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

Navigable Waterways Discipline Report Addendum and Errata

Washington State Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

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

Navigable Waterways Discipline Report Addendum and Errata

Prepared for

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Washington State Department of Transportation

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Acronyms and Abbreviations

EIS	environmental impact statement
FHWA	Federal Highway Administration
HOV	high-occupancy vehicle
I-5	Interstate 5
SDEIS	Supplemental Draft Environmental Impact Statement
SR	State Route
WSDOT	Washington State Department of Transportation

Introduction

What is the purpose of this addendum?

This addendum to the SR 520, I-5 to Medina: Bridge Replacement and HOV Project Supplemental Draft Environmental Impact Statement (SDEIS) Navigable Waterways Discipline Report (Washington State Department of Transportation [WSDOT] 2009) presents the environmental consequences of the Preferred Alternative for the State Route (SR) 520, Interstate 5 (I-5) to Medina: Bridge Replacement and HOV Project; compares its effects on the design options A, K, and L discussed in the SDEIS for the project (WSDOT 2010); and reflects additional analyses that resulted from the public and agency comments received on the SDEIS. These analyses are shown in the context of the Preferred Alternative.

The information contained in the 2009 Navigable Waterways Discipline Report on affected environment and project effects is still pertinent to the Preferred Alternative and its effects, except where this addendum specifically revises it. The discussion below supplements the Navigable Waterways Discipline Report and provides comparisons using new text and new or updated exhibits, where appropriate. Text updated to reflect the Preferred Alternative has been cross-referenced using the page numbers within the Navigable Waterways Discipline Report. Where an addendum exhibit updates or adds new data and/or different potential effects to an exhibit contained in the Navigable Waterways Discipline Report, the exhibit name is followed by "(Update to Exhibit # of the 2009 Discipline Report)."

Project design and construction information used to analyze potential effects of the Preferred Alternative on navigable waterways is included in the Description of Alternatives Discipline Report Addendum (WSDOT 2011a) and the Construction Techniques and Activities Discipline Report Addendum and Errata (WSDOT 2011b).

An errata sheet is attached to this addendum (Attachment 1) to show revisions and clarifications to the 2009 Navigable Waterways Discipline Report that do not constitute new findings or analysis.

What key issues were identified in the public and agency comments on the SDEIS and addressed in this addendum?

Key navigable waterways concerns identified in public and agency comments were as follows:

- Concern about construction effects from the placement of barges and temporary bridges and requests for more information about the barges and bridges
- Concern about restrictions on vessel movement during Opening Day of boating season and the period surrounding Opening Day

A number of comments were received on recreational boating effects and access to moorage. Key issues identified in these comments are addressed in the Recreation Discipline Report Addendum and Errata (WSDOT 2011c).

The errata sheet in Attachment 1 presents clarifications to the Navigable Waterways Discipline Report that respond to the public and agency comments.

What are the key points of this addendum?

The primary effects on navigation related to the Preferred Alternative are summarized in the bullets below. In general, many of the effects would be similar to those of SDEIS Option A, except for the differences shown in bold below. The effects of the Preferred Alternative are discussed in the sections that follow.

- Operation of the Preferred Alternative would permanently change the route that larger recreational and commercial vessels travel to get to areas of Lake Washington south of the Evergreen Point Bridge (smaller boats would still be able to pass under the bridge in several places).
- Elimination of the drawspan opening would shift vessels traveling south to either the east or west navigation channel under the Evergreen Point Bridge, with each channel remaining approximately in its current location, changing in width, but maintaining similar depth. The east navigation channel would increase in height.
- The new east navigation channel would have a clear horizontal opening (channel width) of **approximately 190 feet in between the sets of piers** (compared to 210 feet under Options A, K, and L) and 150 feet parallel to the shoreline. The east channel would also have a maximum overhead (vertical) clearance of approximately 70 feet, a water depth of 33 feet at the center of the channel, and a minimum depth of 21 feet.
- Vessels passing under the west side of the bridge would be able to use two openings: one opening under the west transition span and another opening located one span to the west of the transition span. The minimum span length under consideration for the west navigation channel openings would be 150 feet, providing a minimum horizontal opening (channel width) of approximately 130 feet in between the sets of piers. The maximum overhead vertical clearance for the west navigation channel would be **44 feet** (3 feet higher than Option A and the same as under existing conditions), with a depth of 29 feet at the center of the channel and a minimum water depth at the west edge of the channel of approximately 23 feet.
- Navigational access would be maintained during construction by ensuring that at least one navigation channel under the Evergreen Point Bridge is available at all times. The existing drawspan would not be usable once the pontoons for the new bridge have been floated into place and anchored. The navigation channel under the east transition span would remain at the existing maximum overhead vertical clearance of 57 feet for 12 to 18 months while the new east

transition span is completed. Thereafter, the new east transition span would provide a maximum clearance of 70 feet.

- The planned placement of anchors would require a 200-foot clear zone from each side of the bridge, which is not a change from the required clear zone around the existing bridge. The anchors themselves extend further from the bridge, ranging from about 225 feet to about 800 feet, but their 200-foot depth would generally not pose a navigation hazard.
- As with the SDEIS Options A and L (the options with bascule bridges), under the Preferred Alternative, the Lake Washington Ship Canal would close for a total of 6 days, spread out over at least 9 days. An additional 6 weeks of limited navigation restrictions may be necessary, depending on the final treatment of the bridge deck (grated versus concrete). The U.S. Coast Guard would notify mariners of these navigational restrictions through its "Local Notices to Mariners."

What is the SR 520, I-5 to Medina: Bridge Replacement and HOV Project?

The SR 520, I-5 to Medina: Bridge Replacement and HOV Project 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 NE in Yarrow Point. It would replace the vulnerable Evergreen Point Bridge (including the west and east approach structures) and Portage Bay Bridge, as well as the existing local street bridges across SR 520. The project would complete the regional HOV lane system across SR 520, as called for in regional and local transportation plans.

What is the Preferred Alternative?

