Chapter 2: Alternatives

This chapter provides a detailed description of the 6-Lane Alternative and design options evaluated in this Supplemental Draft EIS (SDEIS). The SDEIS evaluates the 6-Lane Alternative with three design options—Options A, K, and L—and a No Build Alternative. We describe the No Build Alternative first because it serves as a basis for comparison.

2.1 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 2-1). 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 No Build Alternative would not be tolled.

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.
2.2 What is the 6-Lane Alternative?

The 6-Lane Alternative would widen the SR 520 corridor to six lanes (Exhibit 2-2) 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, Portage Bay Bridge, and west approach with new structures. The 6-Lane Alternative would complete the regional HOV lane system across SR 520, as called for in regional and local transportation plans. Major features of the 6-Lane Alternative are described below; variations among design options A, K, and L are addressed in Section 2.3.

Exhibit 1-6 shows the project limits and identifies the portions of the project within three larger study areas: Seattle, Lake Washington, and the Eastside. Within these limits, 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 (Exhibit 2-2). The roadway cross-section would be 115 feet wide, compared to the existing width of 60 feet (shown in Exhibit 2-1). 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. Readers should note that this is a typical cross-section; overall roadway width varies from location to location depending upon ramp configurations.

The 6-Lane Alternative also includes:

- Landscaped lids over the highway
- A regional bicycle and pedestrian path
- Noise reduction measures
- A bridge maintenance facility
- Stormwater treatment facilities
Lids and Landscape Features

The 6-Lane Alternative includes lids in up to five locations:

- I-5/East Roanoke Street
- 10th Avenue East and Delmar Drive East
- Montlake vicinity (design and location vary by option)
- 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 6-Lane Alternative 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. On the west side of the lake, 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 lids 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 connect to a proposed new trail in the Arboretum, creating a loop trail. 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 bicycle/pedestrian path along SR 520 west of Montlake Boulevard.

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. WSDOT’s practice is to work with the owners of these properties during detailed project design to determine the mitigation measures that will be used.

The mediation group recommended 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. Although these recommendations reflect the preferences of the mediation participants, they do not affect FHWA’s and WSDOT’s responsibility to identify and consider effective noise abatement measures under existing laws.

Noise modeling done for the project indicates that noise walls would meet all FHWA and WSDOT requirements for avoidance and minimization of negative effects. Quieter pavement has not been demonstrated to meet these requirements in tests performed in Washington state, and therefore cannot be considered as noise mitigation (see Section 5.7 for additional information on the performance of quieter pavement). The SDEIS evaluates all of the design options both with and without noise walls. WSDOT and FHWA will work with the affected property owners after a design option is selected to make a final determination of reasonable and feasible mitigation measures for project-related noise effects.

**Stormwater Treatment**

The 6-Lane Alternative 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. Table 2-1 identifies which facility types are proposed for each project area drainage basin.

<table>
<thead>
<tr>
<th>Drainage Basin</th>
<th>Type of Proposed Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Union</td>
<td>Stormwater treatment wetland and media treatment vaults.</td>
</tr>
<tr>
<td>Portage Bay</td>
<td>Stormwater treatment wetlands and media filter vault.</td>
</tr>
<tr>
<td>Union Bay</td>
<td>Treatment wetlands, a media filter vault, and biofiltration swale.</td>
</tr>
<tr>
<td>Lake Washington</td>
<td>Media filter vaults and biofiltration swale. High-efficiency sweeping is proposed on the new floating bridge and approach structures.</td>
</tr>
</tbody>
</table>

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 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, but if used as part of a stormwater treatment train, the system achieves the pollutant removal goals of enhanced treatment. A stormwater treatment train is a series of BMPs, each designed to treat a different aspect of runoff.

**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 or tunnel 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.

**Tolls**

The 2006 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. The SDEIS also assumes that SR 520 would be tolled to fund construction. As described in Chapter 1, the 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, with exemptions for transit and HOVs with three or more riders.

These assumptions are used as a basis for comparison among the design options. How tolls would actually be applied (i.e., in segments or at a single point in the corridor), as well as the actual toll rates, will be determined by the Transportation Commission after the final project financing plan is developed. Since the traffic modeling assumptions were applied consistently across the design options, they show the relative performance of each option in comparison to No Build. The Final EIS will update the traffic modeling with updated tolling assumptions, as described in Chapter 1.
Chapter 5 provides more information about how tolling affects traffic operations.

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 be billed by mail.

2.3 What are design options A, K, and L?

This SDEIS evaluates three design options—Options A, K, and L—for the 6-Lane Alternative. The greatest physical difference among the options is in the location of the interchange in the Montlake area (see Exhibit 1-7) and in the profile of the west approach. The options can be summarized as follows:

- Option A is most similar to today’s configuration in terms of its geometry, although wider. It maintains the existing location of the Montlake interchange and adds a new bascule bridge over the Montlake Cut, parallel to the existing Montlake Bridge.
- Option K includes a new SPUI 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 would also include 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.

