

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

MAY 2011

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

Description of Alternatives
Discipline Report Addendum

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

**Description of Alternatives
Discipline Report Addendum**



Prepared for
Washington State Department of Transportation
Federal Highway Administration

Consultant Team
Parametrix, Inc.
CH2M HILL
HDR Engineering, Inc.
Parsons Brinckerhoff
ICF Jones & Stokes
Confluence Environmental Company, Inc.
Michael Minor and Associates
PRR, Inc.
Critigen

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Acronyms and Abbreviations

EIS	Environmental Impact Statement
FHWA	Federal Highway Administration
HOV	high-occupancy vehicle
NOAA	National Oceanic and Atmospheric Administration
SDEIS	Supplemental Draft Environmental Impact Statement
WSDOT	Washington State Department of Transportation



Introduction

What is the purpose of this addendum?

This addendum to the 2009 Description of Alternatives Discipline Report for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project (Washington State Department of Transportation [WSDOT] 2009a) presents the design of the Preferred Alternative and compares it to the design Options A, K, and L presented in the Supplemental Draft Environmental Impact Statement (SDEIS) for the project (WSDOT 2010). The information contained in the Description of Alternatives Discipline Report remains relevant to the discussion of the Preferred Alternative. For more information about how WSDOT and the Federal Highway Administration (FHWA) worked with tribes, regulatory agencies, and the public to develop the Preferred Alternative design, please see the Range of Alternatives and Options Evaluated Discipline Report (WSDOT 2009b) and the Agency Coordination and Public Involvement Discipline Report Addendum and Errata (WSDOT 2011a).

The SDEIS, published in January 2010, evaluated a 6-Lane Alternative with three design options (Options A, K, and L) for the Seattle portion of the SR 520 corridor, and a No Build Alternative. In April 2010, WSDOT and FHWA announced a Preferred Alternative for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project. All components of the Preferred Alternative were evaluated in the SDEIS, and the 6-lane design of the SR 520 corridor has been further refined in response to comments received during public review of the SDEIS.

The Preferred Alternative

The Preferred Alternative would widen the SR 520 corridor to six lanes 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. It would replace the vulnerable Evergreen Point Bridge (including the west and east approaches and the floating bridge) and Portage Bay Bridge with new structures. The Preferred Alternative would complete the regional high-occupancy vehicle (HOV) lane system across SR 520, as called for in regional and local transportation plans.

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. The typical roadway cross-section across the floating bridge would be the same as described in the SDEIS (115 feet wide, compared to the existing width of 60 feet). In response to community interests expressed during public review of the SDEIS, the SR 520 corridor between I-5 and the Montlake area would operate as a boulevard or parkway with median plantings and a posted speed limit of 45 miles per hour. To support the boulevard



concept, the width of the inside shoulders in this section of SR 520 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 description and evaluation of the Preferred Alternative and the comparison of the Preferred Alternative to the design options presented in the SDEIS are organized by three areas along the project corridor: Seattle, Lake Washington, and the Eastside. Within these larger areas, project elements are described by smaller geographic areas, as shown in Exhibit 1. Project features for the Preferred Alternative are summarized in Exhibit 2, and there are detailed descriptions in the subsections below organized by geographic area so that the differences between the Preferred Alternative and the SDEIS Options can be easily identified and compared.

The differences between the Preferred Alternative and the options presented in the SDEIS include:

- Reducing the lid over I-5 to a smaller bicycle and pedestrian overcrossing
- Designing the westbound shoulder on the Portage Bay Bridge to operate as a 14-foot wide managed shoulder that would be used as an auxiliary lane during peak commute hours
- Reducing the posted speed to 45 miles per hour and reducing the overall footprint by narrowing the shoulders in the Seattle portion of the corridor
- Reconfiguring Montlake Boulevard between SR 520 and the Montlake Cut to include transit/HOV lanes
- Increasing the size and length of the lid located in the Montlake area
- Reconfiguring the west approach bridges to have a wider gap between them
- Lowering the roadway height on the floating bridge

What are the Preferred Alternative features in Seattle?

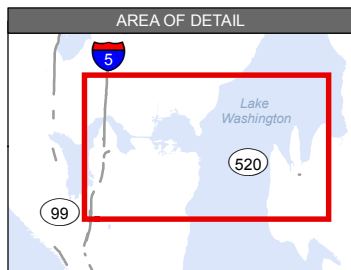
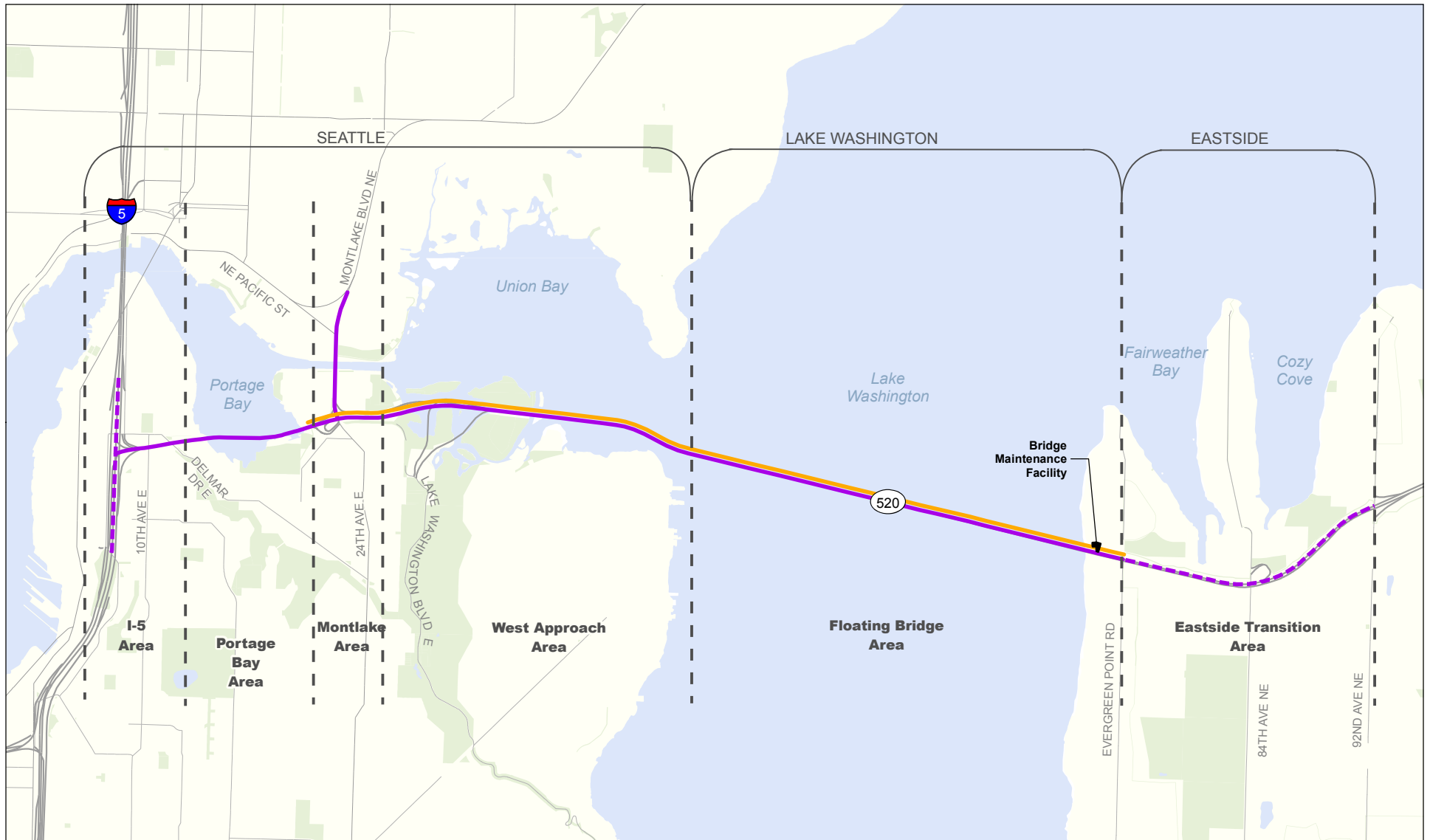
I-5 Area