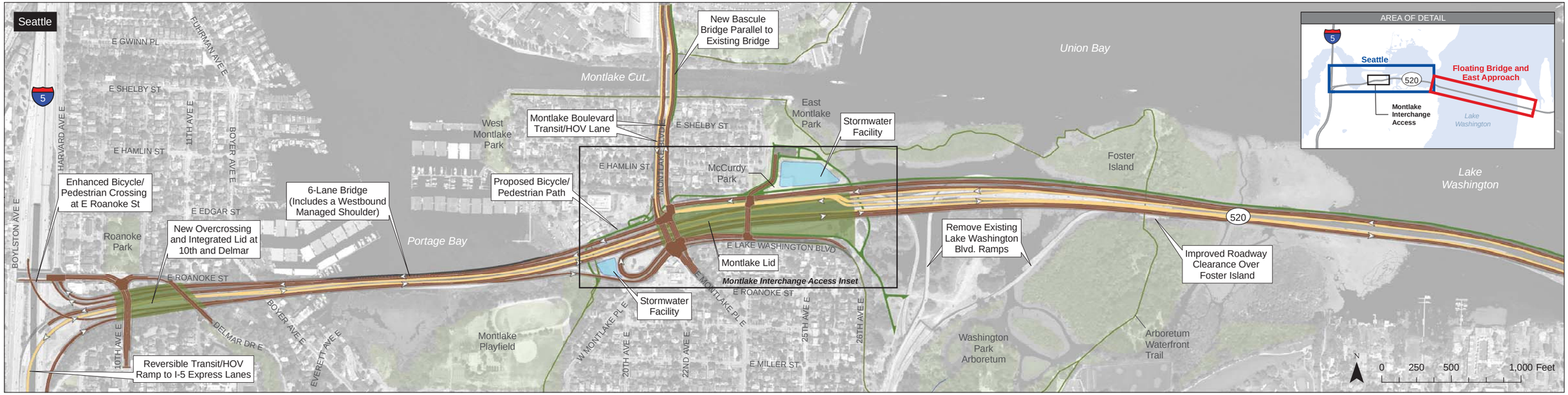
The new SR 520 corridor would be six lanes wide (two 11-foot-wide outer general-purpose lanes and one 12-foot-wide inside HOV lane in each direction), with 4-foot-wide inside shoulders and 10-foot-wide outside shoulders across the floating bridge. The typical roadway cross-section across the floating bridge would be approximately 116 feet wide, compared to the existing width of 60 feet. In response to community interests expressed during public review of the January 2010 SDEIS, the SR 520 corridor between I-5 and the Montlake interchange would operate as a boulevard or parkway with a posted speed limit of 45 miles per hour and median planting across the Portage Bay Bridge. 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. Exhibit 1 highlights the major components of the Preferred Alternative.

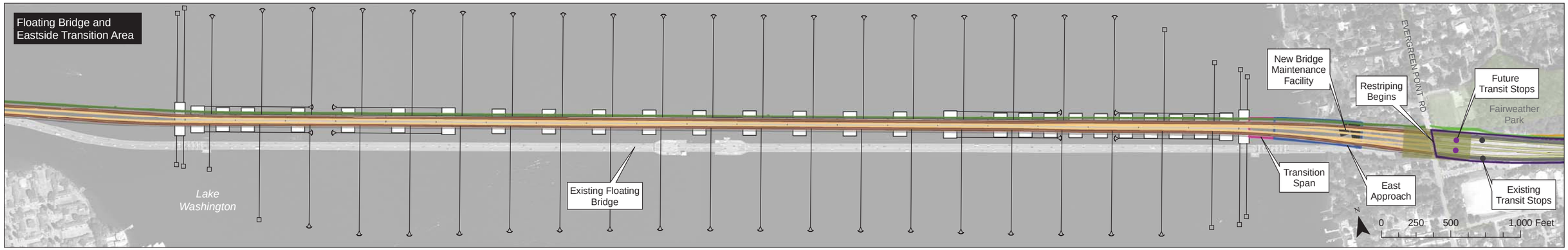
The Preferred Alternative would include the following elements:

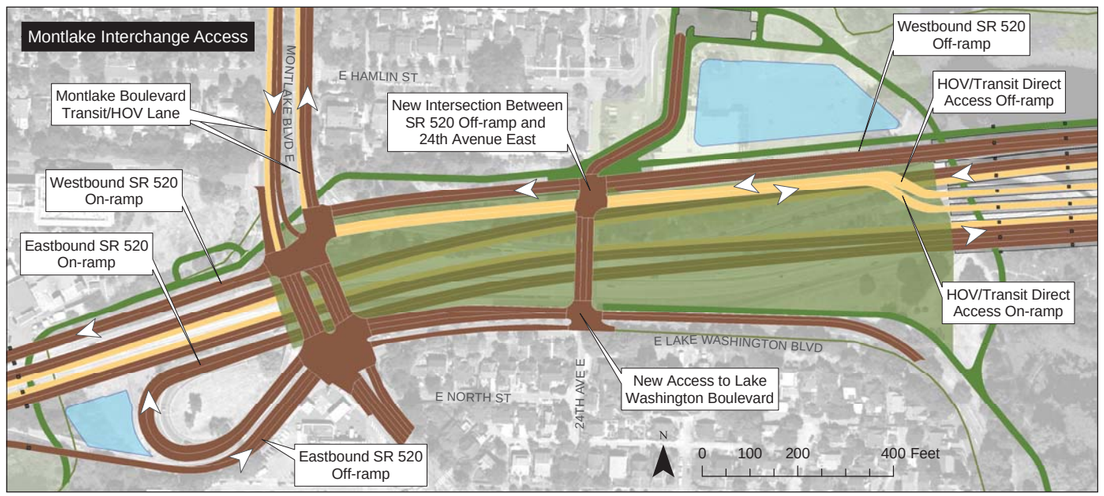
- An enhanced bicycle/pedestrian crossing adjacent to the East Roanoke Street bridge over I-5