All options place an emphasis on multimodal transportation by decreasing reliance on single-occupant vehicle travel and facilitating transit connections. All options would improve the overall flow of SR 520 traffic compared to No Build. Each would include the common features described above—such as lids and landscaped features, stormwater treatment, and a regional bicycle/pedestrian path—although the specific details of those features differ among the options. While the design options vary mainly in the Montlake area, there are also some variations in other portions of the corridor. They include the number of lanes 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. For all 6-Lane Alternative options, the intersections and ramps in the SR 520/Montlake Boulevard interchange area would be configured to meet the transportation needs identified for the project. 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 description and evaluation of Options A, K, and L in this SDEIS are organized by three study areas along the project corridor: Seattle, Lake Washington and the Eastside. Within these larger areas, project elements across all three options are described by geographic area, as identified in Exhibit 1-6 and Table 1-1. The project features for each design option are described under the geographic area headings, so that the differences among options can be easily identified and compared.

I-5 Area

Under all options, the SR 520 and I-5 interchange ramps would be reconstructed in generally the same configuration as the ramps for the existing interchange (Exhibit 2-3). 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.

The I-5 interchange lane configuration is shown in Exhibit 2-4 and described below:

- The westbound SR 520 to northbound I-5 ramp would be one lane, with one lane diverging to East Roanoke Street (same as today).
- The westbound SR 520 to southbound I-5 ramp would be two lanes (same as today).
- The southbound I-5 to eastbound SR 520 ramp would be a one-lane ramp that connects to SR 520 through a tunnel under I-5 (same as today).
- 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.

Under all options, the three local roadway overcrossings (East Roanoke Street, 10th Avenue East, and Delmar Drive East) would be rebuilt as part of lid structures within generally the same alignment and with a similar vertical profile as today (East Roanoke Street would be slightly higher).
As described below and shown on Exhibit 2-4, the lane configuration would change slightly from the existing layout (Exhibit 2-3), as follows:

- The East Roanoke Street bridge over I-5 would be replaced with a 70-foot-wide structure (5 feet wider than today) as part of the new I-5/Roanoke lid. The new crossing would include four lanes (two in each direction), sidewalks, and shoulders. The I-5/Roanoke lid would span I-5 at Roanoke Street. The lid would function as a vehicle and pedestrian crossing, a landscaped area, and open space. The lid would be approximately 435 feet long and would provide connections between the north Capitol Hill, Roanoke, and Eastlake neighborhoods.

- The 10th Avenue East bridge over SR 520 would be replaced with a 100-foot-wide structure (40 feet wider than today) as part of the new 10th Avenue East/Delmar Drive East lid. The new crossing would include four lanes (two in each direction), planter strips, sidewalks, and shoulders.

- The Delmar Drive East bridge over SR 520 would be replaced with a 50-foot-wide structure (same width as today). The new crossing would include two lanes (one in each direction) and shoulders, curbs, and gutters. In addition, 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.

The sides of the lid along Boylston Avenue and along both sides of Roanoke Street would rise to 5 to 6 feet above the sidewalks. The lid would extend to the east and end in a wall. Lid height would increase from west to east to accommodate the difference in east-west elevation across I-5, making the Boylston Street side (west) approximately 10 feet lower than the eastern edge. The change in height could be accomplished by a stepped or smoothly-sloped lid surface.

Because the west edge of the lid would be higher than street level, stairs and ramps would be required to connect sidewalks to the lid surface. One idea discussed in mediation is to build a parking lot with a driveway entrance at the southwest corner of Roanoke and Boylston. A driveway would connect the top surface of the lid to Boylston Avenue East.

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 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.

During design planning, the community identified pedestrian connections and improved traffic flow as the two most important purposes for this lid. The lid would incorporate additional pedestrian connections between 10th Avenue East and Delmar Drive, redevelopment of the path from Bagley Viewpoint to Boyer Way, redevelopment of the Bagley Viewpoint Park, and vista points to overlook Lake Union, Portage Bay, and the panoramas east-and westward. Also important is the lid's integration with the Roanoke Park historic district, located immediately to the north. WSDOT is collaborating with neighborhood representatives under Section 106 of the National Historic Preservation Act to ensure that planning for the lid considers the character of the district.

**Portage Bay Area**

The existing bridge layout is shown on Exhibit 2-5. Under all 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 (Exhibit 2-6), 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 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 freeway. As shown in Exhibit 2-6, the new Portage Bay Bridge under Option A would have 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 (which would not have the auxiliary lane). Because there would be no on- and off-ramps to Montlake Boulevard with Options K and L, the Portage Bay Bridge would be narrower at its eastern end than under Option A. Table 2-2 provides a comparison of the existing bridge characteristics and the new bridge proposed under each option.

