	Memorandum of understanding
mph	miles per hour
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
ROD	Record of Decision
SEPA	State Environmental Policy Act
SDEIS	Supplemental Draft Environmental Impact Statement
SHPO	State Historic Preservation Officer
SPUI	single-point urban interchange
SR 202	State Route 202
SR 520	State Route 520
SR 520, I-5 to Medina project	SR 520, I-5 to Medina: Bridge Replacement and HOV Project
UW	University of Washington
VMT	Vehicle miles traveled
WAC	University of Washington's Waterfront Activities Center
WSDOT	Washington State Department of Transportation

FINAL ENVIRONMENTAL IMPACT STATEMENT
and SECTION 4(f) and 6(f) EVALUATIONS
SR 520 BRIDGE REPLACEMENT AND HOV PROGRAM

JUNE 2011

SR 520, I-5 to Medina: Bridge Replacement and HOV Project

U.S. Department of Transportation
Federal Highway Administration

Washington State
Department of Transportation

FHWA-WA-EIS-06-02-F

SR 520 Bridge Replacement and HOV Program

SR 520, I-5 to Medina: Bridge Replacement and HOV Project Final Environmental Impact Statement and Final Section 4(f) and 6(f) Evaluations

ABSTRACT

The existing Portage Bay and Evergreen Point bridges on SR 520 are at the end of their useful life and must be replaced. The Federal Highway Administration (FHWA) and Washington State Department of Transportation (WSDOT) plan to replace the existing facilities in order to provide structures capable of withstanding windstorms and earthquakes and to improve mobility and access for people and goods along the corridor.

The August 2006 Draft Environmental Impact Statement (EIS) for the SR 520 Bridge Replacement and HOV Program evaluated the No Build Alternative and two build alternatives, the 4-Lane Alternative and the 6-Lane Alternative. The January 2010 Supplemental Draft EIS and Section 4(f)/6(f) Evaluation evaluated the effects of a No Build Alternative and three design options for the 6-Lane Alternative for the SR 520, I-5 to Medina project. These design options were developed through a mediation process established as part of Engrossed Substitute Senate Bill 6099, enacted during the 2008 session of the Washington State Legislature.

Based on findings of the SDEIS and comments submitted, a Preferred Alternative was identified in 2010. This Final EIS analyzes the direct, indirect, and cumulative effects of the Preferred Alternative compared to the No Build Alternative and the three SDEIS design options. No decision will be made on the proposed action prior to July 18, 2011. For information about the project, contact Margaret Kucharski, WSDOT Environmental Lead, 600 Stewart Street, Suite 520, Seattle, Washington 98101, (206) 770-3500.

SUBMITTED PURSUANT TO:
National Environmental Policy Act, 42 USC 4332(2)(C)
State Environmental Policy Act, Chapter 43.21C,
Revised Code of Washington & Chapter 197-11, Washington Administrative Code 468-12
Section 4(f) (49 USC § 303 and USC § 138)

Daniel M. Mathis

Daniel M. Mathis, P.E.
Washington Division Administrator
Federal Highway Administration

05/26/2011
Date of Approval

Megan White

Megan White, P.E.
Director, Environmental Services Office
Washington State Department of Transportation

5/26/2011
Date of Approval

Americans with Disabilities Act (ADA) Information

Materials can be provided in alternative formats—large print, Braille, cassette tape, or on computer disk—for people with disabilities by calling the ADA/504 Compliance Manager, Shawn Murinko, at (360) 705-7097. Persons who are deaf or hard of hearing may contact OEO through the Washington Relay Service at 7-1-1.

Title VI Information

It is the Washington State Department of Transportation's (WSDOT) policy to assure that no person shall, on the grounds of race, color, national origin, or sex, as provided by Title VI of the Civil Rights Act of 1964, be excluded from participation in, be denied the benefits of, or be otherwise discriminated against under any of its federally funded programs and activities. Any person who believes his/her Title VI protection has been violated may file a complaint with WSDOT's Office of Equal Opportunity (OEO). For Title VI complaint forms and advice, please contact OEO's Title VI Coordinator, George Laue, at (509) 324-6018.

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SEPA Fact Sheet

Project Title: SR 520, I-5 to Medina: Bridge Replacement and HOV Project

Project Description

The State Route (SR) 520, I-5 to Medina: Bridge Replacement and HOV Project proposes to replace SR 520's Portage Bay and Evergreen Point bridges and improve the existing roadway between Interstate 5 (I-5) in Seattle and Evergreen Point Road in Medina.

The proposed action spans 5.2 miles of the SR 520 corridor and is one of four projects in the SR 520 Program. A 2006 Draft Environmental Impact Statement (EIS) analyzed proposed corridor construction from the I-5 interchange in Seattle to just west of I-405 in Bellevue. A Supplemental Draft EIS in 2010 evaluated the effects of a No Build Alternative and three 6-lane design options for the SR 520 corridor from I-5 to Medina. A Preferred Alternative, similar to Option A, was identified in April 2011 following consideration of comments on the SDEIS.

The Final Environmental Impact Statement and Final Section 4(f) and 6(f) Evaluations analyzes a No Build Alternative along with a Preferred Alternative and the three SDEIS design options for the I-5 to Medina corridor. The Preferred Alternative and the design options would replace vulnerable structures, add continuous HOV lanes, and include landscaped lids over SR 520 to reconnect neighborhoods that are now separated by the highway.

Project Proponents

The Federal Highway Administration (FHWA) is the National Environmental Policy Act (NEPA) lead agency; Washington State Department of Transportation (WSDOT) is the lead State Environmental Policy Act (SEPA) agency.

Responsible NEPA Official

Daniel M. Mathis, P.E.
Division Administrator
FHWA Washington Division

Responsible SEPA Official

Megan White, P.E.
Director, Environmental Services Office
Washington State Department of Transportation

Proposed Project Implementation

Construction is planned to begin in 2012, and the new Evergreen Point Bridge is expected to open to traffic as early as 2014. The rest of the project is planned for completion by 2018, but may be built in phases based on funding availability.

Contact Information

For information about the project contact the following:

Margaret Kucharski
WSDOT Environmental Lead
SR 520, I-5 to Medina: Bridge Replacement and HOV Project
600 Stewart Street, Suite 520
Seattle, WA 98101

Access the Final EIS online at www.wsdot.wa.gov/projects/sr520bridge/. To listen to a recording of the latest project information or to submit a question, please call the project hotline at 1-888-520-6397.

Anticipated Permits and Approvals

Federal

U.S. Army Corps of Engineers:

- Section 404, Individual Permits
- Section 10, Rivers and Harbors Act of 1899

U.S. Coast Guard: Section 9, Rivers and Harbors Act of 1899

U.S. Department of the Interior Land and Water Conservation Fund Act (Section 6(f))

U.S. Department of Transportation Section 4(f)

U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration Fisheries:

- Section 7, Endangered Species Act Consultation
- Magnuson-Stevens Essential Fish Habitat Consultation

Washington Department of Archaeology and Historic Preservation: National Historic Preservation Act Consultation (Section 106)

State and Regional

Puget Sound Clean Air Agency Clean Air Conformity Certification

Washington Department of Fish and Wildlife Hydraulic Project Approval

Washington Department of Natural Resources Aquatic Lands Use Authorization

Washington State Department of Ecology:

- 401 Water Quality Certification
- 402 National Pollutant Discharge Elimination System
- Coastal Zone Management Act

Local

WSDOT will obtain the applicable local permits from the cities of Seattle and Medina, where the project would be located. These permits include:

City of Medina:

- Building Permit
- Shoreline Substantial Development Permit/Variance/Conditional Use
- Noise Variance

City of Seattle:

- Environmentally Critical Areas Permit
- Shoreline Substantial Development Permit/Variance/Conditional Use
- Street Use Permit
- Noise Variance

Authors and Principal Contributors

This Final EIS was prepared under the direction of WSDOT and FHWA. Research, analysis, and document preparation were provided by the preparers listed in Attachment 3.

Final EIS Issue Date

June 17, 2011

Anticipated Record of Decision Issue Date

FHWA expects to issue a Record of Decision on this project no earlier than July 18, 2011.

Location of Background Data

The 2006 Draft EIS, 2010 SDEIS, technical discipline reports, and other supporting documentation are maintained at the following locations:

Federal Highway Administration
Randy Everett
Seattle Major Projects Oversight Manager
Federal Highway Administration
915 Second Avenue
Room 3142
Seattle, WA 98174

Washington State Department of Transportation
Allison Hanson
Environmental Director
Mega Projects Office
999 Third Avenue, Suite 2424
Seattle, WA 98104

Document Cost and Availability

The Final EIS is available on CD-ROM at no charge, and print copies are available for $60, a cost which does not exceed printing and mailing costs. Copies can be obtained at the SR 520 Project Office, 600 Stewart Street, Suite 520, Seattle, WA 98101. The Final EIS and related attachments can also be viewed at the following libraries:

Aberdeen Timberland Library

Bellevue College Library Media Center

King County Library System - Bellevue Regional Library

King County Library System - Kingsgate Library

King County Library System - Kirkland Library

King County Library System - Lake Hills Library

King County Library System - Newport Way Library

King County Library System - Redmond Regional Library

Lake Washington Technical College, Technical Library

Municipal Research and Services Center Library

Natural Resources Library

North Seattle Community College Library

Seattle Central Community College, Library

Seattle Public Library - Central Branch

Seattle Public Library - International District/Chinatown Branch

Seattle Public Library - Madrona-Sally Goldmark Branch

Seattle Public Library - Montlake Branch

Seattle Public Library - North East Branch

Seattle Public Library - University Branch

Sound Transit

Timberland Regional Library

US Army Corp of Engineers - Seattle District Library

US EPA Region 10 Library

UW - Suzzallo and Allen Libraries

UW Department of Engineering - Library

UW Office of the Board of Regents

Washington State Department of Ecology Library
Washington State Library
WSDOT Headquarters Library



Chapter 1: Introduction to the Project

This chapter describes the purpose and history of the SR 520, I-5 to Medina: Bridge Replacement and HOV Project, including the progress made since the Supplemental Draft Environmental Impact Statement was published in 2010 (see Attachment 10). It also summarizes the input of the public and many stakeholders and presents the Preferred Alternative for the SR 520, I-5 to Medina project.

1.1 Introduction

The State Route (SR) 520, Interstate 5 (I-5) to Medina: Bridge Replacement and High-Occupancy Vehicle (HOV) Project (also referred to as the State Route (SR) 520, I-5 to Medina project) is located at the western end of the SR 520 corridor (Exhibit 1-1). It begins at SR 520's interchange with I-5, the main north-south artery through Seattle, and ends at Evergreen Point Road in Medina, east of Lake Washington. In addition to the I-5 interchange, the 5.2-mile-long corridor currently includes an interchange at Montlake Boulevard and ramps connecting to Lake Washington Boulevard, both in Seattle.

Exhibit 1-1. **Project Vicinity Map**

SR 520 is a critical link connecting the major population and employment centers of the Puget Sound region on either side of Lake Washington. The floating span of the Evergreen Point Bridge, opened in 1963, now carries approximately 115,000 vehicles per day across the lake, providing east-west access for commuters, freight, transit, and general-purpose traffic. The aging floating bridge is vulnerable to failure in a severe windstorm, and the fixed bridges along the corridor do not meet current seismic standards and could collapse in an earthquake. In addition, the corridor currently carries nearly twice as many vehicles as it was originally designed for, resulting in extended congestion and impaired mobility. The uninterrupted movement of people and goods across SR 520 and the floating bridge is essential to the region's economic vitality and quality of life.

The proposed project would improve safety and mobility in the SR 520 corridor by replacing the vulnerable bridges and adding eastbound and westbound HOV lanes to move people more efficiently in transit and carpools. It would ensure the continued availability of SR 520 as a key corridor for transportation and commerce.

The SR 520, I-5 to Medina project is designated as a strategic project in the Puget Sound Regional Council's *Vision 2040* plan (PSRC 2009), the Metropolitan Transportation Plan for the Puget Sound region. It is accounted for in the financial strategy and air quality conformity analysis of the current regional transportation plan. Full funding is reasonably anticipated to be available for completion of all phases of the project within the time period anticipated for completion of the project. The project is also included in the Washington State Department of Transportation's (WSDOT's) 2009-2012 Statewide Transportation Improvement Program (WSDOT 2009a).

Why is this project important?

The 48-year-old Evergreen Point Bridge is fast becoming a victim of age and obsolescence. Despite the expansion of the Lake Washington Interstate 90 (I-90) bridge crossing to the south in 1989, the Evergreen Point Bridge and the adjoining stretches of SR 520 are choked with traffic for hours every weekday. Simply stated, more people want to use the highway than it can accommodate. Narrow shoulders and the lack of an HOV lane mean that a single breakdown can snarl traffic for hours, while buses and carpools creep along with general-purpose traffic in the resulting congestion. Meanwhile, strong winds and high waves threaten the integrity of the floating portion of the bridge and sometimes force its closure. In addition, the Portage Bay Bridge and both the west and east approaches to the Evergreen Point Bridge are supported by hollow columns that are especially vulnerable to damage in an earthquake.

For these reasons, the SR 520, I-5 to Medina: Bridge Replacement and HOV Project is one of the state's highest transportation priorities. Traffic safety and reliability need to be improved, and the vulnerable structures built in the 1960s must be replaced. Travel in the region must be made more efficient by providing better transit options in the SR 520 corridor. The neighborhoods and the region as a whole must be better served by the transportation infrastructure; at the same time, the built and natural environment must be protected as much as possible from the potential effects of a major transportation corridor.

Why is this Final EIS being prepared?

Environmental review for this project began in 2000, when the Federal Highway Administration (FHWA) and WSDOT filed a Notice of Intent to issue an environmental impact statement (EIS) under the National Environmental Policy Act (NEPA, implemented by 40 Code of Federal Regulations [CFR] Sections 1500 through 1508) and the State

Environmental Policy Act (SEPA, implemented by Washington Administrative Code [WAC] Chapter 197-11). Both NEPA and SEPA require that an EIS be prepared when an undertaking is likely to result in significant adverse impacts on the natural and/or built environment.

In August 2006, FHWA and WSDOT issued a Draft EIS evaluating the effects of the No Build, 4-Lane, and 6-Lane Alternatives, as well as several design options for the 6-Lane Alternative (Attachment 12). The Draft EIS covered improvements in the SR 520 corridor from I-5 in Seattle to just west of I-405 in Bellevue. Following its issuance, FHWA and WSDOT determined that the portion of the corridor east of Evergreen Point Road had independent utility and should be evaluated as a separate project. In January 2010, FHWA and WSDOT issued a Supplemental Draft EIS (SDEIS) for the SR 520 corridor from I-5 to Medina that evaluated three new 6-Lane Alternative design options developed by a legislatively mandated mediation group (Attachment 10). (More information on the development and evaluation of alternatives and options can be found in Chapter 2.) The Draft EIS and the SDEIS generated, in total, over 2,500 comment letters, e-mails, and oral testimonies, comprising thousands of individual comments from the public, regulatory agencies, and Native American tribes. Additional information on comments is provided later in this chapter and in Attachments 11 and 13.

After publishing the SDEIS and evaluating the comments received, FHWA and WSDOT identified a Preferred Alternative in April 2010. The Preferred Alternative is most similar to SDEIS Option A, but includes a number of improvements to reduce neighborhood and park effects, improve regional and local transit connections, and enhance compatibility with potential future light rail transit in the corridor. A description of the Preferred Alternative can be found in Chapter 2.

NEPA and SEPA require that FHWA and WSDOT prepare a Final EIS to respond to comments received on the Draft EIS and SDEIS (40 CFR Sec. 1503.4). NEPA also requires FHWA and WSDOT to discuss at appropriate points in the final EIS "any responsible opposing view which was not adequately discussed in the draft statement" (40 CFR Sec. 1502.9) and indicate their responses to the issues raised. In addition, a preferred alternative must be identified in the Final EIS (40 CFR Sec. 1502.14). Preparing this Final EIS provides FHWA and WSDOT the opportunity to respond to comments from agencies, tribes, and the public; further evaluate the Preferred Alternative identified in April 2010; supplement, improve, and modify previous analyses as appropriate; and make corrections to previous environmental documentation. The results of these additional analyses have been incorporated into the Final EIS.

How is this Final EIS organized?

This Final EIS is designed to provide readers with a complete record of the environmental analysis completed and the decision-making process that resulted in the identification of the Preferred Alternative. Accordingly, it includes the full analysis of Options A, K, and L from the SDEIS, as well as new analysis of the Preferred Alternative and updates to the No Build Alternative. The Preferred Alternative is compared with the No Build Alternative and the SDEIS options to allow readers to understand how future conditions would change from the baseline, and also how its effects would differ from Options A, K, and L for each aspect of the built and natural environment.

The Final EIS has the same chapter arrangement as the SDEIS, but adds three new chapters (9, 10, and 11):

- Chapter 1 introduces the project and its purpose and need.
- Chapter 2 describes the development and evaluation of project alternatives, provides information on the design of the Preferred Alternative, and compares the Preferred Alternative to the SDEIS options and the No Build Alternative.
- Chapter 3 describes project construction methods and sequencing.
- Chapter 4 repeats the information on the affected environment from Chapter 4 of the SDEIS, with updates as appropriate.
- Chapter 5 identifies the project's permanent direct and indirect effects on the built and natural environment, with new text on the Preferred Alternative added to the SDEIS discussions of Options A, K, and L. Updates to the No Build Alternative are also described for applicable disciplines.
- Chapter 6 identifies the effects of project construction on the built and natural environment, with new text on the Preferred Alternative added to the SDEIS discussions of No Build and Options A, K, and L.
- Chapter 7 discusses the project's cumulative effects, with new information provided for the Preferred Alternative as appropriate.
- Chapter 8 discusses other considerations, such as areas of controversy and unavoidable adverse effects.
- Chapter 9 is the final Section 4(f) Evaluation for the project (the draft Section 4(f)/Section 6(f) evaluation was Attachment 6 in the SDEIS).
- Chapter 10 is a summary of the Section 6(f) Environmental Evaluation for the project. The complete Section 6(f) Environmental Evaluation is provided in Attachment 15. (In the SDEIS, the draft Section 6(f) evaluation was combined with the Section 4(f) evaluation in Attachment 6.)

- Chapter 11 discusses the comments received during the public comment periods for the 2006 Draft EIS and the 2010 SDEIS, and WSDOT's general approach to reviewing and providing responses to the principal issues raised.

Attachments 1 through 6 are provided in hard copy in this Final EIS, and Attachments 7 through 19 are included on the DVD attached to the cover of the Executive Summary. Updated discipline reports, addenda, and errata are presented in Attachment 7 along with the corresponding discipline reports from the 2010 SDEIS. The project mitigation plans and the Section 106 Programmatic Agreement are included in Attachment 9. The comments received on the SDEIS and WSDOT's responses are found in Attachment 11, and Attachment 13 contains the Comment Summary Report prepared in response to the comments on the 2006 Draft EIS. A complete set of the Draft EIS comments is also included in Attachment 13.

1.2 What is the project purpose?

In 2000, the Trans-Lake Washington Study Committee developed the statement of purpose, which has guided the environmental review process since that time:

> The purpose of the project is to improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.

The statement of purpose—part of a longer purpose and need statement also adopted in 2000—has helped the project team develop and evaluate alternatives for the EIS analysis by defining the objectives that the alternatives must meet. Although the project limits have changed since the original statement was adopted, the project still has the purpose of improving mobility within the SR 520 corridor, and its transportation performance is evaluated on a corridor-wide basis. However, the I-5 to Medina project also serves another important purpose: to replace the aging and vulnerable Evergreen Point, Portage Bay, and west approach bridges. The following section describes the need for the project in terms of both mobility and safety.

What is mobility, and how is it measured?

The fact that the project purpose statement reads, "improve mobility for people and goods"—rather than "for vehicles and goods"—is significant. Recognizing the importance of transit and carpooling in this urban corridor, the Trans-Lake Washington Study Committee adopted evaluation criteria that measured how well potential alternatives would move people in addition to how well they would move vehicles. For this reason, the transportation analysis estimates future person-trips as well as future vehicle trips in the corridor, with an objective of serving as many *people* as possible within a given roadway capacity. While this EIS looks at many measures of transportation performance—travel times, levels of service, areas, and hours of congestion—this emphasis on maximizing the flow of people and goods through the corridor is central to the project purpose. Please see Chapter 2 for more information on evaluation criteria, and Chapter 5 (Section 5.1) for a detailed analysis of the project's effects on mobility.

1.3 Why is the project needed now?

The Evergreen Point Bridge is a critical component of the Puget Sound region's transportation infrastructure. It is one of only two connections across Lake Washington that link urban centers in Seattle and the Eastside. The SR 520, I-5 to Medina: Bridge Replacement and HOV Project addresses two key issues facing the SR 520 corridor: 1) bridge structures that are vulnerable to catastrophic failure; and 2) worsening traffic levels and congestion due to growth in jobs and housing over the last two decades.

SR 520's bridges are vulnerable to catastrophic failure.

The Evergreen Point Bridge and its approaches are in danger of structural failure. Recent WSDOT studies have demonstrated that the floating span of the Evergreen Point Bridge is highly vulnerable to windstorms, while the Portage Bay Bridge and the east and west approaches to the Evergreen Point Bridge are vulnerable to earthquakes. In 1999, WSDOT estimated the remaining service life of the floating portion of the Evergreen Point Bridge to be 20 to 25 years, based on its structural condition and the likelihood of severe windstorms. Its life expectancy now is only 10 to 15 years.

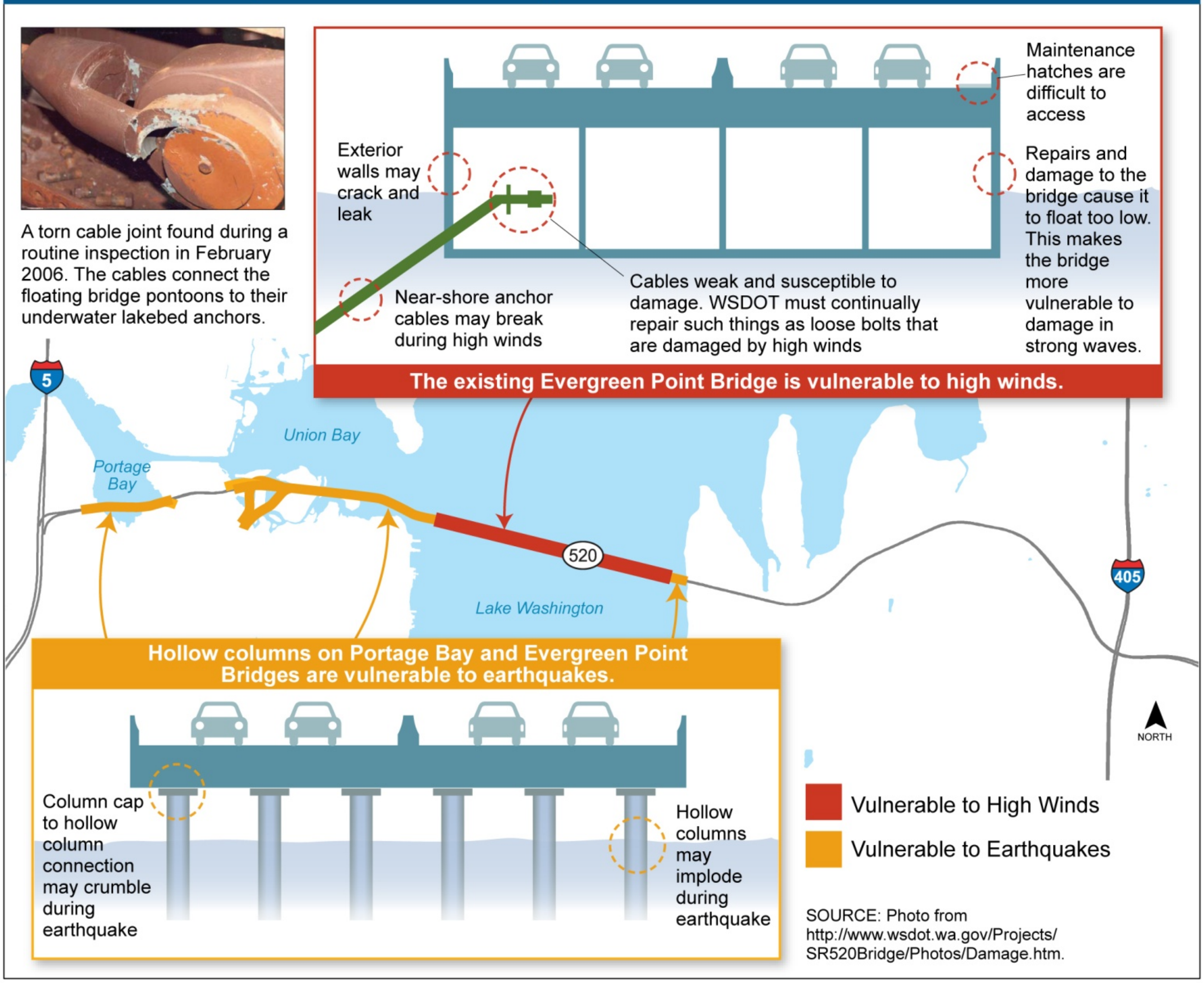
The floating span was originally designed for a sustained wind speed of 57.5 miles per hour (mph). In 1999, WSDOT rehabilitated the bridge to allow it to withstand sustained winds up to 77 mph. This still falls well short of the current design standard of 92 mph. Moreover, some bridge mechanisms have been damaged in recent storms. The floating pontoons currently float about 1 foot lower than originally designed, increasing the likelihood of waves breaking onto the bridge deck. Cracks in the structure leak water that WSDOT must pump out on a regular basis. The probability that the bridge will sustain serious structural damage (i.e., sink or become impassable to traffic) over the next 15 years is extremely high. To bring the Evergreen Point Bridge up to current design standards and eliminate the risk of its catastrophic failure, the existing span must be completely replaced. Exhibit 1-2 shows the vulnerable sections of SR 520.

The ever-present possibility of an earthquake in the Seattle area poses additional risks to other bridges in the SR 520 corridor. The columns of the Portage Bay Bridge and both the west and east approaches to the Evergreen Point Bridge are hollow and do not meet current seismic design standards. Hollow-core columns are difficult and costly to retrofit to today's accepted seismic protection levels; WSDOT studies indicate that such retrofitting would cost nearly as much as building new structures, and would have similar environmental effects. WSDOT estimates that over the next 50 years, there is a 20 percent chance of serious damage to these structures in an earthquake.

SR 520 is congested and unreliable, and does not encourage maximum transit and carpool use.

A second key reason for implementing this project now is the severe traffic congestion in the SR 520 corridor, which was the reason for initiating the original Trans-Lake Washington Study in 1998. The traffic demand in both directions exceeds the highway's capacity, creating several hours of congestion every weekday. The corridor was not built to handle as many

Exhibit 1-2. **Points along SR 520 Vulnerable to Earthquake or Windstorms**



SOURCE: Photo from http://www.wsdot.wa.gov/Projects/SR520Bridge/Photos/Damage.htm.

vehicles as currently want to use it. All of these vehicles result in frequent breakdown of the traffic flow and long backups of vehicles traveling at very slow speeds.

A number of factors have contributed to today's traffic congestion on SR 520. One factor is the pattern of population growth and the changing location of jobs in the project area since the highway opened in 1963. The new crossing of Lake Washington made it much easier for people to live in Eastside communities and work in Seattle, increasing the number of westbound vehicles across the Evergreen Point Bridge in the morning and eastbound in the evening. Meanwhile, some of these Eastside communities began to develop their own commercial and employment centers, eventually leading to substantial growth of "reverse commute" traffic. Today, seven times more vehicles cross SR 520 each day than when the bridge first opened in 1963, and there is no longer a reverse commute: traffic during peak hours is nearly equal in each direction.

Beyond the number of people and cars, another important factor causing today's congestion is the design of the Evergreen Point Bridge. By today's engineering standards, the bridge is too narrow. The narrow shoulders provide no room for vehicles to pull over after an accident or breakdown. Instead, disabled vehicles must stay in the through lane and block other traffic, immediately rendering a full lane of traffic unusable. This slows down traffic and impedes emergency vehicle response. In addition, the westbound HOV lane on the Eastside ends at the bridge. This creates congestion as westbound HOV traffic is forced to merge with general-purpose traffic.

Together, growth and physical limitations will make the future traffic situation on SR 520 worse if the corridor is not improved. Under average evening peak-hour conditions today, a single-occupant vehicle traveling westbound takes approximately 39 minutes to travel SR 520 from SR 202 in Redmond to I-5 in Seattle—a distance of about 13 miles. By 2030, if the project is not built, this same trip will take over an hour (Final Transportation Discipline Report, Attachment 7). This makes it imperative that commuters be provided with travel choices that allow them to avoid driving alone, and that the proposed project be built to support increased use of transit and HOVs.

Traffic congestion is more than an inconvenience for drivers. It also impairs the regional economy and the quality of our lives and communities. Delays increase business costs, discourage growth, and create disincentives for businesses to locate in the region. Congestion also generates pollutants from idling vehicles, which are much less efficient than vehicles operating at higher speeds.

1.4 What would the project accomplish?

The SR 520, I-5 to Medina: Bridge Replacement and HOV Project would improve safety and mobility in the SR 520 corridor by improving SR 520 from I-5 in Seattle to Evergreen Point Road in Medina.

The project would include the following components:

- A new Evergreen Point Bridge, designed to current standards for wind and wave resistance
- New Portage Bay and west and east approach bridges to a floating bridge designed to current seismic standards
- Four general-purpose lanes and two HOV lanes, providing increased mobility and reliability for transit and carpools as well as for general-purpose vehicles

- Wider shoulders and improved curves for greater safety and improved reliability
- Variable-rate tolling to provide project funding and improve mobility during peak periods
- Landscaped lids over sections of the highway to reconnect neighborhoods
- A regional bicycle/pedestrian path across Lake Washington with connections to existing bicycle and pedestrian facilities
- Stormwater treatment to improve the quality of runoff from SR 520, which is currently not treated
- Noise reduction strategies to lower sound levels in neighborhoods and parks adjacent to the corridor

1.5 What would happen if the project were not built?

If the project were not built, the section of SR 520 between I-5 and Evergreen Point Road would not be improved, and these critical needs would not be met:

- The risk of bridge failure in a storm or earthquake would increase as the structures continued to age, with consequences ranging from severe traffic congestion to loss of life. As the floating bridge becomes more fragile, it would require more frequent closures to protect its components from damage.
- Planned growth in the project area over time would cause continued growth in traffic volumes on SR 520, increasing congestion and raising the potential economic and social cost of traffic closures and/or bridge failures.
- Transit vehicles and carpools would remain in congested general-purpose lanes, increasing travel time, reducing reliability, and discouraging commuters from choosing transit.
- The facility's narrow shoulders would continue to result in blocked lanes and long delays when accidents occur.
- Without lids, SR 520 would continue to serve as a barrier between neighborhoods.
- Pedestrians and bicyclists would remain limited to I-90 as a choice for crossing Lake Washington.
- Stormwater discharging from SR 520 into Portage Bay and Lake Washington would remain untreated.

1.6 Who has been involved in the environmental process?

Who are the lead agencies?

NEPA and SEPA require that one or more lead agencies take responsibility for the environmental review process. For this project, FHWA is the federal lead agency under NEPA, and WSDOT is the project proponent and the state lead agency under SEPA. FHWA is providing highway design guidance and environmental oversight. WSDOT is leading the highway design efforts and development of the EIS. The lead agencies also give close consideration to public, agency, and tribal comments on the project.

Who are FHWA and WSDOT's cooperating agencies for this project?

Staff from the affected jurisdictions, representatives of state and federal natural resource agencies, and tribes have provided advice and recommendations to the lead agencies about the scope and content of environmental analysis. These "cooperating agencies" are defined under NEPA as those that have an interest in a proposed project for which environmental documents are being prepared. Most cooperating agencies issue or contribute to permit decisions for a project, and will use FHWA's and WSDOT's EIS under NEPA or SEPA in support of these decisions. A list of cooperating agencies for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project is shown in the box at right.

WSDOT worked with the cooperating agencies through a forum known as the Regulatory Agency Coordination process (RACp). All agencies with jurisdiction over the project were invited to attend, as were all tribes with fishing rights and/or cultural resource interests in the project area. While the RACp itself was primarily focused on sharing of information, smaller technical working groups (TWGs) met more often to focus on topics of specialized interest, including natural resource effects, in-water construction, mitigation, stormwater, parks, Endangered Species Act compliance, and the design of the bridge maintenance facility. In the TWGs, agency and tribal staff worked closely with WSDOT to collaborate on methods for impact assessment and mitigation planning. WSDOT also met regularly with resource agency directors to keep them apprised of project status.

How have FHWA and WSDOT consulted with Native American tribes?

FHWA and WSDOT have engaged with affected tribal nations through government-to-government consultation and conducted outreach through correspondence, individual meetings, and resource agency meetings. The Muckleshoot Indian Tribe and the Snoqualmie Indian Tribe are cooperating

Cooperating Agencies

- Federal Transit Administration
- National Marine Fisheries Service
- National Park Service
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- Muckleshoot Indian Tribe
- Snoqualmie Indian Tribe
- Washington State Department of Archaeology and Historic Preservation
- Washington State Department of Ecology
- Washington State Department of Fish and Wildlife
- Washington State Department of Natural Resources
- Washington State Recreation and Conservation Office
- Sound Transit
- Puget Sound Clean Air Agency
- Puget Sound Regional Council
- King County
- City of Medina
- City of Seattle

agencies under NEPA for the SR 520, I-5 to Medina project. In this role, they had the opportunity to review discipline reports for the SDEIS (Attachment 7) and other environmental documents prior to public release.

The Muckleshoot Indian Tribe is the only tribe with usual and accustomed treaty fishing rights in Lake Washington and its tributaries. FHWA and WSDOT have coordinated and are continuing to coordinate with the tribe on effects on fishing access and fish habitat. Staff from the Muckleshoot Indian Tribe Fisheries Division (MITFD) participated in the RACp and the Natural Resource TWG, where they provided input on impact calculation methods and potential mitigation measures. MITFD staff also provided comments on the published SDEIS. Currently, formal government-to-government consultation is ongoing between FHWA, WSDOT, and the Muckleshoot Tribe to determine appropriate mitigation for the project's effects on resources protected by treaty fishing rights. A draft agreement identifying formal commitments is expected to be completed in summer 2011, with a final agreement in late 2011.

Section 106 of the NHPA and its implementing regulations require federal agencies to consult with tribes when proposed projects could affect properties with historic, religious, or cultural significance to those tribes. Tribes may have input on these cultural resources regardless of whether they have court-affirmed treaty rights or are federally recognized. FHWA and WSDOT have consulted with tribes whose cultural resources might be affected by the project, including the federally recognized Muckleshoot Indian Tribe, Snoqualmie Tribe, Suquamish Tribe, and Tulalip Tribes, as well as the non-federally recognized Duwamish Tribe. Although the project team has corresponded with the Yakama Indian Nation, the Yakama Indian Nation defers to tribes more local to the project and has not met with WSDOT since publication of the Draft EIS (Attachment 12). All affected tribes have had an opportunity to review the cultural resource evaluation for the project.

The results of tribal consultation under Section 106, including mitigation measures to which WSDOT has agreed, are memorialized in a Programmatic Agreement between FHWA, WSDOT, the tribes, and the Department of Archaeology and Historic Preservation (DAHP). WSDOT is also working in consultation with the tribes and DAHP to develop a Foster Island Treatment Plan (FITP). FHWA and WSDOT will continue to coordinate with the tribal nations throughout detailed project design to implement the mitigation measures committed to in the Programmatic Agreement and the FITP and to ensure that construction activities are monitored as necessary to ensure that any unanticipated discoveries of cultural resources are addressed appropriately. The Programmatic Agreement is included in Attachment 9 of this Final EIS.

WSDOT has worked with tribes to address cultural resource concerns, including by involving tribal staff in fieldwork in culturally sensitive areas, and through development of the Programmatic Agreement and FITP. The FITP addresses effects to Foster Island, a traditional cultural property identified through the Section 106 process. For example, following identification of the project's Preferred Alternative, WSDOT conducted archaeological explorations at locations on Foster Island where new bridge columns were proposed. WSDOT involved tribal staff in the work plan development for this fieldwork, extended opportunities for tribal monitors to participate, notified tribes prior to beginning the work, and hosted tribal staff and members on field visits to observe WSDOT crews. Similar opportunities will be extended to tribal members for additional fieldwork and construction taking place in culturally sensitive areas.

For potential construction of supplemental stability pontoons in Aberdeen, WSDOT and FHWA have coordinated with the Quinault Indian Nation and the Chehalis Tribe as part of the SR 520 Pontoon Construction Project.

How have FHWA and WSDOT coordinated with other transportation agencies and projects?

FHWA and WSDOT have coordinated with executive and technical staff from King County Metro and Sound Transit on an ongoing basis. FHWA has delegated most technical coordination work to WSDOT, but has participated in meetings to provide strategic support and confirm interagency agreements, as appropriate.

In 2007, WSDOT, King County, and Sound Transit partnered with the University of Washington to develop the 2008 High Capacity Transit (HCT) Plan to accomplish the legislative directive of Engrossed Substitute Senate Bill (ESSB) 6099. ESSB 6099 called for the partner agencies to jointly develop a multimodal transportation plan that ensured coordination of bus and rail services throughout the SR 520 corridor, specifically calling out development of alternatives for a multimodal transit center in the Montlake interchange vicinity. The 2008 HCT Plan (WSDOT, Sound Transit, and King County Metro 2008) recommended implementation of bus rapid transit (BRT) in the SR 520 HOV lanes once the project was complete, and provided recommendations for routes and service levels. The SR 520, I-5 to Medina project would provide the needed infrastructure for BRT service, but implementation of enhanced service would be the responsibility of the transit agencies. The plan also recommended the development of a multimodal transportation center in the Montlake Triangle area to serve bus, light rail, bicyclists, and pedestrians.

Since completion of the HCT Plan, technical staff from WSDOT, Sound Transit, and King County Metro, and the Seattle Department of Transportation (SDOT) have met regularly to ensure coordination of planning for proposed projects and service. Most recently, the agencies collaborated on various transportation planning and financing recommendations as part of the ESSB 6392 workgroup. More information on the workgroup's efforts can be found in Section 1.12 of this chapter.

1.7 How is the SR 520, I-5 to Medina project related to other projects and processes in the SR 520 Program?

The SR 520 Bridge Replacement and HOV Program

The SR 520 program projects are:

- SR 520, I-5 to Medina: Bridge Replacement and HOV Project
- SR 520, Medina to SR 202: Eastside Transit and HOV Project
- SR 520 Pontoon Construction Project
- SR 520 Variable Tolling Project

The Draft EIS for the SR 520 HOV and Bridge Replacement Project, published in August 2006, evaluated the SR 520 corridor from I-5 in Seattle to 108th Avenue NE in Bellevue as a single project. Since that time, in response to changing conditions, WSDOT has worked with FHWA to develop new projects within the context of an overall SR 520 corridor program. Each project has a separate purpose and need; each provides independent benefit to the region. The four projects in the SR 520 program include:

- SR 520, I-5 to Medina: Bridge Replacement and HOV Project
- SR 520, Medina to SR 202: Eastside Transit and HOV Project
- SR 520 Pontoon Construction Project
- SR 520 Variable Tolling Project

This section briefly describes each of the other projects in the SR 520 Bridge Replacement and HOV Program, how they meet FHWA's criteria for logical termini under NEPA, and the status of their environmental planning processes.

SR 520, Medina to SR 202: Eastside Transit and HOV Project

The SR 520, Medina to SR 202: Eastside Transit and HOV Project was initiated in 2008 to improve transit travel time and reliability in response to strong growth in jobs, housing, and transit demand east of Lake Washington. The project will complete the SR 520 HOV system from Evergreen Point Road in Medina to SR 202 in Redmond; build direct transit access from the South Kirkland Park-and-Ride; and provide community and environmental benefits, including lids, noise walls, a bicycle/pedestrian path, and stream and habitat enhancements. These improvements will support existing demand and planned improvements in transit use, and will enhance safety by improving HOV lane operations.

WSDOT and FHWA prepared an environmental assessment (EA) to evaluate the effects of the SR 520, Medina to SR 202 project. The EA was issued in December 2009 (WSDOT 2009b), and after a 30-day public comment period, an updated EA was issued in May 2010 (WSDOT 2010c). Based on the environmental assessment and public comment period, FHWA determined that project improvements would not result in significant adverse effects on the environment. These findings and the mitigation measures that have been incorporated into the project are described in the Finding of No Significant Impact (FONSI), issued on May 21, 2010 (WSDOT 2010d). In November 2010, WSDOT awarded a contract for the project to Eastside Corridor Constructors, with construction expected to begin in early 2011 and conclude in 2014.

The termini of the SR 520, Medina to SR 202 project are Evergreen Point Road on the west and SR 202 on the east. The existing freeway transit stop at Evergreen Point Road is a key hub for transit on the Eastside, connecting north-south routes with east-west routes across Lake Washington; SR 202 is the end point of SR 520 and the Eastside HOV lanes. The project will provide benefit whether or not the SR 520, I-5 to Medina project is built, improving transit travel times significantly within the Eastside portion of the SR 520 corridor. The new transit stop proposed for Evergreen Point Road is designed not to restrict consideration of alternatives for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project, and will serve its intended purpose even if that project is not built.

SR 520 Pontoon Construction Project

The SR 520 Pontoon Construction Project was an outcome of planning conducted for the Evergreen Point Bridge in 2006-2007. The planning process evaluated the potential for catastrophic failure of the existing bridge and concluded that the pontoons had the longest lead time of any component of the bridge, and that it would be prudent for WSDOT to have replacement pontoons ready for an emergency. The project's purpose is to construct and store new pontoons, which would be used to restore the existing traffic capacity of the Evergreen Point Bridge in the event of a catastrophic failure. Having pontoons ready for such a catastrophic failure would allow the bridge to be restored several years faster than if the pontoons were constructed in response to a disaster. This would, in turn, reduce adverse effects on traffic and the regional economy.

FHWA and WSDOT prepared a Draft EIS on the project in May 2010 (WSDOT 2010e), and issued a Final EIS in December 2010 (WSDOT 2010e) and a Record of Decision in January 2011 (WSDOT 2011). WSDOT has awarded a design-build contract to Kiewit-General Joint Venture for building pontoons in Grays Harbor County. Final design and construction of a new pontoon construction facility is scheduled to begin in spring 2011, with the first pontoons being completed in 2012.

The project will build only enough pontoons to replace the existing 4-lane capacity of the bridge in a design that meets current standards. If the pontoons are not needed for catastrophic failure before construction begins on the SR 520, I-5 to Medina: Bridge Replacement and HOV Project, they will be used for the proposed replacement of the floating bridge. Additional supplemental stability pontoons would be needed to provide flotation for 6 lanes of traffic. The construction of these additional pontoons is needed only for the SR 520, I-5 to Medina project, and therefore is being evaluated in this Final EIS.

The SR 520 Pontoon Construction Project has independent utility because the bridge is vulnerable and would need to be replaced if it failed, regardless of whether the SR 520, I-5 to Medina project goes forward. Its pontoons are designed for a 4-lane replacement bridge that can be expanded to 6 lanes; hence, it does not restrict consideration of alternatives for projects in the SR 520 corridor.

SR 520 Variable Tolling Project

The SR 520 Variable Tolling Project is part of the Lake Washington Congestion Management Program, funded by the U.S. Department of Transportation. In summer 2011, WSDOT will begin automated electronic tolling on SR 520 to relieve existing congestion. Variable pricing will encourage drivers to choose alternate routes, times, and travel modes, or to eliminate trips altogether. This is expected to result in reduced congestion, providing a more reliable trip for users of SR 520. WSDOT prepared an EA on this project (WSDOT 2009c) and received a FONSI from FHWA in June 2009 (WSDOT 2009d).

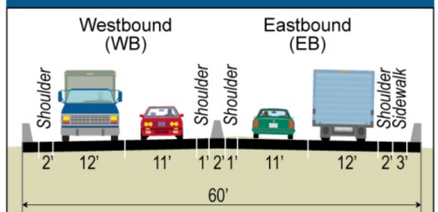
Under the Variable Tolling Project, users of the existing bridge will be charged a toll whose amount will vary based on time of day. The toll is designed to maintain travel time, speed, and reliability while generating revenue to fund improvements in the SR 520 corridor. Tolls will be completely automated, with no toll booths. All vehicles will be charged a toll to cross SR 520 except transit, registered vanpools, maintenance vehicles, and tow trucks responding to blocking incidents. Users who are required to pay the toll will have transponders (Good To Go! passes; www.goodtogo.org) that are read by an electronic reader. Cars without transponders will have their license plates photographed and will be billed by mail at a higher fee to defray the cost of processing and mailing.

The Lake Washington Congestion Management Program includes tolling as a key component of the SR 520 program's financing plan, which is consistent with previous assumptions in the Draft EIS and SDEIS. Tolling was authorized by the legislature in 2009 under ESHB 2211, with variable toll rates also set by the legislature in 2011 under ESSB 6700. Any future changes to the toll rate structure after the new bridge is in place will be determined by the state tolling authority. Please see Section 1.11 for additional information on tolling assumptions made for the SR 520, I-5 to Medina project. Although the SR 520, I-5 to Medina project and the Variable Tolling Project would each impose a toll on SR 520, they would do so for different purposes. The Variable Tolling Project's tolls are designed primarily to reduce existing congestion, although the legislature has chosen to allocate their proceeds to funding projects in the SR 520 corridor. Tolls for the SR 520, I-5 to Medina project, on the other hand, would be set to meet funding requirements. Congestion management would provide an independent benefit, regardless of whether the SR 520, I-5 to Medina project is built, and would not affect consideration of alternatives for improvements to the corridor.

1.8 What is the Preferred Alternative evaluated in the Final EIS?

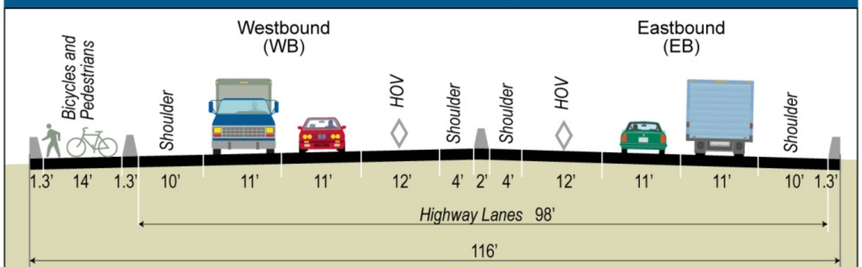
The new SR 520 corridor would be six lanes wide (two 11-foot-wide outer general-purpose lanes and one 12-foot-wide inside HOV lane in each direction), with 4-foot-wide inside shoulders and 10-foot-wide outside shoulders across the floating bridge. Exhibit 1-3 shows a cross section of the existing bridge and Exhibit 1-4 shows the proposed 6-lane cross section. The typical roadway cross-section across the floating bridge would be 116 feet wide, compared to the existing width of 60 feet.

Exhibit 1-3. **No Build Alternative Roadway Cross Section**



NOTE: Dimensions shown on the diagram are on the existing Evergreen Point Bridge.

Exhibit 1-4. **6-Lane Alternative Floating Bridge Roadway Cross Section**



NOTE: Dimensions shown on the diagram are approximate for the proposed Evergreen Point Bridge.

In response to community interests expressed during public review of the January 2010 SDEIS, the SR 520 corridor across the Portage Bay Bridge would operate as a boulevard or parkway with a widened, planted median and a posted speed limit of 45 miles per hour. To reduce width in this area while maintaining safe operations, a 14-foot managed shoulder (rather than an auxiliary lane) would carry westbound traffic destined for northbound I-5 during peak congestion periods. Elsewhere in this section of the corridor, the width of the inside shoulders would be narrowed from 4 feet to 2 feet, and the width of the outside shoulders would be reduced from 10 feet to 8 feet.

The major components of the Preferred Alternative are illustrated in Exhibits 2-2 and 2-3 in Chapter 2.

The Preferred Alternative would include the following elements (listed from west to east):

- An enhanced bicycle/pedestrian crossing adjacent to the East Roanoke Street bridge over I-5
- Reversible transit/HOV ramp to the I-5 express lanes, southbound in the morning and northbound in the evening

DEFINITION

Managed Shoulder

A managed shoulder provides the function of an auxiliary lane by using the shoulder to maintain acceptable traffic operations during the peak commute periods, special events, and for accident management. It also allows for a narrower footprint and maintains traffic operations on both the freeway and local system when needed to help relieve congestion.

- New undercrossings and an integrated lid at 10th Avenue East and Delmar Drive East
- A six-lane Portage Bay Bridge with a 14-foot-wide westbound managed shoulder that would be used as an auxiliary lane during peak commute hours
- An improved urban interchange at Montlake Boulevard integrated with a 1,400-foot-long lid configured for transit, pedestrian, and community connectivity
- A new bascule bridge (drawbridge) across the Montlake Cut to provide additional capacity for transit/HOV, bicycles, and pedestrians
- Improved bridge clearance over Foster Island and the Arboretum Waterfront Trail
- A new west approach bridge configured to be compatible with future high-capacity transit (including light rail)
- A new 14-foot-wide bicycle/pedestrian path with scenic pull-outs along the north side of the new Evergreen Point Bridge (including the west and east approaches), connecting regional trails on both sides of Lake Washington
- A new bridge maintenance facility and dock located underneath the east approach of the Evergreen Point Bridge
- Re-striped and reconfigured roadway between the east approach and 92nd Avenue NE, tying in to improvements made by the SR 520, Medina to SR 202: Eastside Transit and HOV Project
- Noise reduction strategies including 4-foot concrete traffic barriers with noise-absorptive coating, lid portals with noise-absorptive material, noise walls where recommended by the Final EIS noise analysis and approved by affected property owners, and quieter concrete pavement, which WSDSOT is evaluating as a noise reduction strategy
- Basic and enhanced stormwater treatment facilities

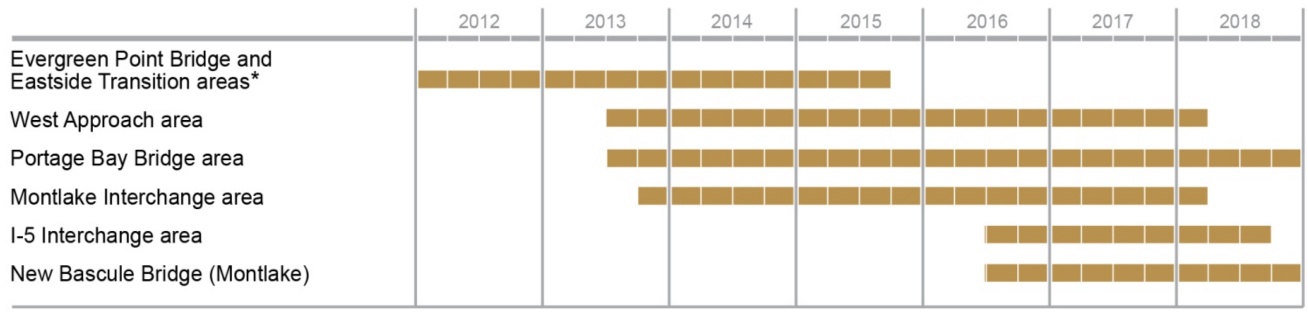
For a more detailed description of the Preferred Alternative, see Chapter 2 and the Description of Alternatives Discipline Report Addendum (Attachment 7).

1.9 When would the project be built?

Construction is planned to begin in 2012, after project permits are received. The floating bridge would open to traffic as early as 2014. If full funding is provided by 2014, the rest of the project is currently planned for completion by 2018. As described in Section 2.8 of Chapter 2, construction may be phased if full funding is not available.

The most vulnerable structure (the Evergreen Point Bridge, including its east approach) would be built in the first stage of construction. The remaining components of the project would be built in subsequent stages, as shown in Exhibit 1-5. Mitigation measures would be implemented concurrent with the portion of the project resulting in the impact.

Exhibit 1-5. Preferred Alternative Construction Stages and Durations



Note: Completion dates shown for construction stages assume full funding.

*Bridge opening would occur as early as 2014 but construction would be finalized in 2015.