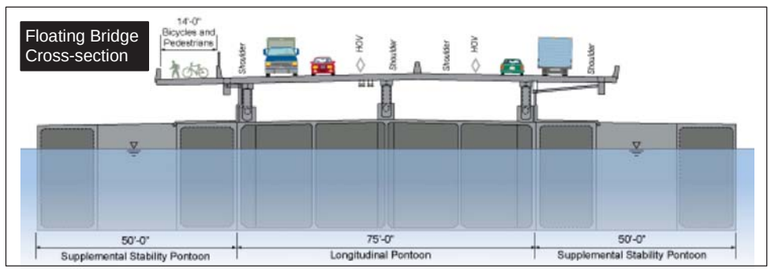
- Reversible transit/HOV ramp to the I-5 express lanes, southbound in the morning and northbound in the evening
- New overcrossings and an integrated lid at 10th Avenue East and Delmar Drive East
- A six-lane Portage Bay Bridge with a 14-foot-wide westbound managed shoulder that would be used as an auxiliary lane during peak commute hours
- An improved urban interchange at Montlake Boulevard integrated with a 1,400-foot-long lid configured for transit, pedestrian, and community connectivity
- A new bascule bridge across the Montlake Cut that provides additional capacity for transit/HOV, bicycles, and pedestrians
- Improved bridge clearance over Foster Island and the Arboretum Waterfront Trail
- A new west approach bridge configured to be compatible with future high-capacity transit (including light rail)
- A new floating bridge with two general-purpose lanes, and one HOV lane in each direction
- A new 14-foot-wide bicycle/pedestrian path with scenic pull-outs along the north side of the new Evergreen Point Bridge (west approach, floating span, and east approach), connecting regional trails on both sides of Lake Washington
- A new bridge maintenance facility and dock located underneath the east approach of the Evergreen Point Bridge
- Re-striped and reconfigured roadway between the east approach and 92nd Avenue NE, tying in to improvements made by the SR 520, Medina to SR 202: Eastside Transit and HOV Project
- Design features that would also provide noise reduction including reduced speed limit on Portage Bay Bridge, 4-foot concrete traffic barriers, and noise absorptive materials applied to the inside of the 4-foot traffic barriers and lid portals. Quieter concrete pavement would also be used for the new SR 520 main line, and noise walls where recommended by the noise analysis and approved by affected property owners would be included in the design
- Basic and enhanced stormwater treatment facilities

Exhibit 2 summarizes the Preferred Alternative design compared to the existing corridor elements, and compares the Preferred Alternative to design options A, K, and L as described in the SDEIS. For a more detailed description of the Preferred Alternative, see the Description of Alternatives Discipline Report Addendum (WSDOT 2011a).









I-5 to Medina Project Elements

- Column
- Anchor and Cable
- Existing Regional Bicycle/Pedestrian Path
- General-Purpose Lane
- HOV, Direct Access, and/or Transit-Only Lane
- Westbound Managed Shoulder
- Proposed Bicycle/Pedestrian Path
- East Approach
- Transition Span
- Restriping Area
- Stormwater Treatment Facility
- Lid
- Pontoon

Medina to SR 202 Project Elements

- General-Purpose Lane
- HOV Lane
- Bike Path
- Points Loop Trail
- Medina to SR 202 Project Lid

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 1. **Preferred Alternative Project Elements**

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. The bridge would include direct-access ramps to and from the Eastside. Access would be provided to Lake Washington Boulevard via a new intersection at 24th Avenue East.	Interchange location similar to Option A. Lid would be approximately 75 feet longer than previously described for Option A, and would be a complete lid over top of the SR 520 main line, which would require ventilation and other fire, life, and safety systems. Transit connections would be provided on the lid to facilitate access between neighborhoods and the Eastside. Montlake Boulevard would be restriped for two general-purpose lanes and one HOV lane in each direction between SR 520 and the Montlake Cut.
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.

When will the project be built?

Construction for the SR 520, I-5 to Medina project is planned to begin in 2012, after project permits and approvals 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 (the Evergreen Point Bridge including the west and east approaches, and Portage Bay Bridge) would be built in the first stages of construction, followed by the less vulnerable

components (Montlake and I-5 interchanges). Exhibit 3 provides an overview of the anticipated construction stages and durations identified for the SR 520, I-5 to Medina project.

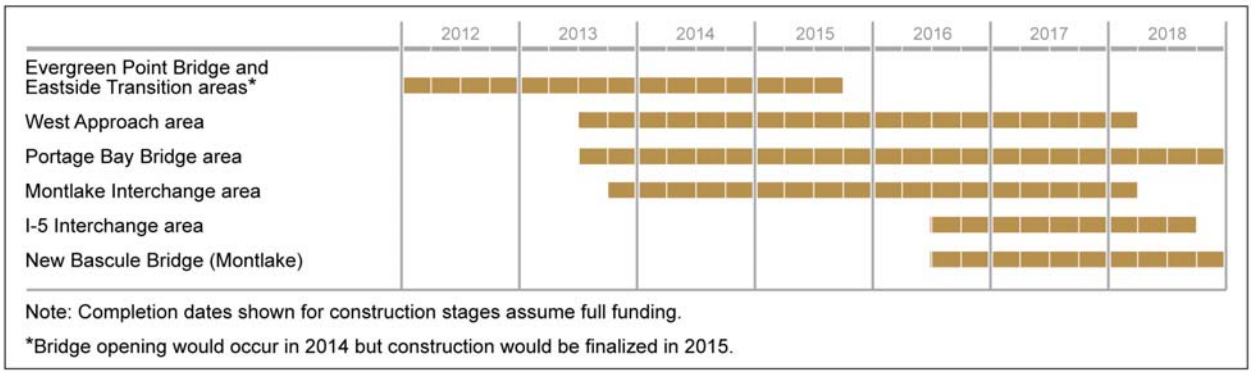


Exhibit 3. Preferred Alternative Construction Stages and Durations

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. 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. Therefore, this discipline report addendum addresses only the effects anticipated as a result of the updated construction schedule.

Are pontoons being constructed as part of this project?

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 at Concrete Technology Corporation in the Port of Tacoma, and if available, at the new pontoon construction facility located on the shores of Grays Harbor in Aberdeen, Washington. Final construction locations will be identified at the discretion of the contractor. 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 2011b).