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 2-7, the new bridge would be about 12 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. Members of the mediation group identified preferences for aesthetic treatment of the bridge. 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 (i.e., concrete elements made to look like arches, although the bridge would be supported by girders
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Exhibit 2-6. Portage Bay Area

Option A

West end of bridge

Portage Bayshore Condominiums

Queen City Yacht Club

Seattle Yacht Club

East end of bridge

Options K and L

West end of bridge

Portage Bayshore Condominiums

Queen City Yacht Club

Seattle Yacht Club

East end of bridge

Columns

Proposed bicycle/pedestrian path

Signalized intersection

General-purpose lane

Existing regional bicycle/ pedestrian path

HOV, direct access, and/or transit-only lanes

Bridge limits

Lid or landscape feature

Stormwater treatment facility

Pavement
rather than by the arches). For Option L, the bridge type and treatment would be determined later; however, in the SDEIS it was analyzed with faux arches.

### Table 2. Comparison of Portage Bay Bridge Options

<table>
<thead>
<tr>
<th></th>
<th>Existing Structure</th>
<th>Option A</th>
<th>Option K</th>
<th>Option L</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Width (feet)</strong></td>
<td>61 to 75</td>
<td>110 to 165</td>
<td>100 to 144</td>
<td>100 to 146</td>
</tr>
<tr>
<td><strong>Span length (feet)</strong></td>
<td>100</td>
<td>100 to 300</td>
<td>100 to 300</td>
<td>100 to 300</td>
</tr>
<tr>
<td><strong>Total number of columns</strong></td>
<td>119</td>
<td>66 to 72</td>
<td>56 to 62</td>
<td>56 to 62</td>
</tr>
<tr>
<td><strong>Column size (diameter in feet)</strong></td>
<td>4.5</td>
<td>5 to 9</td>
<td>5 to 9</td>
<td>5 to 9</td>
</tr>
<tr>
<td><strong>Number of columns in water</strong></td>
<td>89</td>
<td>46 to 50</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

Note: The bridge characteristics for Portage Bay are based on mediation group recommendations. The table shows a range for the numbers and size of columns for Portage Bay Bridge due to the potential variations in bridge design.

### Montlake Area

As discussed previously, many of the key differences between the 6-Lane Alternative design options occur within the Montlake area. The differences can be summarized as follows:

- Option A is most similar to today's configuration. It maintains the existing location of the Montlake interchange and adds a new bascule bridge over the Montlake Cut, parallel to the existing Montlake Bridge.
Option K includes a new SPUI 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 would also include 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 existing interchange layout is shown on Exhibit 2-8.

![Exhibit 2-8. No Build Alternative - Montlake Area](image)

**Option A**

Under Option A, 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. The new interchange design would include 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. The proposed lane configuration is similar to today’s. It is shown on Exhibits 2-9 and 2-10 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 tapers off the main line and becomes three lanes at Montlake Boulevard (one more lane than today).

**Interchange Design**

For all 6-Lane Alternative options, 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.
The westbound off-ramp would be two lanes that taper off the main line and become three lanes at Montlake Boulevard (two more lanes than today).

The westbound on-ramp would be two lanes that merge into one lane west of Montlake Boulevard (one more lane than today). 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.

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.

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 both directions 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 2-9 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 2-10). 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 2-11). 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 tallest walls may be benched and stepped, as shown in Exhibit 2-11.

The new interchange design would include 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 would be 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 splits 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 where it daylights, the three existing legs at the Montlake Boulevard/NE Pacific Street intersection would need to be lowered and reconfigured. As shown in Exhibit 2-9, the new intersection design would include adding a new seven-lane approach.
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Exhibit 2-9. Montlake Area

Option A

- Columns
- Signalized intersection
- Existing regional bicycle/pedestrian path

- Proposed bicycle/pedestrian path
- General-purpose lane
- HOV, direct access, and/or transit-only lanes

- Lid or landscape feature
- Stormwater treatment facility
- Pavement

Future UW Link
Light Rail Station

Existing signal

New signal

Existing signal

Existing signal

 Existing signal

255 Feet

Exhibit 2-9.
Montlake Area

1

2

1

2

SR 520, I-5 TO MEDINA: BRIDGE REPLACEMENT AND HOV PROJECT | SUPPLEMENTAL DRAFT EIS 2-16
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Exhibit 2-9. Montlake Area

- Existing signal
- New signal
- Future UW Link Light Rail Station
- Existing regional bicycle/pedestrian path
- Proposed bicycle/pedestrian path
- HOV, direct access and/or transit-only lane
- Stormwater treatment facility
- Lid or landscape feature
- General-purpose lane
- Tunnel
- Pavement

Columns

SR 520, I-5 TO MEDINA: BRIDGE REPLACEMENT AND HOV PROJECT | SUPPLEMENTAL DRAFT EIS
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 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.