1.10 How much would the project cost, and how much has been funded?

The total cost to construct the SR 520, I-5 to Medina project includes the costs of the Seattle portion, the Eastside (Medina) portion, the floating bridge (including the east approach and transition section), and 44 additional pontoons that are needed for a 6-lane bridge and are not included in the SR 520 Pontoon Construction Project. As shown in Table 1-1, these costs are estimated to total approximately $3.42 billion for the Preferred Alternative and between $3.39 and $5.54 billion for the SDEIS options, depending upon the suboptions chosen. Table 1-1 also compares the overall costs estimated in 2008 for the SR 520 Bridge Replacement and HOV Program—including the I-5 to Medina, Pontoon Construction, and Medina to SR 202 projects—to program costs estimated in 2010 after identifying the Preferred Alternative.

The totals shown for Options A, K, and L were estimated during a Cost Estimation Validation Process (CEVP®) workshop held in 2008, and range between $4.53 and $6.67 billion at year of expenditure. Since publication of the SDEIS, WSDOT has awarded contracts for the SR 520, Medina to SR 202 project and the SR 520 Pontoon Construction Project, and held another CEVP® workshop to estimate costs for the Preferred Alternative. While the cost of the pontoons in the 2010 cost estimates is higher than in the 2008 estimates, costs on the Eastside project are estimated to be lower than previously calculated. WSDOT continues to pursue cost savings in the form of contract delivery, cost estimate refinement, and design refinements wherever feasible.

Table 1-1. Cost Estimates for SR 520 Corridor Projects (millions of dollars)

	SR 520, I-5 to Medina Project[a]	Most Likely Total SR 520 Corridor Cost[c]
Preferred Alternative[b]	$3,419	$4,615
6-Lane Alternative with Option A	$3,392 to 3,668	$4,526 to 4,802
6-Lane Alternative with Option K	$5,440 to 5,538	$6,574 to 6,672
6-Lane Alternative with Option L	$3,932 to 4,012	$5,066 to 5,146

Note: Estimates are adjusted to account for risk and inflation using the Cost Estimate Validation Process® (CEVP) method. All estimates include anticipated mitigation costs.
[a]The ranges shown for Options A, K, and L reflect the cost of potential suboptions for each option. No suboptions were evaluated for the Preferred Alternative; therefore, a cost range is not provided.
[b]Costs were estimated for the Preferred Alternative during a 2010 CEVP® workshop.
[c]Total corridor cost includes the Pontoon Construction Project and the SR 520, Medina to SR 202 Project.

The budget established by the legislature in 2009 for the SR 520 program (including the I-5 to Medina, Medina to SR 202, and Pontoon Construction projects) is $4.65 billion. As shown in Table 1-2, WSDOT has secured a variety of state and federal funding sources to help pay for the SR 520 program.

Table 1-2. Committed Funding Sources for SR 520 Bridge Replacement and HOV Program

Funding Source	Amount
State gas tax	$550 million
Federal funds	$70 million
SR 520 Account (tolling and future federal funding)	$1,850 million
Sales tax deferral	$150 million
Total funding identified to date	**$2,620 million**
Total program cost[a]	**$4,650 million**
Unfunded portion of program cost	**$2,030 million**

[a]Total program cost is based on Engrossed Substitute House Bill (ESHB) 2211 legislation
Source: Washington State Legislature 2011 Legislative Budget.

However, the funding for the full corridor program falls approximately $2.03 billion short of the $4.65 billion total. WSDOT and the legislature are working to identify additional funding sources to fill the gap. In January 2010, the SR 520 legislative workgroup recommended a financing strategy that included:

- Use of previously authorized funding included in Scenario 7 of the 2008 SR 520 Finance Plan (WSDOT 2008b)
- Creating high occupancy toll (HOT) lanes on I-90 as soon as practicable
- Pursuing new federal and state revenue to be identified within 2 years
- General tolling of I-90 no sooner than 2014, only if other federal and state funds cannot be secured

Two tolling bills (House Bill 2211 and Senate Bill 6392) have allocated toll revenues to allow WSDOT to move forward with the following components of the SR 520 Bridge Replacement and HOV Program, pending completion of environmental review and permitting:

- Building a new pontoon construction facility in Grays Harbor and producing pontoons at that facility
- Beginning construction of the SR 520, Medina to SR 202 project
- Constructing a new floating bridge and approaches
- Advancing design on the Seattle side of the corridor

As shown in Exhibit 1-5, WSDOT has proposed project construction for completion by 2018, based on the assumption that full funding will be provided by 2012. Should full funding not be available, the project would be phased, with the floating bridge and landings comprising the initial construction phase. For more information on the potential for phased construction, please see Section 2.8 of Chapter 2.

1.11 How will tolling be used on SR 520?

Tolling is currently slated to begin on the existing Evergreen Point Bridge in summer 2011 as part as the implementation of the SR 520 Variable Tolling Project. Tolling is also planned on the new 6-lane Evergreen Point Bridge once it is completed as part of the SR 520, I-5 to Medina Project. The assumptions made for tolling the new bridge are somewhat different from the toll program for the existing bridge. Details on how tolling will be done for the Variable Toll Project are provided on page 1-15. The assumptions used for tolling under the SR 520, I-5 to Medina project are discussed in this section.

Tolling on the new Evergreen Point Bridge will be similar to the system discussed for the Variable Tolling Project. Tolls will be completely automated, with no toll booths. All one- or two-occupant vehicles will be charged a toll to cross the Evergreen Point Bridge. Users who are required to pay the toll will have transponders, or “cards,” that will be read by an electronic card reader. Two types of transponders could be used: transponders that attach permanently to a vehicle’s windshield and portable transponders that could be transferred among multiple vehicles. Cars without transponders will have their license plates photographed and will be billed by mail, at a higher cost to defray the cost of mailing.

What legislation has been passed to authorize tolling?

The SR 520 Draft EIS identified tolling as a way to generate revenue for project construction, and assumed a toll as part of the traffic modeling analysis. Since that time, the discussion of tolling has continued. House Bill 1773, passed by the legislature in 2008, set statewide guidelines for the implementation and use of tolls on state highways. House Bill 3096, also passed in 2008, created a Tolling Implementation Committee to work with the public to evaluate a variety of tolling scenarios. The Tolling Implementation Committee evaluated tolling for financing the SR 520 Bridge Replacement and HOV Program, engaged citizens and regional leadership in the evaluation, and enhanced understanding of tolling alternatives. The committee hosted a series of public outreach events and input opportunities related to tolling in the SR 520 corridor during summer 2008, and reported to the Governor and legislature in January 2009. The results of this outreach identified general support for tolling as a way to manage congestion and fund improvements in the SR 520 corridor.

In fall 2007, the Lake Washington Urban Partnership (which includes WSDOT, King County, and the Puget Sound Regional Council) was awarded a grant from the U.S. Department of Transportation to help manage congestion on the corridors crossing Lake Washington. The total grant of up to $154 million funded several projects, including $63 million for the SR 520 Variable Tolling Project. As described in pages 1-14 and 1-15, this project would begin tolling the Evergreen Point Bridge *before* its planned replacement in order to reduce traffic congestion. ESHB 2211, passed in April 2009, authorized tolling on SR 520 for congestion management in accordance with the grant provisions. ESHB 2211 provides that if the tolls on the SR 520 corridor significantly alter the performance of nearby facilities, the legislature will reconsider the possibility of tolling on those facilities. The legislature authorized toll rates for the Variable Tolling Project in 2011 under ESSB 5700.

The project's financing plan includes long-term tolling to fund the SR 520 corridor, consistent with previous assumptions in the Draft EIS and the SDEIS. Future changes to the toll rate structure after the new bridge is in place will need to be separately authorized by the legislature based on the approved project budget, with toll rates to be set by the legislature. If the SR 520, I-5 to Medina project were not built (i.e., if the No Build Alternative were chosen), it is assumed that the toll authorized under ESHB 2211 and ESSB 5700 would expire once the bonds for the SR 520 Pontoon Construction Project and the SR 520, Medina to SR 202 project had been paid.

What assumptions were made about tolling in the Final EIS?

Both the 2006 SR 520 Draft EIS and the 2010 SDEIS identified tolling as a way to generate revenue for project construction, and assumed a toll as part of the traffic modeling analysis for all build alternatives. The SDEIS traffic analysis made the following assumptions for how the project would be tolled:

- Segmental tolling (i.e., tolls collected at multiple locations along the corridor) between I-5 and I-405.
- Variable toll rates depending on the time of day and whether trips are taken on a weekday or a weekend.
- A maximum toll rate of $3.81 for a full-length trip, with exemptions for transit and HOVs with three or more riders

These assumptions have been updated for the Final EIS traffic analysis based on new legislation and public comment received during outreach events for the Tolling Implementation Committee. The Final EIS traffic analysis made the following assumptions for how SR 520 would be tolled under the Preferred Alternative:

- Single-point tolling implemented on SR 520 for vehicles crossing the Evergreen Point Bridge.
- Variable toll rates depending on the time of day and whether trips are taken on a weekday or a weekend.
- A peak toll rate of $3.81 (year 2007 dollars), with exemptions for transit and HOVs with three or more riders.

Tolling Assumptions

Tolling assumptions included in the transportation model for the Final EIS are:

- Single-point tolling implemented on SR 520 between I-5 and I-405
- Variable toll rates depending on the time of day and whether trips are taken during a weekday or during the weekend
- A maximum toll rate of $3.81, with exemptions for transit and HOVs with three or more riders (toll rates are in 2007 dollars for consistency with the *2007 SR 520 Finance Plan*).

Like the SDEIS, the Final EIS assumes that the 2030 No Build Alternative would not include tolls. For more information on how tolling was evaluated in the traffic model, please see section 5.1 and the Final Transportation Discipline Report (Attachment 7).

Why doesn't the Final EIS evaluate a tolled No Build Alternative?

Because the Lake Washington Variable Tolling Project will implement a toll on SR 520 beginning in summer 2011, it might seem logical to assume that this toll would continue indefinitely even if the SR 520, I-5 to Medina project were not built. However, this is not the case. As described in Section 1.7, the purpose of the Lake Washington Variable Tolling Project is to manage congestion on SR 520. For traffic modeling purposes, the toll was assumed to remain in place until construction of the SR 520, I-5 to Medina project began, at which point a new toll would be authorized by the legislature to fund project construction.

As discussed above, ESHB 2211 allocated funds from the Variable Tolling Project revenues toward completion of projects in the SR 520 corridor. Funding for the SR 520 Pontoon Construction Project was authorized by this legislation, and funding for the SR 520, Medina to SR 202 Eastside Transit and HOV Project was subsequently authorized by ESHB 6392. Under state law, the tolls will remain in place until construction bonds for these projects are retired; if the I-5 to Medina Project were not built, current estimates suggest that this would occur prior to the project design year of 2030. Therefore, WSDOT assumed that no tolls would be in place in 2030 if the SR 520, I-5 to Medina project were not built. The traffic modeling for No Build is based on this assumption.

Even though funding of other projects in the SR 520 program would not necessitate tolling under No Build in 2030, FHWA and WSDOT recognize that there could be a toll on SR 520 under No Build in 2030 for other reasons. If the SR 520, I-5 to Medina project were not built, the legislature might choose to impose a toll to manage worsening levels of congestion as population and employment growth continued to exceed the capacity of a four-lane corridor. Region-wide tolling of major corridors, as recommended in the Puget Sound Regional Council's *Transportation 2040* plan (PSRC 2010a), might also be implemented by that time. Since it is not possible to say whether or how these tolls would be implemented, WSDOT did not include them in its baseline assumptions. However, traffic volumes for a tolled No Build Alternative were evaluated for comparison to the untolled No Build, to help readers understand how tolling of a 4-lane SR 520 would affect future demand. Section 5.1 of this Final EIS provides information on the analysis.

1.12 What else has happened since publication of the SDEIS?

Collaboration with Seattle, UW, and Transit Agencies under ESSB 6392

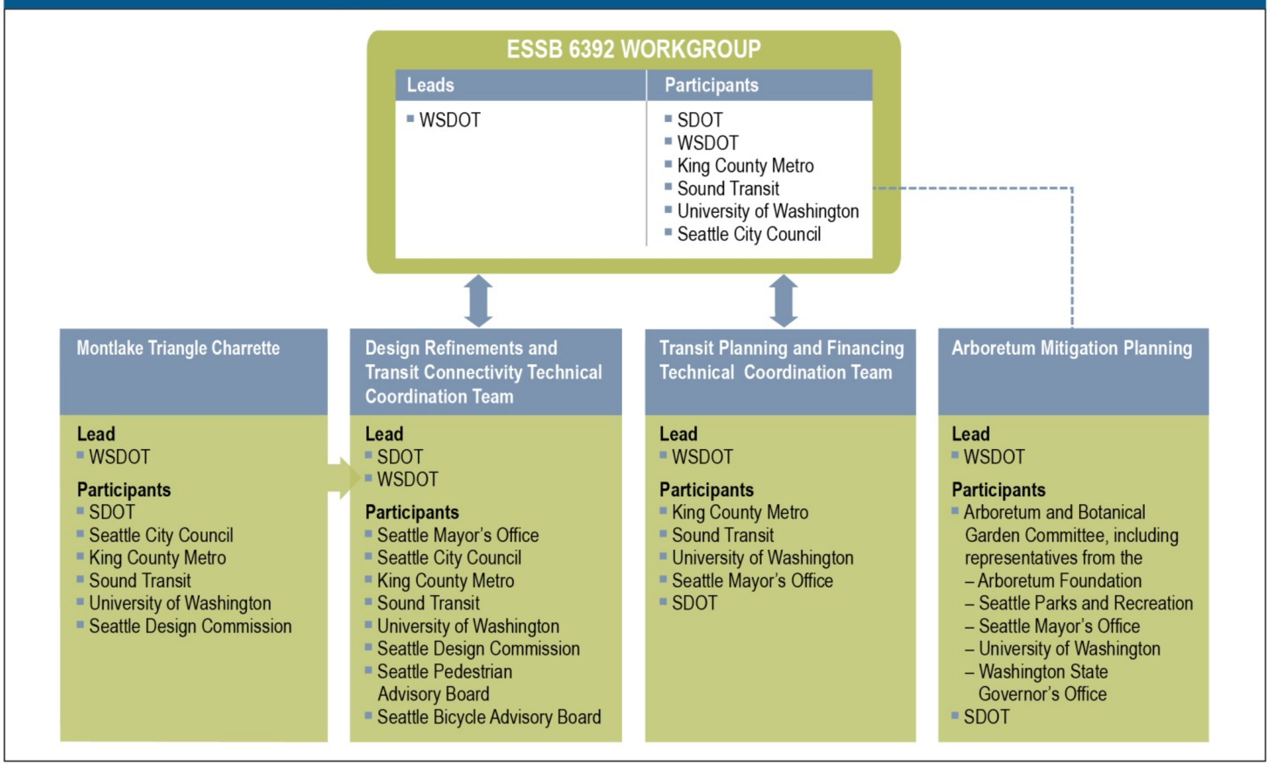
In March 2010, the Washington State legislature passed and Governor Gregoire signed ESSB 6392. The bill outlined the following design, schedule, and funding requirements for the SR 520 corridor:

- There will be six total lanes for the SR 520 corridor, with two transit/HOV lanes and four general-purpose lanes.
- Use of HOV lanes will require three or more people (3+) in the vehicle.
- WSDOT will report to the legislature when average transit speeds in HOV lanes fall below 45 miles per hour at least 10 percent of the time.
- Toll collection on the existing Evergreen Point Bridge for the Variable Tolling Project will begin in spring 2011.
- SR 520 toll revenue is to be used on projects within the full SR 520 corridor from I-5 to SR 202.
- $200 million of bond proceeds will be provided to the SR 520, I-5 to Medina: Bridge Replacement and HOV Project.

- A special account will be created for fines resulting from toll violations, which may be used as funding for the SR 520 program, including mitigation.
- A mitigation plan will be prepared for the Washington Park Arboretum.

In addition to the requirements listed above, ESSB 6392 also directed WSDOT to work with regional agencies to refine components of the Preferred Alternative, including design refinements and transit connections, and transit planning and financing. In response to this direction from the legislature, WSDOT led a workgroup process in collaboration with the City of Seattle, King County, the University of Washington, and Sound Transit. The ESSB 6392 workgroup was informed by two technical coordination teams established by WSDOT and the Seattle Department of Transportation, one on design refinements and transit connections and the other on transit planning and finance (Exhibit 1-6). These teams reported technical findings to the ESSB 6392 workgroup.

Exhibit 1-6. **ESSB 6392 Workgroup Process**



Members of the team working on design refinements and transit connections included staff from the Seattle Department of Transportation, Seattle Mayor's Office, Seattle City Council, WSDOT, King County Metro, Sound Transit, and the University of Washington. This technical coordination team also included members from the Seattle Design Commission, Seattle Pedestrian Advisory Board, and Seattle Bicycle

Advisory Board. Members of the transit planning and finance technical coordination team included staff from WSDOT, King County Metro, Sound Transit, City of Seattle, and University of Washington.

The team working on design refinements and transit connections developed a separate process, which evaluated opportunities to enhance pedestrian and bicycle connectivity in the Montlake Triangle area while respecting the schedules for the Sound Transit University Link light rail station and the University of Washington Rainier Vista project. The charrette members identified conceptual design options that would provide safe, efficient transfers for bicyclists, pedestrians, and transit users to connect to the Link light rail station near Husky Stadium. Participants in the Montlake Triangle charrette included representatives from WSDOT, Seattle Department of Transportation, the Seattle Design Commission, the University of Washington, King County Metro, and Sound Transit.

The ESSB 6392:Design Refinements and Transit Connections Workgroup Recommendations Report (Attachment 16) was submitted in October 2010. The High Capacity Transit Planning and Financing Finding and Recommendations Report (WSDOT, Sound Transit, and King County Metro 2010) was submitted in December 2010. Chapter 2 provides additional information on these recommendations and how they were incorporated into the Preferred Alternative.

Coordination with Agencies and Tribes to Develop Natural Resource Mitigation

In June 2010, the Natural Resources TWG was convened to guide the project team's development of permit applications and mitigation plans that clearly identify impacts, mitigation sequencing strategies, avoidance and minimization measures, and appropriate compensatory mitigation for the Preferred Alternative. This process also informed ongoing Endangered Species Act (ESA) consultation. Natural Resources TWG participants represented multiple local, state, and federal agencies that oversee compliance with environmental regulations, as well as the Muckleshoot Indian Tribe Fisheries Division and the University of Washington.

In 2010 the TWG worked through a series of eight all-day meetings. Initial meetings discussed construction activities and operation of the project in key geographic zones, while later meetings focused on project-wide construction sequencing, impacts, and mitigation. Between meetings, the project team used input from participants regarding ideal mitigation characteristics to determine which potential mitigation sites and opportunities would best fit the identified impacts. At the final two meetings, the TWG considered the full set of identified impacts and mitigation for construction, operational, and cumulative impacts.

The meetings provided guidance for natural resources mitigation, addressing topics such as in-water work windows, best management practices, wetland impact calculations and mitigation approach, aquatic resource impact calculations and mitigation approach, and proposed stormwater treatment methods. The guidance that WSDOT received through the Natural Resources TWG process was incorporated directly into the Biological Assessment (Attachment 18), conceptual wetland and aquatic habitat mitigation plans (Attachment 9), and this Final EIS. In April 2011, the project team reconvened the Natural Resources TWG to help prepare permit applications. The project team is continuing to work with individual agencies and the Muckleshoot Indian Tribe Fisheries Division to resolve outstanding issues related to specific jurisdictional requests.

Arboretum and Botanical Gardens Committee Coordination on Arboretum Mitigation Plan

As part of the ESSB 6392 workgroup process, a group was also convened to address potential effects and identify mitigation measures for the Washington Park Arboretum. A WSDOT staff team worked with the Arboretum and Botanical Gardens Committee (ABGC), which includes representatives of the City of Seattle, the University of Washington, the Arboretum Foundation, and the Washington State Governor's Office, to develop a plan for Arboretum mitigation. The Arboretum mitigation planning group met 12 times over an 8-month period. The Arboretum Mitigation Plan (ABGC 2000), submitted to the legislature on December 22, 2010, includes a number of mitigation recommendations agreed upon by WSDOT and the ABGC. The plan's recommendations are discussed in Chapter 9 of this Final EIS, and the plan itself is included as Attachment 9.

WSDOT, the City of Seattle, and the University of Washington have developed a Memorandum of Understanding (MOU) to define roles and responsibilities for implementation of the Arboretum Mitigation Plan. The MOU was executed in April 2011 and includes an implementation schedule, as well as commitments to develop more detailed scopes of work for the highest-priority projects. Funds for full plan implementation would be committed concurrently with construction of the west approach portion of the project (see Exhibit 1-5).

Section 106 Compliance Process: Consulting Party Outreach, DAHP Coordination, and Programmatic Agreement

Section 106 of the National Historic Preservation Act requires a project's lead federal agency (in this case FHWA) to involve consulting parties in a process "to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties" (36 CFR 800.1(a)). The Section 106 regulations outline specific points at which consulting parties must be involved. The lead federal agency (FHWA) or its delegate (WSDOT) evaluates potentially historic properties and makes a determination on their eligibility for the National Register of Historic Places, and requests the concurrence of the State Historic Preservation Officer (SHPO). Once the SHPO has concurred on this eligibility determination, FHWA determines the effects on historic properties according to Section 106, and again requests SHPO's concurrence. If the SHPO and FHWA disagree on the effects determination, and resolution is required, the Advisory Council on Historic Preservation (ACHP) is consulted.

In addition to the SHPO and tribal historic preservation officers (THPOs) for Native American tribes, consulting parties can include individuals and organizations with a demonstrated interest in the undertaking and a "concern with the undertaking's effects on historic properties" (see 36 CFR §800.2(c)(5)). These other entities may include local historic preservation officials, historic preservation groups, community organizations, individual property owners, and other stakeholders.

WSDOT and FHWA have signed a Programmatic Agreement under Section 106 with DAHP, ACHP, the U.S. Army Corps of Engineers, affected tribes, and other consulting parties (as defined above) that identifies the avoidance, minimization, and mitigation activities WSDOT will undertake. Tribal issues have primarily been addressed in a separate Foster Island Treatment Plan that is included in the Programmatic Agreement by reference.

ESA Consultation and Submittal of the Biological Assessment

Since May 2007, the ESA Steering Group—consisting of FHWA, WSDOT, NOAA Fisheries, and USFWS—has met biweekly to provide a forum for early ESA Section 7 coordination. The purpose of the ESA Steering Group has been to identify important issues or challenges and work together to establish the appropriate analytical framework for the consultation. Since publication of the SDEIS, the ESA Steering Group has met approximately 35 times to work through a variety of technical topics. The ESA Steering Group's work culminated in WSDOT's submittal of the Biological Assessment in November 2010 (Attachment 18). The project team completed consultation in May 2011 and received Biological Opinions from both NOAA Fisheries and USFWS (Attachment 18).

Design-Build Procurement

In late 2010, WSDOT solicited design-build proposals for construction of the Evergreen Point Bridge and landings. This is the first construction stage of the SR 520, I-5 to Medina project. The solicitation was conducted in accordance with 23 U.S. Code (USC) 636.109, which allows design-build contracts to be initiated before completion of the NEPA process. Three teams submitted qualifications and were invited to submit proposals. WSDOT plans to select a contractor in mid-2011. Final design under the contract will take place following the issuance of the Record of Decision. Construction of the floating bridge and landings will begin in 2012 after final design has been completed and permits received.

1.13 How has the public been involved during the preparation of the Final EIS?

At the beginning of the environmental analysis and decision-making process, WSDOT developed and implemented an ongoing program to engage the public and to provide information about the project. This program started with a public involvement plan that established specific goals and activities. Some of the activities and resources to encourage public engagement are as follows:

- Newsletters
- Community and agency briefings
- Project Web site
- Media outreach
- Public meetings, workshops, and tours
- Interviews with social service providers and minority and low-income populations
- Outreach to the business community

The process of engaging the local communities during the Draft EIS and SDEIS development has encompassed nearly 30 open houses, more than 15 community design workshops, and more than 77 community group meetings. Additional information on how the public has had the opportunity to participate to date in the SR 520, I-5 to Medina project is found in the Agency Coordination and Public Involvement Discipline Report Addendum and Errata (Attachment 7).

What have we learned from these outreach efforts?

Comments provided during ongoing outreach activities have in many ways remained consistent with previous public input, addressing the following common themes:

- Protect and enhance neighborhoods and community connectivity.
- Maintain local parks and trails and add a new bicycle path to enhance bicycle and pedestrian mobility.
- Include noise reduction measures throughout the SR 520 corridor.

- Carefully consider potential project funding methods (tolling, taxes, private funding) and the project budget and costs.
- Improve and expand the HOV and bus system.

During the SDEIS public comment period, in addition to the themes noted above, the public provided more specific feedback about the range of alternatives presented in the document and specific engineering design considerations. For example, members of the public provided comments about bridge width, the Montlake Freeway Transit Stop, design components specific to different geographic areas, and accommodating light rail in the SR 520 corridor.

What groups of people has WSDOT worked with in the public outreach program?

A regional transportation facility like SR 520 affects a large number of people—those who travel on it, those who live and work near it, and, in a broader sense, any person or business that depends upon the region's ability to move people and goods across Lake Washington. WSDOT developed appropriate outreach methods to reach these different public audiences. (Engagement of resource agencies and tribes is discussed above in Sections 1.6 and 1.12.) Audiences immediately affected along the SR 520 corridor include:

- Cities and towns in the corridor
- Specific neighborhoods in Seattle, including Montlake, north Capitol Hill, Portage Bay/Roanoke, Madison Park, University District, Laurelhurst, and Eastlake
- Major institutions such as the University of Washington

The outreach also extended to a broader set of public audiences, which included:

- Commuters who use the corridor to travel via bus or car to and from Seattle and the Eastside
- Businesses that rely on the corridor for movement of employees, goods, and customers
- Chambers of commerce that are interested in transportation issues
- Minority, low-income, and limited-English-proficiency users of the corridor
- Social service and advocacy organizations that work with minority and low-income communities
- Other interested groups such as bicycle, environmental, and neighborhood organizations

WSDOT also has worked with a large number of local, state, and federal jurisdictions and agencies that are involved in transportation and natural resource issues around the SR 520 corridor. WSDOT's work with these agencies is described in more detail in the Agency Coordination and Public Involvement Discipline Report Addendum and Errata (Attachment 7).

What comments has WSDOT received during the public comment periods for the Draft EIS and SDEIS?

WSDOT received a total of over 5,000 individual comments on the Draft EIS and SDEIS. These comments came from members of the public, community organizations, agencies, and tribes. Attachments 11 and 13 of this Final EIS contain all comments received, along with FHWA's and WSDOT's responses to them. Chapter 2 explains how the comments were considered in the environmental analysis and the evaluation of alternatives and design options for the SR 520, I-5 to Medina project.

What public involvement is still ongoing?

WSDOT will continue to inform and engage the public through venues such as community council briefings, fairs and festivals, the project and program Web sites, press releases, e-mails, and the Project Dialogue Center. As the NEPA process concludes, public outreach will shift to focus on permit acquisition (many permitting processes include public hearings and/or comment periods) and construction-related outreach. WSDOT has also committed to involving public stakeholders in processes to refine project design and construction methods, as appropriate.

What outreach has WSDOT done with low-income and minority populations?

From 2000 to the present, WSDOT has conducted outreach activities to provide low-income and minority populations with information about the project and to engage them in identifying potential adverse effects and benefits of the project. This outreach included the translation of informational materials into appropriate languages for the study area, which WSDOT identified by reviewing census data. For example, the SR 520 fact sheet was translated into Chinese, Vietnamese, and Spanish for distribution at public outreach events. Translated materials also provided information about how the Draft EIS and SDEIS could be reviewed, how to obtain a copy, and how to submit formal comments. In addition, interpretation services were made available at any time upon request. Please see the Agency Coordination and Public Involvement Discipline Report (Attachment 7) for more information.

To increase WSDOT's understanding of how tolling of the Evergreen Point Bridge might affect low-income or minority populations, WSDOT conducted the following surveys, interviews, and focus groups in 2008:

- A telephone survey of 685 individuals who use the Evergreen Point Bridge two or more days a week. Approximately 300 respondents qualified as Black, Hispanic, Asian, Pacific Islander, American Indian, or Alaskan Native, or indicated that their household income fell below the federal poverty line.

- Telephone interviews in Spanish with Evergreen Point Bridge users.
- An intercept survey of 422 transit users on the Evergreen Point Bridge. About 3 percent of respondents had household incomes below the federal poverty level, nearly 23 percent of the respondents were minority, and 6 percent spoke a language other than English at home.
- Two focus groups composed of survey respondents and others who were recruited through social service agencies that serve low-income and minority populations who use the Evergreen Point Bridge.

Native Americans are a minority population, so coordination with the tribes that the project could affect is part of WSDOT's environmental justice outreach. Coordination with the tribes is discussed in Section 1.6.

1.14 What are the next steps?

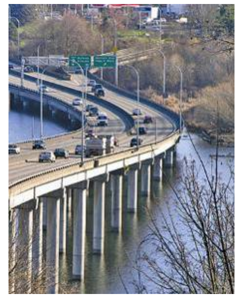
After publication of the Final EIS, if FHWA determines the analysis to be adequate and to comply with necessary standards, the agency will prepare and sign a Record of Decision (ROD) that describes the decision, explains why it has taken a particular action, and presents the mitigation measures and commitments to be incorporated into project construction and operation. The ROD will identify the selected alternative, explain the alternatives considered, and specify an "environmentally preferable alternative." The ROD will also identify outstanding issues yet to be resolved. Any comments received after publication of the FEIS will be responded to in the ROD.

Although the ROD is the conclusion of the NEPA process, it signals the beginning of project implementation. WSDOT will further develop the engineering design for the project, including additional detail on project phasing, construction staging, and construction techniques. Having a preferred alternative identified also will allow WSDOT to develop more specific designs for mitigation measures, which will be documented in project permit applications. These designs will be prepared by WSDOT and FHWA, in cooperation with the affected jurisdictions, tribes, and resource agencies.

1.15 How can I be involved, and how will WSDOT communicate with the public?

Join the project mailing list. WSDOT will continue to keep the public informed about opportunities for input. If you provide your name, we will add you to the project mailing list, which allows you to receive regular e-mail updates. You may join the mailing list by logging onto our Web site at www.wsdot.wa.gov/projects/SR520Bridge or by calling the project hotline at 1-888-520-NEWS (6397).





Chapter 2: Alternatives

This chapter begins with a description of how the alternatives for SR 520 were developed and evaluated, from the Trans-Lake Washington Study through the identification of the Preferred Alternative. The second part of the chapter provides a detailed description of the Preferred Alternative in comparison to the No Build Alternative and the three 6-Lane Alternative design options (A, K, and L) that were evaluated in the SDEIS.

Planning for the SR 520 corridor began in 1998 with the work of the Trans-Lake Washington Study, initiated by the legislature to explore ways of improving mobility across and around Lake Washington. Many potential solutions for the corridor have been developed and evaluated since that time. The first part of this chapter summarizes how WSDOT, FHWA, and numerous stakeholders have worked through the years to identify and screen potential alternatives and design options. It provides an overview of the project's NEPA process and the alternatives and design options that have been evaluated. The *Range of Alternatives and Options Evaluated* report (Attachment 7) provides additional detail on alternatives analysis from 1998 to 2009.

In April 2010, after consideration of comments received on the SDEIS, FHWA and WSDOT announced a Preferred Alternative for the SR 520, I-5 to Medina project. The second part of this chapter describes the characteristics of the Preferred Alternative and how it responds to input from agencies, tribes, and the public. It also compares the Preferred Alternative to the 6-Lane Alternative design options (A, K, and L) that were evaluated in the SDEIS.

2.1 How were the alternatives and design options for SR 520 identified and evaluated during project scoping?

In the Trans-Lake Washington Study, a 47-member stakeholder group evaluated a broad range of potential modes and routes for crossing Lake Washington. The concepts the group considered included new project corridors (for example, a crossing from Sand Point to Kirkland); different crossing methods, such as tubes and tunnels; new travel modes, such as ferries or rail; and the management of travel demand through tolling or land use changes.

These concepts were screened, and the most promising were combined into "solution sets," which ultimately formed the basis for the alternatives evaluated in the Draft EIS. The study recommended that the following configurations of SR 520 be carried forward as build alternatives:

- "Minimum Footprint" alternative (maintain existing four general-purpose lanes with improved shoulders and bicycle/pedestrian access)
- Add one HOV lane in each direction, for a total of six lanes
- Add one HOV and one general-purpose lane in each direction, for a total of eight lanes

The study also recommended that the 6-lane and 8-lane alternatives be evaluated with and without high-capacity transit (HCT) in the corridor because no regional decision had yet been made on whether SR 520 or I-90 would be the initial corridor to carry HCT across the lake to the Eastside. A more detailed description of the Trans-Lake screening process and results is included in the Range of Alternatives and options Evaluated Report in Attachment 7.

In 2000, FHWA, WSDOT, Sound Transit, and the Federal Transit Administration (FTA) initiated the EIS for what was then called the Trans-Lake Washington Project. This included establishing a series of committees (Executive, Technical, and Advisory) to help provide project oversight and guidance. The committees collaborated with the project leads on the development of the project purpose and need statement (discussed previously) and two levels of screening criteria, based on effectiveness, environmental effects, and cost (described in the Range of Alternatives and Options Report in Attachment 7) to be used in evaluating how well alternatives met the purpose and need.

Public scoping for the project was conducted from June to August 2000. To gather input, WSDOT held public meetings and community briefings, distributed newsletters, and set up a project website and hotline. During the scoping period, the following potential alternatives were suggested:

- No Build
- Minimum footprint
- HOV lanes only
- Bus and vanpool lanes only
- General-purpose lanes only
- Conversion of existing lanes to HOV or transit

- Combinations of general-purpose and HOV lanes
- HOV tunnel
- New crossing between Sand Point and Kirkland
- HCT in SR 520 corridor
- HCT in I-90 corridor
- New cross-lake HCT corridors (not on SR 520 or I-90)
- Passenger ferry
- New arterial connections
- Increased effectiveness/investment in travel demand management

WSDOT evaluated all these potential solutions using the first-level screening criteria. The alternatives identified to be carried forward to second-level screening were:

- No Build
- Minimum footprint
- HOV lanes only
- Combinations of general-purpose and HOV lanes
- Bus and vanpool lanes only
- HCT in SR 520 corridor (seven route options)
- HCT in I-90 corridor (two route options)
- New mid-lake HCT corridor

Through the screening process, the co-lead agencies reached the conclusion that I-90, rather than SR 520, would be the initial east-west corridor for fixed-guideway (i.e., rail) HCT, although SR 520 would continue to be studied as a potential route for bus rapid transit (BRT) if HOV lanes were included in the new design. Based on this decision, FTA ceased participating as a co-lead agency in the SR 520 program. See Section 2.4 for more information on the history of regional high-capacity transit planning for the SR 520 and I-90 corridors.

As part of the screening process, WSDOT also evaluated the available technical options for crossing Lake Washington. Although the facility characteristics had not yet been defined, the evaluation assumed two, three, or four travel lanes in each direction (with or without HCT) as well as pedestrian and bicycle access. The structural solutions evaluated included bored tunnels below the lake bottom, sunken tunnels on the lake bottom, floating tunnels immersed below the lake surface, floating bridges on the lake surface, and fixed bridges above the lake surface. Because of their high cost, environmental concerns, design and geotechnical risks associated with lakebed soils, and limited ability to connect with surface roads and ramps, tunnels were dismissed from further consideration. Although some fixed bridge designs could have been feasible, they had much higher costs than a

Why can't SR 520's vulnerable bridges be retrofitted?

WSDOT has performed several evaluations of the potential to retrofit the existing bridges for safety rather than building new structures. Retrofitting has been studied for both the floating bridge and the fixed structures. These studies have concluded the following:

- The floating bridge has already undergone extensive repairs, which have reduced its buoyancy; cracks in the structure leak water that WSDOT must pump on a regular basis. Additional repairs would add more weight and are not feasible.
- Although it is technically feasible to retrofit the fixed bridges, the cost and environmental impact of doing so would be almost as high as that of building new structures. The retrofitted bridges would have a much shorter life span than new bridges, so a retrofit is not cost-effective.

floating bridge and would have had high environmental and visual impacts. As the lowest-cost and lowest-impact solution, a floating bridge was recommended as the preferred crossing technique.

The second-level screening process resulted in the following recommendations by the project's Executive Committee in January 2002:

- Continue analyzing the 4-Lane Alternative, built to current standards.
- Evaluate the 6-Lane Alternative with an HOV lane that could be used for BRT, with and without an additional Montlake Cut crossing.
- Carry forward the 8-Lane Alternative, consisting of three general-purpose lanes plus one HOV/BRT lane in each direction.
- Support the Sound Transit Phase II vision of placing fixed-guideway HCT in the I-90 corridor first.
- Accommodate long-term future exclusive right-of-way for HCT on SR 520, taking into account maximum flexibility for HCT technologies.
- Evaluate significant investment in travel demand management.

Table 2-1 provides an overview of the project's NEPA process and alternatives and the design options that have been evaluated.

Table 2-1. History of SR 520, I-5 to Medina Project NEPA Process and Alternatives

Trans-Lake Washington Study (1998 –1999)		
NEPA/Project Element	Goal/Purpose and Need	Address traffic congestion across and around Lake Washington.
	Screening	Study committee identified and evaluated potential solutions.
	Alternatives	Seven "solution sets" representing different mixes of roadway, transit, transportation demand management and transportation systems management solutions developed
Process	6-Lane Design Options	N/A
	Activities	Identified and evaluated potential solutions: new corridors, new modes (ferry, high-capacity transit), increased capacity on existing corridors, crossing methods (tubes, tunnels), demand management.
	Recommendations and Outcomes	Move forward with improvements to SR 520. Prepare EIS to evaluate the following alternatives: No Build, 4-Lane, 6-Lane (with and without HCT), 8-Lane (with and without HCT).
EIS Initiation and Alternatives Screening (2000 – 2002)		
NEPA/Project Element	Goal/Purpose and Need	Improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.
	Screening	Two levels of screening criteria developed from Purpose and Need and applied to Trans-Lake alternatives.
	Alternatives	Project corridor alternatives evaluated: No Build, 4-Lane, 6-Lane, 8-Lane.

Table 2-1. History of SR 520, I-5 to Medina Project NEPA Process and Alternatives

Process	6-Lane Design Options	N/A
	Activities	Developed Purpose and Need statement based on Trans-Lake findings. Established screening criteria.
	Recommendations and Outcomes	Evaluate No Build, 4-Lane, and 6-Lane Alternatives in DEIS. Do not further evaluate 8-Lane Alternative. Do not further evaluate new corridors and crossing methods due to risk, impacts, and cost. Continue regional planning assumptions of I-90 as initial HCT corridor. Defer HCT on SR 520 in near term, but provide long-term compatibility.
Draft EIS (Released August 2006)		
NEPA/Project Element	Goal/Purpose and Need	Improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.
	Screening	Design options proposed by community members were screened using original criteria.
	Alternatives	Project corridor alternatives evaluated: No Build, 4-Lane, 6-Lane, 8-Lane (described rationale for dropping), Eastside options.
Process	6-Lane Design Options	Evaluated: Pacific Street Interchange (PSI), Second Montlake Bridge, No Montlake Freeway Transit Stop.
	Activities	Conducted coordination and outreach with local jurisdictions, resource agencies, and the public. Prepared and published Draft EIS incorporating evaluation of No Build, 4-Lane, and 6-Lane Alternatives and 6-Lane design options. Seattle City Council Resolution 30974 provided guidance on design elements and mitigation measures to be included in replacement alternative.
	Recommendations and Outcomes	Traffic modeling identified 6-Lane Alternative as better meeting Purpose and Need. 4-Lane does not meet mobility portion. 6-Lane Alternative improves mobility overall. PSI option provides best local mobility in Seattle, but increases impacts to wetlands, aquatic habitat, and parks compared to 6-Lane base. Gov. Gregoire identified 6-Lane Alternative as "best serving needs of regional transportation system."
Supplemental Draft EIS (Released January 2010)		
NEPA/Project Element	Goal/Purpose and Need	Improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.
	Screening	Mediation group identified shortlist of options (A, K, L); FHWA and WSDOT agreed to evaluate.
	Alternatives	Draft EIS 6-Lane Alternative and design options dropped from further analysis. SDEIS evaluated: No Build, 4-Lane (traffic analysis only), 6-Lane with design options noted below.
Process	6-Lane Design Options	Evaluated: Option A: new Montlake bascule bridge; Option K tunnel under the Montlake Cut and lowered SPUI; Option L diagonal bridge over the Montlake Cut and surface SPUI.
	Activities	Legislation (ESSB 6099) directed development of a 6-lane corridor interchange design for the Montlake area through a mediated community involvement process. Seattle City Council Resolution 31109 comments on results of mediation and confirms City recommendations for corridor. Mediation explored 12 design options

Table 2-1. History of SR 520, I-5 to Medina Project NEPA Process and Alternatives

		but did not reach a consensus solution. Prepared discipline reports to evaluate the impacts of Options A, K, and L. Conducted coordination and outreach with agencies and the public. Legislative Workgroup created by legislation (ESHB 2211) recommended Option A with suboptions.
	Recommendations and Outcomes	4-Lane Alternative not further considered after updated traffic analysis confirms it fails to meet Purpose and Need. Mediation participants agree on three options to carry forward: A, K, and L. WSDOT evaluates A, K, and L in the SDEIS. Preferred Alternative identified following comments on SDEIS.
Final EIS (Released June 2011)		
NEPA/Project Element	Goal/Purpose and Need	Improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.
	Screening	N/A
	Alternatives	No Build and Preferred Alternative.
Process	6-Lane Design Options	Options A, K, and L compared to Preferred Alternative.
	Activities	Prepare final evaluation of Preferred Alternative and compare to SDEIS design options.
	Recommendations and Outcomes	Proceed with preparation of Record of Decision.

N/A = not applicable

2.2 What were the alternatives and design options studied in detail in the Draft EIS?

Between 2003 and 2005, the SR 520 team advanced conceptual design of the corridor alternatives and conducted transportation and environmental analysis for the Draft EIS. During this time, the 8-Lane Alternative was dropped from further evaluation because transportation analysis showed that the increased traffic flow on SR 520 would necessitate extensive improvements and major impacts on I-5 and the SR 520/I-405 interchange. Thus, only the 4-Lane and 6-Lane alternatives were studied in the Draft EIS. Both build alternatives were assumed to be tolled to provide funding for the project.

- **The 4-Lane Alternative** evaluated in the Draft EIS would replace the existing SR 520 corridor with two general-purpose lanes in each direction—the same as today—and would include wider lanes and shoulders to meet current highway standards. All of the vulnerable structures in the corridor would be replaced with new structures, but no HOV and transit capacity would be added. While the 4-Lane Alternative improved safety and reliability in the corridor, the Draft EIS traffic analysis showed that it did not meet the project purpose of improving the movement of people and goods across SR 520.

- **The 6-Lane Alternative** evaluated in the Draft EIS included two general-purpose lanes and one inside HOV lane in each direction, along with wider lanes and shoulders to meet current highway standards. It would replace all of the corridor's vulnerable structures and add new capacity for transit and carpooling. Unlike the 4-Lane Alternative, the 6-Lane Alternative included lids across SR 520 designed to help reduce the effects of adding two new lanes to the corridor and to connect communities on either side of the highway. The Draft EIS analysis indicated that the 6-Lane Alternative would fully meet the project purpose, because in addition to improving safety and reliability by providing new bridges and wider lanes, it would increase mobility for people and goods by including continuous HOV lanes throughout the corridor.

What were the Draft EIS 6-Lane Alternative design options?

In 2005, after the 6-Lane Alternative had been developed and discussed with project stakeholders, neighborhoods adjacent to the highway expressed concern that the 6-Lane Alternative, as then configured, was too wide in the Montlake interchange area. Communities and transit agencies also expressed interest in developing better connections between SR 520 and proposed regional transit facilities. In response, WSDOT worked with stakeholders to develop several additional "design options"—different configurations of the 6-Lane Alternative within the Montlake interchange area that would reduce the 6-Lane Alternative's effects and/or enhance its benefits. The Draft EIS evaluated three 6-Lane Alternative design options in Seattle:

- **The Pacific Street Interchange option** proposed to consolidate the existing Montlake and Lake Washington Boulevard interchanges into one new interchange, located east of the existing Montlake interchange. It also included a 4-lane bridge over Union Bay, terminating at the existing intersection of Montlake Boulevard East and Pacific Street. This option was designed to provide more reliable transit connections to the Montlake multimodal center and the future Sound Transit Link light rail station near Husky Stadium.
- **The Second Montlake Bridge option** proposed a second drawbridge across the Montlake Cut, parallel to the existing Montlake Bridge. Like the Pacific Interchange option, it eliminated the Montlake freeway transit station, but provided more reliable connections to the Montlake multimodal center and the Link light rail station at Husky Stadium.
- **The No Montlake Freeway Transit Stop option** proposed to eliminate this freeway transit station, independent of other design changes. This would require relocation of transit riders and services currently using the facility.

The *SR 520 Bridge Replacement and HOV Project Draft EIS* (WSDOT 2006a), which evaluated the alternatives and options described above, was published in August 2006. The Draft EIS text is included in Attachment 12.

What types of comments did FHWA and WSDOT receive on the Draft EIS?

The Draft EIS comment period lasted from August 18 to October 31, 2006. Interested parties commented on the document online, by mail, by e-mail, and at two public hearings. In all, WSDOT received 1,734 comments from agencies, tribes, organizations, and individuals. Chapter 11 provides additional detail on the number and nature of comments received.

The largest proportion of comments from the public expressed a preference for or against one or more of the 6-Lane Alternative design options. The Pacific Street Interchange option generated over 800 of these comments, far more than any other design option. Many commenters from the Montlake community expressed strong support for this option, while commenters from other areas voiced concerns regarding its impacts and expense. Parks, and in particular the Washington Park Arboretum and its natural areas, were a topic of concern; over 40 botanical gardens around the United States sent letters opposing the Pacific Street Interchange because it had larger effects on this park than other options. Other comments from the public focused on traffic, transportation systems, and transit; urban design and aesthetics; neighborhood impacts; and other topics such as tolling, noise, bicycle and pedestrian access, and wetlands.

Government agencies, institutions, and tribes submitted 36 comment letters during the Draft EIS comment period. Common themes included the need for more detailed discussion of project effects, especially during construction; the importance of avoiding and minimizing impacts as part of project design; and the need for more specific mitigation measures to be provided in the Final EIS. A number of resource agencies and the University of Washington expressed specific concerns about the Pacific Street Interchange design option, including statements that it had a higher potential for substantial effects than other choices and that it was the most environmentally damaging. These concerns were based primarily on the larger in-water footprint of this option compared to the other 6-Lane Alternative options and its effects on wetlands in the Arboretum, including on Marsh Island. Because the interchange would have required a substantial amount of land from the University of Washington's south campus, the University stated in its comment letter that "the Pacific Street Interchange option appears to be the one that would have the greatest negative impacts on our mission."

WSDOT's responses to the comments received on the Draft EIS are summarized in the Draft EIS Comment Summary Report in Attachment 13. Because many of the topics raised in these comments have been addressed in subsequent analyses, WSDOT has prepared summary responses that address key themes in the comments. The original comment letters are also provided in Attachment 13 on the DVD attached to the Executive Summary rather than printed.

2.3 What alternatives and design options were studied in the SDEIS?

How did WSDOT move forward following the Draft EIS?

In December 2006, in a report entitled *A Path Forward to Action* (Gregoire 2006), Governor Christine Gregoire identified the 6-Lane Alternative as the state's preference for the SR 520 corridor. Governor Gregoire stated:

> I believe the needs of the regional transportation system will best be served by an alternative that replaces the four existing general-purpose lanes and adds two HOV lanes to strengthen regional transit services. The ongoing environmental review process provides support for this approach.

However, the Governor noted the diversity of public opinions expressed in the Draft EIS and through public outreach efforts regarding the configuration and effects of the 6-Lane Alternative and its design options. She concluded:

> The impacted communities on the west end of the project need to determine what design from Union Bay and westward to I-5 will best serve the neighborhoods, the University of Washington, and parks and natural resources. City and community leaders and residents need to come together and develop a common vision on the best solution that fits the character and needs of the local communities. I have asked WSDOT to provide support when requested for such a process.

In spring 2007, responding to the Governor's request, the Washington State Legislature passed Engrossed Substitute Senate Bill (ESSB) 6099. The bill directed the Office of Financial Management to hire a mediator and appropriate planning staff to develop a 6-lane corridor design for the Seattle portion of the project area. Specifically, the bill directed the mediation group to prepare a project impact plan to address the impacts of the SR 520 Bridge Replacement and HOV Project's design on Seattle city neighborhoods and parks. The bill also directed that the project impact plan provide a comprehensive approach to mitigating the impacts of the project, including incorporating construction mitigation plans. It required that the plan be submitted to the Governor and legislature by December 2008.

Legislative goals identified for ESSB 6099 included the following:

- Minimize the total footprint and width of the bridge.
- Minimize the project impact on surrounding neighborhoods.

- Incorporate the recommendations of a health impact assessment.
- Effectively prioritize travel time, speed, and reliability.
- Provide six total lanes, with four general-purpose lanes and two HOV lanes.
- Articulate in environmental documents the alignment of the selected design.

Who participated in mediation?

The mediation participants were identified through interviews with a broad range of stakeholder organizations, including those identified in the legislation and others who had been actively involved with the SR 520 project during development of the Draft EIS. (See the text box at right for a list of organizations that were represented in the mediation group.) Over the course of 2008, the mediation participants developed and reviewed more than a dozen design options for the configuration of SR 520 through Seattle.

What were the design options developed through mediation?

The mediation participants brainstormed design options that were aimed at meeting identified community interests. Nearly all focused on the area between the Portage Bay Bridge and the western end of the floating bridge. The design options (designated with the letters A through L) included the following:

- **Option A**. Redesign of the Montlake interchange options evaluated in the Draft EIS to address Seattle City Council resolution elements and Draft EIS comments.
- **Option B**. Redesign of the Pacific Street Interchange design option evaluated in the Draft EIS to address Seattle City Council resolution elements and Draft EIS comments.
- **Option C**. Evaluation of the following "full tunnel" options:
  - Tunnel from the floating bridge to I-5 with no access points in Seattle, with a separate 2-lane bus tunnel from the floating bridge to the light rail station, and with a vertical profile 50 feet below grade. Reconfigured I-5 to remove the weave—all entrances/exits would be on the right side. Reclaimed SR 520 right-of-way would be used for a trail and park.
  - Tunnel from the floating bridge to I-5 with distributed access points.
- **Option D.** Retrofit of the current 4-lane bridge with a separate 2-lane tunnel for transit to the light rail station (separate structure across the lake and then a tunnel from the floating bridge).

Organizations Represented in the Mediation Group

- WSDOT
- Sound Transit
- Office of the Governor (representing state agencies, including the Departments of Ecology, Fish and Wildlife, Archaeology and Historic Preservation, Natural Resources, and the Recreation and Conservation Office)
- University of Washington
- King County Metro Transit
- Seattle Mayor's Office
- Seattle City Council
- Seattle Design Commission
- Arboretum Foundation/Arboretum and Botanical Garden Committee
- Cascade Bicycle Club
- Friends of Seattle's Olmsted Parks
- Transportation Choices Coalition
- Boating Community
- Greater Seattle Chamber of Commerce
- Bellevue Chamber of Commerce
- Freight Advisory Committee
- Montlake Community Council
- Madison Park Community Council
- Roanoke/Portage Bay Community Council
- Laurelhurst Community Council
- University District Community Council
- North Capitol Hill Community Council
- Eastlake Community Council
- Ravenna Bryant Community Association
- City of Yarrow Point
- City of Medina
- City of Clyde Hill
- City of Hunts Point
- City of Bellevue
- City of Kirkland
- FHWA
- National Marine Fisheries Service (also representing U.S. Fish and Wildlife Service and fishery interests)
- U.S. Coast Guard
- Washington State Legislature (one seat available to any legislator who wished to attend a mediation session)

- **Option E.** A car/bus tunnel to the University of Washington, with a submerged exit/entrance just west of the floating bridge under Union Bay that would surface at Pacific Street.
- **Option F.** Second Montlake Cut bridge—design would emulate and reflect, but not copy, the historic bridge.
- **Option G.** Tunnel and viaduct—tunnel from the floating bridge under the Washington Park Arboretum with a viaduct through Portage Bay.
- **Option H.** Similar to the Draft EIS Pacific Street Interchange design option, with a refined single-point urban interchange (SPUI) northeast of the Washington Park Arboretum (interchange with two levels), and a bridge to Pacific Street and Lake Washington Boulevard.
- **Option I.** Retrofit with revised alignment and tunnel to the north of the Washington Park Arboretum, with a "people mover" below ground from the transit station to the University of Washington and a second Montlake Cut bridge.
- **Option J.** Interchange between the Montlake and Pacific Street Interchange options from the Draft EIS, with a short tunnel, a spur to Lake Washington Boulevard, an intersection under the main line, and no Washington Park Arboretum ramps.
- **Option K**. Tunnel in Washington Park Arboretum and East Montlake interchange with a tunnel under the Montlake Cut to the Pacific Street and Montlake Boulevard East intersection.
- **Option L.** Interchange east of Montlake Boulevard East (similar location as in Option K above), with a bridge across the east end of the Montlake Cut instead of a tunnel.