Affected Environment

No updates were needed for the descriptions of existing navigable waterways and restrictions to navigation in the study area. Pages 17 to 19 of the Navigable Waterways Discipline Report list the waterways in the study area. See Exhibit 8 in the Navigable Waterways Discipline Report for the location of many of these waterways. Pages 19 to 28, including Exhibits 9 through 15, describe the existing characteristics of these waterways, including restrictions on navigation in the study area. Discipline report Exhibits 12 and 15 diagram those restrictions for Puget Sound to Lake Washington bridges and for Lake Washington bridges, respectively.

Exhibit 4 updates 2009 discipline report Exhibit 17, Summary of Bridge Openings for Vessel Passage, to include 2009 data. Additionally, the analyst reviewed WSDOT's bridge opening logs for the Evergreen Point Bridge drawspan for 2008 and 2009 to determine the types of vessels requiring passage. Approximately half of the openings in 2008 and 2009 were for barges and/or barge cranes, which are able to adjust the height of onboard equipment.

Exhibit 4. Summary of Bridge Openings for Vessel Passage (Update to Exhibit 17 of the 2009 Discipline Report)

	Total Number of Bridge Openings			
		Montlake Bridge		
Year	Evergreen Point Bridge	Opening West	Opening East	University Bridge
2009	12[a]	1,171	1,178	3,488
2008	13[b]	1,040	1,067	3,422
2007	6	1,552	1,621	3,573
2006	10	1,444	1,577	3,617
2005	3	1,490	1,593	3,647
2004	4	1,748	1,790	3,806
2003	0	1,724	1,751	3,687
2002	4	1,646	1,806	3,592
2001	5	ND	ND	3,713
2000	6	ND	ND	3,390
1999	6	ND	ND	3,468
1998	11	ND	ND	4,049
1997	13	ND	ND	ND
1996	3	ND	ND	4,213
1995	14	ND	ND	ND

ND = no data
[a] While initial data provided by WSDOT showed 20 non-maintenance openings in 2009, review of WSDOT's bridge opening logs showed that eight openings in July 2009 were for not for vessel passage, so the actual number of openings for vessel passage in 2009 was 12.
[b] Review of WSDOT's bridge opening logs showed 13 openings for vessel passage in 2008 rather than the 10 shown in the Navigable Waterways Discipline Report.
Sources: WSDOT Bridge Opening Logs (WSDOT 2010). Personal communications: Greg Funk, Seattle Department of Transportation (SDOT), June 2010; Ed Mortensen, SDOT, December 2008; Heather Haley, WSDOT Northwest Region Bridge Maintenance, June 2010 and December 2008.

Current vessel traffic (other than bridge openings) and future development plans for the navigable waters in the study area were not updated for this addendum. The information in the Navigable Waterways Discipline Report is still relevant (see pages 28 to 38 of the 2009 Navigable Waterways Discipline Report).

Additional analysis of recreational moorage was conducted for the Final EIS and is included in the Recreation Discipline Report Addendum and Errata (WSDOT 2011c).

Potential Effects

The Navigable Waterways Discipline Report provides a detailed discussion of effects of the No Build Alternative and Option A, K, and L (see pages 39 through 49 of the 2009 Navigable Waterways Discipline Report). The discussion below supplements the Navigable Waterways Discipline Report and discloses the effects of the Preferred Alternative, comparing it with the No Build Alternative and the SDEIS options using new text and new or updated exhibits where appropriate.

How would construction of the Preferred Alternative affect navigable waterways?

Navigation effects of project construction for the Preferred Alternative would be similar to those described for Option A in the Navigable Waterways Discipline Report (see pages 39 through 46 of the 2009 Navigable Waterways Discipline Report), except where noted in the description below. As with Option A, construction of the Preferred Alternative would involve a number of construction techniques and scheduling that would affect navigation in the study area.

Construction within the SR 520 Corridor

Bridge construction and demolition of existing bridge structures would be staged from construction work bridges and barges. Work bridges are required when water depth is too shallow to allow barge-mounted cranes to be used and would be built to allow equipment access over the water for construction. The typical layout of a construction work bridge is a 30-foot-wide structure with heavy timber decking supported by steel beams. Depending on location, staging would occur on land or from barges. Construction would also involve sheet pile walls (temporary walls typically used in areas with high ground water or in underwater situations) and cofferdams (temporary, watertight enclosures built in the water and pumped dry to create a work environment for construction below the water surface). Construction stages affecting navigable waterways would have varying durations. Construction effects on navigation within the SR 520 corridor and their expected durations are described below by geographic area. Additional construction scheduling and sequencing information has been developed since publication of the SDEIS and is reflected in this addendum. Exhibit 5 summarizes the restrictions on navigation from major construction activities that affect navigable waterways under the Preferred Alternative.

Portage Bay Bridge Area

As with Option A, work bridges would be constructed along both the south and north sides of the existing Portage Bay Bridge. Finger piers constructed perpendicular to the existing bridge would provide access to the existing and proposed bridge columns.

Exhibit 5. Construction Effects of the Preferred Alternative on Navigation

Area	Preferred Alternative Likely Construction Activities	Approximate Duration of Construction	Effects
Portage Bay Bridge	Work bridges and finger piers	64 to 72 months	Work bridges would restrict vessel access in the immediate vicinity of the bridge. Limited or no vessel access to and from areas south of the Portage Bay Bridge. Access to some Queen City Yacht Club visitor slips could also be affected.
Montlake Cut	Use of barges, to install new bascule bridge components. Use of cofferdams, and/or sheet pile walls would not limit navigation.	31 months	Complete closure of a portion of the Lake Washington Ship Canal for two 24-hour periods and two weekends, for a total of 6 days of closure spread over a period of at least 9 days. An additional 6 weeks of limited navigation restrictions may be necessary, depending on the final treatment of the bridge deck (grated versus concrete).
West Approach Area and West Navigation Channel	Use of barges and/or work bridges	57 months	Closure of navigation channel for a total of 158 days spread out over the duration of construction in this area, during which, the east navigation channel would be open. Restrictions to Arboretum shoreline access.
Evergreen Point Bridge Drawspan	Existing midspan drawbridge would be permanently removed once pontoons for the new floating bridge are anchored.		
East Navigation Channel	Use of barges	37 months	Existing midspan drawbridge would be permanently removed during construction. Closure of navigation channel for a total of 214 days spread out over the duration of construction in this area, during which, the west navigation channel would be open.