In addition to the improvements described above, a full or partial lid would be constructed at the Pacific Street/Montlake Boulevard intersection to
maintain pedestrian and bicyclist connectivity. If a partial lid were constructed, the center area of the intersection would remain uncovered and a ring of walkways would be provided around an uncovered portion. If a full lid were constructed, it would also allow diagonal crossings across the lid.

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 2-9). 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 2-9). 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.

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 2-9, 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. The SPUI interchange configuration (Exhibit 2-12) 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 bascule bridge and connect to a reconstructed Pacific/Montlake intersection near the University of Washington.

As shown on Exhibit 2-9, 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 2-9). 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.

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 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 2-13. The structures in the west approach area would be widest with Options K and L where the SPUI on- and off-ramps would begin to taper into the main line. The profile of the west approach would also be altered, with height differences among the options. Option K would maintain the lowest profile, with a lower profile than the existing highway at Foster Island where the freeway would pass under a land bridge.

---

**Bridge Width and Columns West of Foster Island**

The configuration of the west approach between Montlake and Foster Island is driven by the profile of the roadway, the width of the structure, and the design of the Montlake interchange. Generally speaking, very low profiles require shallow structures to maintain all necessary clearances under the bridge, and more smaller-diameter columns to support the structure.

Option A would require the least number of in-water columns within Union Bay because it has a higher profile and narrower width. This option is narrower than the others because the Montlake interchange would remain in its existing location, and would not require the same kind of ramp tapers within Union Bay needed for a SPUI.

Option K would require the most in-water columns because it has a very low profile through Union Bay, and is a very wide structure. The low profile would accommodate the low roadway at Foster Island resulting from the land bridge, and the Montlake shoreline where the SPUI and tunnel approach would be located. The wide structures would be required for the on- and off-ramps serving the SPUI.

Option L would be wider and lower than Option A, primarily because the on- and off-ramps serving the SPUI influence the bridge design in this area.
The new structures for all options would be supported by concrete columns that would vary in size and number. Because of its low profile through the Arboretum, Option K would require the most columns. Table 2-4 provides a comparison between the existing structure characteristics and each option. Under all 6-Lane Alternative options, the existing Lake Washington Boulevard eastbound on-ramp and westbound off-ramp and the R.H. Thomson Expressway ramps would be removed.

**Option A**

Under Option A, the bridge structure through Union Bay would be wider than today’s (Table 2-3 and Exhibit 2-14). 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 2-15). 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 2-15).

**Option K**

Under Option K, the new bridge structure across Union Bay would begin approximately 900 feet east of the SPUI, and would maintain a low profile, dipping slightly below ground across Foster Island (Exhibit 2-15 and Table 2-3). 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 2-14).

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.
Table 2 3. West Approach Structures

<table>
<thead>
<tr>
<th>Bridge Structure Between Montlake and Foster Island</th>
<th>Existing Structure</th>
<th>Option A</th>
<th>Option K</th>
<th>Option L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width (feet)</td>
<td>60 to 150</td>
<td>147 to 205</td>
<td>192 to 250</td>
<td>199 to 270</td>
</tr>
<tr>
<td>Typical span length (feet)</td>
<td>100</td>
<td>112 to 140</td>
<td>20 to 65</td>
<td>63 to 140</td>
</tr>
<tr>
<td>Estimated total number of columns</td>
<td>237</td>
<td>98</td>
<td>782</td>
<td>155</td>
</tr>
<tr>
<td>Typical column size (diameter in feet)</td>
<td>4.5</td>
<td>6</td>
<td>2.5</td>
<td>6</td>
</tr>
<tr>
<td>Estimated number of columns in water</td>
<td>176</td>
<td>71</td>
<td>733a</td>
<td>117</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bridge Structure Between Foster Island and Floating Bridge</th>
<th>Width (feet)</th>
<th>60</th>
<th>115</th>
<th>115 to 162</th>
<th>115 to 167</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical span length (feet)</td>
<td>100</td>
<td>140</td>
<td>30 to 140</td>
<td>140 to 350</td>
<td></td>
</tr>
<tr>
<td>Estimated total number of columns</td>
<td>228</td>
<td>110</td>
<td>211</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Typical column size (diameter in feet)</td>
<td>4.5 to 9</td>
<td>6</td>
<td>2 to 7</td>
<td>7 to 9</td>
<td></td>
</tr>
<tr>
<td>Estimated number of columns in water</td>
<td>228</td>
<td>110</td>
<td>211</td>
<td>72</td>
<td></td>
</tr>
</tbody>
</table>

*a Total number of columns does not include fill for the portion of the interchange east of Montlake 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 construct 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.
Exhibit 2-15. West Approach Profiles

**Option A Profile**

- **Existing Profile**
- **Existing Ground**
- **Water Level**

Note: Vertical scale is exaggerated. The profile of Option A could be adjusted to have a constant slope like Option L’s below.