How were the mediation options evaluated, and what were the conclusions?

Mediation participants evaluated and refined design options at monthly meetings that were held from November 2007 through December 2008. The meetings included presentations from WSDOT, independent experts, and the mediation participants. More information on how the mediation options were evaluated can be found in the Final Project Impact Plan (Parametrix 2008) and the Agency Coordination and Public Involvement Discipline Report Addendum and Errata (Attachment 7).

In February 2008, mediation members agreed to focus on Options A, K, and L with various suboptions for each. Subsequent meetings of the mediation group focused on refining these options to more closely meet the goals of mediation participants. The mediation design options ultimately agreed upon by the group were described in the Final Project Impact Plan (Parametrix 2008). As noted above, WSDOT agreed to evaluate these design options in an SDEIS. As required by NEPA and SEPA, the SDEIS objectively analyzed and disclosed the effects of the project with each of the design options. WSDOT continued to work with resource and permitting agencies and tribes to share information on the design options and to ensure that the analysis reflected the regulatory and treaty requirements with which the project must comply. The SDEIS reflected the results of this coordination and provided information on how the design options perform with regard to mobility, safety, and environmental effects.

What were design options A, K, and L?

Design options A, K, and L, shown in Exhibit 2-3 in the section *What is the Preferred Alternative?*, represented three possible configurations of the 6-Lane Alternative in Seattle. Their greatest physical differences were in the Montlake Cut crossing, the location of the interchange in the Montlake area, and the profile of the west approach bridge connecting the Evergreen Point Bridge floating span with the Montlake shoreline. The options are described briefly below and are compared to the Preferred Alternative in more detail later in this chapter. Like the Draft EIS alternatives and options, all of the SDEIS design options were assumed to be tolled to provide funding for the project.

Option A was most similar to today's configuration, but had six lanes (four general-purpose and two HOV lanes) rather than the existing four general-purpose lanes. It maintained the existing location of the Montlake interchange and added a new bascule bridge over the Montlake Cut, parallel to the existing Montlake Bridge. Its profile rose from the west shore of Union Bay to a height of 15 to 20 feet over Foster Island, descended to a low point east of Foster Island, and then rose again to meet the west transition span. Evaluated with Option A were three potential suboptions:

- Add an eastbound HOV direct access ramp from Montlake Boulevard.
- Add an eastbound on-ramp and a westbound off-ramp between SR 520 and Lake Washington Boulevard.
- Use the Option L profile for the west approach bridge, which maintained a constant slope from the Montlake shoreline to the west highrise.

Option K included a new single-point urban interchange about a half mile east of the existing Montlake interchange. The new interchange ramps would pass beneath the SR 520 roadway, with the northern leg of the interchange crossing beneath the Montlake Cut in a tunnel. The profile of Option K would remain low throughout the west approach area; on Foster Island, the roadway would be excavated to about 4 feet below the existing grade to accommodate construction of a "land bridge" over the top. Option K had one potential suboption: the addition of an eastbound off-ramp from SR 520 to Montlake Boulevard.

Option L also included a SPUI with an alignment similar to Option K. However, instead of being beneath the SR 520 mainline, the interchange

Is it a highrise or a transition span?

A transition span is a bridge span that connects the fixed approach bridges to the floating portion of the bridge. The Evergreen Point Bridge has two transition spans, one at the west end of the floating bridge transitioning traffic on and off of the west approach, and one on the east end of the floating bridge transitioning traffic on and off of the east approach. These spans are often referred to as the "west highrise" (shown) and the "east highrise" during the daily traffic report, and the west highrise even has a traffic camera mounted on it.

For the FEIS, highrise and transition span are used interchangeably, and refer to the area along the bridge where the east and west approach spans transition to the floating span.

The existing highrises have two characteristics–large overhead steel trusses and navigation channels below the spans where boat traffic can pass underneath the Evergreen Point Bridge. The new design for the floating bridge would not include overhead steel trusses on the transition spans, which would change the visual character of the highrise.

ramps would rise above it. The northern leg of the interchange would cross the Montlake Cut at a diagonal on a new bascule bridge. The west approach would rise at a constant slope from the west shore of Union Bay to the west transition span, with an elevation of approximately 10 to 15 feet above Foster Island. Option L had two potential suboptions:

- Add one northbound lane to Montlake Boulevard from Pacific Street to 25th Avenue NE.
- Add left-turn access from Lake Washington Boulevard to the SPUI south ramp.

All of the design options placed an emphasis on multimodal transportation by decreasing reliance on single-occupancy vehicle travel and facilitating transit connections. All would improve the overall flow of SR 520 traffic compared to the No Build Alternative. Each included a number of common elements of the 6-Lane Alternative, such as landscaped lids, stormwater treatment, and a regional bicycle/pedestrian path, although details of those features differed among the options. While the design options varied mainly in the Montlake area, other differences included the width and the type of aesthetic treatment to be used for the Portage Bay Bridge, as well as the roadway profile across Foster Island and eastward to the floating bridge.

Why were alternatives and design options in the Draft EIS not considered in the SDEIS?

The 4-Lane Alternative was identified in the Draft EIS as not fully meeting the project purpose and need. While it would improve safety by replacing vulnerable structures and widening lanes and shoulders, it would not meet the project purpose of improving mobility in the SR 520 corridor. Additional modeling for the SDEIS, using the same updated traffic model used to estimate travel demand for Options A, K, and L, confirmed that the 4-Lane Alternative would provide substantially lower mobility benefits than the 6-Lane Alternative for both general-purpose traffic and transit. Therefore, the 4-Lane Alternative was eliminated from further study.

The 6-Lane Alternative design options evaluated in the Draft EIS were also eliminated from consideration. As discussed above, public comments on the Draft EIS expressed strong opinions either for or against specific design options. A plurality of the comments expressed strong support of the Pacific Street Interchange option; however, comments from members of the public, environmental resource agencies, and the University of Washington reflected serious concerns about the impacts of this option. Findings by the Seattle City Council indicated that the 6-Lane Alternative and design options, as described in the Draft EIS, were too wide through the corridor and that mitigation for their construction effects needed to be further defined. The level of controversy and concern generated by the Draft EIS design options was a key factor leading to the establishment of the mediation process. Consequently, the design options resulting from mediation were the only ones considered in the SDEIS. The 6-Lane Alternative studied in the SDEIS was also narrowed throughout the corridor to reduce its overall footprint.

As noted earlier, the Trans-Lake Washington Project also evaluated an 8-Lane Alternative, which was one of the original alternatives recommended by the Trans-Lake Study Committee. Various studies indicated that this alternative would not perform effectively due to existing bottlenecks at I-5 and I-405. On the basis of these findings, the 8-Lane Alternative was eliminated from further study prior to the Draft EIS.

ESHB 2211 and the SR 520 Legislative Workgroup

In May 2009, after the mediation process had ended, Governor Gregoire signed Engrossed Substitute House Bill (ESHB) 2211, which authorized tolling on the Evergreen Point Bridge beginning in 2010 and set the budget for the SR 520 Program at $4.65 billion. The bill also established a legislative workgroup on SR 520, which was charged with the following responsibilities:

- Recommend design options that provide for a full SR 520 corridor project that meets the needs of the region's transportation system, while providing appropriate mitigation for neighborhoods and communities in the area directly affected by the project. The group was also tasked with identifying projects in the corridor for which WSDOT would apply for federal stimulus funds under the American Recovery and Reinvestment Act of 2009.
- Review and recommend a financing strategy, in conjunction with WSDOT, to fund the projects in the SR 520 corridor that reflect the recommended design options.
- Present a final report with recommendations on financing and design options to the legislature and the Governor by January 1, 2010.
- Form a subgroup to conduct a detailed review of design options between I-5 and the west end of the floating bridge, consult with affected neighborhood and community groups, and make recommendations.

The legislative workgroup met from July through December 2009. The group received extensive input from mediation participants about ideas for modifying the design options to reduce cost and/or to better achieve project objectives. WSDOT assisted with layout of the new concepts and provided information to support the work of an expert review panel, which validated WSDOT's budget and schedule estimates. The workgroup also solicited advice from resource agencies, local jurisdictions, the Seattle Parks Department, the Coast Guard, and other stakeholders. State budget officials and financing specialists identified potential funding sources and scenarios for the project.

New ideas proposed to the workgroup by the mediation participants included the following:

- Option A+, which would add Lake Washington Boulevard ramps and an eastbound HOV direct-access ramp to Option A to increase mobility, as well as a constant-slope profile for the west approach to improve stormwater drainage and treatment. These proposed changes had little or no impact compared to the original Option A and were all evaluated as suboptions in the SDEIS.
- Option M, which would eliminate the Option K SPUI and replace the excavated tunnel with an immersed-tube tunnel that would be built by dredging across the Montlake Cut rather than tunneling below it. This option was not evaluated in the SDEIS; because of its cost, risk, and greater environmental impact than the design options already under study, it was determined not to be a reasonable alternative to meet the project purpose and need.

On November 17, 2009, the workgroup made a draft recommendation to forward Option A+ to the legislature and the Governor as its preferred design option for the 6-Lane Alternative. In support of its recommendation, the group cited the following considerations:

- It met the purpose and need of the project and complies with statutory requirements to implement a six-lane bridge replacement project (per ESSB 6099 and ESHB 2211).
- It met the transportation needs of the corridor with the least impact to the surrounding environment.
- It could be constructed within the $4.65 billion financial threshold.
- The impacts were covered within the SDEIS.
- It met the needs of transit providers within the SR 520 corridor and on local surface streets.
- It had broad-based support from local communities, including the University District Community Council, Ravenna Bryant, and Friends of Olmsted Parks, and from regional organizations including the University of Washington, Greater Seattle Chamber of Commerce, King County Metro, and the Eastside Transportation Partnership.

The workgroup's recommendations were presented to the Seattle City Council on November 24, 2009, and to the public in a town hall meeting that same evening. Both meetings provided opportunities to comment on the options and the workgroup's decision process. At each meeting, people expressed support for a variety of choices, including Option M, Option A+ with and without the Lake Washington Boulevard ramps, a transit-optimized 4-Lane Alternative, and retrofitting the seismically vulnerable bridges to allow more time to develop a long-term solution. A number of commenters expressed the general sentiment that no matter what solution was chosen, it should be implemented quickly to provide jobs, enhance mobility, and reduce the risk of catastrophic failure.

On December 8, 2009, the workgroup voted 9-3 to present its draft recommendations report to the full legislature. The workgroup's final report was presented to the legislature in December 2010. The report reiterated the recommendation of Option A+ for the 6-Lane Alternative, and included a minority report by two of the workgroup members who opposed the recommendation.

What types of comments did FHWA and WSDOT receive on the SDEIS?

The SDEIS for the SR 520, I-5 to Medina project was published on January 22, 2010. During the public comment period, which was extended from its original closing date of March 8, 2010, to April 15, 2010, WSDOT received 415 comment cards, letters, and e-mails. Of these, 392 were from the public, including individuals, businesses, and community organizations. The categories that were most frequently mentioned by the public, along with examples of the topics addressed, included:

- **Transportation:** Transit and HOV use of SR 520, including timing for potential addition of light rail; inclusion of Lake Washington Boulevard ramps and associated traffic effects in the Arboretum; assumptions and conclusions of traffic and transportation modeling; transit reliability and connectivity with removal of Montlake Freeway Transit Stop; bicycle and pedestrian mobility
- **Engineering design:** Bridge width, particularly with respect to Portage Bay Bridge; height of proposed floating bridge compared to existing bridge; design components specific to a geographic area; replacement for functions of Montlake Freeway Transit Stop; infrastructure needs for accommodation of light rail in the SR 520 corridor
- **Design Option A:** Opinions for and against the option; questions regarding need for design components, especially Lake Washington Boulevard ramps and second Montlake bridge; requests for additional information
- **Funding and cost:** Funding method (tolling, taxes, private funding); concerns regarding accuracy of project costs, particularly estimates of tunneling cost; concerns that mitigation and enhancement measures would be eliminated if project was not fully funded; magnitude of project planning and analysis costs; use of public dollars; project budget
- **Recreation:** Impacts of project on Washington Park Arboretum, including land acquisition, noise and visual effects, traffic, and wetland

filling/shading; effects on other local parks; effects on recreational activities that may be affected during construction and/or operation, such as recreational boating and Opening Day events

- **Section 106 effects:** Concerns that effects on historic properties had not been fully evaluated, particularly with regard to construction effects; requests for additional and/or improved coordination through Section 106 consulting party process
- **NEPA-related topics:** Assertions that SR 520, I-5 to Medina project was improperly segmented from Eastside and/or pontoon projects; suggestions that additional alternatives, such as a transit-optimized 4-Lane Alternative and immediate implementation of light rail transit, were reasonable and should have been evaluated further; statements that preferred alternative selection was predetermined by WSDOT and the legislature.

Of the 415 comment cards, letters, and e-mails received during the SDEIS comment period, 23 were from government entities, including federal, state, and regional agencies; local jurisdictions; and tribes. The categories that were most frequently mentioned by agencies, jurisdictions, and tribes, along with examples of the topics addressed, included:

- **Agency and tribal coordination:** Requests for continued coordination between WSDOT, regulatory agencies and tribes; requests to provide more information on impact calculation methods and engage agencies and tribes in developing more detailed proposals for mitigation in anticipation of permitting requirements
- **Traffic and transportation:** Requests for additional study of light rail transit and/or exclusive transit use of the HOV lanes; assertions that funding would be needed to replace the function of the Montlake Freeway Transit Station and meet additional service demands; requests for additional coordination with City of Seattle to better integrate pedestrian/bicyclist and transit features in Montlake interchange vicinity
- **Engineering design:** Bridge height, including a general preference by resource agencies for higher bridges to reduce intensity of shading; desire for narrower width of the Portage Bay Bridge; questions as to whether design of the floating bridge and west approach was compatible with light rail transit; elements in specific geographic areas; effects of Option A on NOAA Northwest Fisheries Science Center campus; design considerations for components like lids, transit stops, and bridge segments
- **Natural resource effects:** Concerns regarding lack of agency and tribal participation in mitigation development; effects of wider floating bridge on lake circulation and temperature; effects of project construction and operation on salmon stocks; construction impacts and aquatic fill under Option K

- **Mitigation:** Need to avoid and minimize effects before mitigating; requests for additional information about natural resources, social, economic, transit-related, and air quality effects in order to assess appropriate mitigation requirements; temporary versus permanent effects
- **Recreation:** Concerns regarding impacts to the Washington Park Arboretum and other local parks; requests to provide specific mitigation under federal laws protecting recreational resources; requests for continued engagement with agencies with jurisdiction over parks

All comments received on the SDEIS are responded to in this Final EIS. Attachment 11 includes the original comments alongside FHWA's and WSDOT's responses. Due to the volume of material (over 3,000 pages), Attachment 11 is provided on the DVD attached to the Executive Summary. Section 2.5 below identifies design elements of the Preferred Alternative that respond to comments made on the SDEIS.

2.4 What additional alternatives were considered after the SDEIS?

NEPA requires that if new reasonable alternatives are proposed via comments on a draft (or supplemental draft) environmental document, they must be fully analyzed. Commenters on the SDEIS suggested two alternatives that they believed should have been evaluated further:

- A "transit-optimized" 4-Lane Alternative
- An alternative that would include light rail transit (LRT) on SR 520 when it opened, rather than accommodating it as part of a future project

Although both the 4-Lane Alternative and a multimodal alternative including LRT were evaluated and eliminated earlier in the NEPA process, WSDOT re-evaluated both to determine whether changed conditions might result in their being considered "reasonable alternatives" as defined by NEPA (40 Code of Federal Regulations [CFR] Section 1502.14(c)). Reasonable alternatives are considered "those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant" (from Question 2(a) Answer in CEQ 40 FAQs).

This section begins with a brief overview of regional land use and transportation planning, which helps to frame the range of reasonable alternatives for study in an EIS. This is followed by a discussion of why the two alternatives described above were determined not to be reasonable alternatives, and are therefore not considered further.

Although there was not a formal request for its analysis in the SDEIS comments, several comments suggested that Option M, which was proposed by the former supporters of Option K during the legislative workgroup process, was dropped without sufficient consideration. Option M had a similar alignment to Option K, but substituted a dredged tunnel across the Montlake Cut for the excavated tunnel included in Option K. WSDOT's evaluation of Option M at that time indicated that it was not a reasonable alternative. A brief discussion of the factors considered in this conclusion is also provided below.

How do regional land use and transportation planning affect the range of reasonable alternatives for SR 520?

A key component of the SR 520, I-5 to Medina project purpose and need is improving mobility in the SR 520 corridor. Measuring whether alternatives achieve this purpose requires that WSDOT establish baseline (or No Build) conditions for the project design year (2030) as a basis for comparison. This, in turn, requires predictions about how population and employment are likely to change in the region, and what transportation choices people will make in response to these changing conditions.

As an agency whose primary purpose is to build and operate the statewide highway and ferry systems, WSDOT does not make decisions about where people live and work or how communities will grow. The framework for local jurisdictions' future development is established by their comprehensive land use plans. Under Washington's Growth Management Act (Chapter 36.70A Revised Code of Washington [RCW]), these plans include growth targets for employment and population within each urban area that are based on land use and zoning designations. The Puget Sound Regional Council (PSRC)—the regional metropolitan planning organization—uses these projections to estimate future regional population and employment within geographic areas called "transportation analysis zones." This allows a computer model to predict how many people in each zone will need to drive, take a bus or train, carpool, or travel by some other mode in a given period of time (e.g., daily or during the peak hour). By adding new features, like lanes or interchanges, to the transportation network, planners can see how many people would use these features and how they would affect the overall performance of the system. This is how alternatives are compared to No Build in a traffic model.

Because PSRC is the region's metropolitan planning organization, it is responsible for guiding the integration of transportation and land use planning. Therefore, WSDOT's traffic analysis is required to use PSRC's estimates for future population, employment, and travel patterns. Under the Growth Management Act, WSDOT has a responsibility to provide transportation infrastructure that will accommodate the region's planned growth. For this reason, PSRC's *Transportation 2040: Toward a Sustainable Transportation System* (PSRC 2010a) includes a 6-lane configuration for

SR 520. The project is also consistent with federal, state, and local policies (including City of Seattle policies) that call for completion of the HOV system to increase the range of transportation choices.

Although WSDOT has an integrative function among statewide transit agencies (see RCW 47.01.330), those agencies must develop their own plans for provision of service. Sound Transit and King County Metro are each charged with determining transit service levels and planning future transit routes. They are also responsible for infrastructure associated with providing their services, such as maintenance facilities or (in the case of Sound Transit) rail lines. WSDOT partners with these agencies to support the provision of facilities such as HOV lanes, direct-access ramps, and park-and-ride lots to enhance mobility and increase transportation choices. For the SR 520, I-5 to Medina project, WSDOT has worked extensively with both King County Metro and Sound Transit to ensure that the project will be compatible with their long-term service planning. This effort has included the agencies' collaboration on the *SR 520 High-Capacity Transit Plan* (WSDOT, Sound Transit, and King County Metro 2008), which would implement rapid transit in the proposed HOV lanes and provide improved regional and local transit connections at the Montlake Multimodal Center.

Under NEPA, WSDOT is not limited to evaluating alternatives that are within its own jurisdiction if other alternatives provide reasonable ways of meeting the project purpose and need. However, to support the integration of NEPA with local planning processes, agencies are required to consider consistency with adopted state, local, and regional plans, or, in the case of conflicts, to describe how the agency would reconcile its proposed action with those plans (40 CFR 1506.2(d)).

Why is a transit-optimized 4-Lane Alternative not evaluated further?

A number of commenters expressed the opinion that the 4-Lane Alternative had been unfairly dismissed because it was not "transit-optimized" and did not include refinements that were made to the 6-Lane Alternative and options following publication of the Draft EIS in 2006. Although there was no clear consensus among the comments on the design refinements needed to optimize the 4-Lane Alternative for transit, commenters suggested tolling to reduce general-purpose travel demand to the point where four lanes of traffic could flow freely, thereby reducing delay and increasing reliability for transit. This tolling approach is different than the original assumption for the 4-Lane and 6-Lane Alternatives, which was that the primary purpose of tolls would be to provide funding for the project (although they would also help to manage congestion).

What is "transit-optimized"?

The term "transit-optimized" refers to a 4-lane alternative that would achieve the same travel time benefits for buses and HOVs as those provided by the HOV lane in the 6-lane Alternative.

To evaluate this suggestion, WSDOT performed travel demand modeling to determine what level of tolling on a 4-lane SR 520 would be required to achieve free flow (see Attachment 19). As discussed in the preceding section, the model used growth forecasts for 2030 that were based on adopted land use plans. The modeling results indicated that in order to achieve free flow on SR 520 with 4 lanes, peak-hour tolls on the bridge would need to be a minimum of $5.50. At this toll rate, enough traffic would divert from SR 520 to I-90 that I-90 would be well over its capacity; in effect, congestion would be transferred from one cross-lake route to the other. Congestion on I-90 would result in higher emissions of both criteria pollutants and greenhouse gases from vehicles operating at lower, less efficient speeds, and potentially in localized traffic effects from vehicles queuing at ramps or cutting through local neighborhoods in an effort to reduce travel times. In addition, this scenario would create a greater hardship for low-income populations using SR 520, who would need to choose either to pay a higher toll or to spend more time in the increased congestion on I-90. Tolling of I-90 in addition to SR 520 might balance congestion somewhat between the two lake crossings, but would likely result in non-free-flow conditions on SR 520 and a resulting continued disincentive to transit use. Finally, a 4-lane SR 520 is inconsistent with regional plans and policies, which over the past decade have continued to affirm the importance of completing the regional HOV system.

The 4-Lane Alternative evaluated in the Draft EIS was not evaluated further because it was determined not to meet the project purpose of improving mobility on SR 520. While a 4-Lane Alternative operating at free flow would, by definition, improve mobility in the SR 520 corridor, it could only achieve this objective by creating substantial adverse effects on regional traffic, with corresponding effects on the built and natural environment. Because trips from SR 520 would be forced onto other congested facilities, many of the travelers that this project is intended to serve would experience these congested conditions, which is inconsistent with the project's mobility goals. Creating congestion in other corridors also conflicts with the project goal of avoiding or minimizing impacts on affected neighborhoods and the environment. Conversely, the 6-Lane Alternative would provide substantial benefits for transit and HOV mobility on SR 520 with minimal traffic diversion compared to No Build. Based on these considerations, FHWA and WSDOT concluded that a transit-optimized 4-Lane Alternative does not merit further consideration.

Why is initial implementation of light rail transit on SR 520 not evaluated further?

In February 2010, Seattle Mayor Mike McGinn stated his opposition to the Legislative Workgroup's recommendation of Option A+ and his support for "a 520 bridge replacement that maintains its current auto-capacity and features light rail from the start" (McGinn 2010). Mayor McGinn engaged a consultant to explore the possibilities of building light rail transit in the SR 520 corridor; the resulting report, entitled *SR 520 Light Rail Alternatives* (Nelson/Nygaard Consulting Associates 2010), was issued in draft form on

April 6, 2010, prior to the close of the SR 520 public comment period. Although the report did not include a recommendation for immediate implementation of light rail in the corridor, many commenters voiced a request for FHWA and WSDOT to consider initial light rail implementation as an alternative. This section discusses the regional planning context for light rail transit and additional analysis that WSDOT performed to evaluate the reasonableness of this potential alternative. Because the report stated that WSDOT's current designs were incompatible with future light rail in the corridor, this section also includes a discussion of how the Preferred Alternative would accommodate light rail if and when a regional decision is made to provide it on SR 520.

The decision to site Sound Transit's initial east-west LRT corridor on I-90 rather than SR 520 was made through extensive regional deliberation. Table 2-2 illustrates the history of regional decisionmaking on east-west mass transit routes, which began in 1967 when the *Report on a Comprehensive Public Transportation Plan for the Seattle Metropolitan Area* (De Leuw Cather & Company 1967) identified a rail corridor from Seattle to Bellevue and Redmond across I-90. Additional studies and agreements over the subsequent 40 years have all continued to affirm I-90 as the preferred rail transit corridor, with similar or higher predicted ridership than SR 520 and substantially lower costs and environmental impacts. Some key milestones include:

- In **1986**, the Puget Sound Council of Governments Multi-Corridor Analysis found that LRT on SR 520 would have lower ridership, lower feeder bus potential, higher cost, and lower cost-effectiveness than I-90. As a result, SR 520 was eliminated as an alternative LRT corridor.
- In **1996**, Sound Transit's first long-range plan identified the I-90 corridor as an HOV expressway with potential LRT service, and began NEPA evaluation of two-way transit and HOV operations in that corridor. The plan designated SR 520 for "local bus service" (later identified as regional express bus service).
- In **2002-03**, the multi-modal alternatives analysis for the Trans-Lake Washington Project (see discussion above), conducted by co-lead agencies WSDOT, FHWA, Sound Transit, and FTA, concluded after evaluating both SR 520 and I-90 that I-90 would be the region's initial cross-lake corridor for HCT. The agencies agreed that SR 520 would be designed to accommodate HCT in the future. FTA and Sound Transit subsequently ceased to be co-lead agencies.
- In **2005**, Sound Transit's long-range plan update continued to designate I-90 as the priority HCT corridor, while calling for SR 520 to include BRT in the proposed HOV lanes.
- In **November 2008**, voters approved funding for Sound Transit's ST2 plan to extend LRT east from downtown Seattle across I-90 to downtown Bellevue and east to the Overlake Transit Center in

Redmond, as well as north from the University of Washington station to Northgate. The plan also allocates funding for study of potential future rail transit on SR 520.

- In **December 2008**, WSDOT, Sound Transit, and King County Metro published the *SR 520 High-Capacity Transit Plan*, which provided an outline for how transit could build on capital investments identified for the SR 520 corridor by substantially increasing service and improving off-corridor transit facilities to help meet future demand. The plan identified up to five BRT routes in the SR 520 HOV lanes, and predicted a growth in transit ridership of 60 percent in the corridor by 2020 if funding is identified to implement the recommended service improvements. The HCT plan reiterated ST2's commitment to a planning study of light rail on SR 520 to evaluate potential alignments, stations and costs, and potential implementation strategies.

Table 2-2. Regional High-Capacity and Light Rail Planning

Year	Action/ Event
1967-9	Comprehensive Public Transportation Plan for the Seattle Metropolitan Area – 1985 Horizon identifies rail corridor from Seattle-Mercer Island-Bellevue-Redmond Included in Forward Thrust bond measure in 1968 – had simple majority but did not meet required 60% supermajority needed for financing
1970s	Region debates at length whether to expand and modernize I-90, including whether transit should have semi- or fully-exclusive right-of-way
1976	I-90 Memorandum of Agreement – specifies dedicated transit facility to be included on new I-90 bridge Signed by cities of Seattle, Mercer Island, and Bellevue and King County Metro Transit and WSDOT
1986	Puget Sound Council of Governments – Metro performs the Multi-Corridor Analysis LRT on SR 520 eliminated as alternative in Phase II analysis due to low ridership, lower feeder bus potential, higher cost, and lower cost-effectiveness compared with I-90
1990s	Joint Regional Policy Committee (JRPC) begins planning regional HCT JRPC, which includes King, Pierce, and Snohomish counties and WSDOT, is pre-cursor to Regional Transit Authority (RTA)
1993	JRPC completes EIS on Regional Transit System – light rail on I-90 identified as preferred mode Following adoption of JRPC's Regional Transit Plan, Central Puget Sound RTA forms
1994-5	RTA conducts public outreach on JRPC's Regional Transit Plan and identifies set of HCT investments for vote 1994 RTA plan includes I-90 LRT from Seattle to Redmond, but fails in 1995 ballot RTA develops Sound Move investment plan, with express bus service in HOV lanes substituted for LRT
1996-8	Sound Transit adopts first long-range plan, which highlights I-90 corridor as HOV expressway and potential LRT SR 520 identified in plan for "local bus service" (later identified as regional express bus service) I-90 Two-Way Transit and HOV Project EIS started
1999	For Trans-Lake Study, Sound Transit (a co-lead) states a goal of either confirming I-90 as preferred cross-lake corridor or defining a better crossing location Trans-Lake Study Committee recommends that an HCT element be carried forward into development of EIS alternatives

Table 2-2. Regional High-Capacity and Light Rail Planning

Year	Action/ Event
2000	Trans-Lake Washington Project studies confirm that I-90 rather than SR 520 is the preferred corridor for light rail due to higher ridership, lower cost, and lower environmental impact
2004	Amendment to 1976 I-90 Memorandum of Agreement identifies a preferred alternative from I-90 Two Way Transit and HOV Project as first step to having transit operating in dedicated right-of-way PSRC prepares Central Puget Sound Region High Capacity Transit Corridor Assessment Report - findings about 520 HCT/LRT
2005	Following SEIS and public outreach, Sound Transit updates and adopts long-range plan designating I-90 as LRT or convertible BRT corridor Long-range plan identifies HOV/BRT system for SR 520 corridor
2006	Sound Transit Board passes Resolution No. R2006-15 identifying light rail as the preferred mode for HCT for Seattle to Bellevue and Redmond via I-90
2007	Legislature directs Sound Transit, King County Metro, and WSDOT to prepare a High-Capacity Transit Plan for SR 520 Draft HCT Plan identifies up to five BRT routes across SR 520, adding 130,000 service hours by 2022
2008	Sound Transit adopts ST2, calling for LRT construction on I-90, BRT on SR 520, and planning studies for LRT on SR 520 ST2 funded by voters
2010	SR 520 Bridge Replacement and HOV Program revisits SR 520 with LRT Seattle Mayor's Office issues report asserting that SR 520 SDEIS options are not compatible with future LRT WSDOT identifies Preferred Alternative incorporating design features to enhance future LRT compatibility

Source: Document prepared for Regulatory Agency Coordination process (RACp) meeting held on August 6, 2009.

WSDOT has worked with Sound Transit since 2003 to design for future rail compatibility in the corridor. The Mayor's April 2010 report identified several changes to the SDEIS options that were believed to be necessary to "meet the mayor's goal of an SR 520 bridge that is readily convertible to rail." While WSDOT believed that the design already met this goal, it worked with the City of Seattle and Sound Transit to identify changes that would enhance the corridor's rail compatibility. The Preferred Alternative reflects these design change and allows for two future rail options:

- **Option 1:** Convert the HOV/transit lanes to light rail. This approach would accommodate light rail by converting the HOV lanes to exclusive rail use. Trains would use the direct-access ramps at Montlake Boulevard to exit, or could use a 40-foot gap between the westbound and eastbound lanes of the west approach to make a more direct connection to the University Link station at Husky Stadium. This gap would narrow across Foster Island to minimize effects on the Arboretum, while still allowing the rail line to turn north toward the station.
- **Option 2:** Add light-rail-only lanes, also utilizing the gap between the westbound and eastbound west approach lanes. This approach would

allow several connections—via a high bridge, a drawbridge, or a tunnel, as suggested in the Nelson/Nygaard report (2010)—to the University Link station.

Both approaches would require the addition of supplemental floating bridge pontoons to support the additional weight of light rail, should the regional decision to do so be made and funded. Such a decision would need to be planned and programmed by regional land use and transit agencies, funded by a public vote, and evaluated in its own environmental analysis. An SR 520 rail project would need to have logical termini and independent utility, which would require detailed study of routes, stations, ridership, and potential connection points to existing and planned LRT routes on either side of the lake.

Although any future decision to make SR 520 a rail corridor will require additional authorizations and detailed study, WSDOT undertook additional analysis following the SDEIS to help answer public questions about how rail in this corridor might operate and the ridership it might generate. The analysis revisited the potential for implementing LRT on SR 520 *in place* of the planned HOV/transit lane between the Montlake interchange and the Eastside (see Attachment 19). This evaluation was completed by:

- Determining a "representative light rail alignment" and associated stations to serve the SR 520 corridor
- Modifying the Preferred Alternative transit network in the SR 520 Final EIS travel demand model to serve the representative light rail alignment and associated stations
- Evaluating model results to determine effects on SR 520 and I-90 transit ridership and vehicle volumes (general-purpose and 3+ HOV)

The analysis concluded that light rail would not provide mobility benefits before 2030 because of service duplication with East Link. Modeling showed that opening of the East Link route, coupled with BRT service across SR 520 beginning in 2016, would absorb much of the demand for east-west transit service until 2030. Cross-lake transit trips were forecasted to increase by only 4 percent when the SR 520 corridor was assumed to be served exclusively by light rail, as compared to a BRT system using HOV lanes and other dedicated bus facilities. The effect on a region-wide basis was even less significant, with total transit trips increasing by less than 1 percent with light rail on SR 520. By 2030, transit ridership across SR 520 was forecasted to be approximately the same as it is today. Thus, LRT service on SR 520 before 2030 would have relatively low ridership and would likely fail to meet cost-effectiveness criteria used by FTA in ranking projects for grant funding. The existing economic climate and the resulting challenges in implementing even adopted and funded plans (see Sound Transit's ST2/Sound Move Integration and Implementation White Paper, October 2009) reinforce the decision to prioritize BRT on SR 520 for the nearer term, while continuing to evaluate future implementation of LRT as regional demand increases.

These findings support the conclusions drawn from past similar work and the resulting decisions made, i.e., that the long-range cross-lake transit market can be adequately served by a combination of BRT service along the SR 520 corridor and a light rail system on I-90. Transit demand along the SR 520 corridor may eventually warrant significant alteration to the system currently being planned to serve cross-lake needs, and the proposed SR 520 bridge design and HOV/transit improvements anticipate and support future HCT. Periodic monitoring of the corridor's transit system performance should provide an indication of when it is appropriate to conduct another assessment of the next generation of transit improvements for cross-lake travel. While the findings demonstrate that replacing the proposed HOV improvements on SR 520 (and much of the bus service that would use these improvements) with a light rail system could result in more transit trips using cross-lake facilities, light rail would not induce an increase in ridership to a degree that would warrant the significant investment and impacts accompanying such an undertaking.

Why was "Option M" not evaluated in the SDEIS?

As discussed previously in this chapter, a coalition of Seattle mediation participants that had previously supported Option K presented a new design option, called Option M, to the SR 520 Legislative Workgroup in the fall of 2009. Option M followed a similar alignment to Option K, but was constructed with an immersed tube tunnel rather than the excavated tunnel of Option K. Rather than tunneling beneath the Montlake Cut, the immersed tube tunnel would dredge a channel in open water across the cut, and then a concrete tube that had been formed offsite would be sunk into the dredged excavation and backfilled to the original depth.

One of the key drivers for Option M's development was the potential for reduced costs compared to Option K, which had by far the highest cost of the SDEIS design options ($4.1 billion to $4.2 billion from I-5 to Medina, compared to $2 billion to $2.3 billion for Option A). At the time Option M was proposed, WSDOT worked with the option's proponents to develop a design concept that would allow its costs and impacts to be evaluated. Although preliminary analysis suggested that the substitution of a dredged tunnel for an excavated tunnel had the potential for cost savings, the overall costs of Option M would still have been substantially higher than those of Option A. The cost review panel supporting the workgroup expressed concern that, given the range of probable costs for Option M, it was unlikely to fit within the legislatively established budget for the project.

In addition to the cost concerns posed by Option M, WSDOT's initial discussions with resource agencies and tribes regarding this option indicated that the construction effects of open-channel dredging might have posed insurmountable difficulties in project permitting, given that lower-impact options were available. The legislative workgroup's final report (SR 520 Legislative Workgroup, December 2009: "Because the Montlake Cut is an environmentally sensitive area, we believe the permitting of Option M's wetland impacts will be risky and very costly to mitigate and we believe there would be a high likelihood of a much longer delay (12 to 24 months) in order to negotiate the permitting issue with the U.S. Army Corps of Engineers." In light of these cost and environmental concerns, Option M was not carried forward for further consideration in the NEPA process.

2.5 What is the Preferred Alternative, and how was it chosen?

How were comments on the Draft EIS and SDEIS used in developing the Preferred Alternative?

Comments on the 2006 Draft EIS (discussed in Section 2.2) were focused primarily on the 6-Lane Alternative design options then under consideration, and thus are not directly relevant to the options evaluated in the SDEIS. However, some key themes from those comments guided the development of the mediation design options as well as the Preferred Alternative. These themes include:

- Narrow the corridor as much as possible to minimize impacts on neighborhoods, parks, and the environment.
- Reduce the project's effects on the Washington Park Arboretum.
- Improve local traffic congestion, particularly on Montlake Boulevard and for traffic moving between SR 520 and areas to the north.
- Incorporate innovative measures wherever possible to reduce traffic noise.
- Provide more detailed information on construction impacts and project mitigation measures.

During and after the SDEIS comment period, FHWA and WSDOT carefully reviewed all public, tribal, and agency comments. Comments on the SDEIS (summarized in section 2.3) were a key consideration in developing the Preferred Alternative. On April 29, 2010, Governor Gregoire announced the details of the Preferred Alternative to the public. Table 2-3 identifies how design elements of the Preferred Alternative respond to specific themes in the SDEIS comments. The remainder of this chapter describes the Preferred Alternative and compares it to SDEIS Options A, K, and L.

Table 2-3. Design Elements in Preferred Alternative that Respond to Public, Agency, and Tribal Comments

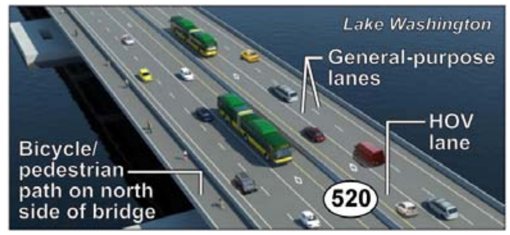
Comment	Source of Comment	How Preferred Alternative Responds to Comment
Project design is not compatible with addition of light rail.	Seattle Mayor's Office, community groups, individuals	Although project has always been designed to accommodate future rail, modifications have been made to better facilitate potential future rail connections to University Link station, either within HOV lanes or on separate structure.
New floating bridge would be too high compared to existing conditions and would block views.	Community groups, individuals	Height of bridge has been lowered from approximately 30 feet (in Draft EIS and SDEIS) to approximately 20 feet above lake surface.
Footprint across Arboretum and Foster Island is too wide.	Tribes, Seattle Parks, Arboretum Foundation, individuals	Footprint in Arboretum has been further refined, with right-of-way acquisition reduced from SDEIS options
West approach bridge should be as high as possible to minimize shading.	Resource agencies, tribes	Preferred Alternative includes a constant slope profile slightly higher than that of SDEIS Option L.
Noise in the corridor should be reduced using methods other than walls, e.g., innovative methods identified by Noise Expert Review Panel.	Community groups, individuals	As identified by the Noise Expert Review Panel, the Preferred Alternative includes 4-foot concrete traffic barriers, noise-absorptive coatings on barriers and lid portals, and lower speed limit west of Montlake lid; as a result, fewer noise walls are warranted. Quieter pavement is also included, although its effectiveness is still being evaluated and it is not an approved noise mitigation measure.
Portage Bay Bridge should be as narrow as possible (6 lanes maximum).	City of Seattle, community groups, individuals	Portage Bay Bridge includes 6 lanes plus a managed shoulder to improve traffic operations during peak hours; overall width is 7 feet less than SDEIS Option A.
The Option A Montlake lid is discontinuous and would not effectively reconnect communities.	Community groups, individuals	Montlake lid has been lengthened to approximately 1,400 feet and extended across SR 520.
Option A with Lake Washington Boulevard ramps would increase wetland impacts and create more traffic in the Arboretum.	Community groups, individuals	No Lake Washington Boulevard ramps, as access to Lake Washington Boulevard has been consolidated with Montlake interchange; traffic through Arboretum is projected to decrease compared to No Build.
Construction of Option K tunnel would have severe impacts on aquatic habitat and species.	Resource agencies, tribes	Preferred Alternative does not include a tunnel.
Mitigation measures are not adequately defined.	Resource agencies, tribes, City of Seattle, community groups, individuals	Detailed mitigation measures and implementation steps have been developed and are included in this Final EIS and its attachments.

How was the Preferred Alternative refined based on ESSB 6392?

As described in Chapter 1, during the 2010 legislative session, the Washington State Legislature passed ESSB 6392. Signed into law by Governor Gregoire, the bill outlined specific areas and elements of the Preferred Alternative to refine through a multi-agency process.

ESSB 6392 directed WSDOT and the Mayor and City Council of the City of Seattle to establish two workgroups that bring together King County Metro, University of Washington, Sound Transit, and other designees to consider design refinements to and transit connections within the Preferred Alternative. WSDOT was also directed to convene a workgroup with King County Metro and Sound Transit to study options for planning and financing high-capacity transit through the SR 520 corridor. In addition, the bill directed WSDOT to work with the governing board of the Arboretum to develop a mitigation plan, and established various reporting timelines for the different work efforts.

The legislature directed that design refinements to the preferred alternative be "consistent with the current environmental documents prepared by the department for the supplemental draft environmental impact statement," so as to accommodate a "timely progression" of the SR 520, I-5 to Medina project. Accordingly, the ESSB 6392 workgroup recommendations included only design refinements that were within the range of impacts studied in the SDEIS and would not require additional supplemental analysis.

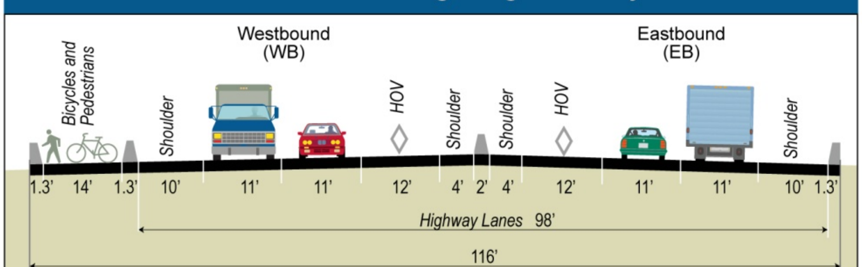


6-Lane Floating Bridge Roadway

What is the Preferred Alternative?

The SR 520, I-5 to Medina project Preferred Alternative would widen the SR 520 corridor to six lanes (Exhibit 2-1) from I-5 in Seattle to Evergreen Point Road in Medina and would restripe and reconfigure the lane channelization in the corridor from Evergreen Point Road to 92nd Avenue Northeast in Yarrow Point. It would replace the vulnerable Evergreen Point Bridge, including the floating bridge and west and east approaches, and the Portage Bay Bridge with new structures. The project would complete the regional HOV lane system across SR 520, as called for in regional and local transportation plans. Major features of the Preferred Alternative are described below; the major variations among the Preferred Alternative and SDEIS design options A, K, and L are discussed in Section 2.3.

Exhibit 2-1. **6-Lane Alternative Floating Bridge Roadway Cross Section**



NOTE: Dimensions shown on the diagram are approximate for the proposed Evergreen Point Bridge.

Exhibit 2-2. **Overview of Geographic Areas Along Project Corridor**

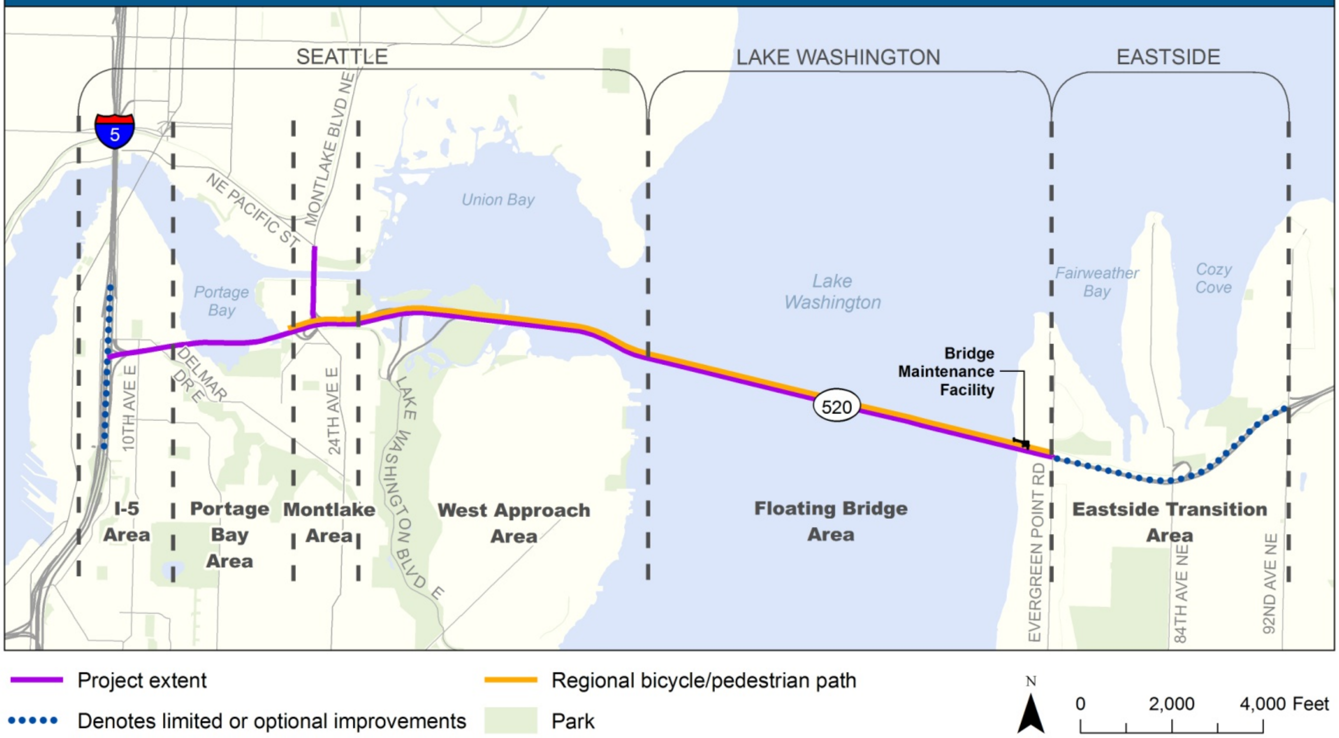
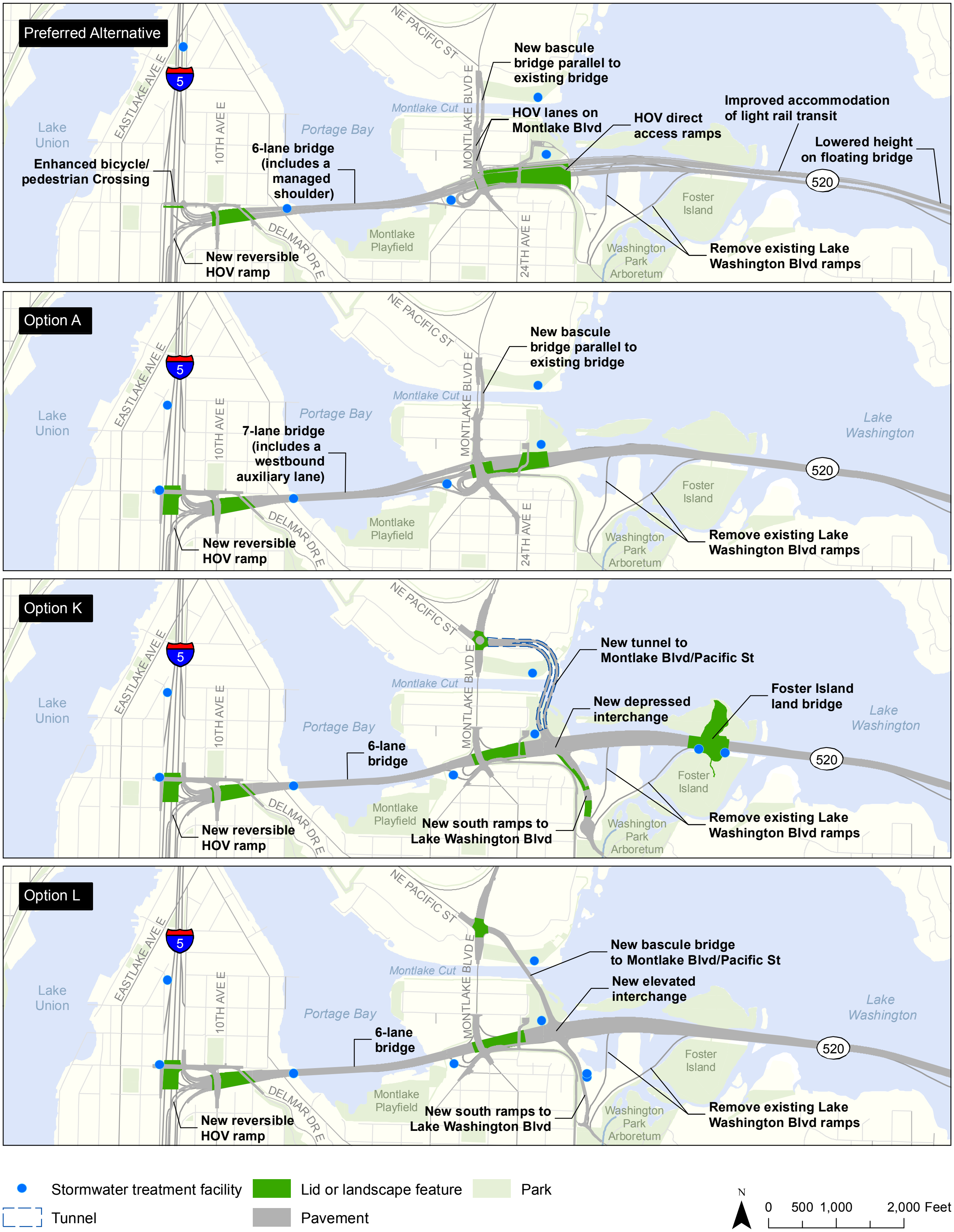


Exhibit 2-2 shows the project limits and identifies the portions of the project within three larger study areas: Seattle, Lake Washington, and the Eastside. SR 520 would be six lanes (two 11-foot-wide outer general-purpose lanes and one 12-foot-wide inside HOV lane in each direction), with 4-foot-wide inside shoulders and 10-foot-wide outside shoulders across the floating bridge (Exhibit 2-1). The typical roadway cross-section would be approximately 116 feet wide, compared to the existing width of 60 feet, as shown in Exhibit 2-1. In areas where there are ramps and/or gaps between lanes, the overall width of the roadway would be greater. The additional width is needed for the new HOV lanes and to accommodate wider, safer travel lanes and shoulders. It has, however, been reduced by 18 feet from what was shown in the Draft EIS to respond to community concerns. The Preferred Alternative also includes:

- Landscaped lids over the highway
- A regional bicycle and pedestrian path
- Noise reduction measures
- Reversible ramps to and from I-5
- A bridge maintenance facility
- Stormwater treatment facilities
- A new bascule bridge parallel to the existing Montlake Bridge

The Preferred Alternative incorporates a number of features that respond to comments on the SDEIS from the public, agencies, and tribes. It is most similar to SDEIS Option A, but includes the following refinements (Exhibit 2-3):

Exhibit 2-3. Preferred Alternative and Options A, K, and L



- Reduction in the overall mainline footprint by narrowing the shoulders, and reducing the posted speed to 45 miles per hour between I-5 and Montlake Boulevard.
- Portage Bay Bridge design that incorporates a 14-foot-wide westbound managed shoulder rather than an auxiliary lane, and narrower inside shoulders to reduce overall footprint.
- An expanded, 1,400-foot landscaped lid at Montlake Boulevard that provides complete coverage of SR 520 along with bicycle and pedestrian amenities, HOV direct access ramps, and transit facilities.
- Elimination of the Lake Washington Boulevard ramps.
- Improved accommodation of potential future light rail transit in the corridor, either in the HOV lanes or in a new dedicated right-of-way.
- A narrower overall footprint across Foster Island
- Northbound and southbound HOV lanes on Montlake Boulevard to improve transit reliability.
- Innovative measures to reduce noise in adjacent neighborhoods and parks, resulting in fewer recommended noise walls.
- A lower height on the floating span to minimize visual effects.