Source: WSDOT (2010).

Construction durations include testing of new systems and facilities, but do not include mobilization or closeout activities. Mobilization includes material procurement, preparing construction staging areas, and moving equipment to the site. Closeout includes demobilization of staging areas.

Construction work bridges in Portage Bay would restrict the use of recreational vessels such as canoes or kayaks in the immediate vicinity of the work bridges and would limit access to and from south Portage Bay. Navigation will be restricted underneath the work bridges. Private moorage slips in south Portage Bay and several Queen City Yacht Club slips may be unavailable for use construction. WSDOT will work with the individual owners and tenants whose moorage or boat access is affected by construction work bridges. See the Land Use, Economics and Relocations Discipline Report Addendum and Errata (WSDOT 2011d) for further discussion. See the Recreation Discipline Report Addendum and Errata (WSDOT 2011c) for discussion of recreational boating.

Montlake Area

Overall, construction of the new bascule bridge would require approximately 31 months, with navigation effects similar to Option A. Construction of the new bascule bridge abutments would use sheet pile walls and cofferdams. The abutments would be constructed from land, avoiding any closure or navigation limitation in the Montlake Cut. Installation of the bascule bridge components spanning the Montlake Cut would likely require complete closure of that portion of the Lake Washington Ship Canal for two 24-hour periods and two weekends, for a total of 6 days of closure spread over a period of at least 9 days. During the closures, barges would be used to install the bridge components. Barges may be anchored in the Montlake Cut for that effort or may be maneuvered using tugboats.

If the bascule bridge is designed to have a concrete deck, the deck would be poured after the overwater structures are installed. Each bridge span would be poured separately, and each span would require a 3-week curing period (approximately 6 weeks total) during which, the bascule bridge would not be able to be opened and may restrict passage to vessels with a vertical clearance of less than 46 feet.

West Approach Area, Floating Bridge, and East Approach Area

Construction work bridges would be constructed on both sides of the west approach. The west approach work bridges would extend from the east shore of Montlake, across the water to Foster Island, then east to where water depth is approximately 16 feet. Finger piers would allow access from the work bridges to the existing and proposed columns. If possible, barges would be used in certain locations to support bridge construction and demolition.

Navigation will be restricted underneath the work bridges in Union Bay and Lake Washington. Where feasible, WSDOT will work to provide limited navigation passage underneath the work bridges in the Arboretum area to provide canoe and kayak access to the Arboretum shoreline. However, recreational vessels may be restricted from passing under the work bridges. Vessels would still have access to the docks on the north shore of Madison Park. Work bridges in the west approach area and any barges for construction staging of the floating bridge would be located within the limits of the construction defined for the project (see Chapter 3 in the Final EIS). See the Recreation Discipline Report Addendum and Errata for further discussion of recreational boating, including hand-carry boat launch sites.

The existing midspan drawbridge on the Evergreen Point Bridge would not be usable once the pontoons for the new bridge have been floated into place and anchored. During construction of the floating bridge and east approach, the navigation channel beneath the east transition span would be the existing maximum overhead vertical clearance of 57 feet for 12 to 18 months before it would be increased (see "How would operation of the Preferred Alternative affect navigable waterways?" below).

Evergreen Point Bridge Navigation Channels

The west and east navigation channels of the Evergreen Point Bridge would be closed during some construction periods. Exhibit 6 shows expected closures of the east and west transition spans, based on additional construction scheduling and sequencing information that was developed after publication of the SDEIS. During these closures, other openings of varying heights would still be available for vessels to pass under the bridge. WSDOT would maintain at least one of the two navigational channels open at all times.

Exhibit 6. Estimated East and West Channel Closures During Construction of the Preferred Alternative

Effect / Year	West Navigation Channel	East Navigation Channel
Months of construction in vicinity of channel	31 months for north half and 40 months for south half	42 months
Expected Number of Days of Closure During each Year of Construction		
2012	56	105
2013	48	68
2014	14	10
2015	32	31
2016	8	0
Total	158	214

Source: WSDOT (2010).

Note:
Construction durations include testing of new systems and facilities but do not include mobilization or close-out activities. Mobilization includes material procurement, preparing construction staging areas, and moving equipment to the site. Close-out includes demobilization of staging areas.
East and west navigation channels would not be closed concurrently. WSDOT would keep at least one of the two navigation channels open at all times.

Pontoon Towing and Barge Movement

Coastal and International Waters

Construction effects of the Preferred Alternative in coastal and international waters would be similar to those described for SDEIS Option A (pages 42 to 43 of the 2009 Navigable Waterways Discipline Report). The U.S. Coast Guard has recommended that vessels moving through international waters off the coast of Washington travel at least 25 miles offshore. Ocean-going tugs moving pontoons from Grays Harbor north to installation locations would follow international rules of right-of-way and would likely follow voluntary tow lanes developed through this area. The movement of other vessels would not be substantially limited, even though they might have to maneuver with respect to these tugs during transport. Such maneuvering, which is a regular part of vessel movement in these waters, would not constitute a discernible effect on navigational uses.

Puget Sound

Construction effects in Puget Sound would be similar to those described for Option A (see page 43 of the 2009 Navigable Waterways Discipline Report). The U.S. Coast Guard Sector Seattle Vessel Traffic

Service regulates vessel traffic in Puget Sound, monitoring and directing vessel movements to maintain safety and to minimize shipping interruptions and delays. Commercial and industrial entities use Puget Sound extensively. It is unlikely that transporting pontoons to Puget Sound would require any temporary closures of navigation channels because those channels are sized to accommodate a substantial number of vessels throughout the year.

Lake Washington Ship Canal to the Evergreen Point Bridge

Bridge pontoons would be moved into the Lake Washington Ship Canal via the large locks; the small locks would still be available for vessel passage during that time. Pontoon movement would occur from January through the end of October. Drawspan bridges in the Lake Washington Ship Canal—Ballard, Fremont, University, and Montlake—would likely require opening to accommodate the movement of at least some construction barges.