**Option K Profile**

- **Existing Profile**
- **Foster Island Land Bridge**
- **Existing Ground**
- **Water Level**

Note: Vertical scale is exaggerated.

**Option L Profile**

- **Existing Profile**
- **Existing Ground**
- **Water Level**

Note: Vertical scale is exaggerated.
The land bridge would be landscaped and would provide views of the lake. New trees would be planted on the north and south sides of the land bridge to screen the structure and blend with the remaining existing woods. The Arboretum Waterfront Trail would be reconstructed to pass over the land bridge.

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).

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, as opposed to 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 continue east until the bridge elevation meets the required elevation at the new transition span.

**Suboptions to Options A, K, and L**

Options A, K, and L each include potential “suboptions.” These are specific design details that would have minor effects on the project footprint (Exhibit 2-16) and could be added to the design options singly or in combination. While they generally differ only minimally from the basic design options, they have been analyzed in this SDEIS to determine their transportation benefits and environmental effects. The conclusions from this analysis have been placed in sidebars throughout Chapters 5 and 6 where relevant.

The suboptions for Option A (all included in Option A+) are:

- Add an eastbound HOV direct-access on-ramp from Montlake Boulevard.
- Add a Lake Washington Boulevard eastbound on-ramp and westbound off-ramp.
Chapter 2: Alternatives

Exhibit 2-16. Montlake Area Options A, K, and L with the Suboptions

Option A with added Lake Washington Boulevard ramps and eastbound direct access on ramp.

Option K with added eastbound off ramp to Montlake Boulevard.

Option L with added capacity on Montlake Boulevard north of NE Pacific Street.

**Area of Detail**

- Signalized intersection
- Existing trail/bicycle path
- Suboption
- General-purpose lane
- Proposed bicycle/pedestrian path
- HOV, direct access, and/or transit-only lane
- Lid or landscape feature
- Existing right-of-way
- Pavement

**Stormwater treatment facility**

- **Option L with left turn access.**
  - Left turn access to SR 520 from Lake Washington Blvd

**Exhibit 2-16**

Montlake Area Options A, K, and L with the Suboptions

**Legend**

- **SR 520, I-5 to Medina: Bridge Replacement and HOV Project | Supplemental Draft EIS**

2-28
Use the Option L roadway profile for improved stormwater management.

Option K has 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 are:

- 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 selected design option may include one or more of the suboptions described above. For example, if Option A+ is selected, it would include an eastbound HOV direct-access ramp, Lake Washington Boulevard ramps, and the Option L roadway profile. The evaluation of the suboptions in this document is designed to inform decisions on the final configuration of a selected design option.

**Floating Bridge Area**

Exhibit 2-17 shows the alignment of the floating bridge and its connections to the west and east approaches. The alignment and elevation of the floating bridge are the same as those evaluated in the Draft EIS. 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. The roadway would be about 22 feet higher than the existing bridge deck. A 14-foot-wide bicycle and pedestrian path with five scenic vantage points and pullouts would be located on the north side of the bridge.

**Pontoon**

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 2-17 shows the pontoons’ locations and dimensions. Table 2-4 compares the dimensions of the existing pontoons and bridge with those of the proposed 6-Lane Alternative. The new longitudinal pontoons would be larger than the existing ones to provide the flotation needed for wider lanes and shoulders; the supplemental stability pontoons would provide additional buoyancy for the 6-lane configuration.

![What are the advantages of an elevated floating bridge deck on the Evergreen Point Bridge?](image)

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. Presently, 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.
Table 2.4. Area and Dimensions for the Floating Portion of the Evergreen Point Bridge

<table>
<thead>
<tr>
<th>Location</th>
<th>Existing (No Build Alternative)</th>
<th>6-Lane Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floating bridge length</td>
<td>7,578 feet</td>
<td>7,620 feet</td>
</tr>
<tr>
<td>Pontoon area, total</td>
<td>10.8 acres</td>
<td>20 acres</td>
</tr>
<tr>
<td>Pontoon depth</td>
<td>14-22 feet</td>
<td>28-34 feet</td>
</tr>
<tr>
<td>Pontoon width</td>
<td>60 feet</td>
<td>50-75 feet</td>
</tr>
</tbody>
</table>