The SR 520 and I-5 interchange ramps would be reconstructed in generally the same configuration as the existing interchange. The only exceptions would be that a new reversible HOV ramp would connect to the existing I-5 reversible express lanes south of SR 520, and the alignment of the ramp from northbound I-5 to eastbound SR 520 would shift to the south (Exhibit 3).

The I-5 interchange lane configuration would be as follows:

- The westbound SR 520 to northbound I-5 ramp would be two lanes, 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).





- Project Extent
- - - Denotes Limited or Optional Improvement
- Regional Bicycle/Pedestrian Path
- Park



0 1,000 2,000 4,000 Feet



Source: King County (2005) GIS Data (Stream and Street), King County (2007) GIS Data (Waterbody), CH2M HILL (2008) GIS Data (Park). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.

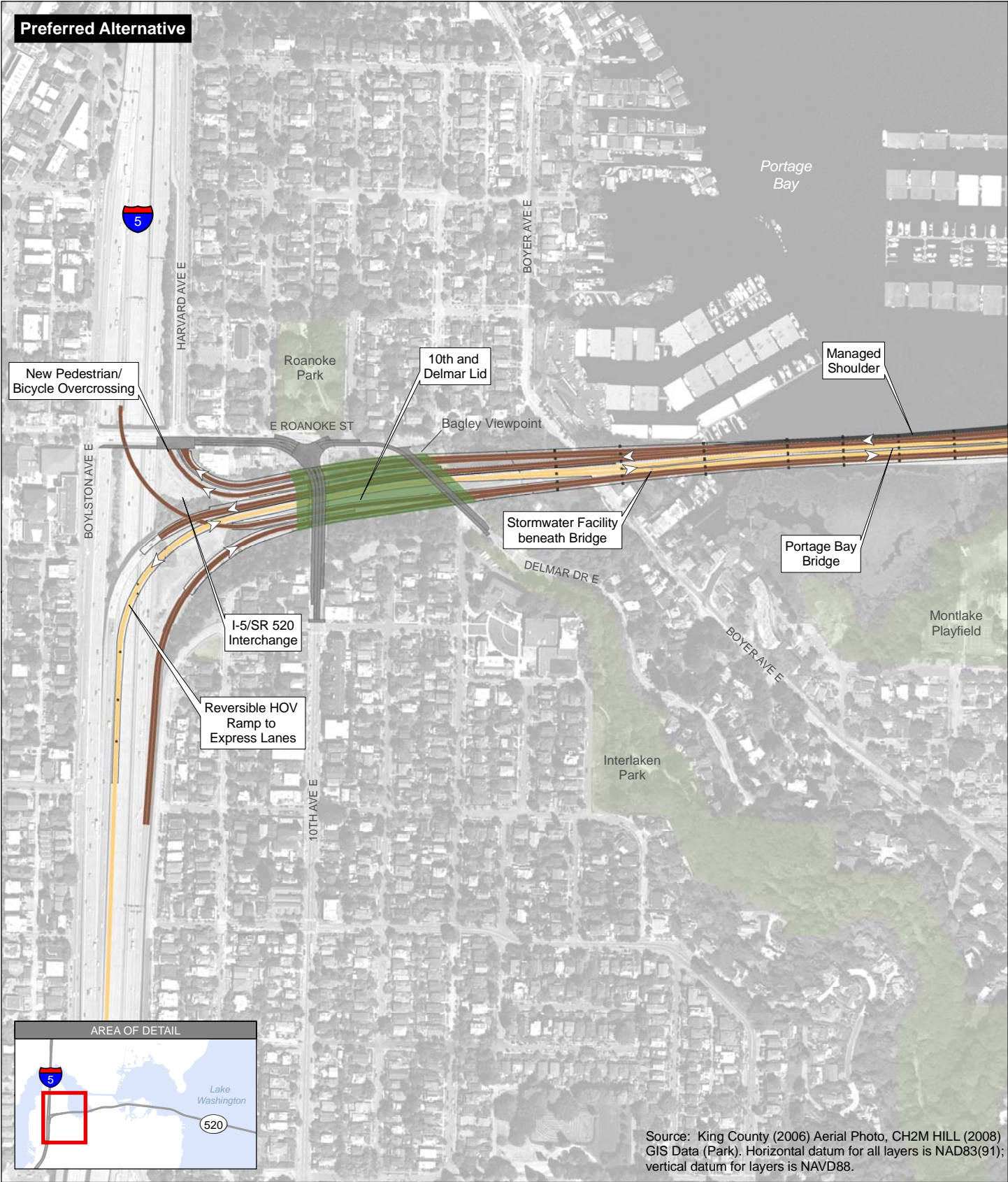
Exhibit 1. Geographic Areas along SR 520 evaluated in the Final EIS (Update to Exhibit 1-2 of the 2009 Discipline Report)

I-5 to Medina: Bridge Replacement and HOV Project

Exhibit 2. Preferred Alternative and Comparison 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 mainline, 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 most similar to Option L, and slightly steeper; 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 at the midspan (about 10 to 12 feet higher than the existing bridge deck).	Similar to design described in the SDEIS. 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.





Source: King County (2006) Aerial Photo, CH2M HILL (2008) GIS Data (Park). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.