The Montlake Cut, which is 100 feet wide at full depth, would be able to accommodate pontoon transport, although travel of other vessels through the cut would be limited during transport of a pontoon through the cut.

Overall, construction-related barge trips would not interfere with the movement of commercial or recreational vessels but may disturb tribal fishing activities. See the Environmental Justice Discipline Report Addendum and Errata for discussion about project effects on tribal fishing activities and the Ecosystems Discipline Report Addendum and Errata for a discussion of effects of barge and pontoon movement on fisheries resources that could affect tribal fishing opportunities.

Construction Effects of the Preferred Alternative Compared to the SDEIS Options

Exhibit 7 summarizes the construction effects of the Preferred Alternative and Options A, K, and L on navigable waterways.

Exhibit 7. Summary Comparison of Construction Effects of the Preferred Alternative and the SDEIS Options

Effect	Preferred Alternative	Option A	Option K	Option L
Recreational vessel restrictions in Portage Bay	All options and Preferred Alternative would construct work bridges on both sides of the Portage Bay Bridge and would restrict the use of recreational vessels such as canoes or kayaks in the immediate vicinity of the bridge during construction.			
Recreational vessel restrictions in the west approach area	All options and Preferred Alternative would construct work bridges from the east shore of Montlake, across the water to Foster Island, then east of Foster Island for work on the new west approach structures. The use of recreational vessels such as canoes or kayaks would be restricted around work bridges during construction. Vessels would have water access within the Arboretum and to the northern shore of Madison Park.			
Floating bridge navigation channel clearance reductions	Under all options and Preferred Alternative, the west and east navigation channels of the Evergreen Point Bridge would be closed during certain periods. During these reductions, there would be other openings of varying heights available. WSDOT would maintain at least one of the navigation channels open at all times.			
Floating bridge drawspan closure	Under all options and Preferred Alternative, the Evergreen Point Bridge drawspan would be permanently blocked once the new pontoons were floated into place.			

Exhibit 7. Summary Comparison of Construction Effects of the Preferred Alternative and the SDEIS Options

Effect	Preferred Alternative	Option A	Option K	Option L
Montlake Cut closures	The Preferred Alternative would require complete closure of the Montlake Cut for two 24-hour periods and two full weekends (total of 6 days) for installation of the new bascule bridge. An additional 6 weeks of limited navigation restrictions may be necessary, depending on the final treatment of the bridge deck (grated versus concrete).	Option A would require complete closure of the Montlake Cut for two 24-hour periods and two full weekends (total of 6 days) for installation of the new bascule bridge. An additional 6 weeks of limited navigation restrictions may be necessary, depending on the final treatment of the bridge deck (grated versus concrete).	Construction of the Option K tunnel would not affect the movement of vessels in the Montlake Cut.	Option L would require complete closure of the Montlake Cut for two 24-hour periods and two weekends (total of 6 days) for installation of the new bascule bridge. An additional 6 weeks of limited navigation restrictions may be necessary, depending on the final treatment of the bridge deck (grated versus concrete).
Floating bridge navigation channel closures	Under all options and Preferred Alternative, construction of the new floating bridge would be staged so that the west and east navigation channels would not be closed on the same days. A Local Notice to Mariners would be distributed electronically by the Coast Guard to alert local commercial and recreational boating communities of all construction-related closures in Lake Washington and the Montlake Cut. The notice would allow all potentially affected vessels time to relocate temporarily to prevent being blocked during the bridge construction period.			

How would operation of the Preferred Alternative affect navigable waterways?

Permanent effects of the Preferred Alternative on navigable waterways would be similar to those described for SDEIS Option A (see pages 46 to 49 of the Navigable Waterways Discipline Report); however, the width of the east transition span at full height would be 190 feet rather than 210 feet. This would be 17 feet narrower than the existing channel. Effects are described by area below and are shown in Exhibit 8.

Exhibit 8. Changes in Navigational Restrictions in Lake Washington with the Preferred Alternative

Bridge	Existing		Preferred Alternative	
	Width (ft)	Height (ft)	Width (ft)	Height (ft)
New Montlake Bascule Bridge	N/A	N/A	100	N/A, drawspan
Evergreen Point Bridge:				
West transition span	206	44	130	44
Drawspan	200	N/A	Drawspan removed	Drawspan removed
East transition span	207	55 to 64	190	70

NA = not applicable

Portage Bay Bridge Area

The Preferred Alternative would not affect operation of navigable waterways from the Lake Washington Ship Canal to the Montlake Bridge. Once construction is complete, there would be no changes to navigation associated with the project. No permanent effects on moorage or recreational boat access would be expected (see the Land Use, Economics, and Relocations Discipline Report Addendum and Errata and the Recreation Discipline Report Addendum and Errata).

Montlake Area

In the Montlake area, the Preferred Alternative would add a bascule bridge parallel to the existing Montlake Bridge. The operational effects on navigation would be minimal due to the similarity of design parameters of the existing Montlake Bridge and coordination of bridge openings of the existing and proposed bridges. There would be no new vertical or horizontal clearance restrictions associated with the project; however, the existing restrictions associated with the Montlake Bridge would remain.