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 roadway of the Evergreen Point Bridge would be approximately 22 feet higher than the existing bridge and 29 feet above the lake surface (see Exhibit 2-17). 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 6-Lane Alternative 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. The minimum span length being considered for the west channel openings would be 140 feet, which would provide a minimum opening of approximately 130 feet parallel to the piers. It would be 3 feet lower than it is today with 41 feet of minimum overhead clearance. 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).
Exhibit 2-17. 6-Lane Alternative at Evergreen Point Bridge (Common to All Options)

- Anchor and cable
- Proposed bicycle/pedestrian path
- General purpose lanes
- HOV, direct access, and/or transit-only lanes
- Cross Pontoon
- Longitudinal Pontoon
- Supplemental Stability Pontoon

Note: Vertical scale is exaggerated.
The new east navigation channel would be located under the east transition span and would have a clear opening of approximately 210 feet parallel to the piers and 150 feet parallel to the shoreline. It 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.)

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 be supported by four columns. The structure would meet the existing highway at grade as it approaches Evergreen Point Road, east of the Lake Washington shoreline.

Table 2-5 shows the characteristics of the east approach structure.

<table>
<thead>
<tr>
<th>Table 2-5. East Approach Structure Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing Structure</strong></td>
</tr>
<tr>
<td>Bridge width (feet)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Estimated height above water (feet to bottom of structure)</td>
</tr>
<tr>
<td>Span length (feet)</td>
</tr>
<tr>
<td>Total number of columns</td>
</tr>
<tr>
<td>Number of columns in water</td>
</tr>
</tbody>
</table>

**Bridge Maintenance Facility**

A bridge maintenance facility would be constructed underneath SR 520 between the east shore of Lake Washington and Evergreen Point Road in Medina (Exhibit 2-18). 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 2006 Draft EIS. 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. (The driveway location has changed since the Draft EIS, which described access as occurring from the south side of SR 520.) Elevators inside the building would transport crews and materials to the lake and boat dock.

Exhibit 2-18. Bridge Maintenance Facility

The maintenance dock was also described in the 2006 Draft EIS, but the dock design has changed. 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 event, 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 width not exceeding 14 feet. The new dock design may include a wave barrier and moorage berth at the end of the dock. Exhibit 2-19 is a conceptual view of the proposed dock layout.
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 2-20).

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 in to improvements made under the SR 520, Medina to SR 202 project.

2.4 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 these funding limitations, there is a strong possibility that WSDOT will construct the project in phases over time.

If the project is phased, WSDOT would first complete the project components that are vulnerable to windstorms and earthquakes. Exhibit 2-21 shows how these vulnerable elements are prioritized. The highest-priority components in the project area are:

- The floating portion of the Evergreen Point Bridge, which is vulnerable to windstorms. This is the highest priority in the corridor because of the frequency of severe storms and the high associated risk of catastrophic failure.
- The Portage Bay Bridge, which is vulnerable to earthquakes. This is a slightly lower priority than the floating bridge because the frequency of strong earthquakes is much less than that of severe storms.
- The west approach of the Evergreen Point Bridge, which is also vulnerable to earthquakes.

Replacing these components would allow WSDOT to fulfill the safety and reliability aspect of the project purpose and need, while the remainder of the project would fulfill the mobility aspect. It is important to note that, while the new bridge(s) might be the only parts of the project in place for a period of time, WSDOT’s intent is to build a complete project that fully meets all aspects of the purpose and need.
Exhibit 2-20. 6-Lane Alternative in the East Approach and Eastside Transition Area

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

New Bridge Maintenance Facility

Restripping Begins

Existing Transit Stops

Interim Eastside Transit Stops

Restripping Ends

Pontoon Bridge maintenance facility

East Approach

Lake Washington

Evergreen Point RD

84th Ave NE

Fairweather Park

Hunts Point Park

Wetherill Nature Preserve

AREA OF DETAIL
To address the potential for phased project implementation, this SDEIS evaluates the vulnerable structures separately as a subset of the “full build” analysis. This subset is referred to in the SDEIS as the Phased Implementation scenario and is evaluated in Chapters 5 and 6 of this SDEIS. Under the phasing scenario, corridor improvements in the I-5 and Montlake areas would be completed during later phases, after the vulnerable structures have been replaced. All improvements described for the Phased Implementation Scenario are within the overall footprint of the facilities to be provided under full corridor buildout.