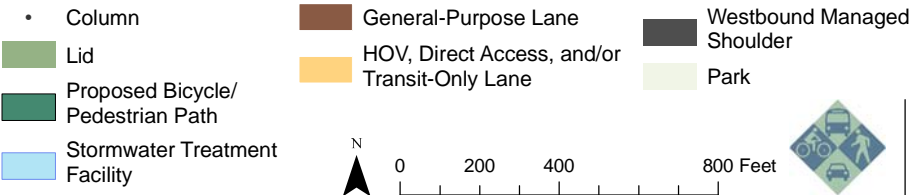


Exhibit 3. Preferred Alternative from I-5 to Portage Bay (Update to Exhibit 1-3a of the 2009 Discipline Report)

I-5 to Medina: Bridge Replacement and HOV Project

- 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.
- The new reversible HOV ramp would reduce the number of I-5 express lanes from four to three between SR 520 and 42nd Street NE. During the a.m. hours, the ramp would act as an add lane to southbound I-5 (expanding the express lanes from three to four lanes); 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).

The Preferred Alternative design would provide an enhanced bicycle/pedestrian overcrossing parallel to the existing East Roanoke Street bridge, which represents a change from the lid design presented in the SDEIS for all the design options. The East Roanoke Street bridge would remain as it is today, and would not be rebuilt as part of the Preferred Alternative.

As described below, the lane configurations for 10th Avenue East and Delmar Drive East would change slightly from the existing layout as follows:

- 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.
- 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 10th Avenue East and Delmar Drive East lid would span SR 520 between these two streets, each of which currently crosses on its own overcrossing. 10th Avenue East and Delmar Drive East would be rebuilt as part of the proposed lid structure within generally the same alignment and with a similar vertical profile as today. 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 range from 500 to 650 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 and design of the lid is compatible with the character of the historic district.

Portage Bay Area

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 Exhibit 3 and Exhibit 4). 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 will separate the eastbound and westbound travel lanes. The Preferred Alternative design of the Portage Bay Bridge would operate traffic at 45 mph as a boulevard..

At its west end, 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 mid-point, the additional width would be located to the north. The east end of the bridge would be wider to the north and south, although the alignment of the new bridge would shift to the south at this point to avoid the National Oceanic and Atmospheric Administration (NOAA) Fisheries Science Center campus.

The height of the western half of the new bridge would match the existing bridge, but the eastern half would be higher. The new bridge would be about 14 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. Exhibit 5 compares the Preferred Alternative design dimensions for the Portage Bay Bridge to the existing bridge and the SDEIS design. For purposes of the environmental analysis, the bridge design is assumed to be a cast-in-place box girder type with faux arches applied for aesthetic treatment. Final bridge design is yet to be determined and will be selected in cooperation with the Seattle Design Commission and public input.

Montlake Area

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. A large new lid would be provided over SR 520 in the Montlake area, configured for transit and bicycle/pedestrian connectivity. The approximately 1,400-foot-long lid would extend from west of Montlake Boulevard to east 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, coordination with the City of Seattle, and surrounding communities. Final lid design is yet to be determined, and will be identified in cooperation with the Seattle Design Commission and public input.

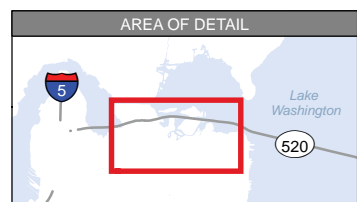
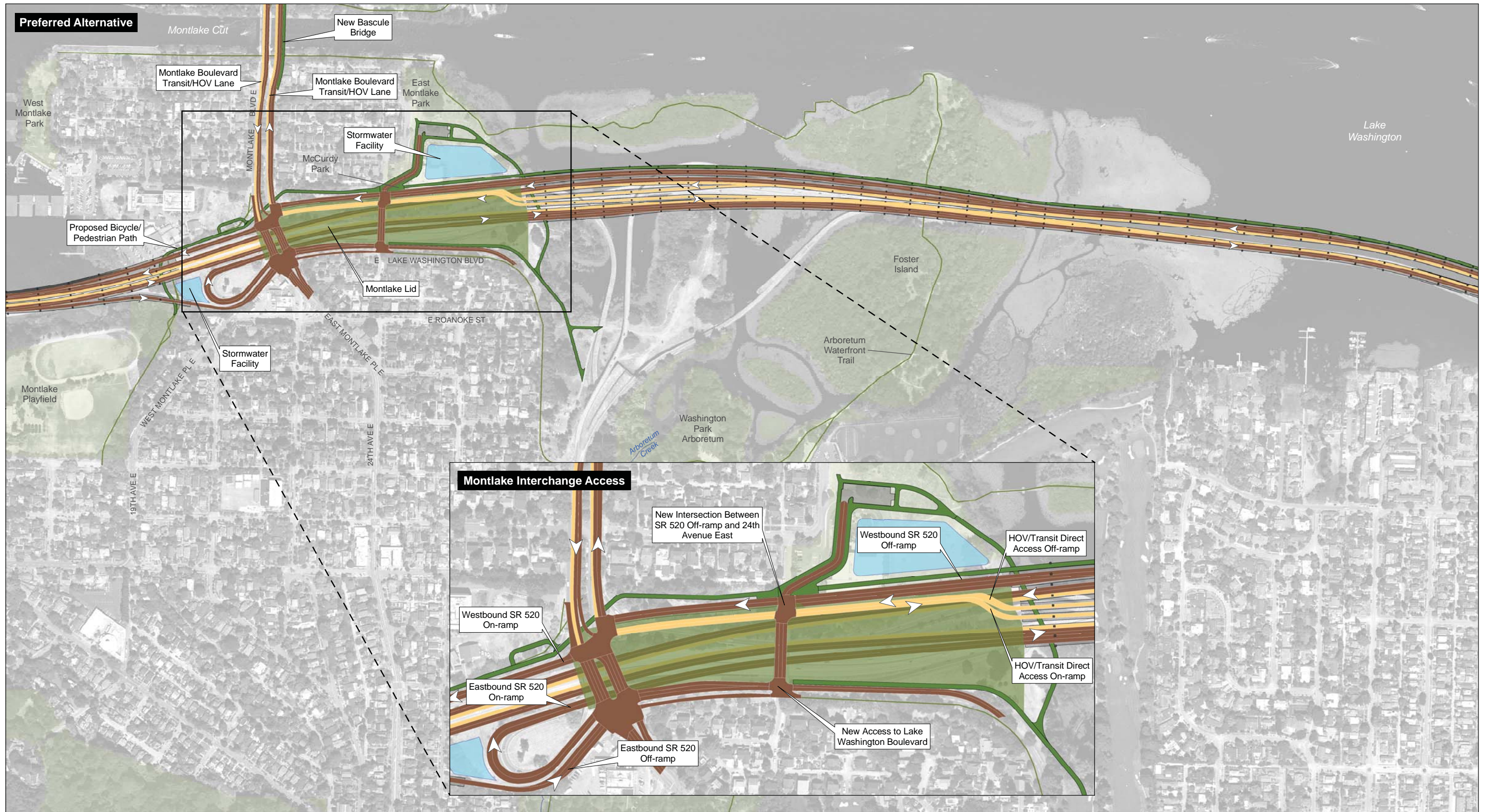
Westbound SR 520 traffic exiting to Montlake Boulevard would travel across the large new lid, and westbound SR 520 traffic would be able to access Lake Washington Boulevard via a new intersection located on the lid at 24th Avenue East. A transit/HOV direct-access ramp would be provided from the lid to eastbound SR 520. The proposed lane configuration (see Exhibit 4) would be as follows:

- The eastbound on-ramp would be a loop ramp with two general-purpose lanes.
- A new eastbound transit/HOV direct-access on-ramp would be one lane from Montlake Boulevard and 24th Avenue East.
- The eastbound off-ramp would be one lane that would taper off the main line and become three lanes at Montlake Boulevard (one more lane than today).
- The westbound off-ramp would be one lane that tapers off the main line and become three lanes at 24th Avenue East. At this intersection, drivers could turn left to access Lake Washington Boulevard or continue on to Montlake Boulevard for right-turn-only movement onto the boulevard.
- The westbound on-ramp would be two lanes that merge into one lane, and would be signalized (one more lane than today).
- 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.