The discussion below describes major project features that are common to the Preferred Alternative and SDEIS Options A, K, and L. Section 2.6 is a detailed comparison of the Preferred Alternative with the SDEIS options.

Lids and Landscape Features

The Preferred Alternative includes lids at the following locations:

- 10th Avenue East and Delmar Drive East
- Montlake Boulevard

The lids would reconnect neighborhoods, enhance movement of pedestrians and cyclists, restore and create views, and provide access to existing and new transit stops.

The following lids were included in Options A, K, and/or L, but are not part of the Preferred Alternative (see Exhibit 2-3):

- I-5/East Roanoke Street (Options A, K, and L)
- Montlake Boulevard NE and NE Pacific Street (Options K and L only)
- Foster Island "land bridge" (Option K only)

The I-5/East Roanoke Street lid was not included in the Preferred Alternative due to the constraints it would place on potential future expansion of I-5. The other lids not included in the Preferred Alternative were unique to the designs of Options K and L.

Regional Bicycle/Pedestrian Path

The project includes a 14-foot-wide bicycle/pedestrian path along the north side of SR 520 through the Montlake area and across the Evergreen Point Bridge to the Eastside. In the Montlake area, the path would connect to the existing Bill Dawson Trail that crosses underneath SR 520 near the eastern shore of Portage Bay. It would also connect to the Montlake lid and East Montlake Park. On the Eastside, the path would connect to the bicycle/pedestrian path proposed as part of the SR 520, Medina to SR 202: Eastside Transit and HOV Project.

A new path beginning in East Montlake Park would pass under the west approach bridge at Montlake to connect to a proposed new trail in the Arboretum. The portion of the existing Arboretum Waterfront Trail that crosses SR 520 at Foster Island would also be restored or replaced after construction of the SR 520 west approach structure. There would be no new bicycle/pedestrian path along SR 520 west of Portage Bay.

Noise Reduction

Under FHWA regulations (23 CFR Part 772), noise abatement measures must be considered when highway noise levels approach or exceed the thresholds set in FHWA's noise abatement criteria, as they do along much of the SR 520 corridor and would continue to do under the No Build Alternative. (See Section 4.7 for information on existing noise levels and the FHWA criteria.) Such measures must meet FHWA and WSDOT guidelines for feasibility and reasonableness, including a WSDOT requirement of making every reasonable effort to attain a 10-decibel or greater reduction in the first row of properties affected by project noise. Feasibility deals primarily with engineering considerations (such as whether substantial noise-level reductions could be achieved or whether property access would be negatively affected). Reasonableness is a cost-benefit analysis based on predicted future noise levels.

The SDEIS evaluated traffic noise reduction measures for each design option. Option A was defined as including noise walls and/or quieter rubberized asphalt pavement. Option K was defined as including only quieter rubberized asphalt pavement for noise reduction. Option L would include noise walls similar to those defined in the Draft EIS, which would extend along most of the corridor.

The Preferred Alternative includes several design elements and general corridor improvements that were added as a result of recommendations from the SR 520 Noise Expert Review Panel and in response to community input. The Preferred Alternative design includes 4-foot concrete traffic barriers, noise-absorptive material on the traffic barriers and around the lid portals, and encapsulated bridge expansion joints. Additionally, the posted speeds on the Portage Bay Bridge between I-5 and the Montlake lid would be reduced to 45 mph. These measures, coupled with project design features such as a higher profile in the west approach area would collectively reduce noise levels throughout the SR 520, I-5 to Medina corridor. Quieter concrete pavement would also be used throughout the corridor in response to public input. However, because the effectiveness of quieter concrete has not been demonstrated in this region, it is not considered a mitigation measure, and no noise reduction benefits were assumed from its use in the project noise analysis.

The noise reduction measures outlined above were incorporated into the Preferred Alternative in response to strong opposition to noise walls expressed in SDEIS comments and in community forums. However, as required, noise walls were evaluated for the Preferred Alternative, as they were for Options A, K, and L, to determine if they would meet the feasibility and reasonableness criteria. By reducing noise levels, the design refinements of the Preferred Alternative reduce the number of recommended noise walls compared to those recommended for Options A, K, and L.

Stormwater Treatment

The project includes the installation of stormwater treatment facilities to collect and treat stormwater runoff. Three facility types incorporating Ecology-approved stormwater best management practices have been identified for the project: biofiltration swales, constructed stormwater treatment wetlands, and media filter vaults (Option K only). Table 2-4 identifies which facility types are proposed for each project area drainage basin.

Table 2-4. Proposed Stormwater Treatment Facilities - Preferred Alternative and SDEIS Options

Drainage Basin	Type of Proposed Facility
Lake Union	Biofiltration swale
Portage Bay	Constructed stormwater treatment wetland and biofiltration swale
Union Bay	Constructed stormwater treatment wetlands and biofiltration swale Media filter vaults (Option K only)
Lake Washington	Biofiltration swale; high-efficiency sweeping in conjunction with modified catch basins and stormwater lagoons on the new floating bridge and approach structures

Biofiltration swales are vegetation-lined channels designed to remove suspended solids from stormwater. They offer *basic* water quality treatment to remove pollutants such as metals, suspended solids, and nutrients from contaminated stormwater.

Stormwater treatment wetlands offer *enhanced* treatment, achieving greater removal of dissolved metals from stormwater than basic treatment. These

Basic versus Enhanced Treatment

Basic and enhanced stormwater treatment best management practices (BMPs) are different types of BMPs that have been designated in the Highway Runoff Manual (HRM) to treat stormwater (see page 3-15, Chapter 3 of the HRM [WSDOT 2008a]).

Basic treatment BMPs remove pollutants such as metals, suspended solids, and nutrients from contaminated stormwater. The HRM performance goal for basic treatment BMPs is 80 percent removal of total suspended solids (WSDOT 2008a).

Enhanced treatment BMPs are designed to achieve greater removal of dissolved metals than basic treatment. In addition to removing 80 percent total suspended solids, the HRM performance goal for enhanced treatment is 50 percent removal of dissolved copper and zinc for influent concentrations, ranging from 0.003 to 0.02 milligram per liter (mg/L) for dissolved copper and 0.02 to 0.3 mg/L for dissolved zinc (WSDOT 2008a).

While these families of BMPs have different performance goals for the stormwater they are designed to treat, the intent of treatment is the same—to produce stormwater discharges that comply with state and federal water quality criteria.

wetlands provide enhanced treatment by using multiple cells and wetland vegetation to reduce the amount of these pollutants in runoff.

Media filter vaults are enclosed treatment facilities (usually underground) that provide stormwater filtration. Vaults house one or more structures, each with a filtering cartridge. The vault channels the collected stormwater through the filtering cartridge(s) at a controlled flow rate. These cartridges trap particulates and dissolved pollutants including metals, hydrocarbons, and nutrients. Media filters alone provide basic water quality treatment. For the SR 520, I-5 to Medina project, media filter vaults are only included to address stormwater needs at Foster Island as part of Option K.

Enclosed spill containment lagoons are also part of the proposed floating bridge design. Surface pollutants would be removed on a periodic basis under normal monitoring and maintenance activites. The lagoons would also allow dilution of remaining pollutants prior to mixing with lake waters beneath the bridge.

Lighting

Similar to today's roadway lighting configuration, continuous lighting would be provided along the SR 520 corridor from I-5 to Foster Island and on bridge structures crossing the Montlake Cut. Recessed lighting would illuminate the proposed bicycle and pedestrian path along the west approach structure and the Evergreen Point Bridge. Lighting would be designed to minimize effects on aquatic habitat, likely through the use of downlights similar to those on the I-90 floating bridges.

Recessed Downlighting

Tolls

Both the 2006 SR 520 Draft EIS and the 2010 SDEIS identified tolling as a way to generate revenue for project construction, and assumed a toll as part of the traffic modeling analysis for all build alternatives. The SDEIS traffic analysis made the following assumptions for how the project would be tolled:

- Segmental tolling (i.e., tolls collected at multiple locations along the corridor) between I-5 and I-405
- Variable toll rates depending on the time of day and whether trips are taken on a weekday or a weekend
- A maximum toll rate of $3.81 (year 2007 dollars) for all vehicle types for a full-length trip, with exemptions for transit and HOVs with three or more riders

These assumptions were updated for the Final EIS traffic analysis based on new legislation and public comment received during outreach events for the Tolling Implementation Committee. The Final EIS traffic analysis made the following assumptions for how SR 520 would be tolled:

- Single-point tolling at one location for vehicles crossing the Evergreen Point Bridge

Tolling Assumptions

Tolling assumptions included in the transportation model for the Final EIS are:

- Single-point tolling implemented on SR 520 between I-5 and I-405
- Variable toll rates depending on the time of day and whether trips are taken during a weekday or during the weekend
- A maximum toll rate of $3.81, with exemptions for transit and HOVs with three or more riders

Like the SDEIS, the Final EIS assumes that the 2030 No Build Alternative would not include tolls. This is because the toll planned to go into effect on SR 520 in 2011 would sunset before 2030. For more information on how tolling was evaluated, please see Chapter 1 and the Final Transportation Discipline Report (Attachment 7).

- Variable toll rates depending on the time of day and whether trips are taken on a weekday or a weekend
- A peak toll rate of $3.81 (year 2007 dollars) for all vehicle types for the bridge crossing, with exemptions for transit and HOVs with three or more riders

These assumptions are used as a basis for comparison among the design options. Actual toll rates and how the tolls would be applied will be determined by the legislature (based on recommendations from the Transportation Commission) after the final project financing plan is developed. Since the traffic modeling assumptions were applied consistently across the alternatives, they show the relative performance of each in comparison to No Build. See Chapter 1 for a discussion about what legislation has been passed to authorize tolling.

All vehicles with one or two occupants would be charged a toll to cross the Evergreen Point Bridge. Users who are required to pay the toll would have transponders, or "cards," that would be read by an electronic card reader. Transponders allow drivers to pay tolls without stopping at a toll booth. Two types of transponders could be used: transponders that would attach permanently to a vehicle's windshield and portable transponders that could be transferred among multiple vehicles. Drivers who do not purchase a transponder would have their license plates photographed as they crossed the tolling point, and bills would be sent by mail to the address at which the vehicle is registered.

2.6 How does the Preferred Alternative compare with SDEIS options A, K, and L?

The greatest physical differences between the Preferred Alternative and the SDEIS design options are in the location and lid configuration of the interchange in the Montlake area (see Exhibit 2-2) and in the profile of the west approach. The Preferred Alternative and the SDEIS options can be summarized as follows:

- The Preferred Alternative is similar to today's configuration in terms of its geometry, although wider. It maintains the existing location of the Montlake interchange but changes the westbound off-ramp so that it connects to 24th Avenue East first, followed by a connection to Montlake Boulevard. It adds a new bascule bridge over the Montlake Cut, parallel to the existing Montlake Bridge. It includes a 1,400-foot continuous lid over Montlake Boulevard with landscaping, ramps, transit facilities, and pathways, and provides near-term transit enhancements along with the ability to accommodate potential future light rail on SR 520.
- Option A was also similar to a widened version of today's configuration. It maintained the existing location of the Montlake

DEFINITION

Bascule Bridge

A bascule bridge is a drawbridge with a counterweight that balances the movable span throughout its upward swing. The bridge provides clearance for boat traffic. All existing bridges on the Lake Washington Ship Canal, except for the I-5 and Aurora bridges, are bascule bridges.

interchange and added a new bascule bridge over the Montlake Cut, parallel to the existing Montlake Bridge. It included a partial landscaped lid over Montlake Boulevard.

- Option K included a new single-point urban interchange about a half mile east of the existing Montlake interchange. The new interchange ramps would pass below the SR 520 roadway, with the northern leg of the interchange crossing beneath the Montlake Cut in a tunnel.
- Option L also included a SPUI with a similar alignment to that in Option K. However, instead of being beneath the SR 520 main line, the interchange ramps would rise above it. The northern leg of the interchange would cross the Montlake Cut on a new bascule bridge.

The Preferred Alternative, like the SDEIS options, places an emphasis on multimodal transportation by decreasing reliance on single-occupant vehicle travel, facilitating transit connections, and improving the overall flow of SR 520 traffic compared to No Build. Like the SDEIS options, the Preferred Alternative includes lids and landscaped features, stormwater treatment, and a regional bicycle/pedestrian path—although the specific details of those features differ. The key differences between the Preferred Alternative and the SDEIS options are in the larger size of the Montlake lid, the increased emphasis on transit access and reliability in the Montlake interchange vicinity, the proposed noise reduction measures, and the fact that access to and from Lake Washington Boulevard would be via 24th Avenue East instead of separate Lake Washington Boulevard ramps. Table 2-5 compares the Preferred Alternative to the SDEIS options by geographic area.

Table 2-5. Preferred Alternative Compared to SDEIS Options

Geographic Area	Preferred Alternative	Comparison to SDEIS Options A, K, and L
I-5/Roanoke Area	The SR 520 and I-5 interchange ramps would be reconstructed with generally the same ramp configuration as the ramps for the existing interchange. A new reversible transit/HOV ramp would connect with the I-5 express lanes.	Similar to all options presented in the SDEIS. Instead of a lid over I-5 at Roanoke Street, the Preferred Alternative would include an enhanced bicycle/pedestrian path adjacent to the existing Roanoke Street Bridge.
Portage Bay Area	The Portage Bay Bridge would be replaced with a wider and, in some locations, higher structure with six travel lanes and a 14-foot-wide westbound managed shoulder.	Similar in width to Options K and L, similar in operation to Option A. Shoulders are narrower than described in SDEIS (2-foot-wide inside shoulders, 8-foot-wide outside shoulder on eastbound lanes), posted speed would be reduced to 45 mph, and median plantings would be provided to create a boulevard-like design.
Montlake Area	The Montlake interchange would remain in a similar location as today. A new bascule bridge would be constructed over the Montlake Cut. A 1,400-foot-long lid would be constructed between Montlake Boulevard and the Lake Washington shoreline, and would include direct-access ramps to and from the Eastside. Access would be provided to Lake Washington Boulevard via a new intersection at 24th Avenue East.	Interchange location similar to Option A. Lid would be approximately 75 feet longer than previously described for Option A, and would be a complete lid over top of the SR 520 main line, which would require ventilation and other fire, life, and safety systems. Transit connections would be provided on the lid to facilitate access between neighborhoods and the Eastside. Montlake Boulevard would be restriped for two general-purpose lanes and one HOV lane in each direction between SR 520 and the Montlake Cut.

Table 2-5. Preferred Alternative Compared to SDEIS Options

Geographic Area	Preferred Alternative	Comparison to SDEIS Options A, K, and L
West Approach Area	The west approach bridge would be replaced with wider and higher structures, maintaining a constant profile rising from the shoreline at Montlake out to the west transition span. Bridge structures would be compatible with potential future light rail through the corridor.	Bridge profile similar to and higher than Option L; structure types similar to Options A and L. The gap between the eastbound and westbound structures would be wider than previously described to accommodate light rail in the future.
Floating Bridge Area	A new floating span would be located approximately 190 feet north of the existing bridge at the west end and 160 feet north of the existing bridge at the east end. The floating bridge would be approximately 20 feet above the water surface (about 10 to 12 feet higher than the existing bridge deck).	Similar to design described in the SDEIS. The profile of the bridge would be approximately 10 feet lower than described in the SDEIS, and most of the roadway deck support would be constructed of steel trusses instead of concrete columns.
Eastside Transition Area	A new east approach to the floating bridge, and a new SR 520 roadway would be constructed between the floating bridge and Evergreen Point Road.	Same as described in the SDEIS.

The following sections describe the Preferred Alternative in comparison to the SDEIS design options. The discussion is organized by geographic area. Where there are substantial differences among the options, they are discussed under separate subheadings.

I-5 Area

The existing SR 520 and I-15 interchange configuration is shown in Exhibit 2-4. Under the Preferred Alternative and all SDEIS design options, the SR 520 and I-5 interchange ramps would be reconstructed in generally the same configuration.

Exhibit 2-4. **No Build Alternative - I-5 Area**

The only exception would be that a new reversible HOV ramp would connect to the existing I-5 reversible express lanes south of SR 520 (Exhibit 2-5).

The northbound I-5 to eastbound SR 520 ramp would be two lanes that merge to one lane prior to connecting to eastbound SR 520 (same as today).

The new reversible HOV ramp would connect the SR 520 center HOV lanes with the I-5 reversible express lanes south of SR 520. During the a.m. hours, the ramp would be used by westbound SR 520 traffic to southbound I-5; during the p.m. hours the ramp would be used by northbound I-5 traffic to eastbound SR 520 (Exhibit 2-6).

The new reversible HOV ramp would act as an add lane to southbound I-5 during the a.m. hours, expanding the express lanes from three to four lanes in this location; during the p.m. hours, the ramp would act as a drop lane from the I-5 express lanes reducing the express lanes from four to three through lanes in the immediate vicinity of the I-5/SR 520 interchange. This configuration would maintain sufficient throughput across the Ship Canal Bridge to serve the expected traffic volumes.

Local Roadway Overcrossings

Under the Preferred Alternative, two local roadway undercrossings (10th Avenue East and Delmar Drive East) would be rebuilt as part of the lid structure. Under Options A, K, and L, the East Roanoke Street crossing of I-5 would also have been rebuilt as part of a lid structure. As described below and shown on Exhibit 2-5, the lane configuration would change slightly from the existing layout (see Exhibit 2-4).

10th Avenue East/Delmar Drive East Lid

The 10th Avenue East and Delmar Drive East lid would span SR 520 between these two streets, each of which currently crosses on its own overpass. The lid would function as a vehicle and pedestrian crossing, a landscaped area, and open space. A curvilinear walkway across the lid would connect the two streets. The lid would be 500 to 600 feet long (because of the angled lid edge) and would reconnect neighborhoods on both sides of the SR 520 corridor by providing walkways and open spaces above the SR 520 roadway. The top of the lid would meet 10th Avenue East and Delmar Drive East at the level of the roadway. The surface of the lid would slope from the high point in the southwest corner at 10th Avenue East to the northeast corner at Bagley Viewpoint.

The East Roanoke/10th Avenue East/Delmar Drive East intersection would be realigned. The turning radius would be increased so that the East Roanoke Street/10th Avenue East traffic movement would become the through movement, rather than East Roanoke Street/Delmar Drive, as it is today.

Exhibit 2-5. I-5 Area (Preferred Alternative and Options A, K, and L)

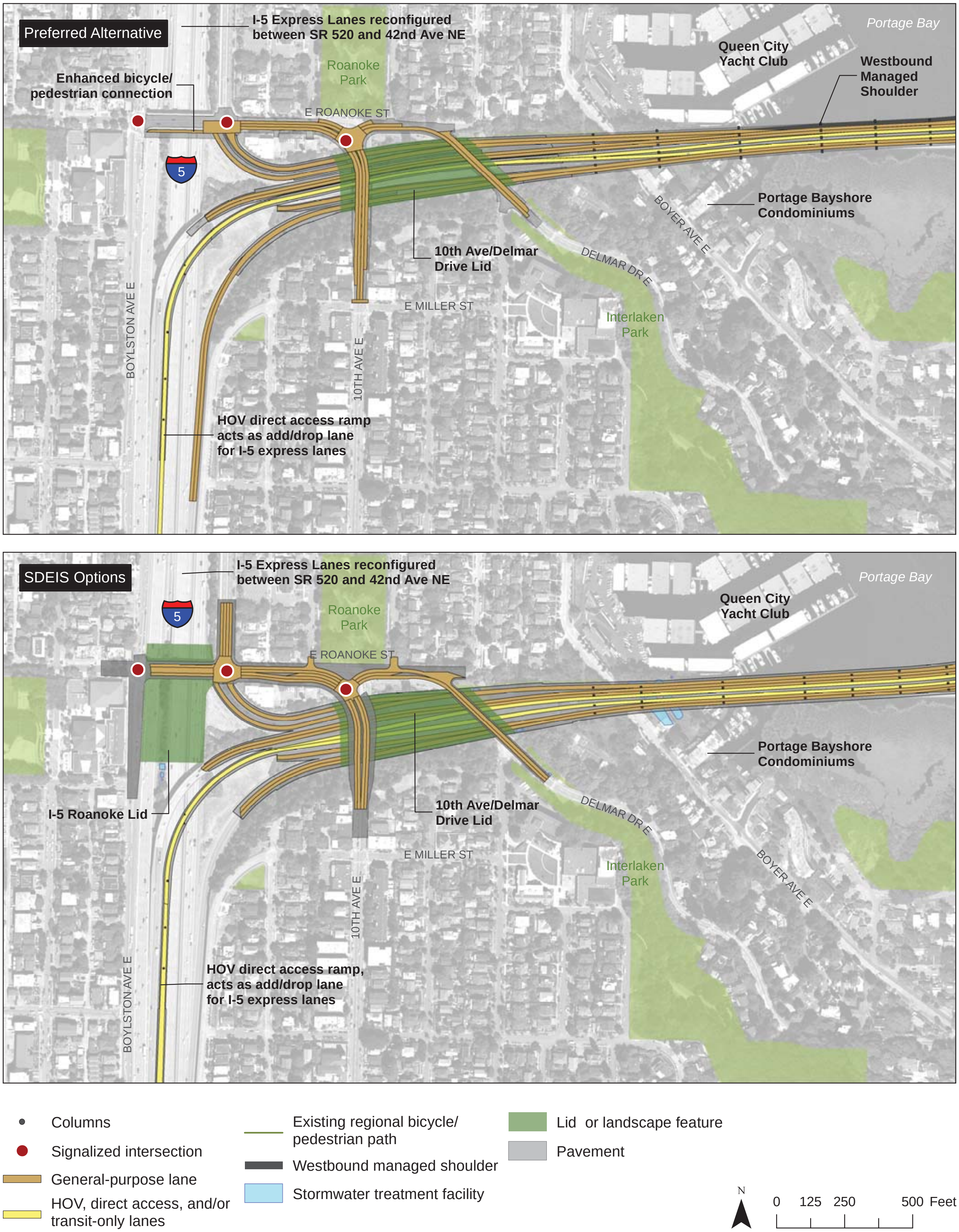


Exhibit 2-6. **Preferred Alternative I-5 Area**

I-5/Roanoke Street Lid

Under Options A, K, and L, the I-5/Roanoke Street lid would span I-5 between Boylston Street and Harvard Avenue East. This lid was eliminated from the Preferred Alternative due to the constraints it would place on potential future expansion of I-5. Cost savings from eliminating the lid in this location would be applied toward the larger Montlake lid, described later in this section.

Portage Bay Area

The existing bridge layout is shown on Exhibit 2-7. As shown, the bridge currently has two general-purpose lanes in each direction.

Under the Preferred Alternative and all SDEIS options, the Portage Bay Bridge would be replaced with a wider and, at the easternmost half of the bridge, taller structure. It would begin just east of Delmar Drive, cross over Portage Bay, and end west of Montlake Boulevard. At its west end (Exhibits 2-8 and 2-9), the bridge would be wider symmetrically between the Queen City Yacht Club on the north and the Portage Bay Condominiums on the south. At its east end, the bridge would make landfall further to the south than the existing bridge and the SDEIS options, and the additional width would be located to the north.

The adjacent interchange ramps to I-5 and Montlake Boulevard add width near the west and east ends of the bridge as they taper on and off of the highway.

The new Portage Bay Bridge design under the Preferred Alternative would have two general-purpose lanes and an HOV lane in each direction, plus a managed westbound shoulder (see Exhibits 2-8 and 2-9). In response to community interest and public comment on the SDEIS, the width of the new Portage Bay Bridge at the midpoint has been reduced from 110 feet to 105 feet, and a planted median would separate the eastbound and westbound travel lanes to provide a boulevard feel to this section of the highway. In addition, the speed limit on the Portage Bay Bridge would be lowered to 45 mph.

Exhibit 2-7. No Build Alternative - Portage Bay

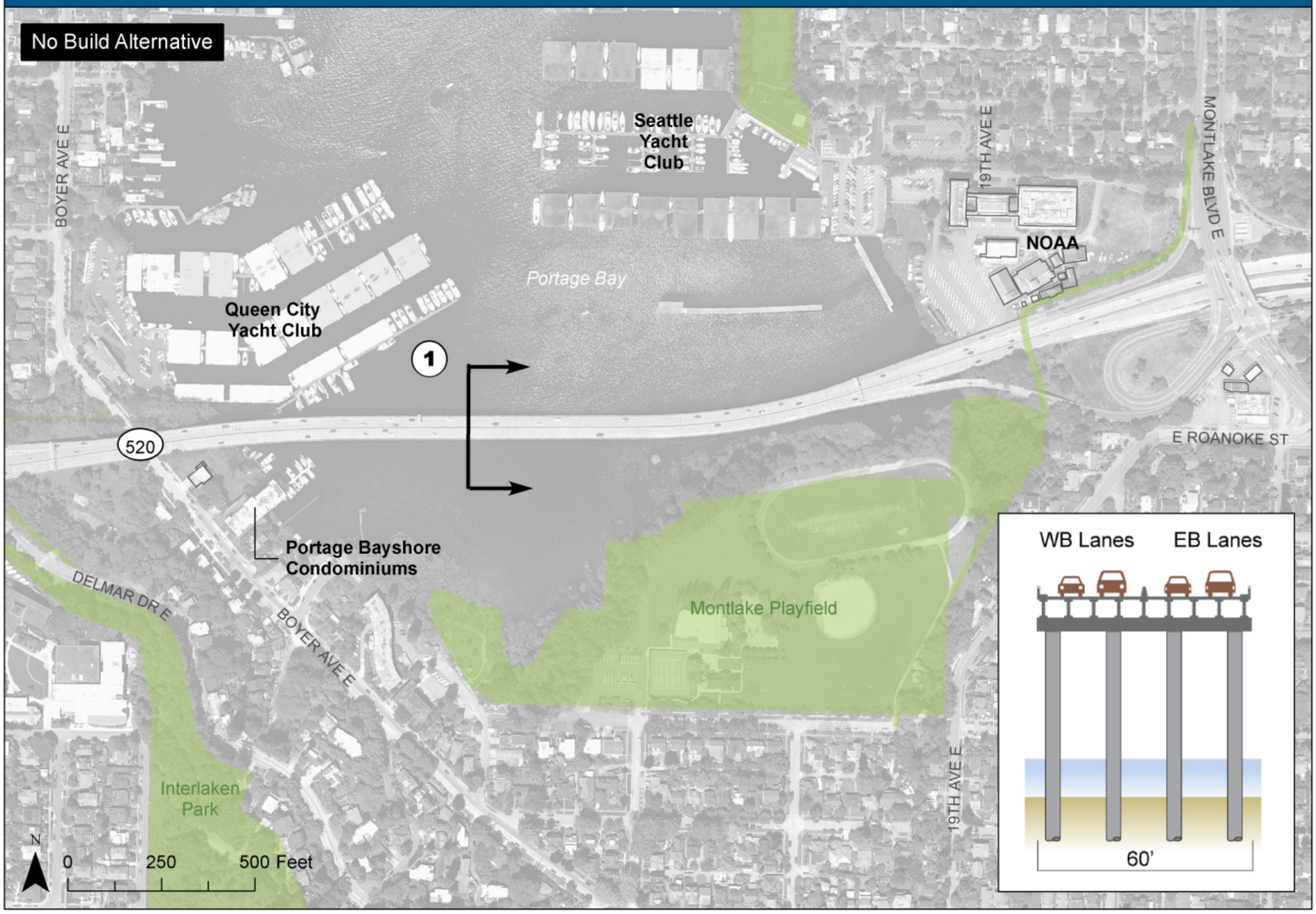


Exhibit 2-8. Portage Bay Bridge Width Comparison, SDEIS Option A and Preferred Alternative Bridge Designs

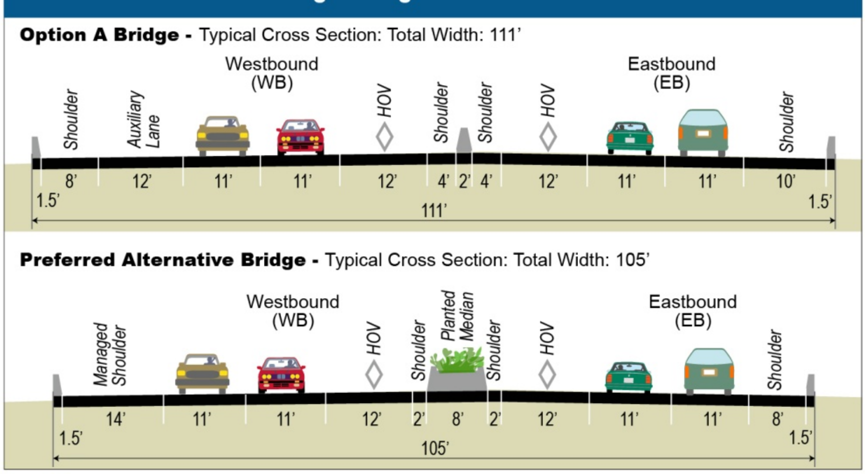
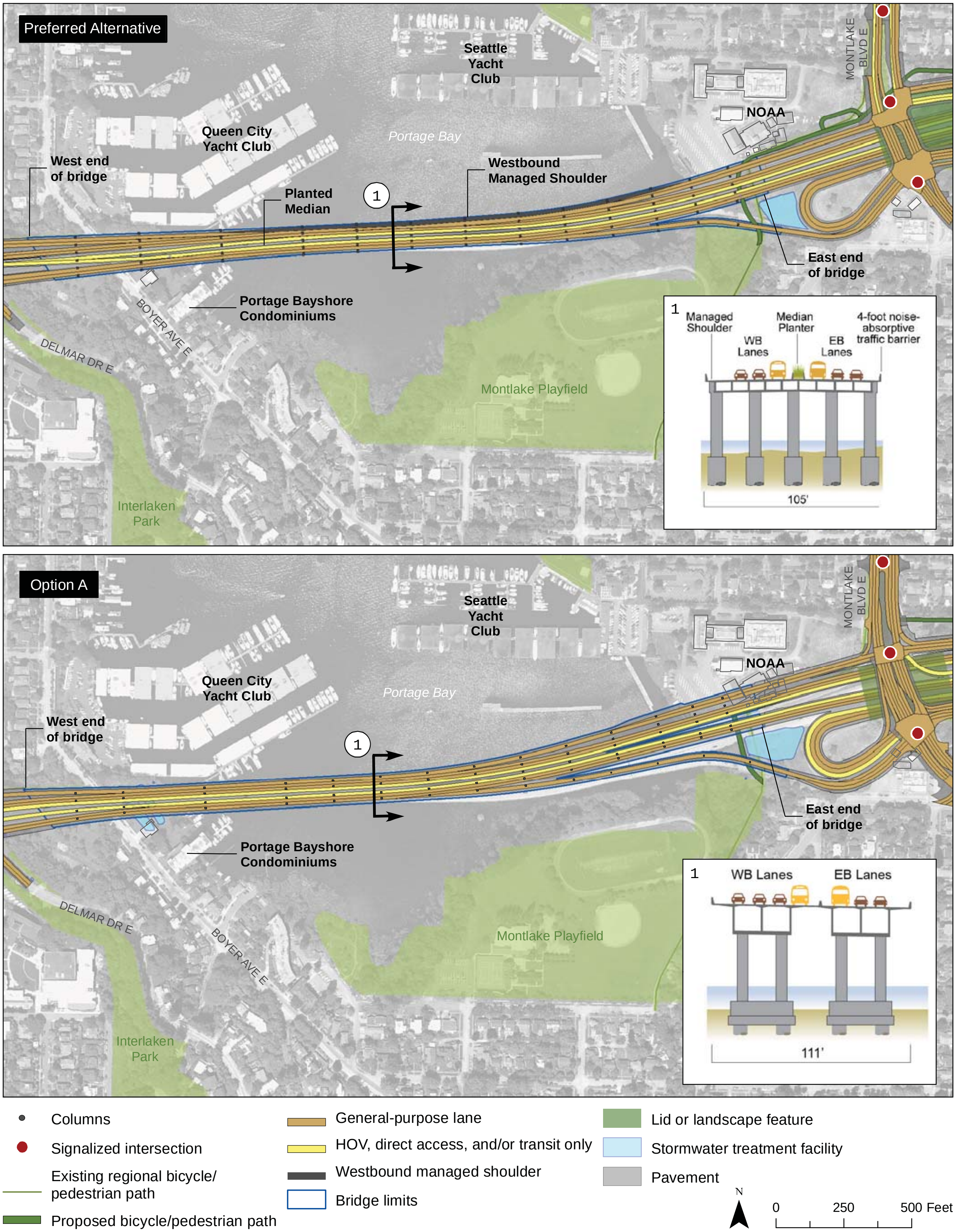
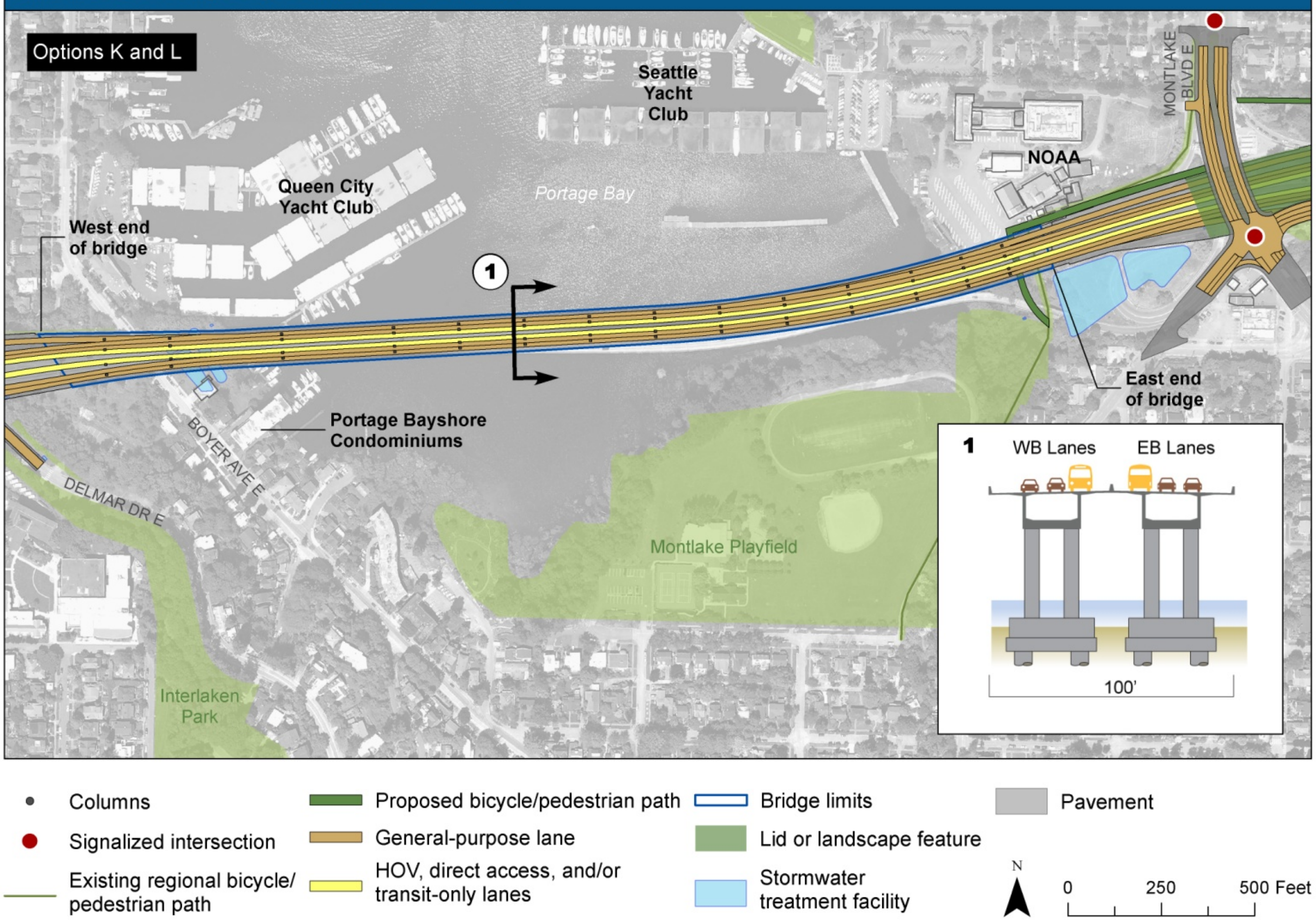


Exhibit 2-9. Portage Bay Area (Preferred Alternative and Option A)



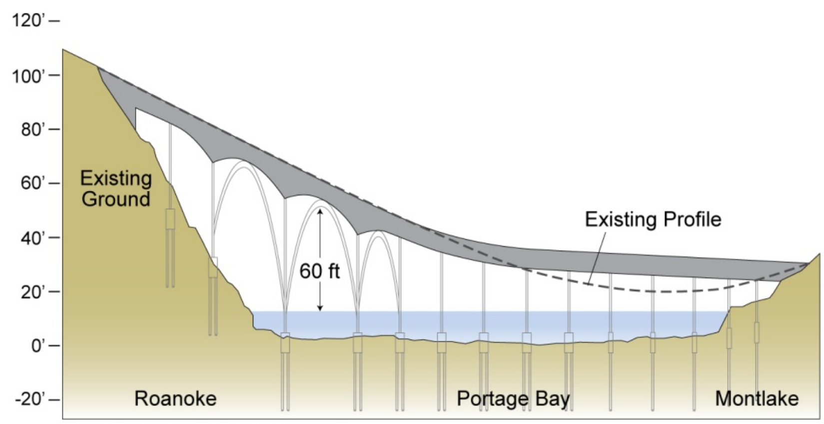
As shown in Exhibit 2-8, the Portage Bay Bridge under Option A included two general-purpose lanes and an HOV lane in each direction, plus a westbound auxiliary lane, making it about 10 feet wider than Options K and L at the midpoint (which did not have the auxiliary lane; Exhibit 2-10). Because there were no on- and off-ramps to Montlake Boulevard with Options K and L, the Portage Bay Bridge was narrower at its eastern end than under the Preferred Alternative or Option A. The design for the Preferred Alternative further reduces the width of the bridge by providing 2-foot-wide inside shoulders and an 8-foot-wide outside shoulder for the eastbound lanes. Table 2-6 compares the existing bridge characteristics with the new bridge proposed under the Preferred Alternative and the SDEIS design options.

Exhibit 2-10. Portage Bay Area (Options K and L)



The height of the western half of the new bridge would match the existing bridge, but the eastern half would be higher. As shown in Exhibit 2-11, the new bridge would be about 15 feet higher than the existing bridge's lowest point near the middle of Portage Bay. The new bridge would be supported by larger but fewer concrete columns than today's bridge (Table 2-6).

Exhibit 2-11. **Portage Bay Profile**



Note: Vertical scale is exaggerated.

Table 2-6. Comparison of Portage Bay Bridge - Preferred Alternative and Options A, K, and L

	Existing Structure	Preferred Alternative	Option A	Option K	Option L
Width (feet)	63 to 102	105 to 158	111 to 165	100 to 144	100 to 146
Span length (feet)	100	116 to 300	100 to 300	100 to 300	100 to 300
Total number of columns	131	71	72	62	62
Column size (diameter in feet)	4.5	7 to 10	5 to 9	5 to 9	5 to 9
Number of columns in water	89	53	50	40	40

Note: Totals include the additional columns and width from the Montlake eastbound off ramp. Width is shown as a range because ramp and/or shoulder widths on the bridge vary from west to east. Span lengths for the new bridge would also vary, with the shorter spans generally on the east side.

For purposes of the environmental analysis, the Preferred Alternative bridge design is assumed to be constructed as a cast-in-place box girder type with faux arches (i.e., concrete elements made to look like arches, although the bridge would be supported by the girders rather than by the arches). The aesthetic treatment of the bridge under Options A, K, and L was identified as part of the mediation process. For Option A, the mediation group recommended that the bridge type and aesthetic treatment be determined through a design competition. Under Option K, the bridge would have faux arches like those proposed for the Preferred Alternative. For Option L, the bridge type and treatment would be determined later; however, in the SDEIS it was analyzed with faux arches. Final bridge design is yet to be determined and will be selected in cooperation with the Seattle Design Commission and public input.

Montlake Area

As discussed previously, many of the key differences between the Preferred Alternative and the SDEIS design options occur within the Montlake area. This section describes the design of the Preferred Alternative and each of the SDEIS design options in this area. The existing interchange layout is shown on Exhibit 2-12.

Exhibit 2-12. **No Build Alternative - Montlake Area**

Preferred Alternative

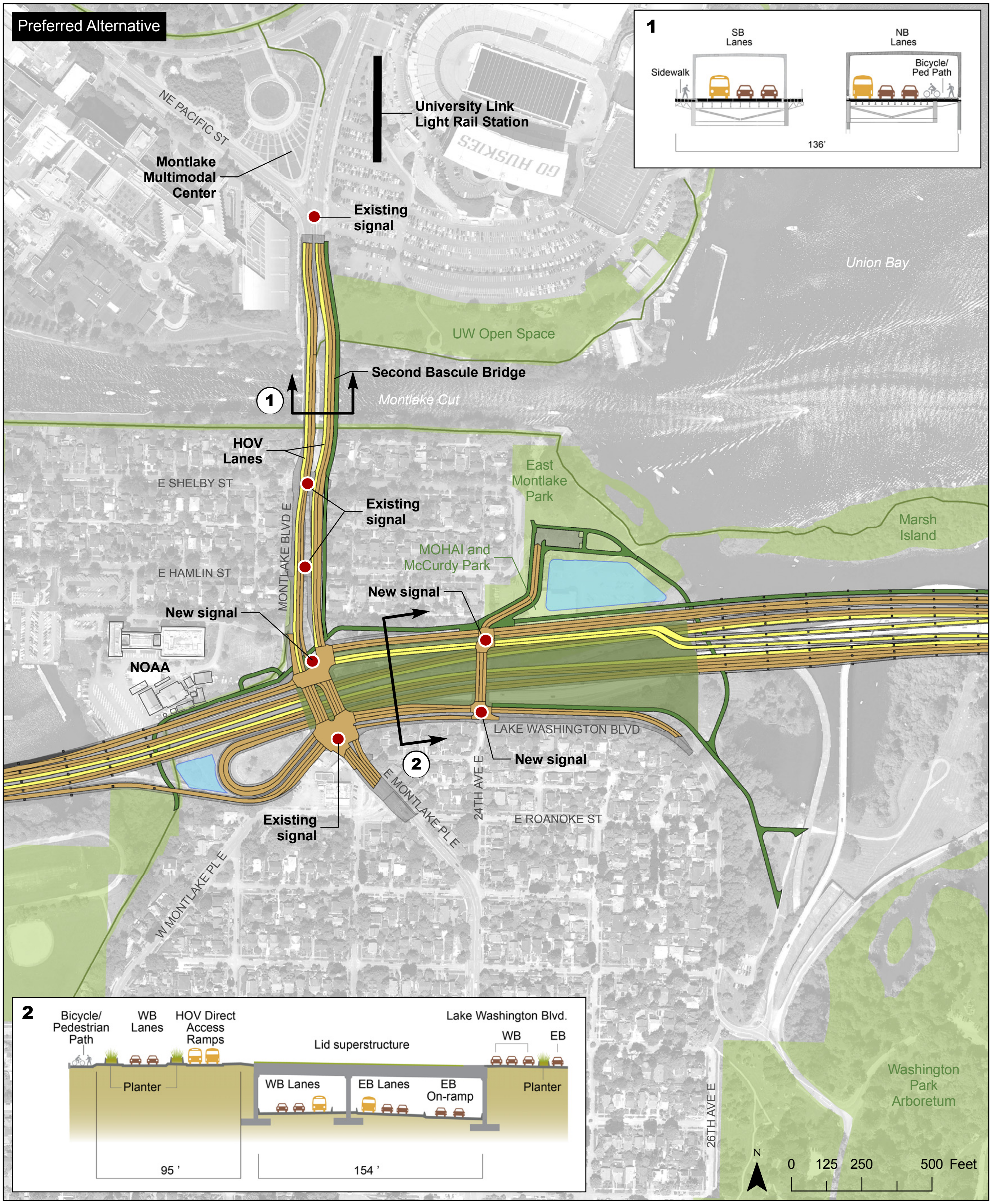
Under the Preferred Alternative, the SR 520 interchange with Montlake Boulevard would be similar to today's interchange, connecting to the University District via Montlake Boulevard and the Montlake bascule bridge (Exhibit 2-13).

The interchange design would include adding new signals at Montlake Boulevard and 24th Avenue East on the westbound ramps, and adding general purpose lanes to the on- and off-ramps. The Montlake Freeway Transit Station on SR 520 would be removed; most transfers that currently take place at the freeway station would occur at the new multimodal transit station at Montlake Boulevard and NE Pacific Street (Exhibit 2-13).

Montlake Freeway Transit Station

Under the Preferred Alternative and all options the Montlake Freeway Transit Station would be removed. Without the Montlake Freeway Transit Station, bus transfers and access in the area would occur at other locations. The effects from these changes are described in Chapter 5, Section 5.1, Transportation.

Exhibit 2-13. **Montlake Area (Preferred Alternative)**



- Columns
- Signalized intersection
- Existing regional bicycle/pedestrian path
- General-purpose lane
- HOV, direct access, and/or transit-only lanes
- Proposed bicycle/pedestrian path
- Lid or landscape feature
- Stormwater treatment facility
- Pavement

New HOV/transit direct access ramps would be provided between SR 520 and Montlake Boulevard, with a signalized intersection at 24th Avenue East. The new lid would be landscaped in a manner consistent with the surrounding historic district and configured for transit and bicycle/pedestrian connectivity.

Montlake Interchange Configuration

Westbound SR 520 traffic exiting to Montlake Boulevard would travel across the northern edge of the large new lid. Access to Lake Washington Boulevard would be provided via a new intersection located on the lid at 24th Avenue East. A transit/HOV direct-access ramp would be provided across the lid from Montlake Boulevard to eastbound SR 520. The proposed lane configuration (shown on Exhibit 2-14) would be as follows:

- The eastbound on-ramp would be a loop ramp with two general-purpose lanes (one more general-purpose lane than today).
- The new eastbound transit/HOV direct-access on-ramp would be one lane from Montlake Boulevard to SR 520, with a signalized crossing at 24th Avenue East.
- The eastbound off-ramp would be one lane that would widen from the mainline to become three lanes at Montlake Boulevard (one more lane than today).
- The westbound off-ramp would be a single lane taper at the mainline, widening to three lanes at 24th Avenue East. At this intersection, one lane would provide left-turn-only access to Lake Washington Boulevard, and the other two lanes would continue on to Montlake Boulevard for right-turn-only movement onto the boulevard.
- The westbound on-ramp would be two lanes (one more lane than today), with one lane merging to the managed shoulder when operating. The on-ramp lanes would merge into one general-purpose lane when the managed shoulder is closed. This ramp would be signalized.
- A new westbound transit/HOV direct-access off-ramp would connect to 24th Avenue East, providing access to Lake Washington Boulevard and to northbound Montlake Boulevard at the SR 520 westbound off-ramp terminus.

Montlake Boulevard and Lid

The alignment of Montlake Boulevard over SR 520 would be similar to today's alignment; however, the bridge over SR 520 would be longer and wider than the existing bridge. A longer and wider bridge would be required to accommodate the additional lanes on SR 520 below Montlake Boulevard and to provide wider through lanes, shoulders, a center median, and additional turning lanes on Montlake Boulevard over SR 520. This bridge would be integrated into the new Montlake lid over SR 520. The 1,400-foot-long lid would extend from west of Montlake Boulevard to east

Interchange Design

The intersections and ramps in the SR 520/Montlake Boulevard interchange area would be configured to accommodate the expected traffic volumes and to provide acceptable levels of mobility. Transportation modeling and analysis were used to determine the number and type of on- and off-ramps that would be needed and to evaluate how each of the interchange configurations would operate.

The number of lanes at the on- and off-ramps is based on the need to minimize traffic delay and congestion at the signals. On-ramps will be controlled by ramp meters, and thus additional storage would be needed on the ramps to allow for improved traffic flow and reduce the likelihood of local arterial congestion related to ramp meter backups. Off-ramps widen out to include additional lanes at the signal-controlled termini to expedite the flow of traffic onto the arterial system. This is necessary to prevent off-ramp congestion from adversely affecting freeway traffic flow.

Exhibit 2-14. **Montlake Interchange (Preferred Alternative)**

of 24th Avenue NE and terminate near the Union Bay shoreline. The length of this structure would require the use of ventilation fans and specialized fire and safety equipment under the lid. The lid would function as a vehicle and pedestrian crossing, a landscaped area, and open space. Conceptual design and treatment for the lid were developed through the Engrossed Substitute Senate Bill 6392 workgroup process and through coordination with the City of Seattle and surrounding neighborhoods.

North of SR 520, Montlake Boulevard would provide three 12-foot-wide through lanes in the northbound direction (two general-purpose lanes and one HOV lane) between the rebuilt interchange and NE Pacific Street. In the southbound direction on Montlake Boulevard, there would be two 11-foot-wide general-purpose lanes, and a 12-foot-wide HOV lane. The southbound lane configuration across SR 520 would include two southbound general-purpose through lanes, a 12-foot-wide right-turn-only lane to eastbound SR 520, and an 11-foot-wide left-turn lane to Lake Washington Boulevard. The northbound lane configuration across SR 520 would include two 11-foot-wide left-turn lanes to westbound SR 520 and two 12-foot-wide general-purpose lanes.

Bascule Bridge

The Preferred Alternative would construct a new bascule bridge parallel to and just east of the existing Montlake Bridge. The two bridges would each operate with three lanes in each direction; the existing bridge would serve southbound traffic, and the new bridge would serve northbound traffic. In addition to the three travel lanes (two general-purpose and one HOV lane in each direction), each bridge would have a bicycle lane and sidewalks. Traffic signals and additional turn lanes would be provided at the cross-street intersections along Montlake Boulevard. The Montlake Boulevard/ NE Pacific Street intersection would operate as it does today. No improvements are planned for the Montlake Boulevard/NE Pacific Street intersection by the SR 520 project, although Sound Transit and the University of Washington are developing transit and pedestrian improvements in this area. Final bridge design is yet to be determined and will be selected in cooperation with DAHP, the Seattle Design Commission and Seattle Landmarks Commission, and with public input.

Option A

Under Option A, the SR 520 interchange with Montlake Boulevard was similar to today's interchange, connecting to the University District via Montlake Boulevard and the Montlake bascule bridge. The new interchange design included adding a new signal at the westbound ramps and adding lanes to the on- and off-ramps. The Montlake Freeway Transit Station on SR 520 would be removed, and a westbound SR 520 bus-only off-ramp would be provided to Montlake Boulevard as a fifth leg to the westbound ramp terminus.