The evaluation focuses on how the effects of phased implementation would differ from those of “full build” of the 6-Lane Alternative, and on how constructing the project in phases might have different effects from constructing it all at one time. Potential construction effects would differ from those of the 6-Lane full build for several reasons. Construction activities would occur twice in the transition areas between project phases, lengthening the construction durations for some project elements. The overall timeframe (number of years) would also increase over the 5 to 7 years currently assumed for constructing the 6-Lane Alternative. At the same time, each individual phase of the project would likely have reduced magnitude and intensity for many construction-related effects compared to the full build scenario.
**Phased Implementation Scenario**

The Phased Implementation scenario would provide new structures to replace the most vulnerable bridges in the SR 520 corridor, as well as limited transitional sections to connect the new bridges to existing facilities. It would include stormwater treatment facilities and noise mitigation for the new facilities as appropriate. The new bridge structures would include the width needed for the 14-foot regional bicycle/pedestrian path. Lids would be deferred until a subsequent phase when the I-5 and Montlake area interchange improvements are constructed. WSDOT would develop and implement all mitigation needed to satisfy regulatory requirements.

As noted above, replacing the most vulnerable structures would fulfill only the safety and reliability aspect of the project’s purpose and need, and not the mobility aspect. Full HOV lane operation would not occur until completion of the entire 6-lane corridor, meaning that the benefits of a complete HOV system would be temporarily deferred. Section 5.15 provides information on how the Phased Implementation scenario would operate compared to the full build.

Because phased implementation would involve multiple periods of mobilization and would span a longer time frame than full build, it could result in higher overall project costs. The likelihood and extent of any additional costs would depend upon which project components were phased, the time gap between phases, and other factors that cannot be predicted at this time.

**Vulnerable Priority 1: Floating Span of the Evergreen Point Bridge and East Approach**

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 portion of the corridor might be built before the other vulnerable components (Portage Bay Bridge and west approach). It is assumed that the SR 520, Medina to SR 202: Eastside Transit and HOV Project would be complete and that 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 and the west transition span of the Evergreen Point Bridge and taper into four general-purpose lanes that would extend from the west end of the Evergreen Point Bridge to I-5.

The floating span of the Evergreen Point Bridge extends from the west transition span, located north of Madison Park, to the east transition span, located a short distance west of the Lake Washington shoreline in Medina. The floating span and east approach (including the bridge maintenance facility) would be replaced with new structures that would be built and striped to their ultimate 6-lane width. The east approach would tie in to the
6-lane configuration of the completed SR 520, Medina to SR 202 project as described in Section 2.3.

If only the floating span were built during the first phase of construction, 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 (Exhibit 2-22). The interim connection would be supported on columns that would later be used for the new west approach bridge (eastbound structure) when it is constructed in a later phase. 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.

If funding for the project allows the full corridor or all the vulnerable structures to be built, the interim connection would not be needed, and the west transition span would join directly to the new west approach.

**Vulnerable Priority 2: Portage Bay Bridge**

With the Phased Implementation scenario, the Portage Bay Bridge would be built to its ultimate width—seven lanes for Option A, six lanes for Options K and L—but would be striped for an interim capacity of four lanes to match the lane widths with existing portions of the corridor on either side. The exit lane and ramps to Roanoke Street and northbound I-5 would be similar to the current configuration. Reconstruction of the Portage Bay Bridge would also include a new bridge over Delmar Drive East. This bridge would eventually become part of the 10th Avenue East/Delmar Drive East lid that would be constructed for full buildout. The Portage Bay Bridge would transition into the existing Montlake interchange on the east shore of Portage Bay. An interim eastbound off-ramp to Montlake Boulevard could be constructed; however, this ramp would be removed if a SPUI is constructed to replace the Montlake Interchange.

**Vulnerable Priority 2: West Approach**

Like the Portage Bay Bridge, the west approach would be constructed to its ultimate 6-lane width in the Phased Implementation scenario, but would be striped for four lanes until completion of the new interchange. The configuration and height of the west approach would vary, depending upon the design option chosen for the Montlake area. It would tie into the existing SR 520 main line just west of 24th Avenue East. Phasing the west approach would require reconstruction of the 24th Avenue East crossing over SR 520. The new crossing would ultimately become part of the lid at Montlake.
Exhibit 2-22. Phased Implementation Transition Areas

Floating Bridge Connection to the Existing West Approach

Floating Bridge Connection to the Future West Approach

I-5 Area

Montlake Interchange

New Overcrossing

Portage Bay Bridge (Priority 2)

Evergreen Point Floating Bridge (Priority 1)

West Approach (Priority 2)

Interim Connection

Existing West Transition Span

Columns from interim connection reused

Interim Westbound Off-Ramp

Interim Eastbound Off-Ramp
To accommodate the greater width of the west approach, WSDOT would build interim eastbound and westbound off-ramps to Montlake Boulevard until the new permanent interchange is completed (Exhibit 2-22). Interim connections to the existing Lake Washington Boulevard ramps would also be constructed to continue serving traffic demand until a new interchange was built. The interim connections would remain in operation until full project buildout and then be removed and/or replaced, depending on the option.