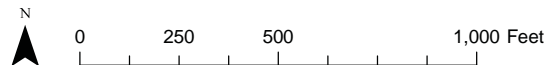
The alignment of Montlake Boulevard over SR 520 would be similar to today's alignment; however, the bridge over SR 520 would be longer and wider than the existing bridge. A longer and wider bridge would be required to accommodate the additional lanes on SR 520 below Montlake Boulevard and to provide wider through lanes, shoulders, a center median, and additional turning lanes on Montlake Boulevard over SR 520. This bridge would be integrated as part of the new Montlake lid over SR 520.

North of SR 520, Montlake Boulevard would provide three 12-foot-wide through lanes in both directions (two general-purpose lanes and one HOV lane) between the rebuilt interchange and Northeast Pacific Street. 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.





- Column
- Existing Regional Bicycle/Pedestrian Path
- Lid
- Proposed Bicycle/Pedestrian Path
- General-Purpose Lane
- HOV, Direct Access, and/or Transit-Only Lane
- Westbound Managed Shoulder
- Park
- Stormwater Treatment Facility



Source: King County (2006) Aerial Photo, King County (2008) GIS Data (Stream), CH2M HILL (2008) GIS Data (Park). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.



Exhibit 4. Preferred Alternative from Portage Bay to Lake Washington (Update to Exhibit 1-3b of the 2009 Discipline Report)
 I-5 to Medina: Bridge Replacement and HOV Project

Exhibit 5. Portage Bay Bridge Elements

	Existing Structure	Preferred Alternative	Option A	Option K	Option L
Width (feet)	63 to 102	105 to 158	110 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 ^a	131	71	72	62	62
Column size (feet)	4.5 (diameter)	7 by 7 square	5 to 9 (diameter)	5 to 9 (diameter)	5 to 9 (diameter)

^aTotal does not include the number of drilled shafts or shaft caps required to support some columns.

The Preferred Alternative would construct a new bascule bridge (drawbridge) 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 this project. Future pedestrian improvements may occur with the Sound Transit University Station project or with University of Washington master plan projects.

West Approach Area

Under the Preferred Alternative, the SR 520 west approach structures would be replaced with higher, wider structures, similar to those described for Option A in the SDEIS (see Exhibit 4). The new structures would be supported by concrete columns that would vary in size. Exhibit 6 provides a comparison between the existing structure characteristics, the SDEIS Options, and the Preferred Alternative. The existing Lake Washington Boulevard eastbound on-ramp and westbound off-ramp and the R.H. Thomson Expressway ramps would be removed.

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 7). 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 high at the point where it crosses the existing Arboretum Waterfront Trail.



Exhibit 6. West Approach Structure Elements

	Existing Structure	Preferred Alternative	Option A	Option K	Option L
Bridge structure between Montlake and across Foster Island					
Width (feet) ^a	60 to 150	180 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 number of columns	237	125	98	782	155
Typical column size (feet)	4.5 (diameter)	6 by 6 (square)	6 (diameter)	2.5 (diameter)	6 (diameter)
Bridge structure from east shore of Foster Island out to floating bridge					
Width (feet) ^a	60	162 to 126	115	115 to 162	115 to 167
Typical span length (feet)	100	150	140	30 to 140	140 to 350
Estimated number of columns	228	129	110	211	72
Typical column size (feet)	4.5 to 9 (diameter)	7.5 by 7.5 (square)	6 (diameter)	2 to 7 (diameter)	7 to 9 (diameter)

^a Width reported for the Preferred Alternative includes the gap distance between the eastbound and westbound structures.

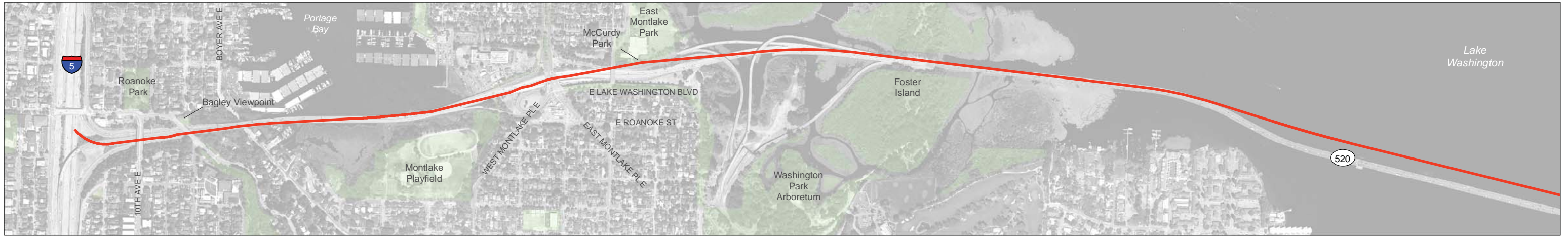
The bridge structure through Union Bay would be wider than today (see Exhibit 4 and Exhibit 6). The westbound structure would include the 14-foot-wide bicycle/pedestrian path, a two-lane off-ramp, three mainline lanes, and an HOV direct-access off-ramp; the eastbound structure would include three mainline lanes and an HOV direct-access on-ramp lane. 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 a future light rail alignment and infrastructure, should Sound Transit determine that a light rail crossing of SR 520 is desirable at some point in the future. No such crossing is currently planned or proposed as part of the SR 520, I-5 to Medina project.

What are the Preferred Alternative features in the Lake Washington area?

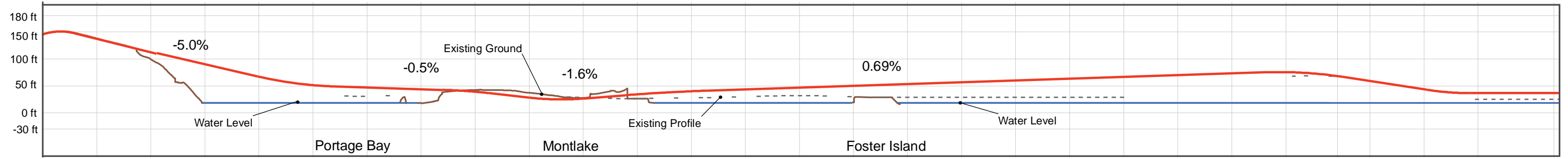
Floating Bridge Area

Exhibit 8 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 SDEIS. The floating span would be located approximately 190 feet north of the existing bridge at the west end and 160 feet north at the east end. Floating bridge dimensions are listed in Exhibit 9.