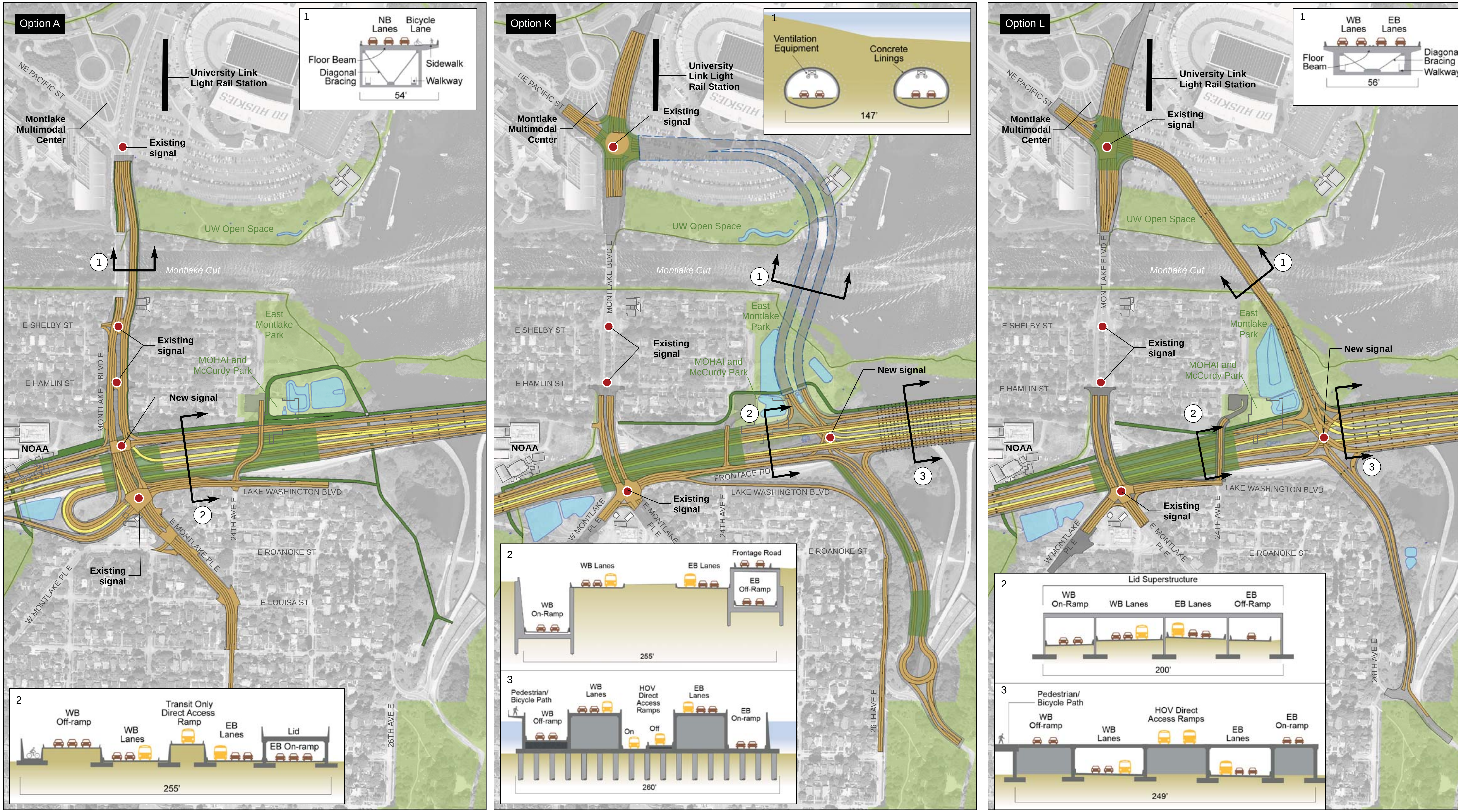
Montlake Interchange Configuration

The proposed lane configuration for Option A was similar to today's. It is shown on Exhibits 2-15 and 2-16 and summarized below:

- The eastbound on-ramp would be a loop ramp with two general-purpose lanes and one HOV bypass lane (one more lane than today).
- The eastbound off-ramp would be one lane that would widen from the main line to becomes three lanes at Montlake Boulevard (one more lane than today).
- The westbound off-ramp would be two lanes, widening to three lanes at Montlake Boulevard (two more lanes than today).
- The westbound on-ramp would be two lanes, merging into one lane west of Montlake Boulevard. This ramp would become the auxiliary lane on the Portage Bay Bridge.
- A new westbound bus-only direct access off-ramp would connect to northbound Montlake Boulevard at the SR 520 westbound off-ramp terminus.

East Montlake Place would have three southbound lanes between Lake Washington Boulevard and East Louisa Street (one more lane than today). This lane would taper off south of East Louisa Street.

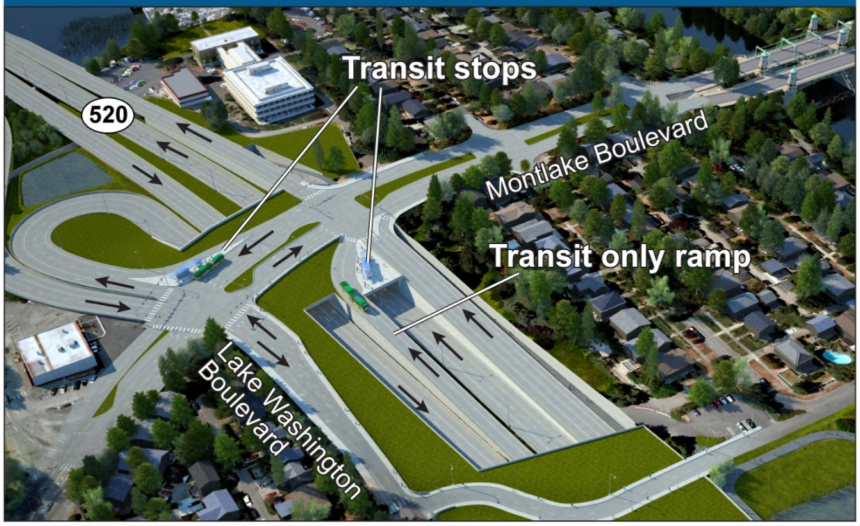
Exhibit 2-15. Montlake Area (Options A, K, and L)



- Columns
- Signalized intersection
- Existing regional bicycle/pedestrian path
- Proposed bicycle/pedestrian path
- General-purpose lane
- HOV, direct access and/or transit-only lane
- Tunnel
- Lid or landscape feature
- Stormwater treatment facilities
- Pavement

N 0 125 250 500 Feet

Exhibit 2-16. **Montlake Interchange (Option A)**



Montlake Boulevard and Lid

The alignment of Montlake Boulevard over SR 520 would be similar to today's alignment; however, the bridge over SR 520 would be longer and wider than the existing bridge, as described for the Preferred Alternative.

East Montlake Place East and Montlake Boulevard would provide two 12-foot-wide through lanes in each direction over SR 520. North of SR 520, Montlake Boulevard would provide three 12-foot-wide through lanes in each direction between the rebuilt interchange and Pacific Street. Option A would construct a new bascule bridge (drawbridge) parallel to and just east of the existing Montlake Bridge. Exhibit 2-15 shows the lane configuration. The two bridges would each operate with three lanes in each direction; the existing bridge would serve southbound traffic, and the new bridge would serve northbound traffic. In addition to the three travel lanes, each bridge would have a bike lane and sidewalks. Traffic signals and additional turn lanes would be provided at the cross street intersections. The Montlake Boulevard/NE Pacific Street intersection would remain as it is today.

A partial lid would extend from west of Montlake Boulevard to east of 24th Avenue NE (Exhibit 2-16). The lid would function as a vehicle and pedestrian crossing, a landscaped area, and open space. Final design and treatment for the lid would be determined through future design collaboration with the surrounding communities.

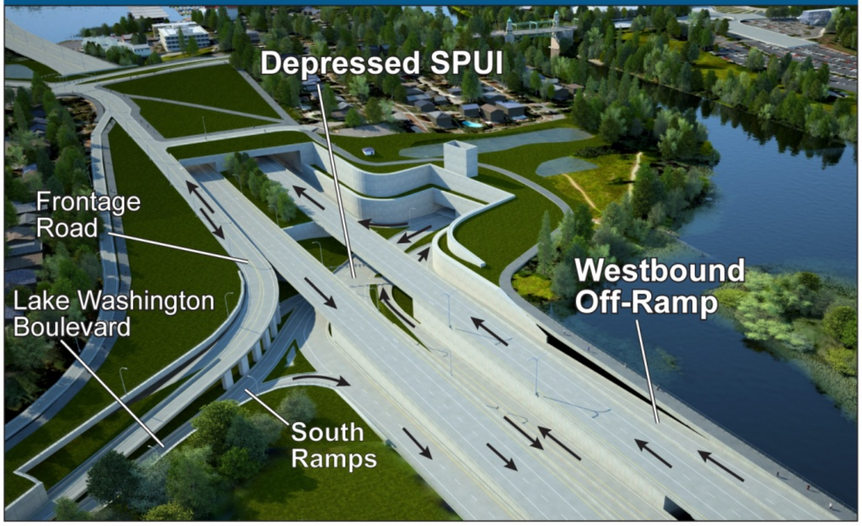
Option K

Under Option K, the existing SR 520 interchange with Montlake Boulevard and the existing Lake Washington Boulevard ramps would be removed and replaced with a SPUI near the current location of MOHAI (Exhibit 2-17).

Option K - South Ramp and Turnaround

This simulation illustrates what the south ramp and turnaround near Lake Washington Boulevard could look like under Option K.

Exhibit 2-17. **Montlake Interchange (Option K)**



SPUI Configuration

The SPUI would be constructed 30 to 50 feet below the existing SR 520 main line. Because the SPUI would be below grade, large retaining walls would be constructed around its perimeter, with heights ranging from 20 feet high south of SR 520 to more than 60 feet high north of SR 520.

The interchange design included ramps to the north and south, improvements to the Montlake Boulevard/NE Pacific Street intersection, and improvements to Lake Washington Boulevard. The SPUI interchange configuration was as follows:

- The westbound off-ramp would be a two-lane ramp. At the SPUI, the right lane would be a free right turn to the north, entering a tunnel that would cross beneath the Montlake Cut and surface near the intersection of Montlake Boulevard and Pacific Street. The left lane would be stop-controlled and then proceed south toward a new turnaround on Lake Washington Boulevard.
- The eastbound off-ramp would be a single-lane ramp that would split into two lanes at the SPUI. The right lane would be a free right turn to the south toward the turnaround on Lake Washington Boulevard, and the left lane would be controlled by the traffic signal and then proceed northbound into the tunnel under the Montlake Cut.
- The westbound on-ramp would be a two-lane ramp, with one lane of traffic coming from the north and the other from the south.
- The eastbound on-ramp would be a two-lane ramp, with one lane of traffic coming from the north and the other from the south.
- Two HOV direct-access ramps would be provided in the median of SR 520 to the SPUI. One ramp would provide HOV direct access from westbound SR 520 to travel north beneath the Montlake Cut through

the tunnel. The other ramp would provide HOV direct access from the tunnel to eastbound SR 520.

- North-south local through movements at the SPUI would be prohibited. Re-access to the freeway after exiting would also be prohibited.

Ramps north of the SPUI would tunnel under the Montlake Cut. The tunnels would surface north of the cut where the University of Washington Husky Stadium parking lot is today, and would connect to a reconstructed Pacific Street/Montlake Boulevard intersection. The west tunnel would carry two southbound lanes and the east tunnel would carry two northbound lanes. Each tunnel would have two 12-foot-wide lanes, an 8-foot shoulder, and a 4-foot shoulder. The tunnels would be approximately 2,000 feet long. To accommodate the new tunnel approach, the three existing legs at the Montlake Boulevard/NE Pacific Street intersection would need to be lowered and reconfigured. A full or partial lid would be constructed at the Pacific Street/Montlake Boulevard intersection to maintain pedestrian and bicyclist connectivity. As shown in Exhibit 2-15, the new intersection design would include adding a new seven-lane approach.

Because the SPUI would be below the lake water level, a pump station located in the median near the tunnel entrance would be required to actively pump stormwater out of the depressed SPUI interchange.

Stormwater media filter vaults and a pump station would be constructed on Foster Island at the eastern and western ends of the proposed Foster Island land bridge. These facilities would treat stormwater from the new west approach bridges to the west entrance of the land bridge. Due to design challenges in this vicinity, the proposed facility would comply with basic water quality requirements only.

On the south side of SR 520, the new four-lane southern ramp would connect SR 520 to the Arboretum area. Parts of the ramp would be constructed below ground and would be covered by a partial lid (Exhibit 2-15). The ramp would merge with a new north-south frontage road at a turnaround near the existing Lake Washington Boulevard ramp termini. The new frontage road is intended to connect Montlake Boulevard with the Arboretum area and would be constructed just north of the existing Lake Washington Boulevard on the new lid over SR 520. From the intersection with Montlake Boulevard eastward, the new road would parallel SR 520, and then fly over the southern ramps before returning to grade and merging with the ramps into a divided four-lane street. South of the merge, the frontage road and ramps would form the turnaround that would manage the in-flow of traffic from the southern ramp, the frontage road, and the Arboretum area.

With the new frontage road in place, Lake Washington Boulevard would become a one-lane eastbound roadway between Montlake Boulevard and Roanoke Street (Exhibit 2-15). It would travel across a landscape feature that would cover part of the SPUI's southern ramp. At East Roanoke, it would become a two-lane roadway that would tie into 26th Avenue NE and serve both eastbound and westbound traffic. It would provide access to local streets only, would have no connection to the interchange, and would not provide local access to Lake Washington Boulevard east of the turnaround or the Arboretum.

Montlake Boulevard and Lid

The existing Montlake interchange on- and off-ramps would be removed and would not be replaced. Montlake Boulevard would continue to serve local traffic needs between Montlake and the University District, and the new SPUI would provide freeway-only access from the north and south—there would be no local traffic movements through the new interchange. As shown in the cross-section on Exhibit 2-15, the SPUI on- and off-ramps would be constructed below grade so that the SR 520 main line traffic could flow uninterrupted over the interchange.

A lid would be provided over SR 520 in the Montlake area and would extend from west of Montlake Boulevard to east of 24th Avenue East. The lid structure would meet Lake Washington Boulevard East to provide pedestrian connections between the communities north and south of SR 520. The final length and shape of the lid and treatment of the underside and top surfaces would be determined through future design collaboration with these communities.

Option L

Under Option L, the existing SR 520 interchange with Montlake Boulevard and the existing Lake Washington Boulevard ramps though the Arboretum would be removed and replaced with a SPUI near the existing location of MOHAI.

SPUI Configuration

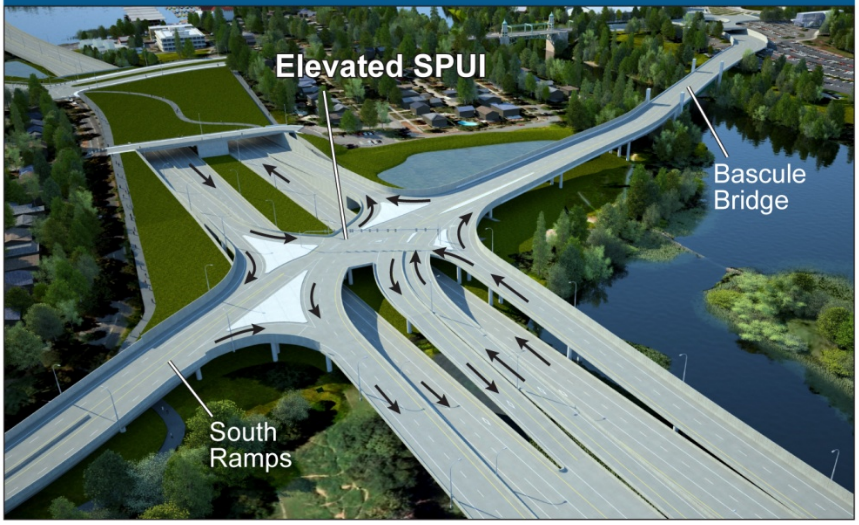
The SPUI interchange configuration (Exhibit 2-18) would operate similarly to the Option K interchange. Unlike Option K, however, Option L would locate the SPUI on structures 20 to 25 feet above the SR 520 main line; the new interchange would carry traffic on the structures, while the mainline lanes would pass below.

Ramps located north of the SPUI would pass over the Montlake Cut on a new diagonal bascule bridge and connect to a reconstructed Pacific/Montlake intersection near the University of Washington.

Option L - South Ramp

This simulation illustrates what the south ramp and ramp terminus near Lake Washington Boulevard could look like under Option L.

Exhibit 2-18. **Montlake Interchange (Option L)**



As shown on Exhibit 2-15, the new four-lane bascule bridge to the north would connect the SPUI with the Montlake Boulevard/Northeast Pacific Street intersection. The bridge would be similar in height to the existing Montlake drawbridge to maintain clearance for boat passage. It would have two lanes in each direction (four total), a center median, and outside shoulders. The north and south approaches to the bridge would be elevated and would be supported by columns in East Montlake Park and in the UW Open Space area. There would be no columns in the water.

To accommodate pedestrian movements and provide adequate sight lines, the three existing legs of the Montlake Boulevard/Northeast Pacific Street intersection would be lowered and reconfigured in the same manner and with the same lid improvements as described for Option K (see description above).

Ramps located south of the SPUI would travel through the Arboretum and connect to Lake Washington Boulevard near the existing ramps. Lake Washington Boulevard traffic traveling southeast would be restricted from accessing the southern ramp. This traffic would need to travel north on Montlake Boulevard to the Pacific Street intersection to access the freeway (Exhibit 2-15). The ramps would consist of a northbound lane and a southbound lane. Only northbound traffic on Lake Washington Boulevard would be able to access the on-ramp.

Montlake Boulevard and Lid

The existing Montlake interchange on- and off-ramps would be removed and would not be replaced. Montlake Boulevard would continue to serve local traffic needs between Montlake and the University District, and the new SPUI would provide freeway-only access from the north and south—there would be no local traffic movements through the new interchange. As shown in the cross-section on Exhibit 2-15, the SPUI on- and off-ramps would be constructed above grade so that the SR 520 main line traffic could flow uninterrupted over the interchange.

A lid in the Montlake vicinity, similar to that described for Option K, would extend from west of Montlake Boulevard to east of 24th Avenue NE. The lid would meet Lake Washington Boulevard East to provide pedestrian connections between the communities north and south of SR 520. The final length and shape of the lid and treatment of the underside and top surfaces would be determined through future design collaboration with these communities.

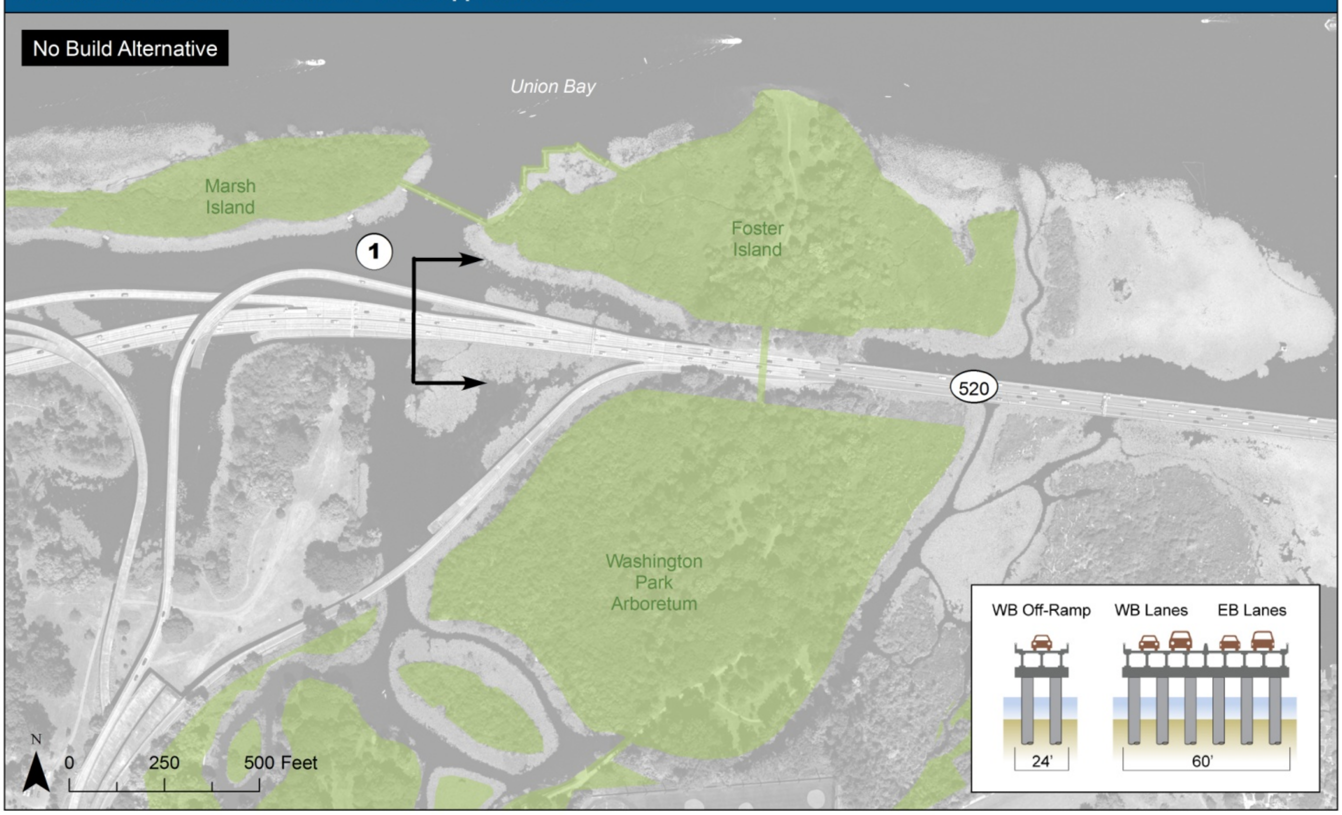
West Approach Area

Under the Preferred Alternative and all design options, the SR 520 west approach structures would be replaced with wider structures. The existing layout of the west approach is shown on Exhibit 2-19. The Preferred Alternative would have narrower structures than SDEIS Options K and L due to the location of the SPUI on- and off-ramps in this area. The Preferred Alternative also differs in profile from the SDEIS options, with a constant eastward slope similar to, but slightly greater than, the slope proposed for SDEIS Option L. Option K would have the lowest profile of the SDEIS options, with a lower profile than the existing highway at Foster Island, where the freeway would pass under a land bridge.

Design Refinements in the West Approach Structure

WSDOT continues to advance and refine the design of the SR 520, I-5 to Medina project with the goal of minimizing impacts. Since the analysis for the EIS was completed, the westbound SR 520 off-ramp to Montlake Boulevard has been reduced from two lanes to one lane, further narrowing the new bridge across Foster Island. This refinement will reduce the bridge width by an additional 10 to 14 feet, although that reduction is not reflected in the impact calculations for this EIS.

Exhibit 2-19. **No Build Alternative - West Approach Area**



The new west approach structures would be supported by concrete columns that would vary in size and number. Table 2-7 provides comparisons between the existing structure characteristics, the Preferred Alternative, and the SDEIS design options.

Under the Preferred Alternative and all the SDEIS options, the existing Lake Washington Boulevard eastbound on-ramp and westbound off-ramp and the unused R.H. Thomson Expressway ramps would be removed.

Table 2-7. West Approach Structures

	Existing Structure	Preferred Alternative	Option A	Option K	Option L
Bridge structure between Montlake and across Foster Island					
Width (feet)	60 to 150	160 to 262	147 to 205	192 to 250	199 to 270
Typical span length (feet)	100	130 to 150	112 to 140	20 to 65	63 to 140
Estimated total number of columns	237	125	98	782	155
Typical column size (diameter in feet)	4.5	6	6	2.5	6
Estimated number of columns in water	176	103	71	733[a]	117
Bridge structure from east shore of Foster Island out to floating bridge					
Width (feet)	60	126 to 162	115	115 to 162	115 to 167
Typical span length (feet)	100	150	140	30 to140	140 to 350
Estimated total number of columns	228	129	110	211	72
Typical column size (diameter in feet)	4.5 to 9	7.5	6	2 to 7	7 to 9
Estimated number of columns in water	228	129	110	211	72

[a] Total number of columns does not include fill for the portion of the interchange east of Montlake area.
Width includes mainline, ramps, and areas between structures.

Preferred Alternative

Preferred Alternative – Arboretum Area

Under the Preferred Alternative, the SR 520 west approach structures would be replaced with higher and wider structures than today's (see Exhibits 2-20 and 2-21). The westbound structure would include the 14-foot-wide bicycle/pedestrian path, a two-lane off-ramp, a direct-access HOV/transit off-ramp, and three mainline lanes; the eastbound structure would include two eastbound on-ramps and three mainline lanes. The new structures would touch down at the shoreline near McCurdy Park. As noted above, the new bridge's profile would have a constant slope from east to west, which would allow gravity drainage of stormwater runoff and avoid the need for treatment or pumping facilities on Foster Island (Exhibit 2-20).

The new structures would be supported by concrete columns that would vary in size. Table 2-7 provides a comparison between the existing structure characteristics and those of the Preferred Alternative and the SDEIS options. The bridge structure in Union Bay and across Foster Island would be supported by 6-foot by 6-foot square columns. The piers would be spaced approximately 130 to 150 feet apart. The bridge structures east of Foster Island would be supported by 6-foot by 6-foot square and 7.5-foot by 7.5-foot square columns and would have 150-foot span lengths.

The westbound and eastbound bridges would have a gap between the structures to be compatible with potential future light rail infrastructure, should Sound Transit determine that a light rail crossing of SR 520 is desirable at some point in the future. (No light rail crossing is currently planned or proposed as part of the SR 520, I-5 to Medina project.) The gap would narrow across Foster Island to reduce impacts on the Arboretum and the Foster Island traditional cultural property, but the design would allow a potential future rail line to rise over SR 520 to connect with the University Link station at Husky Stadium.

The profile of the west approach would be raised from its existing height and would provide a constant grade, increasing from 12 feet above the water surface at the Montlake shoreline up to 48 feet at the west transition span of the floating bridge (Exhibit 2-21). The bottom of the bridge would be about 12 to 24 feet above the water through the Arboretum. The bridge would remain elevated over Foster Island rather than touching land as the SR 520 roadway does today. Clearance under the west approach would be approximately 17 feet at the point where it crosses the Arboretum Waterfront Trail.

Traditional Cultural Property

A traditional cultural property is a site "that is eligible for inclusion in the National Register [of Historic Places] because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community." These properties could include, but are not limited to, ceremonial sites, traditional homes of a particular cultural group, or locations of historic economic, artistic, or other cultural practices. Source: Parker and King (1998).

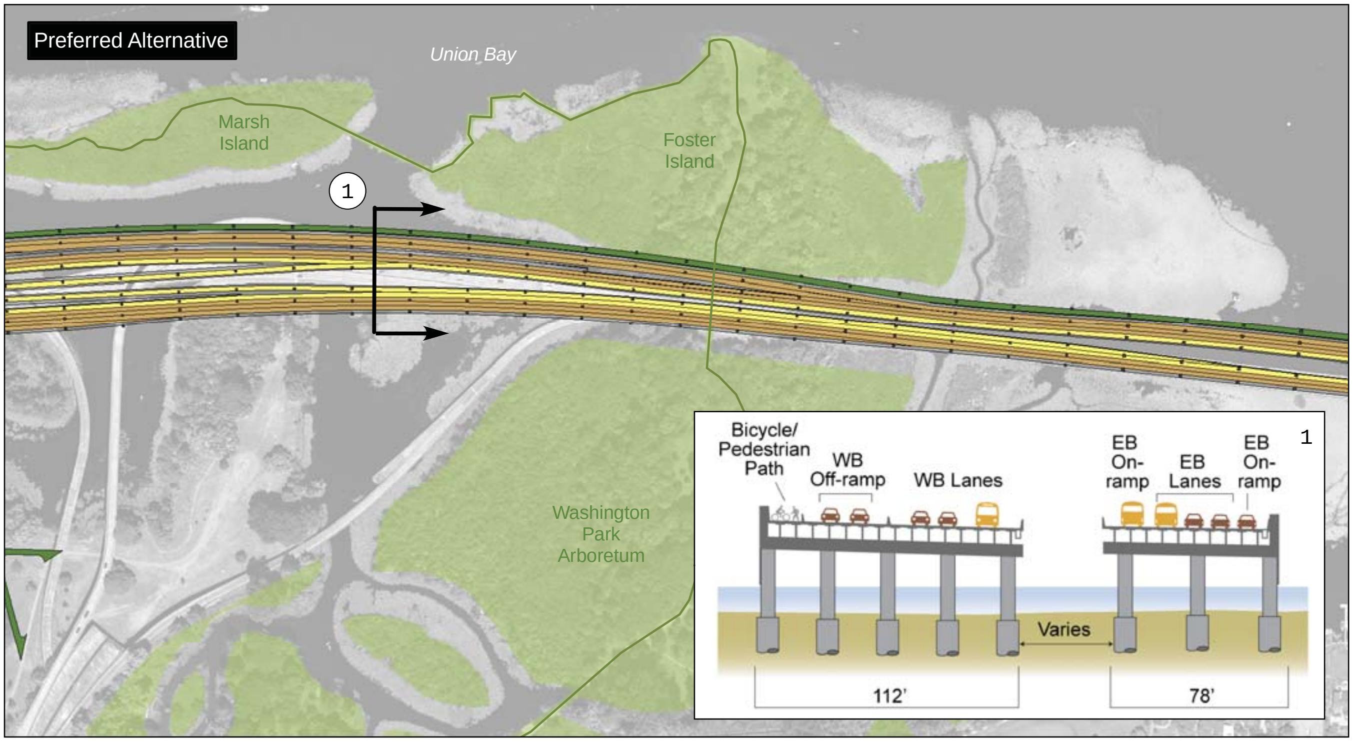
Option A

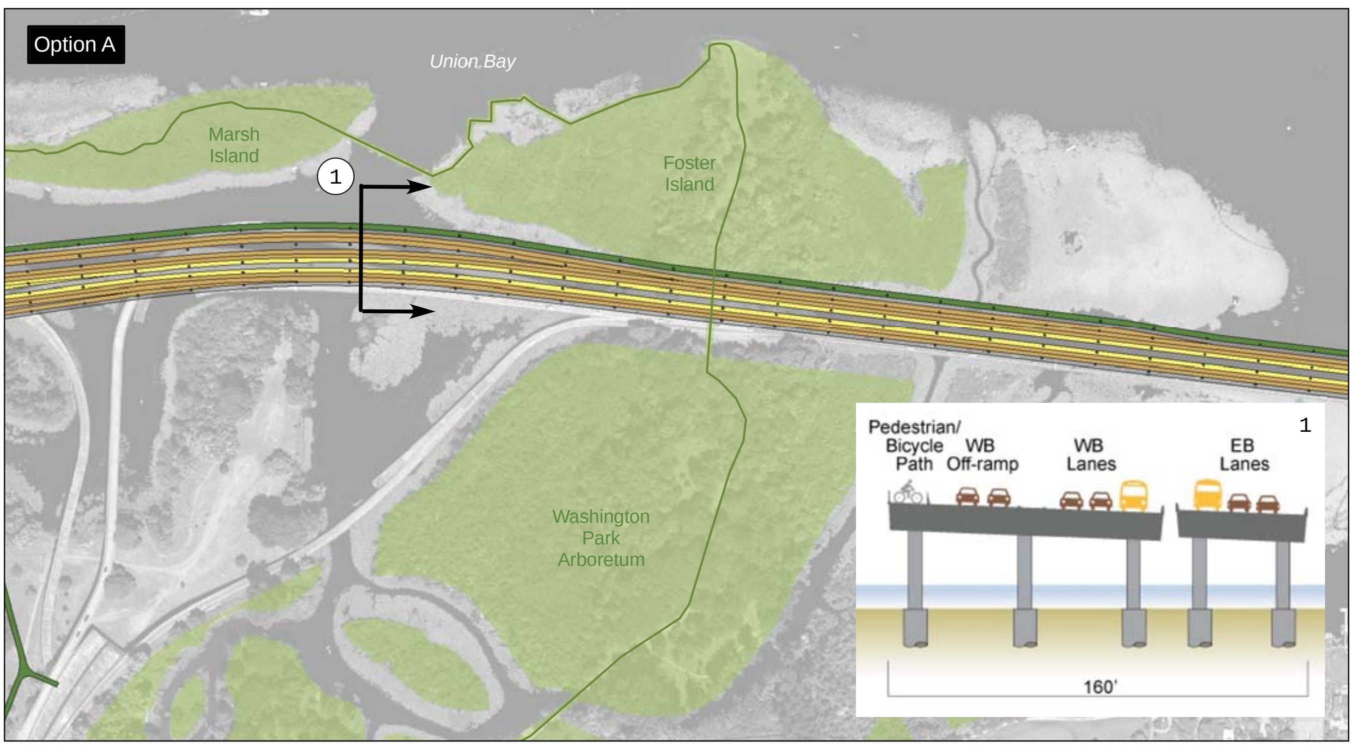
Under Option A, the bridge structure through Union Bay would also be wider than today's (Table 2-7 and Exhibit 2-20). The westbound structure would include the 14-foot-wide bicycle/pedestrian path, a two-lane off-ramp, and three mainline lanes; the eastbound structure would include three mainline lanes. The new structures would touch down at the shoreline near McCurdy Park. The new bridge would have a somewhat higher profile than today's structures through the Arboretum (Exhibit 2-21).

Option A – Arboretum Area

The bridge structure would be supported by 6-foot-diameter columns. The piers would be spaced approximately 112 to 140 feet apart. The bottom of the bridge would be about 25 feet above the water through the Arboretum. The bridge would remain elevated over Foster Island rather than touching land as the SR 520 roadway does today. It would be approximately 15 to 18 feet higher than the existing roadway at the point where it crosses the Arboretum Waterfront Trail. To the east, the bridge would be closer to the water and then rise again to meet the elevation of the new west transition span (the connection between the fixed and floating bridges) (Exhibit 2-21).

Exhibit 2-20. West Approach Area (Preferred Alternative and Option A)



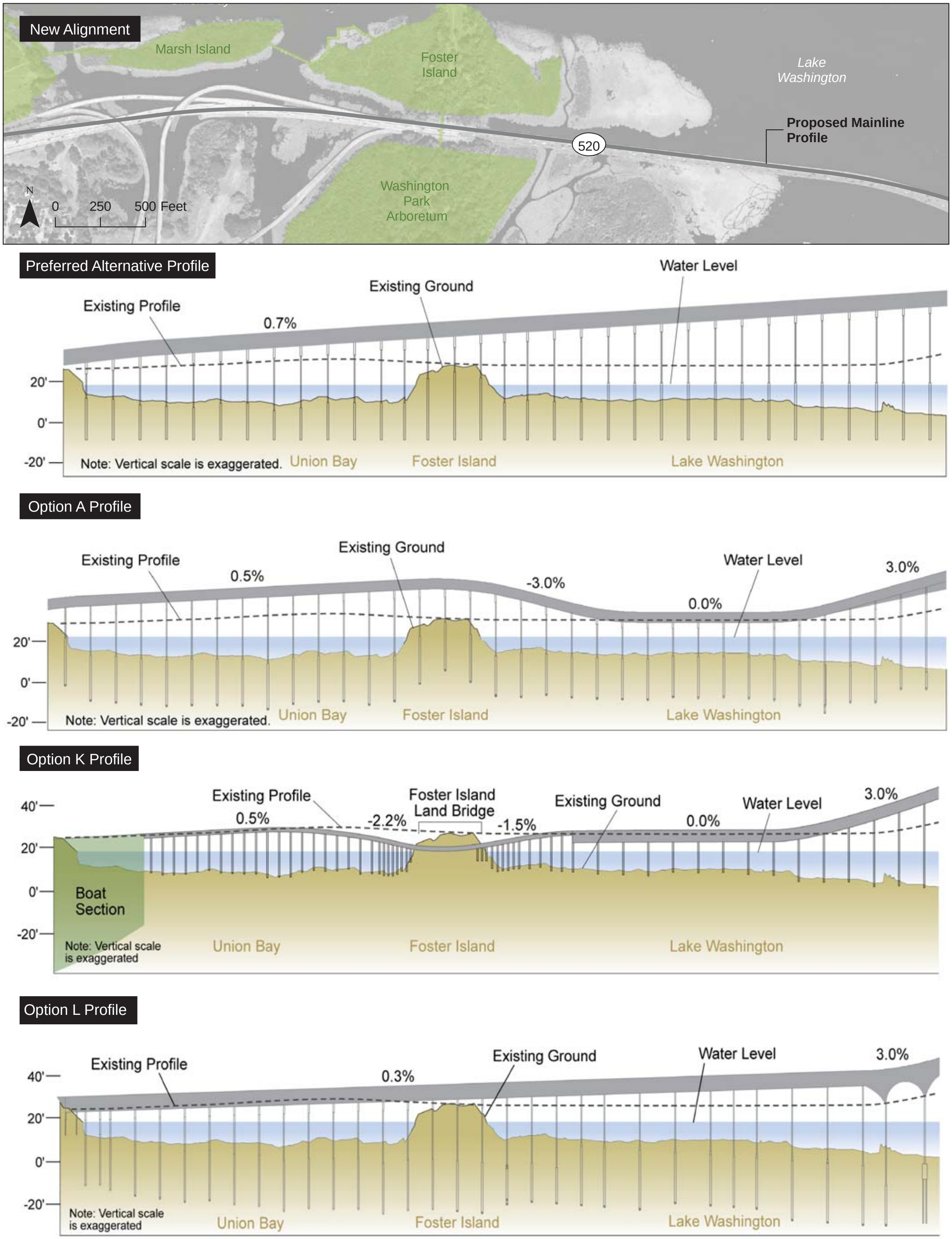


- Columns
- Existing regional bicycle/pedestrian path
- General-purpose lane
- HOV, direct access, and/or transit-only lanes
- Proposed bicycle/pedestrian path
- Lid or landscape feature
- Stormwater treatment facility
- Pavement

N

0 125 250 500 Feet

Exhibit 2-21. West Approach Profiles (Preferred Alternative and Options A, K, and L)



Option K

Under Option K, the new bridge structure across Union Bay would begin approximately 900 feet east of the SPUI, maintaining a low profile and dipping slightly below ground across Foster Island (Exhibit 2-21 and Table 2-7). The structure width would range from 192 to 250 feet. There would be six westbound lanes (two off-ramp lanes, two general-purpose lanes, an HOV lane, and an HOV/transit direct-access ramp) and five eastbound lanes (two on-ramp lanes, two general-purpose lanes, and an HOV lane) (Exhibit 2-22).

Option K Arboretum Area

The bridge west of Foster Island would be supported by 2.5- to 5.5-foot-diameter columns. The piers would be spaced approximately 20 to 65 feet apart. The bottom of the bridge would be 5 feet above the water through the Arboretum.

The bridge east of Foster Island would be supported by 2- to 7-foot-diameter columns. The piers would be spaced approximately 30 to 40 feet apart.

Option K would include a 600-foot-long, 180-foot-wide “land bridge” on Foster Island, connecting the areas north and south of SR 520 for pedestrians and bicyclists. The profile of the SR 520 main line would be lowered by 3 to 4 feet, and the land bridge would span the travel lanes, supported by continuous concrete walls and spread footings. The structure would be partially covered with soil and vegetation, but portions of it would remain visible (see illustration at right). Access from the south side of Foster Island would be along a path on the surface of a new earthen mound that would extend the existing landform to the top of the land bridge. Fill would be placed in the north part of Foster Island to provide a gradual slope from the top of the land bridge to the existing landform.

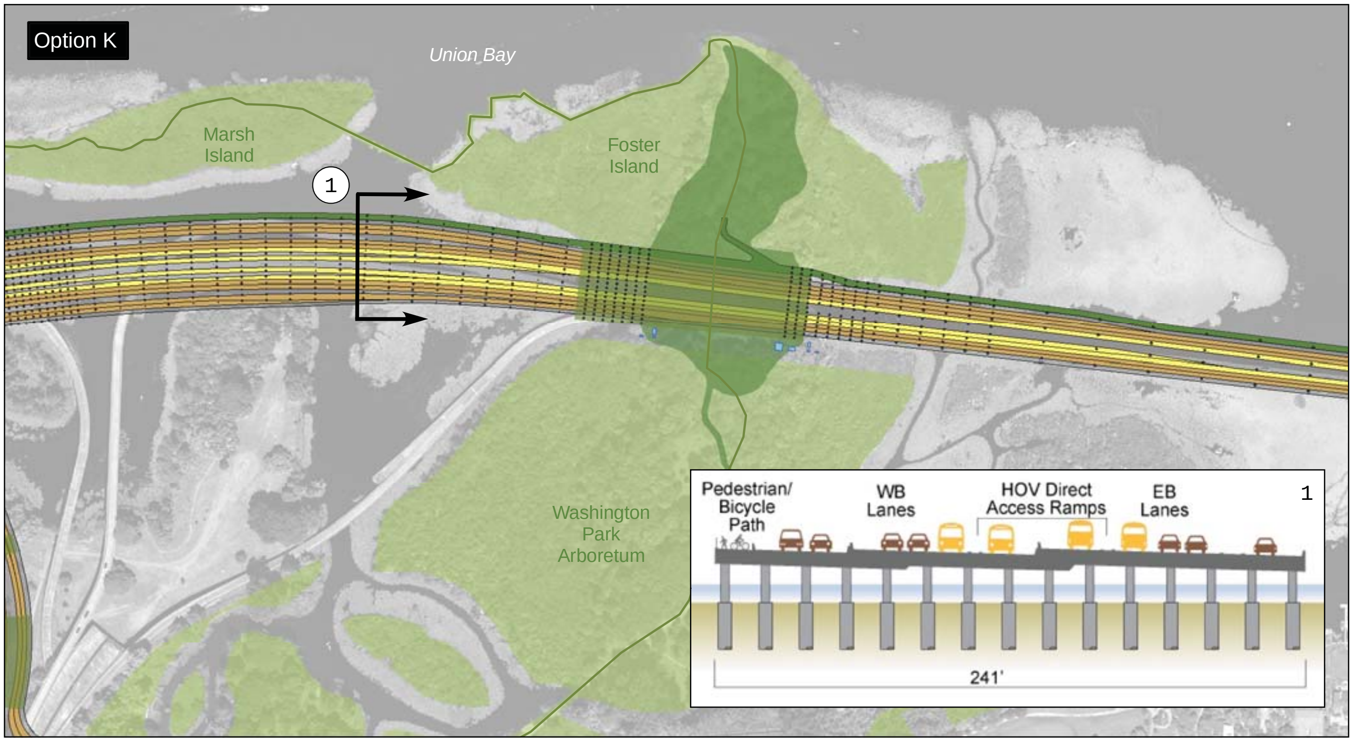
East of Foster Island, the west approach structure would maintain a low profile past Madison Park, and then rise to meet the elevation of the new transition span to the floating bridge.

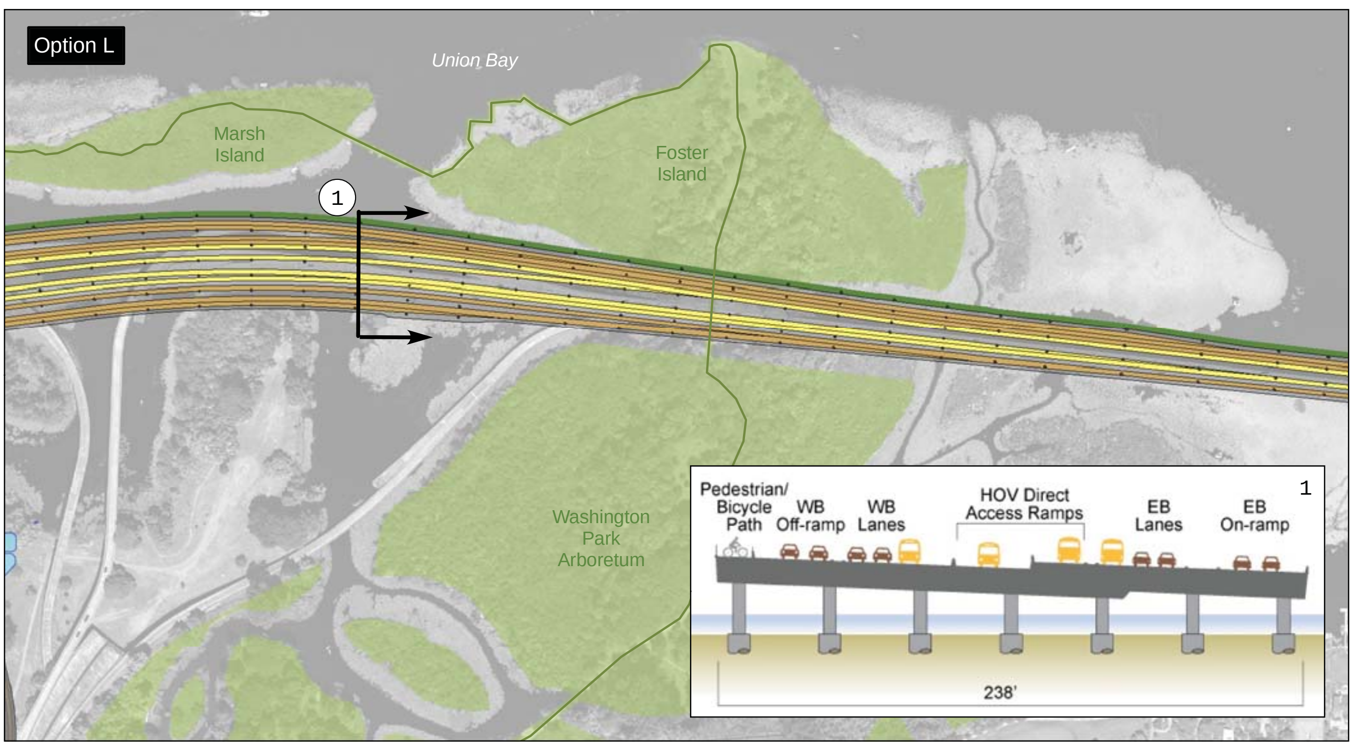
Option L

Under Option L, elevated ramps and roadways would connect the SPUI to the west approach structures. The structure width would be approximately 199 to 270 feet. The bridge profile would be higher than Option K, including at the crossing of Foster Island where the bridge would be 5 to 10 feet higher than the existing bridge through the Arboretum. There would be six westbound lanes (a two-lane off-ramp, three mainline lanes, and an HOV/transit direct-access ramp) and five eastbound lanes (a two-lane on-ramp and three mainline lanes).

Option L Arboretum Area

Exhibit 2-22. West Approach Area (Options K and L)





- Columns
- Existing regional bicycle/pedestrian path
- General-purpose lane
- HOV, direct access, and/or transit-only lanes
- Proposed bicycle/pedestrian path
- Lid or landscape feature
- Stormwater treatment facility
- Pavement

N

0 125 250 500 Feet

The bridge west of Foster Island would be supported by 6-foot-diameter columns. The columns would be spaced 63 to 140 feet apart. The bridge east of Foster Island would be supported by 7- to 9-foot-diameter columns, spaced 140 to 350 feet apart.

The SR 520 roadway would remain elevated across Foster Island, rather than touching land as it does today. The west approach structures would maintain a constant slope from the shoreline at Montlake and steadily rise as they continued east until the bridge elevation met the required elevation at the new transition span.

Suboptions to SDEIS Options A, K, and L

Options A, K, and L in the SDEIS each included potential "suboptions." These were specific design details that would have minor effects on the project footprint (Exhibit 2-23) and could be added to the design options singly or in combination. While they generally differed only minimally from the basic design options, they were analyzed in the SDEIS to determine their transportation benefits and environmental effects.

Option A with Lake Washington Boulevard ramp suboption

The suboptions for Option A (all included in Option A+) were:

- Add an eastbound HOV direct-access on-ramp from Montlake Boulevard.
- Add a Lake Washington Boulevard eastbound on-ramp and westbound off-ramp.
- Use the Option L roadway profile for improved stormwater management.

Option K had one suboption:

- Add an eastbound SR 520 off-ramp to Montlake Boulevard that would be a right-turn-only heading southbound.

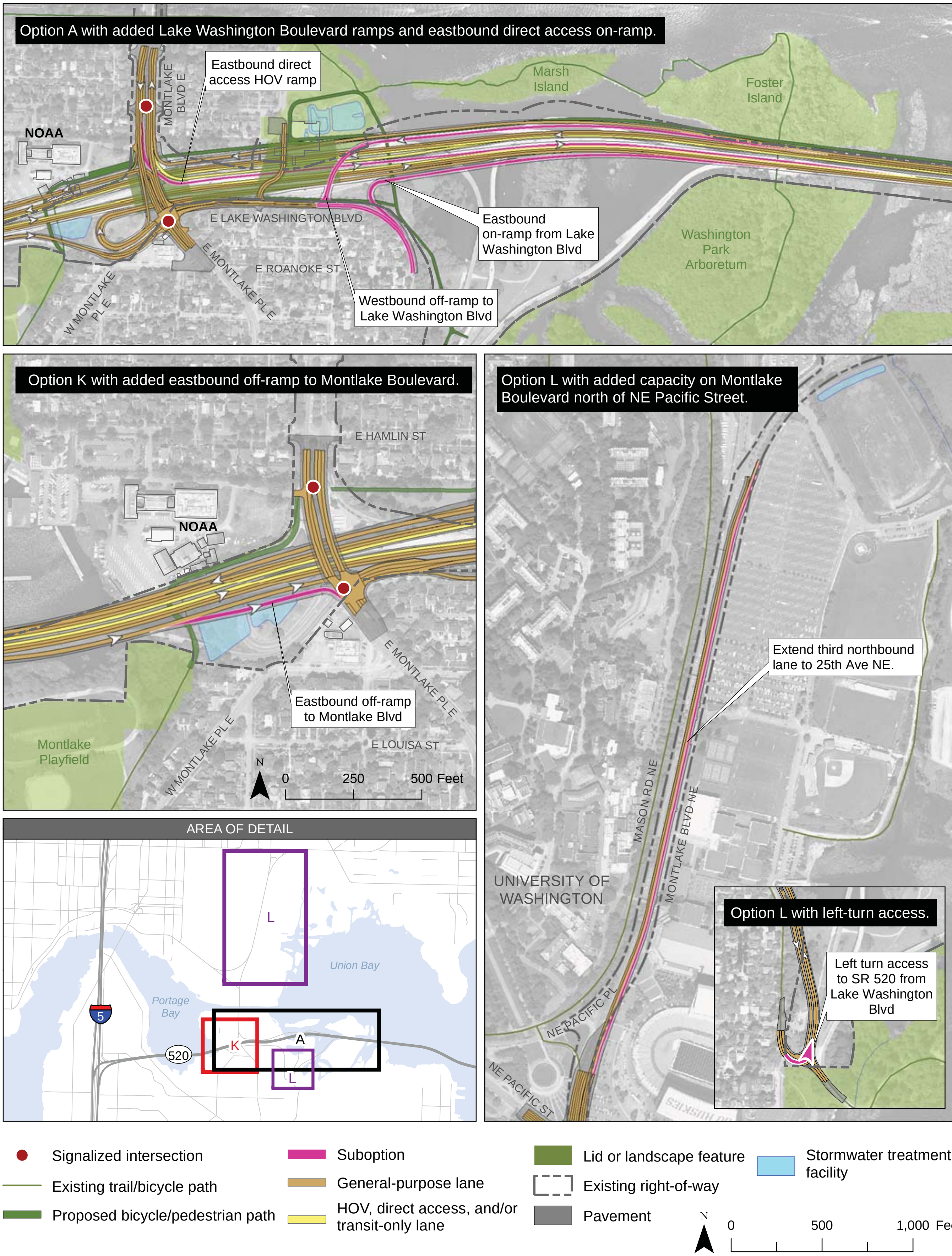
The suboptions for Option L were:

- Add left-turn access from Lake Washington Boulevard onto the SPUI south ramp (this would result in no changes to the project footprint).
- Add northbound capacity on Montlake Boulevard to 27th Avenue NE.

The Preferred Alternative incorporates all three Option A suboptions, with some modifications as follows:

- Access to Lake Washington Boulevard would be consolidated with the Montlake ramps and would occur from 24th Avenue East on the Montlake lid, rather than through construction of separate on-ramps. This change reduces right-of-way acquisition needs and wetland effects.
- The proposed profile for the Preferred Alternative is slightly higher than the Option L profile (a constant slope of 0.7 percent rather than 0.3 percent), which further facilitates stormwater management, improves clearance above Foster Island, and reduces noise in the Arboretum.