**Timing of the Phased implementation Scenario**

The time frame for the Phased Implementation scenario depends upon WSDOT’s ability to fund full construction of the SR 520 corridor. This funding will be based on future revenues and economic conditions. For analysis purposes, the Phased Implementation scenario is evaluated based on a design year of 2030, the same as for full buildout. This does not mean that the vulnerable structures are expected to be the only part of the project built by 2030; it simply provides an objective way to look at the effects of phased implementation consistently with the effects of full project buildout.

**2.5 How will WSDOT make decisions about how to move forward with the project?**

How the project is implemented depends on its funding, which will be influenced by a number of factors. The State Legislature authorized tolling to fund the project in 2009 as part of ESHB 2211, but the estimated revenue from tolling alone is not sufficient to complete any of the 6-Lane Alternative design options being considered. A finance plan for the SR 520 program—another requirement of ESHB 2211—will provide a comprehensive list of all potential funding sources and estimate how much of the project’s needs these sources will cover. As discussed above, WSDOT would prioritize construction of vulnerable structures if funds were not sufficient to build the full project.

The next step in project decision-making is the formal identification of a preferred alternative. FHWA and WSDOT, as the co-lead agencies, make the ultimate decision on the preferred alternative that is included in the Record of Decision. As discussed in Chapter 1, the legislative workgroup has identified Option A+—which includes Option A and all three of its suboptions—as its recommendation for the SR 520, I-5 to Medina project. FHWA and WSDOT will consider this recommendation, along with public and agency comments on the SDEIS and any action taken by the full legislature, in developing the preferred alternative. The preferred alternative is expected to be identified in spring 2010 and will be documented in the Final EIS.
2.6 How do the 6-Lane Alternative design options compare to those evaluated in the Draft EIS?

As described in Chapter 1, the 6-lane design options from the Draft EIS have been eliminated from further consideration. The 6-Lane design options evaluated in this SDEIS represent different solutions than those evaluated in the Draft EIS to address traffic and transit circulation and community concerns. But because the new options must navigate the same small and constrained area as the previous design options, they share some characteristics with the options that were previously studied. Exhibit 2-23 shows a visual comparison of the Draft EIS 6-lane design options with Options A, K, and L; Table 2-6 compares relative widths and structure heights. As shown, Options A, K, and L are considerably narrower than the Draft EIS options across the Portage Bay Bridge and at the Montlake shoreline. On Foster Island, Options K and L are about the same width as the Draft EIS 6-Lane Alternative and Second Montlake Bridge option, while Option A is considerably narrower.

Option A is shown against the background of the Draft EIS Second Montlake Bridge option, which it most resembles. As shown in the exhibit, its footprint is generally narrower than that of the Second Montlake Bridge option in the eastern portion of Montlake and through the Washington Park Arboretum. Option A also would eliminate the Lake Washington Boulevard ramps, further reducing its footprint in the Arboretum compared to the Draft EIS options. A suboption of Option A would include the Lake Washington Boulevard ramps, but in a different configuration that would reduce their footprint over water and in wetlands (see Exhibit 2-16).

Options K and L are shown in comparison to the Pacific Interchange option, which also consolidated the Montlake Boulevard and Lake Washington Boulevard ramps into a SPUI east of the existing Montlake interchange. However, Options K and L both place the SPUI farther west than the Pacific Interchange option, and Option K crosses the Montlake Cut in a tunnel rather than on a bridge. Like Option A, Options K and L are narrower than the Draft EIS design options through the eastern part of Montlake and in the Arboretum.
Exhibit 2-23. Comparison of the SDEIS 6-Lane Design Options with the Alternatives Evaluated in the DEIS

- **Design Option A and Second Montlake Bridge**
- **Design Option K and Pacific Street Interchange**
- **Design Option L and Pacific Street Interchange**

Legend:
- DEIS alternative
- Tunnel
- SDEIS Options A, K, and L
- Park
### Table 2.6. Comparison of Draft EIS and SDEIS 6-Lane Design Options for Portage Bay, Montlake, and West Approach Areas

<table>
<thead>
<tr>
<th></th>
<th>Portage Bay Area at Midpoint</th>
<th>Montlake Area at Shoreline</th>
<th>West Approach Area at Foster Island</th>
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<tr>
<td></td>
<td>Width (feet)</td>
<td>Height (feet)</td>
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<tr>
<td>Draft EIS 6-Lane Alternative</td>
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<td>352</td>
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<tr>
<td>Draft EIS Second Montlake Bridge option</td>
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<tr>
<td>Draft EIS Pacific Street Interchange option</td>
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<tr>
<td>SDEIS Option A (6 lanes plus auxiliary)</td>
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<td>271</td>
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<tr>
<td>SDEIS Option K (6 lanes)</td>
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<tr>
<td>SDEIS Option L (6 lanes)</td>
<td>101</td>
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