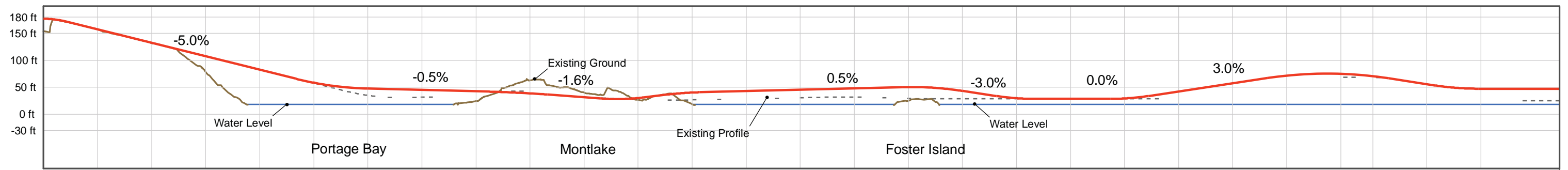




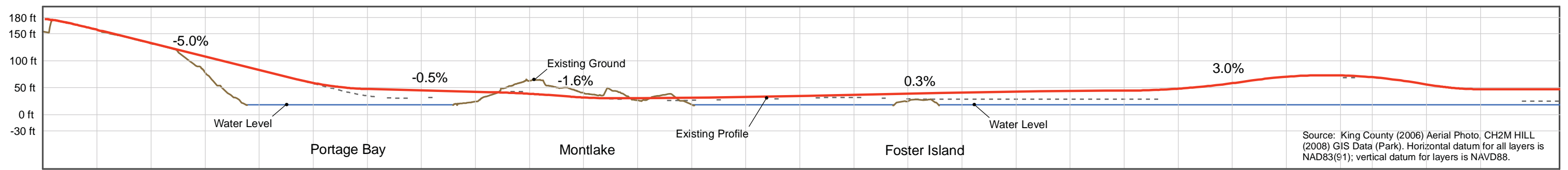
Preferred Alternative Profile



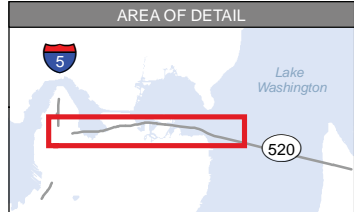
Option A Profile



Option L Profile



Source: King County (2006) Aerial Photo, CH2M HILL (2008) GIS Data (Park). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.



- Proposed Mainline Profile
- - - Existing Profile
- Park

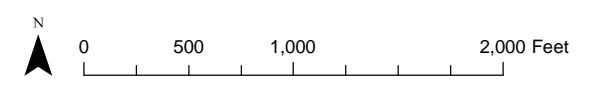
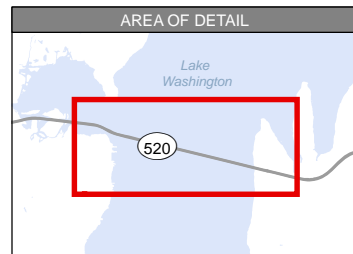
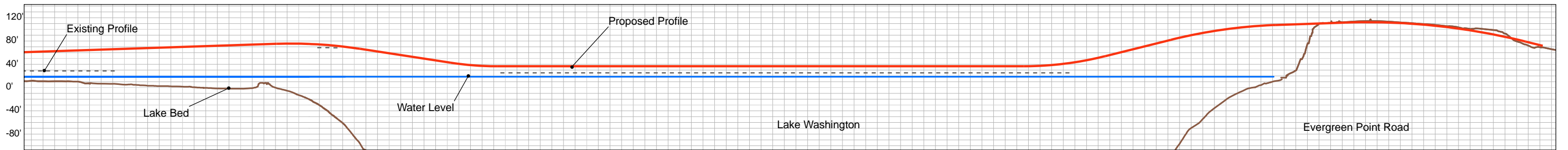
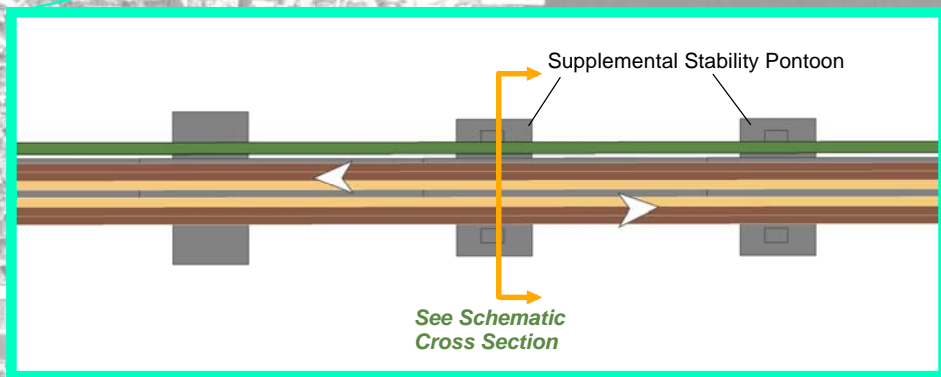
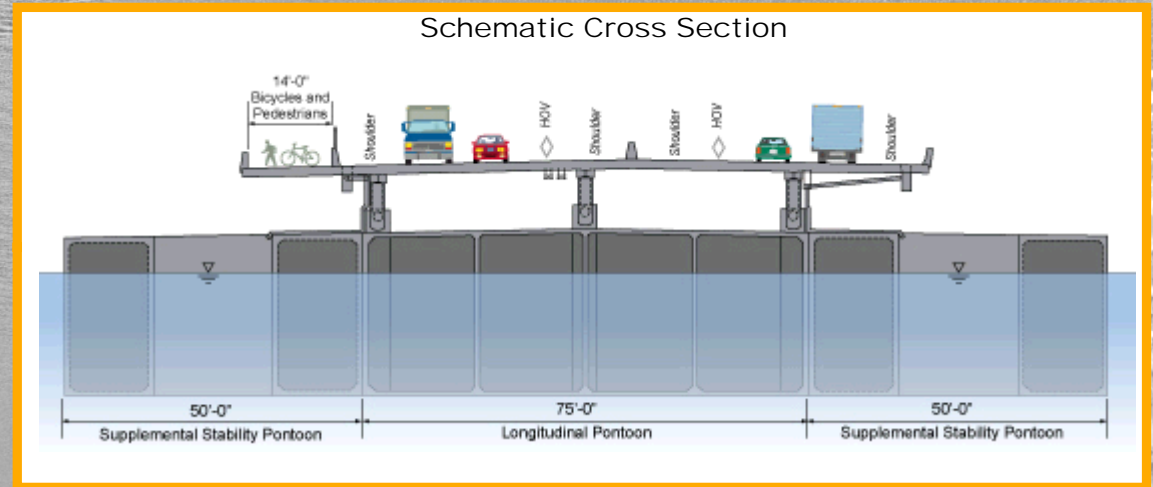
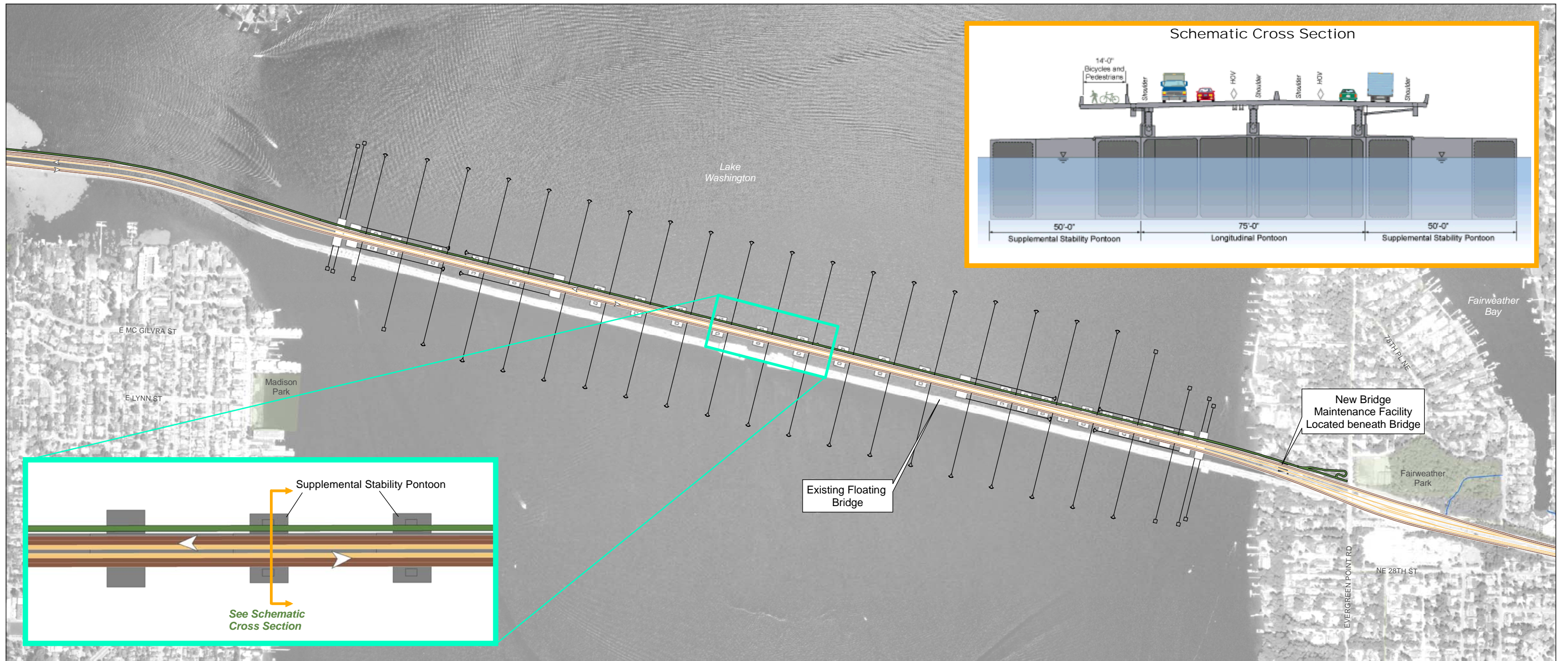
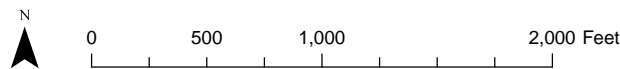