Exhibit 2-23. Montlake Area - Options A, K, and L with the Suboptions



Floating Bridge Area

Exhibit 2-24 shows the alignment of the floating bridge and its connections to the west and east approaches. The alignment of the floating bridge is the same as that evaluated in the Draft EIS and the SDEIS. The floating span would be located north of the existing bridge, approximately 190 feet north at the west end and 160 feet north at the east end. The new bridge would have two 11-foot-wide general-purpose lanes in each direction, one 12-foot-wide HOV lane in each direction, 4-foot-wide inside shoulders, and 10-foot-wide outside shoulders.

As a result of comments received on the SDEIS, the height of the bridge deck above the water has been lowered for the Preferred Alternative to reduce visual effects. At midspan, the floating bridge would rise approximately 20 feet above the water, compared to approximately 30 feet for SDEIS Options A, K, and L. The Preferred Alternative roadway would be about 10 to 12 feet higher than the existing bridge deck.

Under Options A, K, and L, the roadway would be about 22 feet higher than the existing bridge deck. The Preferred Alternative, like all the SDEIS options, would include a 14-foot-wide bicycle and pedestrian path with five scenic vantage points and pullouts located on the north side of the bridge.

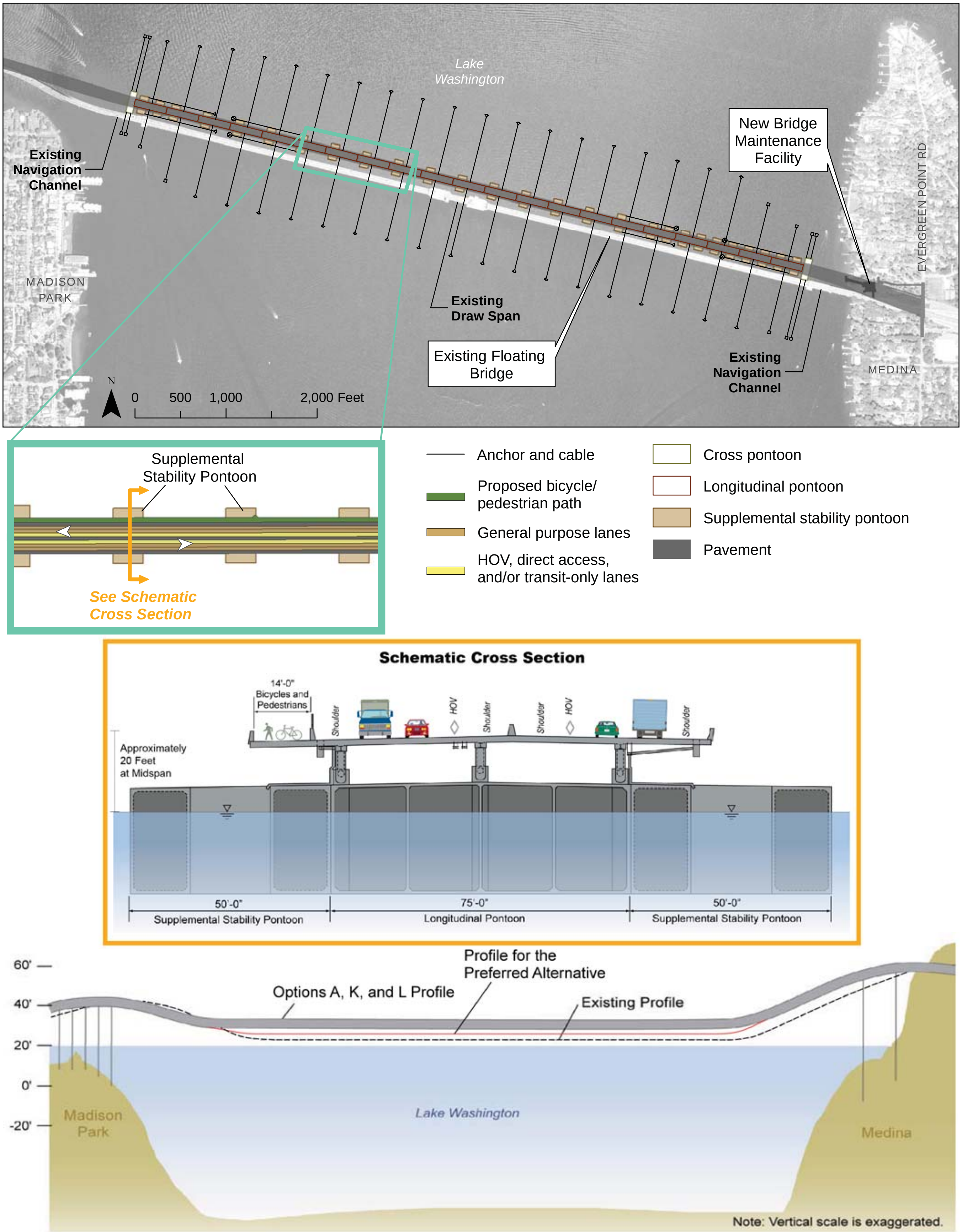
Pontoons

The new floating bridge would consist of a single row of 21 longitudinal pontoons, 2 cross pontoons (located at each end of the floating bridge), and 54 supplemental stability pontoons. Exhibit 2-24 shows the pontoons' locations and dimensions. Table 2-8 compares the dimensions of the existing pontoons and bridge with those of the proposed bridge. The new longitudinal pontoons would be larger than the existing ones to provide the flotation needed for wider lanes and shoulders to meet current design standards; the supplemental stability pontoons would provide additional buoyancy for the 6-lane configuration.

Table 2-8. Area and Dimensions for the Floating Portion of the Evergreen Point Bridge

Location	Existing (No Build Alternative)	Proposed Project
Floating bridge length	7,578 feet	7,710 feet
Pontoon area, total	10.8 acres	20 acres
Pontoon depth	14-22 feet	28-35 feet
Pontoon width	60 feet	50-75 feet

Exhibit 2-24. 6-Lane Alternative at Evergreen Point Bridge (Preferred Alternative and Options A, K, and L)



The new pontoons for the floating bridge would be designed and configured to provide future expansion capability for high-capacity transit. If the SR 520 corridor were identified in the future to carry dedicated HCT, additional supplemental stability pontoons could be added to the new floating bridge to accommodate it. Any such future expansion would need to be evaluated in a separate environmental document. As with the existing floating bridge, the floating pontoons for the new bridge would be anchored to the lake bottom to hold the bridge in place (see Chapter 3 for a detailed description).

The roadway would be supported above the pontoons by rows of three 10-foot-tall concrete columns spaced 30 to 35 feet apart. These rows of columns would be longitudinally spaced about 90 feet apart across the floating bridge. The pontoons would have a deeper draft than the existing pontoons. New pontoons would be 22 to 28 feet below the surface of the water as compared to existing pontoons at 8 feet below the water.

Navigational Channels

The project would eliminate the drawspan opening on the Evergreen Point Bridge. The new west and east navigation channels would remain in approximately the same locations as the current channels. The new west navigation channel would have two openings—one opening under the transition span and another opening one span west of the transition span.

Under the Preferred Alternative, the west channel openings would be approximately 140 feet parallel to the piers. It would have a minimum overhead clearance of 44 feet above normal high water, the same as it is today. Options A, K, and L would have a minimum overhead clearance of 41 feet, approximately 3 feet lower than today.

The west navigation channel would have a depth of approximately 26 feet at the center of the channel and a minimum water depth at the west edge of the channel of approximately 23 feet (when the water is at low lake elevation).

Under the Preferred Alternative and the SDEIS Options, the new east navigation channel would be located under the east transition span and would have a clear opening of approximately 190 feet parallel to the piers. This is a design refinement since publication of the SDEIS, which disclosed a clear opening of approximately 210 feet parallel to the piers. The span above the channel would be higher than today, with 70 feet (minimum) of vertical clearance above high water and a minimum water depth of 21 feet. The height in this location was designed to match the vertical clearance of the existing I-90 East Channel Bridge, and therefore would not impose new limitations on boating in Lake Washington. (See Section 5.14, Navigation, for additional information.)

What are the advantages of an elevated floating bridge deck on the Evergreen Point Bridge?

The new floating bridge would have an elevated bridge deck, providing several advantages over the existing bridge where vehicles travel at or near the water level. These improvements include:

Improved safety. Traffic would be separated from crashing waves, allowing vehicles to safely cross the lake during winds of up to 70 mph. Also, maintenance workers would be able to access the pontoons without being immediately adjacent to traffic.

Improved reliability. The floating bridge would be less likely to be closed due to storms and/or crashing waves. Some maintenance activities that currently require bridge closures could be completed while keeping the facility open to traffic.

Future capacity for light rail. If SR 520 is identified to carry light rail, it would be easier to modify an elevated bridge structure to include light rail than to modify the bridge deck immediately on top of pontoons. In addition, stray electrical currents from the LRT vehicle power system that could cause corrosion in the pontoon reinforcing steel are more easily contained when the rail line is separate (elevated) from the pontoons. Currently, this is a significant issue in placing light rail on the I-90 floating bridge deck, so as not to affect the reinforcing steel and shorten the life of the structure.

Construction efficiency. There are efficiencies in pontoon construction with an elevated roadway, which would make the pontoons easier and quicker to construct and could lead to cost savings.

The west end of the east transition span would be supported by the last row of columns on the floating pontoons. In this location, five columns would support the roadway. The east end of the east approach, as it approaches the shore of Lake Washington, would also be supported by 5 columns. (For the SDEIS, Options A, K, and L assumed four columns at this location.) The structure would meet the existing highway at grade as it approaches Evergreen Point Road, east of the Lake Washington shoreline. Table 2-9 shows the characteristics of the east approach structure.

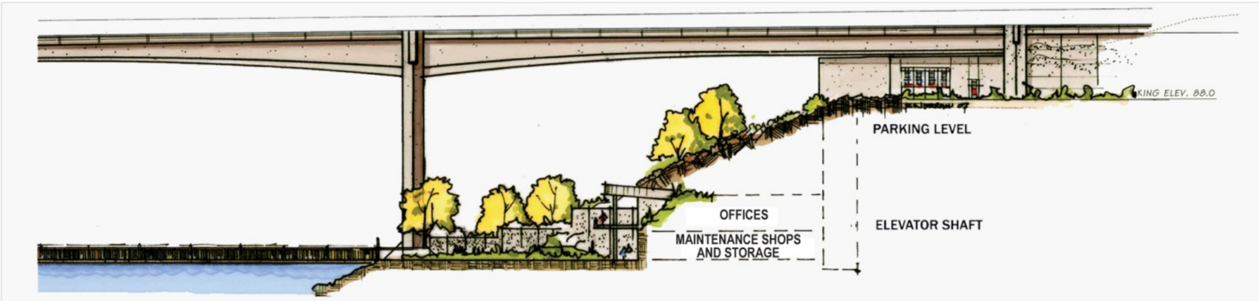
Table 2-9. East Approach Structure Elements- Preferred Alternative and Options A, K, and L

	Existing Structure	Preferred Alternative and Options A, K, and L
Bridge width (feet)	60	83 to 91 (westbound)
		51 to 61 (eastbound)
Estimated height above water (feet to bottom of structure)	57-60	66 – 78
Span length (feet)	100	250 to 350
Total number of columns	26	10
Number of columns in water	14	5

Bridge Maintenance Facility

A bridge maintenance facility would be constructed to provide work space, storage for equipment and materials, and workboat moorage that would facilitate efficient operation, maintenance, and emergency response to the floating bridge. Because the existing bridge maintenance facility is integrated into the floating bridge, it would be decommissioned along with the current bridge, requiring that sites for a new facility be evaluated. WSDOT, in cooperation with regulatory agencies, local jurisdictions, and the Muckleshoot Indian Tribe Fisheries Division worked through a process to identify the most suitable location for the facility. The group defined the project area, identified seven potential locations for the facility, and screened those locations using site feasibility and environmental criteria. Initial screening criteria included elements such as estimated response time to the bridge and accessibility. Three sites were determined to be viable locations, and were further evaluated to determine the environmental effects of developing a bridge maintenance facility in each location. Of the three locations evaluated, WSDOT determined that a bridge maintenance facility constructed underneath SR 520 between the east shore of Lake Washington and Evergreen Point Road in Medina (Exhibit 2-25) has the best overall ranking. This location was determined to have the most optimal maintenance requirements, best bridge response time, and best access, as well as the least environmental effect.

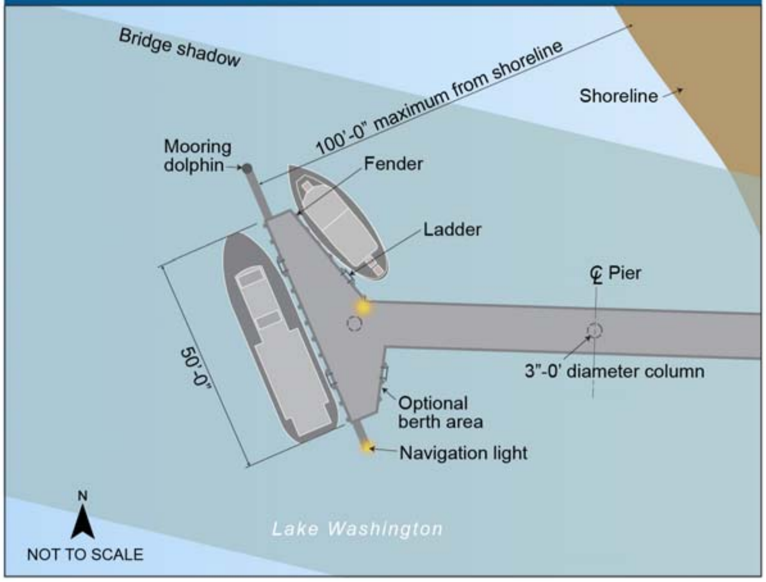
Exhibit 2-25. **Bridge Maintenance Facility**



The new bridge maintenance facility would include a working dock, an approximately 12,000-square-foot maintenance building, and parking. The facility would serve as the maintenance crew duty station and provide shop space for small repair work, staging for maintenance materials, and moorage for two work boats used for bridge maintenance activities. The conceptual design for the maintenance building is the same as the design evaluated in the SDEIS. It incorporates a two-story structure built into the end abutment slope under the new east approach bridge. Most of the facility would be buried in the bank slope. The maintenance crew would access the facility via a driveway from Evergreen Point Road, just north of the new SR 520 highway. The driveway would parallel SR 520 before turning south to enter the facility. Elevators inside the building would transport crews and materials to the lake and boat dock.

The new maintenance dock was also described in the SDEIS, but the dock design has changed since SDEIS publication. The current dock design concept would provide moorage for two workboats with a T-shaped dock. One workboat, 40 feet to 50 feet in length, would be used in fair weather for equipment and material transport and to provide a work platform. This boat would also provide some transport of personnel. However, a smaller, more efficient, 20-foot- to 30-foot-long workboat would be used predominantly for the transport of personnel. The dock itself would be designed to survive a 100-year storm, the same type of event used to design the new floating bridge. The dock design would also seek to minimize environmental effects such as shading and shoreline armoring. The dock would be located underneath the new east approach to the Evergreen Point Bridge. The dock would extend no more than 100 feet from the shoreline, with a stem width approximately 10 feet wide. Exhibit 2-26 is a conceptual view of the proposed dock layout.

Exhibit 2-26. **Conceptual Plan View of Bridge Maintenance Facility Dock**

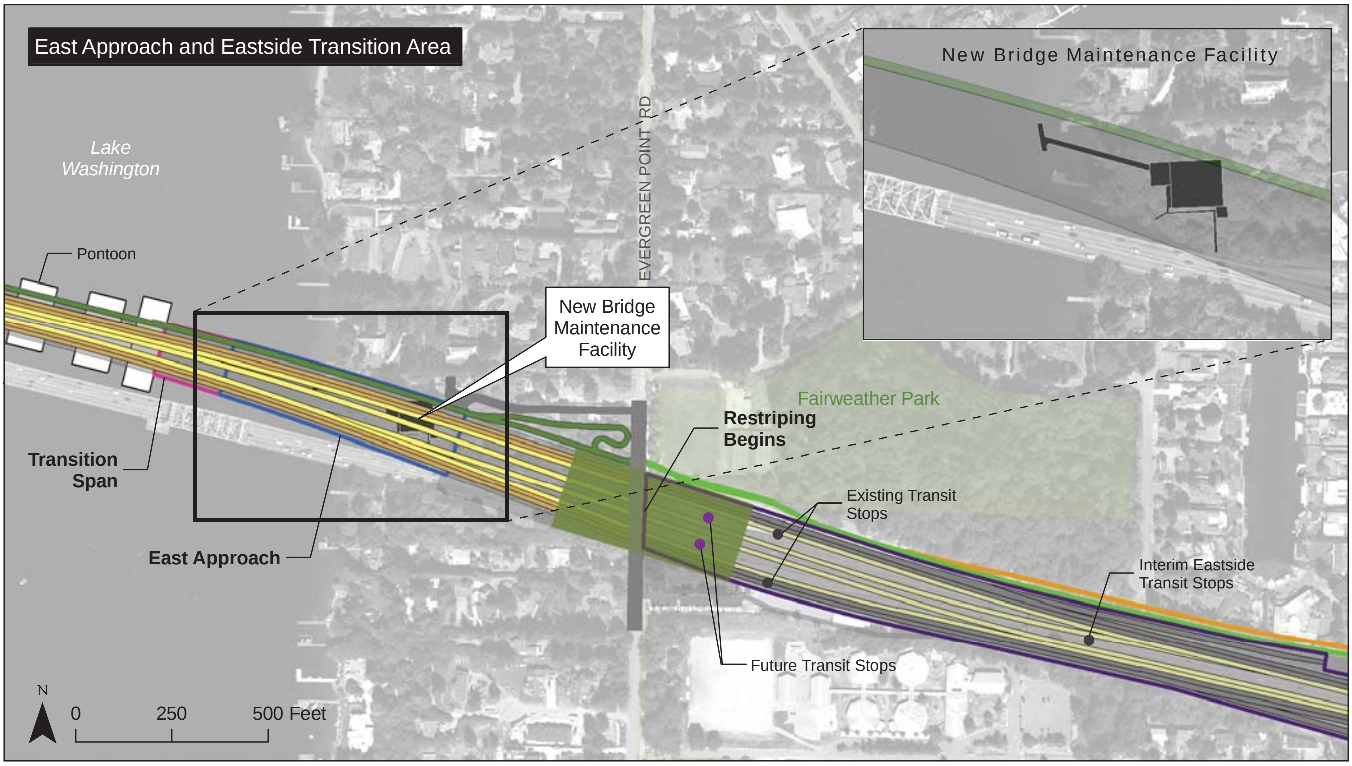


Eastside Transition Area

Once the east approach and floating portions of the Evergreen Point Bridge have been replaced, basic grading and paving operations would occur east to Evergreen Point Road, and the Evergreen Point Road transit stop would be relocated to the lid (constructed as part of the SR 520, Medina to SR 202: Eastside Transit and HOV Project) at Evergreen Point Road (Exhibit 2-27).

In order to make ramps and lanes connect for proper traffic operations, the SR 520 main line would be restriped, beginning at the east end of the physical improvements near Evergreen Point Road and extending east to 92nd Avenue NE. Lane channelization in this area would need to be adjusted to tie into improvements made under the SR 520, Medina to SR 202 project.

Exhibit 2-27. East Approach and Eastside Transition Area (Preferred Alternative and Options A, K, and L)

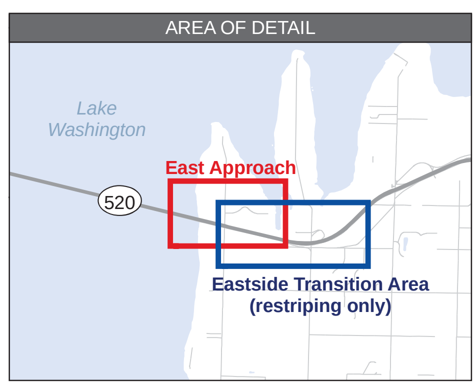


I-5 to Medina Project Elements

- General-purpose lane
- HOV, direct access, and/or transit-only lanes
- Proposed bicycle/pedestrian path
- Pavement
- East approach
- Transition span
- Restriping area

Medina to SR 202 Project Elements

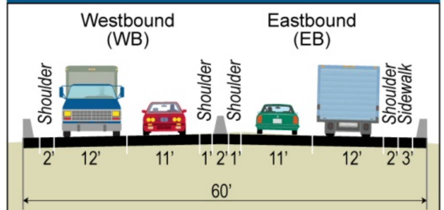
- General-purpose lane
- HOV lane
- Bike path
- Points Loop Trail
- Local road improvements
- Eastside project lid



2.7 What is the No Build Alternative?

The No Build Alternative assumes that, other than normal maintenance and repair activities, the SR 520 corridor between I-5 and Evergreen Point Road would remain exactly the same as it is today (Exhibit 2-28). Under the No Build Alternative, SR 520 would continue to operate as a 4-lane highway with nonstandard shoulders and without a bicycle/pedestrian path. No new facilities would be added and none would be removed, including the unused R.H. Thomson Expressway ramps near the Washington Park Arboretum. Stormwater runoff from the existing roadway surface would continue to discharge to surface waters without treatment. WSDOT would continue to manage traffic using its existing transportation demand management and intelligent transportation system strategies. For the transportation analysis included in this document, it was assumed that traffic in the 2030 No Build Alternative would not be tolled. (See Chapter 1 for a discussion of tolling assumptions used in the traffic model.)

Exhibit 2-28. **No Build Alternative Roadway Cross Section**



NOTE: Dimensions shown on the diagram are on the existing Evergreen Point Bridge.

As described in Chapter 1, the remaining design life of the Evergreen Point Bridge is currently estimated at just 10 to 15 years, and a severe storm could cause it to fail even sooner. The Portage Bay and west approach bridges are also vulnerable to collapse in a severe earthquake. For these reasons, the No Build Alternative is inconsistent with WSDOT's standards for safety and reliability. Given the vulnerabilities of the existing bridges, the No Build Alternative is not a likely scenario; however, it provides a set of baseline conditions to which the expected effects of the project can be compared.

2.8 Could the project be built in phases?

Along with the rest of the nation, Washington State and the Puget Sound region are facing serious revenue shortfalls. Revenue sources for the SR 520, I-5 to Medina Bridge Replacement and HOV Project include allocations from various state and federal sources and from future tolling, but there is still a gap between the estimated cost of the project and the revenue available to build it.

Because of the importance of this project to the region, WSDOT continues to pursue all available avenues of funding. If full project funding becomes available by mid-2012, the entire I-5 to Medina corridor will be completed by December 2018. This construction schedule is used as the baseline in this Final EIS (as it was in the SDEIS) for evaluating the effects of project construction. It represents the highest potential level of concurrent construction activities, and therefore is appropriate for use in gauging the maximum intensity of potential construction effects.

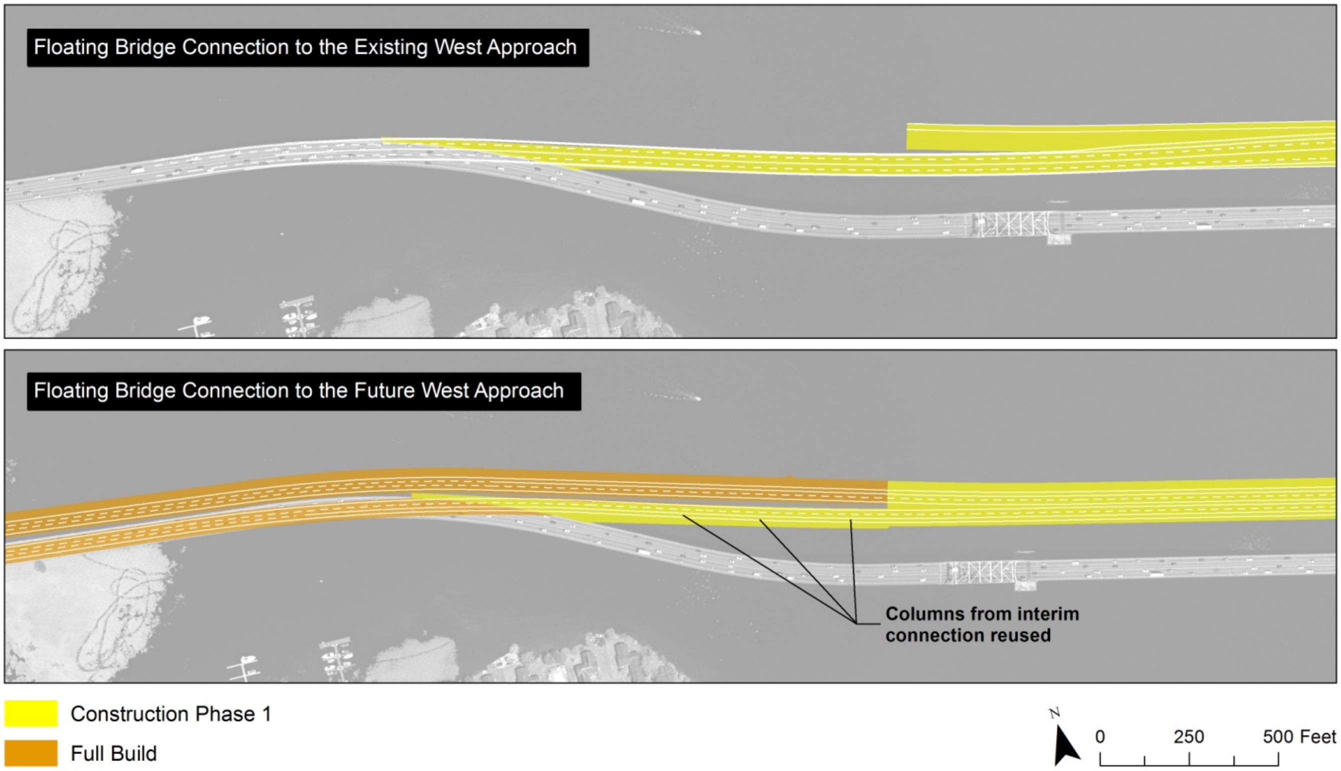
The SDEIS discussed the possibility of constructing the project in separate phases over time, with the vulnerable structures (the Evergreen Point floating bridge, west approach bridge, and Portage Bay bridge) built first. This "Phased Implementation scenario" was analyzed for each environmental resource. Due to the funding shortfall, FHWA and WSDOT still believe it is prudent to evaluate the possibility of phased construction of the corridor should full project funding not be available by 2012. Currently committed funding is sufficient to construct the Evergreen Point floating bridge and landings; a Request for Proposals has been issued for construction of this portion of the project, with proposals due in June 2011. Accordingly, this Final EIS discusses the potential for the floating bridge and landings to be built as the first phase of the SR 520, I-5 to Medina project. This differs from the SDEIS Phased Implementation scenario, which included the west approach and the Portage Bay bridge in the first construction phase.

The remainder of this section describes the limits of this first construction phase and how it will be evaluated in subsequent sections of the document. The evaluation focuses on how the effects of phased implementation would differ from those of "full build," and on how constructing the project in phases might have different effects than constructing it all at one time. Much of the analysis of the Phased Implementation scenario in Sections 5.15 and 6.17 in the SDEIS is still applicable, and has been included in the corresponding sections of this Final EIS.

It is important to note that while the new floating bridge might be the only portion of the project in place for a period of time, WSDOT's intent is to build the complete project described in this Final EIS. Mitigation measures would be undertaken concurrently with the portion of the project causing the impact. Enhancements (such as lids) would continue to be integral to the project, and would be built at the same time as the corresponding portion of the corridor. WSDOT anticipates that if the floating bridge is built as the first project phase, the remaining components of the project would be built in the same sequence as described in Chapter 1. Any changes in design or construction methods for subsequent project phases that could result in new or different environmental impacts would be subject to reevaluation and potentially additional analysis under NEPA and other applicable environmental regulations.

The floating span is the most vulnerable component of the SR 520 corridor, with a high probability of failure in the foreseeable future. Therefore, if funding is severely limited as discussed above, this easternmost portion of the corridor may be built before the rest of the project. A new six-lane floating bridge (two general-purpose lanes and one inside HOV lane in each direction) would be constructed between Evergreen Point Road in Medina and the existing west approach bridge in Seattle (Exhibit 2-29). The floating bridge and east approach (including the bridge maintenance facility) would be replaced with new structures and the roadway striped to its ultimate 6-lane width, tapering to 4 lanes at the west end of the floating bridge. The east approach would tie in to the 6-lane configuration of the SR 520,

Exhibit 2-29. **Construction Phase 1 Transition Area**



Medina to SR 202 project, which is assumed to have been completed by the time the floating bridge and east approach are constructed.

To connect the western end of the floating span to the existing west approach, WSDOT would construct a new interim connection, four lanes wide and approximately 1,500 feet long, between the new west transition span and the existing west approach bridge (see Exhibit 2-28). This interim connection was also described in Section 2.4 of the SDEIS. It would be supported on columns that would later be reused for the eastbound portion of the new west approach bridge. When the new west approach bridge is constructed, the interim bridge deck would be removed and the columns heightened to support the west approach bridge at its planned grade.

To address the potential for phased construction, the Final EIS evaluates construction of the floating bridge and landings separately as a subset of the "full build" analysis. This evaluation is qualitative in nature, and is included in Chapters 5 and 6. It assumes that the floating bridge and landings would be the first portion of the corridor to be constructed and would operate as the only constructed portion until funding is secured for the other project components. Since all improvements needed for the first phase are within the overall footprint of the facilities to be provided by full buildout, the discussion in Chapters 5 and 6 focuses on differences in effects resulting from the timing of construction, rather than the extent of impacts.

This portion of the SR 520, I-5 to Medina project has been defined as a design-build project, and proposals for its construction are being prepared by contractors for submittal in June 2012. Contract award is currently anticipated in fall 2012, with bridge opening as early as 2014. All applicable environmental commitments contained in the Record of Decision and in project permit conditions will be included as contract stipulations for the design-build project.

Chapter 3: Construction Activities

This chapter describes anticipated construction methods, activities, and sequencing for the Preferred Alternative and Options A, K, and L as analyzed in the SDEIS. Methods and activities are the same for all project designs, unless otherwise specified. Information in this chapter provides context for understanding the construction effects discussed in Chapter 6. Information in this chapter is presented at a level of detail intended to promote an understanding of methods that would be used to construct the new SR 520 corridor from I-5 to Medina. The following descriptions do not replace design guidelines and construction standards outlined and prescribed in WSDOT's manuals and specifications, and specific methods could change depending upon conditions or improving technologies. The construction durations, methods, and techniques described in this chapter will continue to be refined in design and construction of the project. Any refinements that result in additional or different effects will be analyzed as appropriate. Construction activities are also subject to various local, state, and federal agency permit requirements. However, the information in this chapter presents WSDOT's best current estimate of how, and in what sequence, the project would be built. Information from this section is based primarily on the Construction Techniques and Activities Discipline Report Addendum and Errata included in Attachment 7.

3.1 Where and when would construction occur?

Construction of the project would occur along the length of the SR 520 corridor between I-5 in Seattle and Evergreen Point Road in Medina. Construction would occur adjacent to the existing roadway and within WSDOT right-of-way to the greatest extent possible. Construction activities would take place on land, on work bridges constructed adjacent to the roadway, and from barges floating on the lake and outfitted with cranes. Construction would be sequenced to maintain traffic flow along the corridor; detour bridges would be constructed where roads cross SR 520 and along the main line, where needed.

Barges

Barges like these would be used to stage construction equipment and activities along the floating bridge.

Major construction activities along the corridor would be ongoing for approximately 7 years for the Preferred Alternative. This estimated time frame is based on the assumption that the project receives full funding and that construction would occur concurrently in multiple locations along the corridor. Within the overall construction period, areas of the corridor would be affected for varying amounts of time.

Construction time frames in the I-5 interchange area, Portage Bay Bridge area, and Evergreen Point Bridge area are similar for the Preferred Alternative and for Options A, K, and L. Construction in the I-5 area is estimated to occur over approximately 26 months, construction of the Portage Bay Bridge is estimated to take approximately 64 months, and replacement of the Evergreen Point Bridge would take approximately 45 months (including pontoon construction, east approach construction, and demolition of the existing bridge). Construction of the Montlake interchange is estimated to take between 56 and 60 months for the Preferred Alternative and Options A and L, and approximately 78 months for Option K. Construction of the west approach is estimated to take approximately 59 months for the Preferred Alternative and Options A and L, and approximately 70 months for Option K. Subsequent sections of this chapter provide more detailed descriptions of how long specific construction activities would take for each geographic area, and describe where activities or durations would differ between the Preferred Alternative and SDEIS options. The following text also provides updates to information presented in the SDEIS for Options A, K, and L.

Construction Staging Areas and Equipment

Construction crews

Construction along SR 520 would be staged from both land and water. Land-based construction staging areas (shown in Exhibit 3-1) would be used for delivery and storage of construction materials and equipment, contractor office and storage trailers, and employee parking. These areas would be fenced and located adjacent to areas where project construction is occurring. Construction staging areas would vary in size and may require grading or excavation to level the site and install drainage improvements, depending on site conditions. Temporary driveways would be established from staging areas to the roadway network.

Office trailers, placed on temporary foundations, would be connected to available utilities, including power, telephone, water, and sewer as needed. Connecting to these utilities may include installing poles for power lines and excavating trenches to place water and sewer pipelines. After construction is complete, staging areas would be restored and disconnected from any utilities.

Along the corridor, construction would occur within WSDOT right-of-way to the greatest extent possible. Construction areas within existing and expanded WSDOT right-of-way would be cleared of vegetation and any

Exhibit 3-1. **Construction Staging Areas for Preferred Alternative and Options A, K, and L**

buildings or structures in order to provide adequate work space. Temporary fencing would be installed around construction areas to separate construction zones from adjacent properties.

Temporary erosion and sediment control measures would be used to prevent runoff of untreated stormwater and sediment from staging areas into city stormwater or sewer facilities, nearby wetlands or water bodies, or adjacent properties. WSDOT would develop and implement a spill prevention control and countermeasures (SPCC) plan to prevent and minimize the potential for spills of hazardous materials and pollutants. Once construction is complete, all staging areas and remaining exposed soils would be stabilized, landscaped, or restored. Planting and restoration efforts would follow permit conditions and mitigation plans.

Roadway and bridge construction activities would require a variety of construction equipment. Types of equipment and their use are shown in Table 3-1. For certain activities, construction crews may also require more specialized equipment such as pile drivers, derrick barge cranes, dewatering pumps and tanks, and conveyor belts.

Table 3-1. Typical Construction Equipment

Equipment	Typical Use
Air compressor	Pneumatic tool power and general maintenance
Backhoe	General construction
Concrete pump	Concrete pumping
Concrete saw	Concrete removal, utilities access
Crane	Materials handling, removal, and replacement
Excavator	General construction and materials handling
Forklift	Staging area work and hauling materials
Generator	General construction work
Haul truck	Materials handling, general hauling
Jackhammer	Pavement removal
Loader	General construction and materials handling
Paver	Roadway paving
Pile driver	Support-installation for structures and hillsides
Pump	General construction use, water removal
Pneumatic tools	Miscellaneous construction work
Service truck	Repair and maintenance of equipment
Tractor trailer	Material removal and delivery
Utility truck	General project work
Vibratory equipment	Activities to shore up hillside or install piles

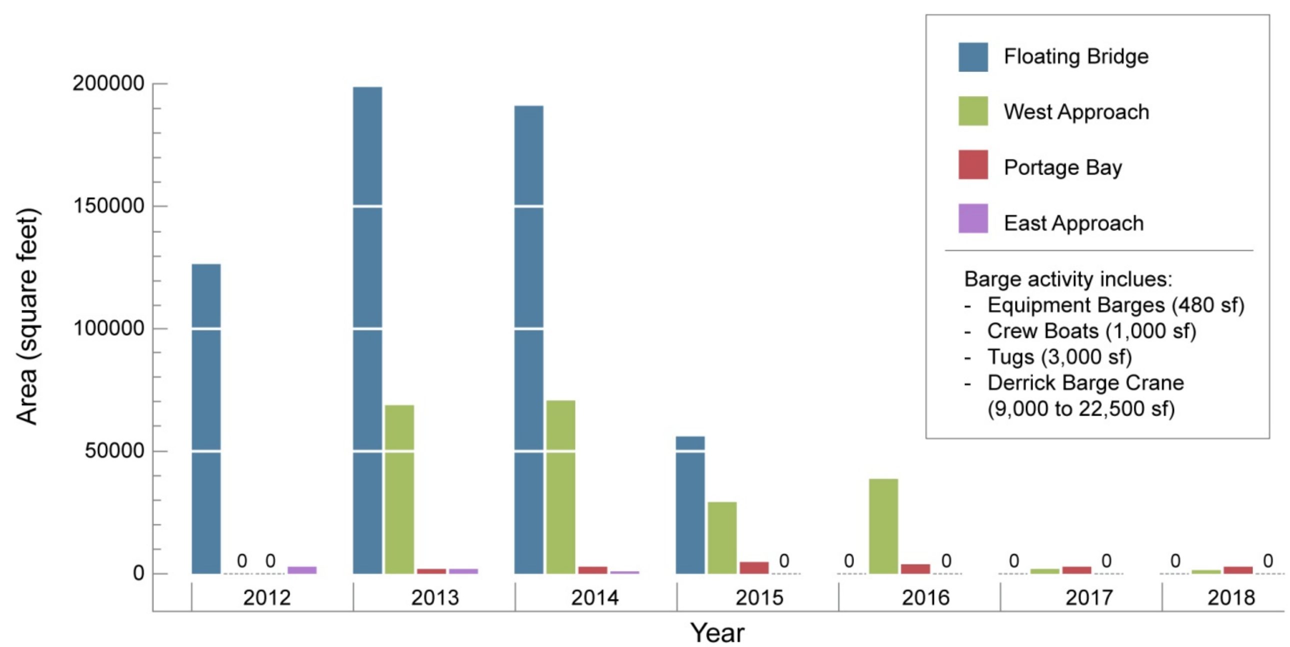
Construction Using Barges and Tug Boats

Barges would be used to stage construction materials, store construction equipment, transport demolition debris, provide a work area for construction personnel, and store water containment systems and water storage tanks. Barges would be used to construct the superstructure on top of pontoons for the new floating bridge, and would be used to construct the columns and bridge spans for the east and west transition spans to the new floating bridge. The far eastern portion of the new west approach would also be constructed from barges. Barges could also be placed below a proposed demolition activity to collect demolition debris. Construction materials such as anchors, piles, timber decking, concrete, structural steel, and precast concrete units could be transported to the construction site by way of barges and tug boats.

The superstructure for the new bascule bridge would likely be transported to the site by barges and tug boats. Once the tug boats are situated in the Montlake Cut, barge-mounted derricks would lift and hold bridge sections in place during installation. Additionally, barges could be used in place of tugs to transport floating bridge anchors and pontoons from upland concrete casting sites to Lake Washington.

Barges would range in size from 12 feet by 40 feet for smaller materials vessels, to 75 feet by 300 feet for crane-mounted barges. Tug boats would be used to maneuver barges and pontoons into and around Lake Washington. Tug boats and crew boats can range in size from 20 feet by 50 feet to 30 feet by 100 feet. Peak barge use would occur during the first 3 years of floating bridge assembly on Lake Washington, and as many as 25 barges could be in use on the lake at one time. Barges would also be used to support construction activities in Portage Bay and for the west approach to the floating bridge. Exhibit 3-2 shows the maximum estimated barge activity for construction of the SR 520, I-5 to Medina project.

Exhibit 3-2. **Maximum Estimated Barge Activity for the Preferred Alternative and Options A, K, and L**



Materials Transport and Haul Routes

Materials would be also transported to and from the construction sites by trucks. Trucks would travel over identified haul routes through Seattle and Medina to SR 520, I-5, and I-405. Construction assumptions developed for the project identify major freeways as primary haul routes intended to carry most project truck traffic. However, there will be times when city streets will need to be used as secondary haul routes. Secondary haul routes for the SR 520, I-5 to Medina project were identified based on criteria such as shortest off-highway mileage, and providing access to locations needed for construction where direct highway access is unavailable.

Potential haul routes identified for material transport, road closures, and estimated truck trips are discussed in the following paragraphs. These routes include both local and regional roadways. Since publication of the SDEIS, WSDOT has refined potential haul routes to avoid using non-arterial neighborhood streets. Local jurisdictions can limit the use of non-arterial streets for truck traffic; therefore, efforts were made to identify designated arterial streets for potential use as haul routes. Local jurisdictions will determine final haul routes for those actions and activities that require a street use or other jurisdictional permit. The permit process typically takes place during the final design phase and prior to construction. Exhibit 3-3 shows the potential primary and secondary truck haul routes evaluated for the Preferred Alternative and SDEIS Options. Most haul route traffic would be on I-5 and SR 520. These main routes would be more efficient for contractors to access work sites. Whenever possible, crews would work from WSDOT right-of-way or build temporary direct-access connections to work sites and staging areas from SR 520.

For analysis purposes, the project assumed all construction spoils would be removed from the project site by truck. This would represent worst-case conditions for truck traffic. Barges may be used to remove spoils if determined to be practicable. Barges are expected to be used to transport materials and demolition debris to and from the project area.

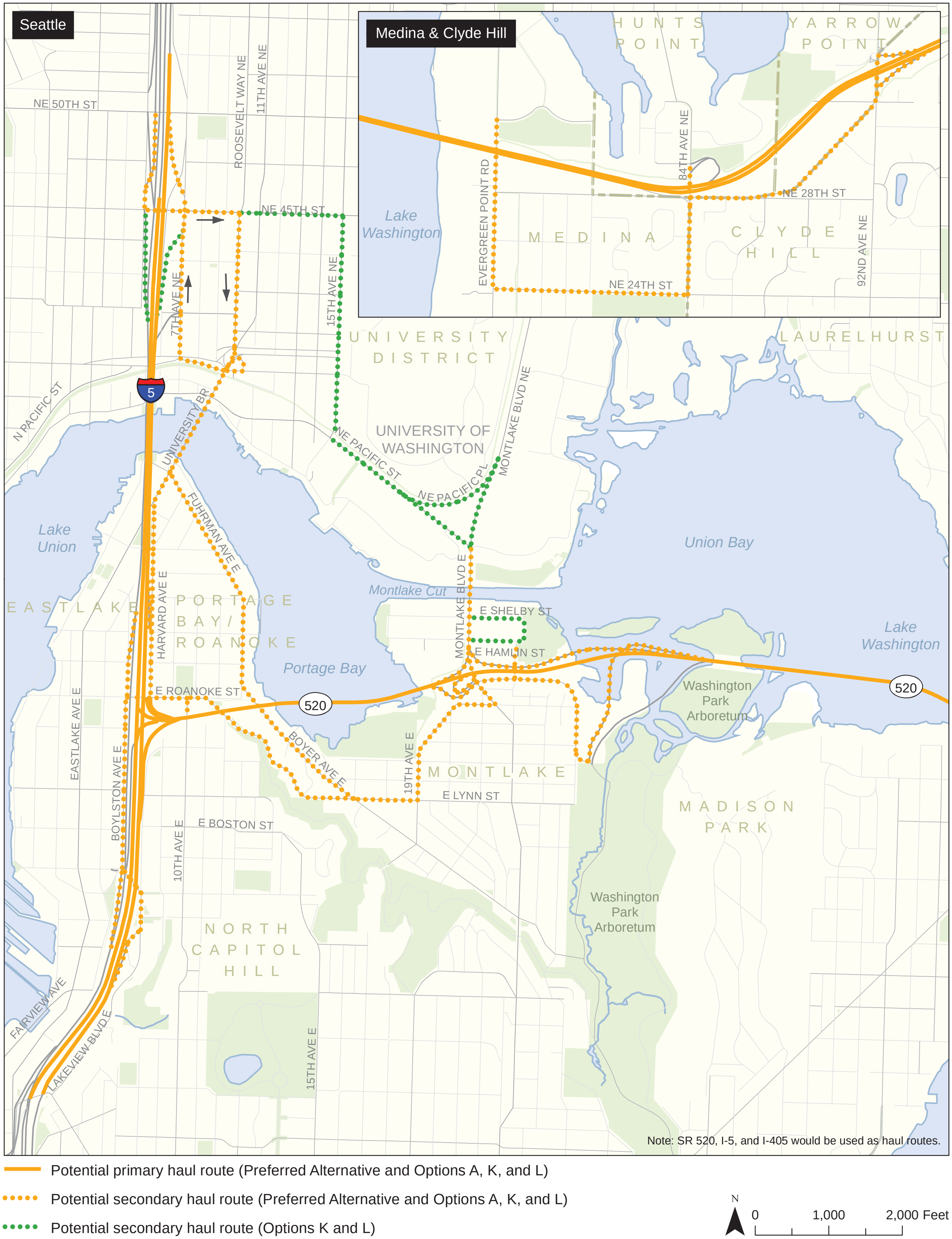
The Preferred Alternative, and Options A, K, and L would require using many of the same haul routes. Potential roadways include:

- SR 520
- I-5
- I-405
- Fuhrman Avenue East
- Boyer Avenue East
- East Roanoke Street
- Delmar Drive East
- Harvard Avenue East
- Boylston Avenue East
- East Lynn Street
- Montlake Boulevard
- NE 45th Street
- NE 24th Street (Medina)

Construction Effects on Traffic

Effects on traffic resulting from project construction, including haul routes and road closures, are discussed in Section 6.1 under the heading *How would construction affect traffic operations?*

Exhibit 3-3. Potential Haul Routes for Preferred Alternative and Options A, K, and L



- Points Drive NE
- 84th Avenue NE
- 92nd Avenue NE

Since publication of the SDEIS, WSDOT made further refinements to some potential haul routes, resulting in removing some haul routes from consideration, and adding others. For instance, the southern leg of Boyer Avenue East (south of East Lynn Street) is not identified for hauling activities in this Final Environmental Impact Statement (EIS) analysis. East Shelby and East Hamlin streets would likely be needed to support tunnel construction activities for Option K, while NE Pacific Street and 15th Avenue NE would be needed to support the new depressed interchange at Montlake and NE Pacific Street under Options K and L. A more detailed discussion of haul routes and related effects can be found in Chapter 6.

Potential haul routes for construction of the east approach bridge and bridge maintenance facility would include SR 520 and potentially Evergreen Point Road and 92nd Avenue NE.

Construction zone access would be provided from temporary driveways and direct access ramps. Temporary driveways would be constructed between the staging areas and the roadway network. These access points would link with the haul routes and be monitored by flaggers, law enforcement, or construction workers, depending on the location. A construction access ramp may be provided directly into the construction zone from the SR 520 westbound Montlake off-ramp, and SR 520 westbound Montlake on-ramp pending further coordination with NOAA. Outbound trucks could also re-enter the Montlake westbound off-ramp near the intersection with Montlake Boulevard. These trucks could either go straight to access the SR 520 westbound on-ramp or turn left and travel to the SR 520 eastbound on-ramp to reach their final destinations.

Peak construction activities (including concrete pours or excavation and fill) would involve the highest numbers of workers, materials, and equipment, and more trucks would use regional and local roadways. In order to meet the current schedule, it was conservatively assumed that during the peak construction activity, peak truck-haul activity would occur simultaneously for different project components, including the Portage Bay Bridge, the Montlake interchange, and the west approach bridge.

Table 3-2 summarizes the potential number of haul route trips on SR 520, I-5, and I-405 during peak construction (per day for each option). As previously indicated, project construction assumptions developed are intended to keep the majority of haul route traffic on major freeways such as I-5, SR 520, and I-405.

Roadway and Ramp Closures

During weekday peak travel, WSDOT would maintain two through lanes on SR 520 in each direction. In addition, the on- and off-ramps at Montlake Boulevard would remain open or temporary ramp connections would be constructed. Most lane and ramp closures required during construction would occur at night and on weekends for limited periods of time. Roadway closure hours and dates would be timed to avoid special events and would be coordinated with closures on other freeways.

Table 3-2. Estimated Number of Peak Construction Period Haul Route Trips on Local Highways

Regional Freeway[a]	Per Day: Preferred Alternative and Option A	Per Day: Option K[b]	Per Day: Option L
SR 520	590	620	420
I-5	340	400	300
I-405	240	320	220

[a]No effects are expected on I-90.
[b]The hauling of material out of the single-point urban interchange and tunnel (Option K) would typically occur for 10 hours per day, and occasionally for up to 16 hours per day.

As project construction progresses, the road closures and traffic detours would change to best accommodate construction needs and to minimize traffic congestion. Detour routes would be determined both during project permitting and as part of ongoing construction management activities. Currently, project construction schedules assume that when portions of SR 520 need to be closed for construction activities, closures would occur at night (between the hours of 9 p.m. and 5 a.m.) and on weekends.

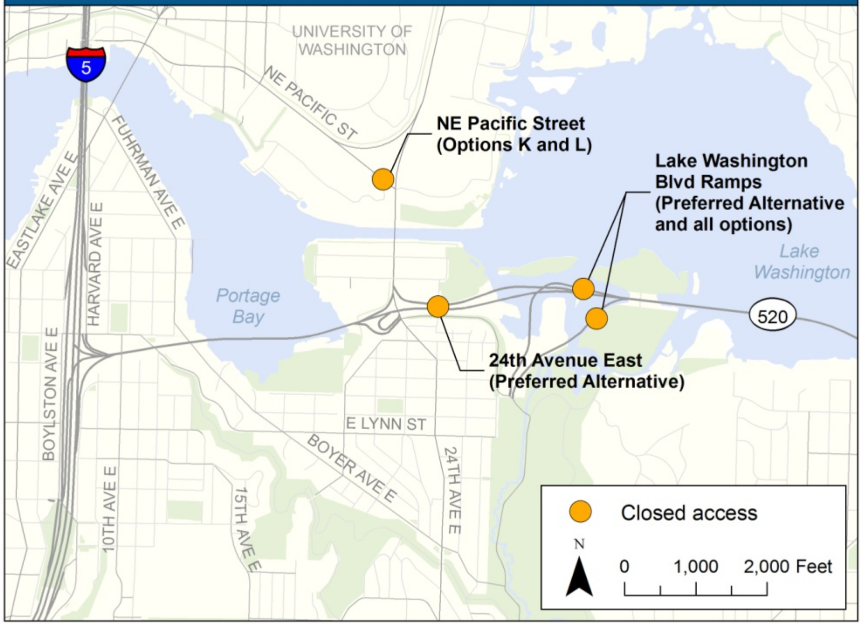
Some local street use may be limited for short durations during construction. Temporary road closures necessary for certain construction activities are likely to result in inconvenient driving conditions and traffic congestion. In addition, direct access to and from some buildings may be disrupted, though not eliminated, for short periods of time. Reductions in access would occur mainly at night and during off-peak hours. Construction of the Preferred Alternative would require at least one temporary roadway closure lasting approximately one year (Exhibit 3-4). New construction sequencing developed since publication of the SDEIS has eliminated the need for the 9-month-long closure at Delmar Drive described for Options A, K, and L. These closures and detours are summarized below. See the Transportation section in Chapter 6 (Section 6.1) for a discussion of how traffic would be affected by construction.

Road Closures

The temporary closure of portions of SR 520 and its ramps would be required periodically for certain construction activities. An example of a construction activity that would require lane closures is placement of precast girders for the new lids over SR 520.

The only permanent road closures identified for the SR 520, I-5 to Medina project are the Lake Washington Boulevard ramps.

Exhibit 3-4. **Road Closures for Preferred Alternative and Options A, K, and L**



Delmar Drive East

For the SDEIS analysis, Delmar Drive East was assumed to be closed temporarily for 9 months under Options A, K, and L to accommodate construction on SR 520, as well as construction of the 10th Avenue and Delmar Drive East lid. The design and the new construction sequencing developed for the Preferred Alternative have eliminated the need for this closure. Instead, traffic on Delmar Drive East crossing over SR 520 would be diverted to a temporary detour on the new lid structure during construction. Staged construction of the 10th and Delmar lid would allow maintenance of traffic on both 10th Avenue East and Delmar Drive East for the duration of construction. This closure refinement could also apply to Options A, K, and L.

Pacific Street

For Options K and L, the portion of Pacific Street from Montlake Boulevard to just west of the University of Washington Medical Center access driveway would be closed for 9 to 12 months to accommodate the lowering of the Pacific Street/Montlake Boulevard intersection and providing a lid in this area. The Preferred Alternative design does not include a lid or grade change at this intersection; therefore, construction of the Preferred Alternative would not require closing Pacific Street.