West Approach Area, Floating Bridge, and East Approach Area

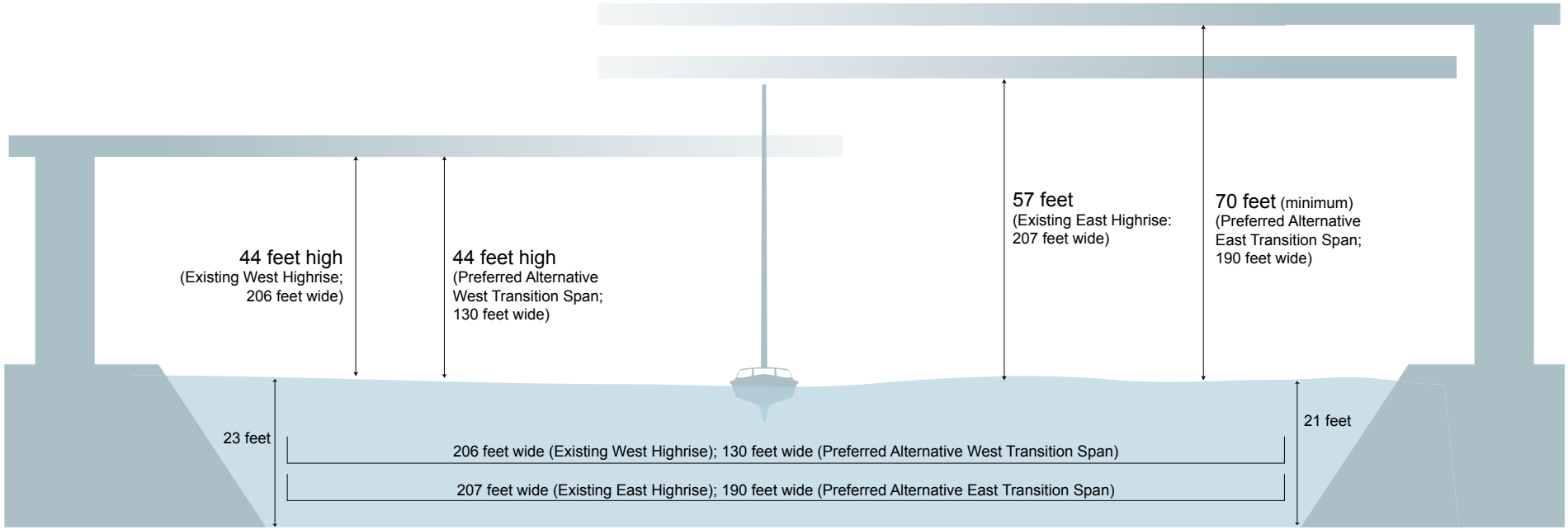
The Preferred Alternative would affect navigation in Lake Washington south of the Evergreen Point Bridge by eliminating the drawspan opening on the Evergreen Point Bridge, permanently prohibiting the passage of any vessel with a mast taller than 70 feet. WSDOT's bridge opening logs for the drawspan show that a large proportion of openings in the past 2 years were for barges and barge cranes (WSDOT 2010). These vessels have the ability to reduce their height, so they would be able to pass under the new east navigation channel.

Evergreen Point Bridge Navigation Channels

Operational effects of the Preferred Alternative would include changes to the navigation restrictions for the Evergreen Point Bridge, as shown in Exhibit 9. The new east and west navigation channels would remain in approximately the same locations as the current channels.

The west navigation channel under the future bridge spanning Lake Washington would serve recreational and small vessel traffic. This channel would have two openings—one under the transition span and another one under the span west of the transition span. The horizontal clearance (width) of the widest navigation channel at the west transition span would decrease from 206 feet to 130 feet in between the sets of piers, with 44 feet of maximum overhead clearance. The maximum vertical clearance under the west transition span would be the same as it is today. The west navigation channel would have a depth of approximately 29 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 east navigation channel under the future bridge spanning Lake Washington would serve as the main access channel for commercial and recreational vessel traffic. The east navigation channel would be located under the east transition span and would have a clear opening (width) of



Note: The dimensions shown here represent a 45-foot-long sailboat with a 60-foot mast height and a 7-foot draft. Depth and width not to scale.

Exhibit 9. **Existing and Preferred Alternative Navigation Restrictions for the Evergreen Point Bridge** (Update to Exhibit 23 of the 2009 Discipline Report)

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approximately 190 feet in between the sets of piers (decreasing by 17 feet from its existing 207 feet) and 150 feet parallel to the shoreline. The maximum vertical clearance of the east transition span navigation channel would increase from its existing 57 feet to 70 feet under the Preferred Alternative. The navigation channel would be between 6 and 15 feet higher depending on where in the channel a vessel crossed. It would have a depth of 33 feet at the center and a minimum depth of 21 feet.

Operation Effects of the Preferred Alternative on Navigable Waterways Compared to the SDEIS Options

Exhibit 10 summarizes the operational and permanent effects of the Preferred Alternative and Options A, K, and L on navigable waterways.

Exhibit 10. Summary Comparison of Operation Effects of the Preferred Alternative and the SDEIS Options

Effect	Preferred Alternative	Option A	Option K	Option L
New vessel height restriction of floating bridge	Under all options and the Preferred Alternative, the draw span would be removed, and the east transition span would be 15 feet higher than it is today. The changes would impose a height restriction of 70 feet for vessels passing under the new Evergreen Point Bridge.			
Bascule bridge openings	Under the Preferred Alternative, the new bascule bridge would coordinate openings with the existing bridge and would not pose height restrictions.	Under Option A, the new bascule bridge would coordinate openings with the existing bridge and would not pose height restrictions.	Operation of the Option K tunnel would not affect navigation.	Under Option L, the new bascule bridge would coordinate openings with the existing bridge and would not impose new height restrictions on the Montlake Cut.
East navigation channel overhead clearance	The permanent effect of a height restriction for vessels passing under the new Evergreen Point Bridge has been minimized by increasing the new east navigation channel's maximum vertical clearance to 70 feet, which is similar in height to the I-90 Lake Washington east channel bridge clearance of 71 feet.			

Mitigation

What has been done to avoid or minimize negative effects on navigable waterways?

Throughout the design process, WSDOT has taken care to avoid and minimize any adverse navigation effects of the Preferred Alternative. Following are aspects and features of the Preferred Alternative design that avoid or minimize negative effects. The features generally are organized by geographic area from west to east.

- The new bascule bridge over the Montlake Cut would be designed with parameters similar to the existing Montlake Bridge and would be located adjacent to the existing bridge, thereby allowing coordinated openings that would not create additional navigation restrictions.

- The permanent effect of a height restriction for vessels passing under the replacement Evergreen Point Bridge has been minimized by essentially matching the east transition span vertical clearance (70 feet) with the 71-foot vertical clearance of the I-90 east channel bridge.
- Any vessel that can currently pass under the I-90 east channel bridge would also be able to pass under the replacement Evergreen Point Bridge.

What would be done to mitigate negative effects that could not be avoided or minimized?