Exhibit 7. 6-Lane Option Profiles from I-5 to Lake Washington (Update to Exhibit 1-6 of the 2009 Discipline Report)
 I-5 to Medina: Bridge Replacement and HOV Project



- Anchor and Cable
- Pontoon
- Proposed Bicycle/Pedestrian Path
- General-Purpose Lane
- HOV, Direct Access, and/or Transit-Only Lane
- Park



Source: King County (2006) Aerial Photo, CH2M HILL (2008) GIS Data (Park). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.

Exhibit 8. Preferred Alternative Evergreen Point Bridge (Update to Exhibit 1-8 of the 2009 Discipline Report)
I-5 to Medina: Bridge Replacement and HOV Project

Exhibit 9. Area and Dimensions for the Floating Portion of the Evergreen Point Bridge

Location	Existing Structure	Preferred Alternative and SDEIS
Floating bridge length (feet)	7,578	7,710
Pontoon area, total (acres)	10.8	20
Pontoon depth (feet)	14 to 22	28 to 35
Pontoon width (feet)	60	50 to 75
Bridge height above water at midspan (feet)	approx. 8 to 10	20

Roadway

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. A 14-foot wide bicycle and pedestrian path with scenic vantage points/pullouts would be located on the north side of the bridge. As a result of comments received on the SDEIS, the height of the bridge deck above the water has been lowered to reduce visual effects. At midspan, the floating bridge would now rise approximately 20 feet above the water, compared to approximately 30 feet for the design described in the 2006 Draft Environmental Impact Statement (WSDOT 2006) and the 2010 SDEIS. The bridge would be about 10 feet higher than the existing bridge. 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.

At each end of the floating bridge, the roadway would be supported by rows of three 10-foot-tall concrete columns spaced 30 to 35 feet apart. The remainder of the roadway across the pontoons would be supported by three lines of steel trusses spaced 30 to 35 feet apart (Exhibit 8).

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. 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. 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. As with the existing floating bridge, the pontoons for the new bridge would be anchored to the lake bottom to hold the bridge in place (see Chapter 3 of the SDEIS for information about anchor installation).

The new pontoons for the floating bridge would be designed and configured to accommodate future expansion for high-capacity transit. If the SR 520 corridor is selected to carry dedicated HCT in the future, additional supplemental stability pontoons could be added to the new floating bridge. Any such expansion would need to be evaluated in a separate environmental document.



Navigational Channels

The Preferred Alternative would eliminate the drawspan 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 west channel openings would be 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. 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).

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. 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.

East Approach

The east approach structure elements are listed in Exhibit 10. 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 nears the shore of Lake Washington, would be supported by 10 columns. The structure would meet the existing highway at grade as it approaches Evergreen Point Road, east of the Lake Washington shoreline.

Exhibit 10. East Approach Structure Elements

	Existing Structure	Preferred Alternative	SDEIS 6-Lane Options
Width (feet)	60	83 to 91 (westbound) 51 to 61 (eastbound)	85 (westbound) 58 (eastbound)
Span length (feet)	100	250 to 350	250 to 350
Total number of columns	24	10	8
Column size (feet)	4.5 (diameter)	8 by 11 (rectangular)	7.5 by 11 (rectangular)

Bridge Maintenance Facility

As described in the SDEIS, a bridge maintenance facility would be constructed underneath SR 520 between the east shore of Lake Washington and Evergreen Point Road in Medina (Exhibit 11). The new bridge maintenance facility would include a working dock, an approximately 12,000-square-foot maintenance building, a fueling facility, and parking. The bridge maintenance 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 remains the same under the Preferred Alternative 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.