24th Avenue East

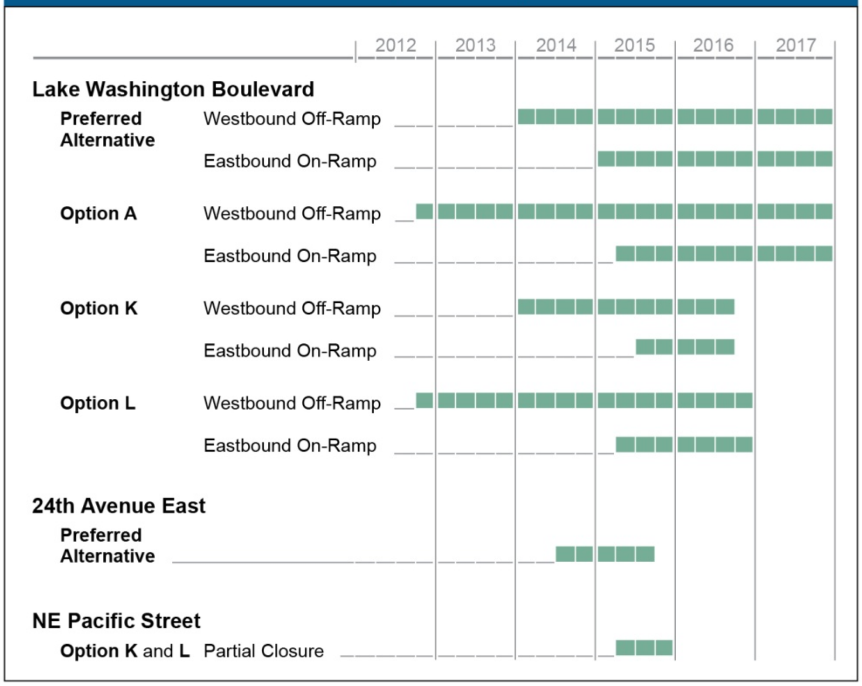
There would be one long-term, temporary road closure during construction of the Preferred Alternative. The 24th Avenue East bridge across SR 520 north of Lake Washington Boulevard would be closed to all traffic for approximately one year while the bridge is demolished and reconstructed. The new 24th Avenue East bridge would be constructed and opened in conjunction with the new westbound off-ramp to Montlake Boulevard, prior to completion of the Montlake lid. Once completed, this new bridge would accommodate SR 520 traffic exiting to Lake Washington Boulevard.

Work Bridge

Lake Washington Boulevard Ramps

Construction of the Preferred Alternative would close the Lake Washington Boulevard ramps to make room for the construction work bridges and the new west approach structure. This closure would be permanent, and ultimately, SR 520 traffic moving to and from Lake Washington Boulevard would have access at the new Montlake interchange via 24th Avenue, located on the new lid (Exhibit 3-5).

Exhibit 3-5. **Durations for Roadway and Ramp Closures**



Before closing the Lake Washington Boulevard ramps, a number of capacity improvements would be made to the existing Montlake Boulevard interchange to accommodate additional traffic (see Section 6.1 for traffic volume details). During the first year the Lake Washington Boulevard ramps are closed for construction, traffic would be detoured to Montlake Boulevard. Once construction of the 24th Avenue East bridge is complete, traffic would be able to access Lake Washington Boulevard via 24th Avenue East or Montlake Boulevard.

In-Water Construction

In-water work requires specific permits from several resource agencies. These permits, which are separate from the National Environmental Policy Act (NEPA) process, specify constraints and guidelines to minimize construction effects on fish and aquatic habitat. Design considerations for in-water construction activities include the location and configuration of permanent and temporary in-water structures, the timing of construction (i.e., appropriate in-water work windows), and measures to protect water quality.

In-water construction activities would occur in Portage Bay, Union Bay, and Lake Washington (Exhibit 3-6).

> DEFINITION
>
> **What is an in-water work window?**
>
> Work windows are time periods specified by natural resource agencies for conducting work in streams, lakes, and rivers. The periods are selected to minimize harm to fish and other aquatic resources. For example, work windows in Lake Washington were established by the Washington Department of Fish and Wildlife (WDFW) to minimize construction effects on salmon during critical times of the year, such as when the salmon are spawning or migrating.

Exhibit 3-6. **Area and Types of In-Water and Over-Water Work**

Construction Activity or Method[a]	Portage Bay Area	Montlake Area	West Approach Area	Floating Bridge Area and East Approach Area	Eastside Transition Area
Pontoon towing	● (green)	● (green)	● (green)	● (green)	
Anchor installation				● (red)	
Pontoon assembly and disassembly				● (green)	
Bridge superstructure outfitting				● (green)	
Work bridge construction and removal	● (red)		● (red)	● (red)	
Cofferdam or sheetpile installation and removal	● (red)		● (red)	● (red)	
Drilled shafts	● (red)		● (red)	● (red)	
Mudline footings	● (green)				
Cast-in-place girder superstructure	● (red)			● (red)	
Existing bridge removal	● (red)		● (red)	● (red)	
Tunneling (Option K)		● (green)			
Bascule bridge (Preferred Alternative and Options A and L)		● (green)			

● (green) No in-water work restrictions
● (red) In-water work restrictions apply

[a] Construction methods identified for the Portage Bay, west approach, and east approach locations cover a range of methods that could be used for construction of the Preferred Alternative and SDEIS options.

Examples of in-water construction activities include the following:

- Work bridge construction and removal
- Drilled shafts and bridge foundations construction
- Cofferdam construction and removal
- Existing bridge demolition
- Stormwater outfall construction
- Floating bridge anchor system installation

Cofferdam

The photo above is an example of a cofferdam. Cofferdams provide a dry work area when construction takes place within a water body.

To minimize effects on fisheries and other natural resources, in-water construction would be limited by permit conditions to the approved work windows. WSDOT continues to work with natural resource agencies through the Natural Resource Technical Working Group to define in-water work windows specific to the project area and activities. Table 3-3 identifies the current in-water work windows established by the Washington State Department of Fish and Wildlife (WDFW) for the Lake Washington Ship Canal and for Lake Washington. Actual work windows for these areas will be defined by WDFW in cooperation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service as conditions presented in the Biological Opinion (Attachment 18) and the Hydraulic Project Approval, prior to construction.

Table 3-3. In-Water Work Windows

Area	WDFW-Published Work Window[a]	WSDOT-Proposed Work Window
Portage Bay	October 1 to April 15	August 16 – April 30
Union Bay	July 16 to March 15	September 1 to April 30 (impact pile-driving only)
Lake Washington (west approach area)	July 16 to March 15 (north of SR 520) July 16 to April 30 (south of SR 520)	August 1 to April 30
Lake Washington (east approach area)	July 16 to March 15 (north of SR 520) July 16 to April 30 (south of SR 520)	July 1 to May 15

[a] WSDOT is working with resource agencies to define project specific work windows based on construction activities, duration of construction, and schedule. Any deviations from the WDFW published work windows are defined in the project Biological Opinions issued by the USFWS and NOAA Fisheries, and will also be identified in the HPA issued by WDFW.

In addition to defining in-water work windows, resource agencies place other types of conditions on their permits to protect aquatic species and habitat. Conditions for the SR 520 project will include requirements that WSDOT apply specified best management practices to prevent construction activities from exceeding state water quality standards. Noise attenuation measures will also be required to reduce the effects of in-water pile-driving on fish and other aquatic species. Chapter 6 contains more detailed information on potential best management practices (BMPs) to minimize effects, on potential noise attenuation measures, and on other forms of construction mitigation.

Demolition would be required for those fixed structures over water that will be replaced by new structures as well as the existing floating bridge. This type of demolition would require impact hammers and other equipment to remove all features of the existing structures (traffic barriers, bridge deck, pier caps, columns, etc.), as well as saw and torch cutting to cut the bridge deck into manageable sections that can be lifted by a crane.

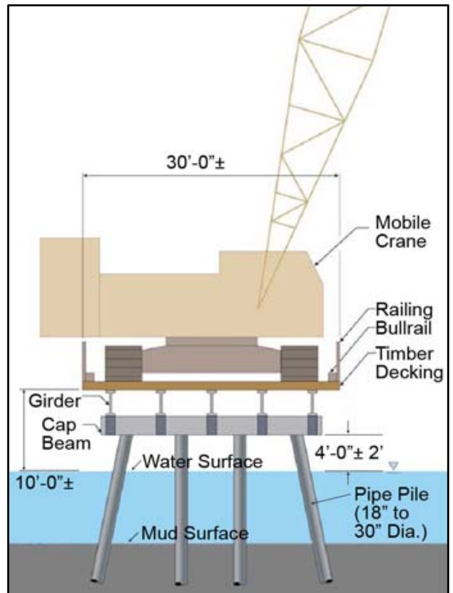
Pieces of the roadway would be loaded by crane onto trucks or barges for disposal or recycling. Columns and piles would be removed (using vibratory extraction where possible and necessary), or cut 2 feet below the mudline (ground surface).

Over-water demolition requires special precautions and equipment to prevent debris or concrete-laden water from entering the natural water system. Nets, tarps, platforms, scaffolds, blankets, barges, and floats can be used to contain the debris; vacuums, diverters, absorption materials, holding tanks, and drainage systems can be used to contain concrete-contaminated water.

Work Bridges and Falsework

Construction work bridges would be built in four general areas along the project alignment: Portage Bay, Union Bay, the west approach in Lake Washington, and the east approach in Lake Washington (Table 3-4). Work bridges are proposed in shallow-water areas where work from barges is not possible. Each of these shallow-water areas is expected to need two construction work bridges, one on either side (north and south) of the new alignment. Work bridges are expected to also be used for demolition purposes. There will be periods when both the north and south work bridges are functional, depending on construction requirements. The typical layout of a construction work bridge consists of about a 30-foot-wide structure, with heavy timber decking supported by steel beams (see Work Bridges sidebar). Work bridges would be built on driven piles installed from a mobile crane.

Construction of work bridges would be accomplished from a crane that starts out on land behind a temporary wall on a pad prepared at the edge of the water. The crane swings out and starts driving piles in the water for the first pile bent. Pile installation for work bridges would be conducted using a combination of vibratory and impact pile-driving (a single crane can be fitted with either a vibratory or impact hammer, depending on the need). After all piles for each bent are driven, they are cut off at the same elevation. Steel cap beams are set on top of the piles to complete the bent. Support beams are welded from one bent to the next and timber deck panels are then bolted to the support beams. After the deck span is in place,



Work Bridges

The diagram above is an example of a work bridge. Similar work bridges would be used in Portage Bay and for construction of the west and east approach structures. These bridges would be approximately 30 feet wide and approximately 5 to 10 feet above the high water elevation.

DEFINITION

Pile Bent

A pile bent is an engineering term that refers to a row of piles that are fastened together. The row of piles together provides a framework for carrying the bridge deck.

the crane is advanced out onto the span and the operation continues until all the bents and work bridge spans are in place.

Table 3-4. Work Bridge Elements by Area - Preferred Alternative

	Portage Bay	West Approach	East Approach
Number of piles	1,300	2,100	165
Area of work bridge (square feet)	261,900	703,400	42,000
Duration of pile-driving[a]	14 non-consecutive months	16 non-consecutive months	5 months
Work bridge duration	64 months	58 months	36 months

[a] Duration of pile-driving is the total number of months that pile-driving could occur during the full duration of construction. For instance, if construction is expected to last 64 months in Portage Bay, pile-driving could occur for as many as 14 months, non-consecutively, during that 64-month construction period.

Falsework (see Falsework sidebar) is a temporary structure that supports permanent bridge structures during construction. It carries the weight of the permanent structure until the permanent structure is capable of supporting its own weight. For example, falsework often supports cast-in-place concrete formwork that holds the freshly placed concrete of a bridge deck. After the concrete of the major structural elements has hardened and attained sufficient strength for the bridge to support its own weight, the formwork and falsework can be removed. Falsework generally consists of steel pipe and/or timber columns, piles, beams, and bracing elements or scaffolding to support the plywood and lumber formwork.

DEFINITION

Falsework

Falsework is a structure built to hold precast bridge sections or forms for concrete in the correct place. The photo in the pile bent sidebar shows falsework supporting a freshly placed concrete bridge deck. Falsework remains in place until the permanent structure is capable of supporting its own weight.

Permanent Bridge Construction

Information in this, and subsequent sections is presented at a level of detail intended to promote an understanding of typical methods that could be used to construct project elements such as roads and bridges. The actual methods used to construct the corridor may vary depending on corridor conditions and available technologies. Any refinements that result in additional or different effects will be analyzed as appropriate. Effects resulting from the construction techniques described in this chapter are presented in Chapter 6, Effects During Construction of the Project.

Drilled Shaft Casing

The photo above shows how a drilled shaft casing is installed. The pipe is first lowered by crane to the substrate and vibrated into position. After the casing is installed, a crane lowers the auger and begins to drill into the substrate, stopping and lifting the auger periodically to pull the substrate out of the hole and deposit it on the work bridge.

Drilled Shafts

The permanent portions of the proposed bridges would be supported by reinforced-concrete drilled shaft foundations. Possible equipment to be used for drilled shaft construction is as follows: vibratory pile-driving hammer, crane-mounted rotator/oscillator, crane-mounted drill auger, crane-mounted rock drill, excavator grab bucket, front-end loader, concrete tremie, concrete pump truck, ready-mix concrete trucks, concrete vibrators, cross sonic logging testing equipment, pumps, and holding tanks. Typical drilled shafts for this project would be between 6 and 12 feet in diameter and drilled with an auger.

In-water drilled shaft construction activities would be staged from land, work bridges, or barges, typically using a casing pipe. This pipe would be lowered by crane to the substrate and vibrated (see Drilled Shaft Casing sidebar) deep enough to prevent hole cave-in and maintain the top of the casing above the waterline. After the casing has been installed, a crane would lower the auger and begin to drill into the substrate/soil material, stopping and lifting the auger periodically to pull the substrate/soil out of the hole and deposit it on the land, work bridge, or barge.

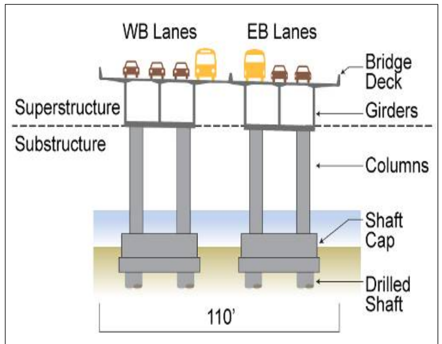
After the shaft excavation is completed, a prefabricated reinforcing steel shaft cage is lowered into the excavation and concrete is pumped into the casing, displacing the water or slurry. The water or slurry would be contained, collected, and treated prior to reuse or disposal. During the concrete placement, the casing pipe may be gradually extracted but would remain at least partially in place to form the top of the shaft.

Bridge Columns/Piers and Shaft Caps

Concrete columns extend from the top of the drilled shaft or shaft cap, and connect the bridge deck and girders to the foundation (e.g., drilled shaft) below (see Substructure and Superstructure sidebar). In situations where the bridge is low and close to the water surface, the columns would extend through the entire water column directly to the top of the shaft (located at or below the mudline).

In-water work to install the columns would be accomplished inside the large-diameter drilled-shaft casing (see previous section) or cofferdam to isolate the work from the open water. Cofferdams are generally constructed with steel sheet-piling vibrated into the mud with a vibratory hammer, typically to 20 feet below the bottom of the excavation. Water is then pumped out of the area within the cofferdam to provide a dry working environment. The casings or cofferdams allow construction access below the waterline to install the column-reinforcing steel and column formwork needed to pour the concrete column in dry conditions. Columns would be constructed from work bridges or barges. Construction activities, equipment, and BMPs used will be similar to those described above for the drilled shafts.

When more than one drilled shaft per column is required to support the bridge load at a given pier, a shaft cap (also called a “footing”) would be constructed. A shaft cap would tie the multiple shafts together and spread the load from the column(s). Multiple drilled shafts and shaft caps are generally needed when soil conditions are poor and a bridge has long spans.



Substructure and Superstructure

A bridge consists of two major parts: a substructure and a superstructure. The substructure includes the bridge foundation and support structures. For Portage Bay, this would include the drilled shafts, shaft caps, and support columns. The superstructure is the part of the bridge above the columns. For Portage Bay, this would include the girders and the roadway slab.

The support column would be constructed on top of the shaft cap. Concrete shaft caps are constructed at the top of shafts using formwork, reinforcing steel, and poured concrete footings. The columns are constructed by building a wire "cage" of reinforcing steel on top of the footings; forms for the concrete columns are constructed around the wire cage, and concrete is poured into the forms. In-water columns can be constructed within cofferdams or installed from barges or work bridges.

Bridge columns along the corridor would be typically either round or rectangular in shape. The final shape of the column may be modified to better serve load-bearing requirements or aesthetic goals.

Superstructure

The bridge superstructure (girders and bridge deck) would be constructed on top of a group of columns, called a pier. Parts of the superstructure may be prefabricated (or precast) and hauled into place using barges, trucks, and/or cranes, or may be constructed from raw materials directly on the pier (called cast-in-place). As previously described, cast-in-place bridge elements typically require some falsework to support the structures while they are being constructed. After the concrete has cured and achieved adequate strength, the forms and falsework would be removed. Construction for the superstructure would take place from work bridges, barges, and, in some cases, the old bridge deck as well.

Bridge spans constructed from precast or prefabricated girders would be constructed by lifting girders into place by a crane, and then the bridge deck (roadway) and other design elements like traffic barriers and noise walls, if included, would be constructed on top of the girders. Roadway deck forms would be supported by the girders, and would support the reinforcing steel and fresh concrete for the concrete roadway deck. After the roadway concrete has cured and achieved adequate strength, the forms would be removed.

Cast-in-place concrete box girder construction would be used for some of the Portage Bay and east approach structures. For cast-in-place construction, falsework is constructed first, directly under and adjacent to the bridge area. Forms for the girders and deck are placed on top of the falsework, reinforcing steel is installed inside the forms, and concrete is poured.

Bascule Bridge

The Preferred Alternative (like Option A) includes a new bascule bridge over the Montlake Cut constructed to the east of the existing bridge. A bascule bridge is a movable bridge with counterweights on either end that balance the leaves (or spans) throughout their upward swing. Hydraulic or gear mechanical systems are used to operate the bridge. When open, the bridge provides unlimited vertical clearance for boat traffic. The existing Montlake and University bridges are examples of bascule bridges.

Most construction activities for the bascule bridge would be staged from land near the shoreline (upland); however, derrick barges would also be temporarily positioned in the Montlake Cut. Barges would be anchored in place using spud anchors (oversized nail dropped into place) at the corners of the barge or with the assistance of tug boats. The upland work would consist of constructing pier supports, which would form the foundation for the bascule bridge. After the pier supports are completed, the bascule-leaf steel members (drawspan bridge deck) would be assembled piece by piece onsite, or the entire leaf may be assembled offsite, barged to the project area, and erected with several derrick cranes. In either case, a barge-mounted derrick crane situated in the Montlake Cut would lift the bridge sections into position while they are attached to the upland piers.

These activities would likely require periodically closing the Montlake Cut to boat traffic. A total of six closures may be necessary over a 3- to 4-week period, typically only while barges are anchored for bascule leaf construction. Barges would be moored in the cut for less than 48 hours at a time to support lifting the bascule leaf spans into place. If final design yields a concrete bridge deck for the bascule bridge, the Montlake Cut could be partially closed to over-height marine traffic during the over-water construction period because the new bridge deck would be poured in two separate events. Construction staging of the bridge deck would leave one bridge leaf open while the other half is poured and cured. The construction barges would likely be anchored in the Montlake Cut only during actual bridge assembly work. Based on these closure requirements, this work would be scheduled for periods of low use by boat traffic.

Bridge Demolition and Disposal

Construction of the SR 520, I-5 to Medina project would require extensive demolition and removal of over-water and in-water structures. Demolition is defined as major breaking, crushing, and cutting of existing structures for eventual disposal; it may include salvage of reusable or recyclable materials. In the context of the project, removal is defined as vibrating, pulling, and dismantling existing structures for eventual disposal, reuse, or recycling.

The Preferred Alternative would result in an estimated 1.95 million cubic yards of demolition debris. This would include demolition for existing structures as well as temporary widening and temporary roadway and bridge connections.

The following represents a typical demolition sequence for an existing and permanent bridge or ramp:

Bridge Demolition

The photo above shows over-water demolition, which requires special precautions and equipment to prevent debris or concrete-laden water from entering the natural water system.

See Chapter 6 for a discussion of the construction effects of demolition activities.

- **Step 1:** Deploy containment BMPs to prevent any demolition materials from entering the water. This step would also include debris containment and demolition water containment.
- **Step 2:** Demolish the traffic barriers and rails. Concrete traffic barriers likely would be demolished with an impact hammer (i.e., jack-hammer or excavator attachment) or a combination of saw cutting and impact removal.
- **Step 3:** Remove the superstructure and crossbeams by saw cutting and using an impact hammer. The concrete bridge deck would be cut and any temporary support elements such as diaphragms or bracing walls would be removed to allow the girders to be lifted. After the deck is cut, the pieces would be removed, one at a time, loaded onto trucks or barges, and then hauled or shipped for offsite demolition.
- **Step 4:** Remove the entire column/pile by vibratory extraction. This method involves attaching a vibratory hammer and a hook from a crane to the top of the column, and simultaneously vibrating and lifting the column. Should this method prove to be ineffective, the column would be cut 2 feet below the mudline by divers using an underwater diamond wire saw. At that point, the columns would be loaded onto a barge for disposal or recycling.
- **Step 5:** Fill any holes or depressions in the substrate caused by the substructure removal process with native material or other material approved by the environmental permits.

Demolition of the existing approach structures and floating bridge would consist of similar steps as those described above for the permanent bridges and would include the following actions:

- Transition span removal
- Elevated floating bridge superstructure removal
- Pontoon removal
- Anchor cable removal and decommissioning
- Approach structure removal

Transition Spans

Two truss structures currently serve as transition spans and link the floating structure to the fixed approach structures on each end of the floating bridge. Demolition would likely be performed by removing each truss structure in one piece, either by using floating cranes to lift the truss off its bearings or by positioning a barge under each transition span and using jacks to lift each truss vertically off its bearings.

The Ballard Locks have a width limit of about 79 feet. The availability of floating cranes that would fit through the locks and also have the capacity to lift an entire transition span could be limited. Because of this, it may be necessary to remove the roadway deck and barriers to reduce weight before removing the steel truss structure in one piece.

Floating Bridge Elevated Superstructure

The extent of elevated superstructure removal from the pontoons would likely be dictated by the destination of individual pontoons after leaving Lake Washington. For pontoons that may be towed in the open ocean, the road deck and columns that rest on some of the pontoons may need to be removed to maintain pontoon stability while under tow. Demolition of the elevated superstructure and columns would be the same as that described for fixed bridges, except that columns would be cut flush with the top of the pontoons. For pontoons that are not towed in the open ocean, much of the elevated superstructure could remain in place until they leave Lake Washington. Options for pontoon disposal are discussed below.

Pontoon Disassembly and Removal

Pontoon disassembly and removal consists of saw-cutting the pontoon joints, disconnecting pontoons from their anchor cables, and towing them away. Some, or all, of the roadway that rests on the pontoons may need to be removed before the pontoons are transported out of Lake Washington.

Anchor and Anchor Cable Removal

Typically, anchor cable removal consists of detaching anchor cables at their connections to the pontoons and anchors, then winding the cables onto spools on barges for transport. Floating cranes would be used to wind the cable onto spools. Divers would detach the anchor cables from the anchors.

The existing floating bridge has three types of anchors: concrete fluke anchors, rock-filled concrete gravity anchors, and pile anchors. Underwater anchor decommissioning consists of abandoning all fluke and gravity anchors in place. If practicable, pile anchors would be removed to the mudline (ground surface) or abandoned in place.

Disposal

Trucks, barges, and tugs would be used to transport materials from demolition and construction sites along SR 520. Barges and tugs would transport a large portion of the material through the Montlake Cut and the Ballard Locks to disposal sites or transfer facilities accessible by water. Due to the large amount of disposal material and the transport required by land and water, multiple disposal sites would likely be used.

Materials disposal would occur at approved disposal sites. Demolition materials would be disposed of in accordance with federal, state, and local laws and ordinances. Demolished concrete pieces could also be transported to local concrete recycling facilities.

As with past WSDOT floating bridge projects, all pontoons, including the elevated superstructure in the existing floating bridge, could be made available for purchase. All existing pontoons, including the elevated superstructure, that were removed as part of the recent Hood Canal Bridge project were sold to private parties. Pontoons could be reused for a wide variety of waterfront functions such as docks, breakwaters, and dolphins. If pontoons are not sold, they would be towed to an approved site, such as a graving dock or floating dry dock, and demolished. WSDOT would not sink any pontoons in any water body as a disposal method.

3.2 What are the construction activities and sequencing for the Preferred Alternative?

The following subsections describe the general nature and sequence of construction activities in each area of the SR 520 corridor. Because the project is at a preliminary level of design, project details and construction methods have not been fully defined and may change somewhat as the design evolves. In addition, construction contractors typically have many choices about construction methods to be used. However, the descriptions below provide a reasonable assessment of how the project would be constructed and provide a baseline for understanding the types of effects that would result from construction activities.

Site Preparation

The first step in construction would be preparation of staging and construction areas. As part of this work, temporary erosion and sediment control (TESC) measures and temporary drainage structures would be installed to prevent run-off of untreated stormwater and sediment from entering city stormwater or sewer facilities, nearby water bodies, or adjacent properties. A variety of temporary construction BMPs could be used, including silt fences, berms, storm drain inlet protection, straw bale barriers, and detention or siltation ponds.

Temporary Fencing

Example of fencing to protect a wetland during construction.

Specialized BMPs are needed around concrete-handling areas to prevent water contaminated by uncured cement from entering water bodies or stormwater treatment facilities. Conveyance systems for the movement of stormwater from a collection point to an outfall can consist of drainage pipes and retention facilities (such as ponds, vaults, and catch basins) and can use gravity or pumps to move the stormwater. Staging areas are often equipped with wheel washes that clean truck tires to reduce tracking of dirt and dust offsite.

Temporary fencing would be installed around construction areas to prevent machinery and equipment, materials storage, and construction activity from intruding into adjacent properties, wetland and stream buffers, and shoreline areas. Staging and right-of-way construction areas would be cleared of any unneeded structures and vegetation to provide adequate work space. Remaining vegetation would be clearly marked to protect it from harm during clearing and use of the site. Staging area sites that are uneven are usually graded flat to facilitate parking, storing materials and equipment, and setting up a construction trailer if needed.

I-5 Area

Construction activities and durations in the I-5 area would occur over approximately 26-month period (Table 3-5), and would be similar for the Preferred Alternative and the SDEIS options. Activities in this area would include roadway reconstruction, excavation and embankment grading, retaining wall and abutment construction, and paving. Potential staging areas would be located within the expanded and existing right-of-way. The areas affected by construction and demolition and the duration and sequence of activities are described below and shown in Exhibit 3-7.

Table 3-5. I-5 Area – Construction Elements and Truck Trips

	Preferred Alternative	Options A, K, and L
Construction duration	approx. 26 months	26 months
Excavation (cubic yards)	54,000	76,000
Daily truck trips typical (average) Daily truck trips (during peak activity)	6 to 25 60 to 240	6 to 25 60 to 240

Note: Construction duration does not include mobilization and project closeout.

I-5/Roanoke Crossing (Preferred Alternative)

The Preferred Alternative includes a new bicycle/pedestrian path located on the south side of the existing East Roanoke Street undercrossing. Construction of the bicycle/pedestrian path would take approximately 9 months. The new bicycle/pedestrian crossing would be built as an expansion of the existing undercrossing and would require some limited demolition of the existing structure in order to build the new path onto it. Abutments and support walls for the path would be constructed in the median and on both sides of I-5. The support walls would be constructed on footings.

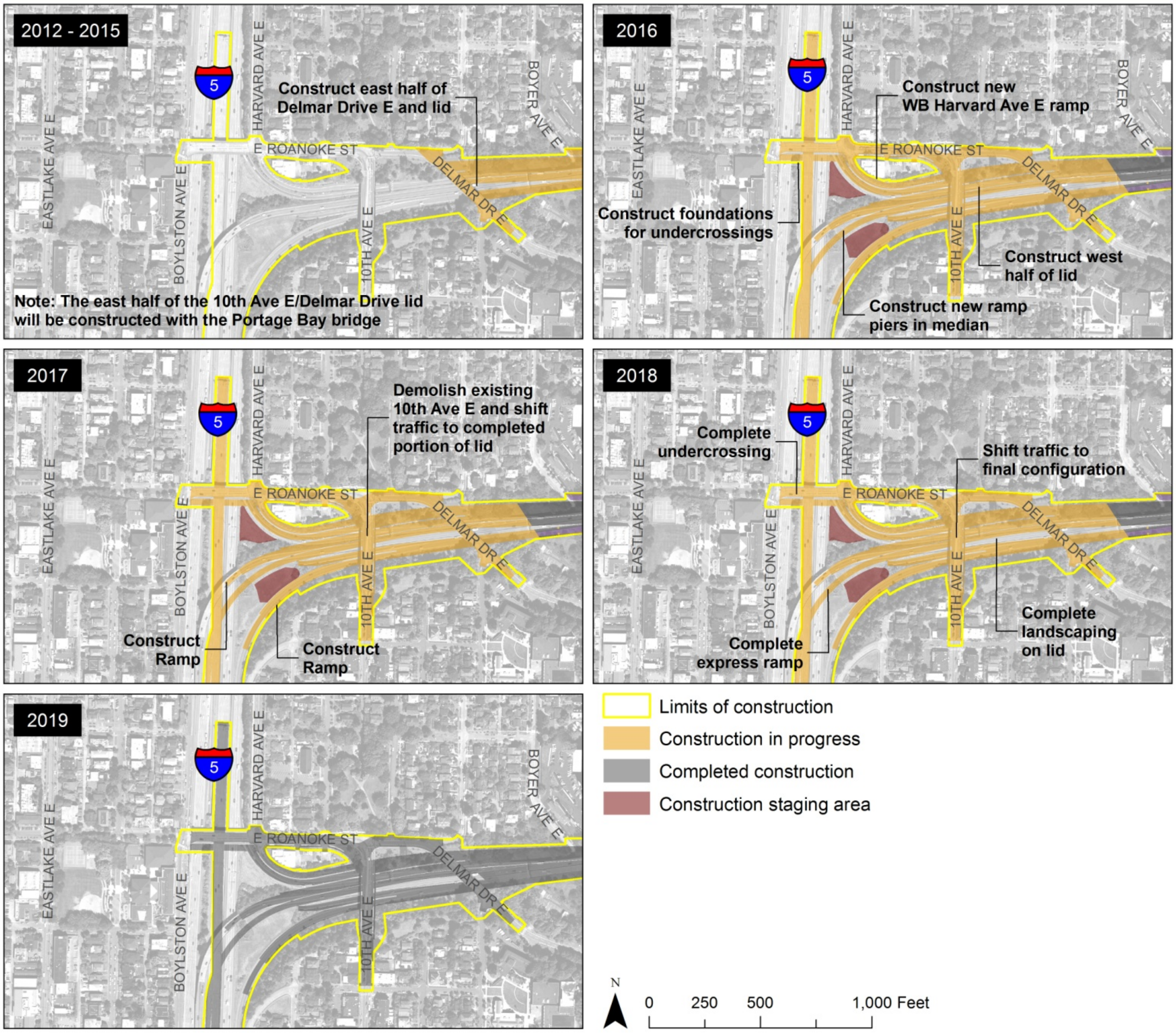
During construction of the support walls, the I-5 northbound and southbound lane widths would be temporarily reduced, and the lanes would be shifted to the center. Once the walls are completed, the new crossing superstructure would be constructed with girders that would span over I-5. For safety reasons, I-5 traffic would be shifted to lanes not under construction when girders are being placed. Any landscaping identified as part of the new crossing would influence the design of the structure, and landscaping would be included during the final phases of construction.

DEFINITION

Undercrossing

In the state of Washington, bridges that span over top of a highway or interstate are called "undercrossings." This term reflects the fact that the highway crosses under the bridge. In the case of bridges along the SR 520 corridor, all bridges crossing the highway are undercrossings because SR 520 passes underneath them.

Exhibit 3-7. **I-5 Area - Construction Sequence for the Preferred Alternative**



I-5/Roanoke Lid (Options A, K, and L)

Options A, K, and L included reconstruction of the Roanoke Street undercrossing on I-5 to be included as part of a new large lid over I-5. The construction duration in this area would remain the same as the Preferred Alternative, approximately 26 months. However, construction activities would be heavier in this area because of the additional construction required for the new Roanoke bridge over I-5 and the lid and associated landscaping.

Construction of the I-5/Roanoke lid would start at the north end of the new lid. When completed, this portion of the lid would be used as a temporary detour for Roanoke Street when the Roanoke Street bridge is demolished and replaced. Abutments and support walls for the new lid would be constructed in the median and on both sides of I-5. The support walls would be constructed on footings, which are concrete pads that provide a large area to distribute the weight of the lid. The walls would provide continuous support for the girders that span the roadways underneath. Construction activities taking place over I-5 would proceed as described above for the Preferred Alternative, but would be more intense because the lid for the SDEIS options is substantially larger than the bicycle/pedestrian crossing. In addition, more landscaping would be installed in a soil layer on top of the lid structure. The adjacent surface streets, Harvard Avenue East and East Roanoke Street, would be reconstructed to match the final lid configuration.

10th Avenue East/Delmar Drive East Lid

The Preferred Alternative and Options A, K, and L would include a lid over SR 520 at 10th Avenue East and Delmar Drive East, and the lid would be constructed concurrently with I-5 area and Portage Bay area elements. While construction activities for the Preferred Alternative design would be similar to those described for Options A, K, and L, the construction sequence for the 10th Avenue East/Delmar Drive East lid differs from that presented in the SDEIS. The Final EIS analysis assumes that the east half of the lid would be built first, allowing traffic to be detoured from Delmar Drive East onto the lid for demolition of the existing Delmar Drive East undercrossing. This staging avoids the long term closure and temporary detour bridge on Delmar Drive East that was described for the options in the SDEIS. Traffic would also be diverted onto the new lid structure as a detour for 10th Avenue East to allow maintenance of traffic while demolishing the existing 10th Avenue East structure. Once the demolitions are complete, the new undercrossings would be constructed and integrated with the new lid, and traffic would be shifted back into the original alignment.

Construction of the lid would use the same methods and sequencing as described above for the I-5/Roanoke lid and crossing. Retaining walls and support walls for the new lid would be constructed in the median and on both sides of SR 520. 10th Avenue East and Delmar Drive East would be reconstructed in the vicinity of the lid to match the final lid configuration. The construction activities and sequence would be the same for the Preferred Alternative and SDEIS Options A, K, and L.

SR 520 Main Line and Ramps

The SR 520 main line and ramps in this area would be reconstructed in generally the same location as today. The lanes would be reconstructed from the I-5 interchange (including ramps) to the 10th Avenue East/Delmar Drive East lid. The Harvard off-ramp retaining walls and westbound lanes would be reconstructed first, followed by the eastbound lanes. Activities would include roadway excavation, embankment construction, grading, and temporary and permanent paving. Cast-in-place retaining walls would be constructed to support the south end of the reversible high-occupancy vehicle (HOV) ramp and the on- and off-ramps at the I-5 interchange.

Portage Bay Bridge Area

Construction of the Preferred Alternative and Option A in the Portage Bay Bridge area would occur over a 64-month period (Table 3-6) and construction for Options K and L would take place over approximately 72 months. Construction for Options K and L would require additional time due to construction staging and scheduling associated with the single-point urban interchange designs. Activities in the Portage Bay Bridge area would include work bridge and falsework installation, bridge demolition, and permanent bridge construction. Construction staging in this area would occur on both existing and expanded WSDOT right-of-way (see Exhibit 3-7). The areas affected by construction and demolition and the duration and sequence of activities are described below.

Table 3-6. Portage Bay Area – Construction Elements and Truck Trips

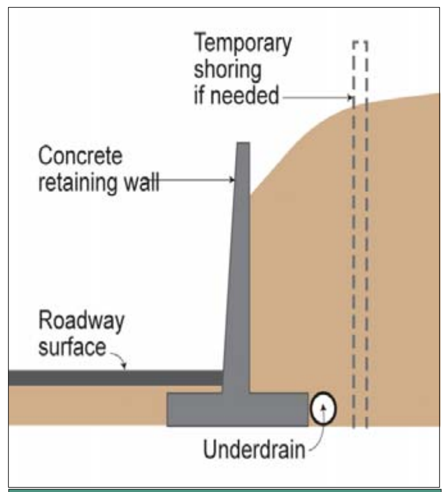
	Preferred Alternative	Option A	Options K and L
Construction duration	64 months	64 months	72 months
Excavation (cubic yards)	33,200	33,200	33,200
Permanent columns	71	72	62
Temporary support piles[a]	850	740 to 750	700 to 710
Falsework piles[a]	400	400	400
Daily truck trips (average)/ Daily truck trips (during peak activity) [a]	15-20/ 120-230	15-20/ 120-230	15-20/ 120-230

Note: Construction duration does not include mobilization and project closeout.
[a]The Final EIS analysis includes refined estimates since publication of the SDEIS.

Exhibit 3-8 illustrates the construction sequence by year for the Portage Bay Bridge. In general the construction sequence would be the same for the Preferred Alternative and SDEIS Options A, K, and L.

Roadway Excavation

Roadway excavation, also called "cuts," involves removing ground surface or other material to the depth and width necessary to achieve a desired grade and slope for a roadway or structure. Heavy equipment is used to remove soil and dozers usually push the material into piles, which are then loaded into haul trucks for transportation. A dump-truck and trailer can typically carry 20 to 30 cubic yards of soil. The photo above shows crews working in the median between westbound I-90 and the center roadway to excavate and install water lines.

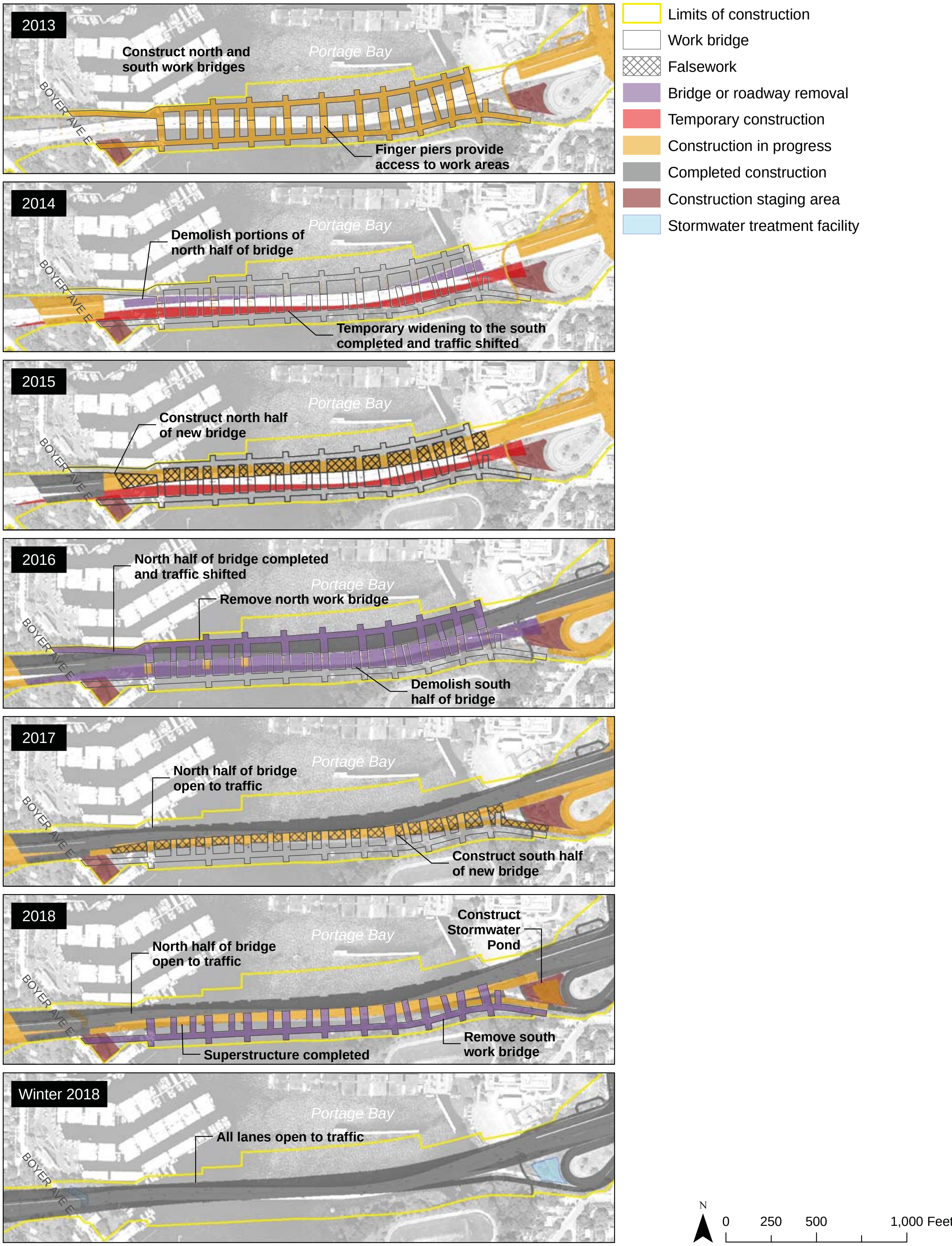


DEFINITION

Cast-in-place Retaining Walls

The schematic above shows a cast-in-place wall with spread footings. Excavation is generally needed to set the footing of the wall beneath the ground surface. Forms made of metal or wood are set in place to hold the wet concrete. Concrete is delivered in mixer trucks and poured into the forms. The concrete is poured in stages from the bottom base up. If the wall will be used to retain a cut slope, temporary shoring may be needed to support the slope until the permanent wall can be backfilled.

Exhibit 3-8. Portage Bay Area - Construction Sequence for the Preferred Alternative



Work Bridge Installation

During the first construction year, work bridges would be constructed along both the south and north sides of the existing Portage Bay Bridge. The work bridges would be approximately 30 feet wide and approximately 5 to 10 feet above the high water elevation. During this phase of work bridge construction, up to 900 total piles could be driven, with as many as 16 piles per day. Construction schedule estimates include an assumption that each pile would require approximately 30 minutes to be driven. Pile-driving activities for work bridge installation are expected to occur during the first year of construction, within permitted in-water work windows.

Pile-driving activities for temporary bridge widening are expected to occur during the first year of construction, between November and April. A majority of the total pile-driving activities in this area would occur during the first few months of initial construction, though pile-driving could occur in the Portage Bay Bridge area in up to 14 nonconsecutive months during the full duration of construction.

The new Portage Bay Bridge footprint substantially overlaps the existing Portage Bay Bridge. In order to keep the existing bridge open with four lanes of traffic during construction, the existing Portage Bay Bridge would be temporarily widened to the south during the first year of construction. Widening the existing bridge will allow the north half of the existing bridge to be demolished and make way for construction the north half of the new bridge, all while maintaining traffic across Portage Bay and through the corridor.

Temporary Widening

Also during the first year of construction, the existing Portage Bay Bridge would be temporarily widened to the south so that four lanes of traffic can be maintained while the new bridge is built. Traffic would be diverted to this expanded southern half of the bridge to allow the northern half of the existing bridge to be demolished and the northern half of the new bridge to be constructed.

The temporary widening of the existing bridge to the south would require temporary in-water foundations, additional columns, and superstructure placed in line with the existing bridge piers. Construction of this temporary widening structure would consist of installing in-water drilled shaft casings to build the support columns and the addition of girders, bridge deck, and barriers. Pile-driving activities associated with the temporary widening are expected to overlap somewhat with work bridge installation.

Permanent Bridge Construction

Generally, the new Portage Bay Bridge would be constructed in halves; the north half would be constructed first, followed by construction of the south half. In-water work would include construction and installation of temporary cofferdams to create dry work areas below the water level for bridge foundation construction. The foundations for the north half of the new bridge would be installed over the first two years of construction. Foundations for the south half of the new bridge would be constructed during the third and fourth years of construction.

After traffic is shifted to the southern portion of the existing Portage Bay Bridge, the northern portion of the existing structure can be demolished and the north half of the new bridge constructed. Demolition activities would begin with removal of the superstructure, and the in-water vibratory removal (or cutting) of roughly half the existing columns. Demolition would typically be conducted from the construction work bridges.

As elements of the substructure are completed, construction of the superstructure can begin. The Portage Bay Bridge superstructure would have two main parts: the girders that span between the bridge columns and the roadway slab (bridge deck). If false arches are identified for aesthetic treatments, they would also be constructed during this stage. See the previous sections in this chapter entitled “Work Bridges and Falsework” and “Permanent Bridge Construction” for detailed information about bridge construction activities that would take place in Portage Bay.

As described in Chapter 2, the Portage Bay Bridge design could include “faux” (false) arches underneath the bridge deck, which would likely be completed last. This architectural treatment would also require the use of falsework, and additional temporary piles would be needed. Falsework would be necessary to support construction for both the north and south sides of the new bridge. Falsework would be built from the work bridge and would be removed before dismantling the work bridge.

Once the northern portion of the proposed bridge is completed, traffic would be shifted to the new north half of the Portage Bay Bridge to allow demolition of the remaining existing bridge, and for construction of the southern half of the new bridge (columns and superstructure). Construction staging estimates for the Preferred Alternative indicate that the remaining 44 to 45 columns of the existing substructure would be removed during this time. The temporary widening of Portage Bay Bridge that occurred at the beginning of construction would also be removed.

Other construction activities taking place throughout the duration would also include stormwater routing and facility construction, bridge lighting, and roadway striping. After all traffic is shifted to the new bridge and all existing bridge demolition is complete, the north and south work bridges and falsework would be dismantled, including the removal of the remaining piles. Landscaping, site cleanup and demobilization would conclude construction activities in the Portage Bay area.

Montlake Interchange Area

Construction activities and durations in this area would differ substantially among the options. Construction in this area would take approximately 56 months for the Preferred Alternative and Option A, 66 to 70 months for Option K, and 60 to 66 months for Option L. Activities in this area would include roadway reconstruction, excavation, retaining wall and abutment construction, concrete reinforced lid work and paving. Table 3-7 shows the estimated construction durations and quantities for the Preferred Alternative and SDEIS Options A, K, and L in the Montlake area.

Table 3-7. Montlake Interchange Area – Construction Elements and Truck Trips

	Preferred Alternative	Option A	Option K	Option L
Construction duration[a]	56 months	56 months	66 to 70 months	60 to 66 months
Excavation (cubic yards)	181,000	92,000	580,000	164,000
Daily truck trips typical (average) Daily truck trips (peak activity)[b, c]	10 to 30 100 to 290	10 to 30 100 to 290	70 120 to 320	10 to 30 100 to 290

[a]Construction duration does not include mobilization and project closeout.
[b]Estimates for haul truck activity at the SR 520 on-ramps
[c]The Final EIS includes refined estimates since publication of the SDEIS.

Potential staging areas for construction in the Montlake area would be similar to those previously described in the SDEIS. The staging areas would include portions of the green Open Space on the University of Washington campus, the East McCurdy Park/Museum of History and Industry (MOHAI) area (acquired as right-of-way for the project), the unused R.H. Thomson Expressway ramps, the closed Lake Washington Boulevard ramps, and unused WSDOT right-of-way adjacent to SR 520. The following discussion describes the anticipated construction staging for the Preferred Alternative and Option A. Chapter 3 of the SDEIS described in detail the construction activities specific to Options K and L. Those activities are summarized below.

Preferred Alternative and Option A

Under the Preferred Alternative and Option A, the Montlake interchange would be rebuilt at its current location. New bridges over SR 520 at Montlake Boulevard and 24th Avenue East would be constructed and integrated into a new lid that would extend from Montlake Boulevard to just west of the Union Bay shoreline. A new bascule bridge would be built parallel to the existing bascule bridge over the Montlake Cut. Construction activities for the Montlake interchange are expected to last approximately 56 months (not including bascule bridge construction), which is described at the end of this section. Table 3-7 summarizes the major construction quantities for the Montlake Area.

Construction staging in this area is likely to be complex, but generally the interchange will be reconstructed at the same time as lid construction takes place. The north half of the lid would be built first, followed by the south half of the lid. SR 520 mainline improvements would be made throughout the duration of construction. Exhibit 3-9 shows the estimated construction sequence at the Montlake interchange area for the Preferred Alternative, and Exhibit 3-10 shows the sequence for the Montlake Cut and bascule bridge area for the Preferred Alternative and Option A.

Montlake Lid (North Half)

The north half of the new lid would be constructed first. A temporary westbound off-ramp would be constructed so that the existing ramp could be demolished and make room for lid construction. The new lid structure would be constructed on reinforced concrete walls with spread footings located within the widened SR 520 footprint. The walls would support the girders and cast-in-place decks that span over the SR 520 corridor. For safety reasons, SR 520 traffic would be shifted to lanes not under construction when girders are being placed.

Montlake Boulevard and 24th Avenue East Undercrossings

Construction on the Montlake Boulevard and 24th Avenue East undercrossings would be ongoing for the duration of construction, and would be closely coordinated with construction of the lid. During the first year of construction, the existing Montlake undercrossing would be widened, and Montlake Boulevard north and south of the crossing over SR 520 would be temporarily widened to accommodate traffic detours and construction.

As lid construction advances, the Montlake Boulevard undercrossing would be incorporated into the new lid. In order to replace the existing crossing, traffic would be detoured onto portions of the new lid as it is constructed in order to demolish and replace the existing structure.

The 24th Avenue East crossing would be demolished during the first year of construction, and the abutment for the new crossing on the north side of SR 520 would be constructed. Construction staging for this undercrossing would result in a temporary long-term closure of up to 2 years. Construction of the new undercrossing would follow north lid construction activities, and 24th Avenue East would reopen to traffic during the third year of construction.

Main Line and Ramps (Westbound)

Construction of the new westbound mainline lanes and off-ramp would take place concurrently while the north section of the lid structure is completed. Roadway reconstruction would occur in the areas underneath the lid outside of the existing travel lanes between Montlake Boulevard and the eastern shoreline for the westbound lanes and for portions of the westbound off-ramp.

Construction of an Undercrossing

The photos above show the construction sequence of the NE 10th Street crossing above I-405 in Bellevue. The support walls were constructed first within the median and on either side of the main line. The second and third photos depict construction of the superstructure and the roadway slab.

Exhibit 3-9. Montlake Interchange - Construction Sequence for the Preferred Alternative

Exhibit 3-10. **Bascule Bridge - Construction Sequence for the Preferred Alternative**

Traffic would continue to use the temporary westbound off-ramp until the new off-ramp on the lid is completed. Once completed, traffic would be shifted onto the new off-ramp and the Lake Washington Boulevard ramps would be closed. Traffic would be able to access Lake Washington Boulevard via 24th Avenue East, which intersects with the westbound off-ramp to Montlake Boulevard.

Construction of the SR 520 main line under the Preferred Alternative in the Montlake area would progress similar to Option A.

Montlake Lid (South Half)

Once the north half of the main line and lid is completed and SR 520 traffic is shifted, construction of the south half of the Montlake lid would begin. Construction would occur in a similar manner as described for the north half.

Main Line and Ramps (Eastbound)

Construction of the new eastbound lanes and on-ramps would begin at the same time as the south portion of the new lid is constructed. Roadway reconstruction would occur in the areas underneath the lid south of the newly completed travel lanes between Montlake Boulevard and the eastern shoreline.

The eastbound on-ramp would be temporarily widened to add a temporary HOV lane and add capacity. The on-ramp would remain functional until the Montlake lid is almost complete and the new ramps on the lid are ready to accommodate traffic. Montlake Boulevard traffic accessing eastbound SR 520 would be temporarily detoured to the new direct-access ramp on the lid, and the existing eastbound loop ramp would be closed, demolished, and reconstructed in the same location as today.

Bascule Bridge

Construction for the new bascule bridge across the Montlake Cut for the Preferred Alternative and for Option A would take approximately 29 months.