Construction Mitigation

Best Management Practices

- The planned construction staging of the replacement bridge would prevent closures of the west and east navigation channels on the same days and would minimize and avoid negative effects for the duration of construction.
- The U.S. Coast Guard would electronically distribute a Local Notice to Mariners to alert local commercial and recreational boating communities of temporary navigation channel closures and restrictions. The notices would allow potentially affected vessels time to relocate temporarily to avoid the closures and restrictions during the construction period. The notices would be distributed for the following effects:
  - The temporary effect of 6 total days of complete closure of the Montlake Cut portion of the Lake Washington Ship Canal
  - Permanent closure of the Evergreen Point Bridge drawspan and the temporary effect of a 57-foot vertical restriction on vessels traveling under the bridge for 12 to 18 months

Other Construction Mitigation

WSDOT would avoid in-water barge work in Portage Bay, along the Montlake Cut, and through the Arboretum (as far east as the west side of Foster Island) during Opening Day of boating season as well as the week before and the week after Opening Day.

Mitigation measures for temporary displacement of moorage in Portage Bay are described in the Land Use, Economics, and Relocations Discipline Report Addendum and Errata.

Operation Mitigation

Compensatory Mitigation

No compensatory mitigation measures would be required. See "What has been done to avoid or minimize negative effects on navigable waterways?" above.

Other Mitigation

No other operation mitigation measures are proposed or would be warranted. See "What has been done to avoid or minimize negative effects on navigable waterways?" above.

What negative effects would remain after mitigation?

Similar to Options A, K, and L, an unavoidable adverse effect of replacing the existing Evergreen Point Bridge under the Preferred Alternative would be the permanent elimination of the drawspan and the establishment of a height restriction on vessels passing under the new bridge. However, it is likely that establishing a vessel height restriction would have no discernible effect on navigation. This conclusion is based on: (1) the ability of vessels currently using the drawspan to be able to use the future east navigational channel and (2) the absence of any major development plans by Seattle, Bellevue, or Renton along the shorelines south of the Evergreen Point Bridge. The design of the Preferred Alternative adequately provides for the navigational needs of the commercial and recreational boating communities.

References

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

Washington State Department of Transportation (WSDOT). 2010. Bridge opening logs 2008-2010. WSDOT Bridge Maintenance Office. Reviewed July 8, 2010.

WSDOT. 2009. *Navigable Waterways Discipline Report.* SR 520**:** I-5 to Medina Bridge Replacement and HOV Project. Supplemental Draft Environmental Impact Statement and Section 4(f)/6(f) Evaluation. SR 520 Bridge Replacement and HOV Program. WSDOT, Olympia, WA. December 2009.

WSDOT. 2010. *SR 520, I-5 to Medina: Bridge Replacement and HOV Project Supplemental Draft Environmental Impact Statement and Section 4(f)/6(f) Evaluation*. SR 520 Bridge Replacement and HOV Program. WSDOT, Olympia, WA. January 2010.

WSDOT. 2011a. *Description of Alternatives Discipline Report Addendum.* SR 520, I-5 to Medina: Bridge Replacement and HOV Project. WSDOT, Olympia, WA.

WSDOT. 2011b. *Construction Techniques and Activities Discipline Report Addendum and Errata.* SR 520, I-5 to Medina: Bridge Replacement and HOV Project. WSDOT, Olympia, WA.

WSDOT. 2011c. *Recreation Discipline Report Addendum and Errata.* SR 520, I-5 to Medina: Bridge Replacement and HOV Project. WSDOT, Olympia, WA.

WSDOT. 2011d. *Land Use, Economics and Relocations Discipline Report Addendum and Errata.* SR 520, I-5 to Medina: Bridge Replacement and HOV Project. WSDOT, Olympia, WA.

Attachment 1

Errata

Attachment 1
Navigable Waterways Discipline Report Errata

The following table corrects errors in and provides clarifications to the 2009 Navigable Waterways Discipline Report (WSDOT 2009).

Page	Current Text	Corrected Text/Clarification
1	The U.S. Coast Guard (Coast Guard) is responsible for identifying and maintaining navigation channels in U.S. waters, such as in Lake Washington and Puget Sound.	The U.S. Coast Guard and the U.S. Army Corps of Engineers are the two federal agencies~~is~~ responsible for identifying and maintaining navigation channels in U.S. waters, such as in Lake Washington and Puget Sound.
4	• Usual and accustomed fishing areas of tribal nations that have historically used the area's aquatic resources and have treaty rights	• Usual and accustomed fishing areas of the Muckleshoot Tribe, which has~~tribal nations that have~~ historically used the area's aquatic resources and has~~have~~ treaty rights for their protection and use
36	National Oceanic and Atmospheric Administration (NOAA) currently docks its vessels on Lake Union and has some provisions stored at Sand Point (located on the western shore of Lake Washington northeast of the University of Washington). NOAA does not use Sand Point for marine traffic often, and they have no current plans for expanded use (Stacy Gomez, NOAA, Seattle, Washington, January 2009. Personal communication).	NOAA currently docks the 60-foot research vessel "Harold W Streeter" at the Northwest Fisheries Science Center (NWFSC) in Montlake. In addition there are six smaller trailerable research vessels stored at the Montlake facility. Routine maintenance and staging is completed at the NWFSC site before and after research trips. The NWFSC is also planning for increased use of the Montlake site for operation and maintenance of vessels. NOAA ~~currently~~ docks ~~its~~ other vessels on Lake Union and has some provisions stored at its Sand Point facility (located on the western shore of Lake Washington northeast of the University of Washington). NOAA transports supplies between Sand Point and Lake Union by truck and does not use Sand Point for marine traffic often, and they have no current plans for expanded use at these facilities (Stacy Gomez, NOAA, Seattle, Washington, January 2009. Personal communication).
45	Channel clearance would be 25 feet over the water during construction of the transition span (HDR et al. 2009).	~~Channel clearance would be 25 feet over the water during construction of the transition span (HDR et al. 2009).~~

Page	Current Text	Corrected Text/Clarification
47	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 west navigation channel would have a depth of approximately ~~26~~29 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).