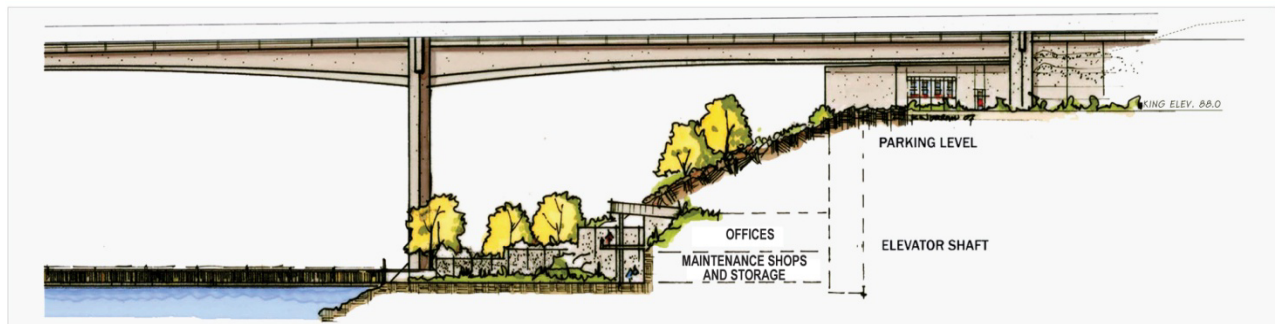


Exhibit 11. Conceptual Sketch of Bridge Maintenance Facility (Exhibit 12 of the 2009 Discipline Report)

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 moorage berth at the end of the dock. Exhibit 12 is a conceptual view of the proposed dock layout.

What are the Preferred Alternative features on the Eastside?

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 13).



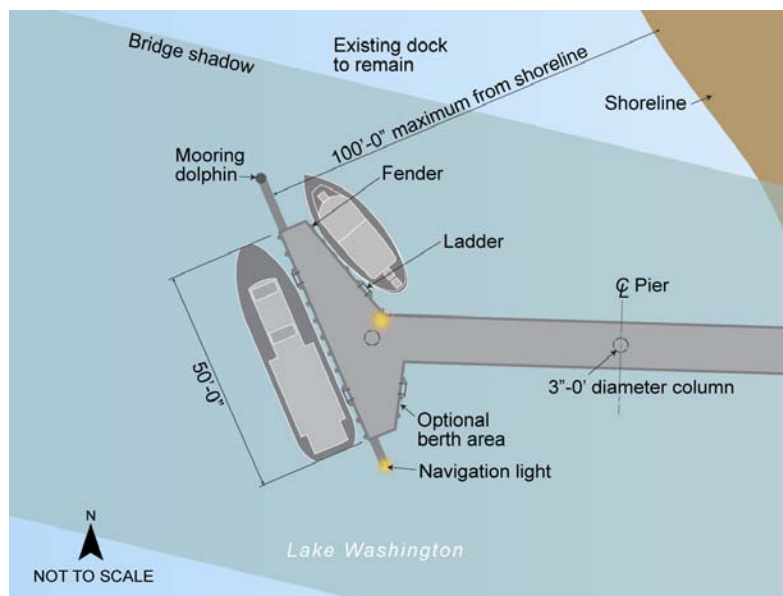


Exhibit 12. Conceptual Plan View of Bridge Maintenance Facility Dock
(Update to Exhibit 13 of the 2009 Discipline Report)

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.

Lids and Crossings

A lid is a wide version of a bridge that covers a portion of the highway. The primary purpose of a lid is to reconnect communities and landscapes by creating open space, restoring or creating views, and enhancing bicycle and pedestrian movement. An enhanced crossing is a structure built over a roadway that improves pedestrian and/or bicycle movements, and offers aesthetic improvements such as plantings or views. The Preferred Alternative includes lids and an enhanced crossing in three locations:

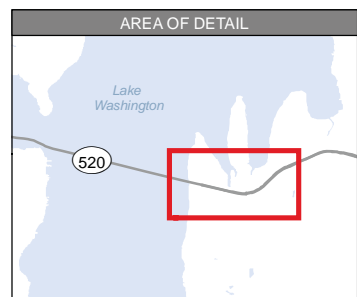
- I-5/East Roanoke Street (enhanced bicycle and pedestrian crossing)
- 10th Avenue East and Delmar Drive East
- Montlake Boulevard and 24th Avenue East vicinity

Each of these features is described in more detail above under the I-5 Area and Montlake Area headings.

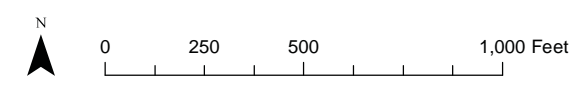
Regional Bicycle/Pedestrian Path

The Preferred 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





- | I-5 to Medina Project Elements | | Medina to SR 202 Project Elements | |
|---------------------------------------|---|--|----------------------|
| | Limits of Construction | | General-purpose lane |
| | Proposed Bicycle/Pedestrian Path | | HOV lane |
| | General-Purpose Lane | | Bike path |
| | HOV, Direct Access, and/or Transit-Only Lanes | | Points Loop Trail |
| | Restriping Improvements | | Eastside Project Lid |
| | Bridge Maintenance Facility | | Park |



Source: King County (2006) Aerial Photo, CH2M HILL (2008) GIS Data (Park). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.

Exhibit 13. Preferred Alternative Eastside Transition Area (Update to Exhibit 1-9 of the 2009 Discipline Report)

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underneath SR 520 near the eastern shore of Portage Bay. It would also connect to the Montlake area 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 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 constructed along SR 520 west of Montlake Boulevard.

Noise Reduction

The Preferred Alternative would include 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, and noise-absorptive material on the traffic barriers and around the lid portals. 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. Refer to the Noise Discipline Report Addendum and Errata (WSDOT 2011b) for more detailed discussion on noise modeling and noise mitigation.

Stormwater Treatment

The Preferred Alternative includes the installation of facilities to collect and treat stormwater runoff. There are no such facilities in the corridor today. The two facility types identified for the project are biofiltration swales and constructed stormwater treatment wetlands, as described in the Water Resources Discipline Report Addendum and Errata (WSDOT 2011c). Both types incorporate stormwater best management practices approved by the Washington State Department of Ecology. Exhibit 14 identifies which facility types are proposed for each drainage basin.



Exhibit 14. Proposed Stormwater Treatment Facilities

Drainage Basin	Type of Proposed Facility
Lake Union	Biofiltration swale
Portage Bay	Constructed stormwater treatment wetland and biofiltration swale
Union Bay	Constructed stormwater treatment wetland and biofiltration swale
Lake Washington	Biofiltration swale Using 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 wetlands provide enhanced treatment by using multiple cells and wetland vegetation to reduce the amount of these pollutants in runoff.