Most construction activities would be staged from the shoreline; however, barges would also be temporarily positioned in the Montlake Cut and stabilized using spud anchors at the corners of the barge, or with the assistance of tug boats. Construction would begin by first installing cofferdams around the area for the new bridge foundations in order to protect the slopes of the Montlake Cut. The cofferdams would be sealed and dewatered, and then the drilled foundations for the piers would be installed. Following shaft construction, the new bridge piers, control towers, and mechanical mechanisms would be constructed. At this time, the new north and south approaches along Montlake Boulevard would be constructed north and south of the Montlake Cut.

The bascule leaf structural steel spans (bridge deck) would either be assembled piece by piece onsite or the entire leaf may be assembled offsite, barged to the project, and installed using barge-mounted cranes. In either case, a barge-mounted crane would lift the bridge sections into position while they are attached to the bridge support structures. As described above, these activities would likely require temporarily closing the Montlake Cut to boat traffic.

If a concrete deck is part of the final design, the deck would be poured after the bascule leaf spans were installed. The new bridge would undergo testing, and then illumination, roadway signing, and striping would be installed along Montlake Boulevard before opening the bridge to traffic.

Option K

Under Option K, the Montlake interchange on- and off-ramps would be removed, and the existing Montlake Boulevard and 24th Avenue East undercrossings would be demolished and replaced with a lid structure. A new single-point urban interchange would be constructed near the MOHAI. The northern ramps of the interchange would tunnel under the Montlake Cut, and the southern ramps would travel through the Arboretum. Because it would be located entirely below the existing grade, this interchange is referred to as a "depressed" single-point urban interchange.

The depressed interchange would be located at the south entrance to the Montlake Cut tunnel, approximately 50 feet below the existing ground surface. The interchange would be contained within a concrete base slab connected to exterior retaining walls. Due to its large size (approximately 800 feet long by 400 feet wide) and depth, it would require extensive excavation. Because the elevation of the interchange would be below the water table, constant dewatering would be needed to prevent water from entering the construction area. A portion of the interchange would extend east of the existing Montlake shoreline and would require placement of about 2.7 acres of fill material in Union Bay.

The extensive excavation and in-water work associated with constructing the depressed interchange would require that traffic on SR 520 be maintained using a temporary detour bridge placed around the excavation area. The 60-foot-wide temporary detour bridge would carry the SR 520 mainline lanes around the work areas and would be supported on hollow steel piles, similar to those used to construct the temporary work bridges. The temporary detour bridge would require approximately 231 temporary piles. This temporary over-water structure would be in place for approximately 4 years.

Two tunnels under the Montlake Cut would connect the interchange to a reconstructed Pacific Street/Montlake Boulevard intersection. Tunnel construction would take place from both ends of the tunnel and would meet at approximately the middle of the cut. Two types of tunnel construction would be employed: cut-and-cover method and sequential excavation method (SEM), a tunnel excavation technique that takes place underground without the use of a tunnel boring machine. Because the soils beneath the Montlake Cut are soft and high in water content, SEM tunnel construction would require freezing the ground to stabilize the soil prior to tunneling

The NE Pacific Street/Montlake Boulevard East intersection would be lowered as part of Option K. A temporary sheet-pile wall would be constructed through the center of the intersection so that excavation could occur on one half, while traffic continued to use the other half. Once the

DEFINITION

Sequential Excavation Method

SEM is a tunnel excavation technique that takes place underground without the use of a tunnel boring machine. The photo above is an example of SEM tunnel construction.

first half is completed, traffic would be shifted and excavation would occur on the second half. After the intersection is complete, the lid superstructure would be constructed on top of the retaining walls. As noted above, the portion of Pacific Street from Montlake Boulevard to just west of the University of Washington Medical Center access driveway would be closed for 9 to 12 months to accommodate the lowering of the Pacific Street/ Montlake Boulevard intersection.

Option L

Under Option L, the existing Montlake interchange would be replaced with an elevated single-point urban interchange (i.e., one in which the ramps pass above the SR 520 main line). The Montlake interchange on- and off-ramps would be removed, and the Montlake Boulevard and 24th Avenue East undercrossings would be demolished and replaced with a lid structure. The new interchange would be constructed near the current location of MOHAI with northern ramps that bridge over the Montlake Cut on a new bascule bridge, and elevated southern ramps that travel through the Arboretum.

Activities for construction of the new lid, undercrossings, and mainline lanes between Montlake Boulevard and the east shoreline would be similar to those described for the Preferred Alternative and Options A and K.

The elevated interchange would be a six-span lid-like structure consisting of concrete superstructure elements, support walls, and spread footings. The structure would connect to the north ramps (crossing the new bascule bridge), the west approach, and the south ramps to Lake Washington Boulevard. It would be approximately 340 feet long from east to west and approximately 350 feet long from north to south. The structure would be supported on spread footings.

Because SR 520 currently occupies the southern portion of the area where the interchange would be built, the northern portion of the structure would be built first. Once this portion is completed, traffic would be shifted before the existing main line is demolished and the southern portion of the interchange constructed.

The new bascule bridge across the Montlake Cut would be constructed by methods similar to those for the new bridge for the Preferred Alternative and Option A. The bascule bridge approaches would be supported by piers on drilled-shaft foundations. The approaches to the bascule bridge would be a two-span bridge structure that would carry the roadway from the bascule bridge to the interchange and to the intersection at Pacific Street. The structure would be located southwest of Husky Stadium in the existing parking lot.

Like Option K, the NE Pacific Street/Montlake Boulevard East intersection would be lowered as part of Option L. Construction of the lowered Pacific Street/Montlake Boulevard intersection would use methods similar to those described for Option K.

West Approach Area

The west approach bridge would travel through Union Bay, across Foster Island, and out into Lake Washington to the beginning of the floating bridge (the west transition span). For the Preferred Alternative and SDEIS options, the new west approach as a whole would be wider than the existing bridge and would be made up of two distinct structures. Westbound traffic and the new bicycle/pedestrian path would be located on the north structure, and eastbound traffic would be located on the south structure. The spans of the new bridges would be longer than those of the existing bridge (i.e., the columns would be farther apart). The increase in span length would result in fewer piers and foundations in the water east of Foster Island. For the Preferred Alternative and all SDEIS options, construction of the new west approach bridge would take between 60 and 70 months. Construction of the new west approach would be closely coordinated with improvements made to the Montlake interchange. Table 3-8 summarizes construction elements and truck trips expected for the west approach area.

Table 3-8. West Approach Area – Construction Elements and Truck Trips

	Preferred Alternative	Option A	Option K	Option L
Construction duration (years)[b]	59 months	59 months	70 months	59 months
Excavation (cubic yards)	55,000	50,000	531,000	77,000
Permanent columns	254	208	993[a]	227
Temporary support piles	2,300	1,990 to 2,040	2,800	1,980
Daily truck trips (average) Daily truck trips (peak activity)[c, d]	30 290	30 290	30 290	30 290

[a]Total number of columns does not include the micropiles that would be used to support Option K single-point urban interchange.
[b]Construction duration does not include mobilization and project closeout.
[c]Estimates for haul truck activity are for Lake Washington Boulevard segment of haul routes.
[d]The Final EIS includes refined estimates since publication of the SDEIS.

Like the Portage Bay Bridge, the new west approach area bridges would require construction of work bridges adjacent to the existing bridge. The work bridges would allow the new bridges to be built in halves so that traffic flow would not be interrupted. Traffic would use the existing bridge until the north half of the new bridge is built, then shift to the new north structure while the existing bridge is demolished and the new south structure is built.

In-water construction would occur from work bridges installed between Montlake and Foster Island, as well as eastward for several thousand feet from Foster Island to a point where water depths would allow construction staging from barges. Work bridges would be constructed on both the north and south sides of the existing west approach structures and along the existing Lake Washington Boulevard ramps. Exhibit 3-11 illustrates the construction sequence for the west approach by year for the Preferred Alternative and Option A. In general, the construction sequence for the Preferred Alternative is similar to the sequence for Option A described in the SDEIS.

Work Bridges (North)

Within the first year of construction, work bridges and finger piers would be constructed along the north sides of the existing west approach through Union Bay and Lake Washington. The first phase of work bridge construction would involve pile-driving in Union Bay and in Lake Washington. These pile-driving activities are expected to occur during a 7-month period. The work bridges would be constructed in a manner similar to those in the Portage Bay area and would be in place for approximately 58 months. Construction barges may also be temporarily anchored in the deeper-water areas to support construction along the west approach.

Permanent Bridges (North)

Once the north work bridges are in place, construction on the northern half of the permanent bridge would begin. The northern half of the west approach in Union Bay and Lake Washington would be constructed from the work bridges. The permanent bridges would have a foundation with drilled shafts and a superstructure with girders and a cast-in-place deck slab. This type of superstructure would minimize the number of piers in the water. See the previous sections entitled *Permanent Bridge Construction* for detailed description of the types of bridge construction activities taking place in the west approach area.

Once the north bridge is completed, both eastbound and westbound SR 520 traffic would be shifted onto the new structure. To maximize roadway width, a portion of the bicycle/pedestrian path would be used temporarily for traffic until the south structure is complete.

Work Bridges (South)

Following construction of the north portion of the new west approach bridge, the south work bridges would be installed. Construction of the south work bridges in Union Bay, and Lake Washington would also include pile-driving activities that would take place over approximately 9 non-consecutive months. Work bridges would also be constructed adjacent to the Lake Washington Boulevard on- and off-ramps to facilitate demolition of the existing ramps.

Exhibit 3-11. **West Approach Area - Construction Sequence for the Preferred Alternative**

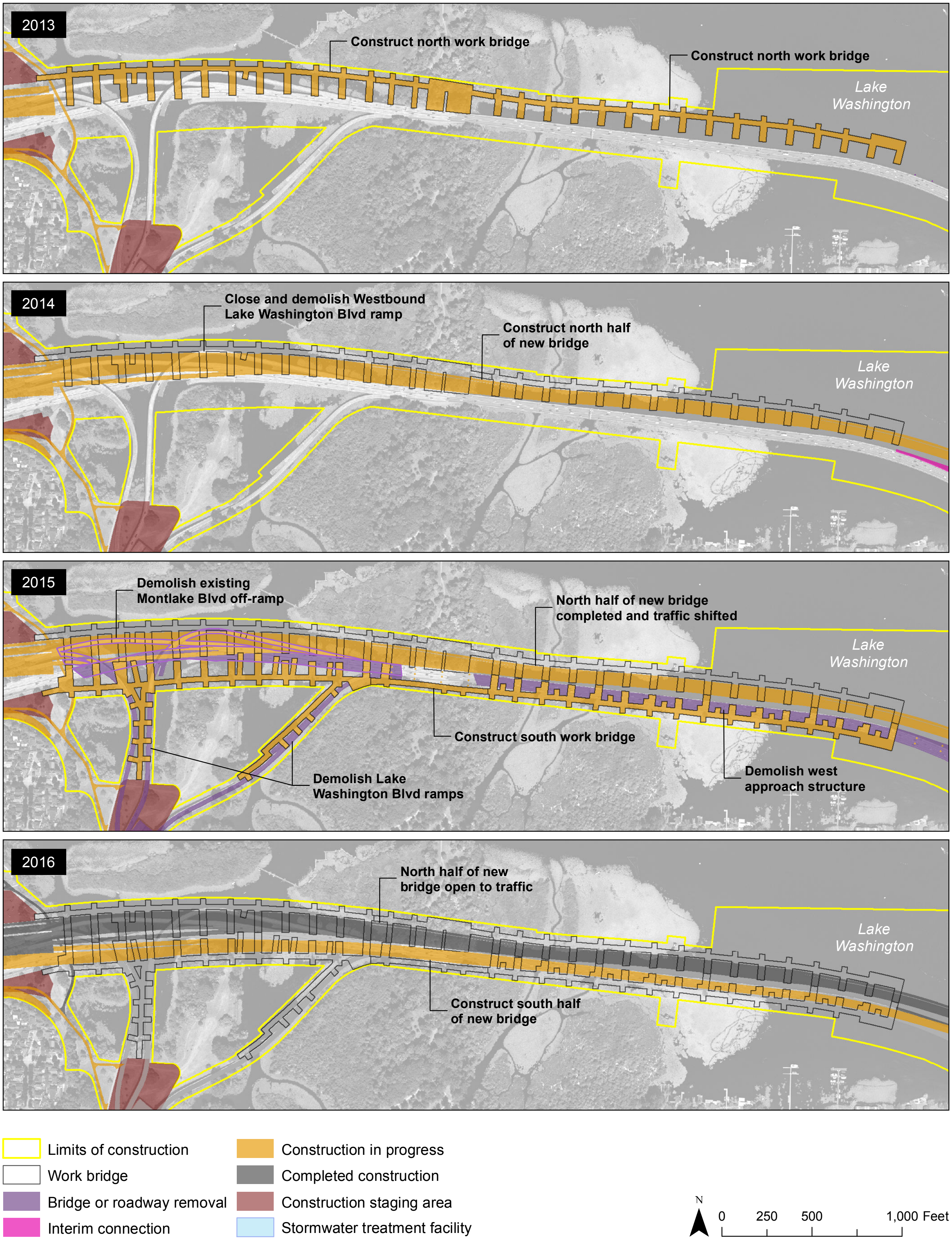
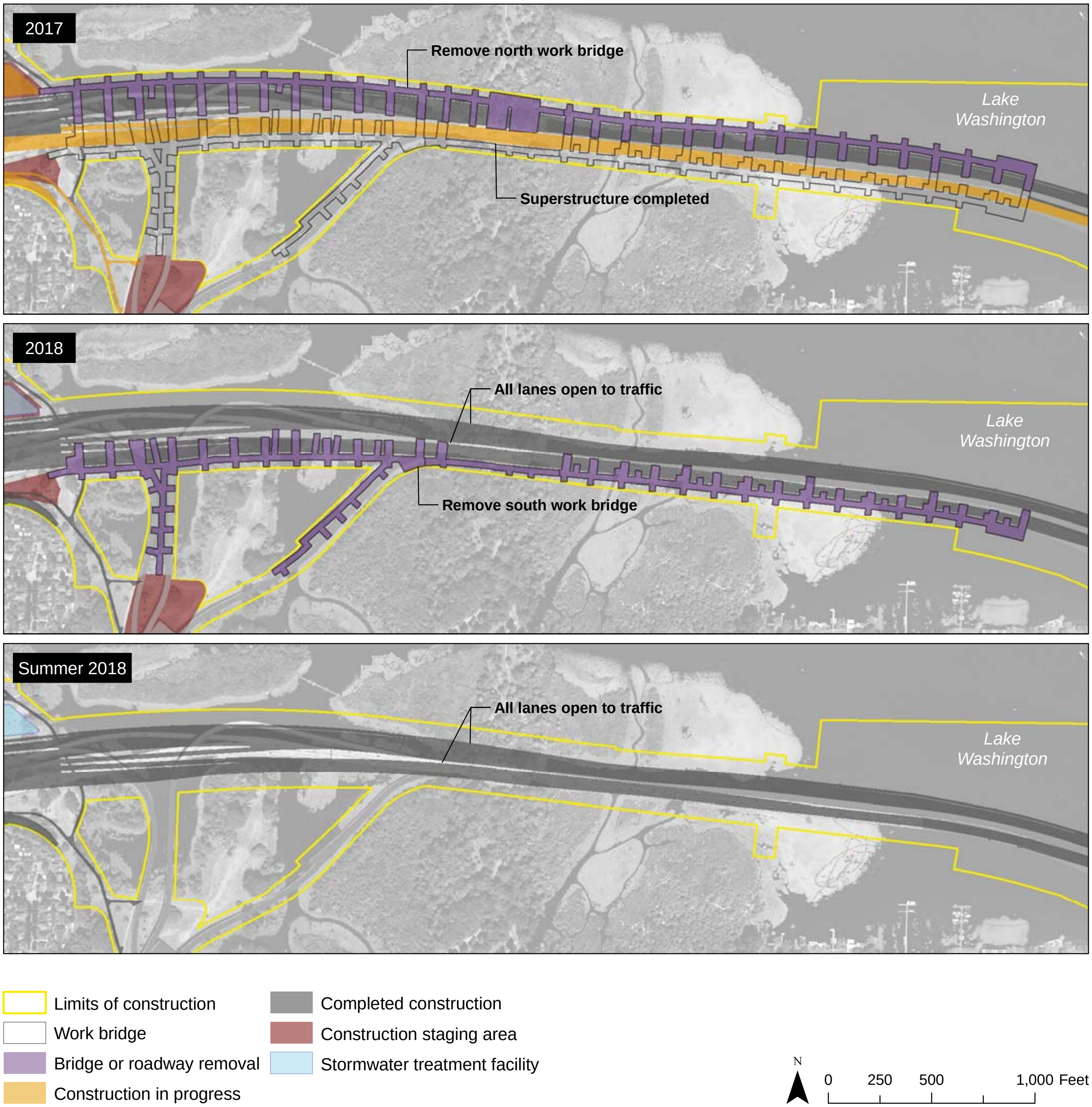


Exhibit 3-11. West Approach Area - Construction Sequence for the Preferred Alternative



Existing Bridge Demolition

Following construction of the north portion of the new west approach bridge, the south work bridges would be installed and the existing bridge would be demolished (see previous section Bridge Demolition and Disposal).

Permanent Bridges (South)

Construction of the southern half of the superstructure would progress into the fourth and fifth construction years. The north work bridges in Union Bay and Lake Washington would be dismantled during this period. Once the southern half is completed, the remaining work bridges would be dismantled and removed. The final stage of construction would consist of site cleanup and demobilization.

Floating Bridge Area

Construction of the floating bridge would be the same for the Preferred Alternative as described for the Options evaluated in the SDEIS.

Pontoons

As described in Chapter 1, WSDOT recognized the urgent need to prepare for catastrophic failure of the Evergreen Point Bridge, and initiated the SR 520 Pontoon Construction Project under an independent NEPA process in January 2008. Construction of 21 longitudinal pontoons, two cross pontoons, and 10 supplemental stability pontoons (33 total pontoons) necessary to replace the existing 4-lane capacity of the bridge in the event of a catastrophic failure was evaluated in the EIS for the SR 520 Pontoon Construction Project. The Final EIS for the SR 520 Pontoon Construction Project was published in December 2010, and the Record of Decision (ROD) was published in January 2011. A pontoon construction facility as described in the Final EIS and Record of Decision is currently under construction in Aberdeen, Washington.

If the floating portion of the Evergreen Point Bridge does not fail before its planned replacement, WSDOT would use the pontoons constructed and stored as part of the SR 520 Pontoon Construction Project for use in the SR 520, I-5 to Medina: Bridge Replacement and HOV Project. The design for the new 6-lane floating bridge would require 21 longitudinal pontoons, two cross pontoons, and 54 supplemental stability pontoons (77 total pontoons). As shown in Table 3-9, the SR 520, I-5 to Medina project would require an additional 44 supplemental stability pontoons beyond those constructed for the SR 520 Pontoon Construction Project. The additional pontoons would be needed to provide buoyancy and stability for the new 6-lane floating bridge. Exhibit 3-12 shows the new pontoon configuration, pontoon dimensions, and floating bridge cross section for the project.

Other Pontoon Size Considerations

If pontoons were smaller, there would need to be more of them to attain the necessary buoyancy and stability to support the bridge superstructure. Using more small pontoons would make the new bridge heavier and deeper than currently designed and would compromise the stability of the bridge. Bridge engineers have sized the pontoons to enable them to fit through the locks in Ballard. The 75-foot pontoon width was set, not as an ideal width for the bridge, but because it is the maximum width pontoon that will fit through the large lock.

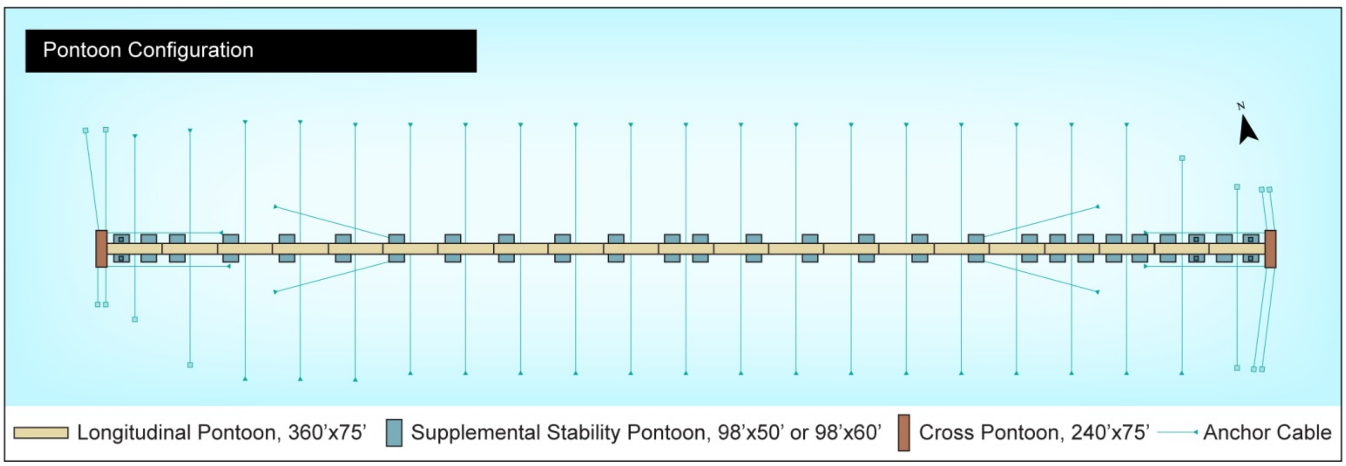
Why are the new pontoons so big?

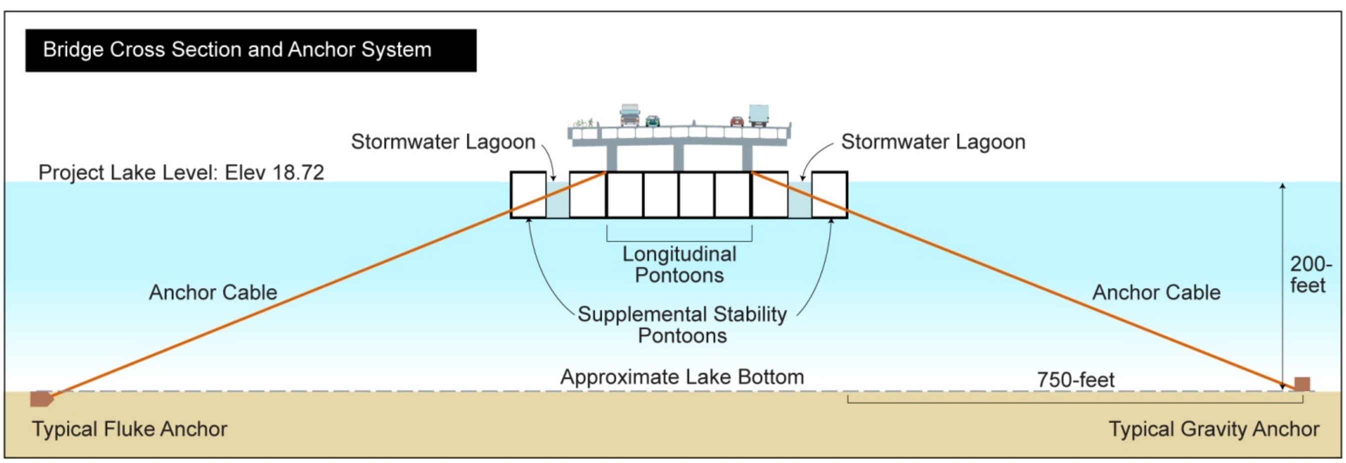
The existing cross pontoons for the floating bridge are 110 feet wide by 60 feet long. The existing longitudinal pontoons are approximately 60 feet wide by 360 feet long. Any replacement bridge design would need to accommodate increased lane width and added shoulders to meet current safety standards. In addition, to eliminate the need for a costly drawspan, improve roadway safety, and facilitate construction and maintenance, the roadway on a new bridge would also be higher (farther above the lake surface) than the current roadway, which is located directly on the surface of the pontoons. The increased width, and height of the roadway, no matter how many lanes, would require larger pontoons to support it.

Table 3-9. Pontoons to be Constructed for Evergreen Point Bridge

	SR 520 Pontoon Construction Project	SR 520, I-5 to Medina Project	Total
Longitudinal pontoons (360-foot-long by 75-foot-wide by 28.5-foot-deep)	21	0	21
Cross pontoons (240-foot-long by 75-foot-wide by 34.5-foot-deep)	2	0	2
Supplemental stability pontoons (98-foot-long by 50- or 60-foot-wide by 28.5-foot-deep)	10	44	54

Exhibit 3-12. **Pontoon and Anchor Configuration**



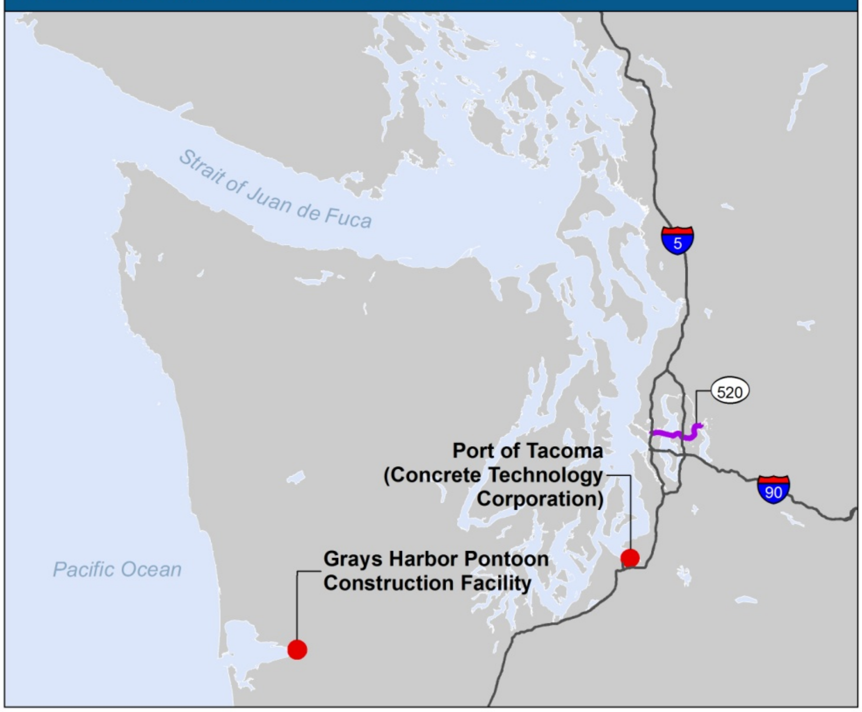


Pontoon Construction and Construction Locations

Pontoons are reinforced concrete structures. To build them, concrete would be poured around steel rebar cages surrounded by wooden or steel forms. When the concrete is set, the forms would be removed and the pontoons would be cured in place. After curing, the pontoons would be launched into open water and towed to Lake Washington for inclusion in the new floating bridge.

The 44 supplemental stability pontoons would be constructed in a casting basin. Construction locations for supplemental stability pontoons include the casting basin at Concrete Technology Corporation (CTC) in Tacoma. If available, the new casting basin facility located in Aberdeen could also be used for supplemental stability pontoon construction. Once the SR 520 Pontoon Construction Project has completed site construction and pontoon production, the casting basin would be available for construction of additional supplemental stability pontoons needed for the SR 520, I-5 to Medina project. Exhibit 3-13 shows the approximate locations of the potential pontoon construction sites.

Exhibit 3-13. Proposed Pontoon Construction Locations



Casting Basin Operation

A casting basin is a large concrete construction area adjacent to a navigable waterway. The interior of the casting basin provides a flat, dry work space where several pontoons can be constructed at the same time. After the pontoons are complete, the basin is flooded in a controlled manner to allow the pontoons to float. When the pontoons are floating, a gate to the basin is opened, allowing tug boats to pull the pontoons out of the basin into the navigable waterway.

The CTC casting basin is located on the Blair Waterway on the eastern edge of Commencement Bay. WSDOT used this facility to construct pontoons for the Hood Canal Bridge Project. The 6.5-acre CTC facility is fully constructed and operating and is routinely used for industrial activities that require a casting basin. The CTC casting basin is located adjacent to an existing concrete batch plant that could serve pontoon-building operations at the CTC and nearby facilities. WSDOT would lease an additional 22 acres at several nearby properties for additional upland construction areas, construction laydown areas, parking areas, and office space to support pontoon construction at the Port of Tacoma.

The casting basin facility at Grays Harbor would have a concrete batch plant, large laydown areas, and water treatment and stormwater systems that would be used and maintained during pontoon construction activities. WSDOT anticipates providing basic water quality treatment for all stormwater runoff at this location, in accordance with WSDOT's *Highway Runoff Manual* (WSDOT 2008).

A permanent dewatering system would be in place during operation of the Grays Harbor facility in order to keep the casting basin dry during pontoon construction. All groundwater leaving the site would be monitored and treated as needed to meet applicable water quality standards before being discharged into the harbor or an approved offsite facility.

The launch channel for the casting basin in Grays Harbor may need periodic maintenance in the form of dredging. This activity would take place within the boundaries of the previously established launch channel, and WSDOT would coordinate with resource agencies to obtain all necessary approvals and permits prior to any in-water maintenance activities. All appropriate BMPs would be employed to minimize effects on the aquatic environment.

Pontoon Towing

Pontoons would be towed by tug boats from Grays Harbor to outfitting or moorage locations and towing would likely be limited to times when the ocean has a maximum wave height of 7 feet. Pontoons would be towed at approximately 4 knots and could take up to two days to travel from Grays Harbor into the calmer Strait of Juan de Fuca.

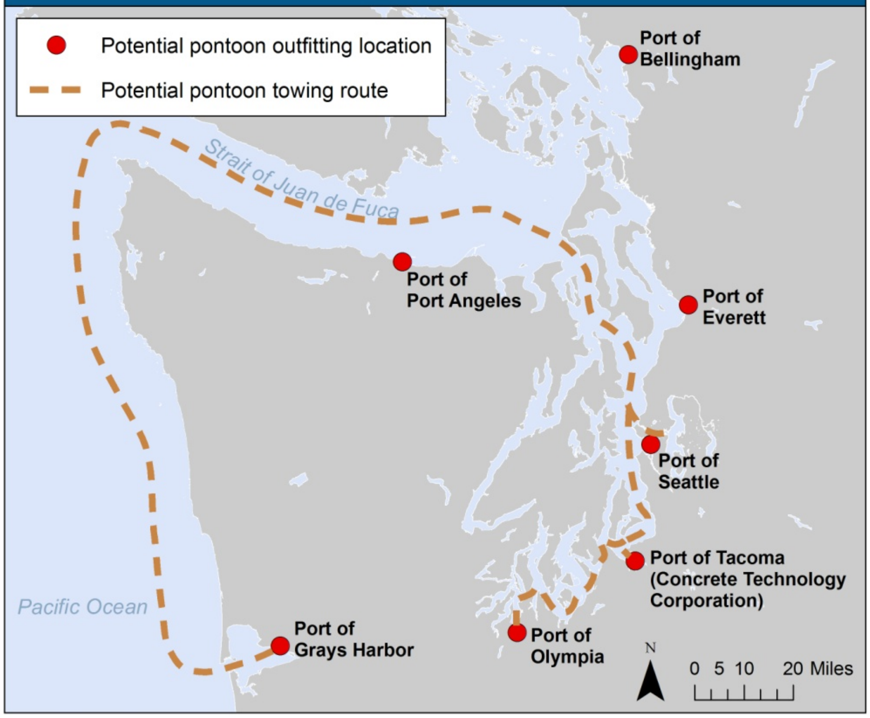
Following outfitting or moorage, pontoons would be towed from the construction or moorage location to the final destination in Lake Washington. Pontoons arriving from Grays Harbor would travel through the Strait of Juan de Fuca into Puget Sound, and enter the Lake Washington Ship Canal at the Ballard Locks. Ocean-going tugs moving pontoons from

What is outfitting?

Pontoon outfitting is a process by which the columns and elevated roadway of the bridge are built directly on the surface of the pontoon. This activity will take place at several possible outfitting locations within Puget Sound, as well as in Lake Washington during construction and placement of the floating bridge.

Grays Harbor north to Puget Sound would follow international rules of right-of-way. Pontoons being towed from CTC would follow typical shipping lanes from the Port of Tacoma to the Port of Seattle, and would also enter Lake Washington via the Ship Canal at the Ballard Locks. Exhibit 3-14 shows the approximate coastal towing route from Grays Harbor, the location of CTC in Commencement Bay, and potential port locations that may be used to outfit the pontoons.

Exhibit 3-14. Potential Pontoon Outfitting Locations and Transport Routes

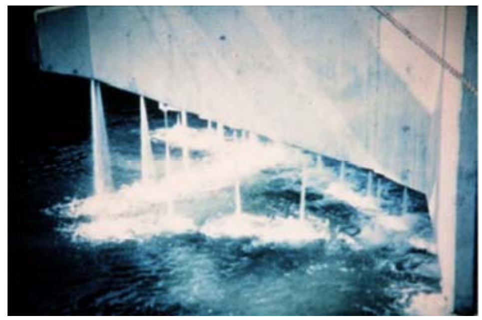


All pontoons would enter Lake Washington through the Lake Washington Ship Canal at the Ballard Locks. The Lake Washington Ship Canal includes Salmon Bay, the Fremont Cut, Lake Union, Portage Bay, and the Montlake Cut. Tug boat(s) could escort one pair of longitudinal pontoons through the Ballard Locks at a time. After passing through the Lake Washington Ship Canal, pontoons would be towed into Lake Washington and placed in the alignment of the new floating bridge.

As many as 23 pontoons may be outfitted at available port locations in Puget Sound. These outfitting locations would be at existing commercial shipping or mooring facilities regularly used by large vessels or barges. Potential port locations include the Port of Bellingham, Port of Everett, Port of Seattle, Port of Tacoma, Port of Olympia, and Port of Grays Harbor. Outfitting of pontoons could take up to 4 months in these port locations and would be consistent with the typical operation of the existing facilities. Once outfitting construction is complete, pontoons would be towed from the port location through the Ballard Locks and into Lake Washington for incorporation in the floating bridge.

Pontoon Installation and Construction on Lake Washington

The new alignment of the floating span would be approximately 190 feet north of the existing bridge at the west end and 160 feet north at the east end. A single row of longitudinal pontoons would support the floating bridge. Floating bridge construction would start from each end of the bridge and progress toward the middle. Pontoon installation and floating bridge construction are described below and shown on Exhibits 3-15 and 3-16. The sequence is based on an estimated schedule.



Fluke anchor with water jets to help embed the anchor into lake bottom.

Construction would begin by first installing the new permanent bridge anchors. Anchors are reinforced concrete structures that would be built offsite (outside of Lake Washington) at an existing industrial facility and transported to Lake Washington using barges. Fifty-eight anchors would be used to secure the new floating bridge pontoons in place. As with the existing bridge, the two main anchor types used would be gravity anchors for harder lake bed materials and sloped areas (approximately 13, near the shores), and fluke anchors for soft bottom sediments and flat areas (approximately 45, middle of the lake).

Fluke anchor

Gravity anchors would consist of large concrete blocks stacked on top of one another to provide the necessary weight to hold the pontoons in place. The number of stacked segments that make up each gravity anchor would vary depending on each anchor location. Gravity anchors could be as large as 30 feet long by 30 feet wide by 20 feet tall.

A fluke anchor is a large concrete structure shaped like a broad triangle. These anchors could be as large as 40 feet long by 20 feet wide by 20 feet tall.

Fluke anchors are constructed out of concrete and rebar using forms, in the same manner that pontoons are constructed. They can be constructed in a casting basin, or in a large industrial yard, and then loaded by crane onto barges for transport to Lake Washington. The anchors are installed using a combination of their own weight and water-jetting to set them below the lakebed surface. Water would be pumped through hoses and jetted through pipes cast into the concrete anchors. As the high-pressure water exits the bottom of the anchor, it liquefies the soft lakebed substrate and allows the anchor to settle into the lakebed sediment.

Both types of anchors would be installed using barge-mounted cranes, and anchors would be connected to the floating pontoons with high-strength steel cables. In addition to these two primary anchor types, shaft anchors would be used in portions of the lake where gravity anchors would present a navigation hazard, or in areas with steep or unstable underwater slopes.

Exhibit 3-15. Evergreen Point Floating Bridge Construction Sequence for the Preferred Alternative and Options A, K, and L

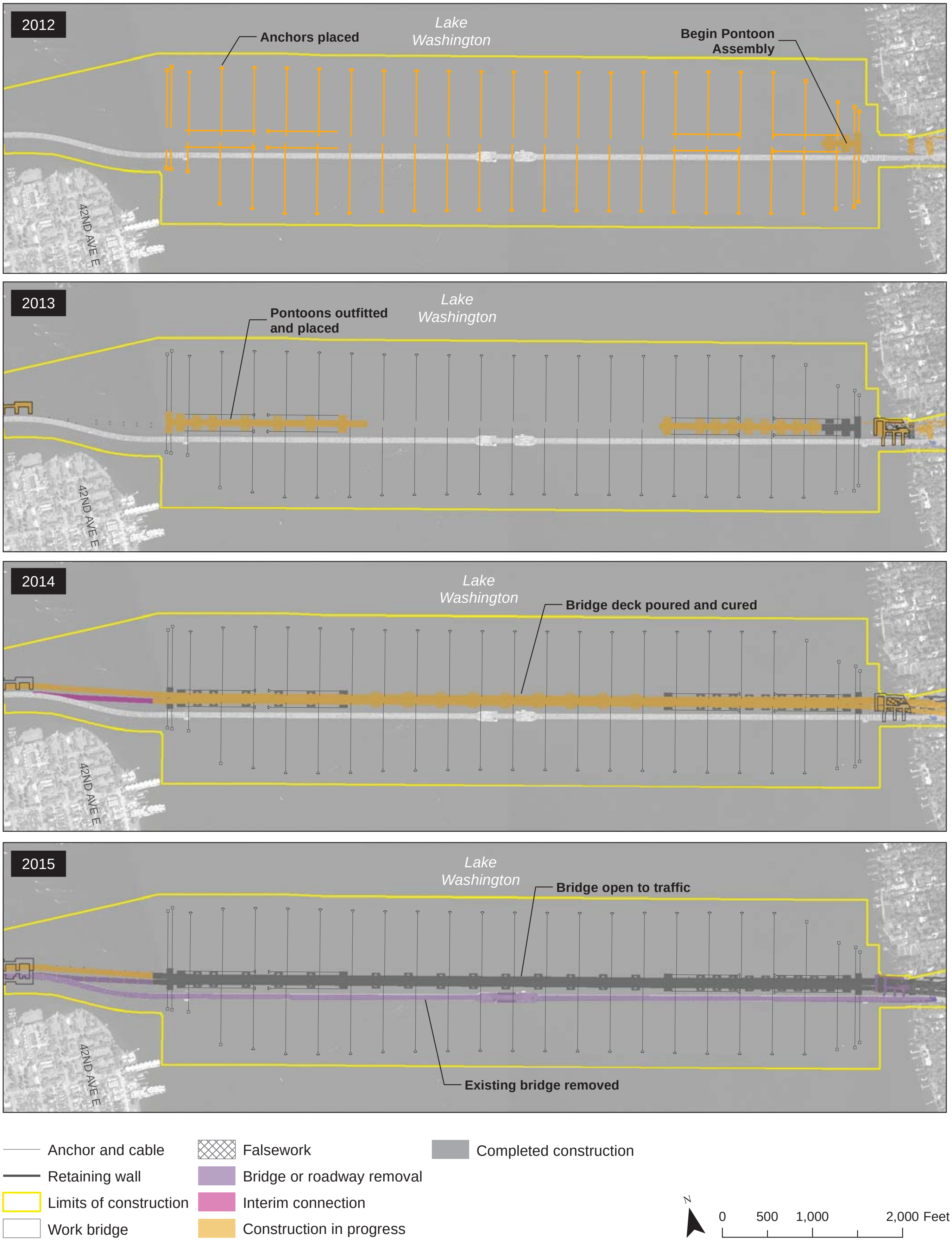
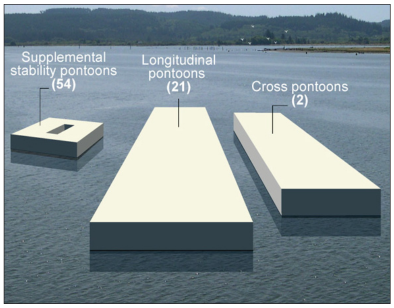
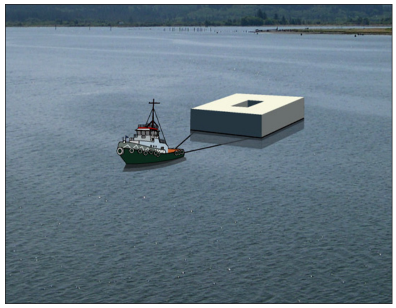


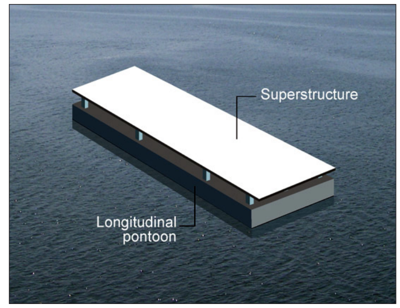
Exhibit 3-16. **Floating Bridge Assembly**



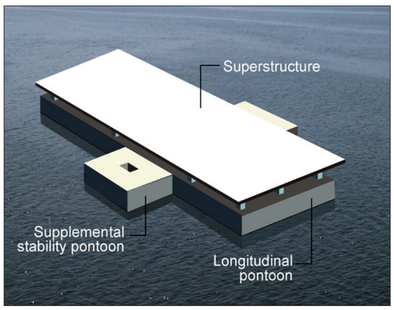
Step 1: Build the necessary pontoons and anchor cables.



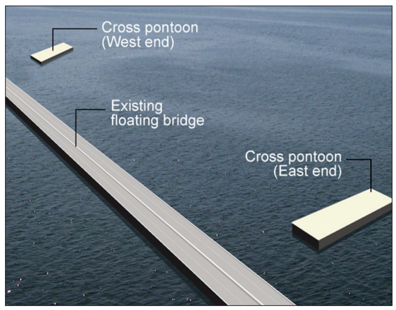
Step 2: Tow pontoons from construction facilities to the Lake Washington area.



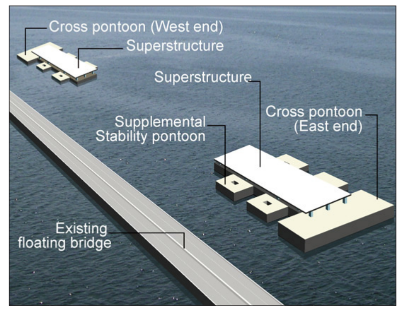
Step 3: Outfit pontoons with a new roadway superstructure on top of each pontoon.



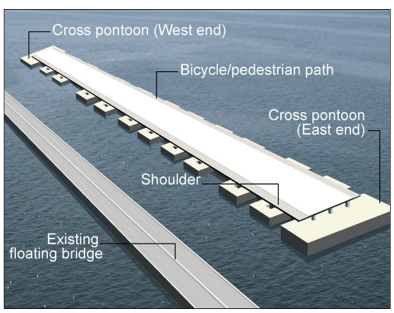
Step 4: Connect supplemental stability pontoons to longitudinal pontoons.



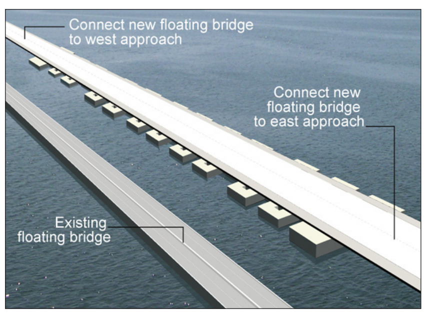
Step 5: Anchor cross pontoons to create the east and west ends of the new floating bridge.



Step 6: Connect pontoons across Lake Washington and secure them with anchors.



Step 7: Complete roadway lanes, shoulders, barriers, and the bicycle/ pedestrian path.



Step 8: Connect new floating bridge to east and west approach bridges.

Step 9: Open new floating bridge to drivers.

Shaft anchors are similar to drilled shaft foundations used for bridge substructure, except that they are used to anchor the pontoons in shallow waters. Shaft anchors would be constructed in the same manner as drilled shaft foundation elements as described earlier in this chapter in the section entitled *Drilled Shafts* (under *Permanent Bridge Construction*).

Some pontoons would arrive at the lake with some bridge structure already in place. The remaining pontoons would need bridge structure constructed on the pontoon once it was placed in the new floating bridge alignment. After the pontoon is outfitted with the bridge substructure and superstructure, the bridge deck would be poured and cured.

Once traffic shifts to the new floating bridge, the existing floating bridge would be dismantled and pontoon sections towed away. Pontoons could be sold for use elsewhere, disposed of, or recycled in accordance with all applicable federal, state, and local requirements. The existing fluke and gravity anchors would be abandoned in place on the lake bed. If practicable, the existing pile anchors could be removed; otherwise, they would also be abandoned in place.

Discussion of the potential effects associated with pontoon construction, transport, and installation is included in Chapter 6 of this Final EIS.

East Approach

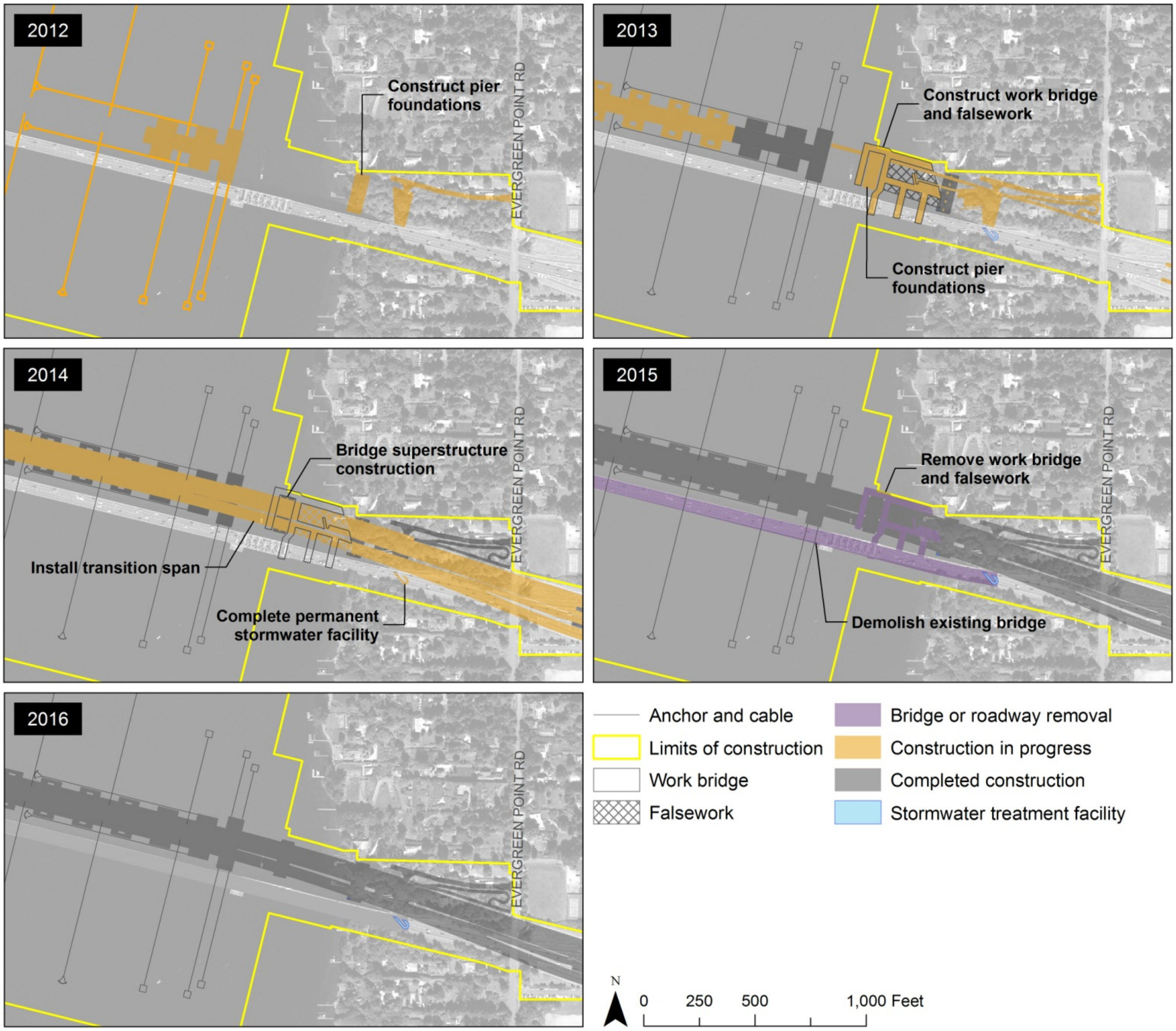
The new east approach of the Evergreen Point Bridge would be located north of the existing bridge. Construction would take place from work bridges and barges, and the westbound (north) side of the east approach structure would be constructed first (Exhibit 3-17). The east approach substructure would consist of drilled shafts, mudline footings (shaft caps), and concrete support columns. The superstructure would also consist of cast-in-place concrete girders and the roadway deck.

Work bridge construction would involve driving up to 165 piles in Lake Washington. These pile-driving activities are expected to occur during a 3- to 4-month period. Once the work bridge is completed, the foundation of the east approach and the maintenance facility dock would be installed.

The foundation of the east approach would consist of two piers. The first pier would be approximately 350 feet out in the water from the shoreline and the second pier would be onshore, several feet from the shoreline. Each pier foundation would consist of approximately ten 10-foot-diameter drilled shafts and two (mudline) footings to support the five bridge columns. Construction of the in-water pier would take place within a cofferdam.

During the third year of construction, the bridge superstructure would be completed from the work bridges, barges, and land access. The westbound transition span between the floating portion and the Eastside transition area would be installed. Both the north and south structures would be completed prior to shifting traffic onto the bridge. The new east approach and floating bridge are expected to be open to traffic in December of 2014.

Exhibit 3-17. **East Approach Area Construction Sequence for the Preferred Alternative and Options A, K, and L**



Demolition of the existing east approach bridge would occur during the final year of construction. With the completion of the new superstructure and demolition of the existing structure, the work bridges and falsework would be dismantled and the 165 piles removed. The final stage of construction would consist of site cleanup and demobilization.

Table 3-10 shows estimated details for different construction elements associated with the east approach.

Table 3-10. East Approach Area Construction Elements including Bridge Maintenance Facility

East Approach	Preferred Alternative and Options A, K, and L
Construction duration	41 months
Excavation (cubic yards)	44,200
Peak barge activity (square feet of barge coverage during peak construction	2,880
Daily truck trips (typical average)	2 to 20
Daily truck trips (peak)	10 to 100

Bridge Maintenance Facility

The project would also include construction of a bridge maintenance facility under the proposed east approach structure. It would consist of an upland facility constructed in the hillside under the proposed approach structure, as well as a working dock (see Exhibit 2-24). The new bridge maintenance facility would be built at the same time as the east approach structure. Permanent and temporary access roads, retaining walls, and the dock substructure would be constructed while the westbound portion of the east approach structure is being built.

The maintenance dock would be located underneath the new east approach to the Evergreen Point Bridge. The proposed maintenance dock would allow WSDOT workboats to support emergency preparedness and essential proactive maintenance activities on a daily basis. The dock would extend no more than 100 feet from the shoreline, with a width of approximately 10 feet. The new dock design would include a moorage berth at the end of the dock. The dock deck may be constructed out of textured concrete and/or include metal grating, allowing sunlight to penetrate underneath the deck.

Eastside Transition Area

Once the east approach, transition span, and floating portions of the Evergreen Point Bridge have been replaced, the SR 520, I-5 to Medina project would grade and pave the section of roadway between the east approach and Evergreen Point Road to transition into the SR 520, Medina to SR 202: Eastside Transit and HOV Project. The Evergreen Point Road Freeway Transit Station would be located to the Evergreen Point lid.

In order to make ramps and lanes connect for proper traffic operations, the SR 520 main line would be restriped beginning at the physical improvements completed near Evergreen Point Road and extending east to 92nd Avenue NE. Restriping efforts may include sand-blasting to remove existing paint lines.