Lighting

Similar to today, continuous roadway lighting would be provided along the SR 520 corridor from I-5 to just east of Foster Island and on both bascule bridges 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 barriers and recessed barrier lights similar to those on the I-90 floating bridges.

Tolls

Both the Draft EIS and SDEIS identified tolling as a way to generate revenue for project construction, and assumed a toll as part of the traffic modeling analysis. Tolling in the SR 520 corridor is discussed as part of the Lake Washington Urban Partnership for the primary purpose of tackling congestion management in the corridor. The SDEIS (pages 1-33 through 1-35) detailed legislation passed that authorized tolling in the SR 520 corridor, including the recommendation to implement segmental tolling between I-5 and I-405.

Since publication of the SDEIS, new legislation has passed that influences tolling in the SR 520 corridor. In addition, public comment received during outreach events for the Tolling Implementation Committee resulted in some new assumptions about tolling that are different than those included in the SDEIS traffic model. Tolling assumptions included in the transportation model developed for the Final EIS considers Engrossed Substitute House Bill 2211 workgroup recommendations and other legislation including Engrossed Substitute Senate Bill 6392. The tolling



assumptions used in the transportation modeling effort for the Final EIS reflect the following elements from the Tolling Implementation Committee:

- Single-point tolling implemented on SR 520 between I-5 and I-405
- Variable toll rates based on a schedule, depending on the time of day, and whether trips are taken during the weekend or on a weekday
- A peak toll rate of \$3.81 (year 2007 dollars) during the evening commute
- Transit and HOV with three or more riders were exempt from the toll

As previously described, 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, “cards” that would be read by an electronic card reader. Transponders allow drivers to pay tolls without stopping at a toll booth. No toll booths will be constructed in the SR 520 corridor, and drivers who do not purchase a transponder would be billed for their trips by mail.

Project Construction

When would the project be built and how?

Construction for the SR 520, I-5 to Medina project is planned to begin in 2012, after project permits are received. To maintain traffic flow in the corridor, the project would be built in stages. Major construction in the corridor is expected to be complete in 2018. The most vulnerable structures (floating portion of the Evergreen Point Bridge, its east and west approaches, and the Portage Bay Bridge) would be built in the first stages of construction, followed by the less vulnerable components (Montlake and I-5 interchanges). Exhibit 15 provides an overview of the anticipated construction stages and durations identified for the SR 520, I-5 to Medina project.

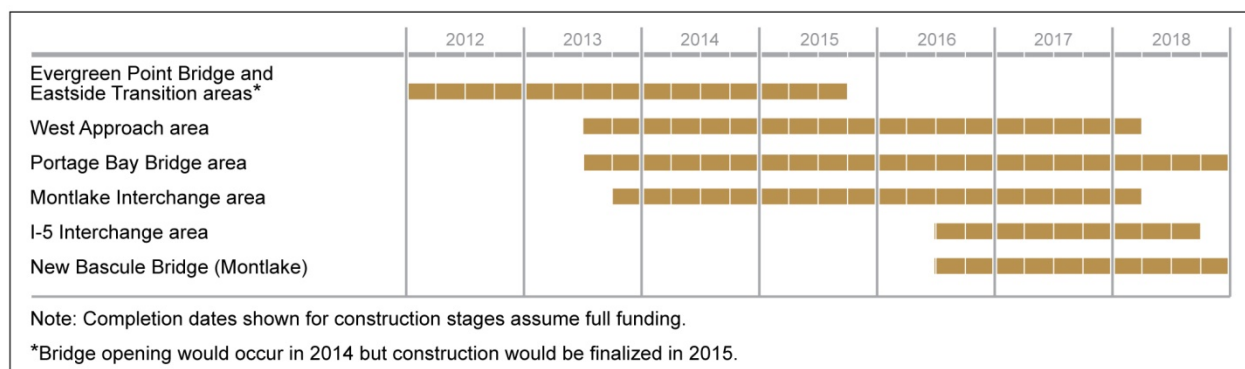


Exhibit 15. Preferred Alternative Construction Stages and Durations

A Phased Implementation scenario was discussed in the SDEIS as a possible delivery strategy to complete the SR 520, I-5 to Medina project in phases over an extended period of time. FHWA and



WSDOT continue to evaluate the possibility of phased construction of the corridor should full project funding not be available by 2012. Current committed funding is sufficient to construct the floating portion of the Evergreen Point Bridge, as well as the new east approach and a connection to the existing west approach. The Final EIS discusses the potential for the floating bridge and these east and west “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. Chapters 5.15 and 6.16 of the Final EIS summarize the effects for this construction phase.

Where is pontoon production and transport addressed?

WSDOT has completed planning and permitting for a new facility that will build and store the 33 pontoons needed to replace the existing capacity of the floating portion of the Evergreen Point Bridge in the event of a catastrophic failure. If the bridge does not fail before its planned replacement, WSDOT would use the 33 pontoons constructed and stored as part of the SR 520 Pontoon Construction Project in the SR 520, I-5 to Medina project. An additional 44 pontoons would be needed to complete the new 6-lane floating bridge planned for the SR 520, I-5 to Medina project. The additional pontoons would be constructed in a casting basin at Concrete Technology Corporation in the Port of Tacoma, and/or if available, at the new pontoon construction facility located on the shores of Grays Harbor in Aberdeen, Washington. For additional information about project construction schedules and pontoon construction, launch, and transport, please see the Construction Techniques and Activities Discipline Report Addendum and Errata (WSDOT 2011d).

References

The following list of references is in addition to those listed in the 2009 Description of Alternatives Discipline Report.

Washington State Department of Transportation (WSDOT). 2006. *Draft Environmental Impact Statement, SR 520 Bridge Replacement and HOV Project*. Prepared for Washington State Department of Transportation, Olympia, WA, and Federal Highway Administration, Washington, DC. August 18, 2006.

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WSDOT. 2009b. *Range of Alternatives and Options Evaluated Discipline Report*. SR 520: I-5 to Medina Bridge Replacement and HOV Project. Supplemental Draft Environmental Impact Statement and



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WSDOT. 2011a (publication pending). *Agency Coordination and Public Involvement Discipline Report Addendum and Errata*. SR 520, I-5 to Medina: Bridge Replacement and HOV Project. WSDOT, Olympia, WA.

WSDOT. 2011b (publication pending). *Noise Discipline Report Addendum and Errata*. SR 520, I-5 to Medina: Bridge Replacement and HOV Project. WSDOT, Olympia, WA.

WSDOT. 2011c (publication pending). *Water Resources Discipline Report Addendum and Errata, SR 520, I-5 to Medina: Bridge Replacement and HOV Project*. Prepared for Washington State Department of Transportation, Olympia, WA, and Federal Highway Administration, Washington, DC.

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